



General Description:

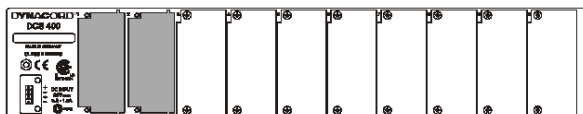
DCS 400 Series modules increase the ProAnnounce system's control capabilities in many ways. The DCS system can be expanded at any time after installation for increased functionality. The DCS control system consists of the following components:

- DCS 400 main module chassis
- DCS 401R primary system control module.
- DCS 405R extension module.
- DCS 408R relay module.
- DCS 409R relay module.
- DCS 412R logic input module.
- DCS 416R analog I/O module.
- DCS 420 monitor unit.

The ProAnnounce operating system defines the total amount of supported control inputs and outputs. A ProAnnounce installation allows integrating a maximum of up to 8 DCS 401R control modules. A single control module can host up to 12 relay boards of the types DCS 408R / DCS 409R in any sequence. In addition, it is possible to connect up to 5 logic input modules, 2 analog I/O modules, and 2 rotary encoders. In total, the ProAnnounce system can manage up to following amounts of different DCS cards:

- 8 DCS 401R control modules.
- 48 DCS 408 / DCS 409 relay modules.
- 10 DCS 412 logic input module.
- 8 DCS 416 Analog I/O module
- 1 DCS420 Monitor Unit

DCS 400 19" RACK FRAME

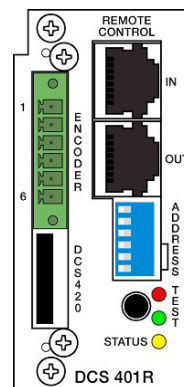


The DCS 400 is a 19" base unit with a height of 2 HU. It can host a control module as well as several relay modules, logic input modules, and analog I/O modules that are connected via internal backplane.

- 10 slots for the insertion of DCS modules.

- 4 position Phoenix type connector for power supply.
- 2 LED's on the front indicating power.
- Internal backplane with system bus.
- Internal self-resetting fuses.

DCS 401R CONTROL MODULE



The module represents the interface for relay boards, logic boards, analog level I/O-boards, a monitor module, and rotary encoders. It is inserted into slot 1 (the slot all the way on the left) on the rear of the DCS 400 rack frame. It is controlled from the DPM 4000 via RS-485 remote interface. Maximally 12 relay modules (DCS 408R / DCS 409R / DCS 408 / DCS 409), 5 logic input modules (DCS 412R, DCS 412), 2 analog I/O modules (DCS 416R / DCS 416), 2 rotary encoders and 1

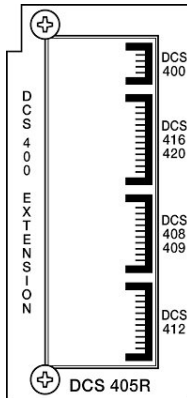
monitor module DCS 420 can be connected to a single DCS 401R control module.

- Two RJ-45 sockets for connecting the DPM 4000 and cascading several DCS 401R or DCS 401 modules.
- Galvanic isolated RS-485 port.
- Connector for 2 rotary encoders.
- Connector for DCS 420 monitor module.
- Monitoring via watchdog circuitry.
- Service-functions and testing-software for all connected modules.
- 6 binary switches for setting addresses and selecting service-functions
- 1 pen-tip pushbutton – test start.
- 3 LED's - red, yellow, green for test mode and status.
- A maximum amount of 8 modules DCS 401R or DCS 401 can be cascaded.

Specifications:

Operating voltage 24 V DC, -10 / +30%
 Operating current 25 mA to 65 mA
 Operating current at 24 V 35 mA
 Operating temperature range +5° C to +40° C
 Dimensions (W x H x D) 37.5 x 80.6 x 245 mm
 Weight 207 g

DCS 405R EXTENSION MODULE



The module is used to provide connection to another DCS 400 rack frame and /or other DCS 400 boards. This is useful in situations where there are more cards on a given DCS 401R than a single DCS 400 frame can support.

Installation Notes

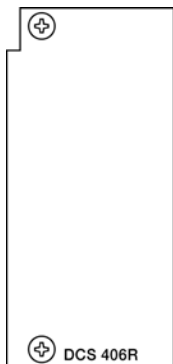
In the first DCS 400 rack frame the DCS 405R extension module always needs to be installed in the first empty slot (the slot right of any other modules installed). In the

DCS 400 extension unit – the second unit installed – the DCS 405R extension module always needs to be installed in slot 1 (the slot all the way on the left, instead of the DCS 401R).

Specifications:

Operating temperature range +5° C to +40° C
Dimensions (W x H x D) 37.5 x 80.6 x 245 mm
Weight 115 g

DCS 406R SHIELDING MODULE

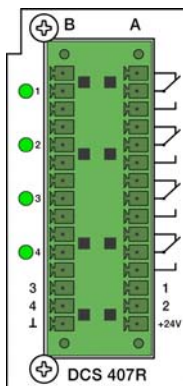


The module is meant for insertion on the rear of the DCS 400 rack frame providing shielding between DCS 408R and DCS 409R modules.

Specifications:

Dimensions (W x H x D) 37.5 x 80.6 x 245 mm
Weight 71 g

DCS 407R CONTROL RELAY MODULE



The module provides switching for audio signals (line level) or control outputs independent from the DCS 400 system.

- 4 LF-relays, each with 2 SPDT switching contacts.
- Gold-plated double-contacts for improved contact.
- Phoenix type connector for all contacts and coils.
- 4 relay control-LED's.
- Configuring the audio distributor is possible through separating wire-

bridges.

- Switchable monitor bus link.

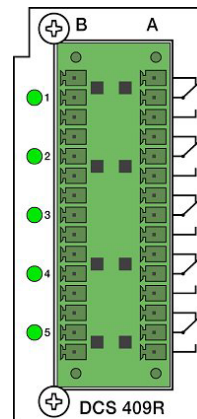
Specifications:

Operating voltage 24V DC, -10% / +30%
Operating current, all relays on 37 to 54 mA
Operating current, all relays on at 24 V 42 mA
Operating temperature range +5° C to +40° C
Dimensions (W x H x D) 37.5 x 80.6 x 245 mm
Weight 163 g

Relay Contacts:

Contacts DPDT
Contact material AgPd + 10μ Au
Contact load (real) 1A / 24V DC, 0.5A / 120V AC
Contact current max. 2A

DCS 408R / 409R CONTROL RELAY MODULES



These modules provide relay contact closures for use in switching audio or other control functions. The 408R is capable of switching of 70v or 100V speaker lines. The 409R is capable of switching line level audio signals or control outputs. The 408R can also be used to provide contact closures where higher voltages and/or current may be involved.

- 5 line relays, each with 2 switching contacts.
- Phoenix type connector for all contacts.
- 5 relay control-LED's.
- Configuring the signal distributor is possible through separating wire-bridges.
- 12 DCS relay modules can be cascaded.

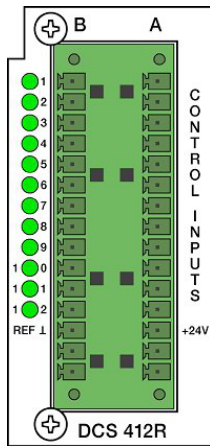
Specifications:

Operating voltage 24V DC, -10% / +30%
Operating current, relays off 5.2 mA to 7.8 mA
Operating current, relays off at 24 V 5.5 mA
Operating current, all relays on 55-130 mA
Operating current, all relays on at 24 V 60-96 mA
Operating temperature range +5° C to +40° C
Dimensions (W x H x D) 37.5 x 80.6 x 245 mm
Weight 225 g

Relay Contacts:

Contacts DPDT
Contact material AgNi 90/10
Contact load (real) 408R-2000 VA, 409R-1A

DCS 412R LOGIC INPUT MODULE



The module provides inputs for control lines, pushbuttons, switches, and sensors, allowing the evaluation of their individual status (ON / OFF) in the DPM 4000 system.

- 12 inputs.
- Selectable polarity of each input.
- Floating inputs can be realized via the separation of wire bridges.
- Separate connections for power supplies of pushbuttons, contacts and sensors.

- Phoenix type connector for all inputs.
- Maximally 5 DCS412R / DCS412 modules can be cascaded.

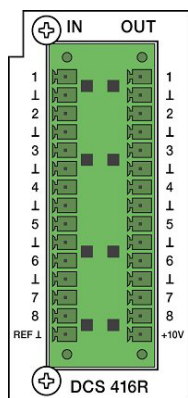
Specifications:

Operating voltage 24V DC, -10 / +30%
 Operating current, all inputs open 2.6 mA to 8.2 mA
 Operating current, all inputs at 24V 60 mA to 83 mA
 Operating temperature range +5° C to +40°C
 Dimensions (W x H x D) 37.5 x 80.6 x 245 mm
 Weight 175 g

Input Level:

Input voltage for off (Low) $U_{IN} < \pm 5$ V
 Input voltage for on (High) $U_{IN} > \pm 10$ V
 Input current at $U_{IN} = 24$ V $I_{IN} = 4.8$ mA
 Input voltage max. $U_{IN\ max} = \pm 31$ V
 Output source voltage 24V DC
 Output source current max. 90 mA

DCS 416R ANALOG I/O MODULE



The module provides analog input and output interfacing capabilities for use in monitoring and control functions. Both inputs and outputs are capable of handling 0 to 10V DC with 256 distinct levels. Potentiometers for volume control can be interfaced using the provided reference voltage output.

- 8 analog inputs.
 - Voltages of 0 to 10V DC or a potentiometer to each input.
 - Output for reference voltage 10V DC.
- 8 analog outputs 0 to 10V DC.
 - Phoenix type connector for all inputs and outputs.
 - Maximally 2 DCS 416R / DCS 416 modules can be cascaded.

Specifications:

Operating voltage 24V DC, -10 / +30%
 Operating current (max.) 160 mA
 Operating temperature range +5° C to +40°C
 Dimensions (W x H x D) 37.5 x 80.6 x 245 mm
 Weight 170 g

Inputs:

Voltage range (min. to max.) 0 V to 10 V DC
 Impedance range ext. (min. to max.) 0 to 10 kOhm
 Maximum input voltage 50 V DC

Outputs:

Voltage range (min. to max.) 0 V to 10 V DC
 Output impedance 47 Ohm
 Maximum load 2k Ohm
 Resolution of Inputs / Outputs 8 Bit
 Reference output voltage 10 V DC
 Reference output current 30 mA (max.)

DCS 420 MONITOR STATION



The DCS 420 Monitor Manager is a 2RU unit offering acoustic control and visual level metering of audio in the system. Switching and displaying of up to 250 audio signal sources, as well as, controlling the volume is carried out via front panel control switches.

THE DCS420 receives its audio feed from the monitor output of the DPM4000. DCS420 system control functions are carried out through a connection to the DCS401 controller module. The front panel controls of the DCS420 offer audio level and line control switching of either the input signal or the output signal of the system amplifiers.

With several external sound sources connected, switching is performed through the DCS 409R module. When using remote-amplifiers, switching audio signals to the monitor bus is accomplished directly inside the amplifier. The signals are transmitted via remote interconnection cables

Architecture & Engineering Specifications:

The expansion system is designed for use with the ProAnnounce system and shall enable the use of a variety of system control and output routing devices. The system shall consist of a 2RU system rack frame accommodating any one of a series of 6 expansion control modules, which slide in the rear of the unit. The rack frame shall hold up to 10 expansion cards. It shall be powered from a 24V DC source supply through a dual spade lug terminal connection. The system shall be equipped with internal self-resetting fuses. The system shall enable the use of analog or digital controls; expand the system operation to include relay operated switching and remote monitoring. The system shall also offer the ability to add a rack mounted monitor unit for in place control and monitoring of any channel.

The expansion system shall be the Dynacord ProAnnounce DCS digital control system.

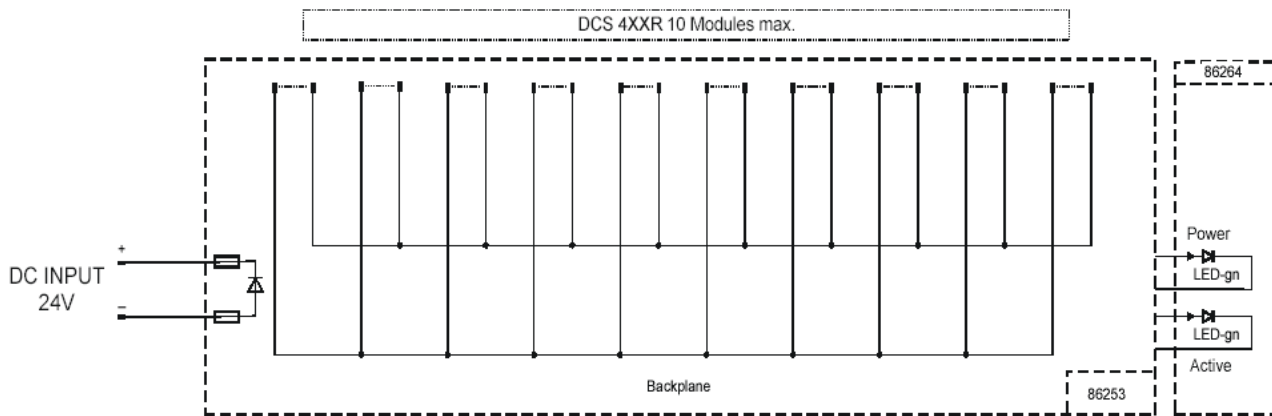
Available Accessories:

Model	Cat. No.	Description
NRS90240	121742	Volume Shaft Encoder

Ordering Information:

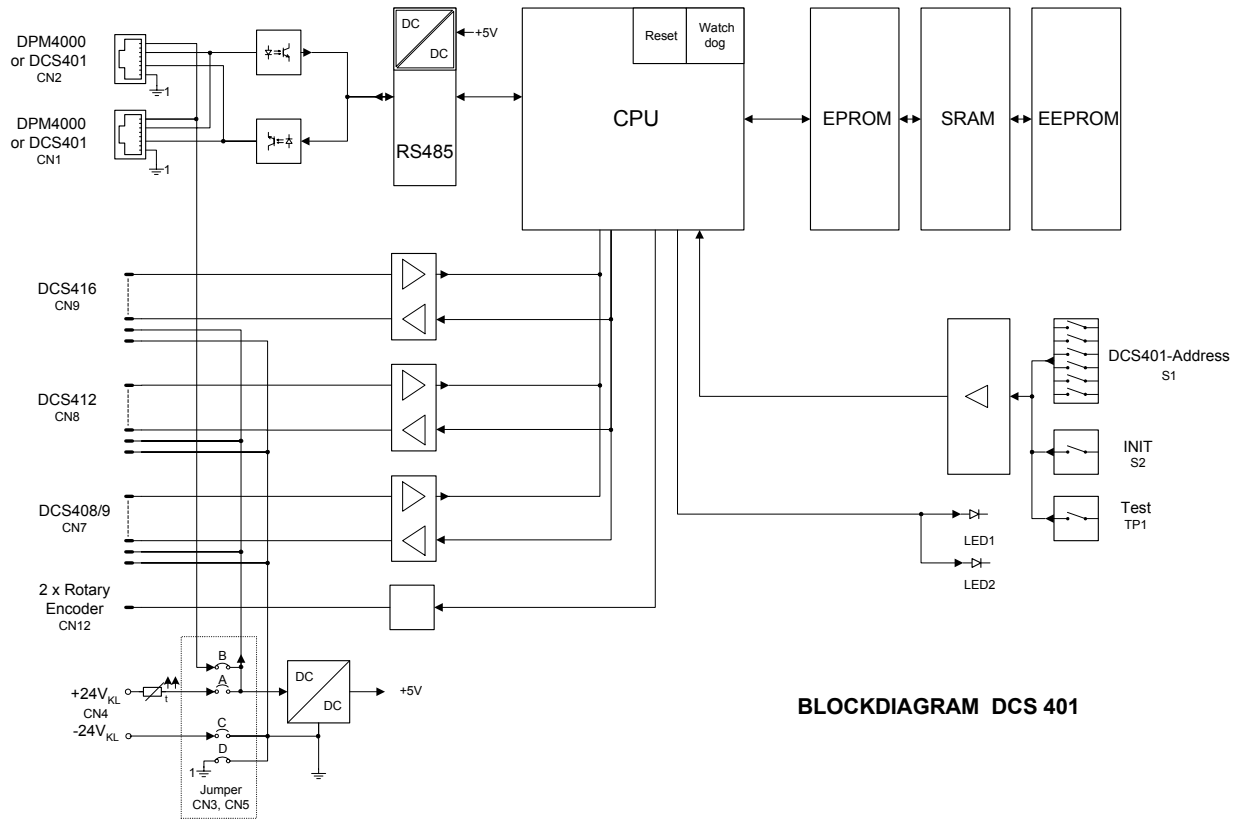
Model	Cat. No.	Description
DCS420	121753	Monitoring Unit
DCS400	121773	19" Frame for DCS Modules
DCS401R	121774	Controller Module
DCS405R	121775	Extension Module
DCS406R	121776	Shield Module
DCS407R	121777	AF-Relay Module w/Ext Control
DCS408R	121778	Lines-Relay Module
DCS409R	121779	AF-Relay Module
DCS412R	121780	Logic Input Module
DCS416R	121782	Analog I/O Module

Block Diagrams:

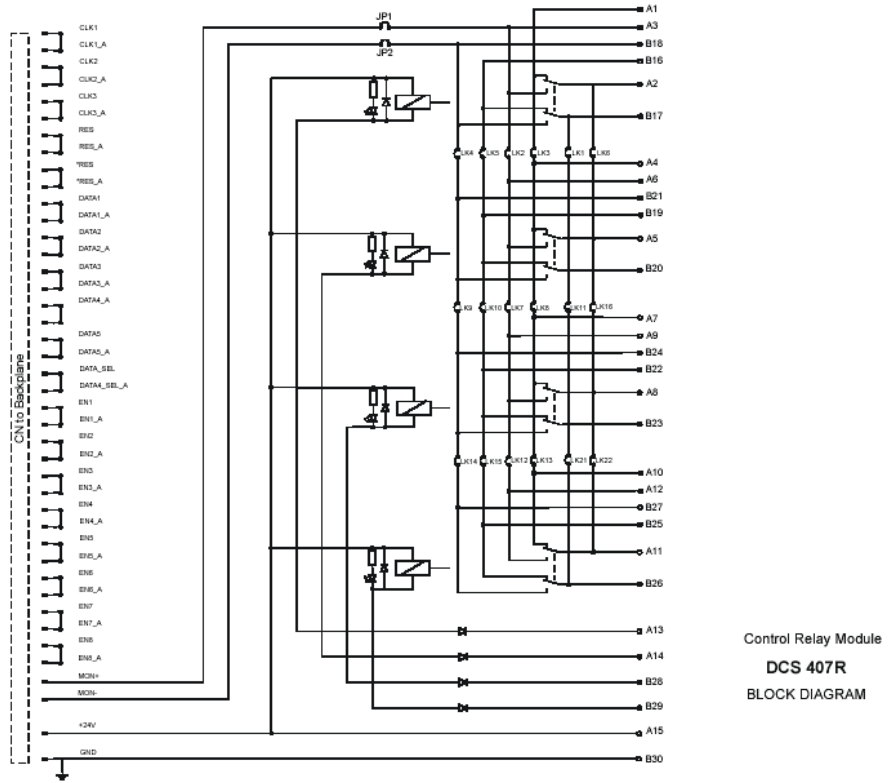


Rack Frame
DCS 400
 BLOCK DIAGRAM

Block Diagrams:

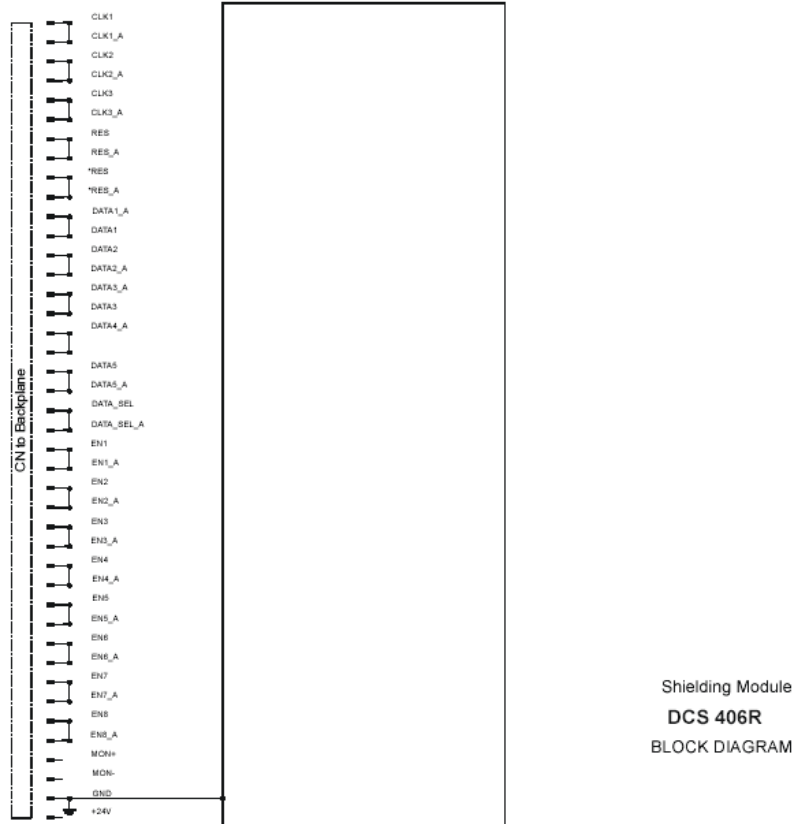
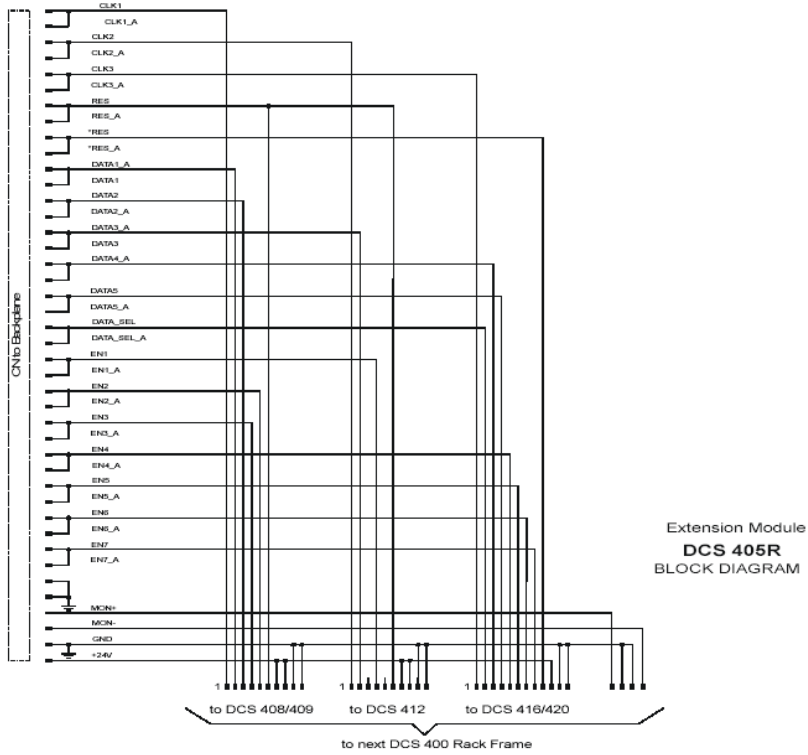


BLOCKDIAGRAM DCS 401

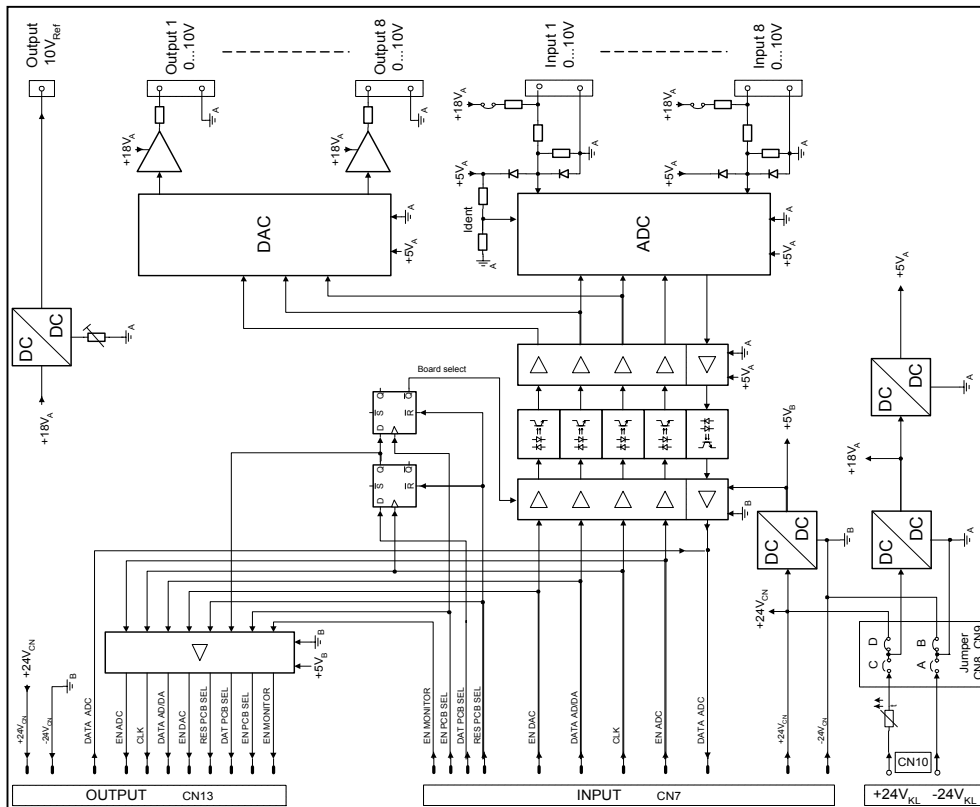
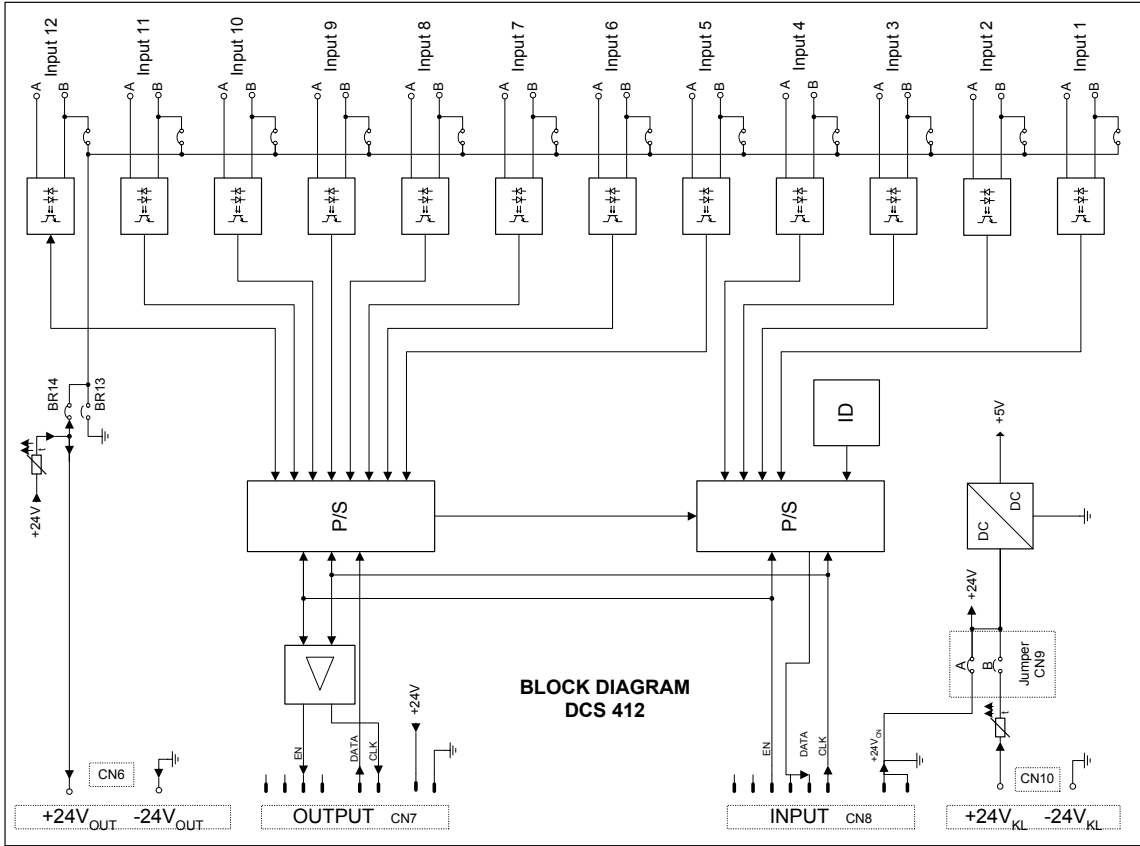


**Control Relay Module
DCS 407R
BLOCK DIAGRAM**

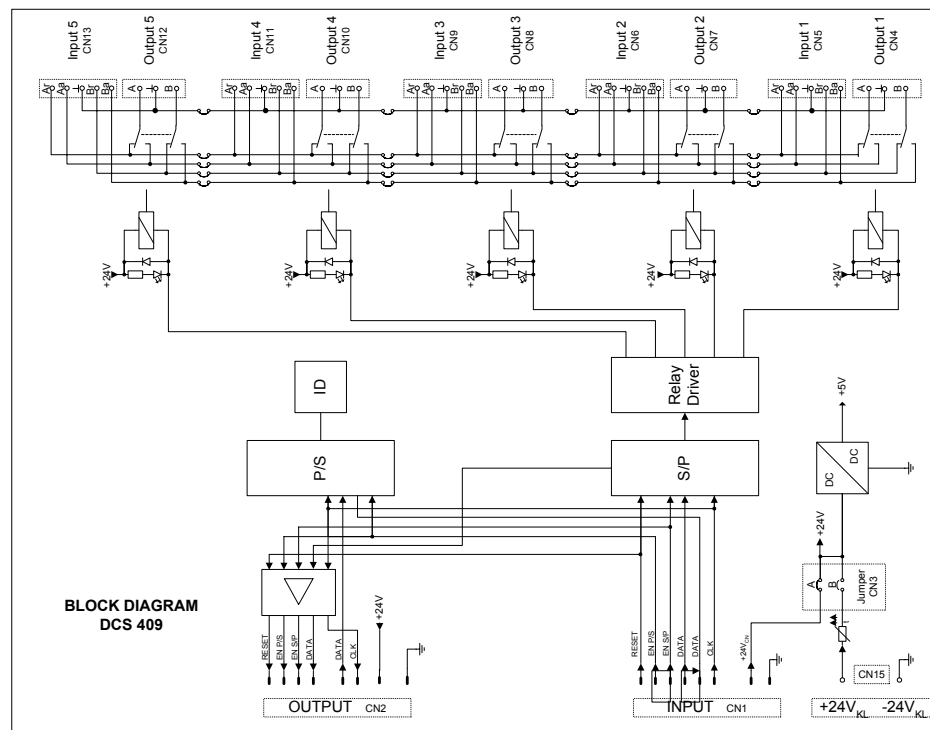
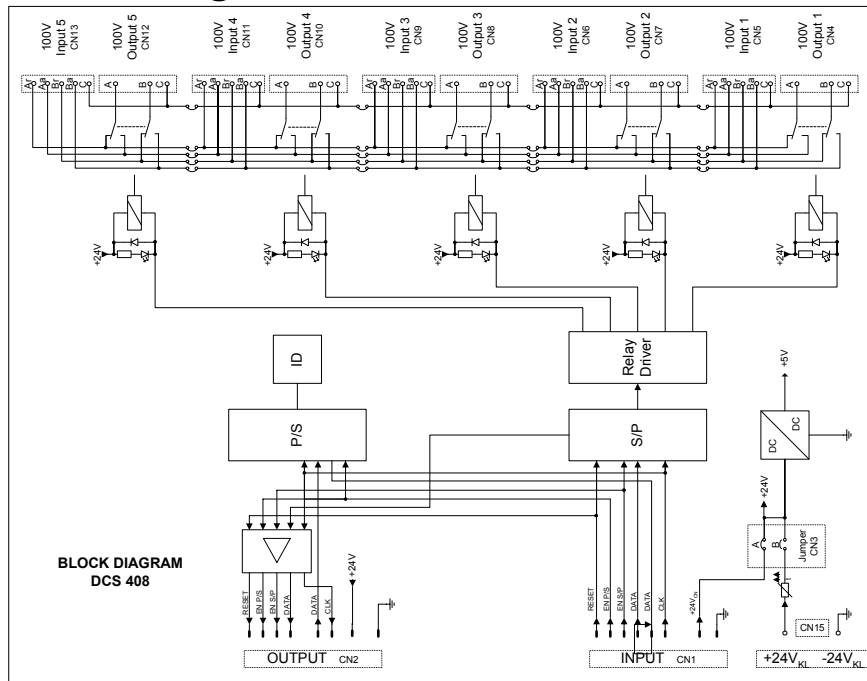
Block Diagrams:



Block Diagrams:



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Key Features:

- Self-monitoring with fault message output
- Password protection over several levels
- RS-232 interface for data backup and servicing purposes
- Integrated service and maintenance program software
- Expandable flash-memory
- Direct digital recording and reproduction of at least 100 different sound and speech signals.
- Maximum recording time up to 16 minutes.
- Maximum bandwidth is 16 kHz.
- 15 acoustical alarm signals and 6 different gong signals



General Description:

The DMM 4650 is a signal processor, capable of audio recording and playback, as well as, audio signal generation such as alarms. The main application is for PA racks, but stand-alone applications are possible as well. The audio signals can consist of alarm, gong, messages and also random combinations. These programs were created by Dynamacord and stored as presets.

The audio quality of the messages can be selected depending on memory extension and different user requirements. With maximum memory extension, a total recording time of 16 minutes is possible.

Password protection is provided. The operation is easy, like cassette recorders or CD players. A computer interface allows saving and loading of unit configurations and message data.

In order to ensure function reliability, a self-test and an audio data verification is installed. The alarm is provided via a dedicated output. The DMM 4650 does not require maintenance due to its use of flash memory.

Technical Specifications:

Operating Voltage	21.6 - 31.2V DC
Power consumption max.	18 watts (without retrofitting kits 90204)
Input voltage	0.775V/0dBu
Max. Input voltage	3.8V/+14dBu (Mic INPUT 50mV/ - 24dBu)
Input impedance	20kOhm (Mic INPUT 1.4kOhm)
Output voltage	0.775V/0dBu
Max. Output voltage	3.8V/+14dBu (Phones 9V/+21dBu)
Output impedance	(bal.) 136 Ohm, (unbal.) 68 Ohm
Frequency response	20Hz-20kHz -3/0dB
Signal-to-noise ratio	>108dB (A-weighted)
THD	< 0.03% (at 1kHz)
Data format AD/DA converter	16 bit linear
DSP internal	24 bit
Sampling rate	35kHz
Control inputs	< ± 5V = Low, > ±10V = High
Dimensions	483 X 43.6 X 225 (W x H x D) 19in, 1HU
Weight	4kg

Architecture & Engineering Specifications:

The message delivery unit shall provide universal generation and control of audio signals. The main application shall be for PA racks, but stand-alone applications are possible as well. The audio signals shall consist of alarm, gong, messages and also random combinations. The audio quality of the messages shall be selected depending on memory extension and different user requirements. With maximum memory extension, a total recording time shall be 16 minutes.

In order to ensure function reliability, a self-test and an audio data verification shall be installed. The fault alarm shall take place via a dedicated output. The utilize flash memory so as to be maintenance free.

Password protection shall be provided. The operation shall be simple, similar to cassette recorders or CD players. A computer interface shall be provided

allowing for saving and loading of unit configurations and message data.

Available Accessories:

Model	Cat. No.	Description
NRS90204	121647	Extension module 4 x I/O
NRS90205	121648	Memory expansion module
NRS90210	121650	Output transformer

Ordering Information:

Model	Cat. No.	Description
DMM4650	121675	Digital Message Manager



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Key Features:

- 200 or 400 watt output power is available.
- 70v or 100v capability for constant voltage speaker lines.
- Full remote control and monitoring functions available.(when used with optional remote modules).
- Integrated standby power supply.
- Remote-start function for mains and battery operation with inrush current limiter protection.
- Power-on noise attenuation.
- Status-LED indicators.
- LED meters with CLIP indication.
- Active, temperature-controlled ventilation.

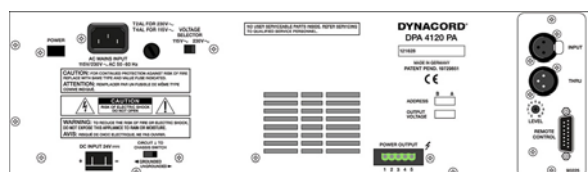
General Description:

The DPA4120/40 amplifiers have been specially designed to ensure durable performance and reliable operation of sound reinforcement systems with several independent loudspeaker lines. The units are best suited for paging and pre-recorded message installations, alert systems, and for general music applications in industrial enterprises, offices, multi-function halls, sport arenas, schools, churches, hotels, hospitals, super markets, cruise ships, and similar venues.

The DPA4120/40 amplifiers can either be operated on the AC mains or connected to an external 24 V battery power source. Switching to battery operation is accomplished via an internal relay.

The DPA4120 and 4140 provides the following remote monitoring functions when used with the remote modules in a ProAnnounce system:

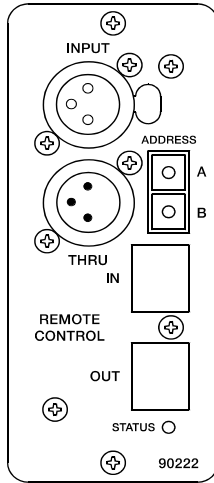
- Setting input levels
- Reading level values of the audio level controls.
- Setting level offsets via virtual controllers.
- Mute function (via level control).
- Remote control power operation ON/OFF.
- Battery operation remote control ON/OFF.
- Monitoring and fault message transmission of thermal overload warnings on the mains transformer or power output stages.
- Monitoring of the functioning of the power output stages via pilot tone signal.
- Ground fault detection for loudspeaker lines.



Technical Specifications:

Nominal output power with mains supply	1 x 200 or 1x400 W
Input characteristics:	Electronically balanced
Nominal input level	775 mV = 0 dBu / 10 k ohms
Power output characteristics:	Balanced, floating
Nominal output voltage -AC supply	100 V / 70 V / 50 V / 20 V
Nominal output voltage - battery supply at 24 V DC	79 V / 56 V / 40 V / 16 V
Nominal load impedance	100 ohms (50 / 25 / 4 ohms)
Noise (A-weighted)	-56 dBu
THD	<1 %
Frequency response	60 Hz to 20 kHz
Distortion-limited response (PA NOMINAL -3dB, kS = 1 %)	60 Hz to 5 kHz
Crosstalk	80dB at 1 kHz
MONITOR output characteristics:	Electronically balanced
MONITOR nominal output voltage	2 V = + 8.2 dBu
MONITOR nominal load impedance	600 ohms
MONITOR frequency response	60 Hz to 20 kHz
Operating temperature range	+5 °C to +40 °C
Dimensions	(W x H x D) 19" (483 mm) x 3HU (132 mm) x 345 mm
Installation depth without external connectors	340 mm
Installation depth incl. external connectors (max.)	400 mm
Weight	22.5 kg
Color	Anthracite

NRS90222 Remote Input Module



This single-channel input module provides DPA 4120 or DPA 4140 power amplifiers with remote functionality.

The module allows connecting balanced XLR-input and XLR-thru lines as well as connection to the remote control bus of the DPM 4000 (RS-485). Prior to connecting the amplifier to the operating voltage, the unit's address has to be set using the switches "A" and "B" (A=low value part)

The following remote functions are available:

Control:

Level control, Mute, Monitor activation (Input / Output), Mains

operation ON/OFF, Battery operation ON/OFF, Pilot tone ON/OFF (optionally available)

The following messages are available : Output level, Pilot tone detection, Ground fault detection, Thermal overload amplifier / mains transformer, Configuration, Measured values of current and voltage at the power output, Extension-kits

Available Accessories:

Model	Cat. No.	Description
NRS90206	121639	Pilot Tone Monitor module
NRS90222	121674	Remote Input Module
NRS90225	121677	Standard Input Module
NRS90207	121799	Ground fault monitor module
NRS90208	121641	Input transformer

Architecture & Engineering Specifications:

The remote control amplifier unit shall provide the following remote monitoring functions:

Setting input levels, reading level values of the audio level controls, setting level offsets via virtual controllers, mute function (via level controls), remote control power operation ON/OFF, battery operation remote control ON/OFF, monitoring and fault message transmission of thermal overload warnings on the mains transformer or power output stages, monitoring of the functioning of the power output stages via pilot tone signal, and ground fault detection for loudspeaker lines.

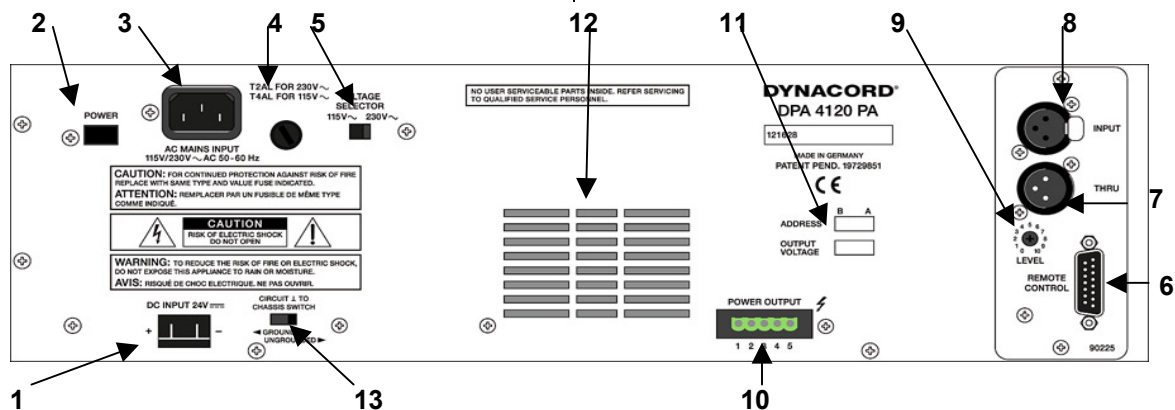
The amplifier shall either be powered by AC mains or connected to an external 24 V battery power source. Switching to battery operation shall be accomplished via an internal relay.

The amplifier shall be 3 RU in height and provide, 1x200, or 1x400 watt operation depending on the model. The output channel must be driven through on-board transformers.

The amplifier shall be the Dynacord ProAnnounce DPA4120 or DPA4140.

Ordering Information:

Model	Cat. No.	Description
DPA4120	121792	1x200 Power Amplifier
DPA4140	121793	1x400 Power Amplifier w/remote



- | | |
|-----------------------------|--|
| 1 DC INPUT 24 V = | 8 INPUT connector |
| 2 POWER ON switch | 9 INPUT level |
| 3 AC MAINS INPUT connector | 10 POWER OUTPUT |
| 4 Mains fuse | 11 Device output configuration label field |
| 5 VOLTAGE SELECTOR switch | 12 Air outlets |
| 6 REMOTE CONTROL connectors | 13 CIRCUIT GROUND TO CHASSIS GROUND SWITCH |
| 7 Signal pass-thru | |



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Key Features:

- Configurable as a 2x200, 2x100 & 1x200, or 4x100 amplifier.
- Operation with 70V loudspeaker networks or 4/8 ohms low-impedance systems
- Outputs protected against idling, short-circuits, over-temp and load variations.
- Integrated Remote Module for control and monitoring (DPA4411 only)
- Routing switch for parallel operation of the amplifier's inputs
- Integrated Standby Power Supply
- Remote-Start function for mains and battery operation with inrush current limiter protection.
- Power-on noise attenuation.
- Status-LED indicators.
- LED meters with CLIP indication.
- Active, temperature-controlled ventilation.

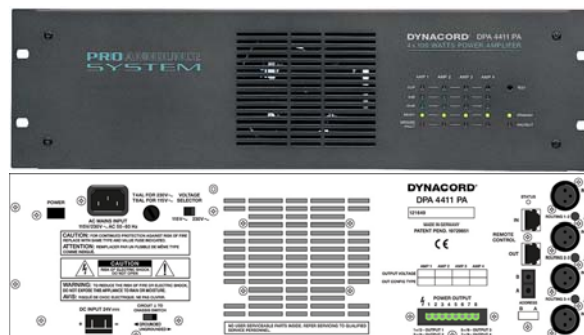
General Description:

The DPA4410/11 amplifiers have been specially designed to ensure durable performance and reliable operation of sound reinforcement systems with several independent loudspeaker lines. The units are best suited for paging and pre-recorded message installations, alert systems, and for general music applications in industrial enterprises, offices, multi-function halls, sport arenas, schools, churches, hotels, hospitals, super markets, cruise ships, and similar venues.

The DPA4410/11 amplifiers can either be operated on the AC mains or connected to an external 24 V battery power source. Switching to battery operation is accomplished via an internal relay.

The DPA4411 provides the following remote monitoring functions when used within a ProAnnounce system:

- Setting input levels on channels 1-4
- Reading level values of the audio level controls.
- Setting level offsets via virtual controllers.
- Mute function (via level controls).
- Remote control power operation ON/OFF.
- Battery operation remote control ON/OFF.
- Monitoring and fault message transmission of thermal overload warnings on the mains transformer or power output stages.
- Monitoring of the functioning of the power output stages 1 to 4 via pilot tone signal.
- Ground fault detection for loudspeaker lines.



Technical Specifications:

Nominal output power with mains supply	4 x 100 W
Input characteristics:	Electronically balanced
Nominal input level	775 mV = 0 dBu / 10 k ohms
Power output characteristics:	Balanced, floating
Nominal output voltage -AC supply	100 V / 70 V / 50 V / 20 V
Nominal output voltage - battery supply at 24 V DC	79 V / 56 V / 40 V / 16 V
Nominal load impedance	100 ohms (50 / 25 / 4 ohms)
Noise (A-weighted)	-56 dBu
THD	<1 %
Frequency response	60 Hz to 20 kHz
Distortion-limited response (PA NOMINAL -3dB, kS = 1 %)	60 Hz to 5 kHz
Crosstalk	80dB at 1 kHz
MONITOR output characteristics:	Electronically balanced
MONITOR nominal output voltage	2 V = + 8.2 dBu
MONITOR nominal load impedance	600 ohms
MONITOR frequency response	60 Hz to 20 kHz
Operating temperature range	+5 °C to +40 °C
Dimensions	(W x H x D) 19" (483 mm) x 3HU (132 mm) x 345 mm
Installation depth without external connectors	340 mm
Installation depth incl. external connectors (max.)	400 mm
Weight	22.5 kg
Color	Anthracite

Architecture & Engineering Specifications:

The remote control amplifier unit shall provide the following remote monitoring functions:

- Setting input levels on channels 1-4
- Reading level values of the audio level controls.
- Setting level offsets via virtual controllers.
- Mute function (via level controls).
- Remote control power operation ON/OFF.
- Battery operation remote control ON/OFF.
- Monitoring and fault message transmission of thermal overload warnings on the mains transformer or power output stages.
- Monitoring of the functioning of the power output stages 1 to 4 via pilot tone signal.
- Ground fault detection for loudspeaker lines.

The amplifier shall either be powered by AC mains or connected to an external 24 V battery power source. Switching to battery operation shall be accomplished via an internal relay.

The amplifier shall be 3 RU in height and be configurable for 2x200, 1x200 & 2x100, or 4x100 watt operation. Jumpers located on the unit chassis shall

accomplish these operation mode changes. The output channels must be driven through on-board transformers.

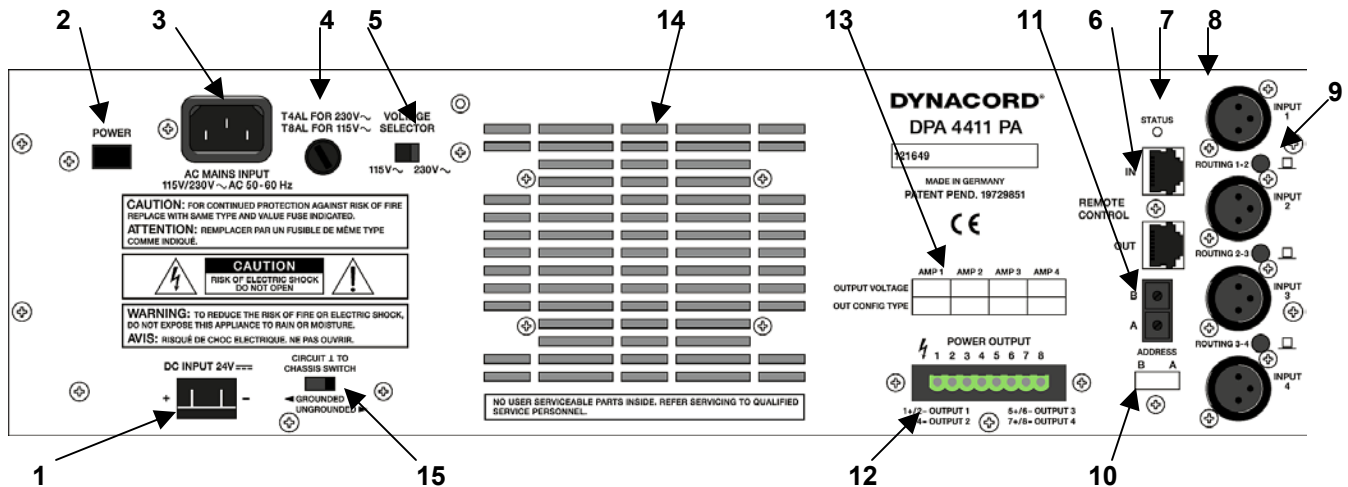
The amplifier shall be the Dynacord ProAnnounce DPA4411 or DPA4410.

Available Accessories:

Model	Cat. No.	Description
NRS90206	121639	Pilot Tone Monitor module
NRS90207	121799	Ground fault monitor module
NRS90208	121641	Input transformer

Ordering Information:

Model	Cat. No.	Description
DPA4410	121792	4x100 Power Amplifier
DPA4411	121793	4x100 Power Amplifier w/remote



- 1 DC INPUT 24 V =
- 2 POWER ON switch
- 3 AC MAINS INPUT connector
- 4 Mains fuse
- 5 VOLTAGE SELECTOR switch
- 6 REMOTE CONTROL connectors
- 7 STATUS indicator
- 8 INPUT connectors 1-4

- 9 ROUTING switch for INPUT 1-4
- 10 Device address label field
- 11 ADDRESS selector switch
- 12 POWER OUTPUT
- 13 Device output configuration label field
- 14 Air outlets
- 15 CIRCUIT GROUND TO CHASSIS GROUND SWITCH



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Key Features:

- All functions are processor-controlled
- Configuration data stored in non-volatile flash memory
- Condenser microphone including pre-amplifier and compressor / limiter
- Programmable key-assignment
- Easy labeling of keys via label-strips and MS WORD templates
- Monitoring of the analog circuitry via integrated pilot-tone oscillator
- Line-monitoring via pilot-tone and polling
- Covered alarm key (except at the DPC 4106)
- Set-up mode allows altering parameter settings directly at the paging station
- Two-line LCD display

General Description:

The ProAnnounce system includes 5 different paging station models and one paging station extension of the DPC 4000 - series. All paging stations employ gooseneck microphones, 6 or 8 function keys, and a covered alarm key. An additional key as well as a key-lock switch can be retrofitted. All paging stations are available with 10, 20, 30, or 50 selection keys. All models come with an LCD display (2 lines with 16 characters each).

The available models are:

- DPC 4106 with 6 function keys
- DPC 4510 with 8 function keys, 10 selection keys and an alarm key
- DPC 4520 with 8 function keys, 20 selection keys and an alarm key
- DPC 4530 with 8 function keys, 30 selection keys plus an alarm key
- DPC 4550 includes 8 function keys, 50 selection keys and one alarm key
- DPC 4350 paging station extension unit provides 50 additional selection keys to any paging station above.



DPC4520 Paging Station

Technical Specifications:

DPC MODEL	4106	4510	4520	4530	4550	4350
Operation voltage	24 V DC (21,6 V - 31,2 V)					
Power cons. (24 V) mA	80	80	85	90	90	90
Min. operation voltage	15 V DC					
Max. pwr cons. (15 V) mA	120	120	120	120	135	95
Audio input external						
Line (default)	0 dBu					
PTT - microphone	-52 dBu					
Audio output	+6 dBu					
Alarm Key	Opt.	Yes			N/A	
Display	2 x 16 digits (LCD)					N/A
Connection	RJ-45					
Cord length (ft.)	3.2					1.6
Enclosure DxH	160 x 65 mm					
Enclosure Width	170	225	270	320	405	335
Weight	1.0	1.5	1.7	1.8	2.5	1.9
Finish	Gray-White RAL9002, microstructure					

Architecture & Engineering Specifications:

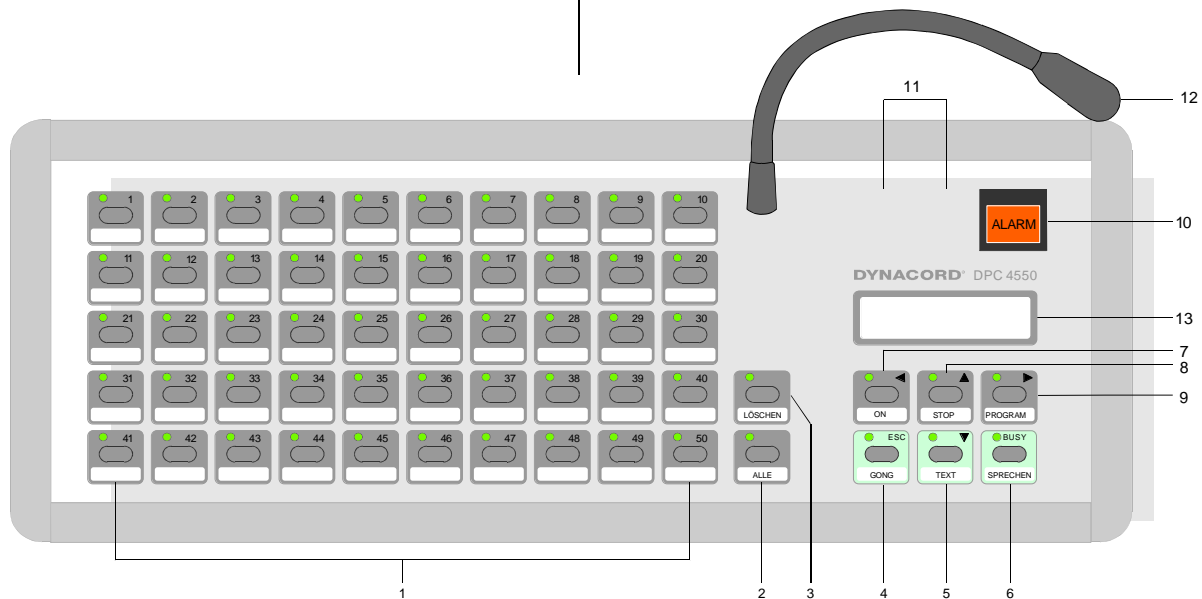
The paging stations shall be processor-controlled and provide several monitoring functions. The units shall provide configuration data storage using non-volatile flash memory. The paging microphone shall be of the condenser type and include pre-amplifier and compressor / limiter. The paging station keys shall be programmable. The paging station keys shall be easy to label via label-strips and MS-WORD templates. The units must contain integrated watchdog circuitry to monitor the processor system while the audio section is guarded by the signal of a switchable pilot tone oscillator. Additionally, the internal supply voltage shall be constantly measured. Once it drops below a critical threshold, a warning signal must be being transmitted. Line-monitoring for the audio-cabling as well as for all RS-485 control-lines allows shall provide early recognition and signaling of line-interrupts and short-circuits. The configuration of the paging stations shall be accomplished via ProAnnounce Designer software. The software shall be a graphical, dialog-oriented user-interface allowing the setting of all key-functions, priorities, options, and several other parameters.

Available Accessories:

Model	Cat. No.	Description
NRS90209	121718	Monitor speaker
NRS90232	121722	I/O Transformer
NRS90231	121721	Keyed Switch
NRS90230	121720	Button/Switch

Ordering Information:

Model	Cat. No.	Description
DPC4106	121762	6 key paging console
DPC4510	121623	8 Function 10 key console
DPC4520	121624	8 Function 20 key console
DPC4530	121622	8 Function 30 key console
DPC4550	121625	8 Function 50 key console
DPC4350	121626	50 key expansion console



- | | | | |
|---|--|----|-------------------------|
| 1 | Selection keys (up to 50 depending on model) | 8 | Stop key |
| 2 | All key with LED | 9 | Program key |
| 3 | Cancel key | 10 | Alarm Key (covered) |
| 4 | "Gong" or "Chime" key | 11 | Space for optional keys |
| 5 | Text key for prerecorded messages | 12 | Microphone |
| 6 | Talk button with "busy" LED | 13 | LCD display |
| 7 | On key | | |

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General Description:

The DPM 4000 allows for audio connections and system expansion through the use of interface card modules. There are three basic types of modules available for the DPM4000. They are:

- Audio Input Modules
- Audio Output Modules
- GPIO Control Modules

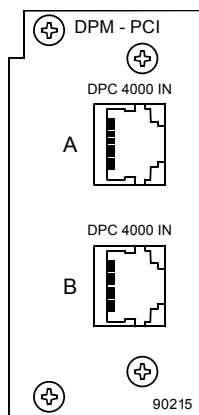
Slots 1 and 2, located on the far right of the DPM 4000 (as viewed from the rear), are the DPM 4000's audio input module slots providing two audio inputs per slot. Each slot can be equipped with any suitable audio input module. The DPM 4000 is shipped with no audio input modules installed.

Slots 3 and 4, located to the left of slots 1 and 2, are the DPM 4000's audio output slots providing two audio outputs per slot. Each slot can be equipped with a 2-channel audio output module. The DPM 4000 is shipped with a 2-channel audio output module installed in slot 3 with slot 4 being left empty.

Slot 5, located to the left of slots 3 and 4, is a control slot, which can be equipped with control modules for general control and query purposes. Control modules provide different kinds of control inputs and outputs. The DPM 4000 is shipped with one 8 channel I/O control module installed.

In addition, an extension slot allows retrofitting additional serial ports, which can be used for the inter-communication amongst DPM 4000 managers or to connect additional external devices. For detailed information, please refer to the owner's manuals of the individual extensions or modules.

2-Channel Paging Station Module (NRS 90215)



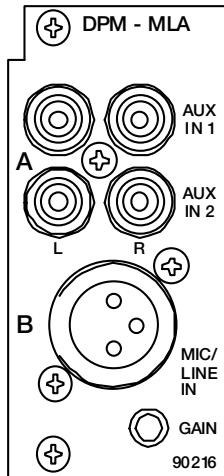
This 2-channel audio input module is meant for the connection of DPC 4000 Series paging consoles. Each of the two input channels provide RJ-45 sockets allowing the connection of up to 4 paging stations plus paging station extensions per input. The microphone terminals are interconnected via 6-conductor parallel cables. The module can be installed in slot 1 and slot 2. Next to the electronically balanced audio input, each input connector provides a serial RS-485 interface

port and the power supply connection for the paging stations (see also: pin-assignment of the RJ-45 connector). The paging stations' power supply employs an electronic, programmable fuse, through which the maximum output current can be matched to meet actual system accommodations. This prevents the entire installation from malfunction, in case of short-circuit occurring in a single paging station only. Input channels can be switched separately onto the monitor bus and you can monitor the audio signal via headphones or loudspeaker, either which is connected to the monitor output. Automatic pilot tone surveillance of the entire input stage is integrated as well. If necessary, retrofitting the audio inputs with transformers is possible.

Specifications:

connection	2 x RJ-45 sockets
inputs	2, electronically balanced
nominal input level	0 dBu / 775 mV
max. input level	+12 dBu / 3 V
input impedance	20 kΩ
input balancing	> -30 dB
frequency response	20 Hz ... 20 kHz, ± 0.5 dB
S/N ratio	> 100 dB (A-weighted)
distortion	< 0.01 %
A/D-conversion	18-bit linear, Sigma-Delta
control interfaces	2 x RS-485 standard
power supply outputs for the DPC 4000	2, short-circuit-proof, electronically programmable fuses
supply voltage	24 V DC (21.6 ... 31.2 V DC)
nominal current	330 mA, 660 mA, 990 mA (adjustable, electronic fuse)
power consumption	2 W
dimensions W x H x D	37.5 x 81 x 248 mm
weight	152 g

MIC/LINE + 2 AUX Input Module (NRS 90216)



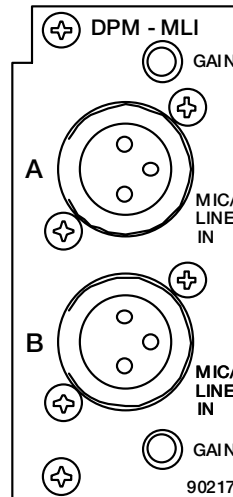
This 2-channel audio input module is meant for the connection of external audio sources of any kind. Channel A employs two switched AUX-inputs with 4 RCA-type connectors (2 x L / R) for CD players, tape decks, tuners, DAT decks, etc. The MIC / LINE-input of channel B is provided through an XLR F-type connector allowing the connection of microphones, mixers and other similar sources. The module can be inserted in slot 1 and slot 2. Input levels of both AUX-inputs can be separately

adjusted via internal potentiometers in a range between -10 dBu to $+12$ dBu. The MIC / LINE-input's sensitivity can also be adjusted through an internal MIC / LINE switch (PAD) providing 30 dB attenuation. The GAIN-control on the appliance's rear panel offers additional control within a range of 40 dB. The MIC / LINE input is electronically balanced and can be retrofitted with a transformer. Phantom power can be switched via a jumper. If necessary, it is also possible to incorporate a compressor/limiter into the audio path via jumper setting. The input channels can be switched separately to the monitor bus and you can listen to the signal via headphones or loudspeaker, either which is being connected to the monitor output. Automatic pilot tone surveillance of the entire input stage is integrated as well.

Specifications:

Connections	1 x XLRF-type / 4 x RCA-type connectors
Input A	2 x AUX, unbalanced, internally summed
nominal input level	-10 dBu ... $+12$ dBu / 250 mV ... 3 V
max. input level	$+12$ dBu / 3 V
input impedance	10 kW
input B	MIC/LINE, electronically balanced
nominal input level	MIC: -54 dBu ... -14 dBu / 1.5 mV ... 155 mV
	LINE: -24 dBu ... $+16$ dBu / 50 mV ... 5 V
max. input level	MIC: $+5$ dBu / 1.4 V
(in limiter operation)	LINE: $+30$ dBu / 25 V
input impedance	MIC: 3.6 kW, LINE: 10 kW
input balancing	> -30 dB
phantom power	24V / 20 mA, switched via jumper
frequency response	20 Hz ... 20 kHz, ± 0.5 dB
S/N ratio	> 95 dB (A-weighted)
distortion	< 0.01 %
A/D-conversion	18-bit linear, Sigma-Delta
power consumption	2.3 W
dimensions W x H x D	37.5 x 81 x 252 mm
weight	160 g

2-Channel MIC/LINE Input Module (NRS 90217)



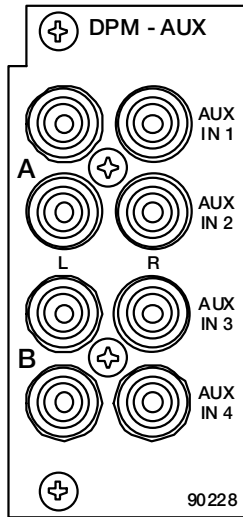
This 2-channel audio input module is meant for the connection of external audio sources, like microphones, mixers, etc. Both channels are furnished with XLR F-type connectors. The module can be installed into slot 1 and slot 2. The sensitivity of the MIC / LINE inputs can be adjusted in a wide range. The internal MIC / LINE switches (PADs) provide 30 dB attenuation. The separate GAIN-controls for each channel provide additional control in a range of 40 dB. The MIC / LINE inputs are electronically balanced and

can be retrofitted with transformers. Phantom power can be switched via jumper setting. If necessary, compressors / limiters can also be incorporated in the audio paths via jumpers. Input channels can be switched separately onto the monitor bus and you can listen to the signal via headphones or loudspeaker, either which is being connected to the monitor output. Automatic pilot tone surveillance of the entire input stage is integrated as well.

Specifications:

connections	2 x XLRF-type connectors
audio	
inputs	2 x electronically balanced
nominal input level	MIC: -54 dBu ... -14 dBu / 1.5 mV ... 155 mV
	LINE: -24 dBu ... $+16$ dBu / 50 mV ... 5 V
max. input level	MIC: $+5$ dBu / 1.4 V
(in limiter operation)	LINE: $+30$ dBu / 25 V
input impedance	MIC: 3.6 kW
	LINE: 10 kW
Input balancing	> -30 dB
phantom power	24V / 20 mA, switched via jumper
frequency response	20 Hz ... 20 kHz, ± 0.5 dB
S/N ratio	> 95 dB (A-weighted)
Distortion	< 0.01 %
A/D-conversion	18-bit linear, Sigma-Delta
phantom power	24V / 20 mA, switched via jumper
power consumption	3 W
dimensions W x H x D	37.5 x 81 x 252 mm
D	
weight	160 g

2-Channel AUX Input Module (NRS 90228)



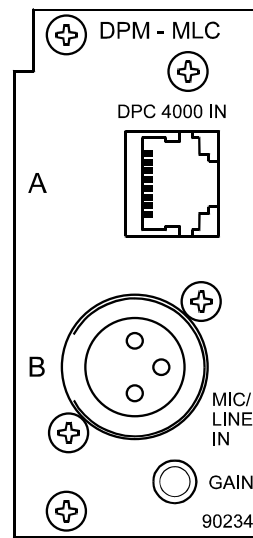
This 2-channel audio input module provides 8 RCA-type connectors (4 x L / R) for connecting external audio sources such as CD-players, tape decks, tuners, DAT decks, etc. The module can be installed into slot 1 and slot 2. The input levels of the four AUX inputs can be independently adjusted in a range between -10 dBu and +12 dBu via internal trim-potentiometers. Input channels can be switched separately to the monitor bus and you can listen to the signal via headphones or loudspeaker, either which

being connected to the monitor output. Automatic pilot tone surveillance of the entire input stage is integrated as well.

Specifications:

connections	8 x RCA-type connectors
inputs	4 x AUX, unbalanced, internally summed
nominal input level	-10 dBu ... +12 dBu / 250 mV ... 3 V
max. input level	+12 dBu / 3 V
input impedance	10 kW
frequency response	20 Hz ... 20 kHz, ± 0.5 dB
S/N ratio	> 100 dB (A-weighted)
distortion	< 0.01 %
A/D-conversion	18-bit linear, Sigma-Delta
power consumption	1.4 W
operational temperature range	+5 °C ... +40 °C
dimensions W x H x D	37.5 x 81 x 252 mm
weight	150 g

MIC/LINE + Paging Station Module (NRS 90234)



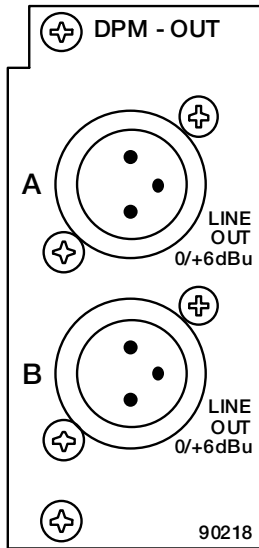
This 2-channel audio input module is meant for the connection of DPC 4000 Series paging stations and other external audio sources. The RJ-45 socket of channel A allows the connection of up to 4 microphone terminals plus paging station extensions. The MIC / LINE input of channel B is furnished through an XLR F-type connector allowing the connection of microphones, mixers and other audio signal sources. The module can be installed into slot 1 and slot 2. Next to the electronically balanced audio input, the DPC 4000 input connector

provides a serial RS-485 interface and the power supply for the connected paging consoles (see also pin-assignment of the RJ-45 connector). The MIC / LINE input employs an internal switch (PAD) providing 30 dB of attenuation. The GAIN-control located on the appliance's rear panel offers additional control in a range of 40 dB. The input is electronically balanced and prepared for retrofitting a transformer. Phantom power can be switched via jumper. If necessary, a compressor / limiter circuit can be incorporated in the audio path.

Specifications:

connections	1 x RJ-45 socket; 1 x XLR F-type connector
input A	DPC 4000, electronically balanced
nominal input level	0 dBu / 775 mV
max. input level	+12 dBu / 3 V
input impedance	20 kW
input B	MIC/LINE, electronically balanced
nominal input level	MIC: -54 dBu ... -14 dBu / 1.5 mV ... 155 mV LINE: -24 dBu ... +16 dBu / 50 mV ... 5 V
max. input level	MIC: +5 dBu / 1.4 V
(in limiter operation)	LINE: +30 dBu / 25 V
input impedance	MIC: 3.6 kW LINE: 10 kW
Phantom power	24V / 20 mA, switched via jumper
input balancing	> -30 dB
frequency response	20 Hz ... 20 kHz, ± 0.5 dB
S/N ratio	> 95 dB (A-weighted)
distortion	< 0.01 %
A/D-conversion	18-bit linear, Sigma-Delta
control interface	1 x RS-485 standard
supply output for the DPC 4000	1, short-circuit-proof, electronic, programmable fuse
supply voltage	24 V DC (21.6 ... 31.2 V DC)
nominal current	330 mA, 660 mA, 990
dimensions W x H x D	37.5 x 81 x 252 mm
weight	165 g

2-Channel LINE Output Module (NRS 90218)



The output module is meant for the connection of power amplifiers with an input sensitivity of 0 dB or +6 dB. Two XLR M-type connectors allow the connection of up to 20 power amplifiers each. The audio signal is electronically balanced; if necessary, transformers can be retrofitted. The module can be installed in slot 3 or slot 4. The output channels can be switched separately to the monitor bus and you can listen to the signal via headphones or loudspeaker, either which is connected to the monitor output.

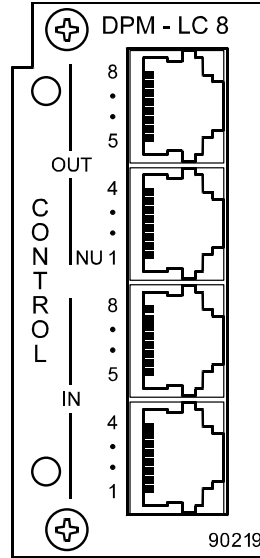
Automatic pilot tone surveillance of the two output

channels is also integrated. The jumpers for adjusting the output voltage to 0 dB or +6 dB are located on the printed board assembly. At the same time you have to alter the jumper setting of the monitor signal correspondingly. The output module employs integrated output relays that prevent switching noise from being heard. When switching the system on, the output signal is put through after the system is been initialized (power-on delay); the contacts are immediately interrupted when switching the power off.

Specifications:

connections	2 x XLRM-type connectors
outputs	2, electronically balanced, transformers are optionally available
nominal output level	0 dBu / 775 mV or +6 dBu / 1.55 V, switched via jumper
output impedance	115 W
frequency response	20 Hz ... 20 kHz, ± 0.5 dB
dynamic range	> 97 dB (A-weighted)
S/N ratio	> 109 dB (A-weighted)
distortion	≤ 0.005 %
D/A-conversion	20-bit linear, Sigma-Delta
power consumption	1.5 W
dimensions W x H x D	37.5 x 81 x 247 mm
weight	160 g

8 I/O Control Module (NRS 90219)



This control module provides 8 floating control inputs and 7 floating logic level outputs (0 V, 24 V). An additional output provides pole change impulses for controlling slave system clocks. Contact is established via 4 x RJ-45 sockets providing 8 contacts each. The module can be installed in slot 5. The slave clock output (NU, OUT 1) is short-circuit proof; up to approximately 40 slave clocks can be connected. Please make sure to connect all slave clocks according to their correct polarity. The control outputs (OUT 2 - 8) are capable of switching

voltages of either polarity and up to a maximum current of 1 A. The control inputs (IN 1 - 8) are capable of handling voltages of either polarity between -31 V and +31 V; for voltages between 0 and 5 V the inputs are not active (low), for voltages between 10 V and 31 V the inputs are active (high). The control inputs can ignite switching functions or macros either during a change of state or in any stationary state. This offers the possibility to monitor line idling currents (e. g. in fire alert system installations).

Specifications:

connections	4 x RJ-45 sockets
logic inputs	8, floating via opto-coupler, bi-polar
voltage when the input is LOW	$U_{IN} < \pm 5$ V
voltage when the input is HIGH	$U_{IN} > \pm 10$ V
maximum input voltage	$U_{IN} \max = \pm 31$ V
logic outputs	7, floating via relay contacts
contact capacity	1 A / 24 V DC
slave clock output	pole change impulse / turning impulse
output voltage	24 V DC
maximum output current	500 mA, electronically protected against overload
power consumption	3.2 W
dimensions W x H x D	37.5 x 81 x 247 mm
weight	195 g

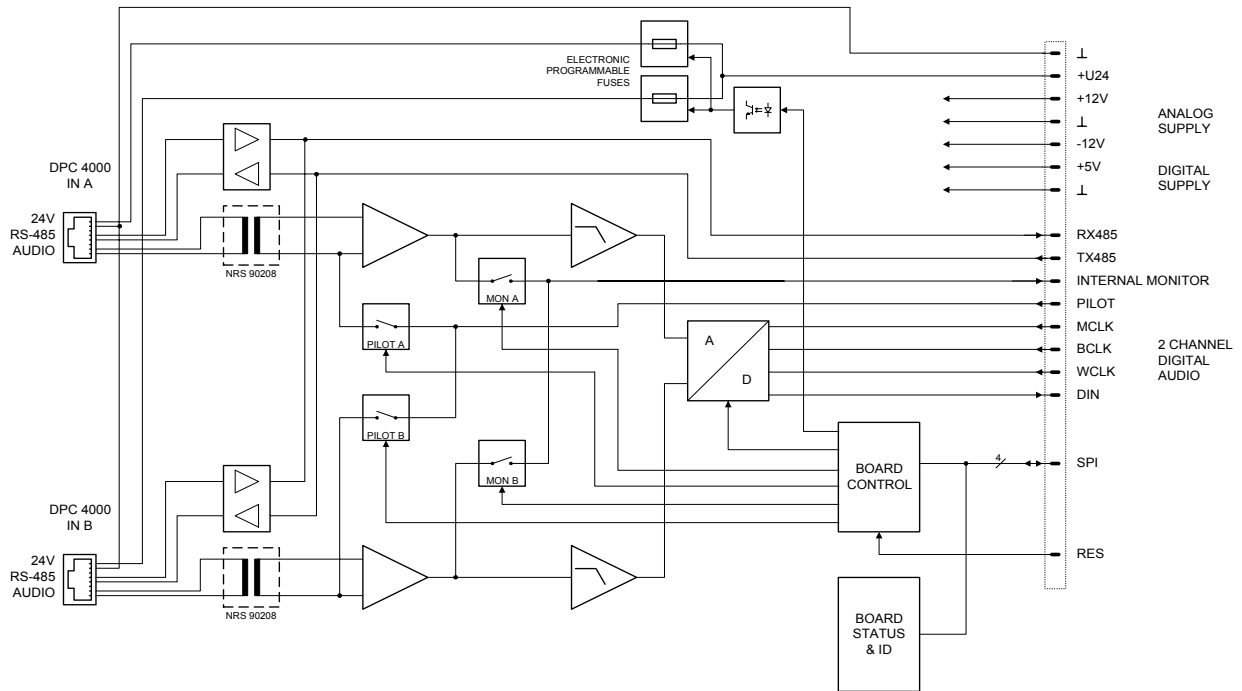
Available Accessories:

Model	Cat. No.	Description
NRS90227	121679	Output Transformer Line Balanced
		Line Balanced Input Transformer
		(1 pc. required per channel)
NRS90233	121682	Input Transformer Mic/Line

Ordering Information:

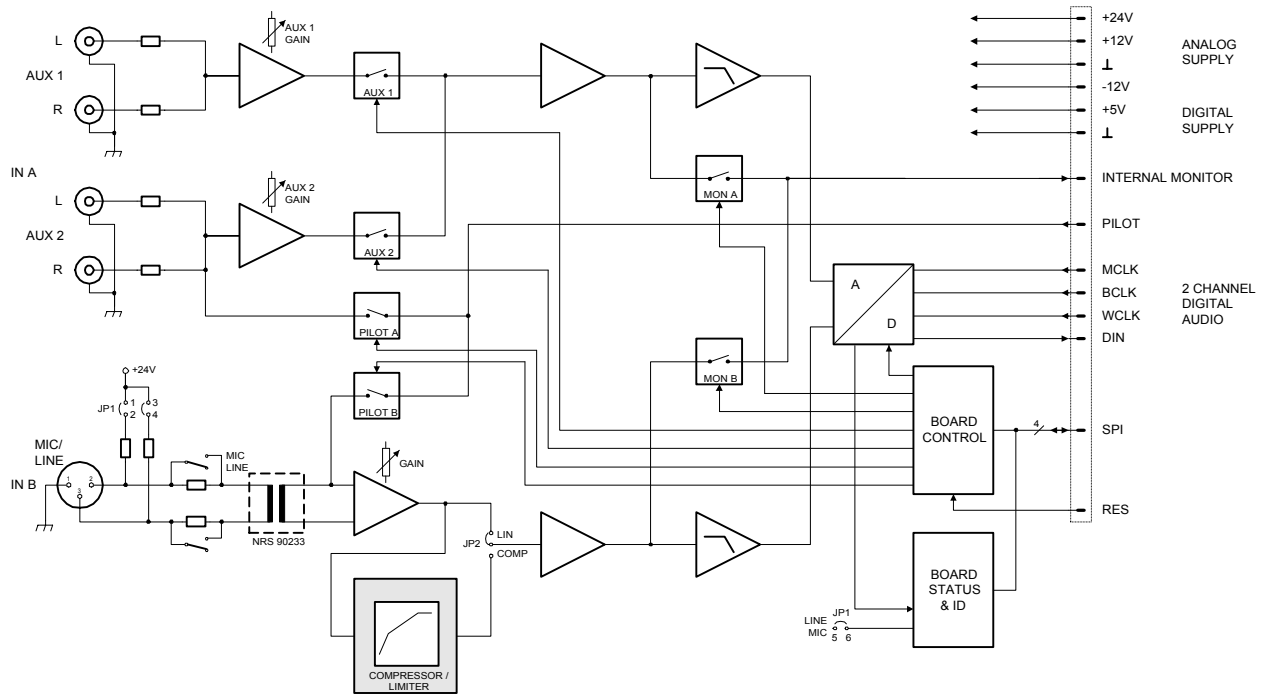
Model	Cat. No.	Description
NRS90215	121665	2 Input Paging Station Module DPC
NRS90216	121666	Input Module: Mic/Line + 2 x Aux
NRS90217	121667	Input Module: Mic/Line
NRS90218	121668	2 Channel Output Line Module
NRS90228	121680	Input Module: 2 Channel Aux (RCA Phono Connectors)
NRS90234	121736	Input Module: Combination Mic/Line + Paging Console

Block Diagrams:

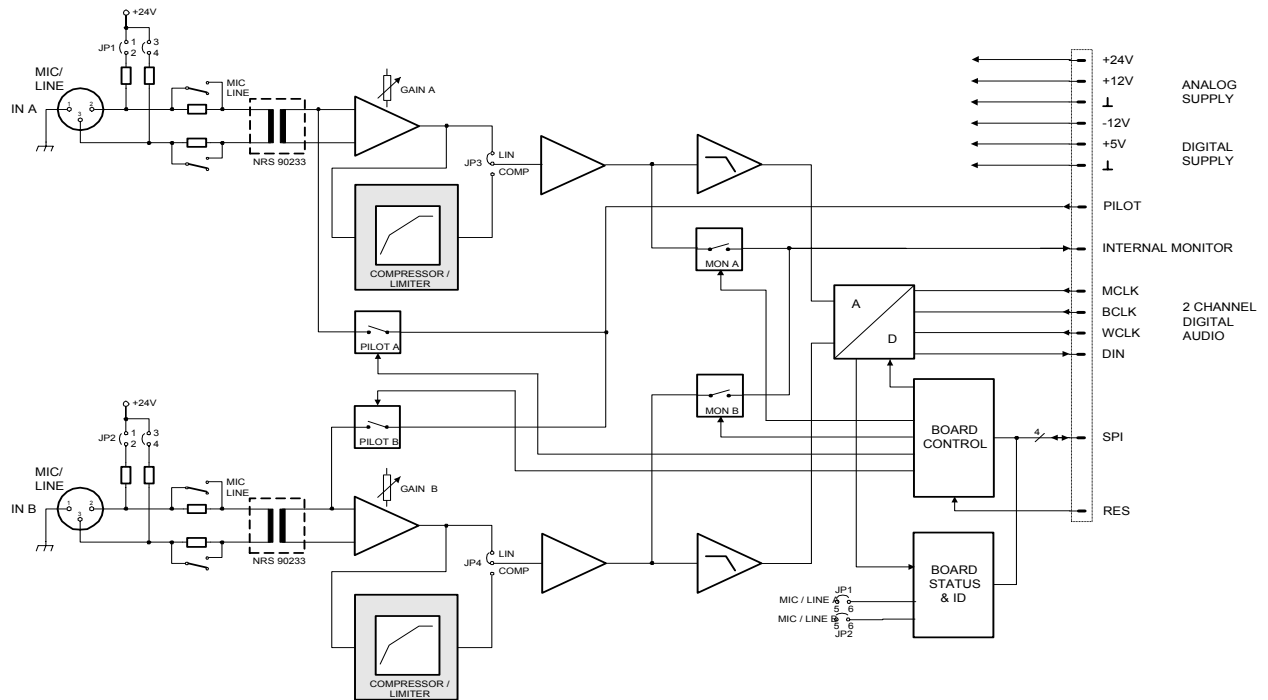


NRS90215 Block Diagram 1

Block Diagrams:

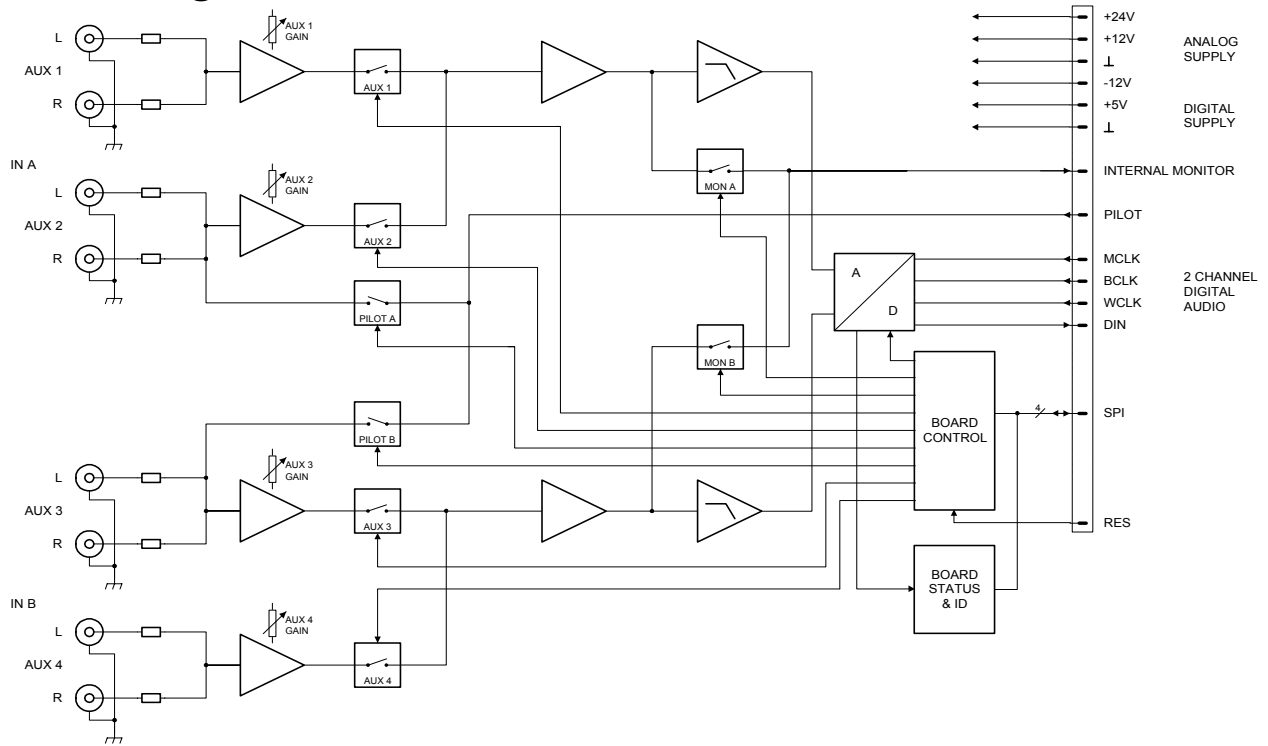


NRS90216 Block Diagram 1

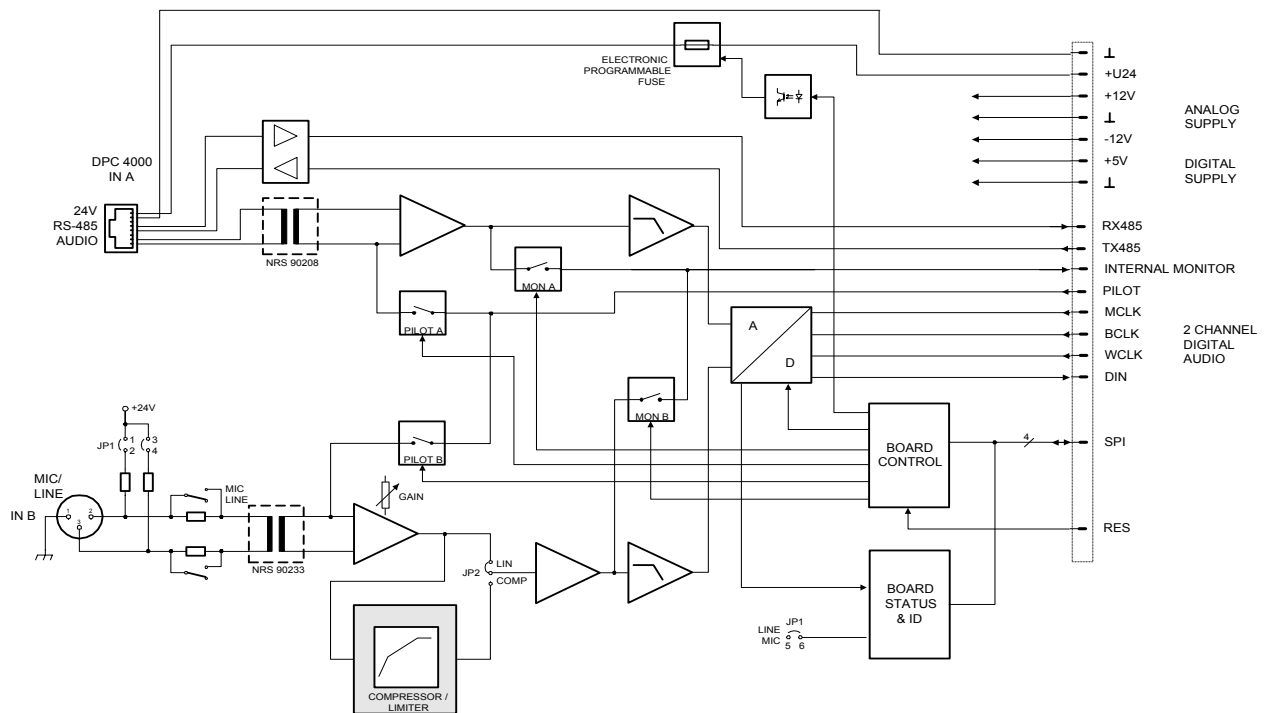


NRS90217 Block Diagram 1

Block Diagrams:

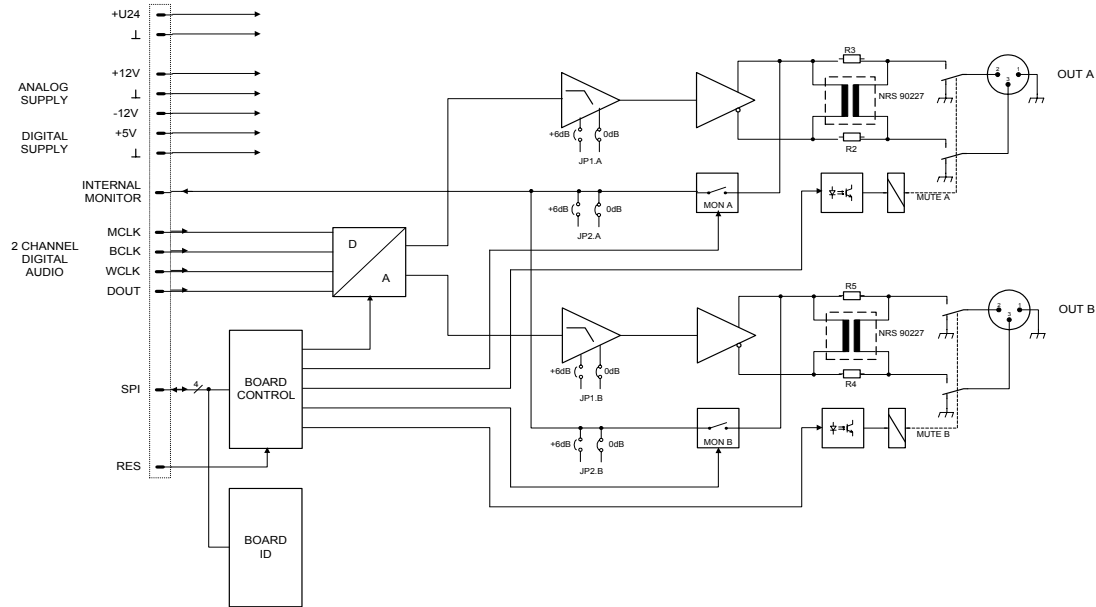


NRS90228 Block Diagram 1

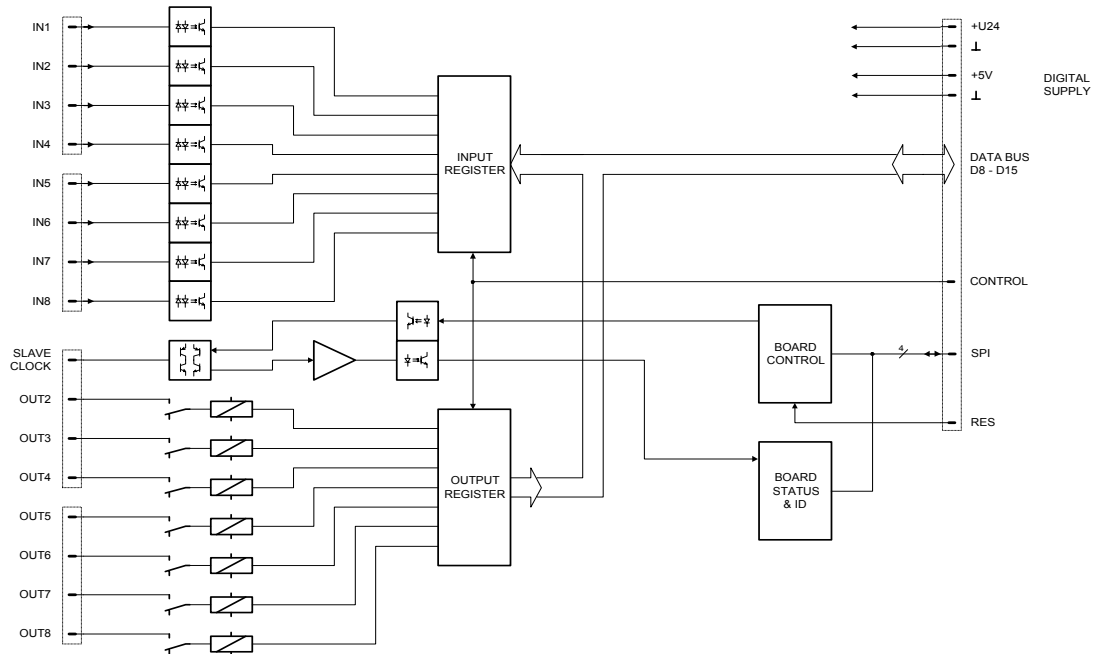


NRS90234 Block Diagram 1

Block Diagrams:



NRS90218 Block Diagram 1



NRS90219 Block Diagram 1



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Key Features:

- Digital 4 x 4 audio mixing matrix with level controls in all inputs and outputs
- Parametric 3-band equalizer for all 4 inputs
- Delay processor for all 4 outputs (optional)
- Multi-chime gong signal (optional)
- Alarm generator (optional)
- Signal generator and evaluation used for pilot tone surveillance
- Voice message recording and playback (optional)
- General purpose inputs
- General purpose outputs
- Linking of internal and external control inputs and outputs
- Monitoring facility for all inputs and outputs as well as DPA 4000 Series power amplifiers and other external audio sources.

General Description:

The DPM 4000 represents the paging management / control unit of the ProAnnounce system incorporating all primary functions that are needed in advanced PA-system installations.

The DPM 4000 employs a digital audio matrix providing four inputs and four outputs. Additional matrix junctions for the integrated gong and alarm signal generators, the vocal recording/playback unit, and the lock-on of the pilot tone and its evaluation are incorporated. All input signals and internally generated signals can be mixed inside the matrix and sent to the four output channels. Simple four-zone paging systems can be constructed using direct routing of output channels to dedicated zone amplifiers. More complicated (larger than four zone) systems can be constructed by using a system controlled relay matrix either pre- or post- amplifier. The DPM 4000 provides priority control of pages and other functions.

The DPM 4000 provides a variety of tone generators for the generation of gong, alarm, and pre-recorded messages. Signal generation is realized through DSP-algorithms, which are extremely flexible in use, so that they can be adjusted to match nearly any possible application. Factory presets include 6 different gong signals and 17 different alarm signals.



Technical Specifications:

Supply voltage	24 V DC (21.6 ... 31.2 V DC)
Nominal power cons.	500 mA
Maximum power cons.	6.7 A
Frequency Response	20 Hz ... 20 kHz, ± 0.5 dB
S/N ratio	> 100 dB (A-weighted)
Distortion	< 0.01 %
24 V output	24 V DC / 400 mA max. (21.6 ... 31.2 V DC)
Ready output	Floating relay contacts, 1 A / 24 V DC
Logic inputs	2, floating via opto-coupler, bi-pole
Maximum input voltage	UIN max = ± 31 V
RS-232 interface	19,200 Baud, 8 data bits, 1 stop bit, no parity, Xon/Xoff
Serial port	RS-485 standard
Supply output	Short-circuit protected, electronically programmable fuse
Supply voltage	24 V DC (21.6 to 31.2 V DC)
Nominal current	330 mA, 660 mA, 990 mA (selectable, electronic fuse)
Monitor input	Electronically balanced
Nominal input level	+2.2 dBu / 1 V
Max. input level	+10 dBu / 2.5 V
Input balance	> -30 dB
Monitor output	6.3 mm phone jack, either for the connection of headphones or speakers
Output level	Headphones: 650 mV / -1.5 dBu, Loudspeakers: 1.8 V / 7.2 dBu
Output power handling	Headphones: 50 mW / 8 Ω, Loudspeakers: 380 mW / 8 Ω
Operating temp.	+5 °C to +40 °C
Dimensions W x H x D	19", 2 HU 483 x 88 x 337 mm
Installation depth	340 mm (410 mm incl. connectors)
Weight	6.4 kg

Architecture & Engineering Specifications:

The unit shall employ a digital audio matrix providing four inputs and four outputs. Additional matrix junctions for the integrated gong and alarm signal generators, the vocal recording/playback unit, and the lock-on of the pilot tone and its evaluation shall be incorporated. All input signals and internally generated signals shall be capable of being mixed inside the matrix and sent to any of four channels. More complicated (larger than four zone) systems shall be capable of being constructed by using a system controlled relay matrix either pre- or post- amplifier. The unit shall provide priority control of pages and other functions.

The unit shall provide a variety of tone generators for the generation of gong, alarm, and pre-recorded message signals. Signal generation shall be realized through DSP-algorithms, which are extremely flexible in use, so that they can be adjusted to match nearly any possible application. The unit shall provide factory presets which will include 6 different gong signals and 17 different alarm signals.

The unit shall accept a variety of different input cards, which enable it to function with microprocessor, controlled paging stations, stereo line level input sources, and balanced mic / line level input sources.

The unit shall also be able to be expanded through the use of an expansion accessory.

The unit shall be the Dynacord ProAnnounce DPM4000.

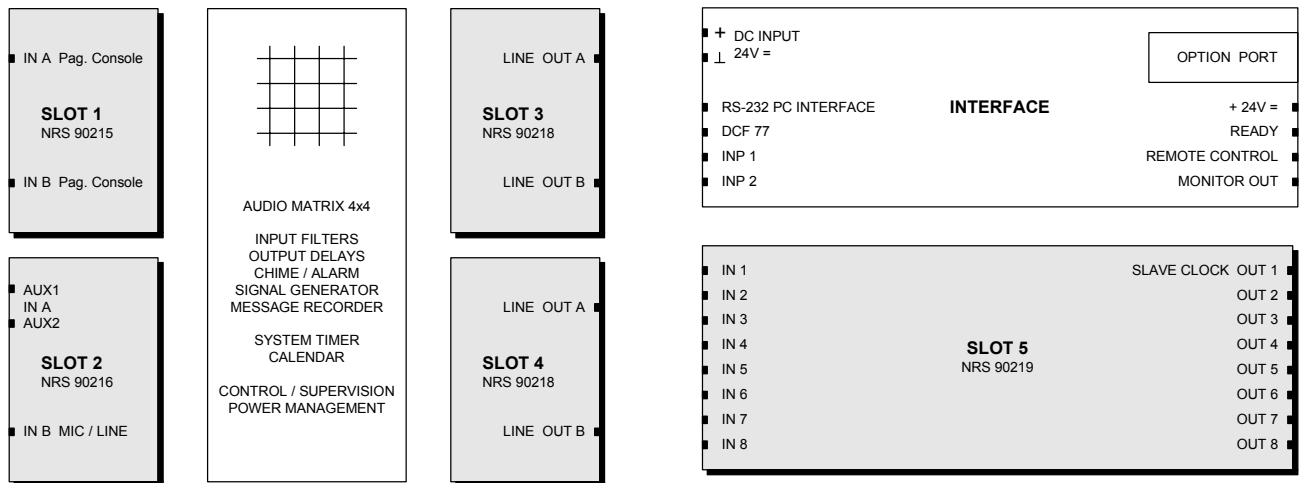
Available Accessories:

Model	Cat. No.	Description
NRS90215	121665	Input module – 2 DPC
NRS90216	121666	Input module – mc/line + aux
NRS90217	121667	Input module – 2 mic/line
NRS90228	121680	Input module – 2 aux
NRS90234	121736	Input module – mic/line + DPC
NRS90218	121668	Output module – XLR line
NRS90205	121648	Message Memory module
NRS90227	121679	Output transformer
NRS90208	121641	Input transformer

Ordering Information:

Model	Cat. No.	Description
DPM4000	121795	4x4 Digital Matrix CPU

Block Diagram:



12000 Portland Av. South, Burnsville, MN 55337
 Phone: 952-887-4051, Fax: 952-887-0043
www.electrovoice.com
 Telex Communications Inc 11/2002
 Part Number 38109-xxx Rev A

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 Customer Service at: 800/392-3497 Fax: 800/955-6831



Key Features:

- 4 XLR MIC/LINE input channels, 4 stereo RCA-type AUX input channels.
- 2 XLR audio outputs.
- Level and tone control (Lo/Hi) in all input channels.
- Input channels can be independently assigned to the output channels and controlled via contact closures.
- Direct outputs for all MIC/LINE and AUX-channels. Pre/Post internally configurable.
- Priority control (ducking function) in the inputs MIC/LINE 1 and 2.
- Limiter in the inputs MIC/LINE 1 and 2 with internally selectable threshold.
- Separate summing controls for both outputs.
- VCA's in both output channels.
- Remote control via 8 external contacts:
- Optional RS-485 or RS-232 serial interface for connecting the DPM 4000 or a PC.

General Description:

The DRM 4000 is a rack-mixer and/or audio signal router offering eight audio inputs and two audio outputs. The inputs are divided into 4 MIC/LINE channels and four AUX channels. Each input channel can be freely assigned to either one or both output channels, offering mono two-channel operation, as well as, stereo operation modes.

The DRM 4000 can be used as a pre-mixer for the DPM 4000, expanding the amount of available input channels. DRM 4000 and DPM 4000 can be linked via an RS-485 remote-interface. Priority functions, preset switching and routing are easy to configure and operate.

The DRM 4000 Mixer & Router can also be used as stand-alone unit for simple sound reinforcement tasks, e.g. in a multimedia set-up, as well as for straightforward paging installations. Typical applications include the use as a mixer for sound reinforcement systems in conference rooms, multi-purpose facilities, clubs, restaurants, houses of worship, etc.



Technical Specifications:

Supply Voltage	24 V DC (21.6 to 31.2 V DC)
Nom. Power Consumption	(24 V) 700 mA
Max. Power Consumption	(24 V) 975 mA
Audio Inputs	4 x MIC / LINE, 4 x AUX, 1 X MIX IN
MIC/LINE Inputs	XLR-type connectors
Nom. Input Level	MIC: -60 to -10 dBu / 0.8 mV to 245 mV
	LINE: -30 to +20 dBu / 25 mV to 7.75 V
Max. Input Level	MIC: +11 dBu / 2.75 V
	LINE: +30 dBu / 24.5 V
Input Impedance	MIC: 3.6 k ohms
	LINE: 10 k ohms
Common Mode Rejection	> 50 dB
Limiter Operating Range	-10 dBu to +20 dBu (MIC/LINE 1 & 2)
AUX Inputs	2 x RCA-type connectors each, unbalanced
Nom. Input Level	-6 dBu respectively +4 dBu / 390 mV respectively 1.23 V
Max. Input Level	+15 dBu respectively +25 dBu / 4.4 V respectively 13.8 V
Input Impedance	> 19 k ohms
MIX Input	2 x RCA-type connectors, unbalanced
Nom. Input Level	0 dBu / 775 mV
Max. Input Level	+21 dBu / 8.7 V
Input Impedance	22 k ohms
Audio Outputs	
Master Output	A/B XLR-type connectors
Nom. Output Level	0 dBu / 775 mV
Max. Output Level	+21 dBu / 8.7 V
Output Impedance	< 120 ohms
Nom. Load Impedance	600 ohms
Send Output	2 x RCA-type connectors, unbalanced
Nom. Output Level	0 dBu / 775 mV
Max. Output Level	+21 dBu / 8.7 V
Output Impedance	< 100 ohms
Direct Outputs	Phoenix type terminal, unbalanced
Nom. Output Level	0 dBu / 775 mV
Max. Output Level	+21 dBu / 8.7 V
Output Impedance	< 100 ohms
Frequency Response	20 Hz - 20 kHz (-1.0 dB)
S/N Ratio	> 100 dB
THD MIC/LINE	< 0.03 %
THD AUX	< 0.01 %
Tone Control	LO ± 15 dB / 60 Hz
	HI ± 15 dB / 13 kHz
Low Cut	85 Hz / 12 dB per octave slope
Environmental temperature	+5°C to +40°C
Dimensions	483 x 43.6 x 351 (W x H x D in mm), 19", 1HU
Weight	10.4 lbs / 4.7 kg

Architecture & Engineering Specifications:

The rack-mixer / audio signal router shall offer eight audio inputs and two audio outputs. The inputs will be divided into four MIC/LINE channels and four AUX channels. Each input channel shall be independently assignable to either one or both output channels, offering mono two-Channel operation as well as stereo operation modes.

The unit shall be enabled for use as a pre-mixer for the DPM 4000, expanding the amount of available input channels. The DRM 4000 shall be capable of RS-485 communications with the DPM 4000. Priority functions, preset switching and routing shall be easy to configure and operate.

The unit shall also be enabled for use as a stand-alone unit for simple sound reinforcement tasks, e.g. in a multimedia set-up, as well as, for straightforward paging installations. The unit shall have four AUX input channels: each with two RCA-type connectors, volume and tone control (Lo/Hi) in all input channels, signal / peak LEDs (green / red) for monitoring the input level in all input channels and direct outputs for all MIC/LINE and AUX-channels. The unit shall also have priority control (ducking function) in the inputs MIC/LINE 1 and 2; and be controllable via external contacts, signal level with adjustable threshold (on the

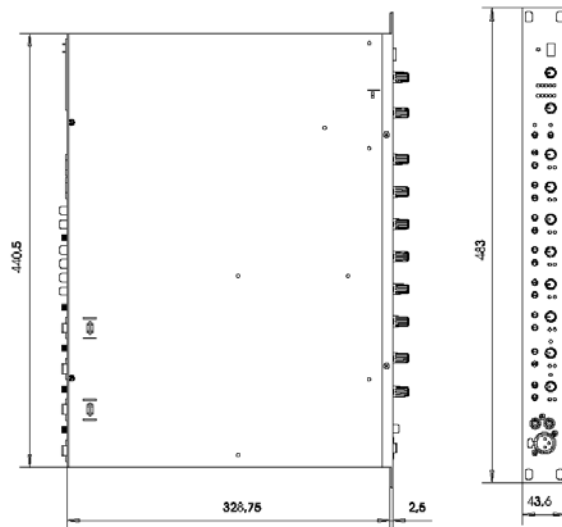
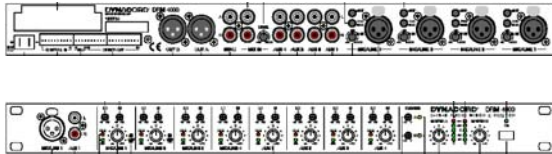
front) or via remote control, indicated via LED's on the front panel. There shall be VCA's in both output channels providing two VCA control inputs A / B for remotely controlling the volume setting via external potentiometer, and also controllable via serial interface (PC, DPM 4000, media-control) or via control contacts. In addition there shall be remote control functionality via external contacts: eight independently configurable control inputs for ducking MIC/LINE 1 and 2, preset switching, routing, volume switching, mute.

Available Accessories:

Model	Catalog No.	Description
NRS90227	121679	Output xformer
NRS90233	121682	Input xformer
NRS90256	121785	RS435 interface
NRS90258	121790	PC interface

Ordering Information:

Model	Catalog No.	Description
DRM4000	121784	8x2 Mixer/Router



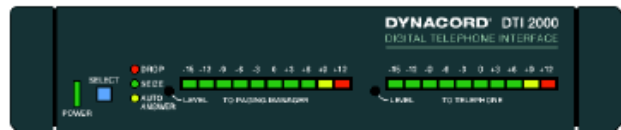
12000 Portland Av. South, Burnsville, MN 55337
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www.electrovoice.com
 Telex Communications Inc 11/2002
 Part Number 38109-xxx Rev A

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 Customer Service at: 800/392-3497 Fax: 800/955-6831



Key Features:

- 100 zones available
- Up to 20 calling groups
- Selection of multiple zones or groups for announcements
- Prerecorded message triggering (message playback)
- Special function triggering (macros)
- Programmable priority
- Two-level password protection
- Acknowledgement signals
- Automatic hang-up
- Front panel audio level control



General Description:

The DTI 2000 is a microprocessor-controlled, configurable telephone interface that allows a ProAnnounce System to be connected to a telephone installation or the phone network. The DTI 2000 provides the user with a full functioning paging interface over a standard analog line. Remote triggering of signals, prerecorded messages and control functions (macros) within the ProAnnounce system are also possible via the DTI 2000.

The DTI 2000 uses DTMF tones and audio beeps to interact with the user. Two levels of password protection are provided to prevent unauthorized access to system functions. Audio from the caller is metered and adjusted from the front panel.

Technical Specifications:

Audio Output Level	0 dBu to + 20dBu
S/N-Ratio	> 60 dB
Frequency Response	300 Hz- 3.8 kHz (+0 / -6 dB)
Telephone Jack Socket	2 x RJ-11 (Loop-Thru)
DPM 4000 Interface	RJ-12, DB-9 female
Power Requirements	100-240 VAC, 50/60 Hz, 1 A
Dimensions (W x H x D)	8.19 x 1.73 x 7.99 inches
	208 x 44 x 203 mm
Weight	4.41 lb (2.0 kg)

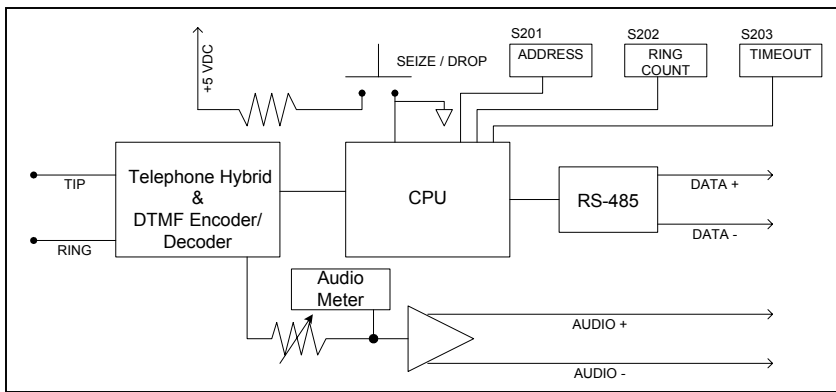
Architecture & Engineering Specs:

The telephone paging interface shall provide the same functions and programmability as a DPC 4000 series paging station. It shall connect to a standard analog (POTS) line or equivalent service. It shall have audio and RS-485 connections that use the standard DPC connector on the DPM 4000PA paging controller. The unit shall provide password protection. It shall provide acknowledgement signals and control via DTMF tones. It shall automatically hang-up after a call is completed. The interface shall be configurable for various telephone systems. The unit shall be the DTI 2000 telephone interface.

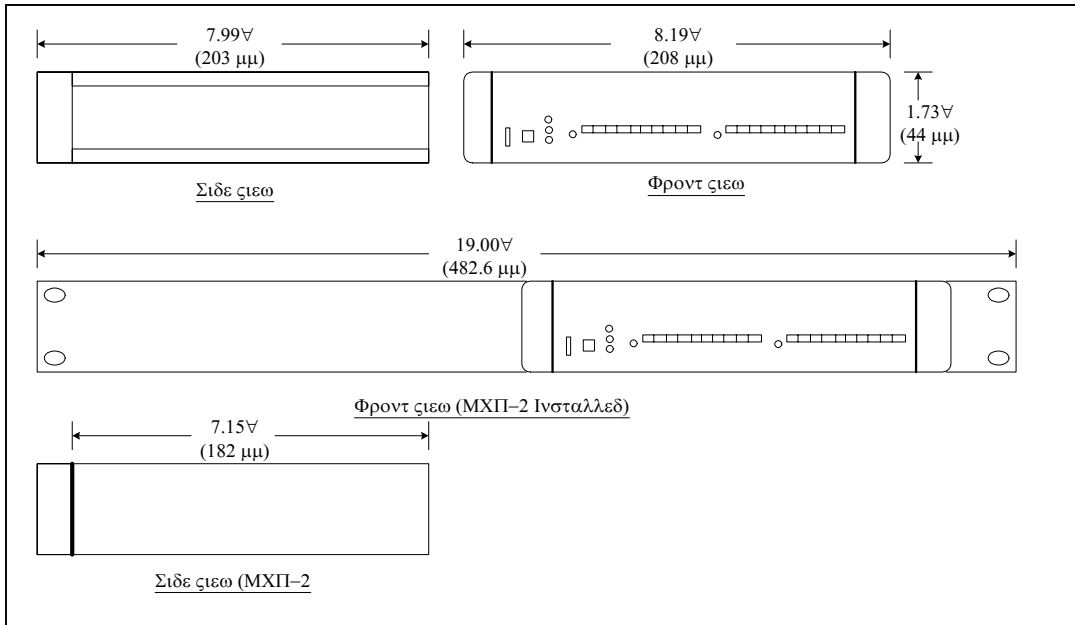
Ordering Information:

Model	Description	Cat. No.
DTI-2000	Main Unit	121813
MCP1	Dual Rack Mount	90027728000
MCP2	Single Rack Mount	90027728001

Block Diagram:



Dimension Drawings:

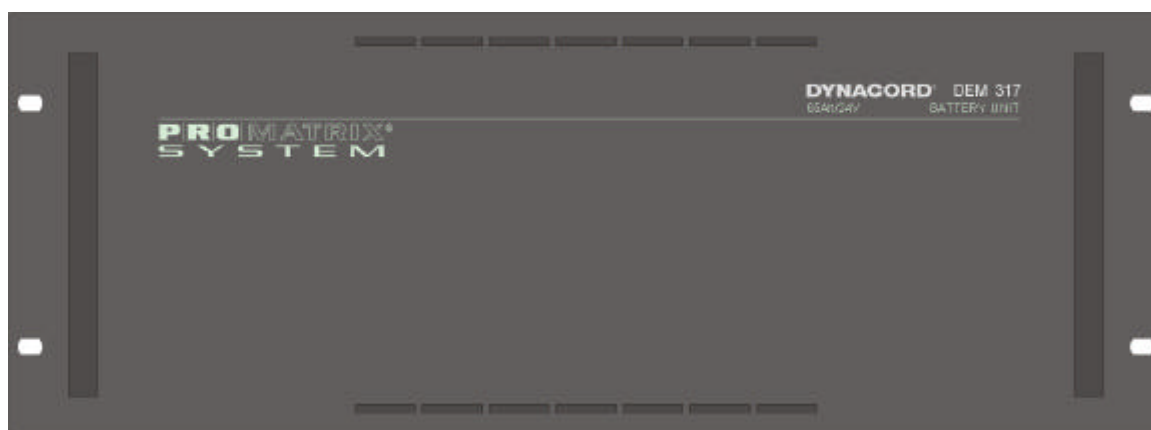


ELA-MODULE-SYSTEM

OWNER'S MANUAL

DEM 316 Batterie-MODULE 24 V / 38 Ah

DEM 317 Batterie-MODULE 24 V / 65 Ah



Features of the battery modules

- 19 " drawer-type chassis with 3 HU, 4 HU and 2x4 HU
- Rated voltage 24 V
- Energy storage
completely maintenance-free, universal-location lead batteries with grid plates and fixed electrolyte, suitable for cycle operation, continuous battery power supply and trickle charge.
- Exhaustive discharge protection relay controlled by DEM 313 charger
- Charging input and battery outputs via AMP flat pin terminals 6.3 x 0.8 mm
charging input and all battery outputs fused.
- Temperature tracking of charging voltage at standby charge depending on the battery temperature with integrated temperature sensor.
- Batteries with VdS-registration and UL recognition.
- The technical specifications comply with the requirements issued by the "Leistungsgemeinschaft Beschallungstechnik", pertaining to the professional association for audio and video technology in the ZVEI.

Table of Contents

1. Emergency power supply of alarm apparatus
2. Commissioning the battery module
 - 2.1 Battery module DEM 316/DEM 317
 - 2.2 Battery module DEM 317 A and DEM 317 B
 - 2.3 Fusing the inputs and outputs
 - 2.4 BATTERY CONTROL connection
 - 2.5 Connection for battery charging
3. Notes for the user
 - 3.1 Use of the battery is to be avoided in the following locations
 - 3.2 Regulations for battery use
 - 3.3 Storage and additional charging
 - 3.4 Transport
 - 3.5 Battery life
 - 3.6 Battery recycling
4. Registrations and Standards
5. Testing and inspecting alarm devices
6. Explanation of terms
7. Specifications Battery Modules DEM 316 / DEM 317
8. Block Diagram

1. Emergency power supply of alarm devices

Alarm devices require 2 independent energy sources, both of which must be able to power the alarm device alone. One of the energy sources must be the general mains supply or a similar network in non-stop operation. The other must be part of the apparatus (e.g. a battery) or an equivalent network fused separately. If the mains power supply is interrupted, the second source of energy must guarantee constant non-stop operation automatically and without interruption. If the energy source belonging to the alarm device consists of a battery, the user must ensure that the batteries used are suitable for stationary and floating operation. The power supply for alarm devices must not be used to supply other apparatus or parts. However, electrical equipment which serves to pass on messages may also be powered by the said source. An automatic charging device is required to charge and maintain the battery. It must be able to charge a battery which is discharged to its discharge voltage up to 80% max. of its rated capacity within 24 hours. The battery capacity must be sufficient to guarantee the fixed alarm duration at the end of the stored energy time. When selecting new batteries, the user should make sure that their capacity is sufficient to compensate the capacity loss due to natural ageing of the batteries during the prescribed service life.

2. Commissioning the battery module

2.1 Battery module DEM 316/DEM 317

The following points must be observed:

- The battery may only be connected to the charging apparatus without load (i.e. all types of consumers must be disconnected) and when the mains is switched OFF.
- The battery must be charged directly after discharging. The battery must not be left uncharged. It becomes impossible to maintain a charge if the battery is left uncharged for any length of time.
- Please ensure that the temperature inside the rack is always within the admissible temperature range specified in the data sheet.

2.2 Battery module DEM 317 A and DEM 317 B

The following points must be observed:

- The insulated screw terminals on the rear side of the battery module DEM 317 are directly connected to the battery poles and are live.
- Before removing the insulating caps, all the connections of the battery modules DEM 317A and DEM 317B are to be disconnected.
- When connecting the cables, the insulating caps on the battery poles should never be removed at the same time because this could cause a short. After the cables have been connected they should be replaced immediately.
- The cables between the battery modules DEM 317A and DEM 317B connect the pole B+ with B+, M with M and B- with B-. When connecting the cables, the lock washer is to be mounted between the cable lug and the nut to secure the screw.

2.3 Fusing the inputs and outputs

The batteries have individually fused outputs for the load connections. Thus all plus and minus lines are protected against excess current and short. Different line cross-sections for consumers with low and high current can be connected to a battery at the same time, providing that the fuse values of their individual outputs are chosen accordingly. **The maximum value of the fuses must not, however, exceed 20 A.**

The total amount of the currents of all the output fuses in a fuse block must not exceed 50 A.

If the fuse values are changed, the current values printed on the units above the fuse switch are to be covered with the enclosed sticky labels. The fuse values for the appropriate plus and minus outputs must always be the same.

If any outputs are not used, the fuses are to be removed and the fuse values above the fuse switches are to be covered over with the enclosed blank sticky labels.

The output secured with 3 A is intended for connection of the control module DEM 207.

The cross-sections of the lines connected must be correctly dimensioned for the fuse value selected. Please note that lines laid in cable channels have a lower permissible current loading due to lower heat dissipation.

The following are guidelines for bundled lines

Number of lines	Reduction factor
2 to 5	0.8
6 to 15	0.7
16 to 30	0.5

Module type	Current consumption at Ebat = 24 V			Fuse value
	Standby -10 dB wert	rated power	rated power	
DEM 287 power amp. 125 W	10 mA	2.5 A	5.7 A	7.5 A
DEM 288 power amp. 250 W	10 mA	3.5 A	10.6 A	10 A
DEM 289 power amp. 400 W with NRS 90 144	10 mA	7 A	19.7 A	20 A

Table I Fuse values of the battery outputs for connection of power amplifiers

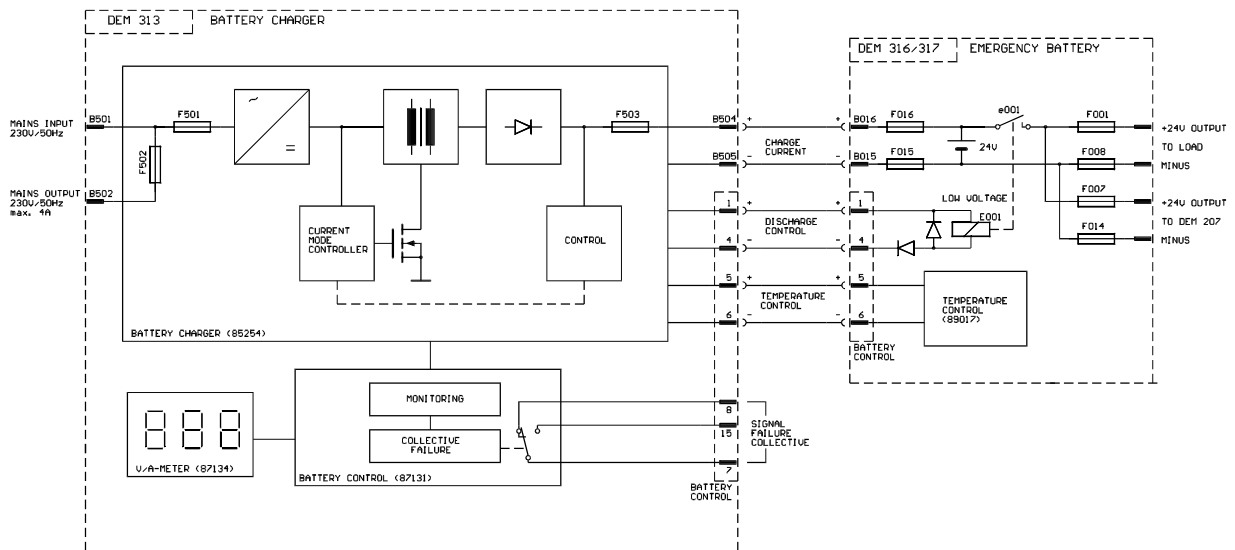
Table II shows the maximum currents which can be drawn from the batteries. These must not be exceeded. This gives the maximum number of power amplifiers which can be powered by the batteries.

Battery type	I max in A	max. number of power amplifiers*		
		DEM 287	DEM 288	DEM 289
DEM 316	100	17	9	5
DEM 317	150	25	13	7

Table II Maximum currents and number of power amplifiers

* The number of power amplifiers which can be directly connected to the battery drawers can be lower than the values specified in Table II (see number of outputs, section 8, specifications). The values specified in the Table only refer to the connection of one amplifier type to one battery type. As long as the maximum current drawn is observed, however, various types of amplifier can be supplied by one type of battery.

Circuit diagram of the battery connection to the charging device.



2.4. BATTERY CONTROL connection

The battery drawers are equipped with an exhaustive discharge protection which is controlled by the monitoring module in the charging device DEM 313. The monitoring circuit checks whether the battery's discharge voltage has been reached when the batteries are discharged. If the battery voltage is less than 19.5 V, measured at the battery poles, the consumers are disconnected from the battery and the battery is thus reliably protected from exhaustive discharge.

Note! If the 15-pole plug connector BATTERY CONTROL has not been correctly connected with the charging device, or if the battery voltage is lower than the discharge voltage, the battery outputs are not live

The connection of the temperature sensor for the temperature tracking of the battery voltage takes place via contact 5 (+temp) and contact 6 (-temp) of the 15-pole plug connector BATTERY CONTROL to the charging device DEM 313. If the connection is faulty, the temperature tracking does not work and the battery will not charge. (Also see the operating instructions for the charging device).

In the case of the battery module DEM 317, the temperature sensor is located in the module DEM 317A.

2.5 Connection for battery charging

Connection of the charging device to the battery takes place via the flat pin connector CHARGE CURRENT. The plus pole of the charging device is to be connected to the plus pole of the battery, and the minus pole of the charging device is to be connected to the minus pole of the battery. (Please also see the operating instructions of the charging devices).

3. Notes for the user

3.1 Use of the battery is to be avoided in the following locations.

- areas exposed to direct sunlight
- areas with excessive radioactivity, infrared radiation or ultra-violet radiation
- areas with organic solvent vapours, dust, salt or corrosive gases
- areas with abnormal vibration.

3.2 Regulations for battery use

- Do not throw batteries into the fire. Do not place batteries in the proximity of fires.
- Do not short battery poles.
- Do not tamper with or open batteries.
- If the battery has been damaged and diluted sulphuric acid comes into contact with skin or clothing, rinse immediately with plenty of water. If diluted sulphuric acid gets into the eyes, consult a doctor immediately.
- Always re-charge a battery after discharging.
- Never use batteries with different capacities, different degree of discharge or a mixture of old and new batteries together. The manufacturing dates should be within one month of each other.
- Batteries should be stored at as low a temperature as possible. If batteries are stored at normal temperatures, additional charging is necessary once every six months.

3.3 Storage and additional charging

During storage the capacity is reduced due to self-discharge. The battery should be stored in a cool, dry place.

If the average monthly temperature is between 20°C and 30°C, one additional charging procedure is necessary every 8 months. If the average monthly temperature is less than 20°C, one additional charging procedure is necessary every 12 months.

If a stored battery is used, one charging procedure should always be carried out before use.

3.4 Transport

If the battery is transported, it should never be exposed to excessive jolting or knocks.

If a battery is connected to a device during transport, it must be secured well and the current circuit must be interrupted.

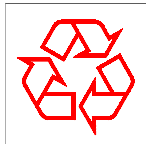
3.5 Battery service life

Generally speaking, the battery service life in standby parallel operation amounts to 3 - 5 years and approximately 260 cycles at 100% discharge depth or more in cyclic operation. The actual service life is reduced if the appropriate operating conditions are not maintained, (i.e. charging, discharging, working temperature and storage).

We recommend charging the battery at an ambient temperature of between 5°C and 35°C to minimize detrimental effects on its service life.

3.6 Battery recycling

The batteries are marked with a recycling symbol as illustrated below. At the end of their service life, the batteries should be returned to the manufacturer or supplier or taken to a special collection centre so that they can be recycled.



4. Registrations and Standards

- VdS registration

The batteries have been tested and recognized by the VdS (Verband der Sachversicherer) and comply with the following standards:

DIN 57 510 / VDE 0510 Akkumulatoren und Batterien, ortsfeste Batterien

DIN 43 534 "Wartungsfreie" verschlossene Akkumulatoren mit festgelegtem Elektrolyt

DIN 43 539 part 5 Prüfungen "wartungsfreie" verschlossene Akkumulatoren mit festgelegtem Elektrolyt

- UL approval

The batteries have received recognition from the Underwriters Laboratories Inc. and have been registered under the number MH 15705.

- IATA classification

The batteries have been cleared by the International Air Transport Association (IATA) for transport in aircrafts and have received the classification "leak-proof".

5. Testing and inspecting alarm devices

In order to guarantee that the alarm device is in working condition, qualified personnel must carry out inspections and servicing regularly.

Inspections must be carried out at least once every 3 months at approximately equal intervals to comply with DIN VDE 0833 part 1.

Servicing must be carried out at least once per year, in accordance with the manufacturer's instructions. The annual services may be linked with the quarterly inspections if so desired, meaning that all sections of the apparatus are inspected within one year.

For the battery of an alarm device this means:

quarterly tests and annual malfunction simulations of the operating duration with the consumers.

We recommend carrying out the battery capacity test in accordance with DIN 43 539 part 1, whereby the battery manufacturer's instructions are to be observed.

Please see section 3.2 for instructions on how to treat maintenance-free lead accus.

7. Explanation of terms:

- **Continuous battery power supply**
In this mode, the battery is constantly kept in full charge. It only gives off current if the DC source, supplied by the mains, fails.
- **Nominal capacity:**
The nominal capacity is the value in ampere-hours for a 20-hour even, uninterrupted discharge with I₂₀ up to the discharge voltage of 1.75 V/cell at a temperature of 22°C.
- **Capacity:**
The capacity of a battery is the amount of electricity which can be extracted under the conditions in question. It depends on the discharge current, the discharge voltage and the temperature.
- **Service life**
For batteries in alarm apparatus and emergency announcing systems, the end of a battery's service life is reached when the capacity is less than 80% of the rated capacity.
- **Stored energy time**
This is the time span between recognizing a failure in the mains supply and remedying this failure.
- **Alarm duration**
The alarm duration is the time during which the alarm signal is given off.
- **Emergency announcement duration**
This is the time during which announcements are made to clear the building or section of a building.

8. Specifications battery modules

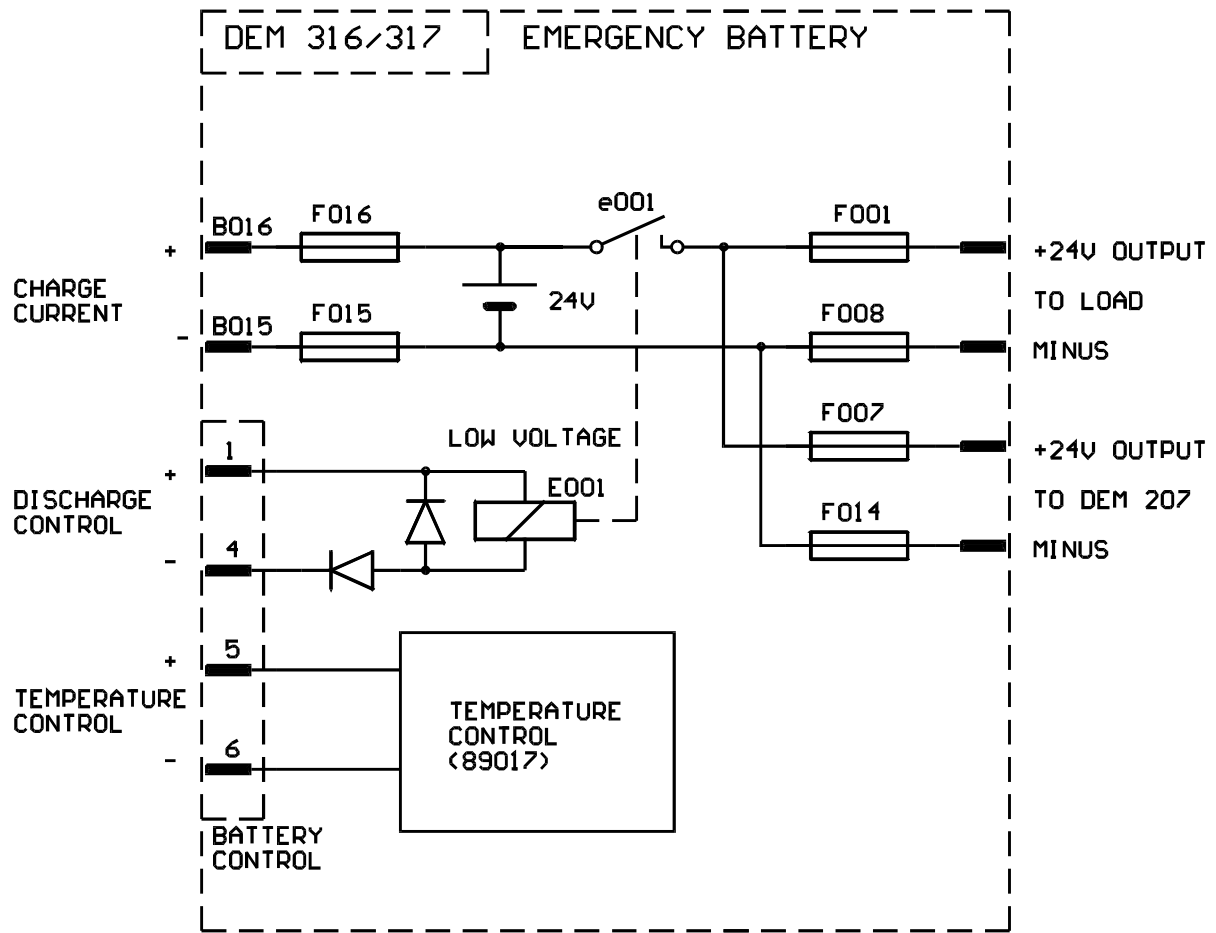
Batterie-Module	DEM 316	DEM 317
Nominal voltage	24 V	24 V
Discharge voltage at 25°C (1)	19,5 V	19,5 V
Nominal capacity for 20 hr	38 Ah	65 Ah
Nominal discharge current I ₂₀	1.9 A	3.25 A
Capacity for 5 hr (2)	33 Ah	55 Ah
Capacity for 1 hr (3)	23 Ah	39 Ah
Capacity for 1 C (4)	20 Ah	33 Ah
Discharge current for 5 hr (2)	6.6 A	11 A
Discharge current for 1 hr (3)	23 A	39 A
Discharge current for 1 hr (4)	38 A	65 A
Max. discharge current	100 A	150 A
Standby current at mains failure ^l	200 mA	300 mA
Number of outputs	14	21
Innenwiderstand für 7.5 A Ausgang	ca.50 mOhm	ca. 50 mOhm
End-of-charge voltage in standby operation at 20 °C (Continuous battery power supply)	27.3 V	27.3 V
Temperature adaption	-40 mV/°C	-40 mV/°C
Nominal charging current	4 A	4 A
Dimensions (W x D)	483 mm x 370 mm	
Height	178 mm	2x178 mm
Weight approx.	36.1 kg	30.0 kg (A) 30.5 kg (B)

(1) Discharge voltage at 25°C: 1.75 V/cell x 12 cells = 21.0 V

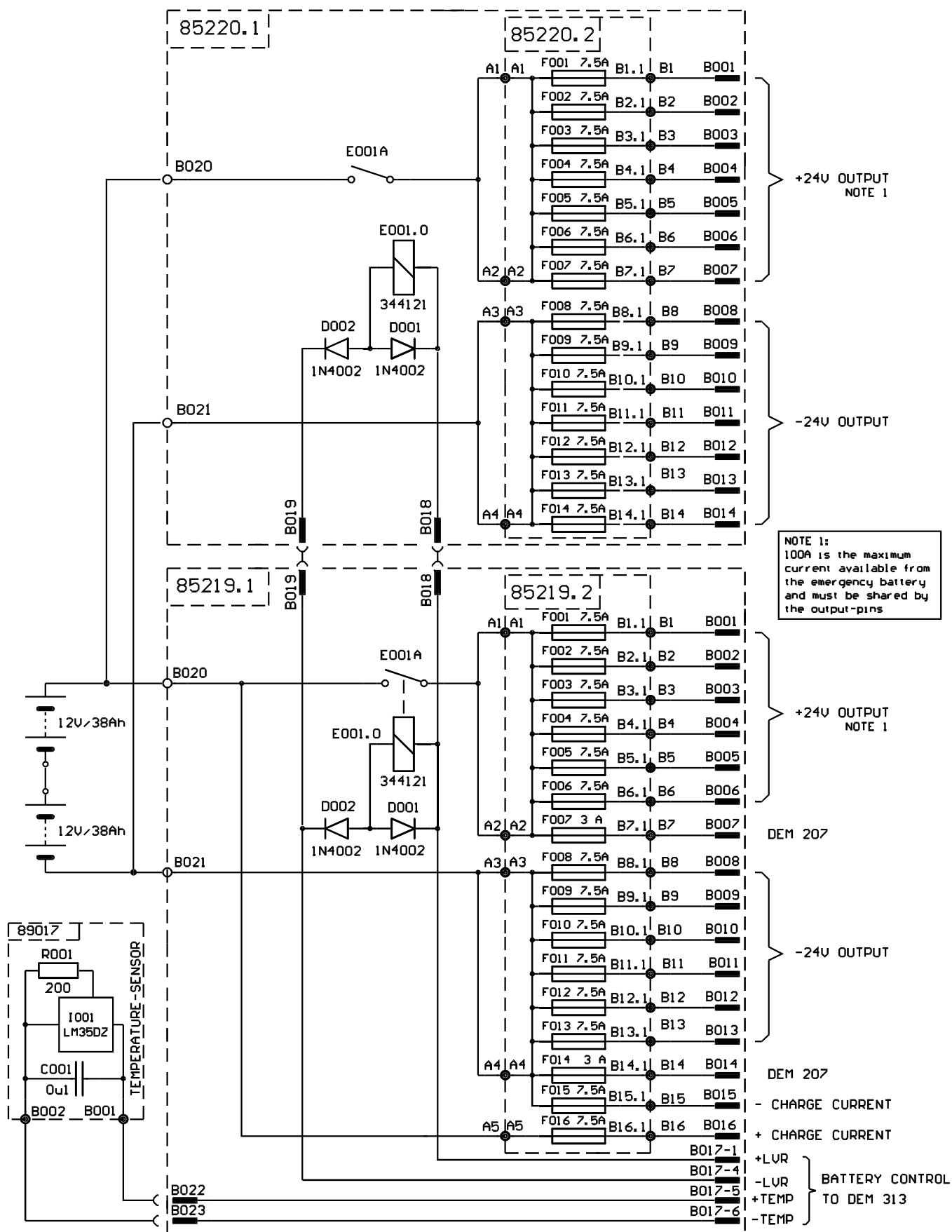
(2) Capacity at 5 hours discharge with discharge current for 5 hr

(3) Capacity at 1 hour discharge with discharge current for 1 hr

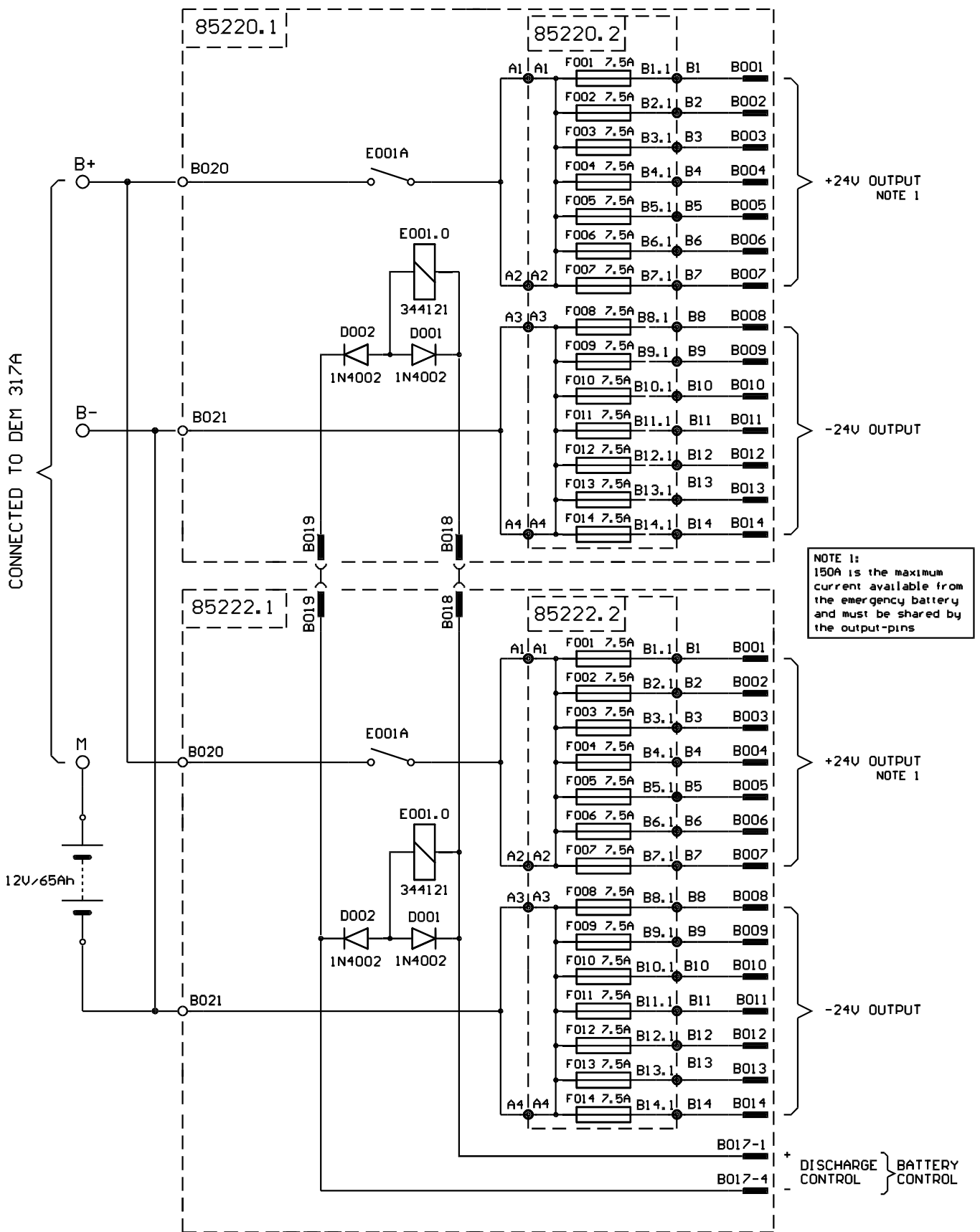
(4) Capacity at discharge with the current in A corresponding with the nominal capacity in Ah



Block diagram



DEM 316



DEM 317B

GARANTIE

Das Werk leistet Garantie für alle nachweisbaren Material- und Fertigungsfehler für die Dauer von 36 Monaten ab Verkauf. Garantieleistungen werden nur dann anerkannt, wenn gültige, d.h. vollständig ausgefüllte Garantieunterlagen vorliegen. Von der Garantie ausgenommen sind alle Schäden, die durch falsche oder unsachgemäße Bedienung verursacht werden. Bei Fremdeingriffen oder eigenmächtigen Änderungen erlischt jeder Garantieanspruch.

WARRANTY

The factory grants warranty covering all verifiable material and manufacturing faults for a period of 36 months after purchase. Warranty claims will only be upheld if valid, i.e. fully completed warranty forms, are submitted. This warranty shall not cover damage caused by incorrect or improper operation. Any claim to warranty shall become null and void in the event of modifications to the equipment being made by third parties or the purchaser himself.



GmbH • Hirschberger Ring 45 • 94315 Straubing • Telefon (09421) 706-0 • Telefax (09421) 706-265

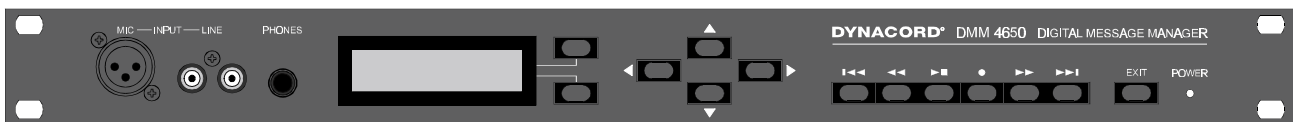
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DYNACORD®

OWNER'S MANUAL

DMM 4650



Description

The DMM 4650 is a signal processor which allows for an universal generation and control of audio signals. Its main purpose is the installation in electro-acoustic rack systems, but stand-alone applications are possible as well. The audio signals can consist of alarm, gong, voice messages but also of random combinations of these sources. The programs were created by Dynacord (preset). Anyway, it is possible for the user (consulting company, etc.) to modify those programs and store them as user-programs. The audio input can be mixed with the DMM 4650 internally generated audio signals (e.g. gong signals with announcements), or given out as priority at the audio output (programmable).

The audio quality of the messages can be selected, depending on memory extension and different user requirements. With maximum memory extension, a total recording time of 16 minutes is possible. Password protection for various operation levels is provided. For "EASY-USER", the provided operation features are similar to those known from cassette recorders or CD players. The control of the programs is performed via floating inputs and floating outputs provide status messages. The priorities and functions of these lines can be programmed individually (Setup). A computer interface facilitates saving and loading of the unit's configuration and its message data.

In order to ensure functional reliability, self-surveillance and audio data verification are employed. The alarm is ignited via internal fault-output while all warnings are logged. The DMM 4650 is maintenance-free since no serviceable parts, batteries or accumulators are to be found inside the appliance.

CONTENTS

INSTALLATION INSTRUCTIONS	5
FRONT PANEL	6
REAR PANEL.....	7
USE OF THE DMM 4650.....	8
Audio functions	8
Control functions.....	8
Sequence functions	9
OPERATION OF THE DMM 4650	10
General	10
Stand-by mode	10
Password, user password	10
Password, entry, operation end	10
Priority function	10
Menu structure	11
Operation menu diagram	11
MESSAGE	12
General	12
Message number, preset	12
Operation menu message	12
Soft key "edt"	13
Title	13
Priority	13
Play all	13
Release	13
Free space	13
Info	13
Checksum	13
Delete	13
Level adjustment, record level	14
Remote recording	14
Audio quality, recording time	14
Message memory extension.....	14
Asterisk (*) after displayed running time.....	14
GONG.....	15
General	15
Gong presets	15
Operation menu gong	15
Load	15
Edit	15
Title	15
Priority.....	15
Save	15
List of available gong parameters.....	16
ALARM.....	17
General	17
Alarm presets	17
Operation menu alarm	17
Load	17
Edit	17
Title	17
Priority.....	17
Save	17
List of available alarm parameters	18
ANNOUNCEMENT	20
General	20
Operation menu announcement.....	20

TRIGGER	21
General	21
Operation menu trigger	21
Trigger detection	22
Examples trigger adjustments	22
SEQUENCE	23
General	23
Sequence Presets	23
Operation menu sequence	23
Load	23
Priority	23
Stop trigger	23
Step list	23
Title	24
Save	24
Sequence example	24
List of available step functions in a sequence	25
SETTINGS	26
General	26
Operation menu settings	26
Contrast	26
Backlight	26
Headphones	26
Priority	26
Password	26
Outputs	26
Bypass	26
Sum gain	27
Init DMM 4650	27
Format Flash	27
Flash space	27
Software	27
Language	27
Backup	27
Restore	28
RS 232	28
Clock	28
SELF-TEST	29
General	29
Operation menu self-test	29
CONNECTIONS	30
Control inputs and control outputs Port A - D	30
General	30
Control levels and currents	30
Inputs	30
Outputs	31
Installation example	31
Inputs	31
Outputs	31
Audio inputs and outputs	32
Remote, RS 232 connection, data backup	33
General	33
Connection REMOTE/RS 232	33
Interface settings	33
Backup, Restore commands, priority	33
List of REMOTE commands	34
Terminal programs	34

FACTORY PRESETS	36
Factory presets, defaults	36
List of trigger signals	36
List of factory preset sequences	37
List of factory preset gong signals	45
List of factory preset alarm signals	46
APPENDIX	47
Troubleshooting	47
FAQ's, hints	48
Examples for alarm texts	50
Block diagram	51
Dimensions	52
Specifications	53
Warranty	54

Installation instructions

The appliance has to be protected against:

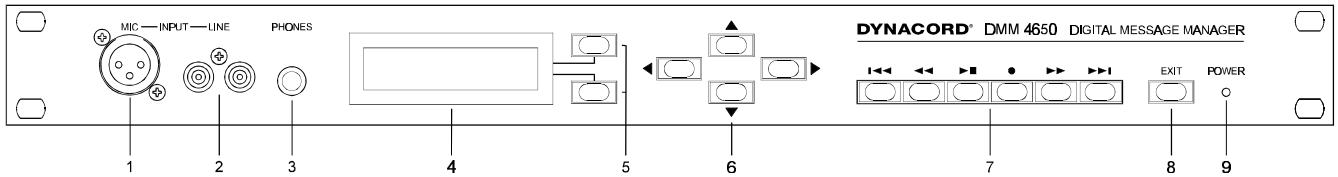
- drip or splash water
- direct sunlight
- high ambient temperature or direct influence of heat sources
- high humidity
- heavy dust deposits
- extreme vibrations

In case the appliance is transported directly from a cold environment to a warm location, dampness can precipitate on the inner parts. Operating the device is only admissible after waiting for approximately one hour until the apparatus has gained the ambient temperature.

Should objects or liquids get into the enclosure, disconnect the unit from the mains immediately and have the appliance checked by a DYNACORD service center, before further use.

Do not use any sprays to clean the unit, because they could lead to severe damage and/or perhaps cause sudden fire hazard.

FRONT PANEL



1. INPUT MIC

XLR-socket for the connection of a microphone when recording a message. By using a short test-sample, the level is automatically adjusted and the setting is saved.

This input can also be used for making announcements.

2. INPUT LINE

RCA-type sockets for the connection of stereo or monaural audio signal sources (tape deck, CD player) when recording a message. A wired in parallel 0dBu socket on the rear panel is also provided. By using a short test-sample, the level is automatically adjusted and the setting is saved.

This input can also be used for making announcements.

3. PHONES

Stereo phone jack 1/4" (6.3 mm) to pre-listen to messages, gong and alarm signals via headphones. Wired in parallel, a 0dBu socket is provided on the rear panel.

4. Multi-function Display

Back-lit LC display, 2 lines with 16 characters, each.

The display lights up by pressing any key.

The display is dimmed whenever the EXIT-key gets pressed or no key is pressed for at all within a short while.

5. SOFT KEY

Depending on the selected operation mode, the soft keys are used in various ways. The according function is indicated on the display.

6. CURSOR

CURSOR-keys to control the cursor on the display and for modifying data.

7. RECORDER

Keys for ...

TITLE skip back, REWIND, PLAY/STOP, REC, FAST FORWARD, TITLE skip forward.

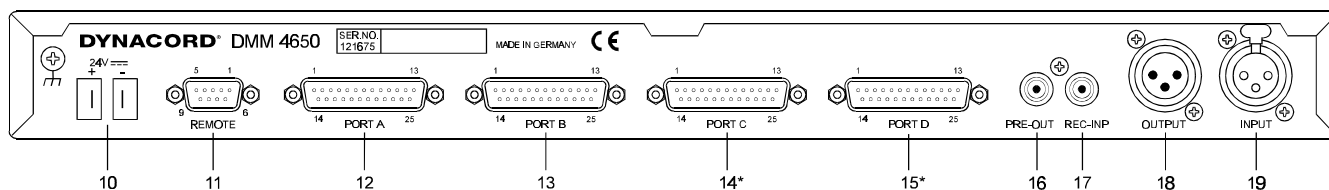
8. EXIT

Key for exiting the edit mode in order to prevent unauthorized operation. Each pressing of the key switches back one menu stage.

9. POWER

The LED lights whenever the DMM 4650 is ready for operation. In case the LED BLINKS you should contact a DYNACORD service center.

REAR PANEL



10. 24 V DC power supply

2 flat-pin plugs 1/4" (6.3 mm) for connection to emergency power supply (battery) or other external power sources. Please mind the correct polarity (+-).

11. REMOTE

The 9-pole D-SUB connector "Remote-Control RS-232" is a serial computer interface for data transfer and service functions.

PORT A-D

All inputs and outputs are provided in 2-pole floating design and isolated from the DMM 4650 circuitry and adjacent lines.

Each input is realized as an AC opto-coupler (AC floating polarity).

Each output has a floating relay contact.

Each port connector (DB 25) has 4 inputs, 4 outputs, and per port +24 V line and ground potential conductors.

By means of the 24 V DC voltage, it is possible to connect external floating control keys as well as contacts directly.

All inputs and outputs and their corresponding functions can be freely assigned or a factory preset can be recalled instead.

12. PORT A

4 control inputs and 4 trigger outputs
1 fault output (alarm on defect of the appliance)
1 ± 24 V DC, 90 mA power source

13. PORT B

Control inputs, trigger outputs and ± 24 V DC

14. PORT C

Control inputs, trigger outputs and ± 24 V DC

* optionally retrofitted

15. PORT D

Control inputs, trigger outputs and ± 24 V DC

* optionally retrofitted

16. PRE-OUT

RCA-type socket, pre-listen

17. REC-INP

RCA-type socket, recording, announcement

18. OUTPUT

3-pole XLR-type connector (audio output) electronically balanced (transformer can be retrofitted).

19. INPUT

3-pole XLR-type connector (audio input) electronically balanced (transformer can be retrofitted).

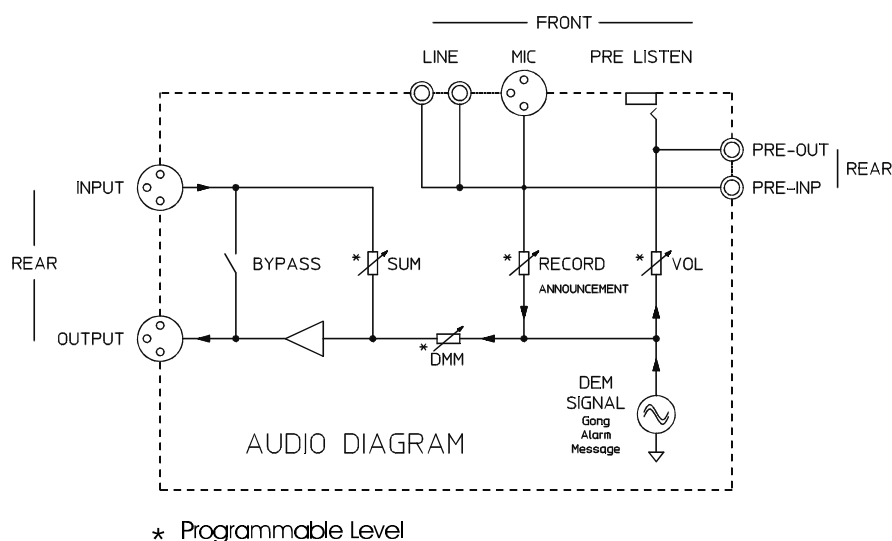
Use of the DMM 4650

The DMM 4650 can be used in both, incorporated in a rack shelf system or as stand-alone unit. The installer should automate the daily sequences by external control keys, sensors, contacts and the corresponding unit settings. This applies for gongs, alarms, messages and their combinations, as well as for recordings of variable announcements. This contributes to a considerable advantage in the ease of use since manually operating the appliance is not necessary anymore.

Often used functions of the DMM 4650 are directly implemented as factory presets and can be utilized without any additional programming effort. By editing the default values and storing them into a user preset a customer-optimized configuration is quickly developed.

Audio function

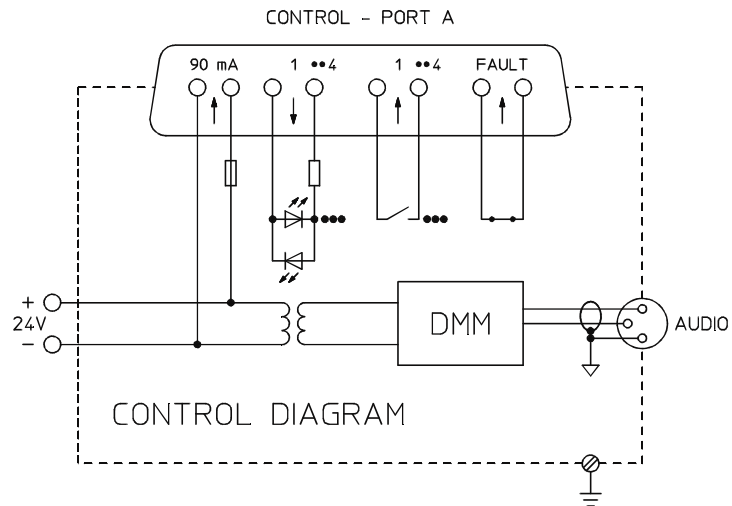
The audio signals of the electro-acoustic sound reinforcement system are looped via INPUT and OUTPUT to the power amplifier. The SUM control can be programmed for this stand-by position. In case of failure a stand-by relay takes over the connection. When starting a sequence via control line, the desired audio signal gets generated (DMM SIGNAL) and fed to the OUTPUT via the programmable DMM-control. The controls (DMM, SUM) defined within the sequence determine, whether the two audio signals are merged or the one gains priority over the other.



The MIC, LINE input is used for recording a message and can also be used for announcement purposes. The headphones outputs PRE-LISTEN and PRE-OUT are for monitoring the DMM signals without actually starting a transmission.

Control function

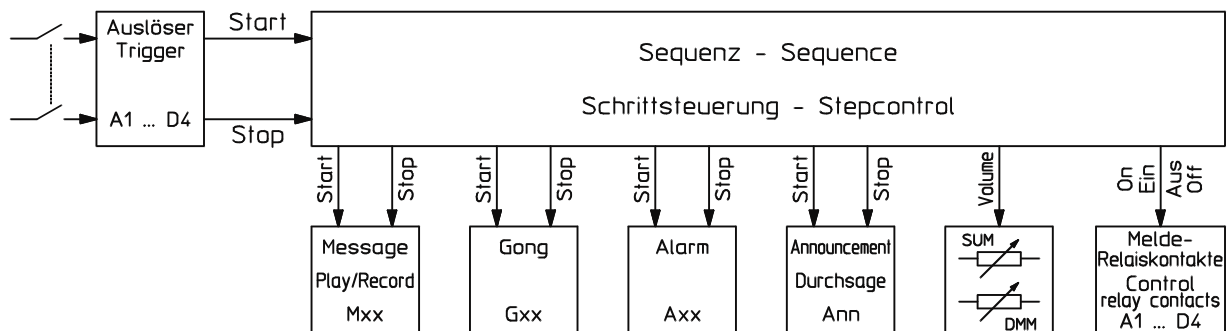
A maximum of 16 floating inputs are provided for integration into a sound reinforcement installation. Their use and polarity can be freely programmed. A maximum of 16 floating relay contacts are provided to be used as control outputs. The inputs and outputs are divided into 4 Ports (A, B, C, D,); where Port A also contains a fault contact.



Each of the 4 ports also supplies a power source in order to facilitate the connection of floating contacts. The ground and earthing conditions are shown in the above diagram. The strict separation of control and audio signals guarantees the trouble-free installation.

Sequence function

The following example shows in sequence the necessary steps from closing the contact of an external switch to listening to the audio signal:



A switch is connected to one of the DMM 4650's control inputs (A1 - D4). The desired input is selected in the trigger menu. Logic level (high, low), delay, and function (dyn, stc, latch) can be set. The desired sequence (Sxx) gets chosen here as well.

For this sequence, the actions of the DMM 4650 are programmed step by step. Standard sequences are provided as factory presets. They can be modified as need arises and stored as user presets.

Example of a sequence: set output (lamp indicator), audio control SUM off, audio control DMM -3 dB, wait for input release, after release start alarm, delay 10 sec. (alarm duration), end.

This sequence is entered line-by-line with special commands (list page 25) and - including name and priority - stored as a preset. If an appliance uses unaltered functions on a regular basis, it is also possible to save these sequences via the RS 232 interface.

OPERATING THE DMM 4650

General

All adjustments carried out at the appliance remain in memory even if the appliance is not connected to a power source (EPROM).

Pressing the EXIT-key lets you step back and forth through the levels of the operation menu tree (page 11). The stand-by mode is entered by pressing the EXIT-key when in the "main menu".

If no key is pressed within a period longer than 5 minutes, the appliance enters the stand-by mode automatically (except during recording and restore).

Stand-by

When the DMM 4650 is connected to a power source, the green POWER-LED lights, the display is dimmed, and the relay outputs are set to their pre-programmed states according to the system's configuration. This stand-by status is remained until a control input starts a sequence. The display shows the sequence's name and number for the duration of the sequence. After completion of the sequence, the DMM 4650 re-enters stand-by mode.

The states of the control "outputs", the audio relay "bypass", and the "sum level" setting during stand-by operation are set in the operation menu "System setup" (page 26).

Password

Password-protection prevents the DMM 4650 from unauthorized operation. Three distinct user levels are available which can be accessed by entering the respective password. As factory defaults, "1111" is programmed for Level 1 (easy operation), "2222" for Level 2 and "3333" for Level 3 (installer). Individual modification for each user is possible. The menu tree diagram (page 11) shows which access is assigned to the respective user level.

Password entry, operation end

Pressing any key on the DMM 4650's front panel, "Password ?" appears on the display. Using the cursor keys you have to enter a 4-digit number and confirm it with the menu key ok. After entering the correct 4-digit password, the display shows the number of your user level. Using the cursor keys you are able to select the desired menu. The EXIT-key cancels the operation and the appliance is protected against unauthorized use.

Priority function

With the DMM 4650 provides the opportunity to set priorities from 0 to 99; where 99 represents the highest priority level. Setting the priority level leads in different results.

The priority of a sequence is defined by its free programmable priority setting (menu "sequence" "priority"). This determines, whether e.g. a fire alarm sequence cancels a gong control sequence. Not the control line of an input, but the priority number of the triggered sequence determines its priority. With equal priorities, the sequence that had been started first remains valid.

The selected user level states the priority for the operation on the appliance. User level 1 = priority no. 33, user level 2 = priority no. 66, and user level 3 = priority no. 99. Modifying the default for lower user levels is performed within the menu "System setup" "priority". The setting of the user priority controls, whether an operator gets interrupted by an important sequences (sequence priority).

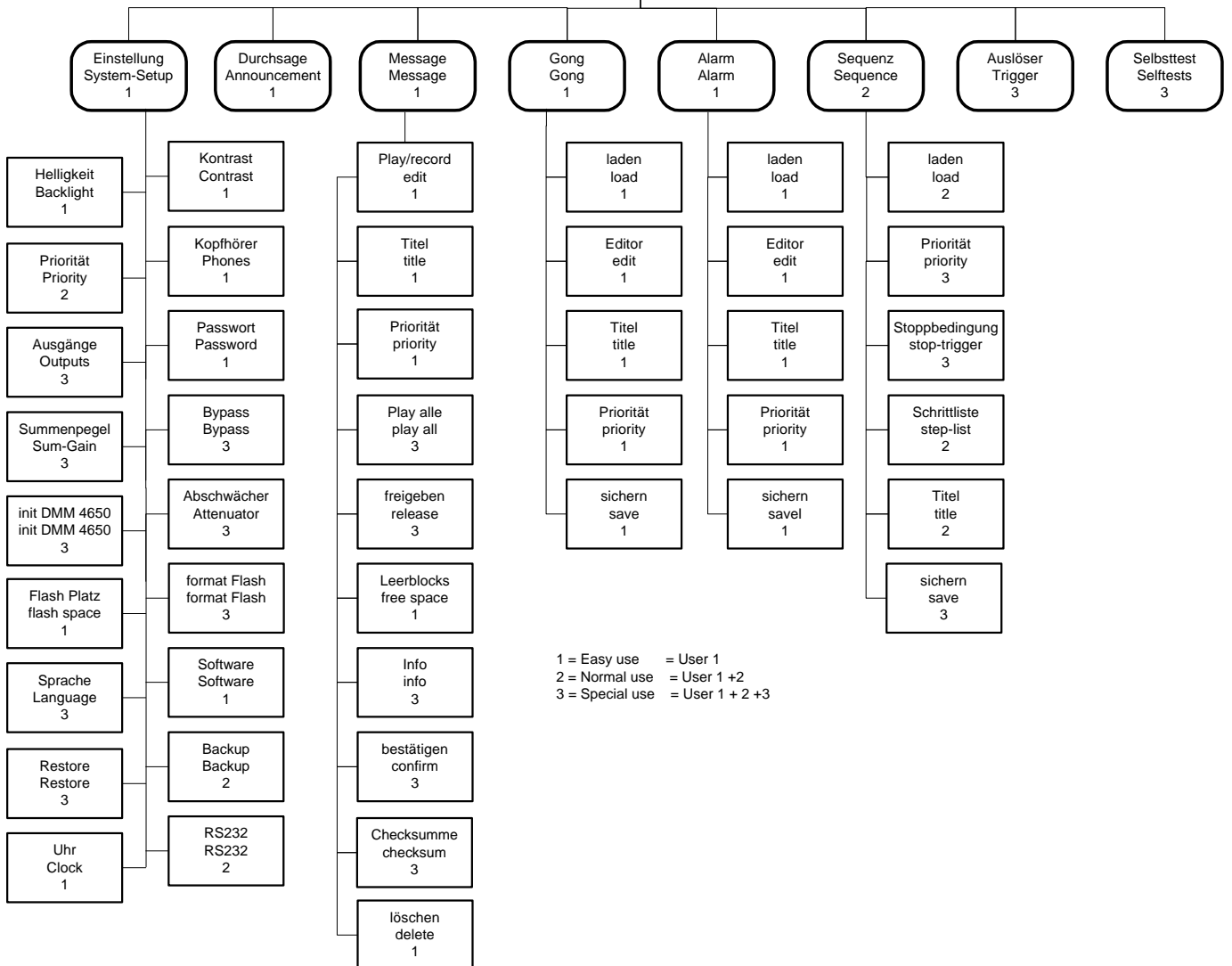
Users are able to modify messages, gongs, and alarms and save them as user presets. Depending on the actual user level, the programs are automatically provided with the corresponding user priority numbers (see above). They are maintained for the case that the original preset's priority is lower. In this way it is guaranteed that user 1 cannot modify the presets of user 2. In order to allow access for other users, the priority allocation can be modified downwards (lower priority) by the respective user before storing a preset

(menu: "message > priority", gong > "priority", "alarm" > "priority")

If recording a message via remote recording, the priority number of the recording sequence is transferred to the message.

Passwort

Hauptmenue
Main-Menue



MESSAGE

General:

Messages are audio signals, stored in the DMM 4650 as information, alarm announcements or other often used texts. Recording a message can be performed directly at the DMM 4650 or by means of remote recording. Playback via sum output is achieved by starting a message (Mxx) within a suitable sequence (see "Trigger", "Sequence").

For test purposes the message can be listened to via the Pre-listen outputs using the recorder keys PLAY/STOP. The functions are similar to a cassette recorder, with the difference that the audio data is saved digitally in maintenance-free flash memories. Depending on individual needs, different audio qualities are selectable. The maximum recording time depends on the selected audio quality and the installed memory (see table, page 14).

A backup of all message audio data is possible through analog recording (cassette deck, DAT recorder) or as a digital backup on a computer via the remote interface (RS 232).

Message number, Preset

Up to 100 distinct messages (M00 to M99) including title, name, and priority can be saved.

The DMM 4650 is shipped without any pre-recorded messages, since - depending on individual user requirements and custom applications - variations would be numerous. Some factory preset sequences use M00, M01, and M02 (see list of preset sequences). Thus, they have to be recorded for incorporating them in the respective applications. Some text examples are to be found at the end of this manual.

Operation menu "message"

Confirming the menu selection "message" by using the soft key "ok", the number of the message appears in the display together with its title and playback time (hours : minutes . seconds). The DMM 4650 is now in the recording/playback mode and can be operated using the transport-keys as follows:

Note: This mode only allows playback via the PRE-listen/Phone outputs!



Title skip backwards, selects the previous actually recorded message. During playback the selected message starts playing immediately.



Rewind, skips back one message, during playback fast rewind enables the user to listen to a specific part several times.



Play/Stop starts or stops the playback of the selected message. Recording is stopped by pressing the stop key.



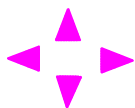
Recording, pressing this key once switches the selected message into recording stand-by. In case a previously recorded message exists, the question "delete?" is displayed and leaving you the choice to record a new message with "Y=Yes" or cancel the command with "N=No". If you choose delete, the record key has to be pressed again after completion of the procedure. If this message is not supposed to be deleted, you have to select an empty location. The items "Recording type" and "Recording level" are explained later. The display now shows "record Mxx" and "pause" with a bargraph, indicating the current signal level. Pressing the record key again starts the recording and "play time" replaces "pause". Pressing the Stop/Play-key terminates the recording.



Fast forward, skips to the next message, forwarding during playback enables the user to listen to parts of a longer message.



Title skip forward, selects the next actually recorded message, during playback this next message is immediately audible.



Using the cursor keys lets you select the previous or next message number.

Soft key "vl" accesses the volume setting dialog for the phone and pre-listen outputs using the cursor keys.

Soft key "edt" accesses the menu level for title editing, etc. (see following paragraph).

Soft key “edt”

Using the “edt” key in playback mode provides the opportunity to edit and manage your message structure. The keys are used to select the following menu items.

Title

Confirming “Title” with the soft key “ok” the selected message’s current name appears on the display. Using the cursor keys lets you enter a name which can consist of up to 8 characters. The soft keys “A-a” are used to toggle between between the upper and the lower letter case while “spc” inserts a blank. After pressing “EXIT” (one menu level down) the question “store y, n” appears, in order to prevent any inadvertent alteration of the name.

Priority

Confirming “Priority” with the soft key “ok”, the priority number of the selected message appears on the display and, by using the cursor keys, providing the user with the possibility to alter the number from 00 up to the his/her priority level. A higher priority prevents unauthorized alteration of this preset by users with lower priority. After pressing “EXIT” (one menu level down) you have to choose on the appearance of the question “store y, n”, whether you want to make your changes permanent.

Play all

Confirming “Play all” with the soft key “ok”, the name of the first message gets displayed. Using the PLAY/STOP-key lets you start or stop the playback of all recorded messages. Mostly, this menu item serves for transferring all recorded messages onto an analog audio tape deck or DAT recorder via the phone/pre-listen outputs.

Release

Confirming “Release” with the soft key “ok”, the display shows that the search for lost blocks in the flash memory (sound memory) has been engaged. Whenever such blocks are found, the memory structure gets repaired which is also indicated on the display. This menu’s operation is used to release memory that has been mistakenly reserved.

Free space

Confirming “Free space” with the soft key “ok”, the number of available flash memory chips and the overall free sound memory capacity are displayed in %.

Info

Confirming “Info” with the soft key “ok”, shows the audio quality setting and the used space for the previously selected message.

Confirm

The audio data of a message is constantly monitored. In case an inaccurate data structure (see also self-surveillance page 29) is detected, the corresponding message is marked with an asterisk (*). Anyway, if the erroneous data does not affect the audible result of the sound reproduction, “confirming” with the soft key “ok” omits the marking (*). From now on, the actual data is utilized as test pattern and you are given the possibility to acknowledge the fault indication (Power-LED blinks) within the menu “self-test” (page 29).

Check sum

Confirming “Check sum” with the soft key “ok”, the check sum of the previously selected message appears on the display. In case of fault, this value is used as a reference for erroneous messages.

Delete

Confirming “delete” with the soft key “ok”, shows the question “delete?” on the display. Using the soft keys “y=yes, n=no” lets you erase the previously selected message.

Recording level

An integrated, electronic control automatically adjusts the input sensitivity of the DMM 4650's (Mic, Line, Rec. Inp) inputs. This level setting remains unchanged, until the question "Select new recording level?" is answered by using the soft key "y=yes" before starting a new recording. By using a short test signal marks the new setting of the control which is automatically stored. Pressing the soft key "ok" exits the recording level menu.

Adjusting the recording level only becomes necessary when the connected signal source is changed or major level changes occur.

Remote recording

It is possible to activate a recording via one of the control inputs (ports A .. D). An example given in the list of factory sequences (S29, S30) on the pages 40-41. The message defined within the sequence is automatically erased before the new recording starts. The example employs an indication lamp for start recording (= deleting end) and the maximum recording time is set to 10 seconds.

Adjusting the recording level corresponds to the description in the previous paragraph. The message's audio quality setting stays unaltered as well. The priority number of the sequence gets copied to the priority of the message.

Audio quality, recording duration

Prior to recording a message, "recording type" is shown on the display. The cursor keys are used to alter the audio cutoff frequency (16 kHz, 8 kHz, 4 kHz) and the signal quality (CD = 16 bit linear, long = 8 bit, μ -Law). The factory default setting is "8 kHz long" for all messages. The newly set audio quality is maintained and individual adjustment for each message is possible.

Table for recording time (minutes) versus audio quality and installed sound memory extension (NR 90205).

Accuracy	CD			long*		
	4 kHz	8 kHz	16 kHz	4 kHz	8 kHz	16 kHz
without NR 90205	2 min	1 min	0,5 min	4 min	2 min	1 min
1x NR 90205	4 min	2 min	1 min	8 min	4 min	2 min
2x NR 90205	6 min	3 min	1,5 min	12 min	6 min	3 min
3x NR 90205	8 min	4 min	2 min	16 min	8 min	4 min

* The specified times for the "long" recording mode are minimum values since the active data reduction recognizes pauses in the audio signal. Pauses are defined as passages where the signal level drops -70 dBu below full modulation.

Message memory extension

It is possible to extend the sound memory capacity of the appliance by incorporating up to three additional plug-in boards (extension kit NR 90205). The corresponding recording times are specified in the table above. The flash memories have to be formatted after insertion (see menu "system setup" > "format flash").

Asterisk (*) behind message duration

An asterisk * behind the message recording time display signals that the corresponding data has been corrupted. The error is shown by the blinking Power-LED. In case you decide that the audio quality is sufficient, after listening to the recording, you have to enter the menu "confirming" (page 13) to delete the *-sign. If the result is not tolerable, the only solution is re-recording the message. To omit the blinking Power-LED you have to acknowledge error no. 14 in the "self-test" menu (page 29).

GONG

General:

Gong Presets are audio signals that can be started within a sequence. Order and parameters of a gong sequence can be edited. For test purposes the sound can be started in the “*gong > editor*” menu by use of the PLAY/STOP keys. It is audible via the Pre-Listen outputs.

Gong Presets

20 freely programmable presets (user preset) are available; from G00 - G19. Starting with G20 and going to G26 factory preset gong sequences are programmed. The corresponding functions are explained in the table on page 45. Erasing the factory presets is not possible. Creating your own gong sequence is easiest accomplished by modifying an existing, possibly similar gong (user or factory preset) and storing it under a new number together with its new title and priority.

Operation menu gong

Confirming the menu selection “gong” with the soft key “ok”, the cursor keys < > allow selecting the following sub menus.

Load

Confirming “load” with the soft key “ok”, “Gxx *Title*” and the soft keys “yes, no” appear on the display. Using the cursor keys the gong number xx is modified while the corresponding name is being displayed. “y” lets you load the selected gong into memory and modification is performed in the “*editor*” menu.

Editor

The “*editor*” menu allows modification of gong sequences, envelopes, repetition amounts and several other parameters (see parameter listing). Testing the gong’s sound properties is possible by starting the gong sequence, using the PLAY/STOP key. The audio signal is presented at the pre-listen outputs. Parameter modifications are audible after performing a restart. Pressing the RECORD key stops the gong. After pressing the “EXIT” key (previous menu level), the question “*store yes, no?*” appears on the display. Acknowledging this question lets you save your new settings in a user preset.

Title

Confirming “*Title*” with the soft key “ok”, the name of the currently loaded gong sequence appears on the display. Using the cursor keys you are able to enter a new name that consists of up to 8 characters. The soft keys “A-a” are used to shift between the upper and the lower character case while “spc” inserts a blank character. After pressing the “EXIT” key (previous menu level), the question “*store yes, no?*” appears on the display. Acknowledging this question lets you save your new settings in a user preset.

Priority

Confirming “*Priority*” with the soft key “ok”, the priority number of the selected gong preset gets displayed. Using the cursor keys, the priority number can be set starting from 00 up to the user priority. A higher priority protects against unauthorized alteration of this preset by users with lower priority level. All factory presets are provided with a priority of 00, because they cannot be overwritten, anyway. This offers any user the possibility to use them as prototype sequences. After pressing the “EXIT” key (one menu level down), the question “*store yes, no?*” appears on the display. Acknowledging this question lets you save your new settings in a user preset.

Save

Confirming “save” with the soft key “ok”, the currently selected gong number gets displayed. Using the cursor keys, the desired gong number can be entered. Storing a preset has to be confirmed with the soft key “y= yes”. With “save” all modifications in the above mentioned menu items are saved into the selected user preset. Thus, individually saving the parameters is not necessary, since they remain in memory until another gong is being loaded.

List of available gong parameters

Type four-stroke, three-stroke

bar1: first gong stroke, A highest sound, B, C, to D deepest sound
attack1: attack rate from 00ms (hard) to 99ms (soft)
release1: fading sound from XXL (long, several seconds.), XL, L, M, S, XS, XXS (short, approx. 1sec)

start 2: start delay of the second gong stroke in seconds. (min 00.0s, max 99.9s)
bar2: second gong stroke, A highest sound, B, C, to D deepest sound
attack2: attack rate from 00ms (hard) to 99ms (soft)
release2: fading sound from XXL (long, several seconds.), XL, L, M, S, XS, XXS (short, approx. 1sec)

start 3: start delay between second and third gong stroke in seconds. (min 00.0s, max 99.9s)
bar3: third gong stroke, A highest sound, B, C, to D deepest sound
attack3: attack rate from 00ms (hard) to 99ms (soft)
release3: fading sound from XXL (long, several seconds.), XL, L, M, S, XS, XXS (short, approx. 1sec)

start 4: start delay between third and fourth gong stroke in seconds. (min 00.0s, max 99.9s)
bar4: fourth gong stroke, A highest sound, B, C, to D deepest sound
attack4: attack rate from 00ms (hard) to 99ms (soft)
release4: fading sound from XXL (long, several seconds.), XL, L, M, S, XS, XXS (short, approx. 1sec)

Type two-stroke, one-stroke

bar1: first gong stroke, A highest sound, B, C, to D deepest sound
attack1: attack rate from 00ms (hard) to 99ms (soft)
release1: fading sound from XXL (long, several seconds.), XL, L, M, S, XS, XXS (short, approx. 1sec)

start 2: start delay of the second gong stroke in seconds. (min 00.0s, max 99.9s)
bar2: second gong stroke, A highest sound, B, C, to D deepest sound
attack2: attack rate from 00ms (hard) to 99ms (soft)
release2: fading sound from XXL (long, several seconds.), XL, L, M, S, XS, XXS (short, approx. 1sec)

repetition: number of repetitions of the gong sequence (min 1x, max 9999x), 0000 corresponds to infinite repetition.

rep-del: time between two gong sequences in seconds (min 00.1s, max 99.9s).

Remarks regarding parameter setting:

Although the above mentioned parameters are extensively variable, the gained results not always represent a good sound. E. g.: attacks for low frequency bar strokes are acoustically quite different from the gong A sound.

Since a maximum of 2 gong strokes can be simultaneously processed, starting the third gong too early will abruptly end the first one and lead to unpleasant sound cut-off knacks. Effects like these resulting from extreme parameter settings are of physical reason and should be optimized by listening tests, first.

ALARM

General:

Alarms are audio signals that can be started within a sequence. The alarms are square wave forms providing the possibility for various parameters to be adjusted. For test purposes, it is possible to start the alarms signals in the *“alarm editor”* menu using the PLAY/STOP key. They are present on the pre-listen outputs.

Alarm Presets

20 freely programmable presets (user presets) are available; from A00 to A19. The factory presets are pre-programmed on the preset numbers A20 - A34. The corresponding functions are explained in the table on page 46. Erasing these presets is not possible. In order to create your own alarm preset, modifying an existing, possibly similar alarm (user or factory preset) and storing it under a new number together with its new title and priority, is the easiest way to accomplish this task.

Operation menu alarm

Confirming the menu selection *“Alarm”* with the soft key *“ok”* lets you select the following sub menus using the cursor < > keys .

Load

Confirming *“load”* with the soft key *“ok”*, Axx ‘Title’ and the soft keys *“yes, no”* appear on the display. Using the cursor keys lets you edit the alarm number xx while the corresponding name is displayed. *“Y”* loads the selected alarm into memory while further editing is performed in the *“editor”* menu.

Editor

The menu *“editor”* allows modification of audio frequencies, envelopes, duty-factors and several other parameters (see parameter listing). Testing the alarm’s sound properties is possible by starting the alarm sequence using the PLAY/STOP key. The sound is presented via the pre-listen outputs. Parameter modifications are audible after performing a restart. The RECORD-key stops the alarm.

After pressing the *“EXIT”* key (previous menu level), the question *“store yes, no?”* appears on the display. Acknowledging this question lets you save your new settings in a user preset.

Title

Confirming *“Title”* with the soft key *“ok”*, the name of the currently loaded alarm is displayed. Using the cursor keys lets you enter a name of up to 8 characters. The soft keys *“A-a”* shifts between the upper and the lower character case while *“spc”* inserts a blank character.

After pressing the *“EXIT”* key (previous menu level), the question *“store yes, no?”* appears on the display. Acknowledging this question lets you save your new settings in a user preset.

Priority

Confirming *“Priority”* with the soft key *“ok”*, the priority number of the selected alarm preset appears on the display. Using the cursor keys, the priority number can be set starting from 00 up to the user priority. A higher priority protects against unauthorized alteration of this preset by users with lower priority level. All factory presets are provided with a priority of 00, because they cannot be overwritten, anyway. This offers any user the possibility to use them as prototype sequences.

After pressing the *“EXIT”* key (one menu level down), the question *“store yes, no?”* appears on the display. Acknowledging this question lets you save your new settings in a user preset.

Save

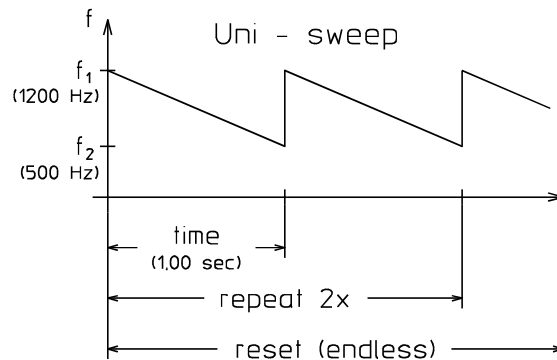
Confirming *“save”* with the soft key *“ok”*, the currently selected alarm number is displayed. Using the cursor keys, you are able to enter the number of the desired alarm. Storing a preset has to be confirmed with the soft key *“y = yes”*. With *“save”*, all modifications in the above mentioned menu items are saved into the selected user preset. Thus, individually saving the parameters is not necessary, since they remain in memory until another gong is being loaded.

List of available alarm parameters

Type Uni-sweep

- frequency1: pitch at sound-start in Hz (min 40Hz, max 9999Hz) is swept until frequency2 is reached.
 frequency2: pitch at sound-stop in Hz (min 40Hz, max 9999Hz).
 time: duration of the sweep - Freq1 to Freq2 - in seconds., (min 0.01s, max 99.99s).
 ratio: duty-cycle of the square wave in percent, (min 1%, max 50%)
 repeat: number of repetitions of the sweep Freq1. > Freq2 (min 1x, max 9999x).
 0000 corresponds to infinite repetition.

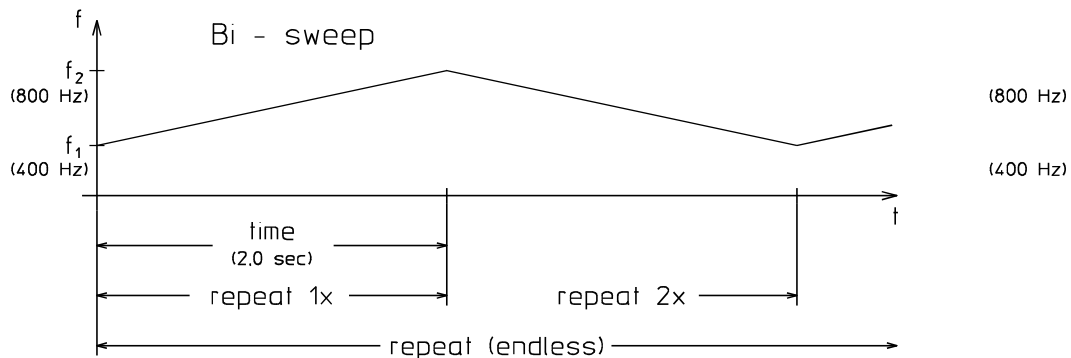
Values in parenthesis (), example DIN alarm, A20



Type Bi-sweep

- frequency1: pitch at sound-start in Hz (min 40Hz, max 9999 Hz) is swept until frequency2 is reached.
 frequency2: reverse frequency of the sound in Hz (min 40Hz, max 9999Hz) is swept until frequency1 is reached.
 time: sweep duration from freq1 to inversion point in sec., (min 0.01s, max 99.99s).
 The duration of the sweep $\text{freq1} > \text{inversion point} > \text{freq1}$ is symmetrical.
 ratio: duty-cycle of the square wave in percent, (min 1%, max 50%)
 repeat: number of repetitions of the sweep Freq1.> inversion point (min 1x, max 9999x).
 0000 corresponds to infinite repetition.

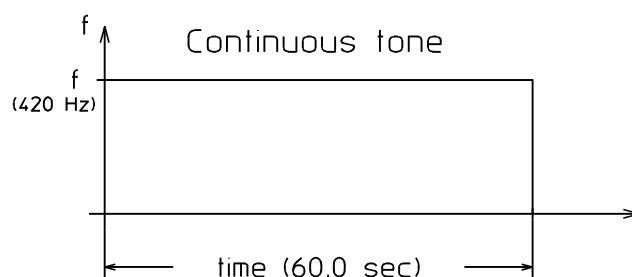
Values in parenthesis (), example siren, A22



Type continuous sound

- frequency: pitch of the sound in Hz (min 40Hz, max 9999Hz)
 ratio: duty-cycle of the square wave in percent, (min 1%, max 50%)
 time: duration in sec., (min 0.01s, max 99.99s). 0.00s corresponds to infinite duration.

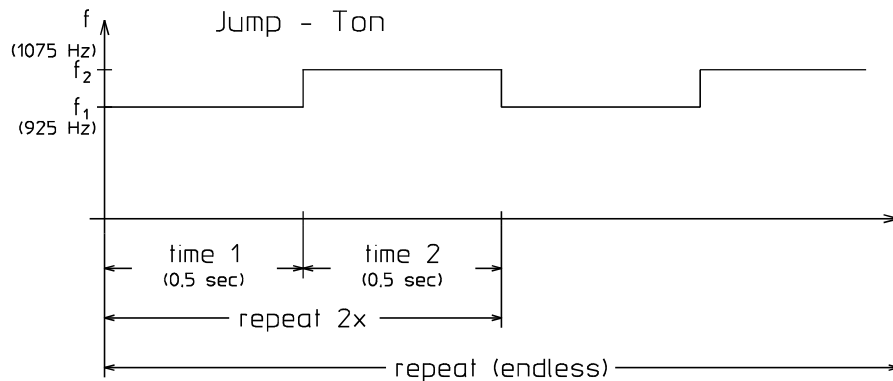
Values in parenthesis (), example BZB all clear signal, A25



Type Jump sound

- frequency1: pitch at sound-start in Hz (min 40Hz, max 9999Hz) jumps after time1 to frequency2
- time1: duration for which freq1 is heard in sec., (min 0.01s, max 99.99s).
- frequency2: pitch of the sound in Hz (min 40Hz, max 9999Hz) jumps after time2 to frequency1
- time2: duration for which freq2 is heard in sec., (min 0.01s, max 99.99s).
- ratio: duty-cycle of the square wave in percent, (min 1%, max 50%)
- repeat: number of repetitions of one frequency (min 1x, max 9999x).
0000 corresponds to infinite repetition.

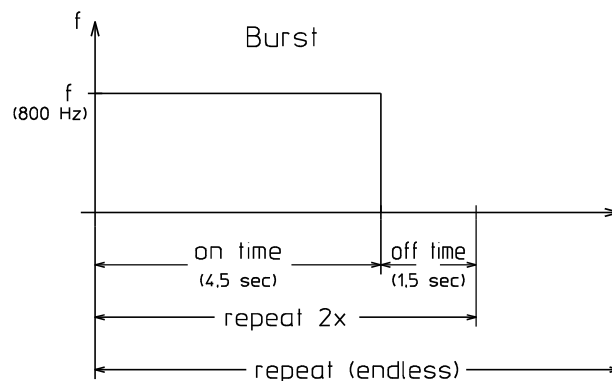
Values in parenthesis (), example Post, A23



Type burst

- Frequency: pitch of the sound in Hz (min 40Hz, max 9999Hz)
- on-time: duration for which the sound is heard in sec., (min 00.01s, max 99.99s).
- off-time: duration of the pause in sec., (min 00.01s, max 99.99s).
- Ratio: duty-cycle of the square wave in percent, (min. 1%, max. 50%)
- repeat: number of repetitions of the sound (min 1x, max 9999x).
0000 corresponds to infinite repetition.

Values in parenthesis (), example ship2, A31



Announcement

General:

Using the announcement function provides the possibility to assign incoming audio signals from the recording inputs (Mic, line, Rec-Inp) directly to the sum output. Especially in stand-alone applications this option is particularly useful, since it will possibly save one microphone amplifier. Starting the function is either performed in the DMM 4650's operation menu or remotely controlled via a control line. For external operation a sequence is provided as factory preset S32 (page 42) which is easily adapted according to individual requirements.

Operation menu announcement

Confirming the menu selection "*announcement*" with the soft key "*ok*", "*select new input level?*" and the soft keys "*yes, no*" are displayed. Adjusting the electronic input level control is performed here. After recording a short test signal, the control's new setting is automatically stored and stays. This value is independent of the recording level in Message recording. Pressing the soft key "*ok*" cancels the level adjustment menu and the DMM 4650 returns into announcement mode.

The display shows the message "*Announcement*" and a bargraph for optical control of the correct input level setting. The soft key "*vl*" allows modifying the pre-listen outputs' volume setting while "*end*" closes the announcement function.

Setting the recording level a new is required only when the connected signal source is changed or any other large scale alterations of the input level take place.

Trigger

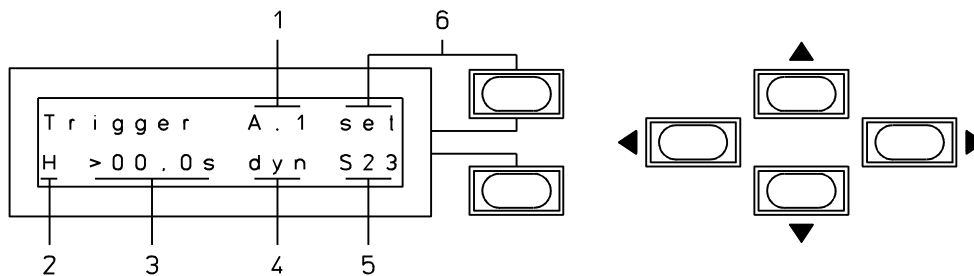
General

The menu trigger allows to assign the connection of a control input to a function of the DMM 4650 (sequence start) while various control inputs can initiate a single sequence. The separate logic control settings for each input provide the possibility to optimally match the requirements of an installation. Pressing the soft key “set” stores the new trigger and it remains in memory even during periods when the mains or battery power is missing.

The control inputs’ technical specifications are to be found in the chapter CONNECTIONS as well as in the APPENDIX.

Operation menu trigger

Confirming the menu selection “trigger” with the soft key “ok”, using the cursor keys provides the possibility to make the following settings:



- 1 Using the cursor keys selects a control input. Possible selections are the Ports A, B, C, D and their corresponding input numbers 1, 2, 3, 4.
- 2 The logic control level gets also selected using the cursor keys: H=high (flowing current), L=low (no current), X=H or L (variable currents) and selecting “off” switches the sequence start of the selected line off.
- 3 Using the cursor keys sets a bounce time between 0.0 and 25.0 seconds. The logic control level selected in point 2 has to be present (stable) at the control input at least for this time value, so that the prerequisite for a sequence start is fulfilled.
- 4 The cursor keys provide the possibility to choose of a selection of three distinct conditions for a sequence to be started. A valid start attempt is initiated only, if the conditions 2 and 3 are fulfilled.

The switch “*dyn*” = dynamic tries to start the stated sequence and simultaneously deletes the start command. A currently running sequence with equal or higher priority prevents the sequence start command from being initiated.

The switch “*stc*” = static tries to start the selected sequence as long as the conditions 2 and 3 deliver a true result. This allows the periodic repetition of a sequence, as long as the conditions are fulfilled (e.g. a key is kept depressed). In case a sequence with equal or higher priority is currently running, the start of a new sequence is only possible after completion of the first sequence and, if the trigger conditions at this moment are still fulfilled.

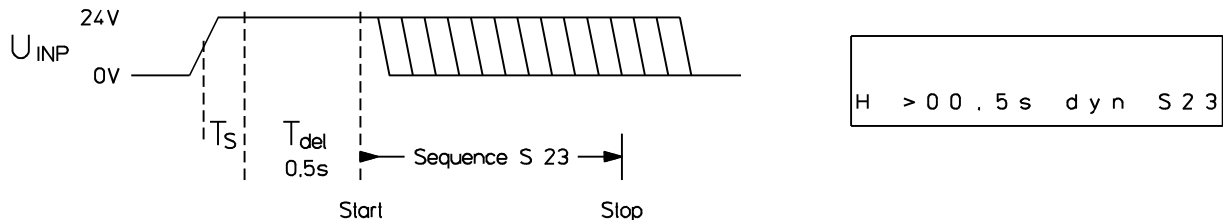
The switch “*lat*” = latched stores the start command and tries to initiate the selected sequence continuously until its launch has been successful. A new triggering of this input is stored only after completion of the sequence. All 16 control inputs are separately stored and the sequences are launched in the succession of their priorities.

- 5 The sequence which is supposed to be started with this control line can be selected with the cursor keys.
- 6 Pressing the soft key “set” stores the above mentioned settings and activates them immediately.

Trigger recognition

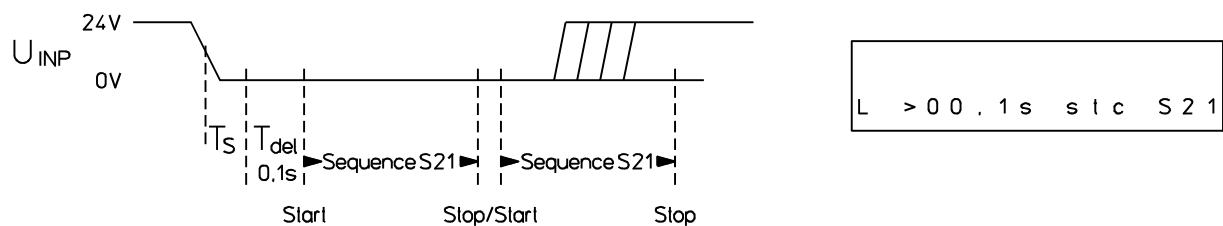
The level of the control inputs are periodically monitored by the processor. The sampling time (T_s = sample rate) is typically $T_{s\text{ typ}} = 30$ msec. The maximum monitor interval can be set to $T_{s\text{ max}} = 100$ msec. Thus, shorter impulses, spikes or quick AC voltages are recognized inaccurate or with a delay (undersampling). The bi-polar control inputs evaluate both half-waves of AC voltages.

Examples for trigger settings

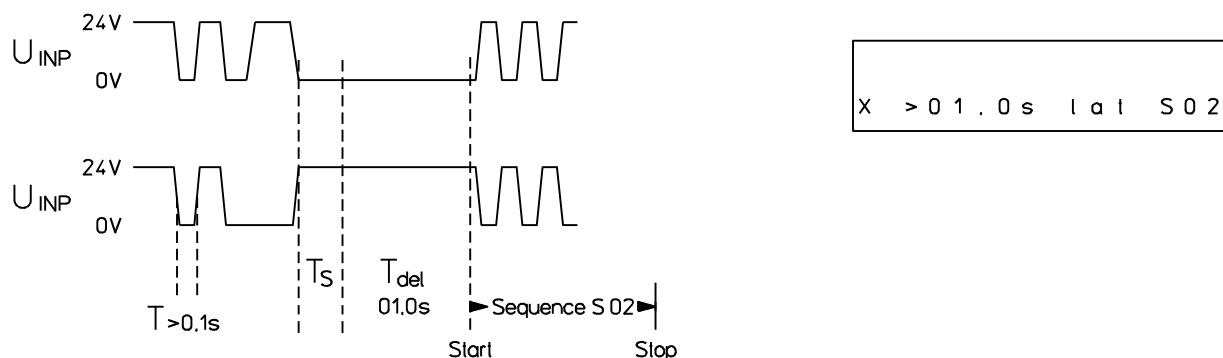


T_s = sample delay, $T_{s\text{ typ}} = 30$ msec, $T_{s\text{ min}} = 0$ msec, $T_{s\text{ max}} = 100$ msec

If the control input is ON for at least 0.6 seconds ($T_{\text{del}} + T_{s\text{ max}}$) and no other sequence with a higher priority is currently running, the sequence 23 is started once. The end of the starting impulse is arbitrary.



Sequence 21 is initiated when the control input is without power for at least 0.2 seconds and no other sequence with a higher priority is currently running. Since the control input is still low at the end of the sequence, S21 starts once again.



If this control line's (watchdog) level is not altered for a period longer than 1.0 seconds, the sequence 02 is launched. If a sequence with a higher priority is currently running, the newly selected sequence will only be initiated after completion of the sequence with the higher priority. Please be aware of the fact, that the truthful recognition of level alterations is only possible when they are applied for a longer period than 100 msec (see trigger recognition).

SEQUENCES

General:

Sequences are a series of single steps, determining the functions of the DMM 4650 step by step. Thus, providing the possibility to define signal sequences, volume levels, trigger outputs, time sequences, loops, etc. Triggering an input ("*trigger*") normally starts a sequence. However, for test purposes it is possible to start a sequence via menu command. A sequence preset can consist of maximally 50 single steps.

Sequence Presets

20 freely programmable presets (user presets) from S00 - S19 are provided. The functions of the factory presets S20-S37 are explained in tables on the pages 36 - 44. Erasing the factory presets is not possible. Probably the easiest way to create your own sequences is to modify already existing, possibly similar sequences (user or factory presets) and store them under different numbers together with their new titles and priorities.

Operation menu sequence

Confirming the menu selection "*sequence*" with the soft key "*ok*", using the cursor keys lets you select the following sub menus:

Load

Confirming "*load*" with the soft key "*ok*", "*Sxx* 'title ' and the soft keys "*yes, no*" appear on the display. Modifying the sequence number *xx* is possible by use of the cursor keys; the corresponding name is displayed. The selected sequence is loaded into memory with "*y*" offering the possibility for editing in other menus.

Priority

Confirming "*Priority*" with the soft key "*ok*", the display shows the priority number of the selected sequence. Using the cursor keys it can be altered in the range of 00 up to 99. After pressing the "*EXIT*" key (previous menu level), the question "*store yes, no?*" appears on the display. Acknowledging this question lets you save your new settings in a user preset.

Stop trigger

When confirming "*stop trigger*" with the soft key "*ok*", a menu is displayed which allows trigger settings for an input control line. Possible choices are described in the chapter "*trigger*". The stop trigger function is only available when the sequence commands "*if stop*" or "*wt stop*" are included. After pressing the "*EXIT*" key (previous menu level), the question "*store yes, no?*" appears on the display. Acknowledging this question lets you save your new settings in a user preset.

Step list

When confirming "*step list*" with the soft key "*ok*", a menu is displayed which allows the indication of all individual steps of a sequence. In caes the listing of a certain sequence is supposed to be edited, the sequence has to be loaded into memory, first (menu "*load*"). The cursor keys are used to modify the step number and its corresponding function (see list of available step functions). The soft keys "*d = delete*" and "*i = insert*" simplify the editing of step listings by deleting or inserting complete rows of steps at the currently displayed step number.

In order to test the functionality of a sequence before the actual storing process is performed, it is possible to launch the sequence including all audio signal and control line results by pressing the PLAY/STOP and RECORD-(stop trigger) keys. Pressing the EXIT key immediately cancels the test function.

After pressing the "*EXIT*" key (previous menu level), the question "*store yes, no?*" appears on the display. Acknowledging this question lets you save your new settings in a user preset.

Title

Confirming “*title*” with the soft key “*ok*”, the name of the currently loaded sequence appears on the display. Using the cursor keys offers the possibility to enter a name of maximally 8 characters. The soft keys “*A-a*” and “*spc*” shift between the upper and the lower character case or enter a blank character, respectively.

After pressing the “*EXIT*” key (previous menu level), the question “*store yes, no?*” appears on the display. Acknowledging this question lets you save your new settings in a user preset.

Save

Confirming “*save*” with the soft key “*ok*” displays the number of the currently selected sequence. The cursor keys are used to enter the desired sequence number. Saving has to be confirmed using the soft key “*y= yes*”. Choosing “*save*” stores all modifications made in the above mentioned menu items into the selected user preset. Thus, individual saving the parameters is not necessary, since they remain in memory until another sequence is loaded.

If a factory preset sequence (S20, S21,...) is chosen for saving, only the ‘*stop trigger*’ is stored.

Sequence example

Via “*sequence*” > “*load*” > S28 > “*step list*” the step function listing of sequence S28 with the name ‘Message 2’ is being selected, which shall serve as a simple example. The purpose of this sequence is the indication of a lamp signal and the playback of a previously recorded message to its end.

Step number	command	parameter	Function
1:	Out	C.1 set	indication lamp ON (relay C1)
2:	Sum=	off	input signal off
3:	DMM=	-2dB	volume DMM signal -2 dB
4:	Start	M02	start message M02
5:	wt	Audio	wait until message end
6:	End		Ende sequenz > stand-by

List of available step functions in sequences

Command	parameter	Function
Nop		-no operation
End		-ending the running sequence
Out	X.Y set X.Y clr X.Y inv	-Output Y (1 ..4) of the I/O module X (A..D) is set to 1 (contact closed) -Output Y (1 ..4) of the I/O module X (A..D) is set to 0 (contact open) -Output Y (1 ..4) of the I/O module X (A..D) is inverted
Start	Axx Gxx Mxx Ann.	-ends a currently running audio signal immediately and starts the alarm preset xx -ends a currently running audio signal immediately and starts the gong preset xx -ends a currently running audio signal immediately and starts the message xx -ends a currently running audio signal immediately and starts the announcement
Break		-ends a currently running audio signal immediately
Finish		-requests the end of the running audio signal. Gong, alarm fade out, messages and announcements are finished, recording is stopped.
DMM=	-xx dB	-controls of the DMM 4650 audio signal is set to -xx dB (*0 dB default)
Sum=	-xx dB	-control of the input - output XLR connection is set to -xx dB
Bypass	set clr inv	-analog bypass relay, direct connection XLR input - output closed -analog bypass relay, no relay connection XLR input - output -inverted analog bypass relay
Audio	prl sum	-switches the started DMM audio signals to pre-listen outputs (Pre-Listen only) -switches the started DMM audio signals to pre-listen and sum outputs (*default)
Record	Mxx	-ends a currently running audio signal immediately and starts the recording of the message xx. At first this message is being erased and then recording starts at the last adjusted recording level. Audio quality and name of this message stay unchanged. The message priority is identical with the sequence priority. The execution time lasts until End Delete Message (start of recording).
Dly=	ttt,t s	-sets a timer to ttt,t seconds and starts measuring this time (sand glass).
Count=	xxxx	-sets a counter (event counter) to a starting value xxxx. With every "if count"-command the counter is decremented by 1 until 0 is reached.
Jump	xx	-resumes the sequence at step number xx.
if	Delay Count Audio In X,Y Z Stop	-only executes the next step number if the delay time has elapsed (see command Dly). Otherwise the next step number is being skipped. -the counter is decremented by 1. The next step number is executed only if the counter has reached 0 (see command Count). If the counter value is greater than 0, the next step number is being skipped. -executes the next step number only if the audio signal started at last is finished (see command start), otherwise the next step number is being skipped. -executes the next step number only if the desired level Z (H or L) is applied at input Y (1 ..4) of the I/O module X (A..D). If this condition is not fulfilled, the next step number is being skipped. -executes the next step number only if the stop trigger condition of this sequence is fulfilled. Otherwise the next step number is being skipped.
wt	Delay Audio In X,Y Z Stop	-waits until the delay time is elapsed -waits until the last started audio signal is finished -waits until the desired level Z (H or L) is applied at input Y (1 ..4) of the I/O module X (A..D). -waits until the stop trigger condition of this sequence is fulfilled.

* setting which is utilized, if a command is not used

System setup

General

Basic functions are defined in the menu system setup. Examples are: behaviour during stand-by, language, data backup, etc. The factory defaults are explained in the table on page 36. Modifications are automatically saved and remain in memory even without supply voltage.

Operation menu system setup

Confirming the menu selection “*system setup*” with the soft key “*ok*”, the following sub menus can be selected using the < > cursor keys .

Contrast

Confirming “*contrast*” with the soft key “*ok*”, the display shows “*LCD contrast*” and the soft key “*norm*”. The display’s contrast is adjusted in +-% using the cursor keys while “*norm*” sets the value to 0%. The EXIT key switches to the prior menu level.

Backlight

Confirming “*backlight*” with the soft key “*ok*”, the display shows “*L CD backlight*” and the soft key “*norm*”. Using the cursor keys, the display’s backlight intensity can be set in a range of 0 % to 100%. The EXIT key switches to the prior menu level.

Headphones

Confirming “*headphones*” with the soft key “*ok*”, the display shows “*headphones*” and the soft key “*norm*”. Using the cursor keys, the value for the volume of the Phone/Pre-Listen outputs can be set in a range of 0 % to 100 % while “*norm*” sets it to 75%. This setting can also be modified with the soft key “*v/*” in the menus “*Message,Gong, and Alarm*”. The EXIT key switches to the prior menu level.

Priority

Confirming “*priority*” with the soft key “*ok*”, the display shows “*Change User prio*” and the soft key “*ok*”. This menu allows fixing user priorities, that are lower than the current user level. The cursor keys are used to assign a user number and its priority. The new setting is only effective after confirming the entry with the soft key “*ok*” (“*new priority stored*”). The EXIT key switches to the prior menu level.

Password

Confirming “*password*” with the soft key “*ok*”, the display shows “*password change*” and the soft key “*ok*”. This menu provides the possibility to change all user passwords, that are lower than the current user level; including your own password. A user number and its password is set with the cursor keys (4 numbers, each from 0-9). The new setting is only effective after confirming the entry with the soft key “*ok*” (“*new password stored*”). The EXIT key switches to the prior menu level.

Outputs

Confirming “*outputs*” with the soft key “*ok*”, the name of a control output (relay contact) is displayed. This menu allows the settings of all 16 outputs, which are valid in the stand-by mode (no sequence running). With the cursor keys one output (A1 to D4) is selected and set to “*low*” (contact open) or “*high*” (contact closed) depending on the application. This modification is effective immediately.

This menu item can also be used to test the functions of the DMM 4650’s outputs during the installation. The EXIT key switches to the prior menu level.

Bypass

Confirming “*bypass*” with the soft key “*ok*”, the message “*bypass is off*” or on appears on the display. This menu item allows the setting of the audio relay’s state (input > output) when in the stand-by mode (no sequence running). The cursor keys are used to change the status. This change is immediately effective. The EXIT key switches to the prior menu level.

Sum level

Confirming "*sum level*" with the soft key "ok", enables the setting of the digital audio control "SUM" (see audio functions). Using the cursor keys this value in "dB"-steps can be changed and is effective at the audio output in stand-by mode (no sequence running); presuming that the bypass relay is off.

A currently running sequence can change the SUM setting. Anyway, when this sequence is finished (stand-by status), the level that was selected previously in this menu is automatically reestablished. The EXIT key switches to the prior menu level.

Attenuation

Confirming "*attenuation*" with the soft key "ok", provides the possibility to set an attenuation level in the range of 0 dB to 10dB for the following audio signals: "Alarms", "Gongs", and "Announcements". The setting effects all audio signals of the corresponding group.

This menu provides the opportunity to match the DMM 4650's output level to different amplifiers and loudspeaker systems. The EXIT key switches to the prior menu level.

init DMM 4650

Confirming "*init DMM 4650*" with the soft key "ok", the message "DMM 4650 init sure?" and the soft keys "y=yes, n=no" appear on the display. If this menu item is confirmed with "yes", the safety query "sure?" appears again, before a complete initialization of the DMM 4650 to its factory default is performed. All user settings are lost!!! Important user presets, stored in the unit, should be transferred into a PC in advance, as described in the menu "*backup*".

The contents of preset memory (EPROM) and message memory (Flash) are deleted or reset to their factory pre-set defaults (see list Factory presets). The number of sound memories is detected automatically. At the end of this procedure the number of bad flash memory blocks is indicated. Afterwards the display shows "*Soft Reset*" together with soft key "ok". After pressing this soft key the initialization process is complete.

The start "*init DMM 4650*" is reserved for basic software updates and for applications where the unit is used differently.

format Flash

Confirming "*format Flash*" with the soft key "ok", the message "*format Flash, bank X*" and the soft key "ok" appear on the display. A bank number can be selected using the cursor keys and "ok", together with the question "sure?", are displayed in order to avoid inadvertent formatting. Formatting deletes all the audio data of the selected memory chip!!! Important message data that is stored in the unit, should be saved in advance ("*message edit play all*", or "*System setup back up*"). After starting the procedure with the soft key "ok", the memory chip passes different tests. Faulty blocks are marked and upon conclusion of the tests their number is indicated on the display.

This menu item is necessary for the installation of memory extensions (NR 90205) into the DMM 4650 and updating the internal message management. The sound memory bank 0 is firmly soldered at the circuit board (Pos. U135). Bank 1 is the retrofit pcb at position CN110, bank 2 = CN111, and bank 3 = CN112. After inserting the board and starting the "*format Flash*" procedure, the newly installed message memory is accessible. In case several extensions are installed, it is necessary to individually format each one them.

Flash space

Confirming "*Flash space*" with the soft key "ok", the number of available flash memory chips and the free space of the sound memory in % appear in the display.

Software

Confirming "*software*" with the soft key "ok", the display shows "*Dynacord DMM 4650*" and the actual software revision number.

Language

Confirming "*language*" with the soft key "ok", using the cursor keys provides the possibility to choose between "*German*" and "*English*". The EXIT key switches to the prior menu level.

Backup

Confirming "*Backup*" with the soft key "ok" displays "*Backup, excl. Msg*" and the soft key "send". The cursor keys are used to select "*Exclusive message*" (= device status + gong preset + alarm preset + sequence

preset), *“update”* (equivalent to exclusive message + message management) or *“inclusive message”* (equivalent to update + audio data). The soft key *“send”* starts the data output via the REMOTE/RS232 connector.

This menu item is meant for data transfers into a computer. This function can also be executed via command at the RS232 interface. A precise description of the necessary control steps and data formats is to be found on the pages 33 - 35. The EXIT key switches to the prior menu level.

Restore

Confirming *“Restore”* with the soft key *“ok”*, the display shows *“Restore release”*. This mode provides the possibility to restore preset data which previously had been saved using the *“Backup”* procedure via the REMOTE/RS232 interface. Since only user 3 has access to the *“Restore”* command, unauthorized modification of the DMM 4650 via the remote interface and other sequences (priority) interrupting a *“Restore”* process in progress is impossible.

A precise description of the necessary control steps and data formats is to be found on the pages 33 - 35. The EXIT key terminates this mode (returning to the prior menu level).

RS232

Confirming *“RS232”* with the soft key *“ok”*, displays the current baud rate of the REMOTE/RS232 interface. With the cursor keys the desired data rate can be set and is effective immediately. Normally, this adjustment is necessary before *“Backup”* or *“Restore”* and remains in memory. This function can also be executed via command at the RS232 interface. A precise description of the necessary control steps and data formats is to be found on the pages 33 - 35. The EXIT key switches to the prior menu level.

Clock

Confirming *“clock”* with the soft key *“ok”*, date and time together with soft key *“set”* appear on the display. After pressing *“set”*, date and time are set anew using the cursor keys. The clock has no power reserve at missing supply voltage and is necessary only for the error log in *“self test”*. With Power-ON the clock always starts from the same value.

Setting date and time is also be achieved via command at the RS232 interface. A precise description of the necessary control steps and data formats is to be found on the pages 33 -35. The EXIT key switches to the prior menu level.

Self test

General

In stand-by mode the DMM 4650 runs a number of test routines in order to detect device faults at an early stage. Errors are indicated by the flashing of the green POWER LED. On fatal errors or on a higher occurrence of errors, the flashing gets faster and the fault relay drops. At the same time the audio input is connected directly to the output via the bypass relay. This menu allows to locate the cause for a device break-down.

Operation menu self test

Confirming the menu selection "*self test*" with the soft key "*ok*" displays an error number ("*Er#xx*"), the amount and a scrolling text in the lower line on the display. Using the cursor keys lets you select individual error numbers. The actual meaning of these numbers is explained in the table on page 47. The number shows how often a specific error has occurred. The scrolling text records the first and last occurrence of the error (see "*setting clock*"). The EXIT key terminates this menu (return to the prior menu level).

Note: Error no.1 only counts the switching "*on*" and "*off*" of the DMM 4650, but does not lead to an external error display (Power On Reset).

In case that error no.14 leads to the blinking of the green POWER LED, the data of one or more messages has been corrupted. The corresponding message(s) is(are) marked with an asterisk (*) (see also page 14).

CONNECTIONS

CONTROL INPUTS AND CONTROL OUTPUTS PORTS A - D

General:

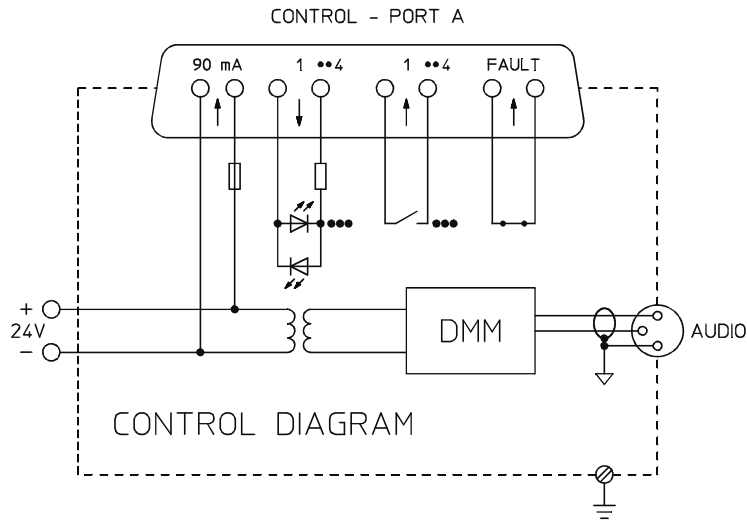
Operation see page 21

(PORTS C, D are optional)

Each of the 4 ports (A, B, C, D) have 4 inputs and 4 outputs and a power source for supplying floating control keys or contacts.

The inputs and outputs are galvanic insulated from the DMM 4650 and the adjacent control lines.

Port A has an additional fault output (relay contact) which, during normal operation, is always closed.



The DMM 4650 provides port connection through 25-pole sub-D connectors (male).

Pin assignment for ports A, B, C, D:

@ corresponds to A, B, C, D

pin	name	pin	name
1	- Batt.	7-20	OUT @1
14	- Batt.	8-21	OUT @2
2-15	INP @1	9-22	OUT @3
3-16	INP @2	10-23	OUT @4
4-17	INP @3	11	- Batt.
5-18	INP @4	24	- Batt.
6	- Batt.	12-25	Fault Out !!Only PORT A
19	- Batt.	13	+ Batt. (max. 90 mA)

Control levels and currents:

Power source -Batt. / +Batt. corresponds to a supply voltage of (20V - 31V) of the DMM 4650. For current limitation (fuse), a PTC resistor (positive temperature coefficient resistor) is provided at the +Batt connection of each port.

Inputs:

The polarity of the control inputs is random.

L = low corresponds to	$U_{INP} < \pm 5V$ (0-5V)	$I_{INP} < 1mA$ (0-1mA)
H = high corresponds to	$U_{INP} > \pm 10V$ (10-31V)	$I_{INP} > 1.8mA$ (1.8-7mA)
	max. $U_{inp} = \pm 31V$	

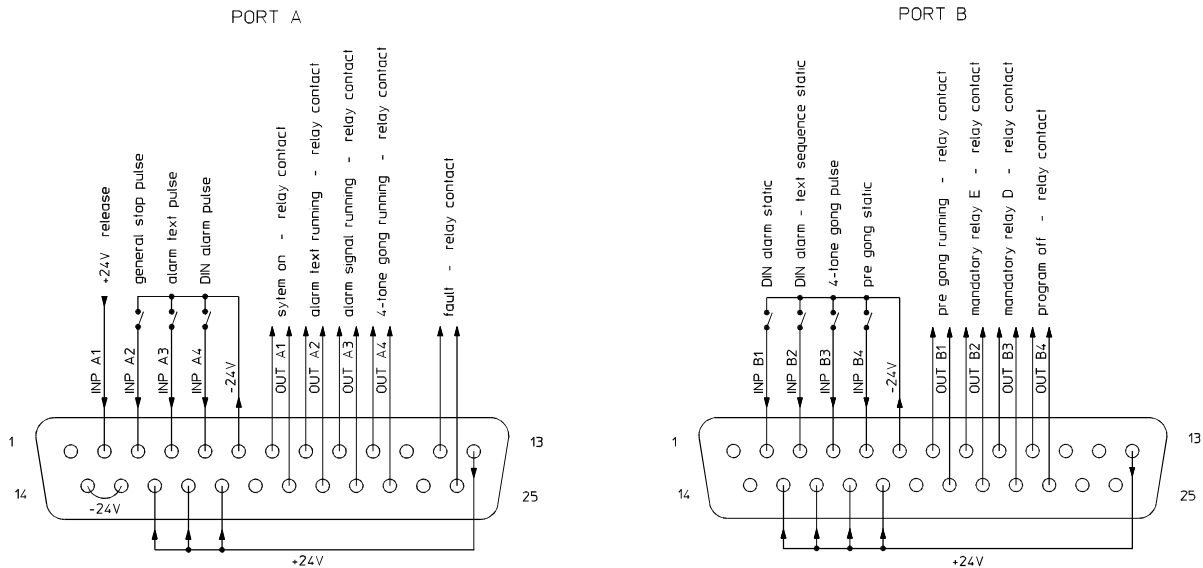
Outputs:

Max. output current (relay contacts): 1A at 24VDC
0.5A at 50VDC

Installation example:

Installation example with factory presets: see also "Factory preset sequences" page 36 - 44

Installation 25pin D-SUB Socket (female)



INPUTS:

All input signals must be applied longer than 200 msec. in order to be securely recognized. Modifying this default is possible in the menu "Trigger".

- | | | |
|----|-----------------|--|
| A1 | Release signal: | Input for re-confirmation signal, whether the unit (power amplifiers) is ready |
| A2 | General Stop: | Input (impulse); interrupts all currently running sequences |
| A3 | Alarm text: | Input (impulse) for playback alarm message (M00) |
| A4 | DIN alarm: | Input (impulse) for infinite DIN alarm (siren 1200 Hz - 500 Hz). |
| B1 | DIN alarm: | Key pressed for DIN alarm on, key released terminates the alarm |
| B2 | DIN alarm text: | Key pressed starts sequence, DIN alarm, 1 sec pause, alarm text (M00), 1 sec pause, DIN alarm, etc., key released terminates the sequence. |
| B3 | 4-tone gong: | Input (impulse) starts a 4-tone gong (G20). |
| B4 | Pre-gong: | Input (static), key pressed starts pre-gong and enables announcement via DMM 4650, key released terminates the sequence. |

OUTPUTS:

All outputs are floating relay contacts.

- | | | |
|----|-----------------------|---|
| A1 | System on: | Switches on the electro acoustics sound reinforcement system. |
| A2 | Alarm text running: | Signaling contact for alarm text active. |
| A3 | Alarm signal running: | Signaling contact for alarm signal active. |
| A4 | 4-tone gong running: | Signaling contact for 4-tone gong active. |
| B1 | Pre-gong running: | Signaling contact for pre-gong active. |
| B2 | Mandatory relay E: | Switches the sound reinforcement system to mandatory reception (E). |
| B3 | Mandatory relay D: | Switches the sound reinforcement system to mandatory reception (D). |
| B4 | Program off: | Switches current music program off. |

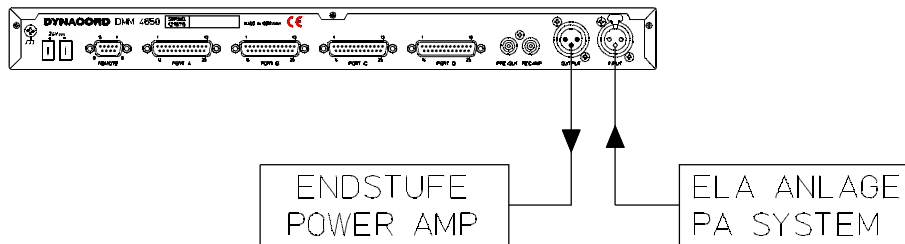
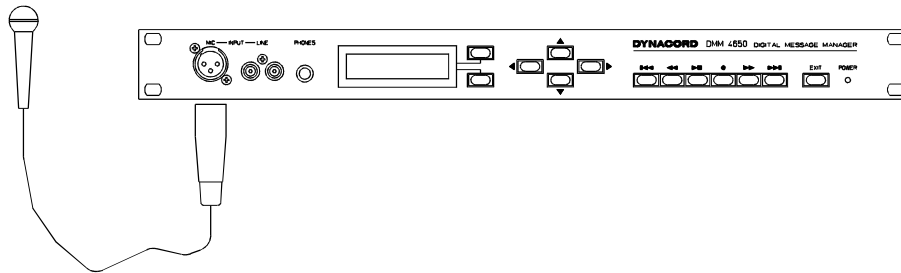
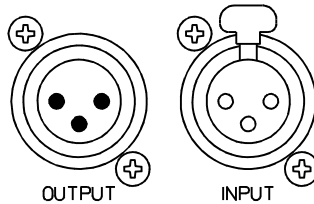
Audio inputs and outputs

The XLR inputs and outputs are electronically balanced and wired according to the IEC 268 standards.

If unbalanced XLR connection is desired, PIN1 and PIN3 have to be bridged using a jumper. Specifications are to be found in the appendix on page 53.

If balanced, floating connection is necessary, the extension kit NR 90211 has to be installed for the INPUT and NR 90210 for the OUTPUT.

PIN 1: SHIELD
 PIN 2: a,+
 PIN 3: b,-



Remote, RS 232 interface, data backup

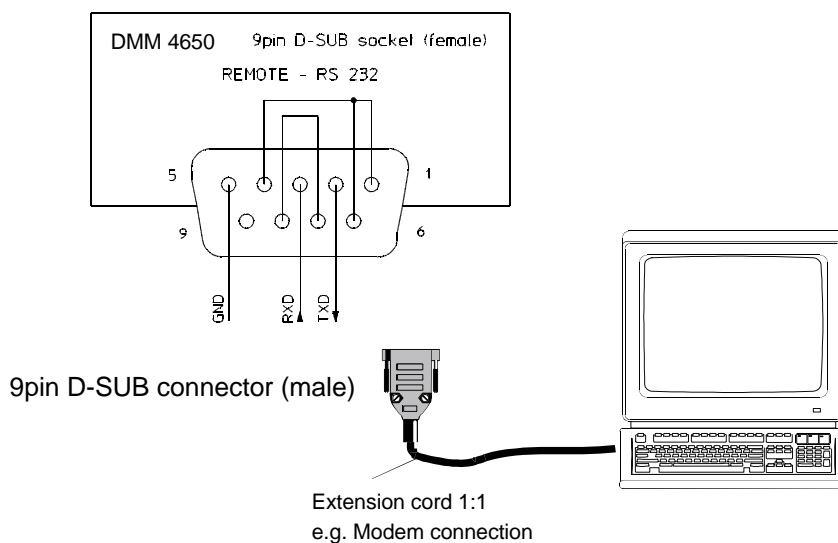
General

Data backup should be performed prior to new installations and programming modifications of the DMM 4650. This ensures that replacing an appliance for service purposes takes the least effort, immediately providing identical functions on the replacement unit. When setting-up systems with similar functions more often, the programming data can be copied using a ready-made data carrier.

For data backup a PC with serial interface and a terminal program is necessary. Please note that the guidelines of the manufacturer of data media (disks, tapes etc.) are to be observed for maximum data safety, since they guarantee data integrity for a limited period of time only.

Using a medium transfer baud rate, the backup of a device status including its gong, alarm, sequences and trigger ("backup") presets lasts about 10 seconds. If the audio data of the message memory ("backup message") is supposed to be saved additionally, the duration depends on the length of the recorded messages and can last several minutes (short message) up to some hours (memory completely used). Thus, it is recommended to perform an audio data backup via the menu "message edit Play all" onto a DAT recorder or tape deck.

Connection REMOTE/RS 232



Interface settings

Baud rate	300 to 38400	The baud rate can be set at the DMM 4650 ("System setup > RS232"), as well as via the interface with command (see list REMOTE commands).
Data bits	8	
Parity	none	After pressing the Return key on the PC (Line Feed), the unit returns
Stop bit	1	"DMM 4650" (communication test).
Protocol	Xon/Xoff	The baud rate is factory preset to 9600 baud.

Backup, Restore commands, Priority

The "backup" command can be given both, from the DMM 4650 menu "System setup > backup", as well as via the REMOTE interface. After starting the backup procedure, the desired data is transmitted in the previously determined format via the REMOTE interface. The PC's terminal program receives the data and creates a corresponding file. The terminal program's configuration is not to be set for any conversion of the received data.

Part of backup file: RESTORE is needed for data re-storing, A00 = alarm preset 00, G=gong, S=sequences, s=stop trigger, TA.1 =trigger PortA Input1, M=message and U=basic settings. This text file can be altered using an editor, e.g. by altering A00 into A05 or deleting whole presets including all data belonging to them. :Data consist of the character string which belongs to the preset and which may not be altered. (! word processor software like WORD or Word Pad should not be used to perform the described alterations, since they add they own format strings to the text.)

RESTORE A00: data	
RESTORE G00: data	
RESTORE s20: data	
RESTORE TA.1:	
RESTORE U: data	

The Backing-up process runs with lowest priority and can be interrupted by other sequences at any time. If this is supposed to be avoided, interrupting sequences are blocked by entering the user3 password (high priority). If the backup is expected to take very long ("*backup message*"), start "*System setup > Restore > ok*" after entering the password, in order to prevent the time-dependent switching-off of the operation.

RESTORE stores the data received via the DMM 4650's REMOTE interface into the stated preset memory. In order to prevent the current memory from being inadvertently overwritten, it is necessary to previously allow this mode in the menu "*System setup > Restore > ok*". The DMM 4650 confirms the successful restoration by displaying the message "*Preset xx restored*".

List REMOTE - commands

Separation command - parameters are separated by a blank character.

The execution takes place after a line feed command (Return) at the end of a line.

Parameter in [] are optional

Bold characters describe factory default settings

Cancel the data transfer with Strg+C

Command	Parameter	Function
backup	[] [status]	The DMM 4650 sends device status (System setup), preset gong, alarm, sequences, stop trigger, trigger
backup	message	The DMM 4650 sends device status (System setup), preset gong, alarm, sequences, stop trigger, trigger and the audio data stored in the message memory (flash memory)
baud	[] [nnnnn]	shows current baud rate, or sets the DMM 4650's baud rate to a new value
date	[] [TT.MM.JJ]	shows the current date, or sets the date to a new value
list	Axx Gxx ...	The DMM 4650 transfers the selected presets' data to the PC in plain text. For documentation, it is possible to print the presets' contents via the PC for further information see help command
Restore	Axx ccccccc Gxx ccccccc ...	The DMM 4650 stores the data into the stated memory (the correct format is determined by the backup) for further information see help command
time	[] [hh:mm:ss]	shows current time, or sets the time to a new value
ver		The DMM 4650 transmits the the software revision number
*		ubsequent characters are ignored by the DMM 4650 (comment)
answer	[] [on] [off]	the answer of the DMM 4650 is switched on or off, or the current status is being displayed
echo	[] [on] [off]	the output of the received characters is switched on (echo) or off, or the current status is being displayed
linefeed	[] [on] [off]	the output of an "empty line" after command execution is switched on or off, or the current status is being displayed
prompt	[] [on] [off]	the output of the character string " DMM 4650 " after command execution is switched on or off, or the current status is being displayed
?		Help function, displays a listing of the commands
Help		Help function, displays a listing of the commands

Definitions:

nnnnn 300 in steps up to 38400
DD.MM.YY day.month.year
xx preset number
cccccc data
hh:mm:ss hours : minutes : seconds

Terminal programs

The utilized terminal software has to be configured for data transfers (send and receive) with a word length set to 8-Bit and no data conversion.

Setting examples for the program "Terminal", coming together with Windows 3.1x package:

Start the terminal software, click the window 'configuration' 'data transmission', set the values for the configuration as described in the paragraph interface settings (see above), and confirm your settings with 'ok'. Select 'conversions no' in window 'configuration' 'terminal settings' and conclude your settings with acknowledging the 'ok' key.

Enter command backup (do not hit the return key yet), then select the menu 'transmission' 'receive text file'. Activate 'receive control character' in this window and, after entering the desired file name, confirm with 'ok'. The terminal program is now waiting for data that is going to be stored in the selected file.

The data transmission starts after pressing the "return" key. The received data is displayed on the PC's screen. After the transmission is finished, select "Cancel" on the lower left-hand side to terminate the data transfer.

Upon completion of the data backup, the contents of the file can be checked using the "read text file" command or any text editor. If necessary, the later allows to change the data (only inserting or deleting whole text lines, see backup, Restore commands above). The text editor should not decode and re-code any characters.

If the backup data is supposed to be loaded back into the DMM 4650, the function Restore has to be activated first (see backup, Restore commands).

After configuring the PC's interface settings (configuration' 'data transfer'), the filename has to be entered in the window 'transmission' 'send text file'. Upon conclusion confirming with "ok" starts the transmission. The DMM 4650's echo gets displayed on the PC screen and upon reception of a complete preset "*restored*" appears on the screen.

FACTORY PRESETS

The installed software v 1.2 provides pre-stored factory presets for sequences, alarms and gongs. Also defined are basic settings (menu "System setup") as well as input and output lines. For direct use of these presets, installation examples are to be found on page 31.

Factory settings, defaults

The user can edit these defaults according to individual requirements.

The data of the menus "outputs" "standby" and "sum level" determines the status of the DMM 4650 in stand-by mode (no sequence running). A running sequence could lead to a modification of the outputs. Upon completion of the sequence, the outputs are switched back to their previous status (stand-by mode).

Menu	Parameter 1	Parameter 2	Parameter 3	Parameter 4
Contrast	0%			
Backlight	50%			
Phones	75%			
Priority	Prio1 33	Prio2 66	Prio3 99	
Password	Prio1 1111	Prio2 2222	Prio3 3333	
Outputs	all Low (relay open), except B4 = High			
Bypass	off (relay open)			
Sum Gain	0 dB			
Attenuation	alarms 0dB	gongs 0dB	messages 0dB	announcements 0dB
Language	German			
RS 232	9600 Baud			

List of trigger signals

Input	Level	Delay sec.	Trigger type	starts sequence	utilization Function (see sequence)
A1	Off				release, S21 to S25, S31 and S33 to S37 wait for High at A1, return message for system ready, upon release the signal output starts
A2	high	>00,1	dyn	S20	stops each running sequence
A3	high	>00,1	dyn	S21	start alarm message M00
A4	high	>00,1	dyn	S22	start DIN alarm, pulse trigger
B1	high	>00,1	dyn	S23	start DIN alarm, high = start, low = stop,
B2	high	>00,1	dyn	S24	start alarm text sequence, high = start, low = stop,
B3	high	>00,1	dyn	S25	4-tone gong, pulse trigger
B4	high	>00,1	dyn	S26	Pre-gong (2-tone), pulse trigger
C1	high	>00,1	dyn	S27	start message M01, pulse trigger
C2	high	>00,1	dyn	S28	start message M02, pulse trigger
C3	high	>00,1	dyn	S29	remote recording M01, pulse trigger, first pulse = start, second pulse = stop
C4	high	>00,1	dyn	S30	remote recording M02, pulse trigger, first pulse = start, second pulse = stop
D1	high	>00,1	dyn	S31	start DIN alarm with announcement key at D2, pulse trigger
D2	Off				announcement in S31, high = announcement, low = alarm
D3	high	>00,1	dyn	S32	start announcement DMM 4650 Mic, high = start, low = stop
D4	high	>00,1	dyn	S36	Morse key

List of factory preset sequences

Sequence Nummer S 20	Title "stop all"	Priority 99	Stopp trigger off
--------------------------------	----------------------------	-----------------------	-----------------------------

Step	Command	Parameter
1:	Break	
2:	End	

Stops all running sequences

Description: Stops all running sequences with low priorities (all factory presets). Upon completion the DMM 4650 returns to the stand-by mode.

Sequence Nummer S 21	Title "Alarmtxt"	Priority 97	Stopp trigger off
--------------------------------	----------------------------	-----------------------	-----------------------------

Step	Command	Parameter
1:	Out	A1 set
2:	wt	In A1 High
3:	Out	B4 clr
4:	Out	B2 set
5:	Out	B3 set
6:	Out	A2 set
7:	Sum=	off
8:	DMM=	-2dB
9:	Start	M 00
10:	wt	Audio
11:	End	

Start alarm text (message 00) once

Description: Turns the sound reinforcement system on (relay A1) and waits for acknowledgment (input A1 = system ready). When the system is ready, the output B4 (music program off) is opened and B2, B3 (mandatory reception E, D) is closed. After closing the signaling contact (A2 = alarm text running) the audio controls are set to alarm text priority. The alarm text (M00) is given out. After the transmission of the message is completed, the sequence is finished and the device returns to the stand-by mode, i. e. all line and relay contact settings re-enter the status, prior to the start of the sequence.

Sequence Nummer S 22	Title "DIN-Alarm"	Priority 93	Stopp trigger off
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Step	Command	Parameter
1:	Out	A1 set
2:	wt	In A1 High
3:	Out	B4 clr
4:	Out	B2 set
5:	Out	B3 set
6:	Out	A3 set
7:	Sum=	off
8:	DMM=	-5dB
9:	Start	A 20
10:	wt	Audio
11:	End	

Start continuous DIN alarm (siren 1200 Hz - 500 Hz, per second)

Description: Turns the sound reinforcement system on (relay A1) and waits for acknowledgment (input A1 = system ready). When the system is ready, the output B4 (music program off) is opened and B2, B3 (mandatory reception E, D) is closed. After closing the signaling contact (A3 = alarm signal running) the audio controls are set to alarm text priority. The alarm signal (A20) is outputted and runs continuously until it is stopped by a sequence with a higher priority (e.g. S20). The control of the settings and relay contacts is taken over by the stop sequence and upon completion the DMM 4650 returns to stand-by mode.

Sequence Nummer S 23	Title "DIN-Alarm"	Priority 95	Stopp trigger B1 Low > 00,1s stc
--------------------------------	-----------------------------	-----------------------	--

Step	Command	Parameter
1:	Out	A1 set
2:	wt	In A1 High
3:	Out	B4 clr
4:	Out	B2 set
5:	Out	B3 set
6:	Out	A3 set
7:	Sum=	off
8:	DMM=	-5dB
9:	Start	A 20
10:	wt	Stop
11:	End	

Start DIN alarm (key B1 ON), Stop with key B1 OFF

Description: Turns the sound reinforcement system on (relay A1) and waits for acknowledgment (input A1 = system ready). When the system is ready, the output B4 (music program off) is opened and B2, B3 (mandatory reception E, D) gets closed. After closing the signaling contact (A3 = alarm signal running) the audio controls are set to alarm text priority. The output of the alarm signal (A20) is started. This sequence is terminated when the input B1 is Low (no current). Upon completion, the DMM 4650 returns to stand-by mode.

Sequence Nummer S 24	Title "Alarm-Txt"	Priority 91	Stopp trigger B2 Low > 00,1s stc
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Step	Command	Parameter
1:	Out	A1 set
2:	wt	In A1 High
3:	Out	B4 clr
4:	Out	B2 set
5:	Out	B3 set
6:	Out	A3 set
7:	Out	A2 set
8:	Sum=	off
9:	DMM=	-5dB
10:	Start	A 34
11:	wt	Audio
12:	Dly=	001,0s
13:	wt	Delay
14:	DMM=	-2dB
15:	Start	M 00
16:	wt	Audio
17:	Dly=	001,0s
18:	wt	Delay
19:	if	Stop
20:	End	
21:	Jump	09
22:	End	

DIN alarm > alarm text > DIN alarm sequence, (start key B2 ON), Stop with key B2 OFF

Description: Turns the sound reinforcement system on (relay A1) and waits for acknowledgment (input A1 = system ready). When the system is ready, the output B4 (music program off) is being opened and B2, B3 (mandatory reception E, D) gets closed. After closing the signaling contacts (A3 = alarm signal, A2 = alarm text) the audio controls are set to alarm priority. The output in sequence is: alarm signal 5 sec (A34) 1 sec. pause alarm text (M00) 1 sec. pause alarm signal 5 sec. (A34) 1 sec. pause, etc. until the input B2 = Low (no current) terminates the sequence. Upon termination the DMM 4650 returns to stand-by mode.

Sequence Nummer S 25	Title "VierKlng"	Priority 89	Stopp trigger off
--------------------------------	----------------------------	-----------------------	-----------------------------

Step	Commend	Parameter
1:	Out	A1 set
2:	wt	In A1 High
3:	Out	B4 clr
4:	Out	B2 set
5:	Out	B3 set
6:	Out	A4 set
7:	Sum=	off
8:	DMM=	-5dB
9:	Start	G 20
10:	wt	Audio
11:	End	

4-tone gong

Description: Turns the sound reinforcement system on (relay A1) and waits for acknowledgment (input A1 = system ready). When the system is ready, the output B4 (music program off) is being opened and B2, B3 (mandatory reception E, D) gets closed. After closing the signaling contact (A4 = gong runs) the audio controls are set to gong priority. The gong signal is being output and fades. After the fade-out the DMM 4650 returns to stand-by mode.

Sequence Nummer S 26	Title "Vorgong"	Priority 87	Stopp trigger B4 Low >00,1s stc
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Step	Command	Parameter
1:	Out	B4 clr
2:	Out	B2 set
3:	Out	B1 set
4:	Sum=	-3dB
5:	DMM=	-5dB
6:	Start	G 24
7:	Dly=	004,0 s
8:	wt	Delay
9:	Out	B1 clr
10:	wt	Audio
11:	wt	Stop
12:	End	

Start Pre-gong (key B4 on), end of announcement with key B4 off

Description: The output B4 (music program off) is opened and in succession B2 (mandatory reception E) is being closed. After closing the signaling contact (B1 = pre-gong runs) the audio controls are set to audio input/pre-gong mix. After 4 seconds the signaling contact (B1, ready for announcement) is being opened. The audio controls remain unchanged until control input B4 terminates the sequence. Afterwards, the DMM 4650 re-enters the stand-by mode.

Sequence Nummer S 27	Title "Message1"	Priority 80	Stopp trigger off
--------------------------------	----------------------------	-----------------------	-----------------------------

Stepp	Command	Parameter
1:	Out	C1 set
2:	Sum=	off
3:	DMM=	-2dB
4:	Start	M 01
5:	wt	Audio
6:	End	

Start Message 1

Description: After closing the signaling contact (C1 = message runs) the audio controls are set to prioritize this message. After the message is finished the DMM 4650 re-enters the stand-by mode.

Sequence Nummer S 28	Title "Message2"	Priority 80	Stopp trigger off
--------------------------------	----------------------------	-----------------------	-----------------------------

Step	Command	Parameter
1:	Out	C1 set
2:	Sum=	off
3:	DMM=	-2dB
4:	Start	M 02
5:	wt	Audio
6:	End	

Start Message 2

Description: Closing the signaling contact (C1 = message runs) switches the audio controls to the priority of the message. After the message is finished the DMM 4650 returns to the stand-by mode.

Sequence Nummer S 29	Title "EasyRec1"	Priority 80	Stopp trigger C3 High >00,1s lat
--------------------------------	----------------------------	-----------------------	--

Step	Command	Parameter
1:	Out	C3 set
2:	Record	M 01
3:	Out	C2 set
4:	Dly=	010,0 s
5:	if	Stop
6:	Nop	
7:	if	Stop
8:	Jump	14
9:	if	Delay
10:	Jump	14
11:	if	Audio
12:	End	
13:	Jump	07
14:	Finish	
15:	Out	C2 clr
16:	Jump	11

Starts the recording of Message 01 (remote recording), starts by briefly pressing the input C3 button (menu trigger), stops by pressing the input C3 button again

Description: Closing the signaling contact (C3 = remote recording runs) starts erasing the message. After successful erasing the signaling contact C2 (=start recording) is being closed. The recording is terminated by switching the control input C3 (current input C3 on). If the termination of the recording mode is not recognized, the maximum duration is limited to 10 sec. Name and priority of the message stay unaltered and the DMM 4650 returns to the stand-by mode.

Sequence Nummer S 30	Title “EasyRec2”	Priority 80	Stopp trigger C4 High >00,1s lat
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Step	Command	Parameter
1:	Out	C3 set
2:	Record	M 02
3:	Out	C2 set
4:	Dly=	010,0 s
5:	if	Stop
6:	Nop	
7:	if	Stop
8:	Jump	14
9:	if	Delay
10:	Jump	14
11:	if	Audio
12:	End	
13:	Jump	07
14:	Finish	
15:	Out	C2 clr
16:	Jump	11

Starts the recording of Message 02 (remote recording), starts by briefly pressing the input C4 button (menu trigger), stops by pressing the input C4 again

Description: Closing the signaling contact (C3 = remote recording runs) starts erasing the message. After successful erasing the signal contact C2 (=start recording) is being closed. The recording is terminated by switching the control input C4 (current input C4 on). If the termination of the recording mode is not recognized, the maximum duration is limited to 10 sec. Name and priority of the message stay unaltered and the DMM 4650 re-enters the stand-by mode.

Sequence Nummer S 31	Title “Fire-Mic”	Priority 98	Stopp trigger off
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Step	Command	Parameter
1:	Out	A1 set
2:	wt	In A1 High
3:	Out	B4 clr
4:	Out	B2 set
5:	Out	B3 set
6:	out	A3 set
7:	DMM=	-5dB
8:	Sum=	off
9:	Start	A 20
10:	wt	In D2 High
11:	Break	
12:	Sum=	0 dB
13:	wt	In D2 Low
14:	Jump	07
15:	End	

Starts a continuous DIN-alarm, pressing the key “fire microphone” allows for an announcement via audio input, after the key is being released the alarm is continued.

Description: Turns the power of the electro-acoustics sound reinforcement system on (relay A1) and waits for acknowledgment (input A1 = system ready). When the system is ready, the output B4 (music program off) is opened and B2, B3 (mandatory reception E, D) gets closed. Closing the signaling contact (A3 = alarm signal running) switches the audio controls to priority for the alarm signal. The alarm signal (A20) is being outputted and runs continuously until the alarm is interrupted by a high signal (=current) at the control input D2 (=fire announcement). As long as the high potential is present at D2, priority is given to the audio input. The alarm continues (infinitely) as long as the D2 potential is low.

A sequence with a higher priority (e. g. S 20) stops this sequence. The control over settings and relay contacts is taken over by the stop sequence. After the stop sequence ends the DMM 4650 returns to the stand-by mode.

Sequence Nummer S 32	Title “Ansage”	Priority 80	Stopp trigger D3 Low >00,1s stc
---------------------------------------	---------------------------------	------------------------------	---

Step	Command	Parameter
1:	Out	D3 set
2:	Sum=	-20dB
3:	DMM=	-3dB
4:	Start	Ann.
5:	wt	Stop
6:	End	

Announcement via recording input DMM 4650 as long as the key is being pressed (System input -20 dB).

Description: Closing the signaling contact (D3 = announcement running) switches the audio controls of the sum input to -20 dB and the controls of the announcement to -3dB. After the correct level was set once in the operation menu (announcement), the announcement is made via one of the DMM 4650's recording inputs. When the message has ended the DMM 4650 returns to the stand-by mode.

Sequence Nummer S 33	Title “BZB-ABC”	Priority 95	Stopp trigger off
---------------------------------------	----------------------------------	------------------------------	------------------------------------

Step	Command	Parameter
1:	Out	A1 set
2:	wt	In A1 High
3:	Out	B4 clr
4:	Out	B2 set
5:	Out	B3 set
6:	Out	A3 set
7:	Sum=	off
8:	DMM=	-5dB
9:	Count=	0003
10:	Start	A 27
11:	wt	Audio
12:	Dly=	012,0s
13:	wt	Delay
14:	if	Count
15:	Jump	17
16:	Jump	10
17:	Dly=	006,0s
18:	wt	Delay
19:	Count=	0003
20:	Dly=	012.0s
21:	wt	Delay
22:	Start	A 27
23:	wt	Audio
24:	if	Count
25:	End	
26:	Jump	20
27:	End	

BZB ABC alarm

Description: Turns the sound reinforcement system's power on (relay A1) and waits for acknowledgment (input A1 = system ready). When the system is ready, the output B4 (music program off) is opened and B2, B3 (mandatory reception E, D) is closed. Closing the signaling contact (A3 = alarm signal running) switches the audio controls to the alarm signal's priority. The signal sequence is defined as follows: 1 minute siren interrupted by two breaks (=5 * 12sec, siren = 330 - 420 Hz), break 30 seconds and repeating of the signal sequence (total duration 150 sec.); the utilized alarm preset is A 27 = 12 sec. siren. Afterwards the DMM 4650 returns to the stand-by mode.

Sequence Nummer S 34	Title “gen-emgc”	Priority 95	Stopp trigger off
--------------------------------	----------------------------	-----------------------	-----------------------------

Step	Command	Parameter
1:	Out	A1 set
2:	wt	In A1 High
3:	Out	B4 clr
4:	Out	B2 set
5:	Out	B3 set
6:	Out	A3 set
7:	Sum=	off
8:	DMM=	-5dB
9:	Start	A 30
10:	wt	Audio
11:	Start	A 31
12:	wt	Audio
13:	Jump	09
14:	End	

Ship alarm “General Emergency”

Description: Turns the sound reinforcement system’s power on (relay A1) and waits for acknowledgment (input A1 = system ready). When the system is ready, the output B4 (music program off) is opened and B2, B3 (mandatory reception E, D) gets closed. Closing the signaling contact (A3 = alarm signal running) switches the audio controls to the alarm signal’s priority. The signal sequence is defined as follows: 7 packages 1.5 sec. 800 Hz tone with 1.5 sec. break (A30) followed by a 4.5 sec. tone with 1.5 sec. break (A31). The sequence runs continuously until it is stopped by a sequence with a higher priority (e. g. S 20). The control of settings and relay contacts is taken over by the stop sequence. After the stop sequence ends, the DMM 4650 returns to stand-by mode.

Sequence Nummer S 35	Title “fireship”	Priority 95	Stopp trigger off
--------------------------------	----------------------------	-----------------------	-----------------------------

Step	Command	Parameter
1:	Out	A1 set
2:	wt	In A1 High
3:	Out	B4 clr
4:	Out	B2 set
5:	Out	B3 set
6:	Out	A3 set
7:	Sum=	off
8:	DMM=	-5dB
9:	Start	A 32
10:	wt	Audio
11:	Start	A 31
12:	wt	Audio
13:	Jump	09
14:	End	

Ship alarm “Fire”

Description: Turns the sound reinforcement system’s power on (relay A1) and waits for acknowledgment (input A1 = system ready). When the system is ready, the output B4 (music program off) is opened and B2, B3 (mandatory reception E, D) is closed. Closing the signaling contact (A3 = alarm signal running) switches the audio controls to the alarm signal’s priority. The signal sequence is defined as follows: 1 package 1.5 sec. 800 Hz tone with 1.5 sec. break (A32) followed by a 4.5 sec. tone with 1.5 sec. break (A31). The sequence runs continuously until it is stopped by a sequence with a higher priority (e. g. S 20). The control of settings and relay contacts is taken over by the stop sequence. When the stop sequence ends, the DMM 4650 returns to stand-by mode.

Sequence Nummer S 36	Title "ManMorse"	Priority 95	Stopp trigger off
--------------------------------	----------------------------	-----------------------	-----------------------------

Step	Command	Parameter
1:	Out	A1 set
2:	wt	In A1 High
3:	Out	B4 clr
4:	Out	B2 set
5:	Out	B3 set
6:	Out	A3 set
7:	Sum=	off
8:	DMM=	-5dB
9:	wt	In D4 High
10:	Start	A 33
11:	wt	In D4 Low
12:	Break	
13:	Jump	09
14:	End	

Ship alarm "Manual Morse key"

Description: Turns the sound reinforcement system's power on (relay A1) and waits for acknowledgment (input A1 = system ready). When the system is ready, the output B4 (music program off) is opened and B2, B3 (mandatory reception E, D) is being closed. Closing the signaling contact (A3 = alarm signal running) switches the audio controls to the alarm signal's priority. A continuous tone (800 Hz = A33) starts when a current is present at the control input D4 and stops after releasing the key. The sequence runs continuously until it is stopped by a sequence with a higher priority (e. g. S 20). The control of settings and relay contacts is taken over by the stop sequence. After the stop sequence ends, the DMM 4650 returns to stand-by mode.

Sequence Nummer S 37	Title "Telefon"	Priority 95	Stopp trigger off
--------------------------------	---------------------------	-----------------------	-----------------------------

Step	Command	Parameter
1:	Out	A1 set
2:	wt	In A1 High
3:	Out	B4 clr
4:	Out	B2 set
5:	Out	B3 set
6:	Out	A3 set
7:	Sum=	off
8:	DMM=	-5dB
9:	Count	0005
10:	Start	A 28
11:	wt	Audio
12:	Dly=	004,0s
13:	wt	Delay
14:	if	Count
15:	End	
16:	Jump	10
17:	End	

Telephone bell

Description: Turns the sound reinforcement system's power on (relay A1) and waits for acknowledgment (input A1 = system ready). When the system is ready, the output B4 (music program off) is opened and B2, B3 (mandatory reception E, D) is closed. Closing the signaling contact (A3 = alarm signal running) switches the audio controls to the alarm signal's priority. The signal sequence is defined as follows: 1 sec. signal (A28), 4 sec. break. It is being repeated five times. Using different signal periods offers the opportunity to realize a code call system. When the call signal ends, the DMM 4650 returns to stand-by mode.

List of factory preset gong signals

gong no.	title	prior.	type	bar	attack	release	start	repeat cnt	rep-del
G20	Vierkling	00	fourtone	1 = A 2 = B 3 = C 4 = D	04 ms 06 ms 07 ms 10 ms	XL XL XL XL	no 1,5 sec 1,5 sec 1,5 sec	no	no
G21	Dreikling	00	threetone	1 = A 2 = B 3 = C	04 ms 06 ms 07 ms	XL XL XL	no 1,5 sec 1,5 sec	no	no
G22	Zweikling	00	twotone	1 = A 2 = B	04 ms 06 ms	XL XL	no 1,5 sec	0001	8,0 sec
G23	Einklang	00	onetone	1 = A	04 ms	XL	no	0001	8,0 sec
G24	Vorgong	00	twotone	1 = A 2 = B	04 ms 06 ms	XL XL	no 0,5 sec	0001	9,0 sec
G25	Türgong	00	fourtone	1 = A 2 = B 3 = A 4 = B	04 ms 06 ms 07 ms 10 ms	M M XL XL	no 0,5 sec 0,5 sec 0,5 sec	no	no
G26	Alrmgong	00	twotone	1 = A 2 = B	04 ms 06 ms	M M	no 0,5 sec	endless	0,5 sec

Definitions for the "gong table": bar A = high frequency, to bar D = low frequency
no = parameter not available
attack = bar attack (ms)
release = bar release (XXS = short, to M = middle to XXL = long)
start = time (sec.) to bar x attack counting from previous bar
repeat cnt = counter of how many times the gong period gets repeated
rep-del = time between two gong periods

List of factory preset alarm signals

Alarm-number	Title	Priority	Type	Freq. 1 Hz	Freq. 2 Hz	time sec	Ratio	repeat
A20	DIN-Alarm	00	Uni-Sweep	1200	500	1,00	14%	endless
A21	slow Whp	00	Uni-Sweep	500	1200	1,00	14%	endless
A22	Sirene	00	Bi-sweep	400	800	2,00	14%	endless
A24	BZB-Luft	00	Bi-sweep	330	420	2,00	14%	30x
A27	BZB-ABC	00	Bi-sweep	330	420	2,00	14%	6x
A34	DIN-Alarm	00	Uni-Sweep	1200	500	1,00	14%	5x

Alarm-number	Title	Priority	Type	Freq. 1 Hz	time 1 sec	Freq. 2 Hz	time 2 sec	Ratio	repeat
A23	Post	00	jumptone	925	0,50	1075	0,50	14%	endless
A28	Telefon	00	jumptone	440	0,0	5494	0,05	50%	20x

Alarm-number	Title	Priority	Type	Frequency Hz	ontime sec	offtime sec	Ratio	Number
A26	BZB-Fire	00	Burst	420	12,00	12,00	14%	5x
A29	AbndnShp	00	Burst	800	12,00	1,50	14%	endless
A30	Schiff1	00	Burst	800	1,50	1,50	14%	14x
A31	Schiff2	00	Burst	800	4,50	1,50	14%	2x
A32	Schiff3	00	Burst	800	1,50	1,50	14%	2x

Alarmnumber	Title	Priority	Type	Frequency in Hz	time in sec	Ratio
A25	BZB-Entw	00	tone	420	60,00	14%
A33	800Hertz	00	tone	800	endless	14%

APPENDIX

Troubleshooting

In stand-by mode the DMM 4650 runs a number of test routines in order to detect device faults at an early stage. Errors are indicated by the flashing of the green POWER LED. With fatal errors or when errors start to appear more often the blinking of the LED gets faster and the fault relay drops. At the same time, the audio input is connected directly to the output via the bypass relay.

The menu "self test" provides a listing of error numbers and occurrence of the following messages:

No:	Error Name	Function test
1	Reset	Power-On counter, no message displayed
2	Software	faulty micro processor interrupt
3	Modul-ID	changing number and activity of control ports (A-D) during power-on
4	+/- 15V	tests internal supply-voltage \pm 15V
5	Bypass	function of audio bypass relay (hardware and software)
6	Fault	function of fault relay (hardware and software)
7	User-mem	data error of passwords and their priorities
8	Trig-mem	data error in trigger settings
9	Sequ-mem	data error in user presets of sequences
10	Stop-mem	data error in user settings of stop triggers
11	Alrm-mem	data error in alarm user presets
12	Gong-mem	data error in gong user presets
13	Msg-dir	data error in message file management
14	Msg-chsu	data error in message audio data (see also "message" on page 14 "**")
15	ARS-RAM	communication error in DSP processor
16	ARS-mod	software error in DSP processor
17	Flash	tests for a changed number of flash memory cards
18	Block	faulty blocks in flash memory has been occurred later
19	EEPROM	error at writing into EEPROM
20	ROM	data modification of the microprocessor's EPROM

User questions, hints

This chapter tries to explain some of the DMM 4650's functions that first may seem somewhat surprising for the user and to provide the amended solution.

Question: Recording a message is suddenly interrupted by the DMM 4650?

Explanation: a) An external contact initiated a sequence with a higher priority (e. g. alarm) than the one of current user. This reaction is necessary and intended, since no user with a priority level 1 or 2 should be able to block the alarm functions.

Solution: a) Record the message with the same number (delete? = yes) after the priority sequence ends.

Explanation: b) Audio memory overrun.

Solution: b) Deleting message numbers that are no longer needed re-provides memory, or install additional audio memory (user 3) in case of need.

Explanation: c) During recording the DMM 4650 has recognized a defect memory address, which is marked as bad and is no longer available for future recordings (bad block).

Solution: c) Start a new recording using the same message number (delete? = yes).

Question: The message number xx cannot be recorded. The message "access denied" is displayed.

Explanation: a) The number has been assigned to a user with higher priority. You cannot delete this message.

Solution: a) Select another message number.

Explanation: b) This also happens during a remote recording, if the desired sequence for the message mistakenly has been recorded by the installer, without programming access for users with a lower priority.

Solution: b) User 3 has to delete this message.

Question: How can I test a sequence (only user 3), without audio transmission?

Explanation: The "System setup" > "Bypass" menu provides the possibility to switch the audio bypass relay to direct connection (input > output) for the duration of the test. This procedure interrupts the audio connection DMM signals > output; except when the test sequence itself switches off the relay again.

Question: What happens when the operation voltage of 24 volts drops for several seconds during the transmission of an alarm sequence?

Solution: In case one of the factory preset alarm signals (trigger A3, A4, B1, or B2) was used re-starts the sequence as long as the alarm button is still pressed.

Question: What do I have to do when the green POWER LED on the front panel blinks?

Solution: The flashing LED is caused by the DMM 4650's self-test routine. The LED blinks whenever an error is being detected. Detailed information on the cause of the error are only available to the service provider (user 3) (see also on page 29). Enter the user 3's password in the "self-test" menu, write down the displayed error messages, and using the soft key "quit" you have to delete all errors one by one.

If the LED starts blinking again, this shows that the error is still present. Look for the cause that generates the problem and try to solve it - otherwise send the appliance to the manufacturer for servicing.

Question: How do I replace a 4-tone gong signal by a 3-tone gong? In accordance to the factory presets, the trigger is connected to the control input B3 and it should stay that way.

Solution: Performing the following changes is only possible for user 3!

The sequence S 25 which initiates the 4-tone gong signal G 20 is being started using the input B3. The selected 4-tone gong signal G 20 has to be changed to the 3-tone gong signal G21 by altering line 9 of sequence S 25 (see also on page 39). After selecting an unused user program memory number (e. g. S 05), the displayed question "store?" has to be answered with "yes" to store the new settings. Select the trigger B3 in the "trigger" menu and change the start sequence from S 25 to S 05. Using the soft key "set" activates the new trigger setting.

Question: I would like to use the start/stop function of the factory presets S 28, S 30 for playback and remote recording of the message M 02 (see also on page 36, 40/41). My installation should include the inputs B3 and B4 instead of the inputs C3 and C4 reserved in the preset. The indication lamps are not needed which makes retrofitting the port C not necessary.

Solution: Performing the following changes is only possible for user 3!

For when the indication signals are not needed, the steps of the sequences S 28 (play message M 02) and S 30 (record M 02) stay unaltered. Only the button C4's stop operation is altered into B4 in the sequence S 30. The new setting is re-stored under S 30. The trigger B3 is selected in the "trigger" menu and the start sequence is changed from S 25 into S 28. Confirming the soft key "set" activates this new setting (play M 02). Now, you have to select the trigger B4 and change the start sequence S 26 into S 30. Afterwards confirm your settings (record M 02) using the soft key "set".

EXAMPLES FOR ALARM TEXTS

Caution: The following examples are not programmed in the message memory. They only serve as examples.

Technical malfunction 1

"Ladies and gentlemen, unfortunately we are experiencing a technical problem.
There is no reason to be concerned. Please stay calm, we are working on the solution."

Technical malfunction 2

"Ladies and gentlemen, we are experiencing a technical malfunction.
For the sake of safety we ask you to please leave the hall using the marked exits."

Technical malfunction 3

"Ladies and gentlemen, may we have your attention, please.
Because we are experiencing some technical difficulties we kindly ask you, to leave the hall immediately using the marked exits.
Please remain calm and follow the instructions of the authorized personal."

Fire

"Attention, fire alarm.
Please use the marked exits to leave the hall immediately. Follow the instructions of the authorized personal.
"Attention, fire alarm: please remain calm."

End of the performance

"Ladies and gentlemen, today's convention is coming to its end.
The exits will soon be closed for the public. We sincerely hope you had a pleasant stay and are looking forward to your return."

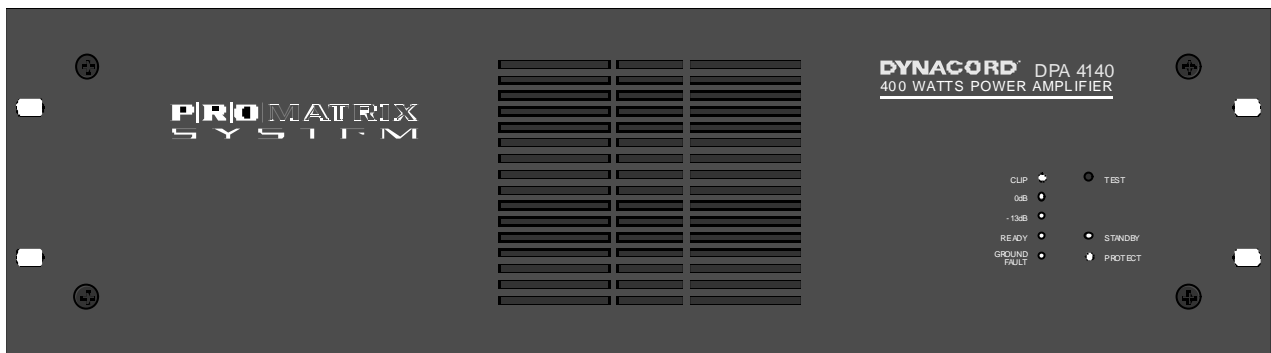
Specifications DMM 4650

Operating Voltage	21.6 - 31.2VDC	
Power consumption	max. 18 watts (without retrofitting kits 90204)	
Input voltage	Input	0.775V/0dBu
	*Line Input	0.775V/0dBu
	*Rec Input	0.775V/0dBu
	*Mic Input	1.4mV/ -54dBu at 600 ohms
Max. Input voltage	Input	3.8V/+14dBu
	*Line INPUT	30V/+32dBu
	*Rec INPUT	30V/+32dBu
	*Mic INPUT	50mV/ -24dBu at 600 ohms
* Using several inputs simultaneously results in a change of the stated voltages.		
Input impedance	Input(bal.)	20kOhm
	Input (unbal.)	10kOhm
	Line Input	20kOhm
	REC Input	20kOhm
	Mic INPUT	1,4kOhm
Output voltage	Output	0.775V/0dBu
	Pre-Output	3.2V/+12dBu
	Phones	3.2V/+12dBu
Max. Output voltage	Output	3.8V/+14dBu
	Pre-Output	9V/+21dBu
	Phones	9V/+21dBu
Output impedance	Output (bal.)	136 Ohm
	Output (unbal.)	68 Ohm
	Pre-Output	220 Ohm
	Phones	220 Ohm
Frequency response	Input > Output	20Hz-20kHz -3/0dB
	Mic Input	20Hz-16kHz -18/3dB
	Others	20Hz-16kHz +0/-3dB
Signal-to-noise ratio	Input > Output	> 108dB (A-weighted)
	Message	> 90dB (A-weighted)
THD	Input > Output	< 0.03% (at 1kHz)
	Message	< 0.05% (at 1kHz)
Data format	AD/DA converter	16 bit linear
	DSP internal	24 bit
Sampling rate	35kHz	
Control inputs	$E_{in} < \pm 5V$	= Low
	$E_{in} > \pm 10V$	= High
Control outputs	floating relay contacts	1A at 24VDC
Dimensions	483 X 43.6 X 225 (W x H x D) 19in, 1HU	
Weight	4kg	
Retrofitting kits		
Port C or D	NRS 90204	
	4 control inputs and outputs	
Memory extension	NRS 90205	
	message memory extension	
Output transformer	NRS 90210	
Input transformer	NRS 90211	

WARRANTY

The factory grants warranty covering all verifiable material and manufacturing faults for a period of 36 months from the original date of purchase on. Warranty claims will only be upheld if valid, i. e. fully completed warranty forms, are submitted. This warranty shall not cover damage caused by incorrect or improper operation.

Any claim to warranty shall become null and void in the event of modifications to the equipment being made by third parties or the purchaser himself.

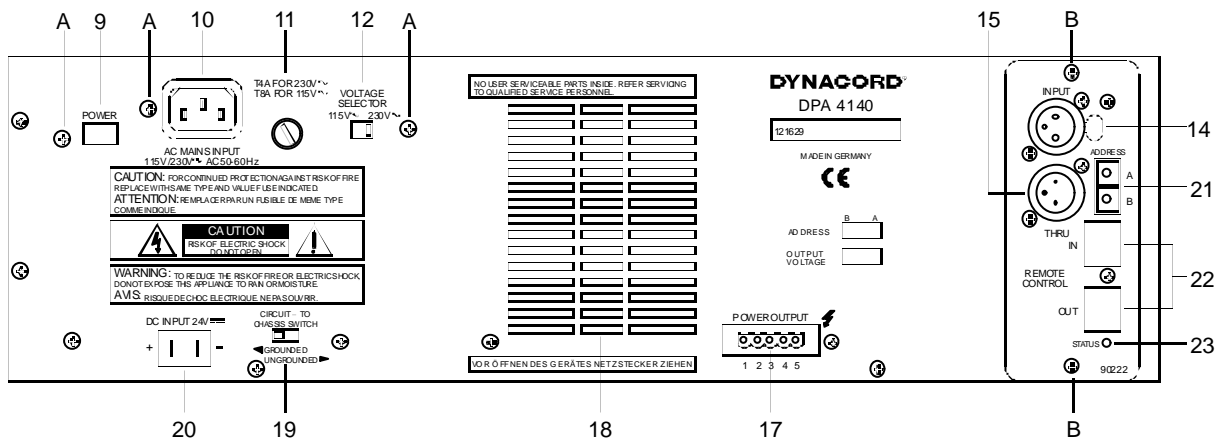
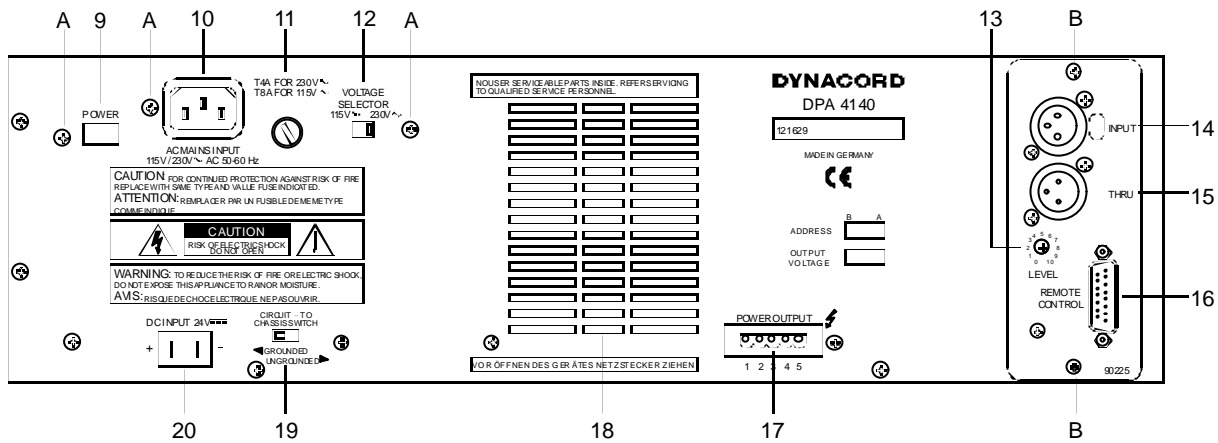
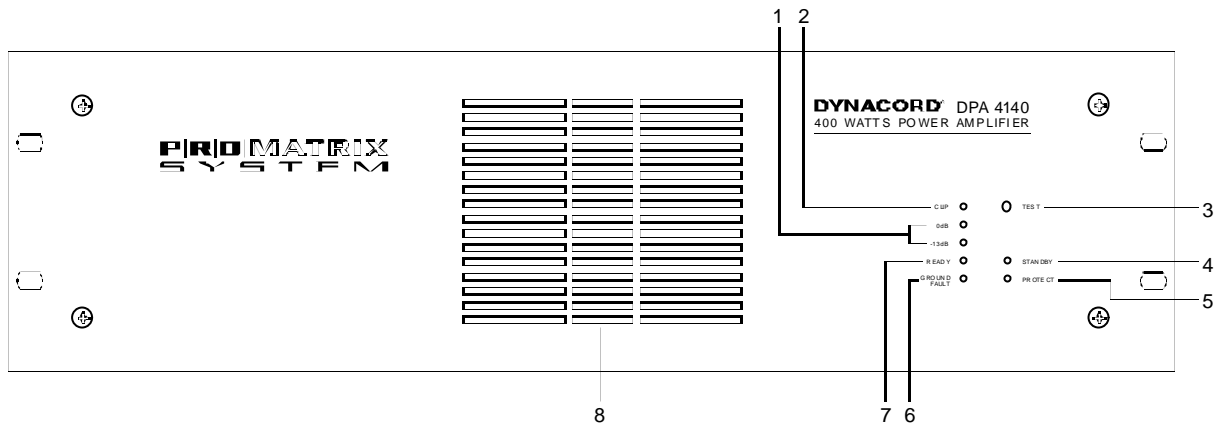


Performance Features

Power amplifier with 200 W or 400 W output power according to the IEC 283-3 standard within a 19" - cabinet (3 HU) providing the following functions:

- supported are 115/230V AC mains as well as 24V DC emergency power source
- power amplifiers DPA 4120 providing 200 W or DPA 4140 providing 400 W output power, idling and short-circuit protection
- output transformer for balanced, floating 100 V speaker networks of optionally 70 V, 50 V or 4 ohms for low-impedance operation
- optional input modules:
 - standard operation INPUT MODULE with level control, electronically balanced input and MONITOR output with optional transformer or
 - REMOTE MODULE for controlling and monitoring the PROMATRIX system, electronic level controls, electronically balanced input and MONITOR output with optional transformer
- integrated stand-by power supply
- mains POWER ON/OFF switch
- ground lift switch
- remotely controllable mains and battery operation with initial current inrush limiter
- power-on switching noise suppression
- status-LED indicators for operation (READY), STANDBY, thermal overload (PROTECT) and occurrence of GROUND FAULT conditions at the power output
- fault message according to the IEC 849 standard
- TEST button to switch between system and average operation, respectively a RESET button to restart after the occurrence of ground fault conditions
- LED level meter instrument with a display range of -13 dB to 0 dB and CLIP
- integrated relays for single call and obligatory reception
- active, temperature controlled ventilation
- pilot tone and ground fault surveillance module according to the DIN/VDE 0800 standard (optional)

Indicators, controls and connections



- | | |
|--------------------------------|---|
| 1 level meter instrument | 10 Mains power connector AC MAINS INPUT |
| 2 CLIP indicator | 11 Mains fuse FUSE |
| 3 Test and Reset button TEST | 12 Mains VOLTAGE SELECTOR |
| 4 STANDBY indicator | 13 Input LEVEL control |
| 5 Fault indicator PROTECT | 14 INPUT socket |
| 6 Fault indicator GROUND FAULT | 15 THRU socket |
| 7 Mode indicator READY | 16 REMOTE CONTROL connector |
| 8 Ventilation louvres | 17 POWER OUTPUT |
| 9 Mains power switch POWER | 18 Ventilation louvres |

- 19 CIRCUIT ⊥ TO CHASSIS SWITCH
- 20 DC INPUT 24V = (battery)
- 21 IDENT ADDRESS switch
- 22 REMOTE CONTROL connectors
- 23 STATUS indicator
- A locking screws power supply printed board

B locking screws INPUT MODULE

Contents

Performance Features.....	23
Indicators, controls and connections	25
1. Utilization	27
2. Installation	27
3. Before the first operation	27
3.1 Mains operation	27
3.2 Battery operation 24V DC	28
4. INPUT	28
5. Outputs	29
5.1 POWER OUTPUT.....	29
5.2 POWER OUTPUT for 100V (70V or 50V) loudspeaker systems.....	29
5.3 SINGLE CALL and obligatory reception relays OVERRIDE BYPASS.....	29
5.4 POWER OUTPUT for low impedance loudspeaker systems.....	29
5.5 MONITOR output	30
5.6 REMOTE CONTROL connector (only NRS 90225)	30
6. Indicators	30
6.1 STANDBY indicator.....	30
6.2 READY indicator.....	30
6.3 PROTECT indicator.....	30
6.4 GROUND FAULT indicator.....	30
6.5 Aussteuerungskontrolle und CLIP-Anzeige	31
7. Switching the output voltage	31
8. Enhanced application field.....	32
8.1 General input module NRS 90225.....	32
8.2 Remote module NRS 90222.....	32
8.3 NRS 90208 input transformer for the floating, balanced input	33
8.4 NRS 90227 output transformer for the floating, balanced monitor output	33
8.5 NRS 90224 pilot tone and ground fault surveillance.....	35
8.5.1 Pilot tone surveillance.....	35
8.5.2 Ground fault surveillance.....	35
9. 19"-case and 19"-rack shelf system installation.....	38
10. Ground lift switch CIRCUIT ⊥ TO CHASSIS SWITCH.....	38
11. Fuses.....	38
11.1 Fuses in the DPA.....	38
11.2 Fuses in the DPA.....	38
12. Power amplifier specifications	42
12.1 DPA 4120 power amplifier 200 W.....	42
12.2 DPA 4140 power amplifier 400 W.....	43
13. Extension specifications	44
13.1 NRS 90225 general input module.....	44
13.2 NRS 90222 remote module	44
13.3 NRS 90208 input transformer for floating, balanced input	44
13.4 NRS 90227 output transformer for floating, balanced monitor output	44
13.5 NRS 90224 pilot tone and ground fault surveillance.....	44
14. Block diagrams	67
14.1 Power amplifiers DPA 4120 / DPA 4140	67
14.2 NRS 90225 general input module.....	68

14.3 NRS 90222 remote module	69
14.4 NRS 90224 pilot tone and ground fault surveillance.....	70
15. Warranty	72

1. Utilization

The amplifiers DPA 4120 and DPA 4140 are specially designed for the power-consistent and reliable operation of PA-systems. The DPA 4120 and DPA 4140 are intended to be used in company intercom, alarm and background music transmission installations, offices and commercial areas, congregation and sport centers, schools, churches, hotels, hospitals, shopping malls and super markets, cruise ships, and other similar applications.

2. Installation

When installing the amplifiers, it is important to assure that for ventilation reasons the front-to-rear air circulation is guaranteed (for details on 19"-case or 19"-rack shelf installation please refer to paragraph 9).

To maintain EMC it is necessary that all input, output, and control lines – except for the power cords – are shielded. Within metal housings or closed rack shelf systems, unshielded output and control cabling is allowable. Shielding is accomplished by connecting the individual cable screens to the enclosure or rack shelf ground potential.

The amplifier has to be protected from:

- water drops or splashes
- direct sunlight
- high ambient temperatures and the direct radiation of heat sources
- high humidity and moisture
- heavy dust
- massive vibrations

Moving the amplifier from a cold into a warm environment can result in the occurrence of condensation on inner parts. Operating the appliance is only permissible after it has accommodated to the altered temperature (approximately after one hour).

Should it happen that foreign solid parts or liquids inadvertently intrude the enclosure, unplug the device from the power source and have it checked by a DYNACORD service center, before using it again.

Cleaning the appliance should not be performed using chemical solvents or sprays, as this might damage the finish and moreover could cause hazard fire.

3. Before the first operation

These power amplifiers are designed to be operated with different input modules. The general input module NRS 90225 is meant for all conventional applications. It allows to remotely start the amplifiers via control lines, monitor their operation by use of the incorporated fault relay, and monitor the transmitted audio signals through the monitor output. Using the remote control module NRS 90222, the amplifiers are connected to the PROMATRIX manager DPM 4000 via RS-485 remote interface providing complete remote operation and surveillance. The desired input module has to be inserted into the module shaft on the rear of the power amplifier. It has to be tightened using the two locking screws (B) (refer also to the paragraphs 8.1 and 8.2).

3.1 Mains operation

For normal AC mains operation, the included mains cord has to be connected to a 230V or 115V 50/60Hz wall outlet. On the appliance itself, the cord has to be connected to the 3-pole mains socket (10).

Caution The appliance is factory preset to **230V AC**. Switching to 115V AC is accomplished using the voltage selector (12).

DPA 4120: For **115V AC** operation, the mains fuse (11) has to be replaced by a **slow blowing 4 ampere type**, labeled "**T4A**" (see also paragraph 11.1).

DPA 4140: For **115V AC** operation, the mains fuse (11) has to be replaced by a **slow blowing 8 ampere type**, labeled "**T8A**" (see also paragraph 11.2).

If the appliance is correctly connected and mains is present the green STANDBY indicator (4) will light. To remotely start the amplifier when it is being operated on the mains, it is necessary to interconnect the contacts 3 - POWER REMOTE and 2 - GROUND STANDBY on the pin terminal strip REMOTE CONTROL (16) (see also paragraph 5.6).

The main power switch POWER (9) on the rear of the appliance is meant for service and maintenance purposes. This allows bridging the mains switching relay, which provides the possibility to operate the amplifier without remote start.

Note	The main power switch POWER (9) on the appliance's rear is only meant for maintenance . Remotely switching off the device is not possible when the POWER switch is engaged.
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Both amplifiers, the DPA 4120 and the DPA 4140, employ power-on switching delays of approximately 3 sec. After this time, the green READY indicator lights and the READY fault message relay picks up when no error is being detected (see also paragraph 6.2).

3.2 Battery operation 24V DC

The amplifiers, DPA 4120 and DPA 4140, use the mains or alternatively an external 24V battery as power source. Switching to battery is performed via integrated relays.

The battery has to be connected on the rear of the amplifiers (20) using **insulated** 6.3x0.8 mm AMP flat plug connectors. The amplifiers are protected against polarity-mismatch. Each, the positive and negative conductors are internally protected by fuses, located on the printed board assembly 85270 (DPA 4120) respectively 85268 (DPA 4140) (see also paragraph 11, figure 10 and 11).

The cable used for battery connection has to be at least 1.5 mm² in diameter (DPA 4120) respectively 2.5 mm² (DPA 4140). Using these diameters, the cable length for the one way distance should not exceed 4.0 m (max. voltage drop <1V).

Caution	The DPA 4120 and DPA 4140 are to be operated only using ungrounded batteries or batteries with grounded negative pole. Operation with grounded positive pole is not permissible.
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4. INPUT

The electronically balanced INPUT (14) providing a sensitivity of 775mV = 0dBu is meant for the connection of control amplifiers. In case it is intended to supply several power amplifiers with identical input signals, these signals can be taken from the THRU connector (15) (see also figure 1 and 2).

The input is prepared to be retrofitted with an input transformer. In case a floating input is needed, it is necessary to install the optional extension NRS 90208 (see also paragraph 8.3).

On the general input module NRS 90225 the input level is set with the level control (13). For the remote control module NRS 90222 the input level is determined by the setting of the internal electronic level control of the PROMATRIX manager DPM 4000 (please also refer to the PROMATRIX handbook).

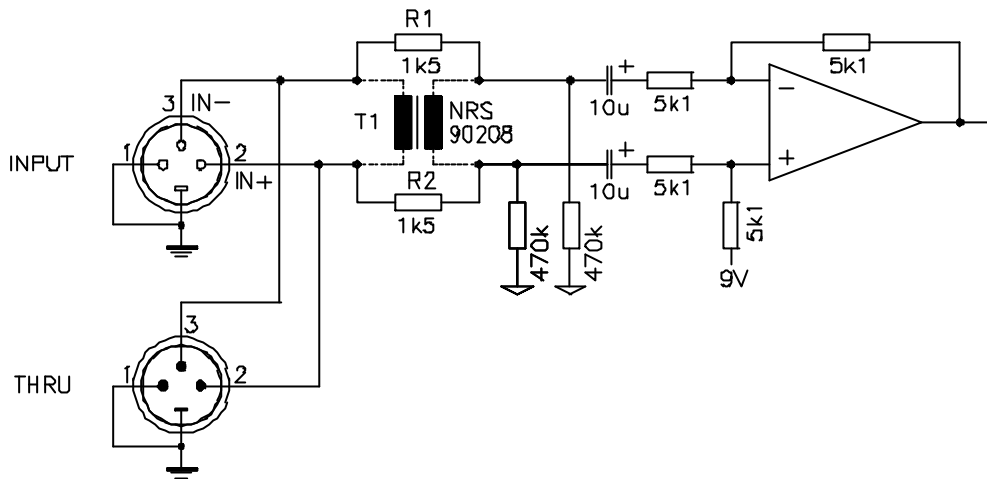


figure 1 connections of the input sockets



figure 2 LF cable for coupling two amplifiers DPA 41xx

5. Outputs

5.1 POWER OUTPUT

The power output is balanced and off-ground potential. The output is factory-configured for the connection of 100V loudspeaker systems. Connection has to be performed by inserting the supplied 5-pole plug into the power output socket (17). Switching the output voltage to 70V, 50V or to low impedance operation (4 ohms) is possible using the plug-in bridge B411 on the printed board assembly 84187 (DPA 4120) respectively 84175 (DPA 4140) (see also paragraph 7).

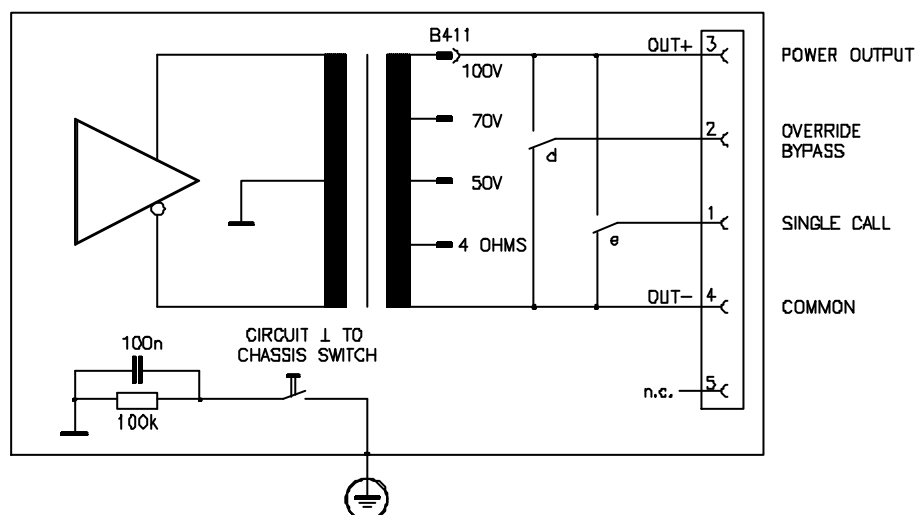


figure 3 connection of the power output

5.2 POWER OUTPUT for 100V (70V or 50V) loudspeaker systems

If the distance between the amplifier and the loudspeakers exceeds 50 m, it is recommended to operate the speaker systems using 100V matching transformers, to reduce line attenuation. This additionally offers a simple way of distributing the output power capacity. In this way it is possible to connect a maximum of as many loudspeaker systems as it takes until the total power consumption of the entire speaker network equals the power output capacity

of 200W (connection impedance 50 ohms) with the DPA 4120, respectively 400W (connection impedance 25 ohms) with the DPA 4140. Connection is performed using the 100V output (17) (see also figure 3). In a few special cases it is also possible to operate the loudspeaker systems with 70V or 50V output voltage (see also paragraph 7).

Caution It is possible that during operation shock-hazard output voltages can be present at the POWER OUTPUT connector (>34V peak value). Thus, the connected loudspeaker groups have to be installed in accordance to applicable security standards and regulations (see also paragraph 8.5.2).

5.3 SINGLE CALL and obligatory reception relays OVERRIDE BYPASS

Combined with the PROMATRIX manager DPM 4000 or other external controls it is also possible to transmit single or collective calls with obligatory reception; i. e. bridging of possibly existing volume controls of the loudspeaker systems. For details on how to connect the outputs, please refer to figure 3; for the connection of relays, please refer to paragraph 5.6 respectively the PROMATRIX handbook.

5.4 POWER OUTPUT for low impedance loudspeaker systems

Switching the output to 4 ohms allows the connection of low impedance loudspeaker systems (4-16 ohms) (see also paragraph 7 and figure 3). Because of the occurring line attenuation, the distance between amplifier and loudspeaker system should not exceed 50m. Please make sure that the overall loudspeaker impedance does not decline a value of 4 ohms and that the stated power handling capacity of a single speaker system is not exceeded.

5.5 MONITOR output




The MONITOR output (16) on the NRS 90225 allows the connection of an additional power amplifier for monitoring purposes. The low impedance output is electronically balanced, which offers the possibility to achieve cable lengths of up to 200 m. Connection is performed via the REMOTE CONTROL pin-connector strip (see also figure 4). For the remote control module NRS 90222, the MONITOR output is located on the REMOTE CONTROL connector (22). The PROMATRIX manager DPM 4000 switches the signal to the according the monitor channel. In case a floating output is required, the monitor output is prepared for retrofitting an output transformer; provided through the optional extension NRS 90227 (please also refer to paragraph 8.4).

Note: Functioning changes in the models DPA 4120 (starting with serial numbers: 100 11) and DPA 4140 (starting with serial numbers: 100 11) in association with the input module NRS 90225: To achieve reliable attenuation of switching noise (knacks), the monitor output stays muted as long as the READY-relay is not pulled. Because of circuit design reasons this causes that the monitor output is also muted even when a ground-fault appears at the main output.

5.6 REMOTE CONTROL connector (only NRS 90225)

The 15-pole sub-D REMOTE CONTROL pin-connector strip (16) provides several different control in-/outputs:

- | | |
|---------------------------------------|-----------------------------------|
| - Ground of the stand-by power supply | - negative pole grounded |
| - POWER REMOTE | - via contact to ground potential |
| - BATTERY REMOTE | - via contact to ground potential |
| - MONITOR output | - electronically balanced |
| - READY-message | - with floating contact |
| - Obligatory reception relay D-RELAY | - via contact to ground potential |
| - Single call E-RELAY | - via contact to ground potential |

- 2 ⊥ STANDBY GROUND
- 3 POWER REMOTE
- 4 BATTERY REMOTE
- 5 D - RELAY
- 6 E - RELAY
- 7 
- 8  READY
- 15 
- 9 + MONITOR
- 10 - MONITOR

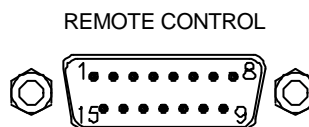


figure 4 connections on the REMOTE CONTROL pin-connector strip

6. Indicators

6.1 STANDBY indicator

When the appliance is correctly connected and mains and/or battery power is present, the green STANDBY indicator (4) will light.

6.2 READY indicator

Both amplifiers, the DPA 4120 and the DPA 4140, employ power-on switching delays of approximately 3 sec. to effectively eliminate power-on switching noise. After this time, the green READY indicator (7) lights and the READY fault message relay picks up when no error is being detected. When the power amplifier's mains transformer exceeds a certain value or, when – with installed NRS 90224 extension – the pilot tone falls below the threshold (see also paragraph 8.5.1), the green READY indicator (7) is not lit and the READY fault message relay drops.

6.3 PROTECT indicator

When thermal overload of the mains transformer or the power amplification stage is encountered, the red PROTECT indicator (5) will light and the READY fault message relay drops. After the amplifier regained normal temperature, the red PROTECT indicator (5) is automatically dimmed and the appliance returns to normal operation. High temperature can be caused by overload, extreme ambient temperatures or faulty functioning of the system's ventilation.

6.4 GROUND FAULT indicator

If, with the NRS 90224 extension installed, a ground fault is being detected at the power output, the red GROUND FAULT indicator (6) will light and the READY fault message relay will drop. During the occurrence of this error normal operation is maintained. After eliminating the cause for the ground fault, pressing the TEST button (3) resets the GROUND FAULT indicator (6) (see also paragraph 8.5.2).

6.5 Level meter and CLIP indicator

The green LED-indicators -13dB and 0dB (1) together with the red CLIP-LED (2) allow to monitor the output level, effectively avoiding overdrive conditions that lead to distortion and overload at the power outputs which could damage the connected loudspeaker systems.

- If the red CLIP-LED (2) shortly lights during program peaks, maximum non-distorted modulation is achieved.
- Continuous lighting or blinking of the red CLIP-LED (2) signals overdrive. In this case the input level has to be reduced.
- If the green LED indicator (1) does not light or is only briefly lit with the red CLIP-LED blinking at the same time, this signals the encountering of an overload or short-circuit condition at the output. In this case the impedance of the connected load has to be checked.

Caution During normal operation the red CLIP-LED should only light briefly and shortly!

7. Switching the output voltage (only to be performed by a qualified service technician!)

The DPA 4120 and DPA 4140 amplifiers allow the connection of 50V, 70V, 100V or low-impedance loudspeaker systems (4 ohms). They are factory-preset to an output voltage of 100 V. Switching the output voltage to 4 ohms, 50V or 70V can be performed by changing the bridge B411 on the power amplifier printed board assembly 84187 (DPA 4120) or 84175 (DPA 4140):

Caution Before opening the appliance, make sure to disconnect the mains and/or battery power source!

- To open the appliance, the top panel has to be removed.
- The bridge B411 (yellow wire) has to be removed from the contact B407 and re-attached to the desired contact (see table 1) (see also figure 8 respectively figure 9).
- The coding-bridges S405 and S406 for the output recognition have to be inserted according to the illustration in figure 5.
(the inserted coding-bridge is marked in black)
- The top panel has to be re-attached.

Note By using a waterproof marker pen and after switching the output voltage, the newly set value has to be marked in the filed "OUTPUT VOLTAGE" on the rear panel of the appliance.

output	bridge B411 to
100 V	B407
70 V	B408
50 V	B409
4 ohms	B410

table 1 bridge B411 settings
switching the output voltage

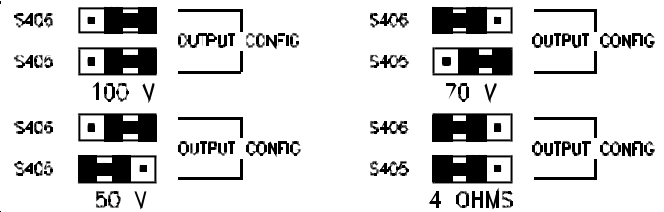


figure 5 coding-bridges S405 / S406 settings
output recognition OUTPUT CONFIG

Caution It is possible that during operation shock-hazard output voltages can be present at the POWER OUTPUT connector (>34V peak value). Thus, the connected loudspeakers have to be installed in accordance to applicable security standards and regulations (see also paragraph 8.5.2).

8. Enhanced application field

8.1 Standard input module NRS 90225

This input module for the power amplifiers DPA 4120 and DPA 4140 is meant for insertion at the power amplifiers' rear. It provides the following functions:

- lockable XLR input connector
- XLR output connector; to patch the input signal through
- gain control; to be adjusted using a screwdriver
- mains remote ON/OFF
- battery remote ON/OFF
- control of the D- and E-relays
- fault messages via the READY relay contact:
 - thermal overload of the mains transformer
 - thermal overload of the power amplification stage
 - ground fault (optional; only with installed NRS 90224)
 - pilot tone signal (optional; only with installed NRS 90224)
- MONITOR output; electronically balanced
- input transformer for floating, balanced input; optional
- output transformer for floating, balanced monitor output; optional

The input module is meant to be used with the power amplifiers DPA 4120 and DPA 4140. The module allows to control and monitor the operation of the power amplifiers using conventional equipment or (with reservations) by the PROMATRIX manager DPM 4000.

Caution: Before installing the input module NRS 90225, you have to unplug the mains connector as well as a presumably connected battery cord.

Before installing the input module, it is necessary to remove the two locking screws B on the rear panel of the appliance. For installation the printed board assembly first has to be inserted into the guiding rails. After carefully pushing the module in it has to be locked by using the two screws mentioned before.

Note: Functioning changes in the models DPA 4120 (starting with serial numbers: 100 11) and DPA 4140 (starting with serial numbers: 100 11) in association with the input module NRS 90225: To achieve reliable attenuation of switching noise (knacks), the monitor output stays muted as long as the READY-relay is not pulled. Because of circuit design reasons this causes that the monitor output is also muted even when a ground-fault appears at the main output.

8.2 Remote module NRS 90222

This input and remote module for the power amplifiers DPA 4120 and DPA 4140 is meant for insertion at the power amplifiers' rear. It provides the following functions:

- lockable XLR input connector
- XLR output connector; to patch the input signal through
- input level; can be set via a programmable audio level control
- MUTE (via level control)
- mains remote ON/OFF
- battery remote ON/OFF
- control of the D- and E-relays
- surveillance and fault messaging via the PROMATRIX manager DPM 4000 corresponding to IEC 849
 - thermal overload of the mains transformer
 - thermal overload of the power amplification stage
 - ground fault (optional; only with installed NRS 90224)
 - pilot tone signal (optional; only with installed NRS 90224)
 - measurement of the output voltage / level
 - measurement of the output current
 - surveillance of the connected loads via current/voltage measurement
- MONITOR output; electronically balanced
- monitoring: input/output signals can be assigned to the monitor bus
- input transformer for floating, balanced input (optional)
- output transformer for floating, balanced monitor output (optional)
- pilot tone signal ON/OFF (optional)

The remote module allows to remotely control and monitor the operation of the power amplifiers DPA 4120 and DPA 4140 from the PROMATRIX manager DPM 4000 (for further details please refer to the PROMATRIX handbook).

Caution: Before installing the input module NRS 90222, you have to unplug the mains connector as well as a presumably connected battery cord.

Before installing the input module, it is necessary to remove the two locking screws B on the rear panel of the appliance. For installation the printed board assembly first has to be inserted into the guiding rails. After carefully pushing the module in it has to be locked by using the two screws mentioned before.

Note After installing the remote module NRS 90222 it is necessary to set its address according to the description in the PROMATRIX handbook using the two "HEX-code switches" ADDRESS (21) and note the setting within the field ADDRESS on the rear panel of the appliance using a waterproof marker pen.

8.3 NRS 90208 input transformer for the floating, balanced input

For the case that floating inputs are required, the inputs of the INPUT MODULE NRS 90225 and the REMOTE MODULE NRS 90222 are prepared for retrofitting input transformers. If so, it is necessary to additionally install the extension kit NRS 90208 per each input.

The installation has to be performed as follows (see figure 6 and/or figure 7):

- to remove the input module you have to loosen the two locking screws (B) on the rear panel of the appliance. Now, the module can be easily torn out.
- before installing the input transformer you have to remove the resistors R1 and R2.
- mount the input transformer onto the printed board assembly, so that the marking located on the connector side of the transformer matches with the one on the printed board assembly. To prevent short-circuits place the supplied insulation disc between the transformer and the printed board assembly.

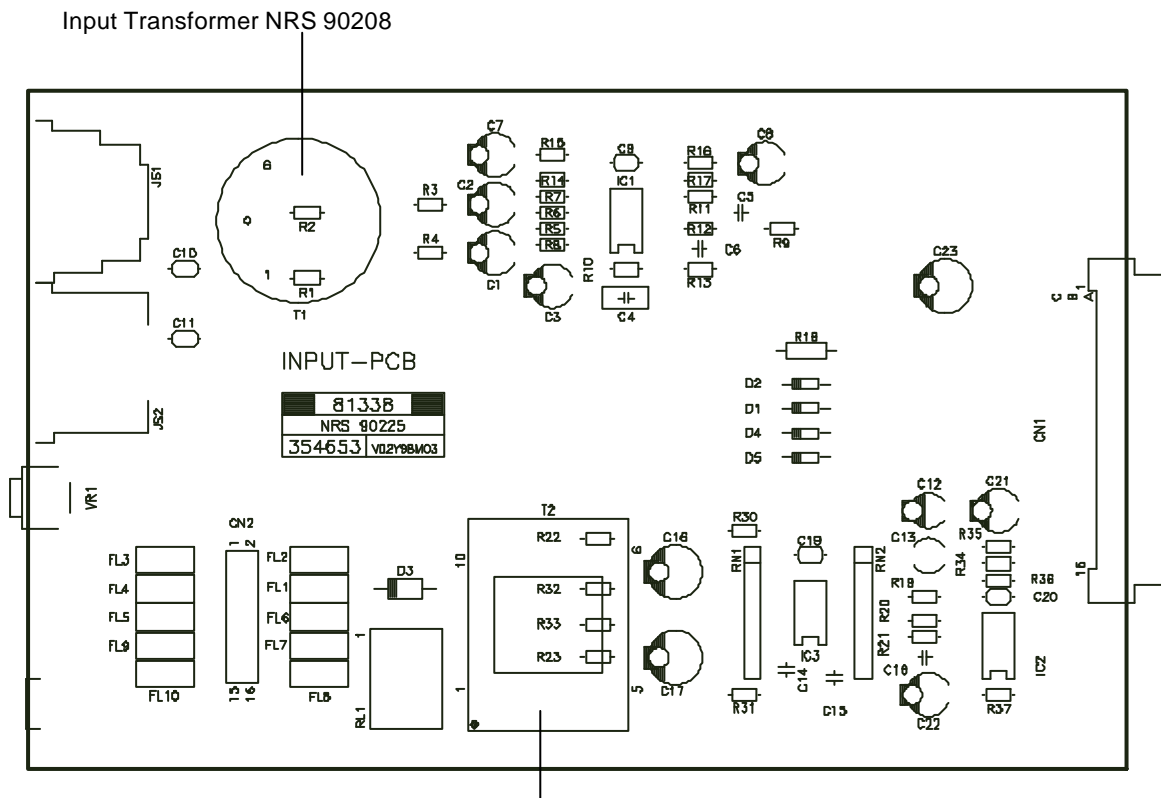
- re-insert the input module and tighten the locking screws (B).

8.4 NRS 90227 output transformer for the floating, balanced monitor output

In case that floating monitor outputs are required, the outputs of the INPUT MODULE NRS 90225 and REMOTE MODULE NRS 90222 are prepared for retrofitting output transformers. If so, it is necessary to additionally install the extension kit NRS 90227 per each output.

The installation has to be performed as follows (see figure 6 and/or figure 7):

- to remove the input module you have to loosen the two locking screws (B) on the rear panel of the appliance. Now, the module can be easily torn out.
- before installing the output transformer you have to remove the resistors R22, R23, R32 and R33 (NRS 90225) respectively the resistors R23, R24, R71 and R72 (NRS 90222).
- now, you can mount the output transformer onto the printed board assembly. Because of the transformer's symmetrical design, polarity is not a critical factor.
- re-insert the input module and tighten the locking screws (B).



Output Transformer NRS 90227

figure 6 printed board assembly 81338 showing the input transformer NRS 90208 and the output transformer NRS 90 227

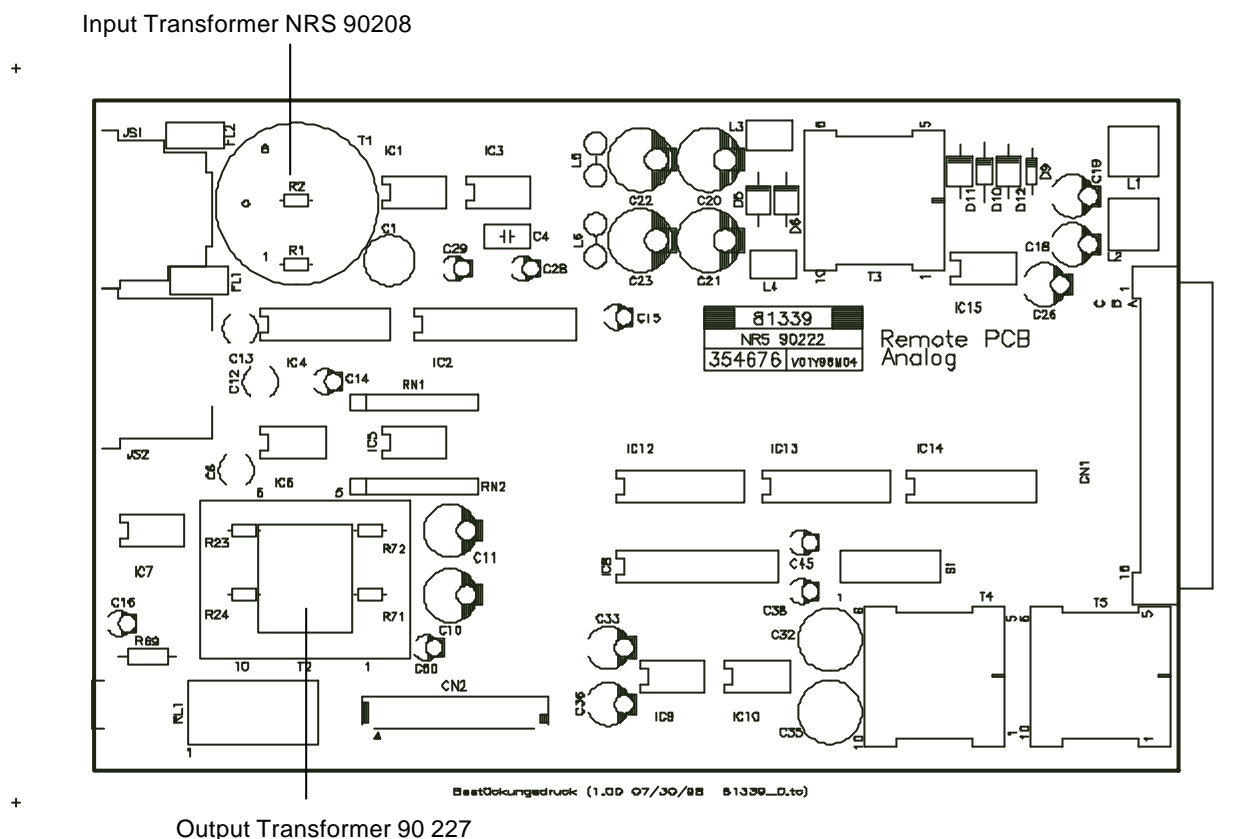


figure 7 printed board assembly 81339 showing the input transformer NRS 90208 and the output transformer NRS 90 227

8.5 NRS 90224 pilot tone & ground fault surveillance

The extension NRS 90224 is meant for insertion. It includes a 19 kHz tone generator and a selective 19 kHz receiver with evaluation stage for pilot tone surveillance. Also incorporated is a monitoring circuit with fault storage and display driver, to guard the cable network connected to the output.

8.5.1 Pilot tone surveillance:

Integration of the extension NRS 90224 provides continuous self-monitoring of the amplifier. This gets accomplished in the way that an extremely low-level 19 kHz pilot tone signal is introduced to the signal path following the input level control LEVEL. After passing the amplifier stages, the pilot tone signal is filtered out at the output and the result is evaluated. If the measured signal declines the pilot tone's predetermined threshold at the output or is not present at all, the READY indicator (7) dims and the READY fault message relay drops. When using the INPUT MODULE NRS 90225, the fault message is output as collective fault message with the floating contact of the READY fault message relay via the REMOTE CONTROL connector (16). When using the REMOTE MODULE NRS 90222, error occurrence is monitored and output by the PROMATRIX manager DPM 4000 (for further details, please refer to the PROMATRIX handbook).

8.5.2 Ground fault surveillance:

When installing and operating 100V-loudspeaker networks, compliance to the VDE regulation DIN VDE 0800 is mandatory. Especially, if 100V-loudspeaker networks are included in alarm system applications, all security standards have to be in accordance to the security class 3 standard.

When off-ground potential loudspeaker cable networks are employed we recommend insulation-monitoring using the ground fault surveillance module NRS 90224. Error recognition: An occurring ground fault either signals that one of the cables is damaged - which most likely point towards a total line interruption in the near future - or that connections have been carried out erroneously which may lead to malfunctioning of the entire system. The fault message GROUND FAULT (6) is also maintained with very short (>5 sec) ground faults, as long as the amplifier is powered-on or a loaded battery is connected. The fault message is displayed via the red GROUND FAULT indicator (6). In case of an inserted INPUT MODULE NRS 90225, it is also outputted as collective fault message with the floating contact of the READY fault message relay via the REMOTE CONTROL connector (16). When using the REMOTE MODULE NRS 90222, error occurrence is monitored and output by the PROMATRIX manager DPM 4000 (for further details, please refer to the PROMATRIX handbook).

The installation has to be performed as follows (see figure 8 and/or figure 9):

Caution Before opening the appliance, make sure to disconnect the mains and/or battery power source!

- To open the appliance, the top panel has to be removed.
- The extension kit NRS 90224 has to be inserted with its component side to the left (from the front view) until it clicks in place.
- Re-install the top plate of the enclosure.

NRS 90 224



S 406
S 405

B 411

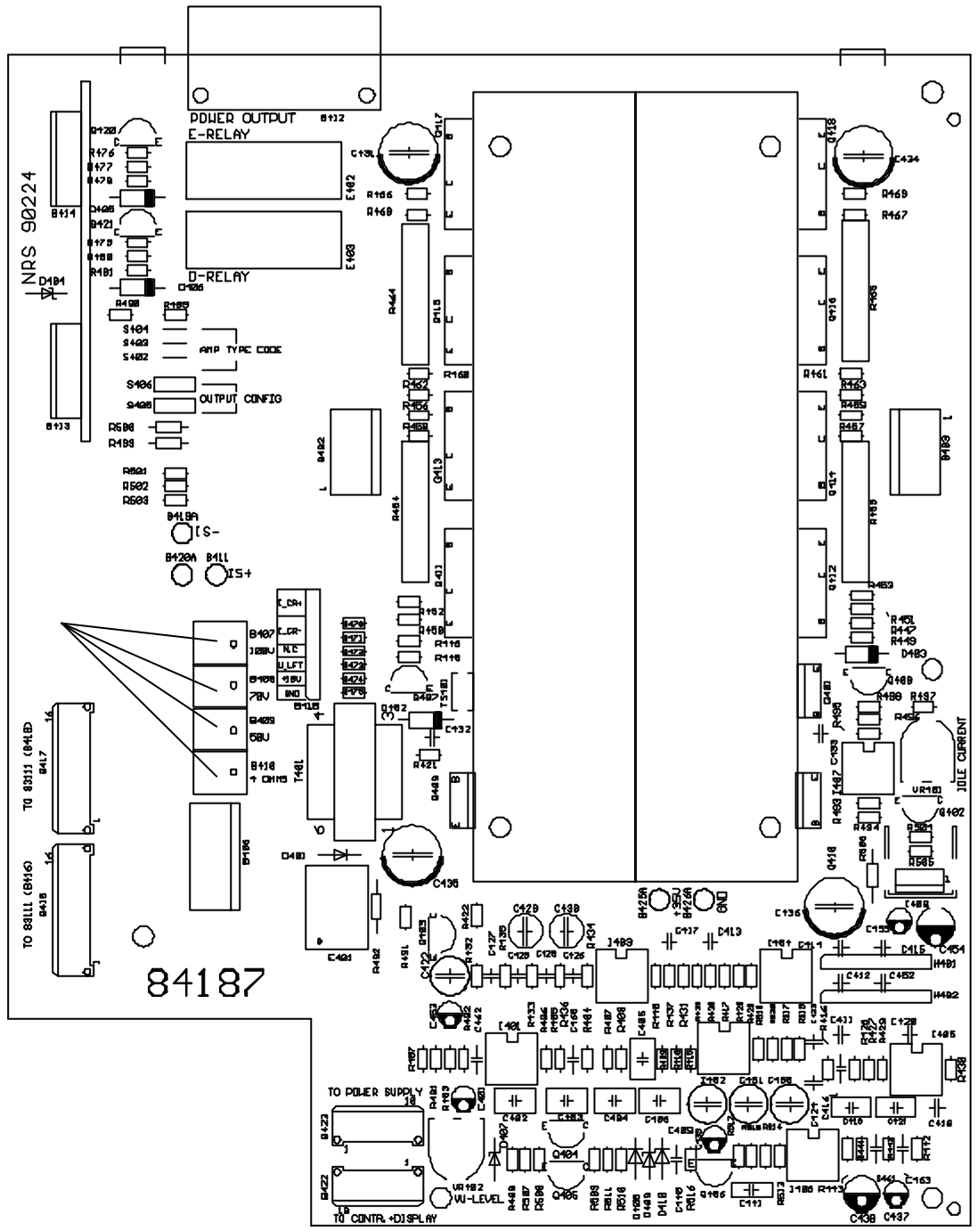


figure 8 printed board assembly 84187 in the DPA 4120 showing the NRS 90224 pilot tone & ground fault surveillance and the bridges B411 and S405, S406 for switching the output voltage; inserted

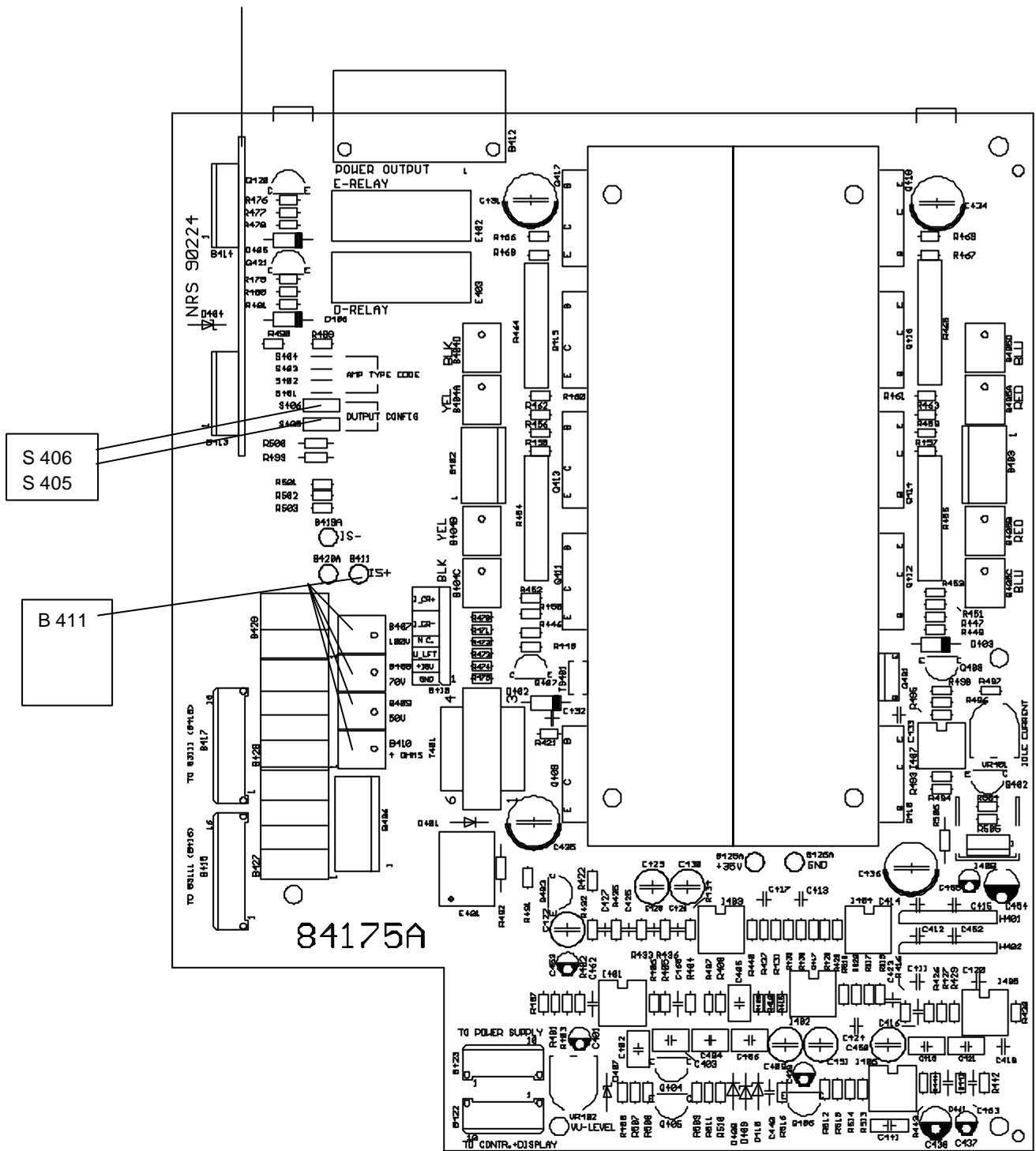


figure 9 printed board assembly 84175 in the DPA 4140 showing the NRS 90224 pilot tone & ground fault surveillance and the bridges B411 and S405, S406 for switching the output voltage; inserted

Checking the pilot tone surveillance function:

When the NRS 90224 is installed and the power amplifier is switched on, the green READY indicator (7) has to light. The testing and reset button TEST (3) serves as a function control for the pilot tone surveillance. With the TEST button being engaged, the 19 kHz generator is inactive. The green READY indicator is off and the READY fault message relay drops. Approximately 3 seconds after releasing the TEST button, the indicator has to light again. This method can also be used to check system configurations with average-switching.

Checking the ground fault surveillance function:

When the NRS 90224 is installed and the power amplifier is switched on, the green READY indicator (7) has to light. Utilizing an external switch to connect one pole of the 100V-loudspeaker network via a 47 k ohms resistor for approximately 5 seconds to ground potential, the corresponding red GROUND FAULT indicator (6) has to light and the READY fault message relay of the INPUT MODULE NRS 90225 drops while the green READY indicator (7) stays lit. After releasing the button, the indication and the fault message are maintained. The TEST button (3) has to be used to reset the ground fault surveillance function. For further details on checking the function with the REMOTE MODULE NRS 90222 being included in your installation, please refer to the PROMATRIX handbook.

9. 19"-case and 19"-rack-shelf system installation

Note	Operation of the power amplifiers DPA 4120 and DPA 4140 with enclosure cover plates detached is strictly prohibited.
-------------	--

When mounting the power amplifiers within rack-cases or rack-shelf systems make sure to provide sufficient airflow. The space between the rear panel of the amplifier and the inner wall of the rack-case has to be at least 60 mm x 330 mm. A free space of at least 100 mm above the rack-shelf system is needed to provide sufficient air circulation. Since it is possible that during operation the temperature inside the rack system increases by 10° C, the maximum allowable ambient temperatures of the rest of the incorporated modules and appliances within a specific rack-shelf or rack-case have to be taken into careful consideration.

Note	To ensure trouble-free operation of the appliance, the maximum permissible ambient temperature of +40°C is not to be exceeded.
-------------	--

10. Ground lift switch CIRCUIT ⊥ TO CHASSIS SWITCH

The ground lift switch CIRCUIT ⊥ TO CHASSIS SWITCH (19) provides the possibility to separate the signal ground from the enclosure (ground potential). This is mainly meant to eliminate noise-problems which are introduced through ground-loops, without jeopardizing the security. In case several appliances within a single rack-case or rack-shelf are furnished with ground lift switches, it is recommended to set all devices but one to "ungrounded". Set one appliance to "grounded". When set to "ungrounded", the impedance between signal ground and enclosure is : 100 k ohms // 100 nF. It is needed to maintain EMV protection.

11. Fuses

11.1 Fuses in the DPA 4120

location	Pos.	purpose	value	dimensions	standard
fuse socket (11)	F601	mains fuse 230V~ AC	T2A	5x20 mm	IEC 127-2-3
fuse socket (11)	F601	mains fuse 115V~ AC	T4A	5x20 mm	IEC 127-2-3
printed board assembly 86243	F602	mains fuse 100V - 250V	T1A	Ø 8.5xRM 5.08mm	IEC 127-3/4
printed board assembly 85270	F502	battery fuse 24V DC	15A	flat fuse	DIN 72581-3
printed board assembly 85270	F503	battery fuse 24V DC	15A	flat fuse	DIN 72581-3

11.2 Fuses in the DPA 4140

location	Pos.	purpose	value	dimensions	standard
fuse socket (11)	F601	mains fuse 230V~ AC	T4A	5x20 mm	IEC 127-2-3
fuse socket (11)	F601	mains fuse 115V~ AC	T8A	5x20 mm	IEC 127-2-3
printed board assembly 86243	F602	mains fuse 100V - 250V	T1A	Ø 8.5xRM 5.08mm	IEC 127-3/4
printed board assembly 85268	F502	battery fuse 24V DC	25A	flat fuse	DIN 72581-3
printed board assembly 85268	F503	battery fuse 24V DC	25A	flat fuse	DIN 72581-3

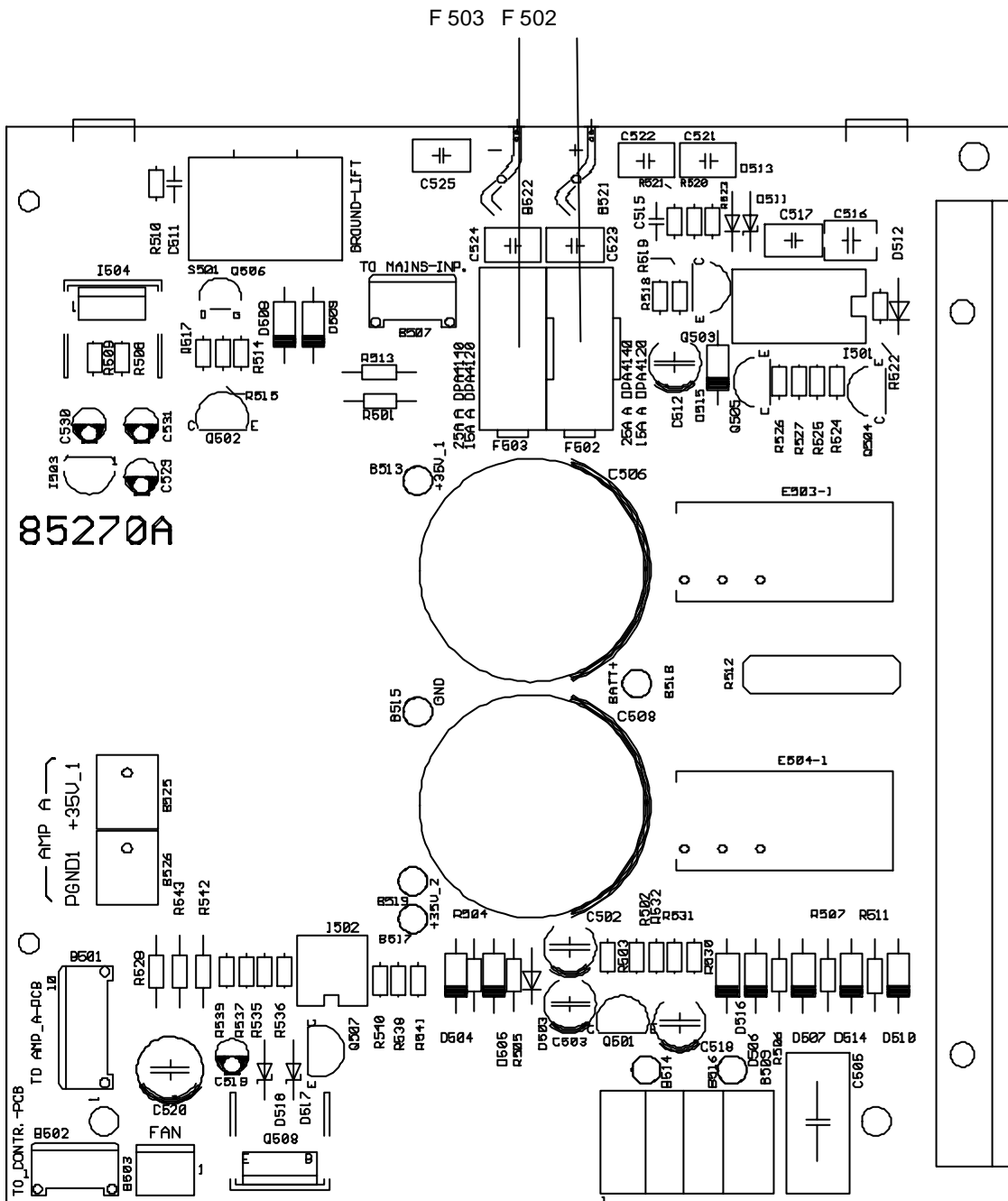


figure 10 printed board assembly 85270 in the DPA 4120 showing the DC fuses F502 and F503

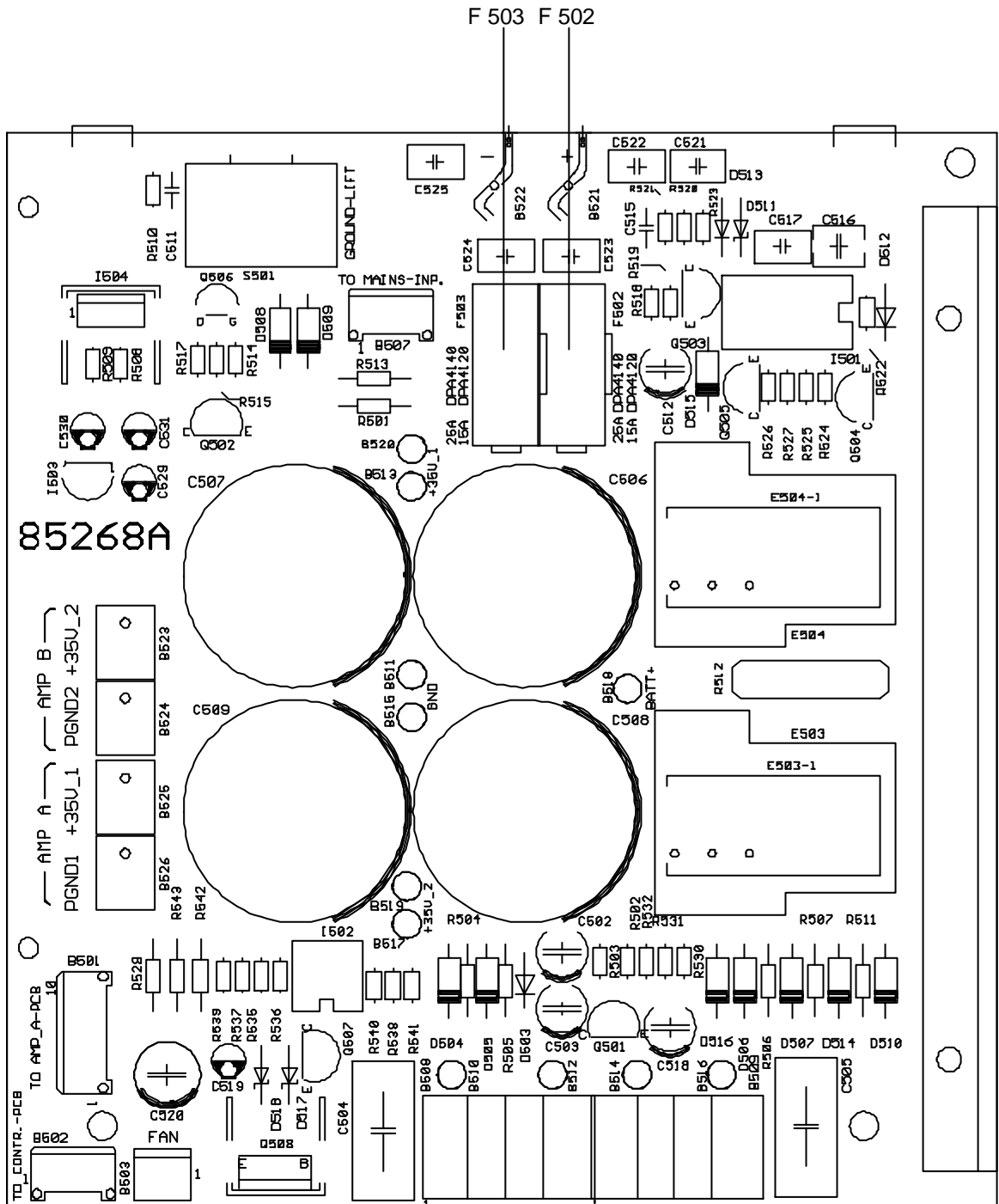


figure 11 printed board assembly 85268 in the DPA 4140 showing the DC fuses F502 and F503

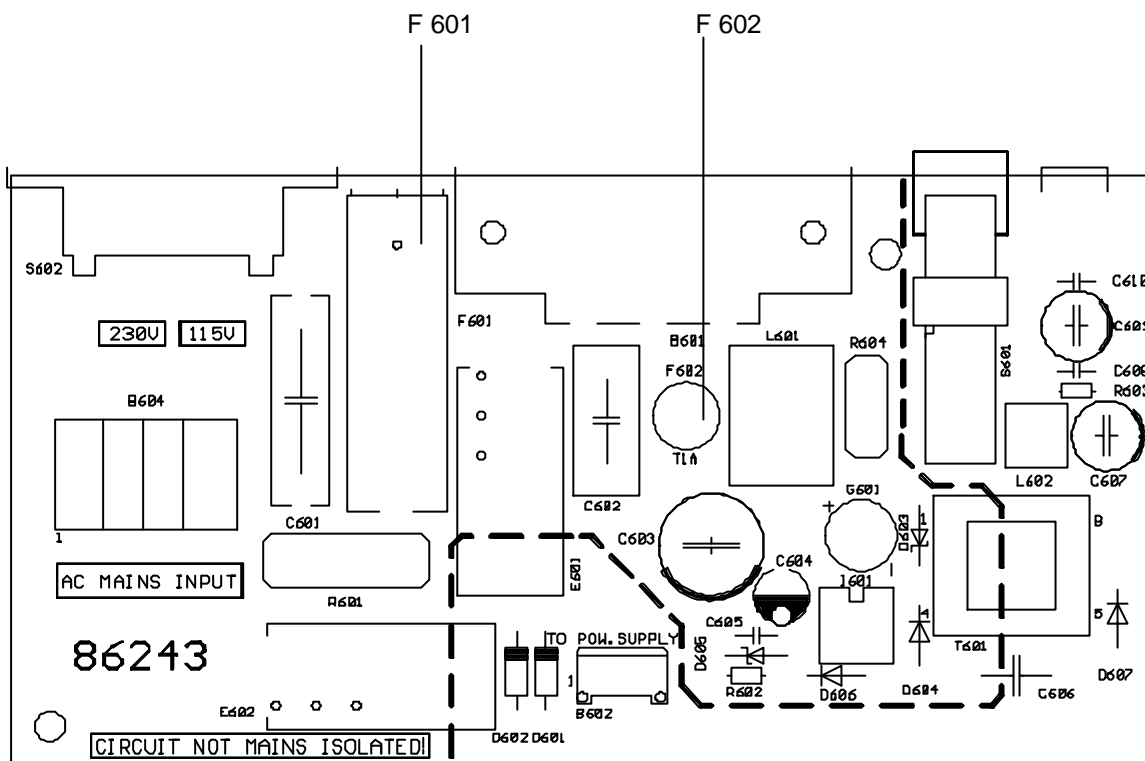


figure 12 printed board assemblies 86243 DPA 4120 and DPA 4140 showing the AC fuses F601 and F602

Caution Before opening the appliance, make sure to disconnect the mains and/or battery power source!

Replacing the fuses F502 and F503 (only to be carried out by the experienced service technician!)

The battery fuses F502 and F503 are located on the power supply PCBs 85270 (DPA 4120) and 85268 (DPA 4140) behind the AMP battery connectors (see also figure 10 and/or figure 11). To replace these fuses you have to remove the cover plate of the appliance and afterwards the power supply input PCB 86243 which is mounted to the rear panel of the appliance. Therefore detach the yellow/green cable from the ground-connector on the appliance's rear panel. Pressing the lock-strap of the AMP-connector together, it can be removed without applying any force. Now, you have to remove the three screws marked "A" (refer to the diagram of the appliance's rear panel on page 2) which allows you to twist the power supply input PCB 86243 up. Make sure not to damage any wires or any other parts. The fuses F502 and F503 are now accessible and can be removed. To re-install the power supply input PCB 86243, these steps have to be proceeded in the opposite order. The yellow/green cable has to be reconnected to the ground-connector on the rear panel of the appliance. By pulling the cable make sure that it sits snugly. Then you can re-attach the cover plate of the enclosure.

Caution For security reasons it is necessary to ensure that, after the installation is completed, all wiring located beneath the power supply input PCB are within a distance of at least 6 mm to the printed board assembly.

12. Specifications

12.1 DPA 4120 power amplifier 200 W

power supply:

mains operation

mains frequency

security class

115 V / 230 V~ AC, ±10 %

50 - 60 Hz

I

mains operation	$U_{\text{mains}} / \text{V}$	$I_{\text{mains}} / \text{A}$	$P_{\text{mains}} / \text{VA}$	$P_{\text{mains}} / \text{W}$	$P_{\text{out}} / \text{W}$	P_{V} / W
idling	230	0.13	30	16	0	16
normal operation (-10 dB)	230	0.83	191	138	20	118
alarm (-3 dB)	230	1.67	384	298	100	198
standard conditions	230	2.27	522	415	200	215
initial current inrush (mains)	< 29 A					

mains operation	$U_{\text{mains}} / \text{V}$	$I_{\text{mains}} / \text{A}$	$P_{\text{mains}} / \text{VA}$	$P_{\text{mains}} / \text{W}$	$P_{\text{out}} / \text{W}$	P_{V} / W
idling	115	0.26	30	16	0	16
normal operation (-10 dB)	115	1.67	191	138	20	118
alarm (-3 dB)	115	3.34	384	298	100	198
standard conditions	115	4.54	522	415	200	215
initial current inrush (mains)	< 20 A					

$P_{\text{mains}} / \text{VA}$ = apparent power $U_{\text{mains}} \cdot I_{\text{mains}}$; $P_{\text{mains}} / \text{W}$ = true power; $P_{\text{out}} / \text{W}$ = output power; P_{V} / W = leakage power

battery operation

24 V DC, -10/+30 %

battery operation	U_{B} / V	I_{B} / A	P_{i} / W	$P_{\text{out}} / \text{W}$	P_{V} / W
stand-by	24	2.5m	60m	0	60m
idling	24	0.43	10	0	10
normal operation (-10 dB)	24	3.74	90	20	90
standard conditions	24	9.10	218	131	87
initial current inrush (battery)	< 3.8 A				

P_{i} / W = input power $U_{\text{B}} \cdot I_{\text{B}}$; $P_{\text{out}} / \text{W}$ = output power; P_{V} / W = leakage power

features of the input:

nominal input level

nominal input impedance

features of the power output:

nominal output capacity during mains operation

nominal load impedance

frequency response

distortion at 1 kHz and nominal output power

interfering voltage (A)

features of the monitor output:

nominal output voltage

nominal load impedance

electronically balanced

775 mV = 0 dBu

≥ 10 k ohms

balanced, floating

200 W (according to IEC 268-3)

50 ohms / 100V; 25 ohms / 70 V; 12.5 ohms / 50 V
or 4 ohms / 28 V

60 Hz .. 20 kHz

≤ 1 %

≤ 1.2 mV = -56 dBu

electronically balanced

2 V = + 8.2 dBu

600 ohms

ambient temperature range
 dimensions (W x H x D)
 depth with / without connections
 weight without extensions
 finish

+5 °C .. +40 °C
 483 x 132 x 345 mm
 max. 400 mm / max. 340 mm
 13.2 kg
 anthracite

12.2 DPA 4140 power amplifier 400 W

power supply:

mains operation

mains frequency
 security class

115 V / 230 V~ AC, ±10 %
 50 - 60 Hz
 I

mains operation	$U_{\text{mains}} / \text{V}$	$I_{\text{mains}} / \text{A}$	$P_{\text{mains}} / \text{VA}$	$P_{\text{mains}} / \text{W}$	$P_{\text{out}} / \text{W}$	P_{V} / W
idling	230	0.19	44	23	0	23
normal operation (-10 dB)	230	1.60	368	263	40	223
alarm (-3 dB)	230	3.10	713	562	200	362
standard conditions	230	4.43	1019	811	400	411
initial current inrush (mains)	< 36 A					

mains operation	$U_{\text{mains}} / \text{V}$	$I_{\text{mains}} / \text{A}$	$P_{\text{mains}} / \text{VA}$	$P_{\text{mains}} / \text{W}$	$P_{\text{out}} / \text{W}$	P_{V} / W
idling	115	0.38	44	23	0	23
normal operation (-10 dB)	115	3.19	368	263	40	223
alarm (-3 dB)	115	6.20	713	562	200	362
standard conditions	115	8.86	1019	811	400	411
initial current inrush (mains)	< 21 A					

$P_{\text{mains}} / \text{VA}$ = apparent power $U_{\text{mains}} \cdot I_{\text{mains}}$; $P_{\text{mains}} / \text{W}$ = true power; $P_{\text{out}} / \text{W}$ = output power; P_{V} / W = leakage power

battery operation

24 V DC, -10/+30 %

battery operation	U_{B} / V	I_{B} / A	P_{i} / W	$P_{\text{out}} / \text{W}$	P_{V} / W
stand-by	24	2.5m	60m	0	60m
idling	24	0.62	15	0	15
normal operation (-10 dB)	24	7.1	170	40	130
standard conditions	24	17.3	415	249	166
initial current inrush (battery)	< 3.8 A				

P_{i} / W = input power $U_{\text{B}} \cdot I_{\text{B}}$; $P_{\text{out}} / \text{W}$ = output power; P_{V} / W = leakage power

features of the input:

nominal input level
 nominal input impedance

features of the power output:

nominal output capacity during mains operation
 nominal load impedance

frequency response

distortion at 1 kHz and nominal output power

electronically balanced

775 mV = 0 dBu

≥ 10 k ohms

balanced, floating

400 W (according to IEC 268-3)

25 ohms / 100V; 12.5 ohms / 70 V; 6.25 ohms /

50 V or 4 ohms / 40 V

60 Hz .. 20 kHz

≤ 1 %

interfering voltage (A)	≤ 1.2 mV = -56 dBu
features of the monitor output:	electronically balanced
nominal output voltage	2 V = + 8.2 dBu
nominal load impedance	600 ohms
ambient temperature range	+5 °C .. +40 °C
dimensions (W x H x D)	483 x 132 x 345 mm
depth with / without connections	max. 400 mm / 340 mm
weight without extensions	16.7 kg
finish	anthracite

extension kits for the DPA 4120 and DPA 4140:

NRS 90208 input transformer for floating, balanced input	Art. No. 121 641
NRS 90222 remote module	Art. No. 121 674
NRS 90224 pilot tone & ground fault surveillance	Art. No. 121 676
NRS 90225 standard input module	Art. No. 121 677
NRS 90227 output transformer for floating, balanced monitor output	Art. No. 121 679

13. Extension kit specifications for the power amplifiers DPA 4120 / DPA 4140

13.1 NRS 90225 standard input module

see specifications DPA 4120 / DPA 4140

13.2 NRS 90222 remote module

see specifications DPA 4120 / DPA 4140

13.3 NRS 90208 input transformer for floating, balanced input

frequency response	20 Hz .. 20 kHz
input impedance	≥ 10 k ohms
idling ratio	1:1
winding resistance; primary	1420 ohms at 20°C
winding resistance; secondary	1420 ohms at 20°C

13.4 NRS 90227 output transformer for floating, balanced monitor output

frequency response	40 Hz .. 20 kHz
nominal load impedance	≥ 600 ohms
idling ration	1:1
winding resistance; primary	18 ohms at 20°C
winding resistance; secondary	18 ohms at 20°C

13.5 NRS 90224 pilot tone & ground fault surveillance

13.5.1 pilot tone surveillance

pilot tone frequency	19 kHz ± 1%
error recognition threshold	≤ 12 mV
fault message output via NRS 90225	collective fault message via READY relay
fault message output via NRS 90222	PROMATRIX manager DPM 4000

13.5.2 ground fault surveillance

input loudspeaker line 4 ohms / 50V / 70V / 100V	
fault message output via NRS 90225	collective fault message via READY relay
fault message output via NRS 90222	PROMATRIX Manager DPM 4000
disruptive strength	1000 Veff
error recognition threshold	≤ 50 k ohms

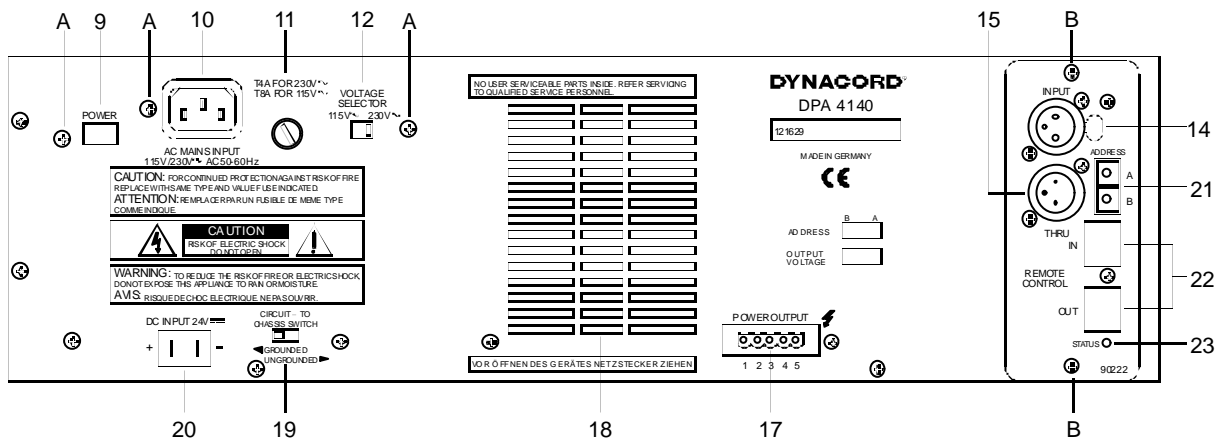
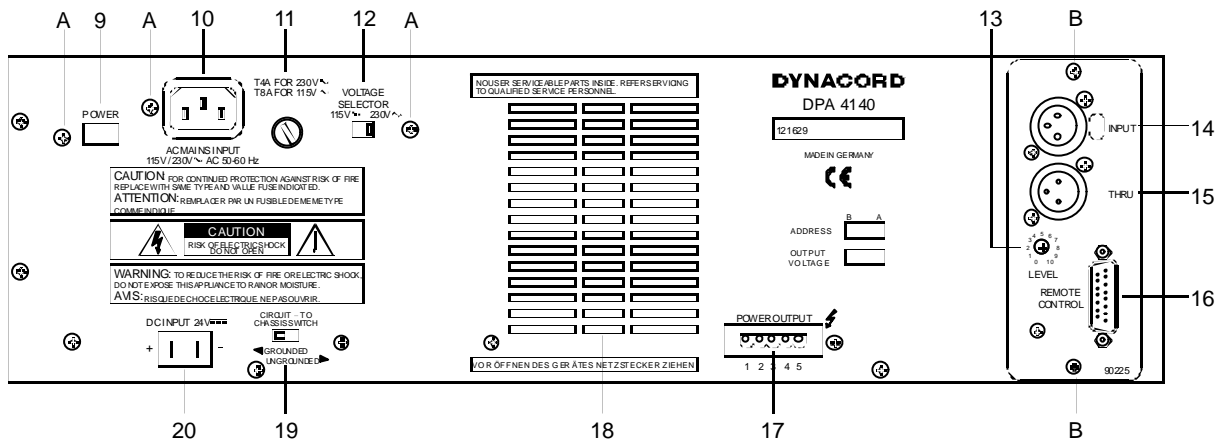
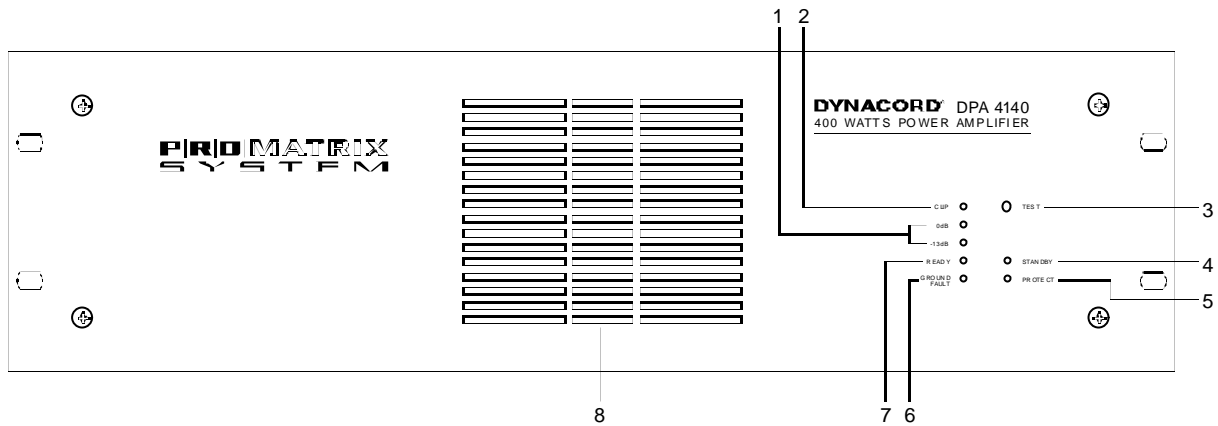


Performance Features

Power amplifier with 200 W or 400 W output power according to the IEC 283-3 standard within a 19" - cabinet (3 HU) providing the following functions:

- supported are 115/230V AC mains as well as 24V DC emergency power source
- power amplifiers DPA 4120 providing 200 W or DPA 4140 providing 400 W output power, idling and short-circuit protection
- output transformer for balanced, floating 100 V speaker networks of optionally 70 V, 50 V or 4 ohms for low-impedance operation
- optional input modules:
 - standard operation INPUT MODULE with level control, electronically balanced input and MONITOR output with optional transformer or
 - REMOTE MODULE for controlling and monitoring the PROMATRIX system, electronic level controls, electronically balanced input and MONITOR output with optional transformer
- integrated stand-by power supply
- mains POWER ON/OFF switch
- ground lift switch
- remotely controllable mains and battery operation with initial current inrush limiter
- power-on switching noise suppression
- status-LED indicators for operation (READY), STANDBY, thermal overload (PROTECT) and occurrence of GROUND FAULT conditions at the power output
- fault message according to the IEC 849 standard
- TEST button to switch between system and average operation, respectively a RESET button to restart after the occurrence of ground fault conditions
- LED level meter instrument with a display range of -13 dB to 0 dB and CLIP
- integrated relays for single call and obligatory reception
- active, temperature controlled ventilation
- pilot tone and ground fault surveillance module according to the DIN/VDE 0800 standard (optional)

Indicators, controls and connections



- | | |
|--------------------------------|---|
| 1 level meter instrument | 10 Mains power connector AC MAINS INPUT |
| 2 CLIP indicator | 11 Mains fuse FUSE |
| 3 Test and Reset button TEST | 12 Mains VOLTAGE SELECTOR |
| 4 STANDBY indicator | 13 Input LEVEL control |
| 5 Fault indicator PROTECT | 14 INPUT socket |
| 6 Fault indicator GROUND FAULT | 15 THRU socket |
| 7 Mode indicator READY | 16 REMOTE CONTROL connector |
| 8 Ventilation louvres | 17 POWER OUTPUT |
| 9 Mains power switch POWER | 18 Ventilation louvres |

- 19 CIRCUIT ⊥ TO CHASSIS SWITCH
- 20 DC INPUT 24V = (battery)
- 21 IDENT ADDRESS switch
- 22 REMOTE CONTROL connectors
- 23 STATUS indicator
- A locking screws power supply printed board

B locking screws INPUT MODULE

Contents

Performance Features.....	23
Indicators, controls and connections	25
1. Utilization	27
2. Installation	27
3. Before the first operation	27
3.1 Mains operation	27
3.2 Battery operation 24V DC	28
4. INPUT	28
5. Outputs	29
5.1 POWER OUTPUT.....	29
5.2 POWER OUTPUT for 100V (70V or 50V) loudspeaker systems.....	29
5.3 SINGLE CALL and obligatory reception relays OVERRIDE BYPASS.....	29
5.4 POWER OUTPUT for low impedance loudspeaker systems.....	29
5.5 MONITOR output	30
5.6 REMOTE CONTROL connector (only NRS 90225)	30
6. Indicators	30
6.1 STANDBY indicator.....	30
6.2 READY indicator.....	30
6.3 PROTECT indicator.....	30
6.4 GROUND FAULT indicator.....	30
6.5 Aussteuerungskontrolle und CLIP-Anzeige	31
7. Switching the output voltage	31
8. Enhanced application field.....	32
8.1 General input module NRS 90225.....	32
8.2 Remote module NRS 90222.....	32
8.3 NRS 90208 input transformer for the floating, balanced input	33
8.4 NRS 90227 output transformer for the floating, balanced monitor output	33
8.5 NRS 90224 pilot tone and ground fault surveillance.....	35
8.5.1 Pilot tone surveillance.....	35
8.5.2 Ground fault surveillance.....	35
9. 19"-case and 19"-rack shelf system installation.....	38
10. Ground lift switch CIRCUIT ⊥ TO CHASSIS SWITCH.....	38
11. Fuses.....	38
11.1 Fuses in the DPA.....	38
11.2 Fuses in the DPA.....	38
12. Power amplifier specifications	42
12.1 DPA 4120 power amplifier 200 W.....	42
12.2 DPA 4140 power amplifier 400 W.....	43
13. Extension specifications	44
13.1 NRS 90225 general input module.....	44
13.2 NRS 90222 remote module	44
13.3 NRS 90208 input transformer for floating, balanced input	44
13.4 NRS 90227 output transformer for floating, balanced monitor output	44
13.5 NRS 90224 pilot tone and ground fault surveillance.....	44
14. Block diagrams	67
14.1 Power amplifiers DPA 4120 / DPA 4140	67
14.2 NRS 90225 general input module.....	68

14.3 NRS 90222 remote module	69
14.4 NRS 90224 pilot tone and ground fault surveillance.....	70
15. Warranty	72

1. Utilization

The amplifiers DPA 4120 and DPA 4140 are specially designed for the power-consistent and reliable operation of PA-systems. The DPA 4120 and DPA 4140 are intended to be used in company intercom, alarm and background music transmission installations, offices and commercial areas, congregation and sport centers, schools, churches, hotels, hospitals, shopping malls and super markets, cruise ships, and other similar applications.

2. Installation

When installing the amplifiers, it is important to assure that for ventilation reasons the front-to-rear air circulation is guaranteed (for details on 19"-case or 19"-rack shelf installation please refer to paragraph 9).

To maintain EMC it is necessary that all input, output, and control lines – except for the power cords – are shielded. Within metal housings or closed rack shelf systems, unshielded output and control cabling is allowable. Shielding is accomplished by connecting the individual cable screens to the enclosure or rack shelf ground potential.

The amplifier has to be protected from:

- water drops or splashes
- direct sunlight
- high ambient temperatures and the direct radiation of heat sources
- high humidity and moisture
- heavy dust
- massive vibrations

Moving the amplifier from a cold into a warm environment can result in the occurrence of condensation on inner parts. Operating the appliance is only permissible after it has accommodated to the altered temperature (approximately after one hour).

Should it happen that foreign solid parts or liquids inadvertently intrude the enclosure, unplug the device from the power source and have it checked by a DYNACORD service center, before using it again.

Cleaning the appliance should not be performed using chemical solvents or sprays, as this might damage the finish and moreover could cause hazard fire.

3. Before the first operation

These power amplifiers are designed to be operated with different input modules. The general input module NRS 90225 is meant for all conventional applications. It allows to remotely start the amplifiers via control lines, monitor their operation by use of the incorporated fault relay, and monitor the transmitted audio signals through the monitor output. Using the remote control module NRS 90222, the amplifiers are connected to the PROMATRIX manager DPM 4000 via RS-485 remote interface providing complete remote operation and surveillance. The desired input module has to be inserted into the module shaft on the rear of the power amplifier. It has to be tightened using the two locking screws (B) (refer also to the paragraphs 8.1 and 8.2).

3.1 Mains operation

For normal AC mains operation, the included mains cord has to be connected to a 230V or 115V 50/60Hz wall outlet. On the appliance itself, the cord has to be connected to the 3-pole mains socket (10).

Caution The appliance is factory preset to **230V AC**. Switching to 115V AC is accomplished using the voltage selector (12).

DPA 4120: For **115V AC** operation, the mains fuse (11) has to be replaced by a **slow blowing 4 ampere type**, labeled "**T4A**" (see also paragraph 11.1).

DPA 4140: For **115V AC** operation, the mains fuse (11) has to be replaced by a **slow blowing 8 ampere type**, labeled "**T8A**" (see also paragraph 11.2).

If the appliance is correctly connected and mains is present the green STANDBY indicator (4) will light. To remotely start the amplifier when it is being operated on the mains, it is necessary to interconnect the contacts 3 - POWER REMOTE and 2 - GROUND STANDBY on the pin terminal strip REMOTE CONTROL (16) (see also paragraph 5.6).

The main power switch POWER (9) on the rear of the appliance is meant for service and maintenance purposes. This allows bridging the mains switching relay, which provides the possibility to operate the amplifier without remote start.

Note	The main power switch POWER (9) on the appliance's rear is only meant for maintenance . Remotely switching off the device is not possible when the POWER switch is engaged.
-------------	---

Both amplifiers, the DPA 4120 and the DPA 4140, employ power-on switching delays of approximately 3 sec. After this time, the green READY indicator lights and the READY fault message relay picks up when no error is being detected (see also paragraph 6.2).

3.2 Battery operation 24V DC

The amplifiers, DPA 4120 and DPA 4140, use the mains or alternatively an external 24V battery as power source. Switching to battery is performed via integrated relays.

The battery has to be connected on the rear of the amplifiers (20) using **insulated** 6.3x0.8 mm AMP flat plug connectors. The amplifiers are protected against polarity-mismatch. Each, the positive and negative conductors are internally protected by fuses, located on the printed board assembly 85270 (DPA 4120) respectively 85268 (DPA 4140) (see also paragraph 11, figure 10 and 11).

The cable used for battery connection has to be at least 1.5 mm² in diameter (DPA 4120) respectively 2.5 mm² (DPA 4140). Using these diameters, the cable length for the one way distance should not exceed 4.0 m (max. voltage drop <1V).

Caution	The DPA 4120 and DPA 4140 are to be operated only using ungrounded batteries or batteries with grounded negative pole. Operation with grounded positive pole is not permissible.
----------------	--

4. INPUT

The electronically balanced INPUT (14) providing a sensitivity of 775mV = 0dBu is meant for the connection of control amplifiers. In case it is intended to supply several power amplifiers with identical input signals, these signals can be taken from the THRU connector (15) (see also figure 1 and 2).

The input is prepared to be retrofitted with an input transformer. In case a floating input is needed, it is necessary to install the optional extension NRS 90208 (see also paragraph 8.3).

On the general input module NRS 90225 the input level is set with the level control (13). For the remote control module NRS 90222 the input level is determined by the setting of the internal electronic level control of the PROMATRIX manager DPM 4000 (please also refer to the PROMATRIX handbook).

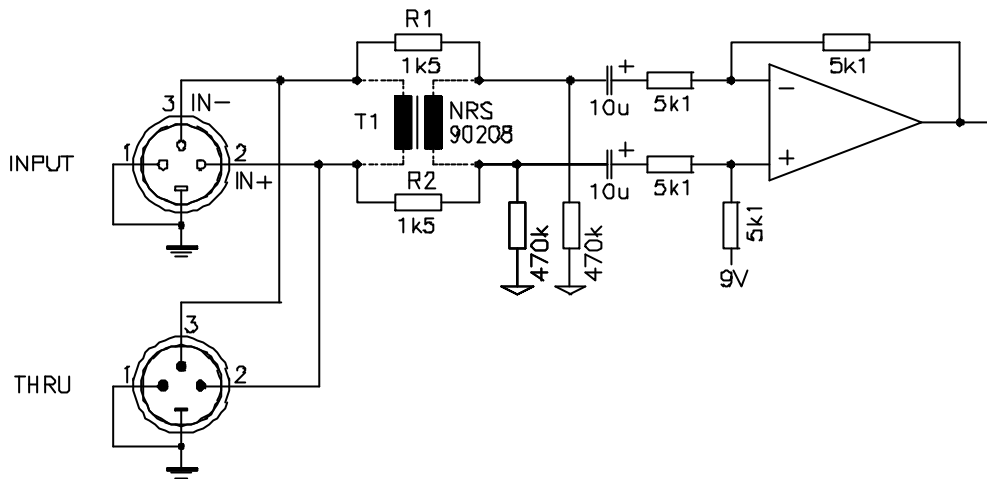


figure 1 connections of the input sockets



figure 2 LF cable for coupling two amplifiers DPA 41xx

5. Outputs

5.1 POWER OUTPUT

The power output is balanced and off-ground potential. The output is factory-configured for the connection of 100V loudspeaker systems. Connection has to be performed by inserting the supplied 5-pole plug into the power output socket (17). Switching the output voltage to 70V, 50V or to low impedance operation (4 ohms) is possible using the plug-in bridge B411 on the printed board assembly 84187 (DPA 4120) respectively 84175 (DPA 4140) (see also paragraph 7).

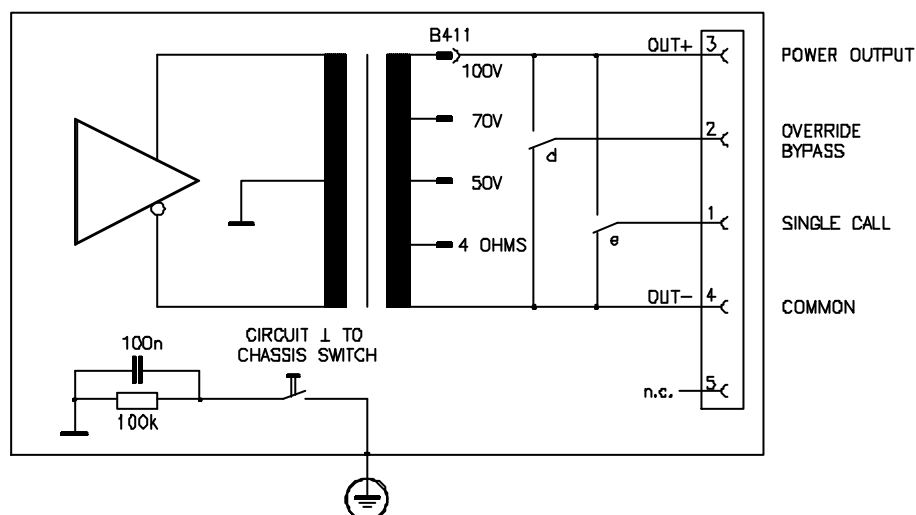


figure 3 connection of the power output

5.2 POWER OUTPUT for 100V (70V or 50V) loudspeaker systems

If the distance between the amplifier and the loudspeakers exceeds 50 m, it is recommended to operate the speaker systems using 100V matching transformers, to reduce line attenuation. This additionally offers a simple way of distributing the output power capacity. In this way it is possible to connect a maximum of as many loudspeaker systems as it takes until the total power consumption of the entire speaker network equals the power output capacity

of 200W (connection impedance 50 ohms) with the DPA 4120, respectively 400W (connection impedance 25 ohms) with the DPA 4140. Connection is performed using the 100V output (17) (see also figure 3). In a few special cases it is also possible to operate the loudspeaker systems with 70V or 50V output voltage (see also paragraph 7).

Caution It is possible that during operation shock-hazard output voltages can be present at the POWER OUTPUT connector (>34V peak value). Thus, the connected loudspeaker groups have to be installed in accordance to applicable security standards and regulations (see also paragraph 8.5.2).

5.3 SINGLE CALL and obligatory reception relays OVERRIDE BYPASS

Combined with the PROMATRIX manager DPM 4000 or other external controls it is also possible to transmit single or collective calls with obligatory reception; i. e. bridging of possibly existing volume controls of the loudspeaker systems. For details on how to connect the outputs, please refer to figure 3; for the connection of relays, please refer to paragraph 5.6 respectively the PROMATRIX handbook.

5.4 POWER OUTPUT for low impedance loudspeaker systems

Switching the output to 4 ohms allows the connection of low impedance loudspeaker systems (4-16 ohms) (see also paragraph 7 and figure 3). Because of the occurring line attenuation, the distance between amplifier and loudspeaker system should not exceed 50m. Please make sure that the overall loudspeaker impedance does not decline a value of 4 ohms and that the stated power handling capacity of a single speaker system is not exceeded.

5.5 MONITOR output




The MONITOR output (16) on the NRS 90225 allows the connection of an additional power amplifier for monitoring purposes. The low impedance output is electronically balanced, which offers the possibility to achieve cable lengths of up to 200 m. Connection is performed via the REMOTE CONTROL pin-connector strip (see also figure 4). For the remote control module NRS 90222, the MONITOR output is located on the REMOTE CONTROL connector (22). The PROMATRIX manager DPM 4000 switches the signal to the according the monitor channel. In case a floating output is required, the monitor output is prepared for retrofitting an output transformer; provided through the optional extension NRS 90227 (please also refer to paragraph 8.4).

Note: Functioning changes in the models DPA 4120 (starting with serial numbers: 100 11) and DPA 4140 (starting with serial numbers: 100 11) in association with the input module NRS 90225: To achieve reliable attenuation of switching noise (knacks), the monitor output stays muted as long as the READY-relay is not pulled. Because of circuit design reasons this causes that the monitor output is also muted even when a ground-fault appears at the main output.

5.6 REMOTE CONTROL connector (only NRS 90225)

The 15-pole sub-D REMOTE CONTROL pin-connector strip (16) provides several different control in-/outputs:

- | | |
|---------------------------------------|-----------------------------------|
| - Ground of the stand-by power supply | - negative pole grounded |
| - POWER REMOTE | - via contact to ground potential |
| - BATTERY REMOTE | - via contact to ground potential |
| - MONITOR output | - electronically balanced |
| - READY-message | - with floating contact |
| - Obligatory reception relay D-RELAY | - via contact to ground potential |
| - Single call E-RELAY | - via contact to ground potential |

- 2 ⊥ STANDBY GROUND
- 3 POWER REMOTE
- 4 BATTERY REMOTE
- 5 D - RELAY
- 6 E - RELAY
- 7 
- 8  READY
- 15 
- 9 + MONITOR
- 10 - MONITOR

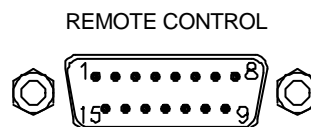


figure 4 connections on the REMOTE CONTROL pin-connector strip

6. Indicators

6.1 STANDBY indicator

When the appliance is correctly connected and mains and/or battery power is present, the green STANDBY indicator (4) will light.

6.2 READY indicator

Both amplifiers, the DPA 4120 and the DPA 4140, employ power-on switching delays of approximately 3 sec. to effectively eliminate power-on switching noise. After this time, the green READY indicator (7) lights and the READY fault message relay picks up when no error is being detected. When the power amplifier's mains transformer exceeds a certain value or, when – with installed NRS 90224 extension – the pilot tone falls below the threshold (see also paragraph 8.5.1), the green READY indicator (7) is not lit and the READY fault message relay drops.

6.3 PROTECT indicator

When thermal overload of the mains transformer or the power amplification stage is encountered, the red PROTECT indicator (5) will light and the READY fault message relay drops. After the amplifier regained normal temperature, the red PROTECT indicator (5) is automatically dimmed and the appliance returns to normal operation. High temperature can be caused by overload, extreme ambient temperatures or faulty functioning of the system's ventilation.

6.4 GROUND FAULT indicator

If, with the NRS 90224 extension installed, a ground fault is being detected at the power output, the red GROUND FAULT indicator (6) will light and the READY fault message relay will drop. During the occurrence of this error normal operation is maintained. After eliminating the cause for the ground fault, pressing the TEST button (3) resets the GROUND FAULT indicator (6) (see also paragraph 8.5.2).

6.5 Level meter and CLIP indicator

The green LED-indicators -13dB and 0dB (1) together with the red CLIP-LED (2) allow to monitor the output level, effectively avoiding overdrive conditions that lead to distortion and overload at the power outputs which could damage the connected loudspeaker systems.

- If the red CLIP-LED (2) shortly lights during program peaks, maximum non-distorted modulation is achieved.
- Continuous lighting or blinking of the red CLIP-LED (2) signals overdrive. In this case the input level has to be reduced.
- If the green LED indicator (1) does not light or is only briefly lit with the red CLIP-LED blinking at the same time, this signals the encountering of an overload or short-circuit condition at the output. In this case the impedance of the connected load has to be checked.

Caution During normal operation the red CLIP-LED should only light briefly and shortly!
--

7. Switching the output voltage (only to be performed by a qualified service technician!)

The DPA 4120 and DPA 4140 amplifiers allow the connection of 50V, 70V, 100V or low-impedance loudspeaker systems (4 ohms). They are factory-preset to an output voltage of 100 V. Switching the output voltage to 4 ohms, 50V or 70V can be performed by changing the bridge B411 on the power amplifier printed board assembly 84187 (DPA 4120) or 84175 (DPA 4140):

Caution Before opening the appliance, make sure to disconnect the mains and/or battery power source!

- To open the appliance, the top panel has to be removed.
- The bridge B411 (yellow wire) has to be removed from the contact B407 and re-attached to the desired contact (see table 1) (see also figure 8 respectively figure 9).
- The coding-bridges S405 and S406 for the output recognition have to be inserted according to the illustration in figure 5.
(the inserted coding-bridge is marked in black)
- The top panel has to be re-attached.

Note By using a waterproof marker pen and after switching the output voltage, the newly set value has to be marked in the filed "OUTPUT VOLTAGE" on the rear panel of the appliance.

output	bridge B411 to
100 V	B407
70 V	B408
50 V	B409
4 ohms	B410

table 1 bridge B411 settings
switching the output voltage

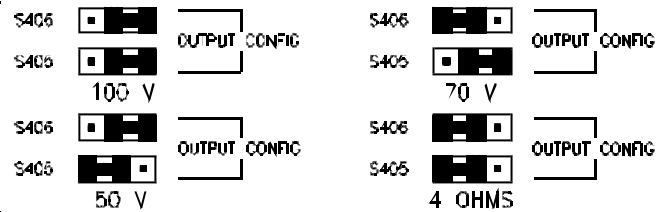


figure 5 coding-bridges S405 / S406 settings
output recognition OUTPUT CONFIG

Caution It is possible that during operation shock-hazard output voltages can be present at the POWER OUTPUT connector (>34V peak value). Thus, the connected loudspeakers have to be installed in accordance to applicable security standards and regulations (see also paragraph 8.5.2).

8. Enhanced application field

8.1 Standard input module NRS 90225

This input module for the power amplifiers DPA 4120 and DPA 4140 is meant for insertion at the power amplifiers' rear. It provides the following functions:

- lockable XLR input connector
- XLR output connector; to patch the input signal through
- gain control; to be adjusted using a screwdriver
- mains remote ON/OFF
- battery remote ON/OFF
- control of the D- and E-relays
- fault messages via the READY relay contact:
 - thermal overload of the mains transformer
 - thermal overload of the power amplification stage
 - ground fault (optional; only with installed NRS 90224)
 - pilot tone signal (optional; only with installed NRS 90224)
- MONITOR output; electronically balanced
- input transformer for floating, balanced input; optional
- output transformer for floating, balanced monitor output; optional

The input module is meant to be used with the power amplifiers DPA 4120 and DPA 4140. The module allows to control and monitor the operation of the power amplifiers using conventional equipment or (with reservations) by the PROMATRIX manager DPM 4000.

Caution: Before installing the input module NRS 90225, you have to unplug the mains connector as well as a presumably connected battery cord.

Before installing the input module, it is necessary to remove the two locking screws B on the rear panel of the appliance. For installation the printed board assembly first has to be inserted into the guiding rails. After carefully pushing the module in it has to be locked by using the two screws mentioned before.

Note: Functioning changes in the models DPA 4120 (starting with serial numbers: 100 11) and DPA 4140 (starting with serial numbers: 100 11) in association with the input module NRS 90225: To achieve reliable attenuation of switching noise (knacks), the monitor output stays muted as long as the READY-relay is not pulled. Because of circuit design reasons this causes that the monitor output is also muted even when a ground-fault appears at the main output.

8.2 Remote module NRS 90222

This input and remote module for the power amplifiers DPA 4120 and DPA 4140 is meant for insertion at the power amplifiers' rear. It provides the following functions:

- lockable XLR input connector
- XLR output connector; to patch the input signal through
- input level; can be set via a programmable audio level control
- MUTE (via level control)
- mains remote ON/OFF
- battery remote ON/OFF
- control of the D- and E-relays
- surveillance and fault messaging via the PROMATRIX manager DPM 4000 corresponding to IEC 849
 - thermal overload of the mains transformer
 - thermal overload of the power amplification stage
 - ground fault (optional; only with installed NRS 90224)
 - pilot tone signal (optional; only with installed NRS 90224)
 - measurement of the output voltage / level
 - measurement of the output current
 - surveillance of the connected loads via current/voltage measurement
- MONITOR output; electronically balanced
- monitoring: input/output signals can be assigned to the monitor bus
- input transformer for floating, balanced input (optional)
- output transformer for floating, balanced monitor output (optional)
- pilot tone signal ON/OFF (optional)

The remote module allows to remotely control and monitor the operation of the power amplifiers DPA 4120 and DPA 4140 from the PROMATRIX manager DPM 4000 (for further details please refer to the PROMATRIX handbook).

Caution: Before installing the input module NRS 90222, you have to unplug the mains connector as well as a presumably connected battery cord.

Before installing the input module, it is necessary to remove the two locking screws B on the rear panel of the appliance. For installation the printed board assembly first has to be inserted into the guiding rails. After carefully pushing the module in it has to be locked by using the two screws mentioned before.

Note After installing the remote module NRS 90222 it is necessary to set its address according to the description in the PROMATRIX handbook using the two "HEX-code switches" ADDRESS (21) and note the setting within the field ADDRESS on the rear panel of the appliance using a waterproof marker pen.

8.3 NRS 90208 input transformer for the floating, balanced input

For the case that floating inputs are required, the inputs of the INPUT MODULE NRS 90225 and the REMOTE MODULE NRS 90222 are prepared for retrofitting input transformers. If so, it is necessary to additionally install the extension kit NRS 90208 per each input.

The installation has to be performed as follows (see figure 6 and/or figure 7):

- to remove the input module you have to loosen the two locking screws (B) on the rear panel of the appliance. Now, the module can be easily torn out.
- before installing the input transformer you have to remove the resistors R1 and R2.
- mount the input transformer onto the printed board assembly, so that the marking located on the connector side of the transformer matches with the one on the printed board assembly. To prevent short-circuits place the supplied insulation disc between the transformer and the printed board assembly.

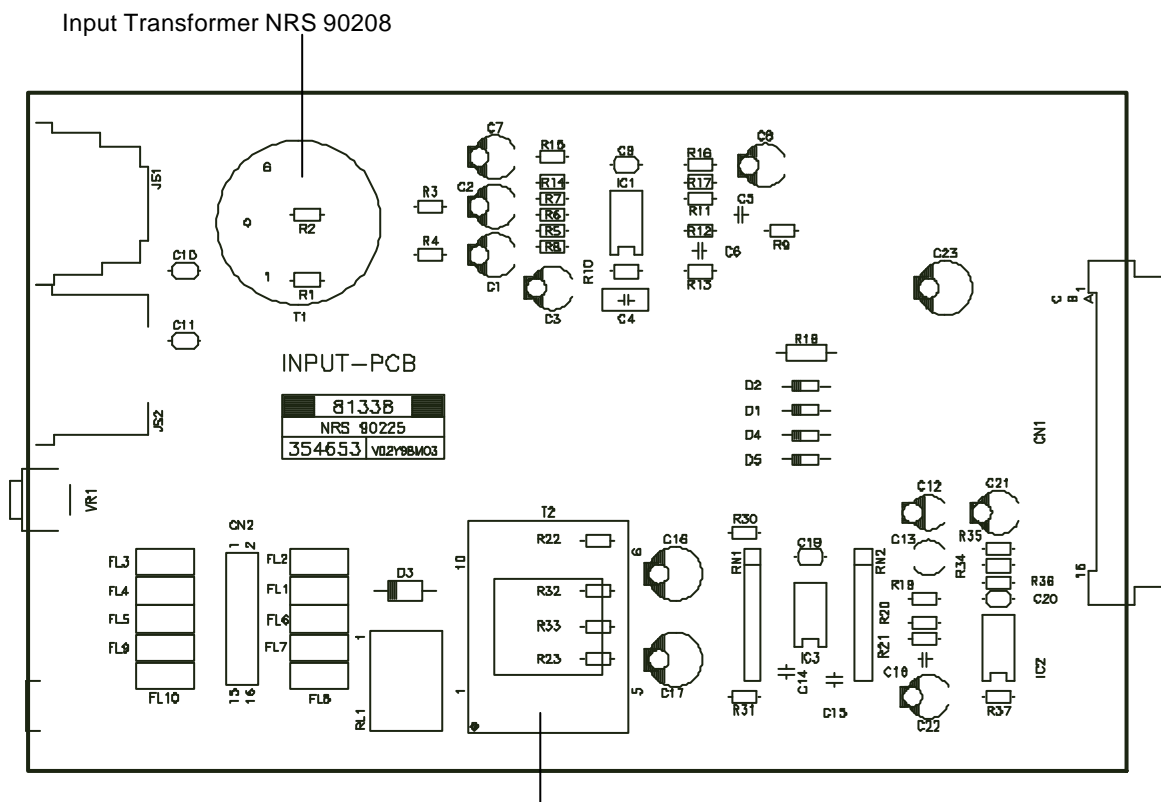
- re-insert the input module and tighten the locking screws (B).

8.4 NRS 90227 output transformer for the floating, balanced monitor output

In case that floating monitor outputs are required, the outputs of the INPUT MODULE NRS 90225 and REMOTE MODULE NRS 90222 are prepared for retrofitting output transformers. If so, it is necessary to additionally install the extension kit NRS 90227 per each output.

The installation has to be performed as follows (see figure 6 and/or figure 7):

- to remove the input module you have to loosen the two locking screws (B) on the rear panel of the appliance. Now, the module can be easily torn out.
- before installing the output transformer you have to remove the resistors R22, R23, R32 and R33 (NRS 90225) respectively the resistors R23, R24, R71 and R72 (NRS 90222).
- now, you can mount the output transformer onto the printed board assembly. Because of the transformer's symmetrical design, polarity is not a critical factor.
- re-insert the input module and tighten the locking screws (B).



Output Transformer NRS 90227

figure 6 printed board assembly 81338 showing the input transformer NRS 90208 and the output transformer NRS 90 227

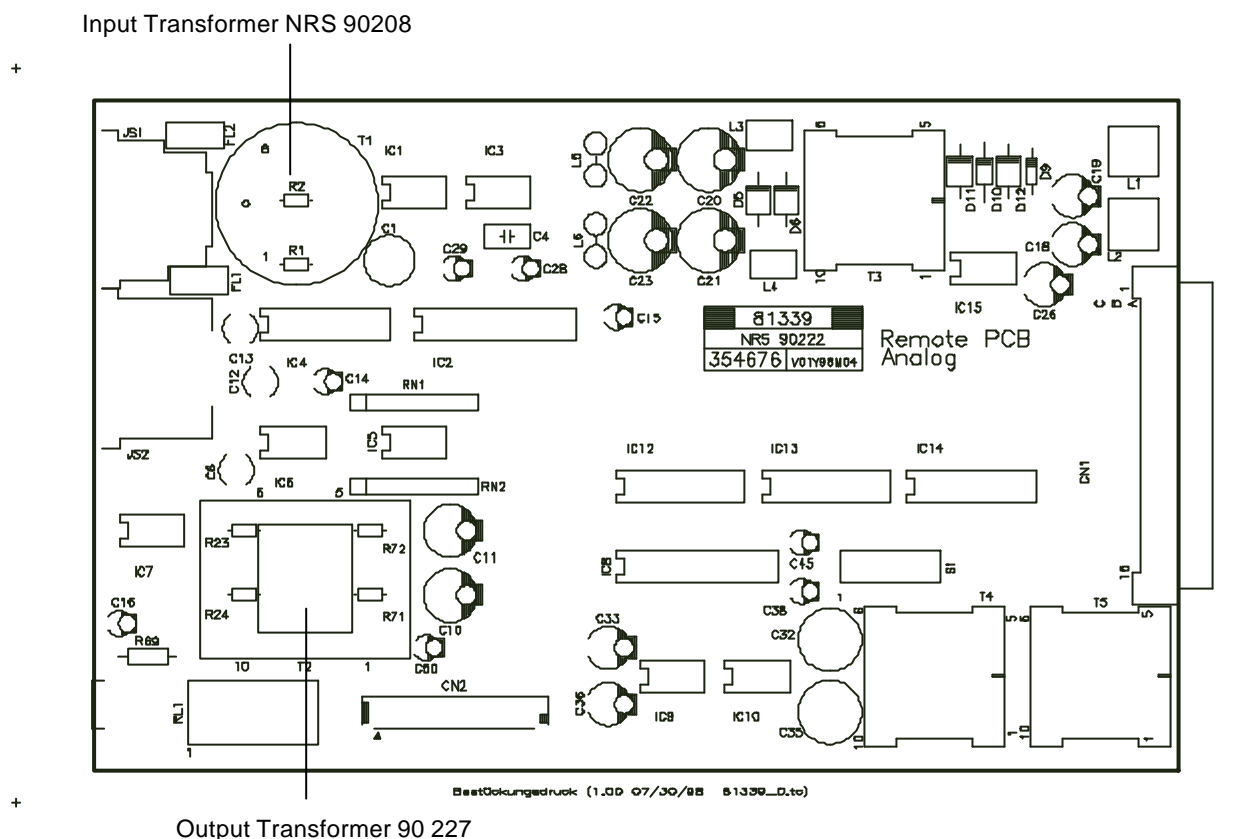


figure 7 printed board assembly 81339 showing the input transformer NRS 90208 and the output transformer NRS 90 227

8.5 NRS 90224 pilot tone & ground fault surveillance

The extension NRS 90224 is meant for insertion. It includes a 19 kHz tone generator and a selective 19 kHz receiver with evaluation stage for pilot tone surveillance. Also incorporated is a monitoring circuit with fault storage and display driver, to guard the cable network connected to the output.

8.5.1 Pilot tone surveillance:

Integration of the extension NRS 90224 provides continuous self-monitoring of the amplifier. This gets accomplished in the way that an extremely low-level 19 kHz pilot tone signal is introduced to the signal path following the input level control LEVEL. After passing the amplifier stages, the pilot tone signal is filtered out at the output and the result is evaluated. If the measured signal declines the pilot tone's predetermined threshold at the output or is not present at all, the READY indicator (7) dims and the READY fault message relay drops. When using the INPUT MODULE NRS 90225, the fault message is output as collective fault message with the floating contact of the READY fault message relay via the REMOTE CONTROL connector (16). When using the REMOTE MODULE NRS 90222, error occurrence is monitored and output by the PROMATRIX manager DPM 4000 (for further details, please refer to the PROMATRIX handbook).

8.5.2 Ground fault surveillance:

When installing and operating 100V-loudspeaker networks, compliance to the VDE regulation DIN VDE 0800 is mandatory. Especially, if 100V-loudspeaker networks are included in alarm system applications, all security standards have to be in accordance to the security class 3 standard.

When off-ground potential loudspeaker cable networks are employed we recommend insulation-monitoring using the ground fault surveillance module NRS 90224. Error recognition: An occurring ground fault either signals that one of the cables is damaged - which most likely point towards a total line interruption in the near future - or that connections have been carried out erroneously which may lead to malfunctioning of the entire system. The fault message GROUND FAULT (6) is also maintained with very short (>5 sec) ground faults, as long as the amplifier is powered-on or a loaded battery is connected. The fault message is displayed via the red GROUND FAULT indicator (6). In case of an inserted INPUT MODULE NRS 90225, it is also outputted as collective fault message with the floating contact of the READY fault message relay via the REMOTE CONTROL connector (16). When using the REMOTE MODULE NRS 90222, error occurrence is monitored and output by the PROMATRIX manager DPM 4000 (for further details, please refer to the PROMATRIX handbook).

The installation has to be performed as follows (see figure 8 and/or figure 9):

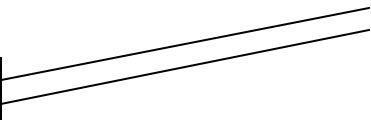
Caution Before opening the appliance, make sure to disconnect the mains and/or battery power source!

- To open the appliance, the top panel has to be removed.
- The extension kit NRS 90224 has to be inserted with its component side to the left (from the front view) until it clicks in place.
- Re-install the top plate of the enclosure.

NRS 90 224



S 406
S 405



B 411

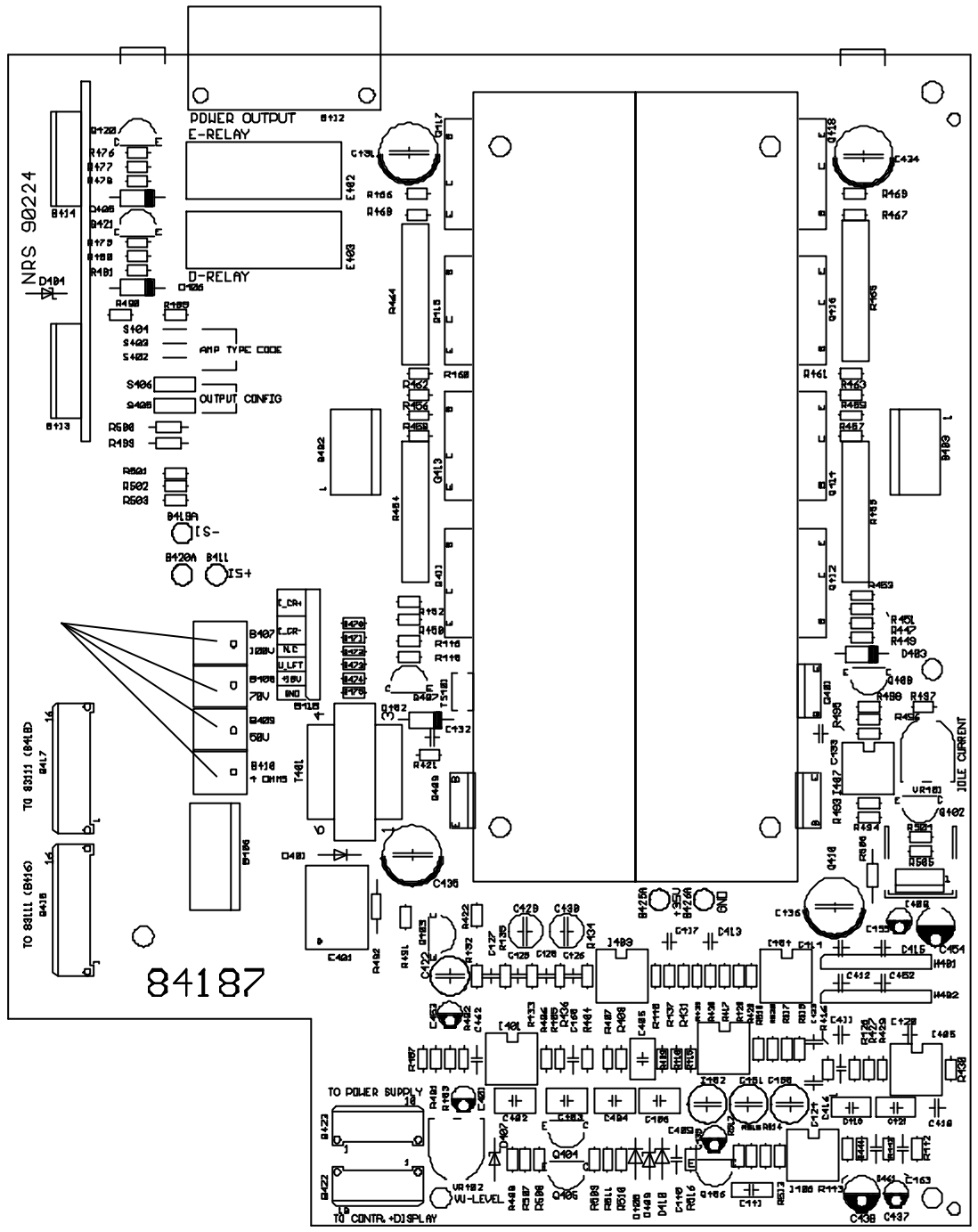


figure 8 printed board assembly 84187 in the DPA 4120 showing the NRS 90224 pilot tone & ground fault surveillance and the bridges B411 and S405, S406 for switching the output voltage; inserted

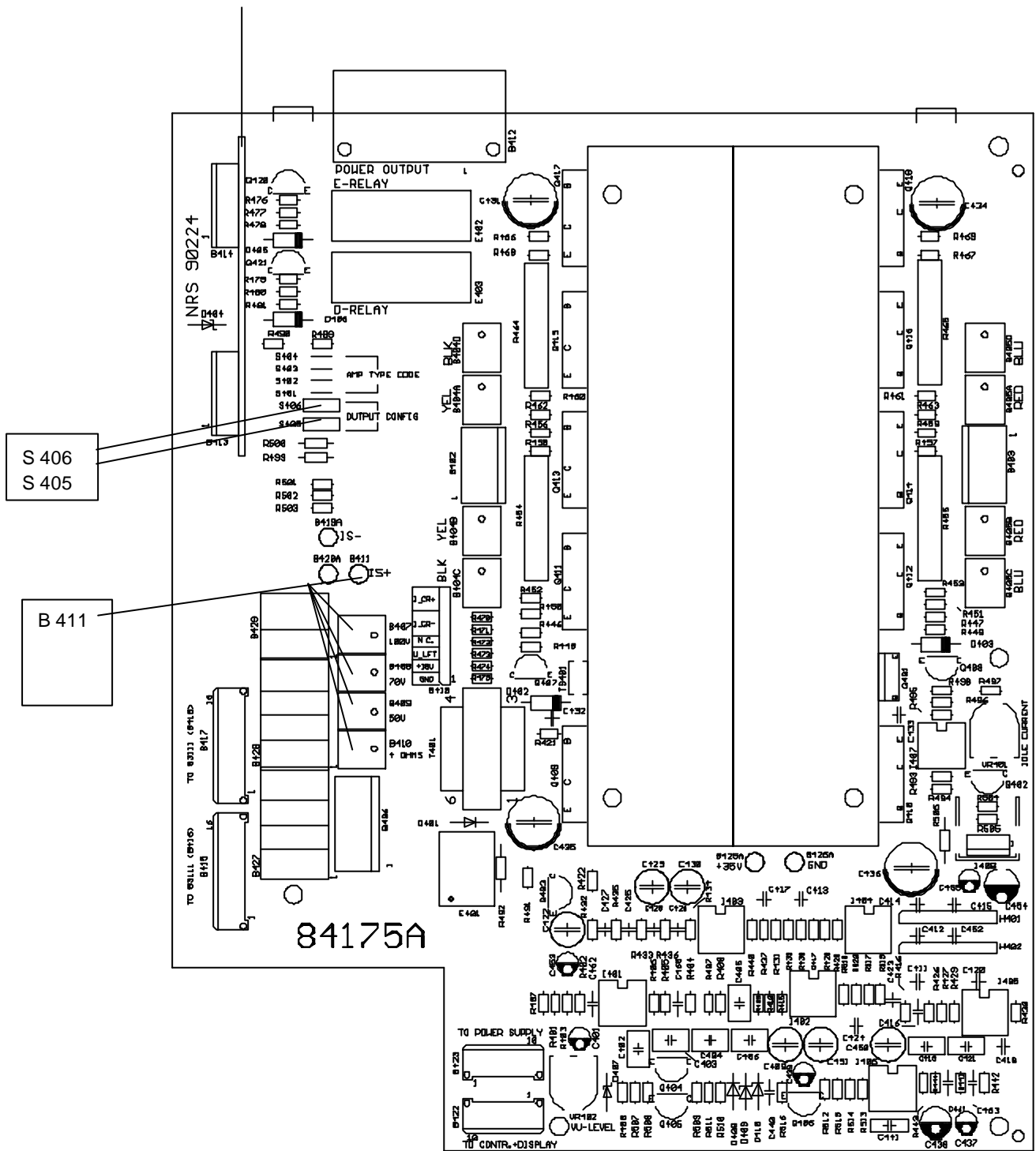


figure 9 printed board assembly 84175 in the DPA 4140 showing the NRS 90224 pilot tone & ground fault surveillance and the bridges B411 and S405, S406 for switching the output voltage; inserted

Checking the pilot tone surveillance function:

When the NRS 90224 is installed and the power amplifier is switched on, the green READY indicator (7) has to light. The testing and reset button TEST (3) serves as a function control for the pilot tone surveillance. With the TEST button being engaged, the 19 kHz generator is inactive. The green READY indicator is off and the READY fault message relay drops. Approximately 3 seconds after releasing the TEST button, the indicator has to light again. This method can also be used to check system configurations with average-switching.

Checking the ground fault surveillance function:

When the NRS 90224 is installed and the power amplifier is switched on, the green READY indicator (7) has to light. Utilizing an external switch to connect one pole of the 100V-loudspeaker network via a 47 k ohms resistor for approximately 5 seconds to ground potential, the corresponding red GROUND FAULT indicator (6) has to light and the READY fault message relay of the INPUT MODULE NRS 90225 drops while the green READY indicator (7) stays lit. After releasing the button, the indication and the fault message are maintained. The TEST button (3) has to be used to reset the ground fault surveillance function. For further details on checking the function with the REMOTE MODULE NRS 90222 being included in your installation, please refer to the PROMATRIX handbook.

9. 19"-case and 19"-rack-shelf system installation

Note	Operation of the power amplifiers DPA 4120 and DPA 4140 with enclosure cover plates detached is strictly prohibited.
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When mounting the power amplifiers within rack-cases or rack-shelf systems make sure to provide sufficient airflow. The space between the rear panel of the amplifier and the inner wall of the rack-case has to be at least 60 mm x 330 mm. A free space of at least 100 mm above the rack-shelf system is needed to provide sufficient air circulation. Since it is possible that during operation the temperature inside the rack system increases by 10° C, the maximum allowable ambient temperatures of the rest of the incorporated modules and appliances within a specific rack-shelf or rack-case have to be taken into careful consideration.

Note	To ensure trouble-free operation of the appliance, the maximum permissible ambient temperature of +40°C is not to be exceeded.
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10. Ground lift switch CIRCUIT ⊥ TO CHASSIS SWITCH

The ground lift switch CIRCUIT ⊥ TO CHASSIS SWITCH (19) provides the possibility to separate the signal ground from the enclosure (ground potential). This is mainly meant to eliminate noise-problems which are introduced through ground-loops, without jeopardizing the security. In case several appliances within a single rack-case or rack-shelf are furnished with ground lift switches, it is recommended to set all devices but one to "ungrounded". Set one appliance to "grounded". When set to "ungrounded", the impedance between signal ground and enclosure is : 100 k ohms // 100 nF. It is needed to maintain EMV protection.

11. Fuses

11.1 Fuses in the DPA 4120

location	Pos.	purpose	value	dimensions	standard
fuse socket (11)	F601	mains fuse 230V~ AC	T2A	5x20 mm	IEC 127-2-3
fuse socket (11)	F601	mains fuse 115V~ AC	T4A	5x20 mm	IEC 127-2-3
printed board assembly 86243	F602	mains fuse 100V - 250V	T1A	Ø 8.5xRM 5.08mm	IEC 127-3/4
printed board assembly 85270	F502	battery fuse 24V DC	15A	flat fuse	DIN 72581-3
printed board assembly 85270	F503	battery fuse 24V DC	15A	flat fuse	DIN 72581-3

11.2 Fuses in the DPA 4140

location	Pos.	purpose	value	dimensions	standard
fuse socket (11)	F601	mains fuse 230V~ AC	T4A	5x20 mm	IEC 127-2-3
fuse socket (11)	F601	mains fuse 115V~ AC	T8A	5x20 mm	IEC 127-2-3
printed board assembly 86243	F602	mains fuse 100V - 250V	T1A	Ø 8.5xRM 5.08mm	IEC 127-3/4
printed board assembly 85268	F502	battery fuse 24V DC	25A	flat fuse	DIN 72581-3
printed board assembly 85268	F503	battery fuse 24V DC	25A	flat fuse	DIN 72581-3

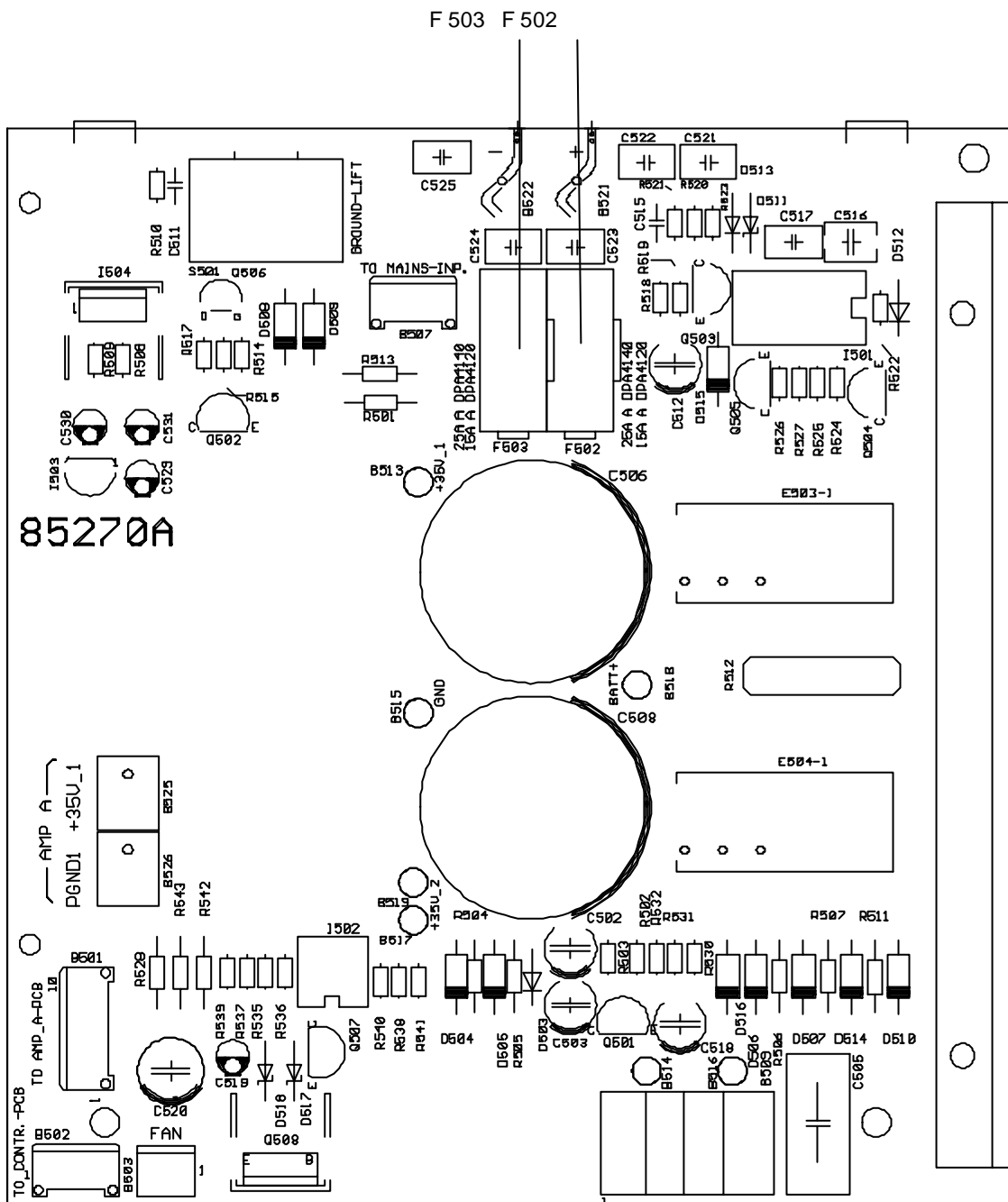


figure 10 printed board assembly 85270 in the DPA 4120 showing the DC fuses F502 and F503

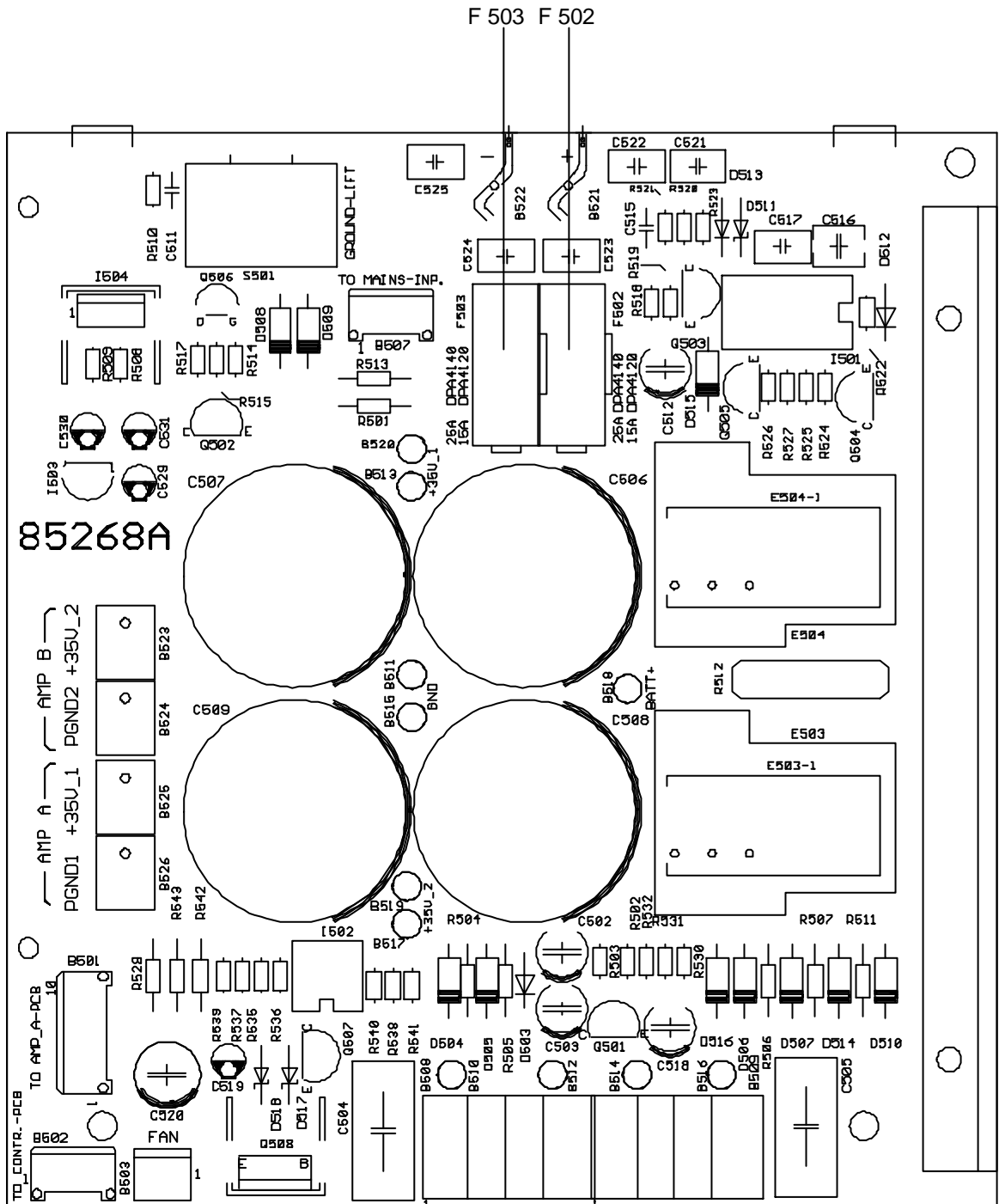


figure 11 printed board assembly 85268 in the DPA 4140 showing the DC fuses F502 and F503

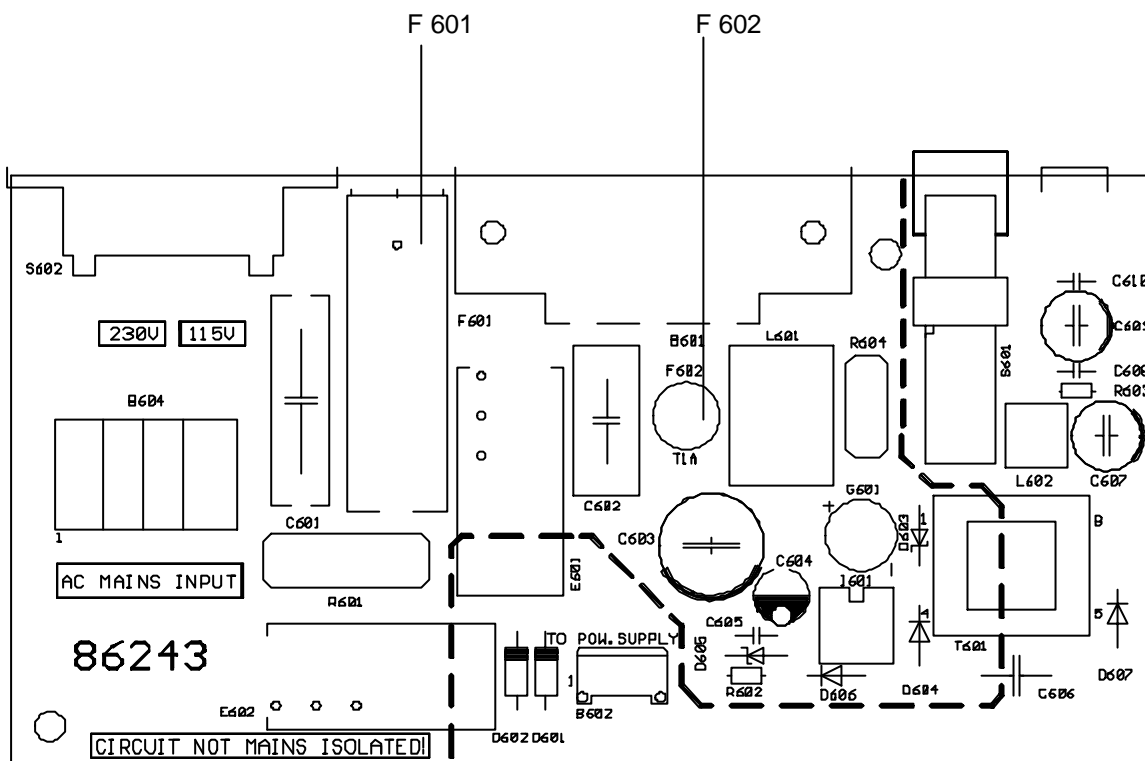


figure 12 printed board assemblies 86243 DPA 4120 and DPA 4140 showing the AC fuses F601 and F602

Caution Before opening the appliance, make sure to disconnect the mains and/or battery power source!

Replacing the fuses F502 and F503 (only to be carried out by the experienced service technician!)

The battery fuses F502 and F503 are located on the power supply PCBs 85270 (DPA 4120) and 85268 (DPA 4140) behind the AMP battery connectors (see also figure 10 and/or figure 11). To replace these fuses you have to remove the cover plate of the appliance and afterwards the power supply input PCB 86243 which is mounted to the rear panel of the appliance. Therefore detach the yellow/green cable from the ground-connector on the appliance's rear panel. Pressing the lock-strap of the AMP-connector together, it can be removed without applying any force. Now, you have to remove the three screws marked "A" (refer to the diagram of the appliance's rear panel on page 2) which allows you to twist the power supply input PCB 86243 up. Make sure not to damage any wires or any other parts. The fuses F502 and F503 are now accessible and can be removed. To re-install the power supply input PCB 86243, these steps have to be proceeded in the opposite order. The yellow/green cable has to be reconnected to the ground-connector on the rear panel of the appliance. By pulling the cable make sure that it sits snugly. Then you can re-attach the cover plate of the enclosure.

Caution For security reasons it is necessary to ensure that, after the installation is completed, all wiring located beneath the power supply input PCB are within a distance of at least 6 mm to the printed board assembly.

12. Specifications

12.1 DPA 4120 power amplifier 200 W

power supply:

mains operation

mains frequency

security class

115 V / 230 V~ AC, ±10 %

50 - 60 Hz

I

mains operation	$U_{\text{mains}} / \text{V}$	$I_{\text{mains}} / \text{A}$	$P_{\text{mains}} / \text{VA}$	$P_{\text{mains}} / \text{W}$	$P_{\text{out}} / \text{W}$	P_{V} / W
idling	230	0.13	30	16	0	16
normal operation (-10 dB)	230	0.83	191	138	20	118
alarm (-3 dB)	230	1.67	384	298	100	198
standard conditions	230	2.27	522	415	200	215
initial current inrush (mains)	< 29 A					

mains operation	$U_{\text{mains}} / \text{V}$	$I_{\text{mains}} / \text{A}$	$P_{\text{mains}} / \text{VA}$	$P_{\text{mains}} / \text{W}$	$P_{\text{out}} / \text{W}$	P_{V} / W
idling	115	0.26	30	16	0	16
normal operation (-10 dB)	115	1.67	191	138	20	118
alarm (-3 dB)	115	3.34	384	298	100	198
standard conditions	115	4.54	522	415	200	215
initial current inrush (mains)	< 20 A					

$P_{\text{mains}} / \text{VA}$ = apparent power $U_{\text{mains}} \cdot I_{\text{mains}}$; $P_{\text{mains}} / \text{W}$ = true power; $P_{\text{out}} / \text{W}$ = output power; P_{V} / W = leakage power

battery operation

24 V DC, -10/+30 %

battery operation	U_{B} / V	I_{B} / A	P_{i} / W	$P_{\text{out}} / \text{W}$	P_{V} / W
stand-by	24	2.5m	60m	0	60m
idling	24	0.43	10	0	10
normal operation (-10 dB)	24	3.74	90	20	90
standard conditions	24	9.10	218	131	87
initial current inrush (battery)	< 3.8 A				

P_{i} / W = input power $U_{\text{B}} \cdot I_{\text{B}}$; $P_{\text{out}} / \text{W}$ = output power; P_{V} / W = leakage power

features of the input:

nominal input level

nominal input impedance

features of the power output:

nominal output capacity during mains operation

nominal load impedance

frequency response

distortion at 1 kHz and nominal output power

interfering voltage (A)

features of the monitor output:

nominal output voltage

nominal load impedance

electronically balanced

775 mV = 0 dBu

≥ 10 k ohms

balanced, floating

200 W (according to IEC 268-3)

50 ohms / 100V; 25 ohms / 70 V; 12.5 ohms / 50 V
or 4 ohms / 28 V

60 Hz .. 20 kHz

≤ 1 %

≤ 1.2 mV = -56 dBu

electronically balanced

2 V = + 8.2 dBu

600 ohms

ambient temperature range
 dimensions (W x H x D)
 depth with / without connections
 weight without extensions
 finish

+5 °C .. +40 °C
 483 x 132 x 345 mm
 max. 400 mm / max. 340 mm
 13.2 kg
 anthracite

12.2 DPA 4140 power amplifier 400 W

power supply:
mains operation
 mains frequency
 security class

115 V / 230 V~ AC, ±10 %
 50 - 60 Hz
 I

mains operation	$U_{\text{mains}} / \text{V}$	$I_{\text{mains}} / \text{A}$	$P_{\text{mains}} / \text{VA}$	$P_{\text{mains}} / \text{W}$	$P_{\text{out}} / \text{W}$	P_{V} / W
idling	230	0.19	44	23	0	23
normal operation (-10 dB)	230	1.60	368	263	40	223
alarm (-3 dB)	230	3.10	713	562	200	362
standard conditions	230	4.43	1019	811	400	411
initial current inrush (mains)	< 36 A					

mains operation	$U_{\text{mains}} / \text{V}$	$I_{\text{mains}} / \text{A}$	$P_{\text{mains}} / \text{VA}$	$P_{\text{mains}} / \text{W}$	$P_{\text{out}} / \text{W}$	P_{V} / W
idling	115	0.38	44	23	0	23
normal operation (-10 dB)	115	3.19	368	263	40	223
alarm (-3 dB)	115	6.20	713	562	200	362
standard conditions	115	8.86	1019	811	400	411
initial current inrush (mains)	< 21 A					

$P_{\text{mains}} / \text{VA}$ = apparent power $U_{\text{mains}} \cdot I_{\text{mains}}$; $P_{\text{mains}} / \text{W}$ = true power; $P_{\text{out}} / \text{W}$ = output power; P_{V} / W = leakage power

battery operation

24 V DC, -10/+30 %

battery operation	U_{B} / V	I_{B} / A	P_{i} / W	$P_{\text{out}} / \text{W}$	P_{V} / W
stand-by	24	2.5m	60m	0	60m
idling	24	0.62	15	0	15
normal operation (-10 dB)	24	7.1	170	40	130
standard conditions	24	17.3	415	249	166
initial current inrush (battery)	< 3.8 A				

P_{i} / W = input power $U_{\text{B}} \cdot I_{\text{B}}$; $P_{\text{out}} / \text{W}$ = output power; P_{V} / W = leakage power

features of the input:

nominal input level
 nominal input impedance

features of the power output:

nominal output capacity during mains operation
 nominal load impedance

frequency response

distortion at 1 kHz and nominal output power

electronically balanced

775 mV = 0 dBu

≥ 10 k ohms

balanced, floating

400 W (according to IEC 268-3)

25 ohms / 100V; 12.5 ohms / 70 V; 6.25 ohms / 50 V or 4 ohms / 40 V

60 Hz .. 20 kHz

≤ 1 %

interfering voltage (A)	≤ 1.2 mV = -56 dBu
features of the monitor output:	electronically balanced
nominal output voltage	2 V = + 8.2 dBu
nominal load impedance	600 ohms
ambient temperature range	+5 °C .. +40 °C
dimensions (W x H x D)	483 x 132 x 345 mm
depth with / without connections	max. 400 mm / 340 mm
weight without extensions	16.7 kg
finish	anthracite

extension kits for the DPA 4120 and DPA 4140:

NRS 90208 input transformer for floating, balanced input	Art. No. 121 641
NRS 90222 remote module	Art. No. 121 674
NRS 90224 pilot tone & ground fault surveillance	Art. No. 121 676
NRS 90225 standard input module	Art. No. 121 677
NRS 90227 output transformer for floating, balanced monitor output	Art. No. 121 679

13. Extension kit specifications for the power amplifiers DPA 4120 / DPA 4140

13.1 NRS 90225 standard input module

see specifications DPA 4120 / DPA 4140

13.2 NRS 90222 remote module

see specifications DPA 4120 / DPA 4140

13.3 NRS 90208 input transformer for floating, balanced input

frequency response	20 Hz .. 20 kHz
input impedance	≥ 10 k ohms
idling ratio	1:1
winding resistance; primary	1420 ohms at 20°C
winding resistance; secondary	1420 ohms at 20°C

13.4 NRS 90227 output transformer for floating, balanced monitor output

frequency response	40 Hz .. 20 kHz
nominal load impedance	≥ 600 ohms
idling ration	1:1
winding resistance; primary	18 ohms at 20°C
winding resistance; secondary	18 ohms at 20°C

13.5 NRS 90224 pilot tone & ground fault surveillance

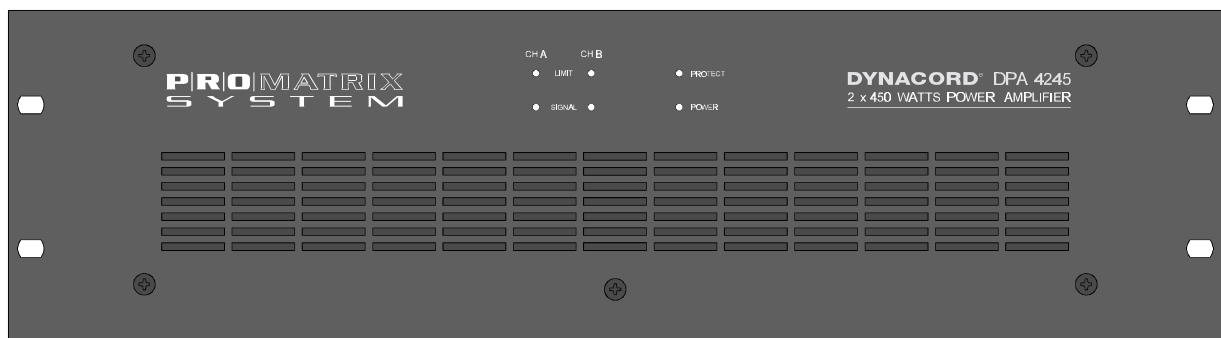
13.5.1 pilot tone surveillance

pilot tone frequency	19 kHz ± 1%
error recognition threshold	≤ 12 mV
fault message output via NRS 90225	collective fault message via READY relay
fault message output via NRS 90222	PROMATRIX manager DPM 4000

13.5.2 ground fault surveillance

input loudspeaker line 4 ohms / 50V / 70V / 100V	
fault message output via NRS 90225	collective fault message via READY relay
fault message output via NRS 90222	PROMATRIX Manager DPM 4000
disruptive strength	1000 Veff
error recognition threshold	≤ 50 k ohms

DPA 4245 / DPA 4260 POWER AMPLIFIER



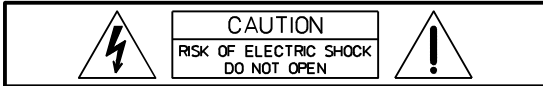
Features

- 2 x 450 watts output power capacity DPA 4245
- 2 x 600 watts output power capacity DPA 4260
- floating 100 V / 70 V / 25 V power outputs (isolated outputs)
- low impedance outputs (direct outputs)
- bridged mode operation, switchable
- all outputs are protected against idling and short-circuit
- mains supply 230 V AC 50/60 Hz
- POWER REMOTE function
- service mains switch
- active ventilation via 2 temperature-controlled DC-fans
- electronically balanced inputs
- routing switch for parallel linked operation
- input gain controls
- integrated audio limiters
- power-on switching noise suppression
- protection circuitry: DC/HF, Back-EMF, output voltage overload limiters, initial inrush current limiter, output peak current limiter
- 18 dB/oct. LO-cut filter at 45 Hz
- SIGNAL and LIMIT indication for optical monitoring
- thermal overload protection for the heat sink and the internal power supply, with PROTECT-function
- inputs transformers for balanced, floating operation are optionally available
- XLR-type and binding post clamping input connectors
- 19" frame size, 3 HU

CONTENTS

Description	17
Installation Notes	18
Rear View	19
Inputs	19
Outputs	20
Specifications	27
Block Diagram	43
Dimensions	44
Warranty	48

IMPORTANT SAFETY INSTRUCTIONS



WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.
AVIS: RISQUÉ DE CHOC ELECTRIQUE. NE PAS OUVRIR.



The lightning flash with arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a damp cloth.
7. Do not block any of the ventilation openings.
Install in accordance with the manufactures instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus that produce heat.
9. Only use attachments/accessories specified by the manufacturer.
10. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

For US and CANADA only:

Do not defeat the safety purpose of the grounding-type plug. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. When the provided plug does not fit into your outlet, consult an electrician for replacement of the absolute outlet.

IMPORTANT SERVICE INSTRUCTIONS

CAUTION: These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the Operating Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

1. Security regulations as stated in the EN 60065 (VDE 0860 / IEC 65) and the CSA E65 - 94 have to be obeyed when servicing the appliance.
2. Use of a mains separator transformer is mandatory during maintenance while the appliance is opened, needs to be operated and is connected to the mains
3. Switch off the power before retrofitting any extensions, changing the mains voltage or the output voltage.
4. The minimum distance between parts carrying mains voltage and any accessible metal piece (metal enclosure), respectively between the mains poles has to be **3 mm** and needs to be minded at all times.
The minimum distance between parts carrying mains voltage and any switches or breakers that are not connected to the mains (secondary parts) has to be **6 mm** and needs to be minded at all times.
5. Replacing special components that are marked in the circuit diagram using the security symbol (Note) is only permissible when using original parts.
6. Altering the circuitry without prior consent or advice is not legitimate.
7. Any work security regulations that are applicable at the location where the appliance is being serviced have to be strictly obeyed. This applies also to any regulations about the work place itself.
8. All instructions concerning the handling of **MOS** - circuits have to be observed.

Note:  **SAFETY COMPONENT (HAS TO BE REPLACED WITH ORIGINAL PART ONLY)**

DESCRIPTION

Especially designed for permanent installations, the DPA-Series power amplifiers offer performance-consistent and reliable operation of PA-systems with 2 individual loudspeaker lines, each. Therefore, DPA-Series power amplifiers are most suitable for company intercom, alarm and background music transmission installations in offices and commercial areas, congregation and sport centers, schools, houses of worship, hotels, hospitals, shopping malls and super markets, cruise ships, and other similar applications.

Each power amplifier incorporates two high-performance output transformers. Next to 100 V, 70 V, and 25 V floating outputs, the direct outputs provide the possibility to also drive loudspeaker systems with low-impedance down to a minimum of 4 ohms. Simultaneous operation of low-impedance speaker systems and floating loudspeaker lines on a single output channel of the power amplifiers is possible as well.

The integrated 45 Hz LO-cut filter with 18 dB/oct. slope protects the connected loudspeaker lines from unwanted ultra-low frequencies.

Comparator circuitry constantly monitors the input and output signals of the power amplifiers and activates their internal limiters whenever non-linear operation is encountered which reliably protects the connected loudspeaker systems against overload conditions and clipping, saturation of the power supply transformers, and overvoltage at the outputs. The DPA-Series power amplifiers' transmission and sound qualities are absolutely superb. The employed comprehensive dimensioned power supply units with low-interference toroidal transformers ensure that the stated nominal performance specifications are accomplished, even in most demanding and critical installations. Since the DPA-Series power amplifiers do not employ V/I-Foldback-Limiter circuits, operation on complex loads up to $\pm 90^\circ$ phase angles is possible without a problem.

Quick optical information on the power amplifiers' momentary operational status is provided through easily readable LED indicators, individually showing whether a channel is ready for operation, a signal is present at the output, if any of the limiter circuits and/or one of the protection circuits has been activated.

The inputs are electronically balanced and carried out as XLR-type and as binding post clamping connectors as well. Parallel linking the two connector types at the input provides the possibility to utilize the carried-through signals to feed additional power amplifiers, without the necessity for special split-cables. Both inputs can be optionally retrofitted with input transformers. Through Input Routing switches it is possible to configure the DPA-Series power amplifiers for stereo, parallel-monaural, or bridged-mode operation.

The dB-scaled level controls – extremely precise and good to operate potentiometers – are located on the rear of the appliances. A Ground-Lift switch which helps eliminating ground noise loops by separating the amplifier circuit ground from the common ground of the enclosure is also to be found on the rear panels. Conveniently connecting the loudspeaker lines to the power amplifiers is provided through a binding post strip, where all voltages – 25 V, 70 V, 100 V – and the low-impedance output are present on individual screw-clamp connectors. The rear panel service mains switches allow turning the power amplifiers' power on directly. Using the provided power remote input, remote-start is also possible.

Consistent thermal stability of the power amplifiers is obtained through extremely silent running fans which are automatically switched stepwise depending on the amplifiers' operation mode. The front-to-rear air circulation guarantees trouble-free operation in rack-shelf enclosures of any size.

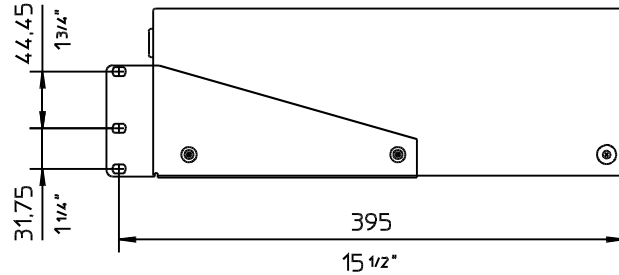
Several other features of the DPA-Series power amplifiers are revealed within this owner's manual. Therefore, please take the time to carefully and entirely read the provided information.

Installation Notes

Generally, it is important to install the power amplifier in a way, that ensures unhindered front-to-rear air circulation.

When installing the power amplifier in a closed rack-shelf system, please make sure that adequate air-flow is guaranteed. The space between the rear panel of the amplifier and the inner wall of the rack-case has to be at least 60 mm x 330 mm. A free space of at least 100 mm above the rack-shelf system is needed to provide sufficient air circulation. Since, during operation, the temperature inside the rack system could easily rise up to 40° C, the maximum allowable ambient temperatures of the rest of the incorporated modules and appliances within a specific rack-shelf system have to be taken into careful consideration.

When mounting the power amplifier inside of a closed rack system, it is recommended to use special rack-rails or optionally available rack-mount ears NRS 90235 (112733) to prevent bending of the appliance's front panel.



Note For maintained trouble-free operation of the appliance, the maximum admissible ambient temperature of +40°C is not to be exceeded.

The amplifier has to be protected from:

- water drops or splashes
- direct sunlight
- high ambient temperatures and the direct radiation of heat sources
- high humidity and moisture
- heavy dust
- massive vibrations

Moving the amplifier from a cold into a warm environment can result in the occurrence of condensation on inner parts. Operating the appliance is only permissible after it has accommodated to the altered temperature (approximately after one hour).

Should any foreign solid parts or liquids inadvertently intrude the enclosure, immediately unplug the device from the power source and have it checked at a DYNACORD service center, before further use.

Cleaning the appliance should not be performed using chemical solvents or sprays, as this might damage the finish and could even cause hazard fire.

Before The First Operation

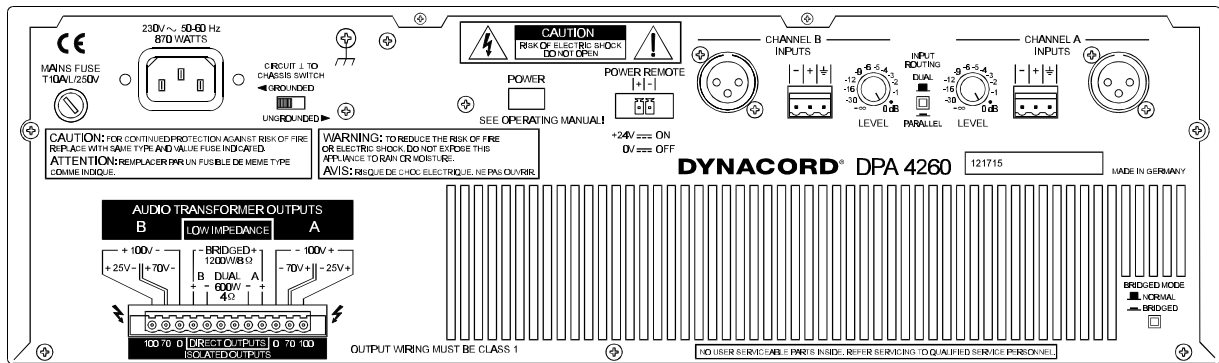
Before switching the amplifier's power on, the included mains cord has to be connected to a 230 V - 50/60 Hz wall outlet. On the appliance itself, the cord has to be connected to the 3-pole mains socket.

To remotely start the amplifier, it is necessary to connect an external 24 V power source to the terminal strip POWER REMOTE. Providing correct connection and with an external power supply being present, the POWER ON indicator will light and the power amplifier is ready for operation.

The mains switch POWER on the rear of the appliance is meant for service and maintenance purposes only. Through bridging the mains switching relay this option provides the possibility to operate the amplifier without an external 24 V power supply connected.

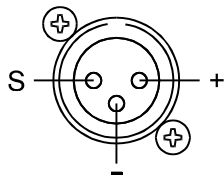
Caution The mains switch POWER on the rear of the appliance is **only** meant for maintenance. Remotely switching off the device is not possible when the POWER switch is engaged.

The DPA-Series power amplifiers employ power-on switching delays of approximately 2 seconds.



Inputs INPUT CHANNEL A&B

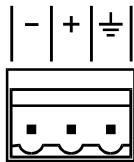
With an input sensitivity of 775 mV = 0 dBu and an input impedance of 20 k ohms, the electronically balanced inputs – INPUT CHANNEL A&B – are meant for the connection of control amplifiers, audio controllers, mixing consoles, etc.



- PIN 1: SHIELD
- PIN 2: a, +
- PIN 3: b, -

Peripheral pieces of audio equipment are either connected via the XLR-type input connectors or using the parallel-linked binding posts. For the latter option you can utilize the supplied screw-plugs. Thus, carrying the audio signals through to feed additional power amplifiers can be conveniently achieved without the need for special split-cables.

The XLR-type input connectors' pin-assignment is in accordance to the IEC 268 standard:



In case the controlling device does not supply balanced output connectors, it is also possible to configure the connectors for unbalanced operation. Therefore, the common ground (pin 1) has to be connected to the (-) input (pin 3). The audio signal is now solely fed through the (+) input (pin 2).

So, to be able to entirely make use of all the advantages the electronically balanced input stage offers – like the suppression of humming and interference noise – it is beneficial to re-establish balanced input connection whenever possible.

In case floating inputs are needed, the inputs are ready to be retrofitted with input transformers; one optional available extension kit NRS 90208 (308840) per channel is necessary.

Instructions On How To Install NRS 90208 Extension Kits

- unplug the power amplifier from the mains
- detach all screws holding the cover plate of the appliance
- lift and remove the cover plate
- disconnect the flat-wire cable of the printed board assembly 81340/1
- detach all screws holding the printed board assembly 81340/1
- remove the printed board assembly 81340/1 and unsolder the resistors R106 ... R109
- attach insulators to the input transformers according to the correspondent marks on the printed board assembly
- re-assemble the appliance by performing all steps described in the opposite order

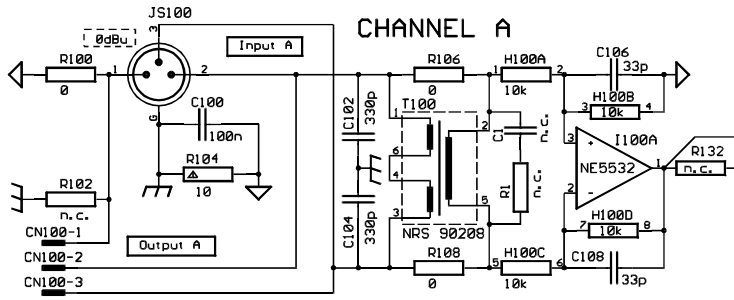


figure: block diagram input channel A

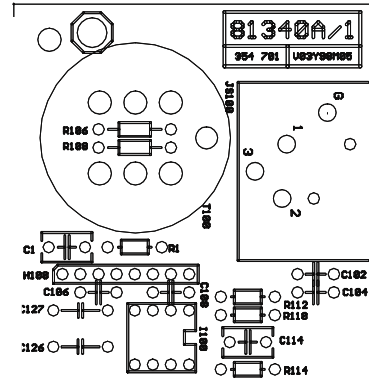


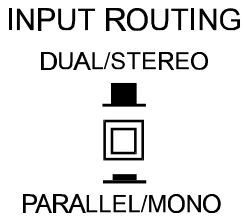
figure: printed board assembly area channel A – transformer retrofitting

Level Control



dB-scaled rotary controls for adjusting the power amplifier’s overall amplification. This control should be positioned between the 0 dB and the -6 dB marks to prevent distortion in source devices. The labeling indicates the actual attenuation applied to the internal specified factor of amplification.

Input Routing



If the switch is set to parallel/mono, the input connectors CHANNEL A and CHANNEL B are electrically linked for direct parallel operation. With only a single audio signal source connected, both channels are driven, while their volume levels are still individually controlled via the level controls A and B.

If the switch is set to its dual/stereo position, channels A and B are separately amplified (two channel or stereo mode).

Power Outputs A&B

The loudspeaker cables are connected to the power amplifier through high-performance binding posts – with the necessary screw-plugs being supplied. For connection purposes, it is possible to remove the 12-pole terminal plug. Cables with a maximum diameter of 2.5 mm² can be utilized. To provide flexible connections, all floating output voltages – 25 V, 70 V, and 100 V (ISOLATED OUTPUTS) – as well as the low-impedance output (DIRECT OUTPUTS) of both channels are directly accessible.

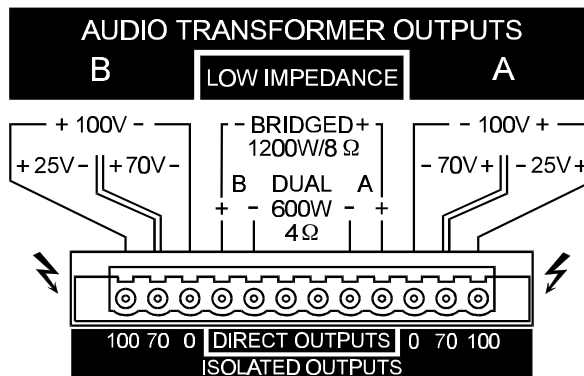


figure: power outputs of the DPA 4260

Power Outputs – AUDIO TRANSFORMER OUTPUTS

The two integrated output transformers convert the power amplifier's nominal output voltage to the commonly used loudspeaker line voltage standards – 25 V, 70 V, and 100 V. These voltages are simultaneously present at the correspondent floating outputs of the binding post strip. The two power amplifier channels can be operated using any possible output voltage combination. Simultaneous operation of low impedance loudspeaker systems and floating loudspeaker lines on a single power amplifier channel is possible as well.

Caution It is possible that during operation shock-hazard output voltages can be present at the power output connectors (>34 V peak value). Therefore, the connected loudspeaker lines have to be installed in accordance to applicable security standards and regulations. When installing and operating 100 V-loudspeaker networks, compliance to the VDE regulation DIN VDE 0800 is mandatory. Especially, if a 100 V-loudspeaker network is included in alarm system applications, all security standards have to be in accordance to the security class 3 standard. Before the first operation of the power amplifier, the loudspeaker terminal strip has to be covered using the supplied protection cover.

Power Outputs - Isolated Outputs 70 V and 100 V

To reduce line attenuation effects when the distance between power amplifier and loudspeaker systems exceeds 50 meters, it is recommended to employ loudspeaker systems with 100 V or 70 V line transformers, which also allows conveniently distributing the output power to the individual loudspeaker systems.

It is possible to connect as many loudspeaker systems until the total power consumption of the loudspeaker network equals the nominal power handling capacity of the power amplifier; while not declining the nominal load impedance of the power amplifier outputs.

For details on nominal power handling capacity and nominal load impedance of the amplifier's individual power outputs, please refer to the specifications in the appendix.

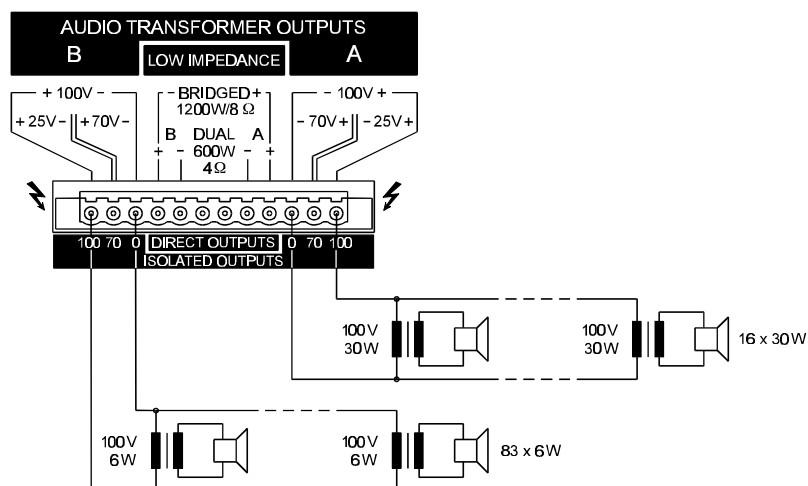


figure: example configuration – DPA 4260 with 100 V loudspeaker systems – maximum load using 30 W / 100 V and 60 W / 100 V loudspeaker systems

Power Outputs - Isolated Outputs 25 V

The floating 25 V output is mainly used for driving low impedance loudspeaker systems (4 - 16 ohms). Because of the effect of line attenuation, the distance between power amplifier and loudspeaker systems should not exceed 50 meters. It is further important that the total impedance of the entire loudspeaker network does not decline the nominal load impedance of the 25 V output. For details on the nominal load impedance of the 25 V output, please also refer to the specifications in the appendix.

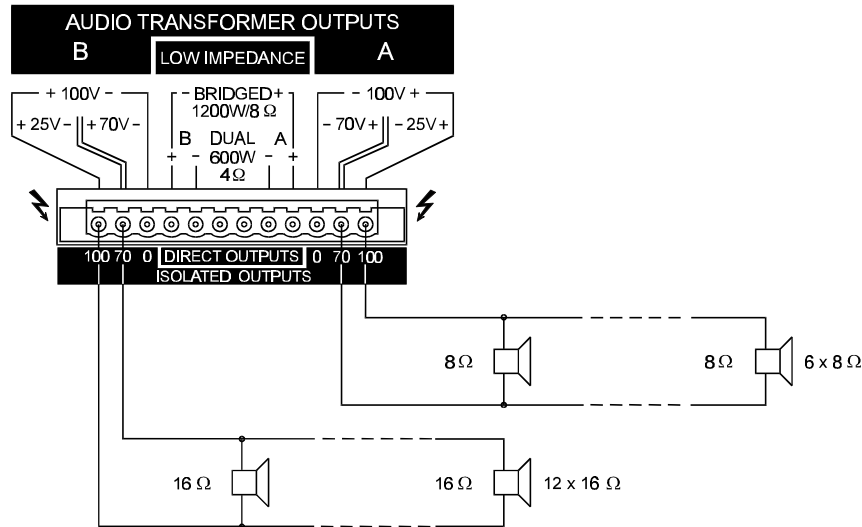


figure: example configuration – DPA 4260 with 8 ohms and 16 ohms loudspeaker systems at maximum load

Power Outputs – DIRECT OUTPUTS

In addition to the output transformer equipped outputs and for driving low impedance, high performance loudspeaker systems, the power amplifier's direct, low impedance outputs are carried out as well, offering a minimal load impedance of 4 ohms. Each power amplifier channel is capable of simultaneously driving loads at the direct output and at the isolated output. But it is of major importance that the overall power consumption of the connected loudspeaker systems or lines does not exceed the output power capacity of the power amplifier.

Example: If a loudspeaker system with 8 ohms and a nominal power handling capacity of 300 watts is connected to the DPA 4260 channel A Direct Output, this equals exactly half of the power amplifier's output power capacity since the minimal load impedance for each channel is 4 ohms. That leaves the possibility to utilize exactly half of the nominal output power capacity of the channel A 100 V output – which in this example equals $500 \text{ watts} / 2 = 250 \text{ watts}$ – to supply a split loudspeaker line. The total impedance of the loudspeaker line has not to decline $20 \text{ ohms} * 2 = 40 \text{ ohms}$.

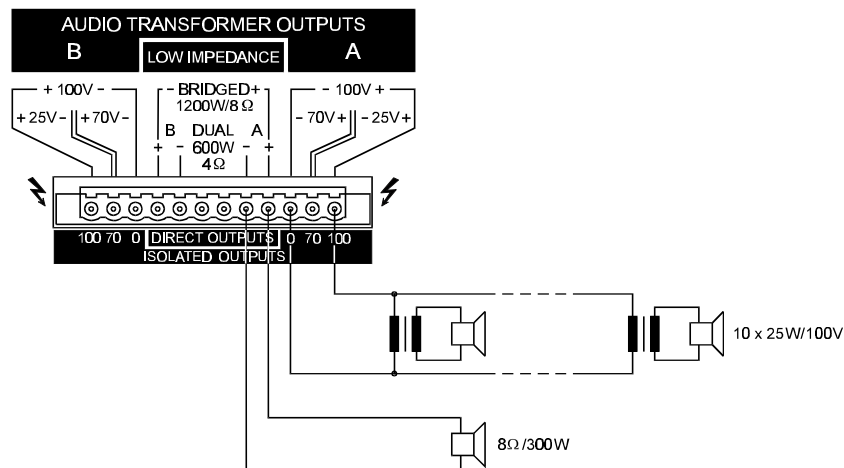


figure: example configuration – DPA 4260 channel A in mixed mode

Bridged Mode

Doubling the power amplifier's output power is accomplished by engaging bridged mode operation, where the two power amplifier output stages are linked for push-pull operation. In other words, a monaural power amplifier is "created" offering double the output voltage and double the output power capacity of a single channel. As a result you are provided with floating 50 V, 140 V, and 200 V as well as with a direct output with doubled nominal output voltage.

If the BRIDGED-MODE switch is engaged, the audio input signal has to be fed via the CHANNEL A input while the CHANNEL B input is without function. The signal is internally inverted and the power amplifier stage B is driven by that inverted signal. The power amplifier stage A is still driven by the unaltered incoming audio signal. Bridged mode operation is possible with using the isolated and/or the direct outputs.

When using the isolated outputs, bridging the (-) binding posts of channels A and B is mandatory, using short cables with suitable diameter (1.5 mm² ... 2.5 mm²)!

Careful consideration of the loudspeaker systems' correct connection is important in preventing phase correlation problems. Channel A carries the signal "in phase" and therefore has to be connected to the (+)-pole of the correspondent loudspeaker system while the loudspeakers (-)-pole has to be connected to the (+)-output connector of channel B. The output voltage of each power amplifier stage A&B is present at the binding post strip, but utilization is not recommended because of the negative correlation.

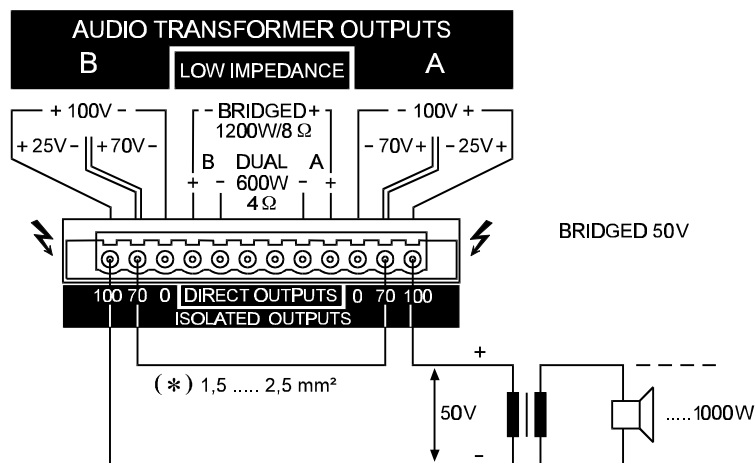
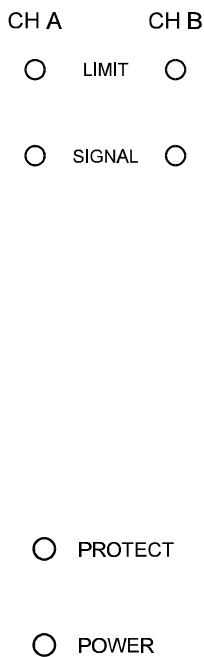
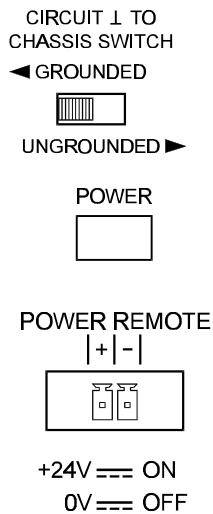


figure: output connection in 50 V bridged mode operation

***Caution!** The bridging cable has to be at least 1.5 mm² in diameter.

Driving 4 ohms loads at the direct output is not admissible in bridged mode operation. For details on nominal load impedance and nominal loads of the individual outputs in bridged mode operation, please refer to the specifications in the appendix. Also in bridged mode, the nominal load impedance is not to be declined.



GROUND Lift Switch

The ground lift switch helps is a perfect means for eliminating possible ground noise loops. In case the power amplifier is operated together with other equipment inside of a rack shelf system, the switch should be set to its GROUNDED position. When using the power amplifier together with other equipment that operates on different ground potentials, the switch should be set to UNGROUNDED.

Power On And Remote Control

When the power amplifier is operated via power remote start (standard operation) an external 24 V power source has to be connected to the POWER REMOTE terminal strip and the mains switch has to be set to its OFF-position. When correctly connected and with a present supply voltage, the power amplifier is operational. The fans run for approximately 2 seconds and the POWER ON-LED on the front panel lights. The mains switch POWER on the rear of the appliance bridges the mains relay. It is meant for service purposes only. This allows to operate the power amplifier without the presence of an external 24 V power source. The current consumption at the POWER REMOTE input is approximately 25 mA.

Limit Indicator

The indicator lights whenever the integrated limiter is activated. While short blinking means no problem, the continuously lit LED indicates that the volume level needs to be reduced to prevent the connected loudspeaker systems from being damaged by overload.

The audio limiters are capable of controlling overdrive levels of up to 20 dB. Most other power amplifiers without integrated limiters begin to clip, generating nasty distortion that not only attacks your ears but also lead to damaging the connected loudspeaker systems by overload. The limiters are activated only in case of the occurrence of non-linear conditions within the power amplifier; e. g. signal clipping at the operation voltage limit. The limiters do not affect the power amplifier's overall dynamic range.

Signal Indicator

This indicator is lit when the audio signal exceeds -30 dB. In case short-circuits resulting from broken loudspeaker cables are detected or one of the power amplifier's protection circuits is activated, the signal indicator is dimmed.

PROTECT

The PROTECT-LED lights whenever one of the power amplifier's protection circuits – thermal overload, RF, DC, Back-EMF – is activated. In PROTECT mode all loudspeaker lines and output transformers are disconnected via relays and the power amplifier's audio inputs are short-circuited to prevent the connected loudspeaker systems from being damaged. When the power amplifier enters the PROTECT mode please examine first whether the appliance is overheated. If this is the case, the front and rear ventilation louvres are possibly covered, the nominal load impedance has fallen below the specified minimum value, or a short-circuit occurred at the power output.

When switching the power amplifier on, the PROTECT-LED lights for approximately 2 seconds. This is normal. It signals that the protection circuitry is in working order.

Power ON Indicator

This LED lights when the power amplifier is connected to the mains and its power switch is set to the ON-position. If the indicator does not light although the power amplifier is switched on, the appliance is not connected to the mains or the primary fuse is blown.

Protection Circuitry

The DPA-Series power amplifiers are equipped with extensive protection circuitry:

- initial current inrush limiter
- power-on delay
- RF and DC protection
- Back-EMF protection
- limiters for the audio signals
- output peak-current-limiters
- thermal overload of the heat sink
- thermal overload of the mains transformer
- output voltage overload limiters

High-level signals in the low frequency range can drive the output transformers of power amplifiers that do not provide audio signal limiters into saturation, resulting in nasty distortion and high thermal load of the power amplification stage. The audio signal limiters of the DPA-Series power amplifiers are designed to quickly identify the occurring saturation of the core of an output transformer. The level is dynamically reduced to a value, that stays just below the point of where the saturation starts. The Limit-LEDs on the front panel indicate that the limiters have been activated. Despite the protection that is provided through the audio signal limiters, the Limit-LEDs should not light over a longer period of time. Please, locate the cause of the faulty operation – e. g. lower the LF-EQ setting at the connected mixing console when at the same time the input level at the power amplifier is approximately +10 dB above the nominal input level.

The DPA-Series power amplifiers employ integrated Lo-Cut filters at 45 Hz with 18 dB/oct. for each channel. They protect the loudspeaker systems that are connected via output transformers against low-frequency audio signals, which, depending on the quality and size of the involved transformers, could lead to problems with core saturation. In addition to the 45 Hz Lo-Cut filters, the frequency response of the DPA-Series power amplifiers top margin is set by 30 kHz Hi-Cut filters with 12 dB/oct., preventing unwanted high-frequency audio signals from being present at the outputs.

Mains Operation And Leakage Power

The mains power consumption as well as the leakage power is stated for driving the power amplifier at different levels. All the values were measured at nominal load via the 100 V output with two channels driven. The shown values differ only slightly when the appliance is operated at different nominal output voltages or in the Direct Out mode.

mains operation at the 100 V output	U _{mains} [V]	I _{mains} [A]	P _{mains} [VA]	P _{mains} [W]	P _{out} [W]	P _v [W]	BTU/hr
DPA 4245							
idling	230V	0,34	78	47	—	47	160
normal operation (-10 dB)	230V	2,76	635	490	70	420	1430
alarm (-3 dB)	230V	5,54	1274	1040	352	688	2347
nominal conditions	230V	7,45	1714	1420	700	720	2456
DPA 4260							
idling	230V	0,57	131	80	—	80	273
normal operation (-10 dB)	230V	3,66	842	655	101	554	1890
alarm (-3 dB)	230V	7,34	1688	1370	506	864	2948
nominal conditions	230V	9,86	2268	1900	1000	900	3070

initial current inrush for both models: < 38 A

P_{mains}[VA] = apparent power U_{mains}*I_{mains}, P_{mains}[W] = active power, P_{out}[W] = output power, P_v[W] = leakage power, 1BTU = 1055.06 W/s

Fuses

location	pos.	utilization	value	dimensions	standard
rear panel DPA 4245	—	mains fuse 230V~ AC	T8A 250V	5 x 20 mm	IEC 127
rear panel DPA 4260	—	mains fuse 230V~ AC	T10A 250V	5 x 20 mm	IEC 127
print 84171/1	F1	power supply	T1A 250V	5 x 20 mm	IEC 127
print 84171/1	F2	power supply	T1A 250V	5 x 20 mm	IEC 127

Extension Kits For The DPA 4245 And The DPA 4260:

NRS 90208 balanced input (input transformer for a single channel)

NRS 90235 1 pair of rack-mount ears

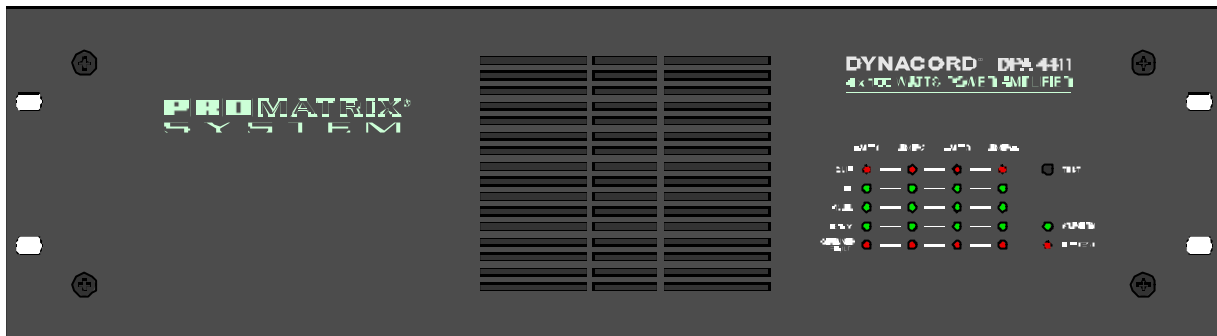
Technical Specifications: DPA 4245, DPA 4260

Amplifier at rated conditions, both channels driven, direct outputs with 8Ω loads, isolated outputs with rated load and voltage, unless otherwise specified.

DUAL MODE	DPA4245					DPA4260				
	Direct Output		Isolated Outputs			Direct Output		Isolated Outputs		
Output Definition	8Ω	4Ω	100V	70V	25V	8Ω	4Ω	100V	70V	25V
Load impedance or rated output voltage										
Rated Load Impedance isolated outputs only			28.5Ω	14Ω	1.8Ω			20Ω	9.8Ω	1.25Ω
Maximum Midband Output Power THD=1%, 1kHz	240W	450W	410W	400W	390W	330W	600W	590W	580W	570W
Maximum Midband Output Voltage THD=1%, 1kHz, RMS, rated load	44V	42.4V	108V	74.8V	26.5V	51.3V	49V	109.5V	75.4V	26.7V
Rated Output Power THD <0.2%, 45Hz ... 20kHz, >10min. according IEC 268-3	230W	350W	350W	350W	350W	300W	500W	500W	500W	500W
Rated Output Voltage THD<0.2%, 45Hz ... 20kHz	42.9V	37.4V	100V	70V	25V	49V	44.7V	100V	70V	25V
Maximum RMS Voltage Swing THD=1%, 1kHz, no load connected		44V	125 V	87V	31V		52V	121V	88V	32V
Frequency Response , -3dB, ref.1kHz LO-Cut-Filter: 18dB/octave, 45Hz HI-Cut-Filter: 12dB/octave, 30kHz	45 Hz 30kHz		45 Hz.... 22kHz			45 Hz 30kHz		45 Hz 22kHz		
Voltage Gain at 1 kHz	34 dB	34 dB	42 dB	39 dB	30 dB	35 dB	35 dB	42 dB	39 dB	30 dB
Input Sensitivity and Impedance at rated condition	0dBu (775mV) / 20 kOhm									
Slew Rate	25 V/μs					30 V/μs				
Power Bandwidth THD=1%, ref. 1kHz, half power @ rated load impedance	45Hz ...50kHz		45Hz 25kHz			45Hz 50kHz		45Hz 25 kHz		
THD at rated output power, MBW=80kHz, 1 kHz	< 0.05%	< 0.1%	< 0.2%	< 0.3%	< 0.3%	< 0.05 %	< 0.1%	< 0.2%	< 0.3%	< 0.3%
IMD-SMPTE 60 Hz, 7 kHz	< 0.08%	< 0.1%	< 0.3%	< 0.5%	< 0.5%	< 0.08%	< 0.1%	< 0.3%	< 0.5%	< 0.5%
DIM30 3.15 kHz, 15 kHz	< 0.03%	< 0.2%	< 0.2%	< 0.2%	< 0.2%	< 0.03 %	< 0.2%	< 0.3 %	< 0.3%	< 0.3%
Crosstalk ref. 1kHz, at rated output power	< -80dB									
Input Impedance 20Hz ... 20 kHz, balanced	20 kOhm									
Damping Factor at 100Hz / 1kHz, direct outputs only	> 300 / > 200					> 300 / > 200				
Insertion Loss isolated outputs only			0.7 dB	0.8 dB	0.9 dB			0.7 dB	0.8 dB	1.1 dB
Signal to Noise Ratio Rated output voltage to noise, A-weighted	> 100 dB									

BRIDGED MODE	Direct Output				Isolated Outputs			
	8Ω	200V	140V	50V	8Ω	200V	140V	50V
Output Definition Load impedance or rated output voltage								
Rated Load Impedance isolated outputs only	—	57Ω	28Ω	3.6 Ω	—	40Ω	19.6Ω	2.5 Ω
Rated Output Power THD<0.2%, 45Hz ... 20kHz	560 W	700 W	700 W	700W	600W	1000W	1000W	1000W
Maximum Bridged Output Power THD=1%, 1kHz	900W	820W	800W	780W	1200W	1180W	1160W	1140W
GENERELL Power Requirements	230V / 50Hz...60Hz							
Power Consumption at 1/8 maximum output voltage @ rated load impedance	690 W				870 W			
Protections	Audio limiters, High temperature, DC, HF, Back-EMF, Peak current limiters, Inrush current limiters, Turn-on delay, Output Transformer Saturation Protection							
Input Connectors	Euro-style, 3pin, detachable or XLR							
Output Connectors	Euro-style, 12pin, detachable, covered							
Cooling	Front-to-Rear, 3-stage-fans							
Regulations	The appliances are in accordance with EN60065, EN50081-1, EN 50082-1							
Safety Class	I							
Operating Temperature Range	+5°C ... +40°C							
Mounting Depht with Connectors	437 mm							
Mounting Depht without Connectors	377 mm							
Dimensions (W x H x D)	483mm x 132.5mm x 382mm							
Weight (net)	20.5 kg				22.5kg			

POWER AMPLIFIER DPA 4411



Features

Power amplifier with 4x100 W output power capacity according to IEC 283-3
19" - rack size (3 HU) unit that provides the following functions:

- Mains operation 115/230 V AC and operation with emergency power supply of 24 V DC
- Output transformers for balanced, floating 100 V loudspeaker networks: 70 V, 50 V or 4 ohms for low-impedance operation can be selected
- All outputs are protected against idling and short-circuit
- Integrated Remote Module for control and monitoring using the PROMATRIX Manager DPM 4000
- Electronic level controls, electronically balanced inputs and electronically balanced MONITOR output
- Input transformer for balanced, floating inputs can be retrofitted
- Monitor output transformer for balanced, floating MONITOR output can be retrofitted
- Routing switch for parallel operation of the amplifier's inputs
- Integrated Standby Power Supply
- Mains function switch - POWER
- Ground lift switch
- Remote-Start function for mains and battery operation with inrush current limiter protection
- Power-on noise attenuation
- Status-LED indicators: operation (READY), STANDBY, thermal overload (PROTECT) and GROUND FAULT at the power outputs
- Fault notification according to DIN EN 60849 via the PROMATRIX Manager DPM 4000
- TEST-switch for systems with average-switching or GROUND FAULT RESET
- LED meters with a range from -13 dB to 0 dB plus CLIP indication
- Mains voltage selector switch 115/230 V AC
- Active, temperature-controlled ventilation
- Modules for pilot tone surveillance and ground fault surveillance according to DIN VDE 0800 are optionally available

IMPORTANT SAFETY INSTRUCTIONS



WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.
AVIS: RISQUÉ DE CHOC ÉLECTRIQUE. NE PAS OUVRIR.



The lightning flash with arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a damp cloth.
7. Do not block any of the ventilation openings.
Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus that produce heat.
9. Only use attachments/accessories specified by the manufacturer.
10. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

For US and CANADA only:

Do not defeat the safety purpose of the grounding-type plug. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. When the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

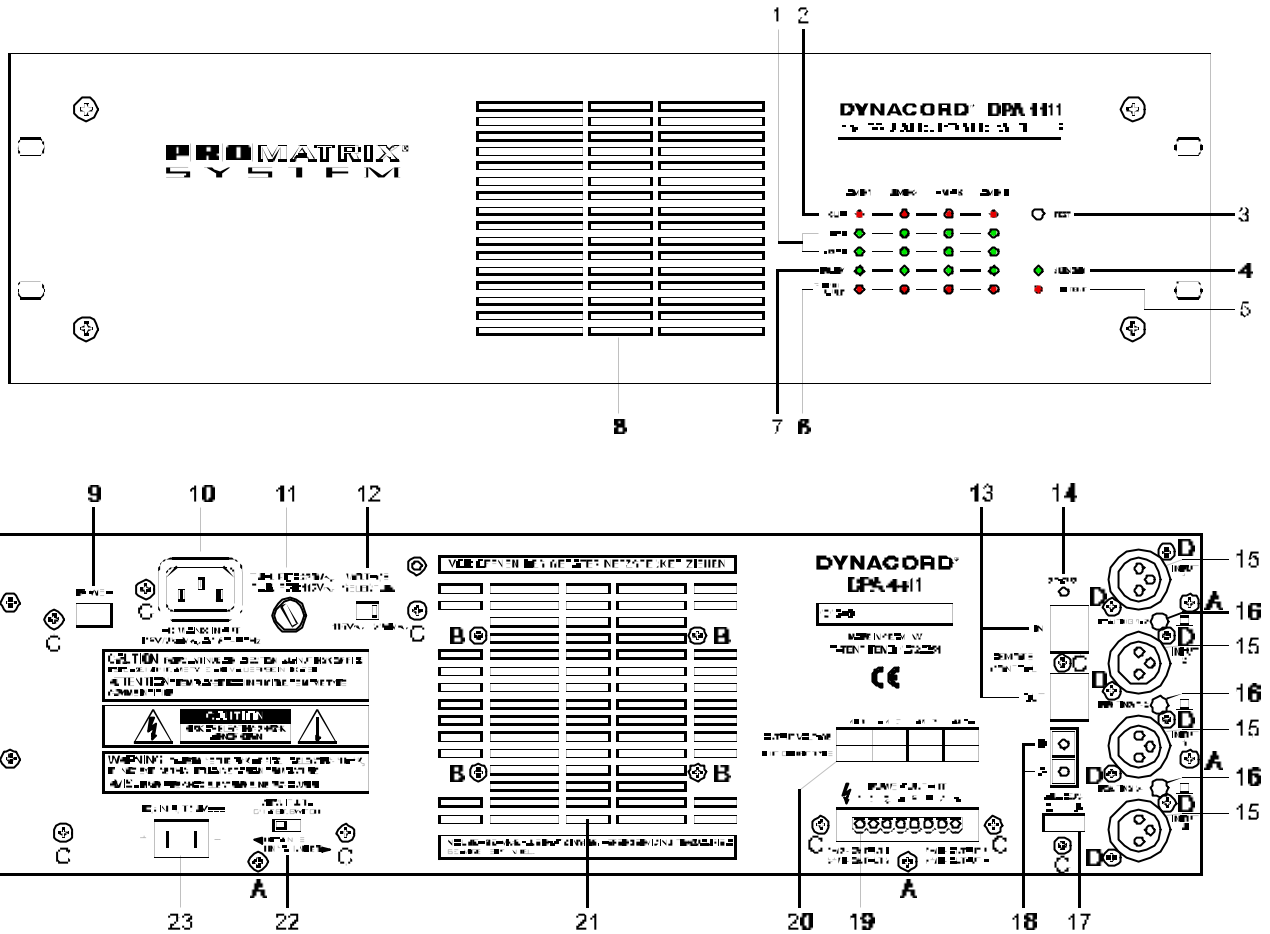
IMPORTANT SERVICE INSTRUCTIONS

CAUTION: These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the Operating Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

1. Security regulations as stated in the EN 60065 (VDE 0860 / IEC 65) and the CSA E65 - 94 have to be obeyed when servicing the appliance.
2. Use of a mains separator transformer is mandatory during maintenance while the appliance is opened, needs to be operated and is connected to the mains
3. Switch off the power before retrofitting any extensions, changing the mains voltage or the output voltage.
4. The minimum distance between parts carrying mains voltage and any accessible metal piece (metal enclosure), respectively between the mains poles has to be **3 mm** and needs to be minded at all times.
The minimum distance between parts carrying mains voltage and any switches or breakers that are not connected to the mains (secondary parts) has to be **6 mm** and needs to be minded at all times.
5. Replacing special components that are marked in the circuit diagram using the security symbol (Note) is only permissible when using original parts.
6. Altering the circuitry without prior consent or advice is not legitimate.
7. Any work security regulations that are applicable at the location where the appliance is being serviced have to be strictly obeyed. This applies also to any regulations about the work place itself.
8. All instructions concerning the handling of **MOS** - circuits have to be observed.

Note:  **SAFETY COMPONENT (HAS TO BE REPLACED WITH ORIGINAL PART ONLY)**

Indicators, Controls And Connections



- 1 LED meters with a range from -13 dB to 0 dB
- 2 CLIP indicators
- 3 TEST button for checking and reset function
- 4 STANDBY indicator
- 5 PROTECT indicator
- 6 GROUND FAULT indicator
- 7 READY indicator
- 8 Air inlets
- 9 POWER ON switch
- 10 AC MAINS INPUT connector
- 11 Mains fuse
- 12 VOLTAGE SELECTOR switch
- 13 REMOTE CONTROL connectors
- 14 STATUS indicator
- 15 INPUT connectors 1-4
- 16 ROUTING switch for INPUT 1-4
- 17 Device address label field
- 18 ADDRESS selector switch
- 19 POWER OUTPUT
- 20 Device output configuration label field
- 21 Air outlets
- 22 CIRCUIT \perp TO CHASSIS SWITCH
- 23 DC INPUT 24 V =

- A Rear plate screws: 6 oval-head sheet-metal screws 3.5 x 6.5 zinc-coated DIN 7981
 B heat-sink-mounting: 4 oval-head sheet-metal screws 3.5 x 9.5 zinc-coated DIN 7981
 C PCB-mounting: 9 oval-head screws M3 x 12 nickel-plated DIN 7985
 D socket-mounting: 8 oval-head screws PT-KA 30 x 8 WN-1412EJOT black, zinc-coated

Table of Contents

Features	19
Indicators, Controls And Connectors	21
1. Utilization	23
2. Installation Notes	23
3. Before Initial Operation	23
3.1 Mains Operation	23
3.2 Battery Operation 24 V DC	24
4. Inputs	24
5. Outputs	25
5.1 POWER OUTPUT	25
5.2 POWER OUTPUT for the connection of 100 V loudspeaker systems	25
5.3 POWER OUTPUT for the connection of low-impedance loudspeaker systems	25
5.4 POWER OUTPUT 100 V - Double Output Power	26
5.5 MONITOR Output	26
6. Integrated Remote Module	26
7. Indicators And Fault Notification	27
7.1 STANDBY Indicator	27
7.2 READY Indicator	27
7.3 PROTECT Indicator	27
7.4 GROUND FAULT Indicator	28
7.5 Meter Instruments And CLIP Indicators	28
7.6 STATUS Indicator	28
8. Switching The Output Voltage (refer to qualified service personnel only!)	28
9. Additional Functions And Features (refer to qualified service personnel only!) ..	29
9.1 NRS 90206 Pilot Tone Surveillance	29
9.2 NRS 90207 Ground Fault Surveillance	30
9.3 NRS 90208 Input Transformer	31
9.4 NRS 90227 Monitor Output Transformer	32
10. 19"-Flightcase Or 19"-Rack System Installation	32
11. Ground Lift Switch CIRCUIT ⊥ TO CHASSIS SWITCH	33
12. Fuses	33
13. DPA 4411 Specifications	35
14. Specifications For DPA 4411 Accessories	36
14.1 NRS 90206 Pilot Tone Surveillance	36
14.2 NRS 90207 Ground Fault Surveillance	36
14.3 NRS 90208 Input Transformer	36
14.4 NRS 90227 Monitor Output Transformer	36
15. Block Diagrams	55
15.1 DPA 4411 Power Amplifier	55
15.2 NRS 90206 Pilot Tone Surveillance	56
15.3 NRS 90207 Ground Fault Surveillance	57

1. Utilization

The amplifier DPA 4411 has been specially designed to ensure durable performance and reliable operation of sound reinforcement systems with several independent loudspeaker lines. The DPA 4411 is best suited for call and message transmission installations, alert systems, and for general music applications in industrial enterprises, offices, multi-function halls and sport arenas, schools, churches, hotels, hospitals, super markets, cruise ships, and similar applications.

2. Installation Notes

When installing or mounting the amplifier, it is important to make sure that unhindered air-flow from the air inlets on the front to the air outlets on the rear of the appliance is guaranteed (see paragraph 10). To maintain EMV disturbance-free operation, the use of shielded cable for all input, output and control lines, except for mains supply and battery cords, is mandatory. When installed inside of metal housings or rack systems, running unshielded output and control lines is possible. Cable screens have to be connected to the enclosure or rack system ground potential.

The amplifier has to be protected against:

- dropping or splashing water
- direct sunlight
- high environmental temperatures or direct radiation of heat sources
- high humidity and moisture
- dust
- shock or vibration

It is not permissible to place containers filled with liquids - e. g. vases - ontop of the appliance

When moving the amplifier from cold into warm environments, condensation of its inner parts can sometimes occur. If so, the appliance can be operated again after gaining the environmental temperature (approximately after one hour).

If a solid object has fallen or liquid has leaked into the device, disconnect all connectors and get in contact with an authorized DYNACORD service center. Do not operate the amplifier after such accidents.

When cleaning the amplifier's outside enclosure, never use any cleaning sprays or detergents, because of inflammability. The use of those liquids will damage the appliance.

3. Before Initial Operation

3.1 Mains Operation

When operated on mains power, use the included mains cord to connect the amplifier to a 230 V or 115 V 50/60 Hz wall outlet. Connect the cable's other end to the appliance's 3-pole machine-type socket (10).

Caution



The amplifier is factory-set to **230 V AC**. To change the setting to 115 V AC, use the voltage switch (12).

For the operation with **115 V AC**, the mains fuse (11) has to be replaced by an 8 Ampère slow-blow fuse with the label print "**T8AL**" (see also paragraph 12).

When correctly connected and with mains power present the green STANDBY indicator (4) will light. Now, through sending the corresponding command via the serial interface of the Remote Module, it is possible to start the amplifier from the PROMATRIX Manager DPM 4000 (see PROMATRIX handbook).

The POWER switch (9) on the rear of the amplifier – for bridging the starting relay – is meant for service purposes only. It offers the possibility to operate the amplifier without remote start.

Note



The POWER switch (9) on the rear of the appliance is for service purposes only. Remote power-off is not possible with the POWER switch set to ON. In this case, the STANDBY indicator (4) provides no function.

The DPA 4411 is equipped with a cut-in delay of approximately 3 seconds to efficiently suppress power-on noise. After this period of time and when no fault was detected, the green READY indicators (7) will light (see paragraph 7.2).

3.2 Battery Operation 24 V DC

The amplifier DPA 4411 can either be operated on the AC mains or connected to an external 24 V battery power source. Switching to battery operation is accomplished via internal relay.

The battery has to be connected to the corresponding socket (23) on the rear panel of the appliance using insulated AMP flat connectors 6.3x0.8 mm. The amplifier is protected against confusion of poles. Additional internal protection is provided through two miniature fuses – F502 and F503 – one per each conductor (+ and -), which are located on the printed board assembly 85272 (see paragraph 12, diagram 11). For the DPA 4411 the battery cable's diameter should be at least 2.5 mm² and the cable length for the single distance should not exceed 4.0 m (max. drop in voltage < 1V).

Caution



Operation of the DPA 4411 is solely allowable using batteries without grounding or batteries with grounding of the negative pole. Operation with batteries with grounding of the positive pole is not permissible.

4. Inputs INPUT 1 to INPUT 4

The inputs INPUT 1 to INPUT 4 (15) are electronically balanced. With a sensitivity of 775mV = 0dBu they are meant for the connection of control amplifiers. For the case that floating inputs are needed, the inputs are prepared for retrofitting input transformers.

Note



If a switch-contact is located between the control amplifier output and the power amplifier input, switch clicks might become audible during switching. If this is the case, incorporating input transformers (NRS 90208 - one per input) can solve the problem (see paragraph 9.3)

Parallel operation of INPUT 1 to INPUT 4 (15) is possible when using the ROUTING switches (16). This allows to connect the input signal through to feed several power amplifiers with the identical program. Use a permanent marker pen to mark the needed setting of the ROUTING switches (16) next to the ROUTING switch push-button symbol.

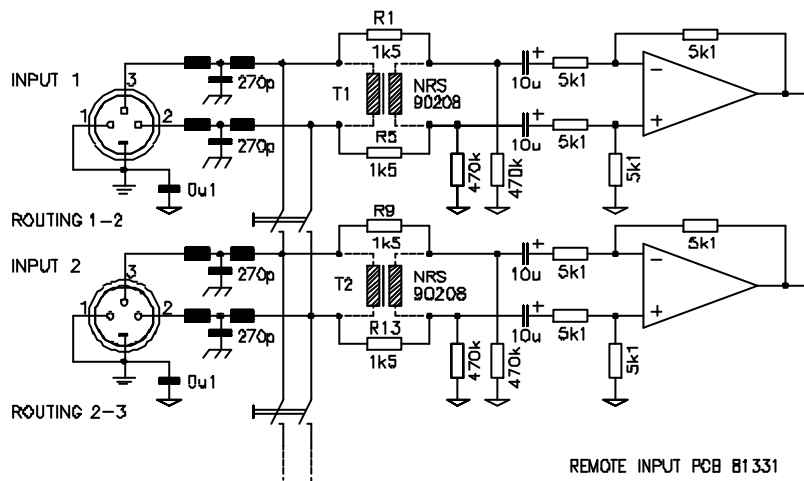


diagram 1 input socket connection

Connector, XLR 3 M

Connector, XLR 3 M

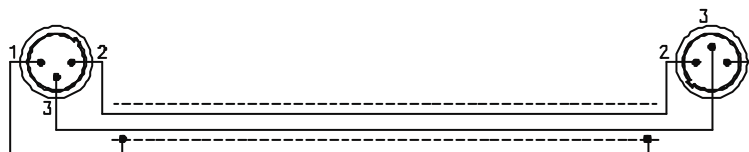


diagram 2 LF-cable for coupled operation of two DPA 4411

5. Outputs

5.1 POWER OUTPUT

All power outputs are balanced and floating. When factory-shipped, the outputs are pre-configured for the connection of 100 V loudspeaker systems. Connection is achieved through plugging the supplied 8-pole socket into the connection strip (19). Switching the output transformer allows to change the output voltage to 70 V, 50 V or 20 V (see paragraph 8). When set to 20 V, operation of low impedance speakers with a load of 4 ohms is possible.

Caution



During operation it is possible that the outputs of the POWER OUTPUT connector may conduct dangerous voltage (>34 V in peaks). Therefore, observing applicable safety regulations is mandatory when connecting and installing loudspeaker lines (see also paragraph 9.2).

5.2 POWER OUTPUT for the connection of 100 V loudspeaker systems

The use of speaker systems with 100 V matching transformers is recommended to reduce the lack in performance when the distance between amplifier and speaker systems exceeds 50 m. This method also offers an easy way to distribute the output power. The total power consumption of the maximum amount of the connected speakers in the network has to match the amplifier's overall output capacity of 100 watts (connection impedance 100 ohms). The connection is accomplished via the 100 V output (19) (see figure 3).

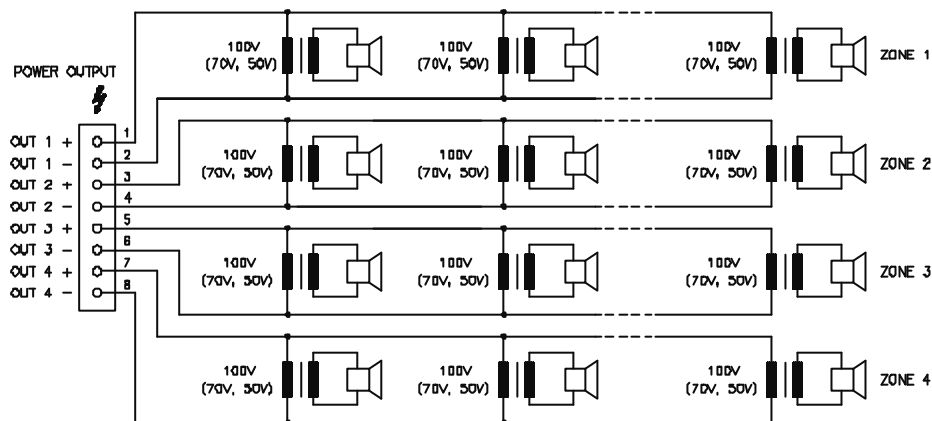


diagram 3 Connection of 100 V (70 V or 50 V) loudspeaker systems

5.3 POWER OUTPUT for the connection of low-impedance loudspeaker systems

When switching the output to 20 V, low-impedance speaker systems (4-16 ohms) can be connected to the corresponding output (see diagram 4). Because of line attenuation, the distance between amplifier and speaker systems should not exceed 50 m. It is of further importance that the overall impedance of the speakers does not decline 4 ohms and that the individual power handling capacity of each speaker is not exceeded.

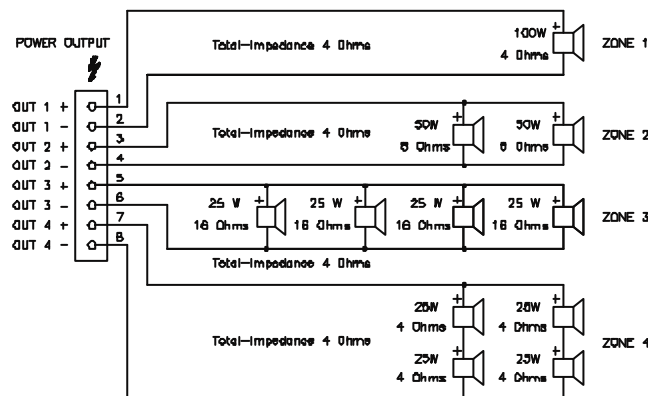


diagram 4 Connection of low-impedance loudspeaker systems

Free combination of the DPA 4411's power output voltages, including mixed 100 V and low impedance (4 ohms) operation, is possible.

5.4 POWER OUTPUT 100 V - Double Output Power

If the output power of one output of the DPA 4411 is not sufficient to feed all cabinets within a speaker network and dividing the speaker chain is not an option, it is possible to double the output power by coupling the outputs of two amplifiers. In that case the amplifier inputs have to be paralleled and the outputs are connected in series. For the connection of inputs, please refer to paragraph 4. For the connection of the loudspeaker network, refer to diagram 5.

Coupling is possible under the following restrictions: only identical amplifiers or power amps can be connected. Since doubling the output voltage comes along with serial connection, it is necessary to switch the outputs of both amplifiers to 50 V (see also paragraph 8), resulting again in an overall output voltage of 100 V. In this case the speaker chain's minimum load impedance is 50 ohms // 50 nF. The input level controls of the corresponding channels of the DPA 4411 have to be set to equal values (refer also to the PROMATRIX handbook).

This results in the following output combinations with a single DPA 4411:
4 x 100 W or 2 x 100 W + 1 x 200 W or 2 x 200 W.

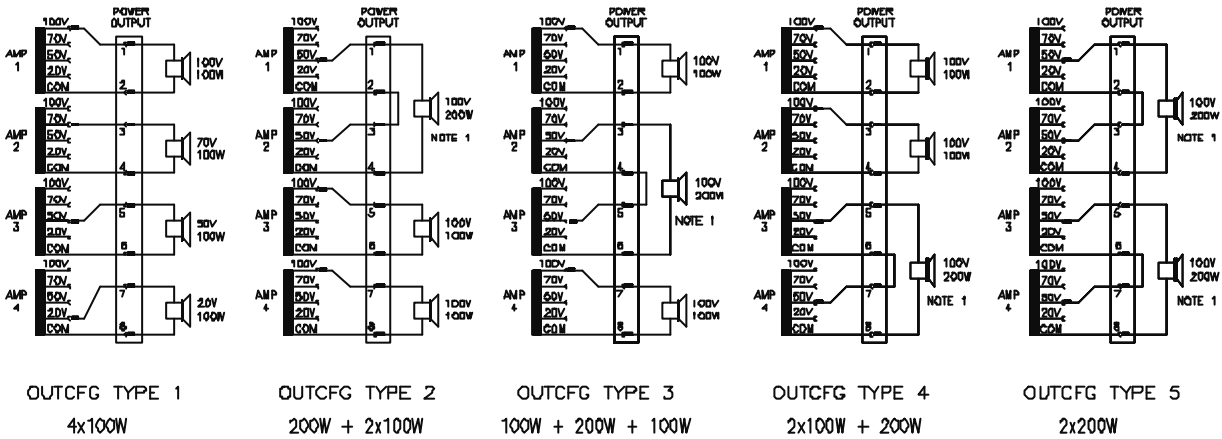


diagram 5 Possible output configuration of the DPA 4411

5.5 MONITOR output

The MONITOR output of the DPA 4411 is configured as monitor bus. It gets connected to the PROMATRIX Manager DPM 4000 via the serial port REMOTE CONTROL (13). If a floating output is needed, the output is prepared for retrofitting a monitor output transformer. In this case the extension NRS 90227 is necessary (see paragraph 9.4). The low-impedance monitor output is electronically balanced. Therefore, the connected cables may be up to approx. 200 m in length.


The PROMATRIX Manager DPM 4000 (see PROMATRIX handbook) offers connection for monitor amplifiers; which can be set to input-monitoring or output-monitoring for the desired amplifier channel.

6. Integrated Remote Module

The integrated remote module of the power amplifier DPA 4411 provides the following functions:

- input levels of INPUT 1 to INPUT 4 can be set via programmable audio level controls
- reading level values of the audio level controls
- setting level offsets 1 to 4 via virtual controllers
- mute function 1 to 4 (via level controls)

- mains operation remote control ON/OFF
- battery operation remote control ON/OFF
- monitoring and fault message transmission via the PROMATRIX Manager DPM 4000; in accordance to DIN EN 60849 standard
 - thermal overload of the mains transformer
 - thermal overload of power output stages 1 to 4
 - monitoring of the functioning of the power output stages 1 to 4 via pilot tone signal (optional, only with NRS 90206 installed)
 - ground fault detection for loudspeaker lines 1 to 4 (optional, only with NRS 90207 installed)
 - measuring of input and output level peaks 1 to 4
 - measuring of output voltages / levels of the power outputs 1 to 4
 - measuring of output currents of the power outputs 1 to 4
 - monitoring of connected loads 1 to 4 via current-voltage-measuring
 - recognition of amplifier type including user-definable name
 - reading of software revision of the remote module
 - reading of error flags
 - reading of the output configuration
 - recognition of extensions NRS 90206 and NRS 90207
- switching the input monitor / output monitor 1 to 4 to the monitor bus
- pilot tone signal ON/OFF (optional, only with NRS 90206 installed)
- ground fault error flags reset

Note  Prior to the first operation of the amplifier DPA 4411, you have to set the amplifier address using the two Hexadecimal Code switches ADDRESS (18) (refer to the PROMATRIX handbook) and using a waterproof marker pen mark the setting in the ADDRESS label field on the rear panel of the appliance.

By sending the corresponding command via the serial port REMOTE CONTROL (13) of the remote module, this function is activated from the PROMATRIX Manager DPM 4000 (see PROMATRIX handbook).

7. Indicators And Fault Notification

7.1 STANDBY Indicator

When correctly connected and with mains voltage and/or battery voltage present, the green STANDBY indicator (4) lights.

7.2 READY Indicator

The power amplifier DPA 4411 provides a power-on delay of approximately 3 s to prevent switch clicks from becoming audible. If after this period of time no faulty condition has been detected, the green READY indicator (7) lights and the mute-relays pull. When thermal overload of the mains transformer or of one of the power output stages is detected, the corresponding green READY indicator (7) will not light and the according mute-relay drops. If, with the NRS 90206 extension installed the pilot-threshold (see paragraph 9.1) is declined, the corresponding green READY indicator (7) goes out but the amplifier stays operational and a fault message gets transmitted to the PROMATRIX Manager DPM 4000.

7.3 PROTECT Indicator

In case of thermal overload of the mains transformer or of a power output stage is detected, the red PROTECT indicator (5) will light. During thermal overload of the mains transformer, all mute-relays drop while during thermal overload of a power output stage, only the according mute-relay drops. After the mains transformer or the power amplifier have regained their normal temperature, the red PROTECT indicator (5) automatically goes out and the appliance recovers normal operation mode. The faulty condition could have been caused by either overload, too high environmental temperature, or by an error in the ventilation system. A fault-message is transmitted to the PROMATRIX Manager DPM 4000.


7.4 GROUND FAULT Indicator

If, with built-in NRS 90207 a ground fault condition at one of the power outputs occurs, the corresponding red GROUND FAULT indicator (6) lights and a fault-message is transmitted to the PROMATRIX Manager DPM 4000. The power amplifier keeps up normal operation during the occurrence of this fault-type. After solving the problem, the GROUND FAULT indicator (6) can be reset by pressing the TEST button (3) or by sending the corresponding command via the serial port of the PROMATRIX Manager DPM 4000 (see PROMATRIX handbook) (see paragraph 9.2).

7.5 Meter Instruments And CLIP Indicators

The green LED-indicator -13 dB and 0 dB (1) as well as the red LED-indicator CLIP (2) allow the precise monitoring of output levels, providing the possibility to securely prevent distortion and clipping that could lead to damaging the connected loudspeaker systems.

- When during program peaks the red CLIP-LED (2) lights briefly, the maximum distortion-free output is gained.
- Whenever the CLIP-LED (2) lights continuously, the amplifier is driven into overdrive and the input level should be reduced.
- Overload or short-circuit at the output is the cause for the green LED-indicator (1) to be out or only briefly lit while at the same time the red CLIP-LED (2) blinks. In that case, please check the impedance of the connected load.


Caution  During normal operation, the red CLIP-LED (2) should hardly light and if, than only very briefly !

7.6 STATUS Indicator

The yellow STATUS-LED (14) that is located on the rear of the appliance lights briefly during normal operation when the DPM 4000 addresses a query to the amplifier. For further information, please refer to the PROMATRIX handbook.

8. Switching The Output Voltage (refer to qualified service personnel only!)

The DPA 4411 offers output voltages of either 20 V, 50 V, 70 V or 100 V. The output voltage is factory-preset to 100 V. Switching the output voltage to 20 V, 50 V or 70 V should only be carried out by qualified DYNACORD service personnel.

Caution  Unplug the mains cord and disconnect batteries before opening the appliance!

- for opening the appliance, please remove the 9 screws on the top of the appliance that lock the cover plate.
- the four output transformers 356762 are located on the left hand side of the appliance. They are numbered 1, 2, 3, and 4; starting from the rear cover plate of the appliance.
- for changing the output voltage (see diagram 6) you have to unsolder the orange wire attached to the transformer's soldering tab 19 (100 V) and solder it instead to the required soldering tab (70 V, 50 V or 20 V).
- closing the appliance: use the 9 screws M3 x 6 DIN 7500 to reattach the cover plate.

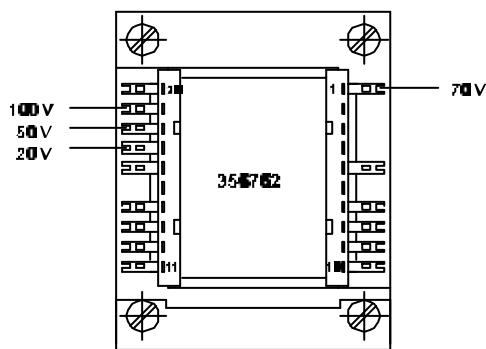


diagram 6 Switching the output voltage at the output transformers 356762

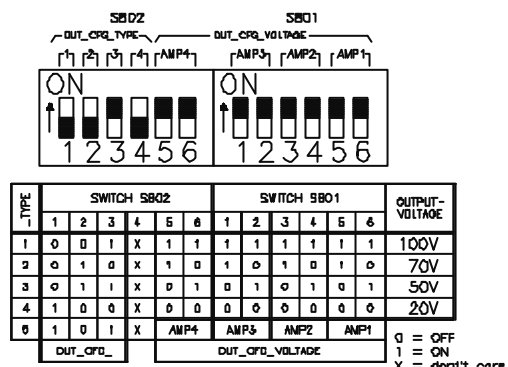


diagram 7 Output configuration settings of the amplifiers (rear view)

Note

After changing the output voltage, use a waterproof marker pen to note the correct, newly set value on the label-field OUTPUT VOLTAGE (20) on the rear of the appliance. Additionally note the corresponding output configuration (see diagram 5) on the label OUT CONFIG TYPE (20). According to the description in diagram 7, adjust the switches S801 and S802 on the printed board assembly 89019.2 that are located next to the transformers on the bottom of the appliance's enclosure (refer also to paragraph 5.4).

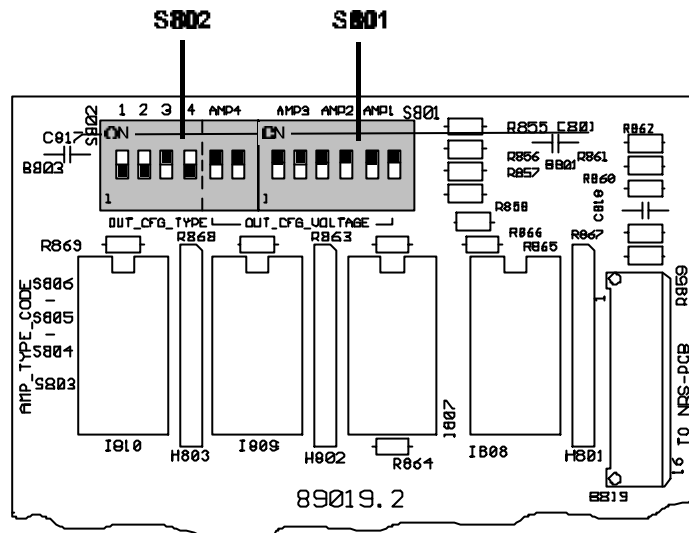


diagram 8 Printed board assembly 89019.2 showing the position of the switches S801 and S802

9. Additional Functions And Features (refer to qualified service personnel only!)

9.1 NRS 90206 Pilot Ton Surveillance

Using the extension-kit NRS 90206 provides continuous monitoring (surveillance) of the individual amplifier channels. This is achieved by sending an ultra low-level 19 kHz pilot tone through the device. It enters the signal path post level controls, runs through the amplification stages and gets filtered out and evaluated at the output. In case the result of this evaluation shows that the pilot dropped beneath a defined threshold or is missing at all, the corresponding READY indicator AMP 1 - 4 (7) goes out but the power amplifier upholds its normal operation. A fault-message is transmitted to the PROMATRIX Manager DPM 4000 (see PROMATRIX handbook). The extension-kit NRS 90206 comes as a plug-in board assembly and consists of a 19 kHz tone-generator and four selective 19 kHz receivers with evaluation stage.

Caution Unplug the mains cord and disconnect batteries before opening the appliance!

9.1.1 To Install The NRS 90206 Proceed As Follows (see diagram 9):

- for opening the appliance, please remove the 9 screws on the top of the appliance that lock the cover plate.
- the NRS 90206 gets retrofitted on the printed board assembly 89019.1, which is located behind the input printed board assembly 81331, in the front area, attached to the left side panel of the amplifier (in front view).
- Be sure to first insert the included board-guides before installing the printed board assembly, assuring the correct position of their guide grooves. The release lever of the guides marked "A" points to the top, while the one of the guides marked "B" points downwards.
- the NRS 90206 extension-kit needs to be inserted with its printed side pointing to the top, until it firmly locks in place. Make sure that the power resistors R917 to R920 that are located underneath the NRS-printed board assembly do not touch this board.
- closing the appliance: use the 9 screws M3 x 6 DIN 7500 to reattach the cover plate.

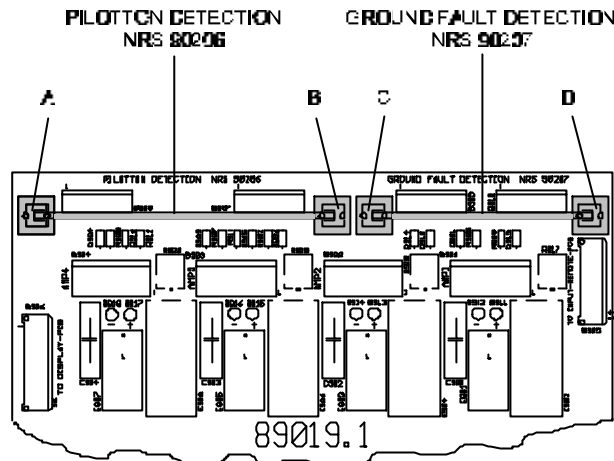


diagram 9 Printed board assembly 89019.1 showing the position of the modules NRS 90206 and NRS 90207

9.1.2 Checking The Function Of The NRS 90206:


With built-in NRS 90206 and powered-on amplifier, the READY-indicators (7) have to light. Use the check and reset-button TEST (3) to check the functioning of the pilot tone surveillance. When holding the TEST-button pressed, the 19 kHz tone-generator is switched off, the READY-indicators (7) go out and a fault-message is being transmitted to the PROMATRIX Manager DPM 4000 (see PROMATRIX hand-book). Approximately 3 seconds after releasing the TEST-button, the READY-indicators (7) have to light again.

9.2 NRS 90207 Ground Fault Surveillance

The VDE regulation DIN VDE 0800 has to be obeyed when planning and operating 100 V sound reinforcement systems. Especially 100 V alert systems have to be in accordance with all protection measures for class 3 appliances.

We recommend the use of the ground fault surveillance module NRS 90207 for floating speaker network installations, offering surveillance of the network insulation. Error registration: A ground fault message signals that a damaged cable has been detected – possibly resulting in an upcoming cable interruption – or a wrongly connected cable, possibly resulting in malfunctioning. The information “ground fault” is memorized as long as the amplifier is powered on or a loaded battery is connected, even for short-term (> 5 s) ground faults. The fault-message is transmitted to the PROMATRIX Manager DPM 4000 (see PROMATRIX handbook).

The NRS 90207 extension comes as a plug-in printed board assembly and consists of a monitoring circuit with error-storage and display-driver for four 100 V outputs.

Caution  Unplug the mains cord and disconnect batteries before opening the appliance!

9.2.1 To Install The NRS 90207 Proceed As Follows (see diagram 9):

- for opening the appliance, please remove the 9 screws on the top of the appliance that lock the cover plate.
- the NRS 90207 gets retrofitted on the printed board assembly 89019.1, which is located behind the input printed board assembly 81331, in the front area, attached to the left side panel of the amplifier (in front view).
- Be sure to first insert the included board-guides before installing the NRS 90207, assuring the correct position of their guide grooves. The release lever of the guides marked “C” points to the top, while the one of the guides marked “D” points downwards.
- the NRS 90207 extension-kit needs to be inserted with its printed side pointing to the top, until it firmly locks in place. Make sure that the power resistors R917 to R920 that are located underneath the NRS-printed board assembly do not touch this board.
- closing the appliance: use the 9 screws M3 x 6 DIN 7500 to reattach the cover plate.

9.2.2 Checking The Function Of The NRS 90207:

With built-in NRS 90207 and powered-on amplifier, the READY-indicators (7) have to light. When using an external switch to shortcut one pole of the 100 V speaker network via a 47 k ohms resistor and the safety earthing conductor for approximately 5 seconds, the corresponding GROUND FAULT indicator (6) has to light. The fault-message is transmitted to the PROMATRIX Manager DPM 4000 (see PROMATRIX handbook). After releasing the external switch, indication and message have to stay present. Use the TEST-button (3) to reset the ground fault surveillance function.

9.3 NRS 90208 Input Transformer For Floating, Balanced Inputs

In case floating inputs are needed, the inputs of the DPA 4411 are prepared for retrofitting input transformers; a separate NRS 90208 extension-kit is needed per input.

Note

If a switch-contact is located between the control amplifier output and the power amplifier input, switch clicks might become audible during switching. If this is the case, incorporating input transformers can solve the problem.

Caution

Unplug the mains cord and disconnect batteries before opening the appliance!

9.3.1 Retrofitting The NRS 90208 On The Printed Board Assembly 81331:

- **for opening the appliance**, please remove the 9 screws on the top of the appliance that lock the cover plate
- **detach the rear panel** by removing the screws marked “A” to “D” (refer to the picture of the rear panel on page 21).
- **remove the input printed board assembly 81331:** (see diagram 10)
remove the 8 screws marked “D” that tighten the input sockets and detach the 6 flat cables CN1 to CN6. For removing the printed board assembly 81331 you have to unscrew the two screws on the side panel
- before installing the **input transformer**, make sure to unsolder the resistors for T1: R1/R5, for T2: R9/R13, for T3: R17/R21, for T4: R25/R29 and clean the corresponding eyelets
- place the input transformer onto the printed board assembly 81331, so that the markings on the board and on the bottom part of the transformer are aligned. As a protection against short-circuit, place the supplied **insulating disk** between the printed board and the transformer
- before re-installing the printed board assembly 81331, reconnect the flat cables CN1 to CN6. Keep in mind that the plug of the cable leading to CN1 (AMP1+2) is marked. Now, reconnect the printed board assembly 81331 to the amplifier’s side panel, using two screws M3 x 12
- **installation of the rear panel:**
first, connect the POWER OUTPUT printed board assembly to the rear panel, using two screws marked “C”. Make sure not to squeeze any wires. Now, you can slide the rear panel underneath the four lock-fish-plates of the input sockets. In doing so, mind that the acknowledge button of the ROUTING switches need to be pulled through the corresponding openings
input sockets are tightened with two screws marked “D”, each
the power supply printed board assembly 85272 gets tightened using two screws marked “C”; mind the acknowledge button of the CIRCUIT ⊥ TO CHASSIS SWITCH.
tighten the Remote Control printed board assembly with two screws marked “C”; mind the **yellow STATUS-LED**
tighten the mains-input printed board assembly 86243 using three screws marked “C”; tighten the mains connector (10) and the mains selector switch (12) with individual screws and **self-securing nuts M3**
reinstall the rear panel using 6 screws marked “A”
tighten the heat sink using four screws marked “B”
- **closing the appliance:** reconnect the cover-plate using 9 screws M3 x 6 DIN 7500

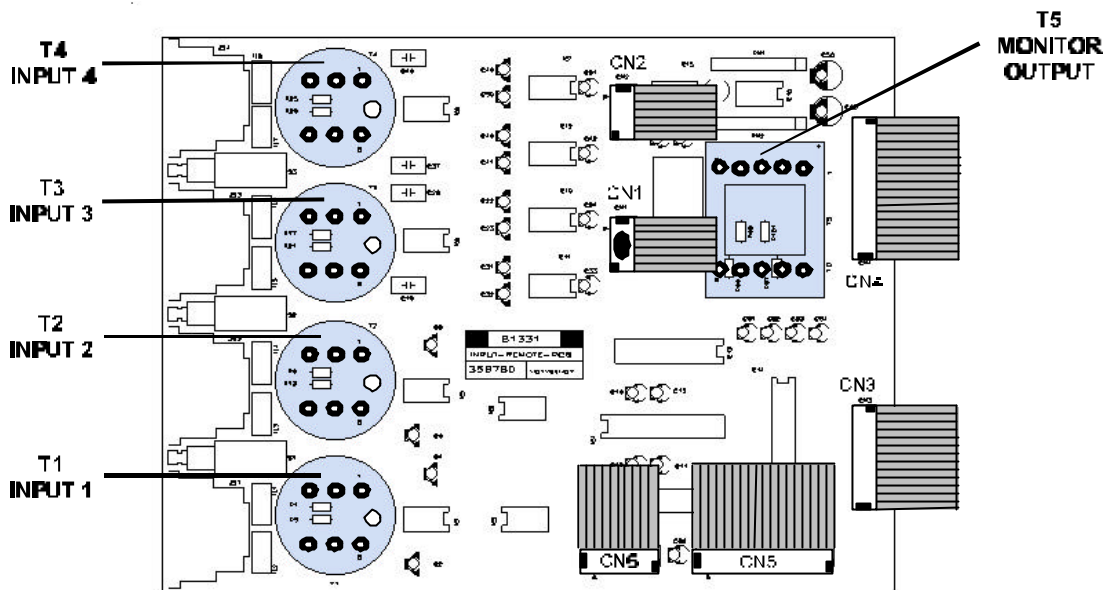


diagram 10 Printed board assembly 81331 showing the position of the input transformers NRS 90208

9.4 Monitor Output Transformer NRS 90227 Offering A Floating, Balanced MONITOR Output

In case a floating MONITOR output is needed, the monitor amplifier' output is prepared for retrofitting an output transformer. Herefore, you will need the extension kit NRS 90227.

Caution ⚡ Unplug the mains cord and disconnect batteries before opening the appliance!

9.4.1 To Install The NRS 90227 Proceed As Follows: (see diagram 10)

- **for opening the appliance**, please remove the 9 screws on the top of the appliance that lock the cover plate.
- de-install the input printed board assembly 81331 following the description in the paragraph 9.3.1.
- disconnect the resistors R95, R96, R97 and R101 before installing the monitor output transformer.
- mount the monitor output transformer on the printed board assembly 81331; in doing so, polarity is of no importance, since the transformer is balanced.
- reinstall the input printed board assembly 81331 following the description in paragraph 9.3.1.
- **closing the appliance**: use the 9 screws M3 x 6 DIN 7500 to reattach the cover plate.

10. 19"-Flightcase Or 19"-Rack System Installation

Caution ⚡ Operating the DPA 4411 without cover-plate is not admissible.

When incorporating the DPA 4411 into a 19" flightcase or 19" rack system, make sure to leave room for sufficient air-flow. Between the amplifier's rear plate and the inside-wall of the surrounding enclosure has to be at least 60 mm x 330 mm of space until up to the enclosures top or its ventilation gaps. At least 100 mm of space should be left above a rack system to guarantee sufficient air circulation. Since, during the operation of the DPA 4411 the environmental temperature within the rack closet may increase by about 10° C, minding the maximum allowable temperature values for other equipment that is installed into the same rack system or enclosure is of major importance.

Note ⚠ For trouble-free operation of the appliance, the maximum environmental temperature of +40 °C is not to be exceeded.


11. Ground Lift Switch CIRCUIT ⊥ TO CHASSIS SWITCH

Using the ground lift switch CIRCUIT ⊥ TO CHASSIS SWITCH (22) lets you separate the audio signal ground from the enclosure ground (safety earthing). This helps to solve problems with hum or noise without jeopardizing safety standards. If several units with ground lift switch are installed in a common enclosure or rack system, it is recommended to set the ground lift switches of all devices but one to “ungrounded”. Set to “ungrounded”, the impedance between signal ground and enclosure is: 100 k ohms // 100 nF. It is necessary to maintain the immunity from EMV.

12. Fuses

Location	Pos.	Used for	Value	Dimensions	Standard
Fuse switch (11)	F601	Mains fuse 230 V~ AC	T4AL 250V	5 x 20 mm	IEC 127
Fuse switch (11)	F601	Mains fuse 115 V~ AC	T8AH 250V	5 x 20 mm	IEC 127
Board 86243	F602	Mains fuse AC	T1AL 250V	8.5 x 8.45 mm	IEC 127
Board 85272	F502	Battery fuse 24 V DC	25AL 32V	Flat type fuse	DIN 72581-3
Board 85272	F503	Battery fuse 24 V DC	25AL 32V	Flat type fuse	DIN 72581-3
Board 85272	F504	Power-AMP 1	T6.3AL 250V	5 x 20 mm	IEC 127
Board 85272	F505	Power-AMP 2	T6.3AL 250V	5 x 20 mm	IEC 127
Board 85272	F506	Power-AMP 3	T6.3AL 250V	5 x 20 mm	IEC 127
Board 85272	F507	Power-AMP 4	T6.3AL 250V	5 x 20 mm	IEC 127

Changing The Fuses F502 And F503 (see diagram 11):

Caution  Unplug the mains cord and disconnect batteries before opening the appliance!

The battery fuses F 502 and F503 are located on the mains (power supply) printed board assembly 85272 behind the AMP-battery connectors. In case they need to be replaced, commence as follows:

- open the appliance by removing the 9 screws that lock the cover-plate
- remove the mains input printed board assembly 86243 that is located at the rear inner wall.
Therefore, unplug the yellow/green ground conductor from the corresponding connector at the rear inner wall. To remove the AMP-plug, press its lock-piece
- now, you have to remove the 3 screws of the mains-input printed board assembly 86243 marked “C” (refer to the picture of the rear panel on page 21).
- disconnect the 6-pole flat cable between the two relays on the mains-input printed board assembly 86243 that is connected to the male multi-point connector B602
- now, the hinged mains-input printed board assembly 86243 can be turned up. In doing so, be careful not to damage any wiring or other parts
- the fuses F502 and F503 are now easy to get to and can be removed to the top
- for re-installing the mains-input printed board assembly 86243, proceed in opposite order:
tighten the mains-input printed board assembly 86243 with the 3 screws marked “C”, where each, the mains plug (10) and the mains selector switch (12) need to be connected using individual screws and self-securing nuts M3.
- reconnect the 6-pole flat cable to the multi-point connector B602
- reconnect the yellow/green ground cord to the ground connector on the rear panel; make sure that it sits tight
- closing the appliance: reattach the cover-plate with 9 screws M3 x 6 DIN 7500

Caution



For safety reasons make sure that after reassembling, wires running underneath the mains-input printed board assembly 86243 are run with a minimum distance of at least 6 mm.

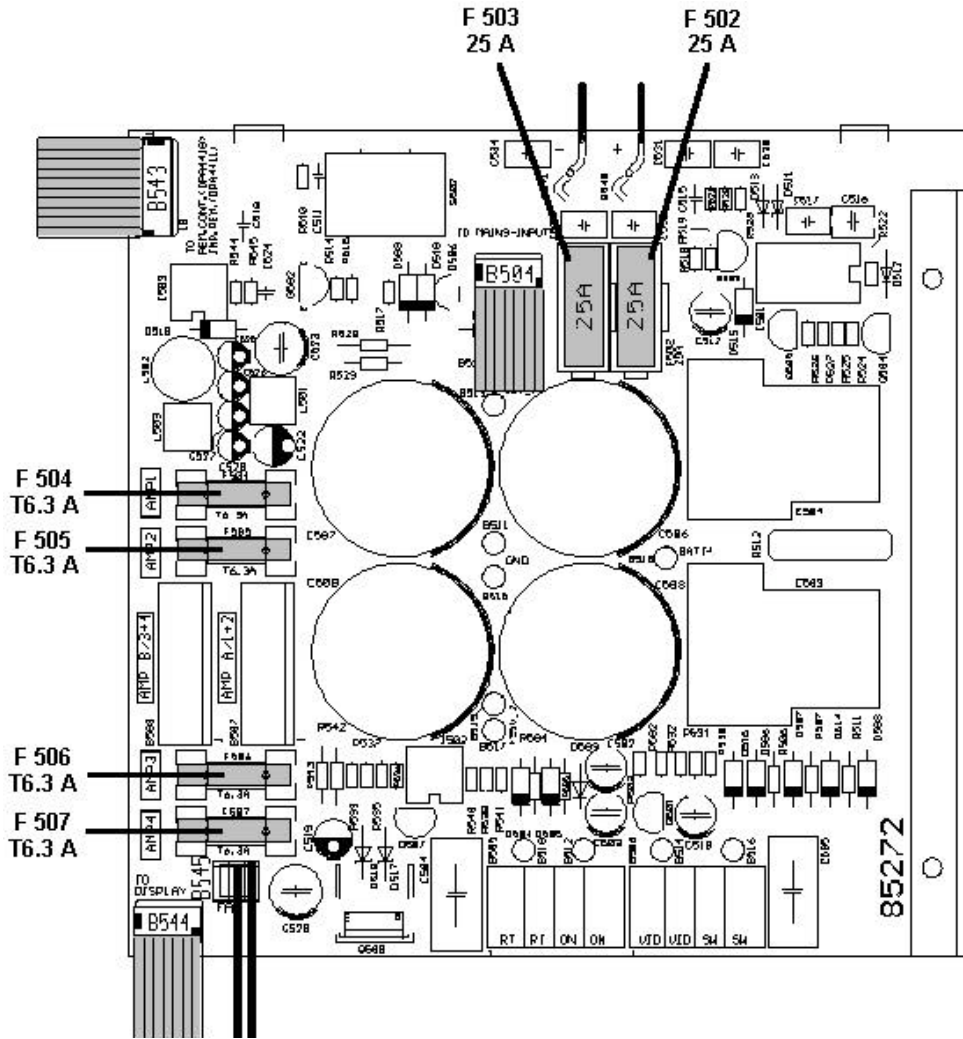


diagram 11

Printed board assembly 85272 showing the position of the DC-fuses F502 to F507

13. DPA 4411 Specifications

Power supply on mains operation:

operation voltage 115 V / 230 V~ AC, ±10 %
 mains frequency range 50 - 60 Hz
 safety class I

mains operation	U _{mains} [V]	I _{mains} [A]	P _{mains} [VA]	P _{mains} [W]	P _{out} [W]	P _v [W]
Standby	230	0,016	3,7	1,5	0	1,5
Idling	230	0,29	67	40	0	40
Normal operation (-10 dB)	230	1,64	377	275	40	235
Alarm (-3 dB)	230	3,25	748	585	200	385
Nominal conditions	230	4,39	1010	815	400	415
mains initial current inrush	< 36 A					

mains operation	U _{mains} [V]	I _{mains} [A]	P _{mains} [VA]	P _{mains} [W]	P _{out} [W]	P _v [W]
Standby	115	0,30	3,5	1,5	0	1,5
Idling	115	0,50	58	40	0	40
Normal operation (-10 dB)	115	3,28	377	275	40	235
Alarm (-3 dB)	115	6,50	748	585	200	385
Nominal conditions	115	8,78	1010	815	400	415
mains initial current inrush	< 20 A					

P_{mains}[VA] =apparent power U_{mains}*I_{mains}, P_{mains}[W] =true power, P_{out}[W] =output power, P_v[W] =leakage power

Power supply on battery operation:

operation voltage 24 V DC, -10/+30 %

battery operation	U _B [V]	I _B [A]	P _i [VA]	P _{out} [W]	P _v [W]
Standby	24	0,06	1,5	0	1,5
Idling	24	1,1	26	0	26
Normal operation (-10 dB)	24	7,5	180	40	140
Nominal conditions	24	18	432	250	182
battery initial current inrush	< 3,9 A				

P_i[W] = input power U_B*I_B, P_{out} [W] = output power, P_v [W] = leakage power

input characteristics:

nominal input level

electronically balanced

775 mV = 0 dBu / 10 k ohms

power output characteristics:

balanced, floating

nominal output power with mains supply

4 x 100 W (according to IEC 268-3)

nominal output voltage

with mains supply

100 V (70 V / 50 V / 20 V)

with battery supply at 24 V DC

79 V (56 V / 40 V / 16 V)

nominal load impedance

100 ohms (50 / 25 / 4 ohms)

minimal allowable output impedance:

100 W output power		200 W output power	
100 V output	100 Ohm // 250 nF	50 V + 50 V output	50 Ohm // 500 nF
70 V output	50 Ohm // 500 nF	_____	_____
50 V output	25 Ohm // 1000 nF	_____	_____
20 V output	4 Ohm // 6250 nF	_____	_____

noise voltage (A-weighted)

≤ -56 dBu

THD at P_A NOMINAL

≤ 1 %

amplification frequency response

60 Hz .. 20 kHz

distortion-limited response ($P_{A \text{ NOMINAL}} -3\text{dB}$, $k_{\Sigma} = 1 \%$)	60 Hz .. 5 kHz
crosstalk between two channels	$\geq 80\text{dB}$ at 1 kHz / $\geq 60\text{dB}$ at 10 kHz
MONITOR output characteristics:	electronically balanced
nominal output voltage	2 V = + 8.2 dBu
nominal load impedance	600 ohms
amplification frequency response	60 Hz .. 20 kHz
environmental temperature	+5 °C .. +40 °C
technical regulations:	
This appliance is in accordance to the following regulations	EN 55103-1, EN 55103-2, EN 55022 EN 60065, EN 60555
dimensions (W x H x D)	19" (483 mm) x 3HU (132 mm) x 345 mm
installation depth without external connectors	340 mm
installation depth incl. external connectors	max. 400 mm
weight	22.5 kg
color	anthracite

Extension kits for the DPA 4411:

NRS 90206 pilot tone surveillance (for four amplifiers)	Order No. 121 639
NRS 90207 ground fault surveillance (for four outputs)	Order No. 121 640
NRS 90208 input transformer (per single input)	Order No. 121 641
NRS 90227 monitor output transformer	Order No. 121 679

14. Specifications For DPA 4411 Accessories

14.1 NRS 90206 pilot tone surveillance (for four amplifiers)

pilot frequency	19 kHz $\pm 1\%$
fault recognition threshold	$\leq 12 \text{ mV}$
fault message output	separate for each output; via PROMATRIX Manager DPM 4000

14.2 NRS 90207 ground fault surveillance (for four outputs)

input	loudspeaker line 20 V / 50V / 70V / 100V
fault message output	separate for each output; via PROMATRIX Manager DPM 4000
voltage strength	1000 Veff
fault recognition threshold	$\leq 50 \text{ k ohms}$

14.3 NRS 90208 input transformer (per single input)

transmission range	20 Hz .. 20 kHz
input impedance	$\geq 10 \text{ k ohms}$
idling ratio	1:1
primary winding resistance	1420 ohms at 20°C
secondary winding resistance	1420 ohms at 20°C

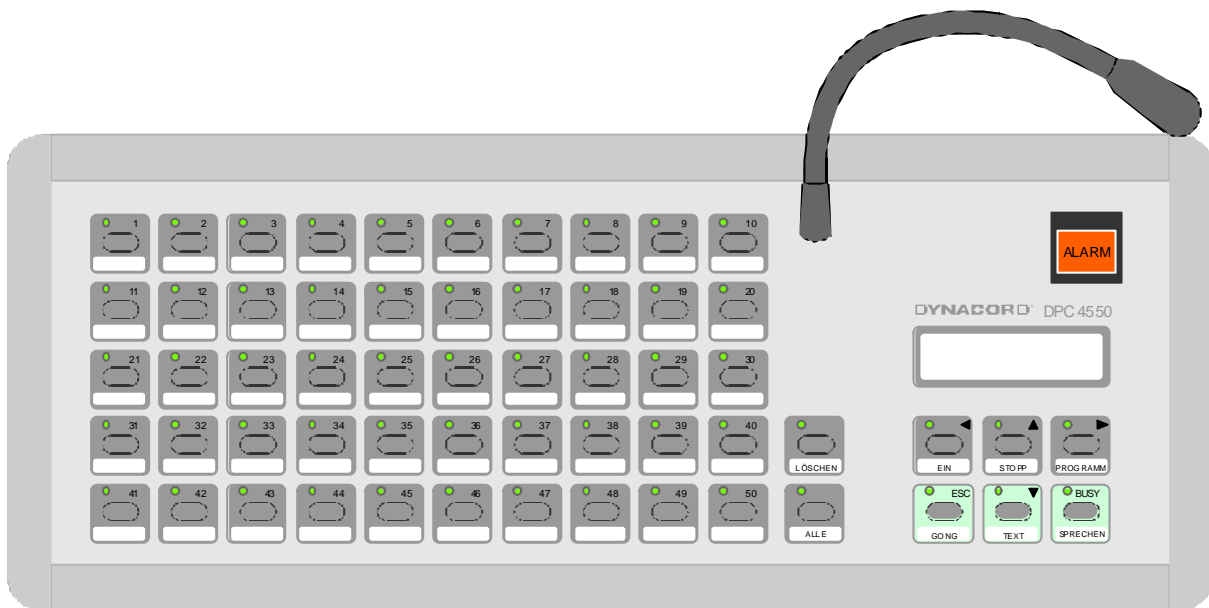
14.4 NRS 90227 monitor output transformer

transmission range	40 Hz .. 20 kHz
nominal load impedance	$\geq 600 \text{ ohms}$
idling ratio	1:1
primary winding resistance	18 ohms at 20°C
secondary winding resistance	18 ohms at 20°C



OWNER'S MANUAL

PROMATRIX paging stations DPC 4000



PRO|MATRIX® SYSTEM

CONTENTS

CONTENTS	18
SYSTEM OVERVIEW	20
PAGING STATION FUNCTIONS	21
CONTROL PANEL DPC 4550	22
CONNECTIONS	24
KEY LABELING	24
OPERATION	25
Selective Call	25
Collective Call	25
Direct Call	25
Gong Signal	25
Text Message	26
General Alarm	26
Selective Alarm	26
Canceling Signals	26
System ON / OFF	27
Program Routing	27
Special Functions	27
INDICATORS	28
PRIORITIES	29
DPC 4350 PAGING STATION EXTENSION	29
FACTORY SETTINGS	30
SPECIFICATIONS	31
WARRANTY	48

System Overview

The PROMATRIX system includes 5 different paging station models and one paging station extension of the DPC 4000 - series. All paging stations employ gooseneck-microphones, 6 or respectively 8 function keys, and a covered alarm key. An additional key as well as a key-lock switch can be retrofitted. All paging stations are available with 10, 20, 30, or 50 selection keys. All models come with LC-display (2 lines with 16 characters each).

The individual models are listed in the following table:

DPC 4106	6 function keys
DPC 4510	8 function keys + 10 selection keys + alarm key
DPC 4520	8 function keys + 20 selection keys + alarm key
DPC 4530	8 function keys + 30 selection keys + alarm key
DPC 4550	8 function keys + 50 selection keys + alarm key
DPC 4350	paging station extension with 50 selection keys

The paging stations employ the following common features:

- all functions are processor-controlled
- non-volatile configuration data FLASH-memory
- condenser microphone incl. pre-amplifier and compressor / limiter
- freely programmable key-assignment
- easy labeling the keys via label-strips and MS WORD templates
- monitoring of the analog circuitry via integrated pilot-tone oscillator
- monitoring of the processor system via watchdog-circuit
- line-monitoring via pilot-tone and polling
- covered alarm key (except at the DPC 4106)
- prepared for retrofitting additional alarm keys or key-lock switches
- prepared for the connection of an external PTT-type microphone or audio signal source
- piezo-humming device for acoustic alerts
- prepared for the installation of an optionally available loudspeaker
- set-up mode allows altering parameter settings directly at the paging station
- two-line LC-display

All paging stations are processor-controlled and provide several monitoring functions. The integrated watchdog-circuitry monitors the processor system while the audio section is guarded by the signal of a switchable pilot tone oscillator. Additionally, the internal supply voltage is constantly measured. Once it drops below a critical threshold, a warning signal is being transmitted. Line-monitoring for the audio-cabling as well as for all RS-485 control-lines allows the early recognition and signaling of line-interrupts and short-circuits.

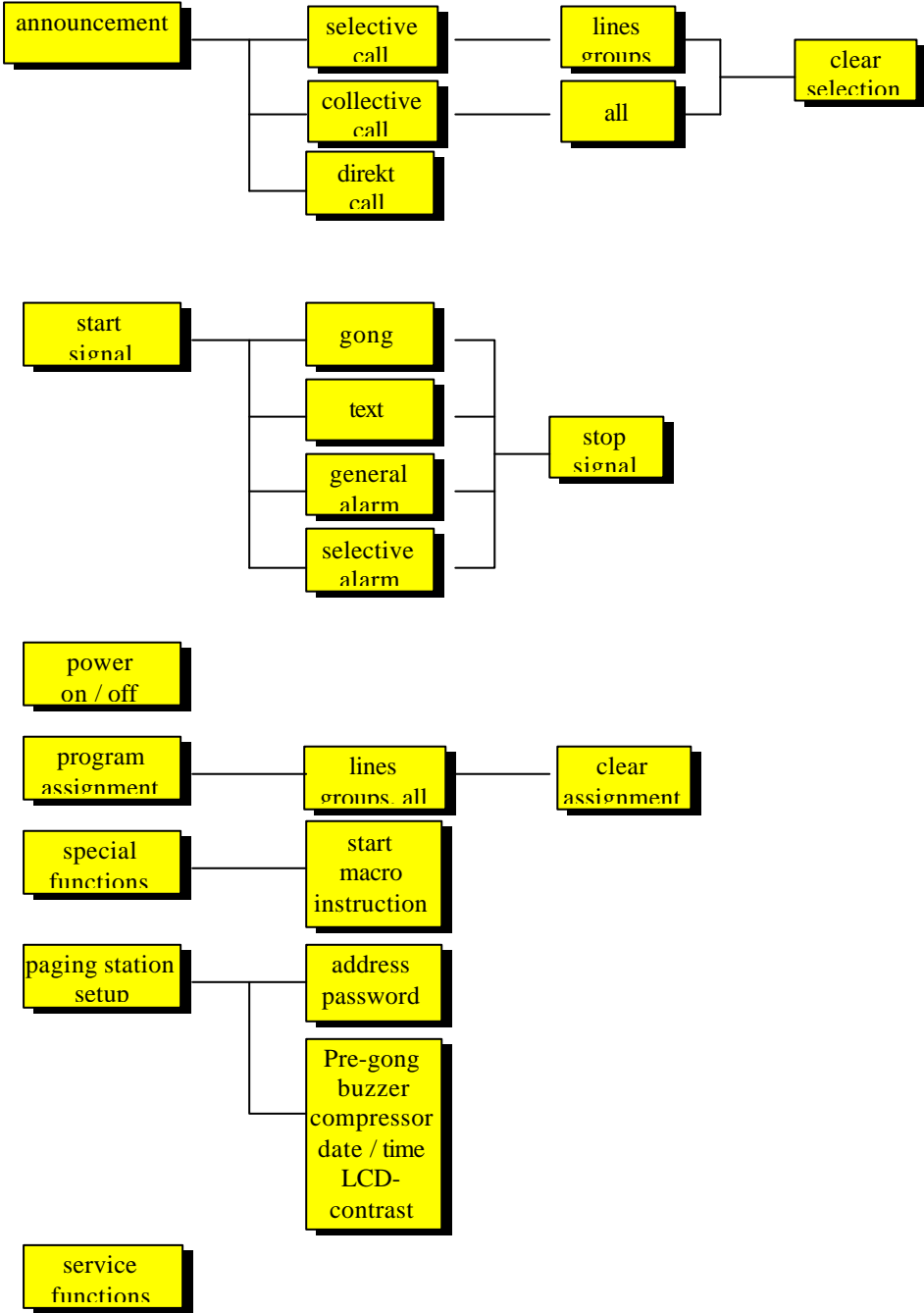
Easy and comfortable configuration of the paging stations is accomplished through the use of the PROMATRIX Designer software. The graphical, dialog-oriented user-interface allows setting all key-functions, priorities, options, and several other parameters.

Note:	Up to four paging stations can be connected to a single input of the central unit. However, it is important to keep the fact in mind that in case of line interruption or short-circuit several microphone terminals can fail at the same time. Despite, inputs allow only launching one message at a time. All other connected paging stations are presented with a busy-message. If these restrictions are not acceptable, every microphone terminal - or at least all directing stations and other important paging stations - should have their own input at the central unit.
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Paging Station Functions

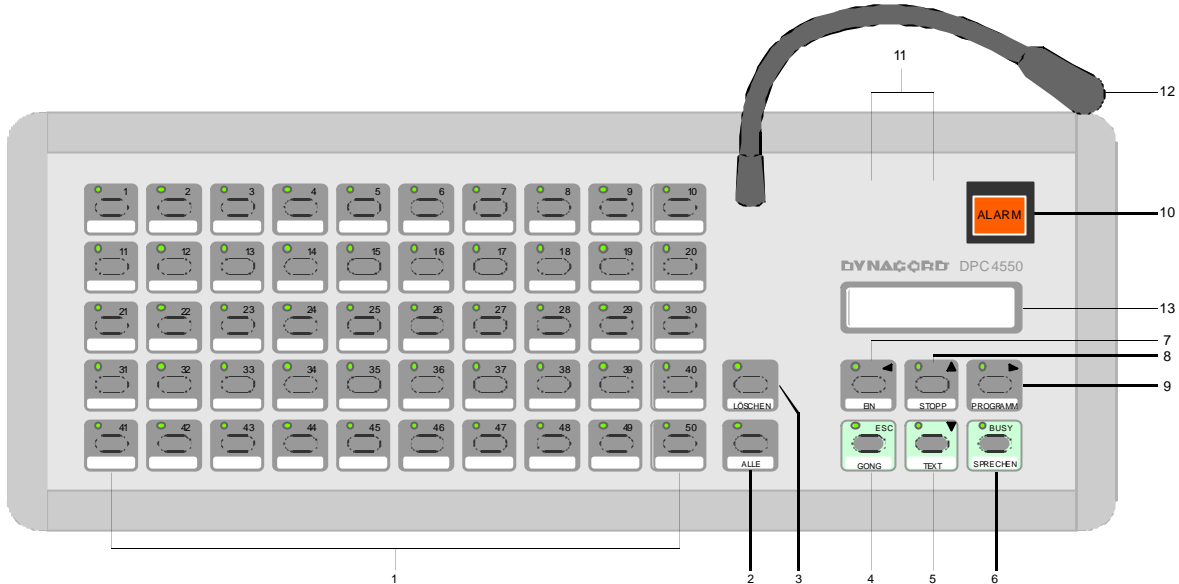
Next to elementary messaging, the paging stations offer several additional functions that in summation are shown in the following diagram. Which functions a microphone terminal can initiate depend on its configuration and priority setting.

Table of all functions



Detailed information concerning the different functions is provided within the following chapters.

Control Panel DPC 4550



1 Selection Keys with LED's

Depending on the individual paging station model, 10, 20, 30, or 50 selection keys with corresponding LED's are provided. The selection keys are used to pre-select areas or groups for the reproduction of messages, gong or alarm signals, vocal messages, or to assign programs (first press = ON, subsequent press = OFF). The LED's indicate the momentary selection status (also refer to the paragraph "indications"). It is also possible to assign special functions or no function at all (no function assigned) to the selection keys. Assigning functions is performed during the configuration procedure via PC.

Note: When shipped, these keys are factory pre-set as area selection keys, where key 1 - area 1, key 2 - area 2, ..., key n - area n.

2 ALL-key with LED

This key allows the selection of all programmed areas at once for the transmission of messages, gong or alarm signals, vocal messages, or to assign programs. One time pressing selects all areas; the corresponding LED's and the ALL-LED are lit. Subsequent pressing cancels the selection.

3 CANCEL-key

This key has different functions, depending on the operation or mode, e.g. canceling the call-pattern or canceling a program assignment. Which function is carried out at times is explained in detail in the paragraph OPERATION.

4 GONG-key (ESC) with LED

Pressing this key starts a gong signal, which is being transmitted into pre-selected areas or groups. The GONG-LED is lit or blinks during the transmission of a gong signal. What kind of chime signal is being transmitted is defined during the configuration procedure. Pressing the STOP-key cancels the reproduction of the gong signal.

While being in set-up mode, this key is used to return to 'normal' user mode (ESCAPE = leaving the set-up mode).

5 TEXT-key (Ū) with LED

Pressing this key starts a prerecorded message (optional voice reproduction) which is transmitted into the pre-selected areas or groups. The TEXT-LED is lit or blinks during the transmission of a prerecorded message. The desired text message sequence is selected during the configuration procedure. Pressing the STOP-key cancels the text message reproduction.

While being in set-up mode, pressing the TEXT-key decreases the selected parameter value (parameter entry).

6 TALK-button with BUSY-LED

This key activates a message for pre-selected areas or groups. While a message is being transmitted, the BUSY-LED is lit. The TALK-button has to be pressed until the end of a message. The BUSY-LED blinks when one or several areas are busy or when an event with higher priority setting interrupts the outgoing message (see paragraph indications). In the latter case, it is necessary to repeat the message.

7 ON-key (<) with LED

This key turns the system's power on or off. Turning the power on can take several seconds. The ON-LED blinks while the system boots. The ON-LED lights steadily when the system is operational. To prevent inadvertent erroneous operation, it is necessary to press the key for at least 1 second when turning the power off. It is also possible to 'block' the operation of the ON-key during the configuration procedure.

In set-up mode this key is used to select the previous parameter (parameter selection).

8 STOP-key (Ū)

Pressing the STOP-key cancels an outgoing alarm, gong signal, or text message. An alarm signal can also be terminated by subsequently pressing the ALARM-key. Only events that were triggered from a specific paging station can be stopped from the exact terminal with the exception of the directing station. This console allows canceling all signals.

While being in set-up mode, this key increases the selected parameter value (parameter entry).

9 PROGRAM-key (>) with LED

Pressing the PROGRAM-key selects the program assign mode. The selection keys are used in this mode to assign a program (background music) to the desired areas or groups. The PROGRAM-LED light when being in program assign mode. In this case the selection-LED's indicates in which areas / groups the program is being transmitted.

Keeping this key pressed and simultaneously pressing the STOP-key selects the set-up mode and the PROGRAM-LED starts blinking. Now you can alter preferences or make other changes as described in chapter 6.2.7 *Paging Station Configuration in set-up mode*.

When in set-up mode, this key is used to select the following parameter (parameter selection).

10 ALARM-key with indicator

Pressing the ALARM-key starts an alarm signal that is transmitted into all areas. The alarm indicator lights as soon as the alarm is being launched. Pressing the STOP-key or subsequently pressing the ALARM-key terminates the alarm signal. What kind of alarm signal is being transmitted is pre-defined during the configuration procedure of the PROMATRIX system.

11 Optional key-slots

These slots allow retrofitting an additional covered key and a key-lock switch. The front panel is already prepared for the installation of two 18 mm pushbuttons / switches. You only have to cut suitable holes into the front panel cover-foil. Internal fittings are also already prepared. The newly installed switches' functions are assigned during the configuration procedure via PC, e. g.: second alarm-pushbutton for transmitting alarm signals into specific areas (selective alarm), or assigning the system ON / OFF function to the key-lock switch.

Detailed information and installation instructions are provided in the PROMATRIX user manual.

12 Microphone

By pressing the TALK-button and after the BUSY-LED lights, the integrated gooseneck microphone allows making announcements in pre-selected areas or groups. The optimum distance from the microphone is approximately 8 to 12 inches. The microphone pre-amplifier embodies a limiter to control signal peaks and protect the system against overdrive.

A second microphone with TALK-button can be connected to the extension socket (EXT). Assigning the function (area, group) of the external microphone is performed during the configuration via PC.

13 Display

Depending on the system's actual operational status, the LCD display with 2 lines and 16 characters, each provides information on time, operation mode, user notes, setting up, fault messages including precise device / module specification, etc.

Connections

1 LAN-socket

This is the connection interface for the DPC 4000 Series paging stations to the PROMATRIX system. The 8-pole RJ-45 connector provides power supply, control interface RS-485 and audio connections. The microphone terminal has to be connected to a corresponding wall outlet using the supplied connection cord (3 m).

2 EXT-socket

This socket is mostly used for connecting a DPC4350 paging station extension. Use the supplied network cable (0.5 m) to connect the DPC4350 to the microphone terminal's EXT-socket.

Additionally, when no paging station extension is connected, it is possible to utilize the EXT-socket to connect a second microphone with TALK-button or other external audio signal sources to the paging station. Detailed information is provided in chapter 6.2.13 *Optionally Available Accessories*.

Key-Labeling

Labeling the keys on the paging stations is done via label-strips, which can be inserted from the side. The label-strips for the 6 respectively 8 function keys are slit in from the right while the selection key strips – for 10, 20, 30, or 50 selection keys – are inserted from the left. Therefore, you have to detach the corresponding side panel (2 screws) and insert the labeled strip into the guiding rail between the front panel and the front panel foil.

The most convenient way of printing the labels is to utilize the word processing software MS-WORD. A suitable MS-WORD template is supplied. Please note that with different printers, margin-settings can vary making it necessary to adjust the template according to the specifications of your printer.

Tested printers are:

HP LaserJet 6P
HP LaserJet 5
HP LaserJet II

The recommended paper thickness is between 120 g/m² and 200 g/m².

Also supplied with this handbook are prepared label-strips in German, English and French as well as blank strips, which only have to be cut out. You can label the empty strips in handwriting or by using adhesive, rub-on letters.

Operation

This chapter explains all functions that are available in general operation mode.

Selective Call

The user can launch calls or announcements into freely selectable areas or groups.

Pressing a single or several selection keys defines the areas or groups that a call is launched into. The individual corresponding LED's will light. By pressing the key of an already pre-selected line once again deactivates that line and the corresponding LED goes out.

After you have made your selection, pressing the TALK-button ignites the actual call. Prior to that you can check via the BUSY-LED whether all lines and the paging station input are actually free. If single lines or the terminal input are busy with lower priority transmissions, the BUSY-LED will blink slowly. Whilst announcements are possible, they will interrupt any other event that is momentarily transmitted. If single lines or the terminal input are busy with higher priority signals, the BUSY-LED will vastly blink and the calling attempt is being ignored (also refer to the description of indicators).

The BUSY-LED lights during announcements. The TALK-button needs to be pressed during the whole message. After releasing the TALK-button, the defined selection stays memorized until the user makes any changes. Pressing the CANCEL-key de-selects the entire selection.

Additionally and in case of a pre-gong signal has previously been programmed, the GONG-LED will light during the transmission of the pre-gong signal.

Collective Call

The announcement is launched into all areas of an installation.

The procedure is similar to making a selective call. First, pressing the ALL-key selects all areas of the installation.

Pressing the TALK-button activates the collective call. During the outgoing call all area and/or group LED's as well as the ALL-LED will light (also refer to "indications"). The TALK-button has to be kept pressed down until the end of an announcement. BUSY-LED indication and the pre-gong signal behave equivalent to what was said for the selective call.

Direct Call

Principally it is possible to assign a direct call to any selection key (area key, group key, ALL-key) during the PC-configuration. This allows making announcements directly by pressing the desired selection key – without the need to press the TALK-key first. For direct calls the BUSY-LED also signals the status of correspondent areas (free, busy with lower priority signal, busy with higher priority signal; see "indications"). When shipped, there is no factory pre-set direct call programmed.

Gong Signal

A gong signal can be transmitted into any selectable area or group of an installation.

First, the desired areas / groups have to be selected, either using the selection keys (selective gong) or with the ALL-key (general gong). Pressing the GONG-key releases the gong signal. While the gong signal is being transmitted, the GONG-LED lights continuously or blinks (also refer to indications). The gong's priority can be set to 6 or 7. Therefore it has priority over announcements from any paging station, except for the directing terminal (priority 10).

Pressing the STOP-key cancels the transmission of a gong signal.

Text Message

A text message recorded on the optional message module or on an external recording/playback device can be transmitted into any selectable area or group of the entire installation.

First, the desired areas / groups have to be selected either using selection keys or with the ALL-key.

Pressing the TEXT-key starts the reproduction of a prerecorded message that had been assigned during the configuration. While the text message is being transmitted, the TEXT-LED lights steadily or blinks (also refer to indications). The priority for text messages can be set to values between 2 and 8.

Pressing the STOP-key cancels the transmission of a text message.

General Alarm

A general alarm signal is always transmitted to all lines of an installation.

Pressing the covered ALARM-key launches the integrated alarm. The key is lit during the transmission of an alarm signal. The priority of the alarm can be set between 7 and 9 and therefore it has priority over any announcement or other event, except for those that were ignited from the directing paging station (priority 10).

Pressing the STOP-key or subsequently pressing the ALARM-key cancels the alarm.

Selective Alarm

When a paging station is equipped with a second ALARM-key, which provides the option for selective alarms, it is possible to transmit alarm signals only into particular lines.

Equivalent to the procedure for making a selective call you first have to select the areas / groups to which the alarm signal will be transmitted. Afterwards, you have to press the covered ALARM-key to start a selective alarm. The key is lit during the transmission of an alarm signal. You can now already enter the lines for the following alarm.

Pressing the STOP-key or subsequently pressing the ALARM-key cancels the alarm.

When shipped, there is no factory pre-set selective alarm pre-programmed.

Note:	Launching an alarm is not related to the originating paging station's priority. Alarms can be launched from any microphone terminal at any time, even when the system is in stand-by mode. A running alarm is optically and occasionally also acoustically indicated at each and every paging station.
--------------	--

Canceling Signals

Pressing the STOP-key cancels alarms, gong signals and text message transmissions. Events can only be terminated at the paging station they were launched from with the exception of the directing terminal (paging station with the highest possible priority-setting 10). Through the directing station it is possible to cancel any signal in progress.

System ON / OFF

The ON-key switches a PROMATRIX system ON or OFF. Mostly, it is not intended that all paging stations provide this option. Thus, this function can be individually programmed for each console via PC-configuration.

With the system being in stand-by mode, the ON-LED is off. Pressing the ON-key turns the PROMATRIX system's power on. This can take up to 10 seconds during which the ON-LED blinks. The ON-LED lights constantly once the system is ready for operation. This also applies for all paging stations of the entire installation

To switch the system OFF, you have to press the ON-key for approximately 1 second. This feature is provided to prevent inadvertently turning off the system.

Pressing an ALARM-key or igniting an alarm sequence at external terminals automatically switches the PROMATRIX system's power on and boots the system.

Program Assignment

In case this feature has been activated, it is possible to assign programs to individual areas and groups of an entire installation during the PC-configuration procedure.

First, by pressing the PROGRAM-key, the paging station has to be set to the program-assign mode. Pressing a single or several selection keys assigns the outputted program (background music) to selected areas and groups. The corresponding LED's are lit. Program transmission has always the lowest priority (1). The level of the audio signal is determined during the PC-configuration procedure. The assignment stays memorized until the selection keys are pressed again. Pressing the CANCEL-key erases the entire assignment-pattern.

Subsequently pressing the PROGRAM-key or any other function key cancels the program-assign mode. It is also automatically canceled after approximately 15 seconds.

In single-program configuration the music reproduction in all areas of the installation needs to be attenuated for the time of an announcement. In double-program configuration it is possible to transmit the background music program into rooms that are not part of an actual announcement selection. If every line incorporates its own LF-output and separate power amplifier, it is possible to freely mix announcements and background programs.

Special Functions

Generally, it is possible to assign a function to each selection key. This allows to utilize a paging station to control the lighting, door openers, blinds, etc.; even controlling volume settings is possible through the use of the UP / DOWN keys.

How to program and assign special functions is explained in detail in PROMATRIX user manual. When factory-shipped, there are no special functions assigned.

Indications

The following table provides an overview of the most important LED-indications.

LED	Status	Description
selection-LED (not for DPC 4106)	OFF	area or group not selected
	lights green	area or group selected / special function activated / direct call activated
ALL-LED (not for DPC 4106)	OFF	collective call not selected
	lights green	collective call pre-selected / direct collective call activated
BUSY-LED	OFF	system not busy, clear for call
	lights green	during own message
	green, slowly blinking	low priority paging station launches a call in selected areas; interruption on cost of the momentary microphone terminal is possible
	green, vastly blinking	system is busy with a higher priority transmission (message, gong, alarm), interruption is not possible, already launched call is interrupted by events with higher priority setting
GONG-LED	OFF	no gong signal started
	lights green	gong signal in progress; manually started or pre-programmed pre-gong signal
	green blinking	gong signal in progress, ignited from another source or time-controlled
ON-LED	OFF	system is OFF (stand-by mode)
	lights green	system is ON and ready for operation
	green blinking	system has been turned on and is booting (initialization)
PROGRAM-LED	OFF	paging station is in message-mode
	lights green	paging station is in program-assign mode
	green, slowly blinking	paging station is password-protected
	green, vastly blinking	paging station is in setup mode
TEXT LED	OFF	no text message launched
	lights green	manually launched text message is in progress
	green blinking	text message in progress, launched from another source or time-controlled
ALARM	OFF	alarm signal not launched
	lights red	alarm signal has been launched from any source
	red blinking	alarm signal has already been stopped, but keeps running until signal-end

Priorities

The PROMATRIX system allows setting 10 priority levels (highest priority = 10, lowest priority = 1) that include announcements as well as alarm and gong signals and vocal message reproduction. A higher prioritized event principally interrupts any other event with a lower priority setting. For events with equal priority the earlier launched signal is continued – it has priority over the latter.

Priority level	Assigned to	Description
10	directing station	highest priority; can ignite any type of events and interrupt all other signals
7 - 9	alarm signal	can only be interrupted from the directing station but interrupts all other signals that have not been launched from the directing terminal
6 - 7	gong signal (manual / time-controlled)	interrupts all signals that are not coming from the directing terminal. Time-controlled gong signals can be delayed/pre-delayed by a pre-defined period of time
2 - 8	recorded message	text messages can be freely assigned to these priorities during the configuration procedure
2 - 6	message from a paging station without / with pre-gong signal	these priorities can be freely assigned to any 'normal' paging station. A pre-gong signal has the priority of the launching microphone terminal
1	program	background music always has the lowest priority level

DPC 4350 paging Station Extension

The DPC 4350 paging station extension provides selection keys only. It is employed whenever more than 50 loudspeaker lines need to be accessed or whenever additional group and special function keys are required. The DPC 4350 can be easily combined with any other paging station model. The following list shows the amounts of maximally accessible lines for various combinations:

combination	max. number of lines
DPC 4106 + DPC 4350	50
DPC 4510 + DPC 4350	60
DPC 4520 + DPC 4350	70
DPC 4530 + DPC 4350	80
DPC 4550 + DPC 4350	100

The extension is directly connected to the main paging station's extension interface (EXT) using the supplied 8-pole RJ-45 cable. Consequently, a paging station consists of two devices, but reports to a common address. Therefore the central unit recognizes such a combination as a single console with a higher number of selection keys. From the view point of the user, the two devices also act as only one paging station; i. e. the selection keys of main and slave paging stations provide equal access to their assigned areas, groups and special functions.

Factory-Shipped Configuration

When shipped, the selection keys 1 – n are assigned to the corresponding areas 1 – n. Therefore, paging stations are ready for operation directly after connection and switching the system power ON.

CAUTION: If several paging stations are operated within an installation, it is extremely important that each one is set to an individual, exclusive address (1 - 16).

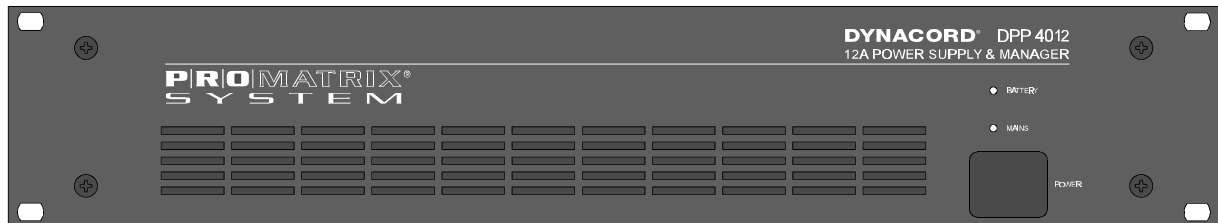
Paging stations provide the following factory pre-set functions and features:

Parameter		Setting / Description
address		OFF
priority		5 (priority for messages)
name		untitled DPC4xxx (type)
password		level 1 no protection default password level 1: 111 level 2 password-protected default password level 2: 2222
pre-gong signal		OFF
buzzer		ON (acoustic alert signal)
compressor		OFF
extension socket	EXT	OFF
options	2nd alarm key	not programmed
	key-locked switch	not programmed
	PTT-microphone	call in pre-selected areas, priority 5
key-assignment	selection keys 1 – n	area selection 1 – n (key 1 area 1, key 2 area 2, ..) (not supported with the DPC 4106)
	TALK	call in pre-selected areas, priority 5 (DPC 4106: call in all areas)
	TEXT	text message in pre-selected areas; text 1, priority 2 (DPC 4106: text message in all areas)
	GONG	4-stroke gong signal in pre-selected areas, priority 8 (DPC 4106: gong signal in all areas)
	ALL	selecting collective call (not supported with the DPC 4106)
	CANCEL	cancel selection / call-pattern (not supported with the DPC 4106)
	ON	switching the system ON / OFF, priority 5
	STOP	terminates any locally launched signal (gong, text, alarm)
	PROGRAM	assigns a program to pre-selected areas (not supported with the DPC 4106)
ALARM	DIN-alarm in all areas, priority 9 (not supported with the DPC 4106)	
special functions		not programmed

Specifications

	DPC 4106	DPC 4510	DPC 4520	DPC 4530	DPC 4550	DPC 4350
operation voltage	24 V DC (21,6 V – 31,2 V)					
power consumption (24 V)	80 mA	80 mA	85 mA	90 mA	90 mA	90 mA
min. operation voltage	15 V DC					
max. power consump. (15 V)	120 mA	120 mA	120 mA	120 mA	135 mA	95 mA
LF – input extern						
Line (default)	0 dBu					-
PTT – microphone (A & B bridges closed)	-52 dBu					-
LF-output (electronically balanced)	+6 dBu					-
sealable alarm-key with cover	optional	Yes				-
DPC 4350 extension connection	yes					-
connections	RJ-45					
supplied connection cords	3 m					0,5 m
LC-display	2 x 16 digits	2 x 16 digits	2 x 16 digits	2 x 16 digits	2 x 16 digits	-
environmental temperature	5 ... 40° C					
enclosure dimensions (W x D x H, in mm)	170x160x6 5	225x160x6 5	270x160x6 5	320x160x6 5	405x160x6 5	335x160x65
gooseneck	8 x 200 mm					-
weight	1,0 kg	1,5 kg	1,7 kg	1,8 kg	2,5 kg	1,9 kg
finish	gray-white RAL 9002, micro-structure					
accessories						
monitor loudspeaker	-	NRS 90209				-
pushbutton / switch selectable, 18 mm	NRS 90230					-
key-lock switch 18 mm	NRS 90231					-
transformer balanced	NRS 90232					-

DPP 4004 / DPP 4012 24V POWER SUPPLY - RACK UNIT



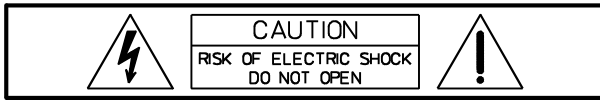
Performance Features

- 19" rack size with 2 HU
- primary sync switch-mode power supply; supports any 24 VDC modules in PA-systems
- covered mains switch
- status indicator LEDs (mains and battery)
- smooth initial current inrush
- short circuit protected
- forced ventilation
- mains voltage 104-127 / 207-253 VAC; internally switchable
- remote output for the remote switching of power amplifiers
- remote output for the remote switching of the battery supply of power amplifiers
- emergency power supply via battery input connector
- switched mains output, max. 1 A
- delayed control output for the release of alarm-gong and summing modules
- direct output, 24 V max. 4 A / 12 A
- switched 24 V output for the connection of modules
- continuous emergency power supply via external battery module
- output for the connection of modules that need persistent power supply (e. g. DPM 4000/4001); max. 4 A / 12 A
- output for power fail recognition

CONTENTS

Performance Features	11
Important Safety Instructions	13
Front View	14
Rear View	14
Utilization	15
First Operation	15
Functions	15
Switching The Mains Voltage	17
Remote Control - Connector	18
Specifications	19
Block Diagram	30

IMPORTANT SAFETY INSTRUCTIONS



WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK,
DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.
AVIS: RISQUÉ DE CHOC ELECTRIQUE. NE PAS OUVRIR.



The lightning flash with arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a damp cloth.
7. Do not block any of the ventilation openings.
Install in accordance with the manufactures instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus that produce heat.
9. Only use attachments/accessoris specified by the manufacturer.
10. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been

For US and CANADA only:

Do not defeat the safety purpose of the grounding-type plug. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. When the provided plug does not fit into your outlet, consult an electrician for replacement of the absolute outlet.

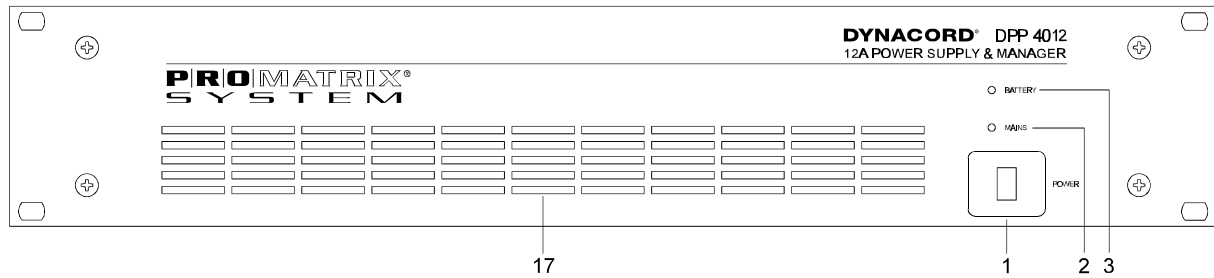
IMPORTANT SERVICE INSTRUCTIONS

1. Security regulations as stated in the EN 60065 (VDE 0860 / IEC 65) and the CSA E65 - 94 have to be obeyed when servicing the appliance.
2. Use of a mains separator transformer is mandatory during maintenance while the appliance is opened, needs to be operated and is connected to the mains
3. Switch off the power before retrofitting any extensions, changing the mains voltage or the output voltage.
4. The minimum distance between parts carrying mains voltage and any accessible metal piece (metal enclosure), respectively between the mains poles has to be 3 mm and needs to be minded at all times.
The minimum distance between parts carrying mains voltage and any switches or breakers that are not connected to the mains (secondary parts) has to be 6 mm and needs to be minded at all times.
5. Replacing special components that are marked in the circuit diagram using the security symbol (Note) is only permissible when using original parts.
6. Altering the circuitry without prior consent or advice is not legitimate.
7. Any work security regulations that are applicable at the location where the appliance is being serviced have to be strictly obeyed. This applies also to any regulations about the work place itself.
8. All instructions concerning the handling of MOS - circuits have to be observed.

NOTE:



SAFETY COMPONENT (HAS TO BE REPLACED WITH ORIGINAL PART ONLY)



- 1.) covered mains switch
- 2.) mains LED-indicator (off, when the mains switch is not engaged)
- 3.) battery LED-indicator (off, when the mains switch is not engaged)
- 4.) mains input connector
- 5.) mains fuse (input connector)
- 6.) mains output connector
- 7.) mains fuse (output connector)
- 8.) ground-lift switch
- 9.) DC-output via flat-connector: +24 V / 4 A (DPP4004) or +24 V / 12 A (DPP4012) direct / GROUND
- 10.) remote control connector – for pin-assignment refer to diagram 1
- 11a.) battery fuse – input – negative pole
- 11b.) battery fuse – input – positive pole
- 12.) battery flat-connector – input – negative pole
- 13.) battery flat-connector – input – +24 VDC
- 14.) DC-output via flat-connector: +24 V / 4 A (DPP4004) or +24 V / 12 A (DPP4012) switched
- 15.) DC-output via flat-connector – negative pole
- 16.) DC-output via flat-connector for the PROMATRIX SYSTEM; persistent power supply
- 17.) ventilation louvres – airflow in
- 18.) ventilation louvres – airflow out

1. Utilization

The switch-mode power supply rack units DPP4004/4012 are meant for the incorporation into 19" rack shelf systems and serve to supply PA-system installations with the operational voltage of 24 V.

The switch-mode power supplies DPP4004/4012 can be operated as single units, together with the PA-system PROMATRIX, or battery-powered, as well as together with the DYNACORD DEM-system.

Caution: It is not permissible to expose this appliance to dripping or splashing water.

2. First Operation

The switch-mode power supply rack units DPP4004/4012 are to be operated on the 230 VAC mains supply. Internally switching the appliances to different voltages is possible (please refer to the paragraph 4: adjusting the mains voltage). Connecting the power supplies is only licit on a accurately installed 3-pole mains outlet.

The mains outlet connector (6) is meant for convenient connection within rack shelf systems. It is possible to connect other devices to the mains output (6), using a common mains cord. A maximum power consumption of 1 A should not be exceeded.

3. Functions of the DPP4004/4012

The power supply rack units DPP 4004 and 4012 were designed to supply PA-systems with or without emergency battery power supply with the necessary power. They can also be used to remotely control (on/off) several functions. Managing the switching between mains and battery supply is performed automatically.

Using the mains switch (1) (main switch function) on the front of the appliance, it is possible to turn the system power off completely. To prevent inadvertent erroneous switching, a cover lid can be installed with the switch being in its ON-position.

When the switch is set to OFF, all outputs are without current and the MAINS (2) and BATTERY (3) LEDs are not lit. With the mains switch being engaged, the internal 24 V power supply is provided with mains voltage. At the same time, the mains output connector on the rear of the appliance gets mains supply (max. 1 A), allowing the connection of external low-level power consumers (tape decks, etc.). With the mains switch being engaged and when the appliance is correctly connected and the mains is present, the MAINS-LED will light. Correspondingly, the BATTERY-LED is lit when a battery power source providing 24 V is correctly connected to the BATTERY IN connectors – (12) and (13) – and with the mains switch being engaged.

The output voltage of the internal power supply is present at the DIRECT OUT (9) connector. With the DPP 4004 this connector's maximum power handling capacity is 4 A; the DPP 4012 provides 12 A. The output offers internal short-circuit protection and it can be operated without load. It also serves to use the appliance as plain power supply – without battery supply and without remote control.

The output SWITCHED OUT (16) is meant for the connection of the DPM 4000 or other external devices that need non-interrupted emergency power supply. With the DPP 4004 this connector's maximum power handling capacity is 4 A; the DPP 4012 provides 12 A. The output offers internal short-circuit protection and it can be operated without load. Usually, this output is connected to the internal switch-mode power supply, so that the connected load is supplied with the needed voltage. In case of temporarily insufficient mains supply, power failure, malfunctioning of the switch-mode power supply or thermal overload of the DPP 40xx, the SWITCHED OUT (16) is switched to battery supply (when present) within fractions of a second, providing gapless power supply to the connected devices. When the mains is present again or after solving the problem that caused the malfunction, the appliance automatically returns with a delay of 600 ms to mains operation. If there is no battery present during the occurrence of a mains complication, the DPP 40xx behave as if the front mains switch has been switched off; except for the fact that the MAINS LED is still lit.

The output MODULES OUT (14) is meant for the connection of devices (relay-fields, alarm-devices, voice reproduction, etc.) that can be switched off during a power outage – during which time the PA-system should operate in the stand-by mode. Switching off unnecessary devices during the occurrence of a power failure is preferable, otherwise the battery is unnecessarily strained. The output employs a "softstart" function that controls the initial current inrush, preventing the main supply from interference by possible

capacitive loads connected. This output is controlled by the inputs ON/OFF (TOGGLE) (pin 1 of the remote control connector) or ON/OFF (MODULES) (pin 2). If the ON/OFF (MODULES) input is connected to the ground potential, the MODULES OUT output is constantly activated; otherwise it is constantly deactivated. The input is controlled from the DPM 4000 or from an alarm or gong signal module.

The input ON/OFF (TOGGLE) can be used for installations, where the PA-system has to be switched "on/off" via remote control (e. g. systems that include DEM-modules). A ground potential contact of the input switches the system "on", another one switches the system "off". The ON/OFF (MODULES) input's priority in the "on" state overrides ON/OFF (TOGGLE). The ON/OFF (TOGGLE) condition is also stored for the time of power failure. Switching the appliance's mains switch off always sets the TOGGLE-state to "off" as well. When utilizing the ON/OFF (TOGGLE) and ON/OFF (MODULES), it is important to remember that the pin-assignment of the floating inputs corresponds to the illustration in chapter 5 (figure 2).

The ON/OFF (TOGGLE) function is deactivated when the appliance is shipped from the factory. To activate the function, the appliance has to be separated from the mains and the internal jumper has to be set to "open".

This input can also be used to detect whether another phase failed. The corresponding jumper must be in place. When short-circuiting the contact and ground, the appliance reacts as if its own mains failed. In case external phase-monitoring is not wanted, leave this input unused.

The control output (pin 4) MAINS REMOTE ON on the REMOTE socket (10) carries ground potential when the output MODULES OUT (14) is switched on and with the mains supply being constantly present. This output can be used to switch remotely controllable power amplifiers of the PROMATRIX and the DEM Series to mains supply.

The control output (pin 5) BATTERY REMOTE ON on the REMOTE socket (10) carries ground potential when the output MODULES OUT (14) is switched on and with the mains supply being unstable. This output can be used to switch remotely controllable power amplifiers of the PROMATRIX and the DEM Series to battery supply.

The control output (pin 6) POWER FAIL OUT on the REMOTE socket (10) signals the loss of the mains supply (main under voltage, mains failure, temperature overload with insufficient output voltage of the switch-mode power supply). An output voltage of +24 V indicates that the mains supply is present and stable. The output's internal resistance is 1 k Ω . It is meant for the connection of the DPM 4000, indicating mains failure conditions.

The control output (pin 7) DELAY OUT on the REMOTE socket (10) is switched to +24 V with a delay of approximately 6 seconds after activating the output MODULES OUT. This function can be used to signal that the installation is ready for operation, after booting the system. In installations incorporating DEM-modules, the output provides the "release" function.

Procedures with occurring mains failure

In a standard application with mains and emergency battery supply, the outputs SWITCHED OUT and MODULES OUT are switched to battery supply when a mains failure occurs. Despite, POWER FAIL OUT signals the loss of mains power and the connected power amplifiers are switched from mains supply to battery supply via the outputs MAINS REMOTE ON and BATTERY REMOTE ON. When the mains returns, these functions are reversed after a delay of approximately 600 ms.

In case the power is gone for a longer period of time, the battery serves as emergency power supply until the cut-off voltage of 21 V is reached. When declining that threshold for the first time, all outputs are being switched off. After the mains being present and stable again, the outputs are switched on again. This prevents over-discharging the battery.

4. Mains Voltage Selection (only to be carried out by a qualified service technician)

After adjusting the mains voltage, operating the DPP 4004/4012 power supplies with 115 V is also possible.

The adjustment has to be carried out before the operation:

- Remove the cover plate.
- Insert the flat wire bridge on the printed board assembly 86245 into the 115V~ position (red conductor).
- With the DPP 4004 additional switching of a switch-mode power supply is necessary. The correspondent switch is located inside the switch-mode power supply (see yellow label). Remove the front panel (4 screws). Using a suitable screwdriver (size 1), the mains voltage selector switch which is located behind the perforated coverage – has to be set to the 115V~ position.

A silvery label stating different voltages is located on the right inside of the enclosure. After switching the appliance to 115V operation, the corresponding label has to be removed and attached to the rear panel, so that it covers the imprinted marking 230V~ below the mains connector.

The following only applies to the DPP4012:

Exchanging the mains fuses to operate the appliance with 115 V ~ AC:

- Replace the mains fuse (T2,5A/H for 230 V operation) located in the fuse socket (5) with a T5A-type fuse. The label on the rear panel T2,5A/H which is located below the fuse socket (5) has to be replaced by the T5A-label.

Lock the top cover plate and the front panel in place.

4.1 Fuses IEC 127, 5 x 20 mm

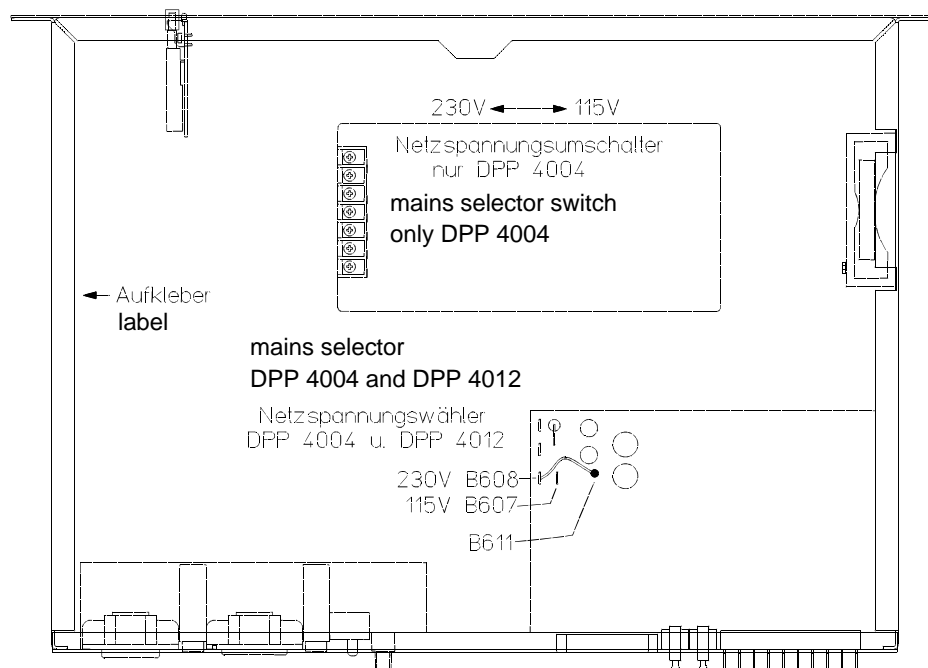
DPP 4012:

fuse socket (5) F501 230 V ~ AC mains fuse:T2,5A/H/250V
(H = high switching ability, 1500 A, has to be replaced using an original fuse only).

fuse socket (5) F501 115 V ~ AC mains fuse:T5A/250V
fuse socket (7) F502 output mains fuse: T1A/250V
fuse socket (11a) F602 (-) pole battery fuse: T15A/32V DC
fuse socket (11b) F601 (+) pole battery fuse: T15A/32V DC

DPP 4004:

fuse socket (5) F501 230 V ~ AC mains fuse:T2,5A/H/250V
fuse socket (5) F501 115 V ~ AC mains fuse:T5A/250V
fuse socket (7) F502 output mains fuse: T1A/250V
fuse socket (11a) F602 (-) pole battery fuse: T15A/32V DC
fuse socket (11b) F601 (+) pole battery fuse: T15A/32V DC



5. Remote Control Connector

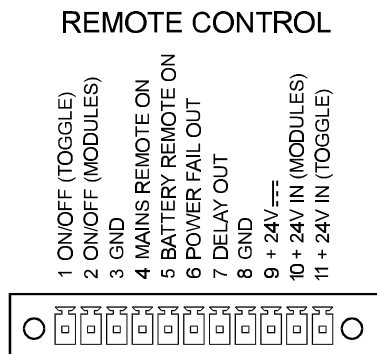


figure 1:
pin assignment of the remote control plug

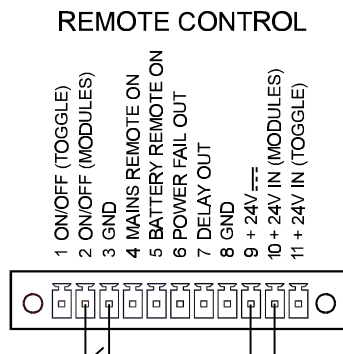
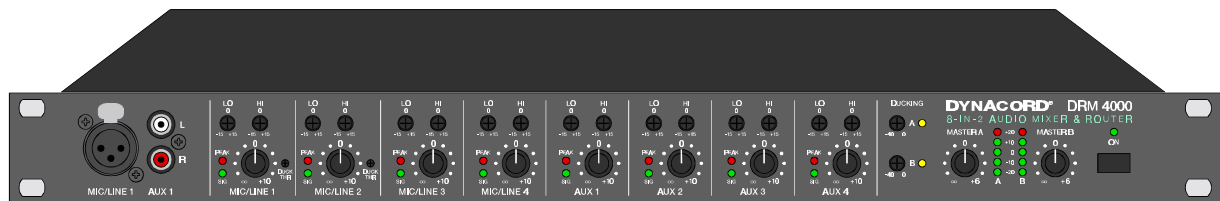


figure 2:
example for a remotely controlled application

- | | |
|----------------------------|--|
| 1 ON/OFF (TOGGLE) INPUT | ON/OFF function of the supply output for the modules MODULE OUT through the pulse contact to the negative potential. Only functions when pin 11 carries an analogous supply voltage and when the internal jumper J502 is set to "open"; can be used to remotely switch the PA-system ON/OFF.
The external power-failure-recognition only functions, when the needed supply-voltage is connected to pin 11 and when the internal jumper J 502 is in place. It can also be used for controlling the PA-installation whenever another phase fails. In that case, identical functions are carried out, as if a failure in the mains supply of the DPP 40xx would occur. Contact connected to ground is equivalent with an ext. mains failure. |
| 2 ON/OFF (MODULES) INPUT | ON function of the supply output for the modules MODULE OUT through permanent contact to the negative potential. Only functions when pin 10 carries an analogous supply voltage; can be used to remotely switch the PA-system via the PROMATRIX System ON/OFF. |
| 3 GND | Negative potential for the inputs 1 and 2; in case the internal supply voltage is utilized for the remote control. |
| 4 MAINS REMOTE ON OUTPUT | Control output for power amplifiers of the PROMATRIX SYSTEM without network operation and for power amplifiers of the DEM System; signals the switching-on command of the mains supply via contact to the ground potential. |
| 5 BATTERY REMOTE ON OUTPUT | Control output for power amplifiers of the PROMATRIX SYSTEM without network operation and for power amplifiers of the DEM System; signals the switching-on command of the battery supply via contact to the ground potential. |
| 6 POWER FAIL OUT OUTPUT | Signals the stable presence of the mains as well as internal 24 V supply voltage via 24 V output voltage; internal resistance 1 kΩ. |
| 7 DELAY OUTOUTPUT | Signals the PA-system's "ready for operation" state via 24 V output voltage and can be used to control alarm / gong / summing modules of the DEM System. |
| 8 GND | Negative Potential for the output 7. |
| 9 +24V OUTPUT | Supply output for the inputs <u>1 and 2</u> ; cannot be used for any other purpose. |
| 10 +24V IN (MODULES) INPUT | Supply input for the MODULES input; has either to be connected to pin 9 or needs +24 V supply from an external source. |
| 11 +24V IN (TOGGLE) INPUT | Supply input for the TOGGLE input; has either to be connected to pin 9 or needs +24 V supply from an external source. |

SPECIFICATIONS

	DPP4004	DPP4012
Mains power supply		
Operational voltage	230 VAC ±10 %	230 VAC ±10 %
internally selectable through bridging	115 VAC ±10 %	115 VAC ±10 %
Mains frequency range	50 ... 60 Hz	50 ... 60 Hz
Power consumption in idling mode	20 VA	20 VA
Power consumption at nominal load	120 VA	360 VA
Battery power supply		
Battery voltage	24 V -10 %/+30%	24 V -10 %/+30 %
Current consumption in idling mode	0.17 A	0.17 A
Current consumption at nominal load	4.1 A	12.1 A
Current power handling capacity with MAINS REMOTE ON	1 A	1 A
Current power handling capacity with BATTERY REMOTE ON	1 A	1 A
Current power handling capacity with DELAY OUT	0.1 A	0.1 A
Input current ON/OFF (TOGGLE)	> 2.2 mA = ACTIVE	< 1mA = inactive
Input current ON/OFF (MODULES)	> 2.2 mA = ON	< 1mA = OFF
Output data		
Nominal output voltage	24 V	24 V
Nominal output current with forced ventilation	4 A	12 A
Residual voltage standing wave d mV pp	< 100mV pp	< 100mV pp
Mains stabilization	±1 %	±1 %
Safety	EN 60065	EN 60065
Radio interference	EN 55022 (B) EN 50082 - 1 EN 61000 4-2....4-6 ENV 50204	EN 55022 (B) EN 50082 - 1 EN 61000 4-2....4-6 ENV 50204 EN 61000-3-2 EN 61000-3-3
Environmental temperature	+5 °C ... +40 °C	+5 °C ... +40 °C
Dimensions (W x H x D)	19" x 2 HU = 483 x 88 x 330 mm	
Depth incl. connections	400 mm	400 mm
Weight	7 kg	7 kg



DRM 4000

8-IN-2 AUDIO MIXER & ROUTER

IMPORTANT SAFETY INSTRUCTIONS



WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.
AVIS: RISQUÉ DE CHOC ELECTRIQUE. NE PAS OUVRIR.



The lightning flash with arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any of the ventilation openings.
Install in accordance with the manufacturer's instructions.
8. Install only in rack with back cover.
9. Only use attachments/accessories specified by the manufacturer.
10. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
11. To completely disconnect mains power from this apparatus, the power supply cord must be unplugged

For US, CANADA and Japan only:

Do not defeat the safety purpose of the grounding-type plug. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. When the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

IMPORTANT SERVICE INSTRUCTIONS

CAUTION: These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the Operating Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

1. Security regulations as stated in the EN 60065 (VDE 0860) and the CSA E60065-00 have to be obeyed when servicing the appliance.
2. Use of a mains separator transformer is mandatory during maintenance while the appliance is opened, needs to be operated and is connected to the mains
3. Switch off the power before retrofitting any extensions, changing the mains voltage or the output voltage.
4. The minimum distance between parts carrying mains voltage and any accessible metal piece (metal enclosure), respectively between the mains poles has to be **3 mm** and needs to be minded at all times.
The minimum distance between parts carrying mains voltage and any switches or breakers that are not connected to the mains (secondary parts) has to be **6 mm** and needs to be minded at all times.
5. Replacing special components that are marked in the circuit diagram using the security symbol (Note) is only permissible when using original parts.
6. Altering the circuitry without prior consent or advice is not legitimate.
7. Any work security regulations that are applicable at the location where the appliance is being serviced have to be strictly obeyed. This applies also to any regulations about the work place itself.
8. All instructions concerning the handling of **MOS** - circuits have to be observed.



Note: SAFETY COMPONENT (HAS TO BE REPLACED WITH ORIGINAL PART ONLY)

CONTENTS

TABLE OF CONTENTS	PAGE
SAFETY AND SERVICE INSTRUCTIONS	1-2
1. INTRODUCTION	1-4
1.1 DRM 4000 Characteristics	1-4
1.2 Unpacking and Warranty	1-5
2. CONTROLS AND CONNECTIONS	2-1
2.1 Front Panel	2-1
2.2 Rear Panel	2-3
3. QUICK START	3-1
4. INSTALLATION AND CONNECTIONS	4-1
4.1 General Notes	4-1
4.2 Input Assignment	4-1
4.2.1 MIC/LINE Inputs	4-1
4.2.2 AUX and MIX IN Inputs	4-2
4.3 Output Assignment	4-2
4.3.1 MASTER Outputs	4-2
4.3.2 SEND Outputs	4-2
4.3.3 DIRECT OUTPUT	4-2
4.4 Control Inputs	4-3
4.4.1 CONTROL INPUTS	4-3
4.4.2 External VCA-Control	4-3
5. INITIAL OPERATION	5-1
5.1 Power-On Operation	5-1
5.2 Level Settings	5-1
5.2.1 Level Adjustment for MIC/LINE Inputs	5-1
5.2.2 Level Adjustment for AUX Inputs	5-2
6. SPECIAL FEATURES OF THE DRM 4000	6-1
6.1 Using Ducking Control	6-2
6.2 Limiter Operation	6-2
6.3 Cascading Several Units via MIX IN and SEND	6-2
6.4 Using The Unit Together With The DPM 4000	6-3
7. SOFTWARE EDITOR DRM 4000	7-1
7.1 System Requirements	7-1
7.2 Installation Notes	7-1
7.3 PC - DRM 4000 Connection	7-1
7.4 Software Description	7-2
7.4.1 General	7-2
7.4.2 Menus and the Toolbar	7-2
7.4.3 Basic Configuration	7-3
7.4.4 Control Inputs	7-5
7.4.5 Online Control / Status	7-6
8. CONFIGURING THE DRM 4000	8-1
9. INTERNAL SETTINGS / EXTENSIONS	9-1
9.1 Internal Configuration Possibilities	9-1
9.1.1 Lo Cut-Filter	9-2
9.1.2 DIRECT OUTPUTS	9-2
9.1.3 AUX Sensitivity Selection	9-3
9.2 Limiter Settings	9-3
9.3 How to install Extensions	9-4
9.3.1 How to install the Input Transformer (NRS 90233)	9-4
9.3.2 How to install the Output Transformer (NRS 90227)	9-5
9.3.3 How to install Interface-Boards	9-6
10. SPECIFICATIONS	10-1
10.1 Specifications	10-1
10.2 User Configuration	10-2
10.3 Block Diagram	10-4
10.4 RS-232 Interface - Programmer's Instructions	10-5
10.5 Dimensions	10-7
10.5 Warranty	10-8

INTRODUCTION

1. INTRODUCTION

First of all, we like to thank you for and congratulate you on buying a DYNACORD DRM 4000 8-in-2 Audio Mixer & Router. To ensure optimal performance and to minimize the risk of damaging the appliance through erroneous operation, please make sure to read this owner's manual carefully before operating the DRM 4000.

1.1 DRM 4000 CHARACTERISTICS

The DRM 4000 is a rack-mixer and/or audio signal router offering 8 audio inputs and 2 audio outputs. The inputs are divided into 4 MIC/LINE channels and 4 AUX channels. Each input channel can be freely assigned to either one or both output channels, offering Mono 2-Channel operation as well as Stereo operation modes.

The DRM 4000 can be used as a pre-mixer for the DPM 4000, expanding the amount of available input channels. DRM 4000 and DPM 4000 are linked via remote-interface. Priority functions, preset switching and routing are easy to configure and operate. The DRM 4000 Mixer & Router can also be used as stand-alone unit for simple sound reinforcement tasks, e.g. in a multimedia set-up, as well as for straightforward intercom installations.

Field of Application

- Pre-mixer to the DPM 4000 for connecting several switchable audio signal sources and microphones with priority or mixing function
- Mixer for sound reinforcement systems in conference rooms, multi-purpose halls, congregation halls, gastronomy, houses of worship, etc.
- Straightforward calling systems with the ability for background music playback

Characteristics

- 4 MIC/LINE input channels: XLR, electronically balanced, transformer optionally available.
- 4 AUX input channels: each with 2 RCA-type connectors.
- Volume and tone control (Lo/Hi) in all input channels.
- Signal / Peak LEDs (green / red) for monitoring the input level in all input channels.
- Input channels can be freely assigned to the output channels, controlled via control contacts, optional RS-232 interface or from the DPM 4000.
- Direct outputs for all MIC/LINE and AUX-channels. Pre/Post internally configurable.
- Frontal connections: 1 MIC/LINE input (XLR) and 1 AUX-input (2 x RCA-type) connected parallel to MIC/LINE1 and AUX1.
- Priority control (ducking function) in the inputs MIC/LINE 1 and 2; controllable via external contacts, signal level with adjustable threshold (on the front) or via remote control, indicated via LED's on the front panel.
- Limiter in the inputs MIC/LINE 1 and 2 with internally selectable threshold.
- 2 audio outputs: XLR, electronically balanced, transformer optionally available.
- Separate summing controls and LED-chains for both outputs.
- VCA's in both output channels. 2 VCA control inputs A / B for remotely controlling the volume setting via external potentiometer, also controllable via serial interface (PC, DPM 4000, media-control) or via control contacts.
- Mix-input for external feeds / extension: 2 x RCA-type, unbalanced, with level control on the rear panel
- Send-output for recording / extension: 2 x RCA-type, unbalanced.
- Remote control via external contacts: 8 freely configurable control inputs for ducking MIC/LINE 1 and 2, Preset switching, routing, volume switching, mute.
- Optional serial RS-232 interface for PC or media-control: Direct control of all routing possibilities, output level control, configuration and storing of presets and the preset switching.

- Optional serial RS-485 interface for connecting the DPM 4000: control of all routing possibilities, ducking control, preset switching via macros, output level control, configuration and storing of presets via Designer software.
- 24V power supply; optional mains adapter for 90 - 240 V AC mains supply.
- Power-on delay: relay switching to prevent audible power-on / off switching noise.
- Enclosure: 19" / 1HU.

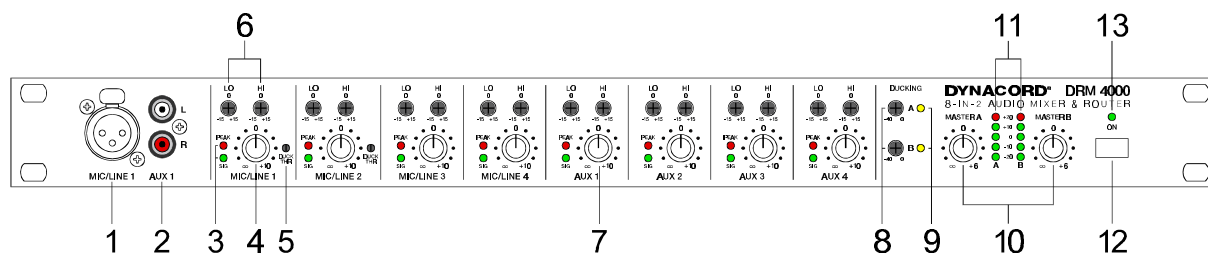
This owner's manual contains lots of valuable information about the DRM 4000. So please keep it at a safe place for further reference.

1.2 Unpacking and Warranty

Carefully open the packaging and take out the DRM 4000. Next to this owner's manual, the appliance is shipped together with three Phoenix-type connectors and the warranty card. Please make sure that the warranty card has been completed. Only with a fully completed warranty certificate any possible warranty claims can be granted. The appliance comes with a 36 months warranty, which is valid starting with the date when you had received the device from your dealer. Please keep the warranty certificate, the original invoice and also the original packaging at a safe place for any eventual shipping.

CONTROLS AND CONNECTIONS

2. CONTROLS AND CONNECTIONS



2.1 Front Panel

1, Socket MIC/LINE 1

Electronically balanced XLR-input on the front panel for the connection of microphones or other signal sources. This socket is connected parallel to the MIC/LINE 1 input on the appliance's rear panel. Gain, Pad and phantom power settings have to be performed on the rear panel.

2, Sockets AUX 1 L/R

The AUX 1 L/R RCA-type connectors on the front panel allow connecting a 2-channel audio signal source (e.g. CD-Player). The connectors are connected parallel to the AUX 1 input on the appliance's rear panel.

3, Signal/Peak-LED's

The signal/peak-LED's provide optical information about the momentary level of the corresponding input channel. When setting the input level, make sure that the signal-LED's blinking follows the rhythm of the fed input signal. Otherwise, use the gain control for correctly adjusting the input level. Blinking or constant lighting of the peak-LED indicates that the input channel is on the edge of clipping. In this case use the gain control to reduce the level of the input signal. The signal-LED lights at approx. 30 dB and the peak-LED at 6 dB below clipping.

4, Control MIC/LINE 1-4

Rotary controls for setting the volume level of the DRM4000's corresponding MIC/LINE inputs. Ideally, the rotary control is set to a value in the area of its center position (0 dB). This provides you with the opportunity to match different levels of different input channels. Afterwards, use the master rotary controls to set the output volume for the entire system.

5, Ducking Threshold control (DUCK THR)

This control allows separately setting the threshold of the ducking control (priority function) for MIC/LINE 1 and MIC/LINE 2. Ducking control is an automatic level detection function, which passes the audio signal of the corresponding input channel (MIC/LINE 1 or 2) through to the pre-selected outputs, while attenuating the audio signals of all other input channels - e.g. background music - by the pre-set value (ducking). The ducking threshold controls allow using the ducking function even under unfavorable conditions (e.g. when using a microphone in a noisy environment or picking up sound over wider distances). The controls are recessed-mounted in the front panel to prevent faulty operation. Accessing the controls is possible using a crosshead screwdriver.

6, Tone Control LO / HI

Each of the four MIC/LINE as well as each of the four AUX inputs has its own tone control section, which allows individually amplifying/attenuating the treble (HI) and bass (LO) by +/-15 dB. Turning the tone controls clockwise amplifies the corresponding frequency range, while turning them counterclockwise results in attenuating the corresponding frequency range. Avoid extreme settings. Generally, minor corrections of the input sound signal will achieve the best result as well as the most natural sound. The controls are recessed-mounted and can only be accessed via screwdriver, to prevent faulty operation.

7, Control AUX 1-4

Rotary controls for setting the volume level of the DRM4000's corresponding AUX inputs. Ideally, the rotary control is set to a value in the area of its center position (0 dB). This provides you with the opportunity to match different levels of different input channels. Afterwards, use the master rotary controls to set the output volume for the entire system.

8, Ducking controls A / B

These controls allow setting a value in dB by which the audio signals of the non-prioritized input channels (e.g. background music) is attenuated when the ducking function is active. Separately setting the ducking depth (attenuation rate) for the outputs A and B to any value between 0 dB (clockwise margin) and -40 dB (counterclockwise margin) is possible. The ducking controls are recessed-mounted and can only be accessed via screwdriver, to prevent faulty operation.

9, Ducking indicators A / B

A lit ducking-LED indicates that the ducking function of the corresponding channel has been activated. In other words, the audio signal of a prioritized channel (MIC/LINE 1 or 2) is connected through while the signals of all other channels (e.g. background music) are attenuated.

10, Control MASTER A / B

These volume controls of the two main outputs Master A and B allow matching the output level of the DRM 4000 to the input level of consecutive equipment - e.g. power amps or the DPM 4000. In this way they are used to set the overall volume. Generally, setting the controls to their center position (0 dB) will provide good results. If a different output level is needed, amplifying the signal by +6 dB (clockwise margin) or attenuating the signal by any amount (counterclockwise margin) is possible.

11, LED-chain Meters A / B

The two 5-segment LED-chains indicate the actual audio signal level at the MASTER-outputs A and B in steps of 10 dB within an indication range of 40 dB; the indicators signal the individual levels at the outputs OUT A and OUT B in dBu. To prevent the occurrence of distortion, set the output levels of the DRM 4000 so that at the highest signal peaks the top LED's of the chains are not lit (+20 dBu).

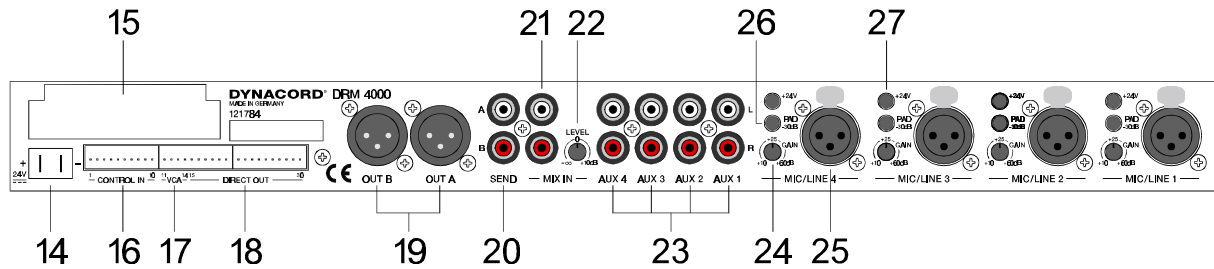
12, POWER-switch

Use this switch to switch the power of the DRM4000 on or off.

13, ON-LED

The ON-LED lights when the DRM4000's power is switched on.

CONTROLS AND CONNECTIONS



2.2 Rear Panel

14, 24 V power supply

These two 6.3mm flat-connectors are utilized to supply the DRM 4000 with an operating voltage of 24 V DC. Whenever incorporating the DRM 4000 in an intercom system, using the system's already existing supply voltage of 24 V is recommended. For stand-alone operation use the optionally available mains adapter (NRS 90257). Make sure to mind the correct polarity (+ = +24V, - = Ground) when connecting the power supply.

15, REMOTE INTERFACE port

This port allows retrofitting an optional serial interface (RS-232 or RS-485). For further detail, please refer to chapter 9.3 "How To Install Extensions".

16, CONTROL IN

These control inputs provide access to eight programmable internal states, including: signal routing, ducking control (priority function), level settings, mute, etc. Connecting it to ground activates a control input. The configuration is factory pre-set for using the DRM 4000 in a multitude of applications. Utilizing a serial interface (optionally available) allows configuring the functions of the eight control inputs via PC-software according to your personal needs. These setting can be saved in the DRM 4000. For details on the pin-assignment and an example of how connection is established, please refer to chapter 4.4.1.

17, External VCA-control

These control contacts allow the connection of two external potentiometers for remotely controlling the volume settings of Master A and B. The VCA's of the two master outputs A or B are controlled by DC-voltage. Please, keep in mind that audio levels of eventually prioritized microphones (Priority Override is enabled) are not attenuated by VCA-control. For details on the pin-assignment and an example of how connection is established, please refer to chapter 4.4.2.

18, DIRECT OUT

Each of the eight input channels (MIC/LINE single-channel and AUX two-channel) has an individual direct output. It is possible to internally assign the direct outputs to PRE (the signal path is split prior to the tone control and volume setting section) or POST (the signal path is split after the tone control and volume setting section). For details on the pin-assignment, please refer to chapter 4.3.3.

19, Master Outputs OUT A / B

These are the two balanced XLR-type outputs of the DRM 4000. They can be used as L/R-stereo or as two separate monaural outputs, depending on the configuration of the DRM4000.

20, SEND output

The pre-master A/B audio signal of the output channels is present at these two RCA-type connectors. Therefore, these outputs can be utilized for easy expanding / cascading several DRM 4000.

21, MIX IN input

This unbalanced stereo/dual input can be used connecting another mixer or an additional DRM 4000 allowing easy expanding / cascading.

22, MIX IN control

This control allows matching the level of the input signal to the MIX IN input. Setting the control to its center position (0 dB) leaves the audio signal unaltered. Turning it clockwise provides amplification of up to +10 dB while turning it counterclockwise attenuates the level accordingly.

23, AUX 1-4 RCA-type inputs

These RCA-type inputs allow connecting unbalanced Line-level signal sources, like for instance CD-Players, Cassette Decks, Tuners, etc., to the AUX 1-4 channels.

24, Gain control

These controls allow separately setting the input levels of each MIC/LINE input channel in an amplification range between +10 dB and +60 dB. It is recommended to set the input level so that it matches the desired nominal level or to match the appliance's optimum internal operation level using the gain controls. In this way you obtain the optimum S/N-ratio. In doing so make sure that the signal-LED lights constantly while, even at the loudest signal peaks, the peak-LED is just not lit.

25, MIC/LINE 1-4 XLR-type inputs

These XLR-type inputs allow connecting balanced signal sources to the MIC/LINE 1-4 channels. The inputs can be matched for use with an extremely wide level range. They are designed to accept microphone levels as well as Line-level signal sources.

26, PAD-switch

Engaging this switch attenuates the audio signals by -30 dB providing the possibility of connecting LINE and MIC signal sources to a single connector. When the switch is not engaged, the corresponding input is configured for the connection of microphones. Engaging the switch allows connecting a balanced LINE-level signal source to the corresponding XLR-type connector.

27, +24V-switch

These switches allow individually activating 24 V phantom power for each MIC/LINE-channel, which allows the connection of condenser microphones or phantom-powered paging consoles.

QUICK START

3. QUICK START

This paragraph describes in an overview the most important steps for a trouble-free operation of the DRM 4000 in your PA-system. For a more detailed description of specific functions when using the DRM 4000 in combination with the DPM 4000, please refer to chapter 6.4. For further details on the functioning and the configuration of the DRM 4000, please refer to the corresponding paragraph in the handbook.

POWER SUPPLY

Connect the DRM 4000 to a 24 V DC power source via the 6.3mm flat-connectors (14) on the rear panel.

AUDIO CONNECTIONS

Before integrating and initially operating the DRM 4000 in your PA-system, you should determine which system configuration you are using. Please refer to chapter 8 "CONFIGURING THE DRM 4000" for a wiring example for the BASIC CONFIGURATION 8-in-2 mixer as well as for notes on how to configure the DRM 4000. Please refer to the additional sheet "DRM 4000 FACTORY CONFIGURATION" for an overview of the factory pre-set assignment of the BASIC CONFIGURATION and the CONTROL INPUTS. After doing so, connect the DRM 4000 according to the chosen configuration. Do not power-on any connected audio signal source yet.

POWER ON OPERATION

After including the DRM 4000 in your PA-system and before operating it for the first time, please set the input controls MIC/LINE 1-4 (4) and AUX 1-4 (7) all the way counterclockwise, so that actually no audio signal is fed to the audio outputs. Proceed in the same way with the gain controls (24) of the input channels MIC/LINE 1-4 on the rear panel of the appliance. Set them to +10 dB (counterclockwise margin). The DRM 4000 is factory pre-configured to be used as 8-in-2 mixer, which is a universal configuration in stereo mode. In case the appliance had previously been operated, it may start-up in any other configuration.

LEVEL SETTING

Set both master controls (10) to their counterclockwise margins, so that actually no audio signal is present at the audio outputs of the DRM 4000. Now, activate the previously connected sound source. If this audio signal source is connected to one of the MIC/LINE-inputs, carefully turn the corresponding gain control (24) on the rear panel of the appliance in clockwise direction. The green SIGNAL-LED (3) indicates signal presence. If the red PEAK-LED (3) lights, reducing the input amplification by turning the gain control counterclockwise will prevent possible distortion. Now, you can turn the input control MIC/LINE (4) or AUX (7) as well as both MASTER-controls (10) clockwise. The audio signal is present at the XLR-type output connectors (19) on the rear panel of the DRM 4000 and the momentary level reading is indicated via the level-meter LED-chains (11).

4. INSTALLATION AND CONNECTIONS

4.1 General Notes

Achieving the best results possible with your DRM 4000 is only doable when making sure that all connections are in perfect order. For operating the appliance, connect its power supply via the flat-connectors on the rear panel to a 24 V DC power source. When incorporating the DRM 4000 in a PA or intercom system, using the already present 24 V supply voltage is recommended. For including the DRM 4000 in other applications, please use the optionally available mains adapter (NRS 90257). The adapter includes a universal input power supply with matching AMP-connectors, which directly fits the power supply connection (14) of the DRM 4000.

CAUTION: When establishing the power supply connection, make sure to connect the positive conductor (24 V) to the +24V-input of the DRM 4000 and the negative conductor (Ground) to the negative input.

To prevent any trouble with temperature, providing sufficient ventilation is as advisable as not to operate the DRM 4000 in environments with ambient temperatures exceeding 40°C. One Height-Unit is necessary for rack-installation. Normally, in this case, there are no special measures, like rack blinds, for ventilation necessary. Like with any other LF-signal processing unit, it is not recommended to install or operate the DRM 4000 directly above or below any device that generates a massive magnetic field; e.g. power amplifiers. In this way the risk of unwanted interference is reduced to a minimum. Before switching the DRM 4000's power on, make sure that all necessary connections have been established. Start with connecting all microphones and other audio signal sources to the inputs of the DRM 4000. Then proceed with connecting the outputs of the DRM 4000 with the inputs of any consecutive device, e.g. power amplifier or DPM 4000. Make sure to also connect the direct-outs, if you are using them.

IMPORTANT:

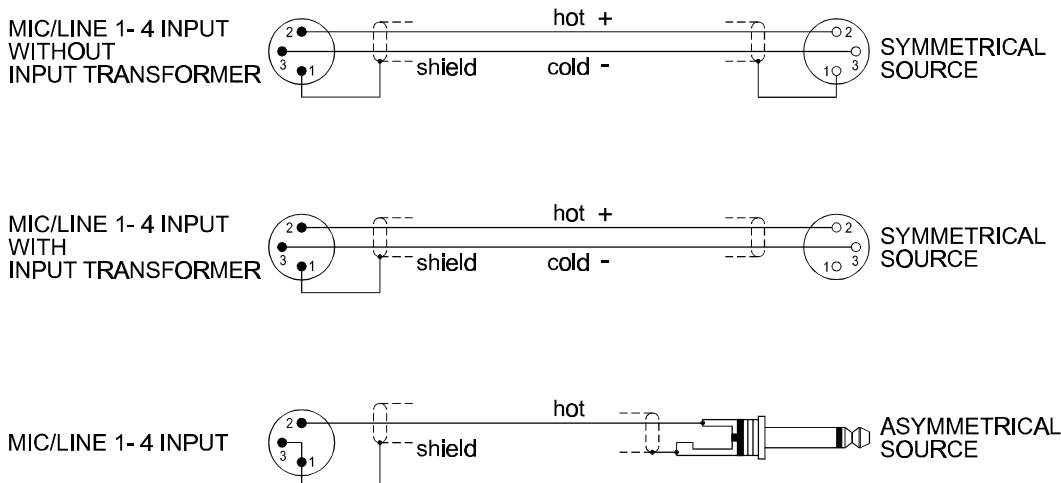
- Always use high-performance, properly shielded cables.
- When establishing connections (especially input connections) make sure that the connection cords do not exceed 10 m in length to prevent the loss of treble frequencies.

4.2 Input Assignment

4.2.1 MIC/LINE inputs

The MIC/LINE-inputs (1 and 25) are provided via XLR-type sockets. The pin-assignment for the XLR-type plugs to be connected has to be: pin 1 = ground (shield), pin 2 = hot (+), pin 3 = cold (-). In case that the inputs are galvanic separated via transformers (NRS 90233), do not connect the shield to the ground of the sending device. The MIC/LINE 1-4 inputs can also be used with unbalanced signal sources. If so, please mind the following pin-assignment: pin 1 = ground (shield), pin 2 = hot (+). For avoiding a signal level attenuation by 6 dB, please interconnect the pins 1 and 3 inside the XLR-type plug. However, if this causes noise interference, remove the bridge again.

The following shows examples for balanced and unbalanced pin-assignments for audio cables, like they are commonly used with the DRM 4000.



INSTALLATION AND CONNECTIONS

4.2.2 AUX and MIX IN inputs

The four AUX-inputs (2 and 23) and the MIX IN-input (21) are provided via RCA-type jacks, which allows the direct connection of common unbalanced audio equipment (CD-Player, Tape Deck, Tuner, etc.). Usually, the needed connection cords are supplied together with the corresponding device. They are also available at basically any electronics store. Especially when using unbalanced cables, cable length matters: the shorter the cable, the smaller the risk of gaining additional noise interference.

4.3 Output Assignment

4.3.1 MASTER outputs

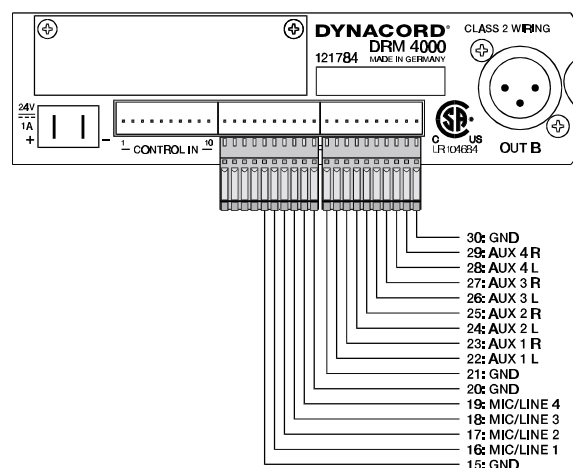
The two low-impedance MASTER outputs (19) are electronically balanced and provided via XLR-type connectors, which allows the use of longer cables. All summed MIC/LINE, AUX and MIX IN input signals are outputted via the MASTER outputs. When the DRM 4000 is used in stand-alone operation, the MASTER outputs are typically connected to the inputs of an external power amplifier. When incorporating the DRM 4000 in an intercom system, the MASTER outputs are connected to the inputs of the consecutive central unit (e.g. DPM 4000 or mixer / router).

4.3.2 SEND outputs

The Pre-Fader Master A/B signals are present at the SEND outputs (20) carrying the summed audio signals with the volume levels being independent from the setting of the MASTER controls. Therefore, when connecting the SEND OUT to the MIX IN of a following unit, allows comfortably cascading several DRM 4000 units, which of course doubles the amount of available input channels. For the case that additional input channels are needed cascading up to eight DRM 4000 units is possible. Using the SEND outputs for any other application that requires a summed signal input is possible as well. Examples for such applications are: the connection of open reel recorders, tape decks, or DAT / Minidisc devices for recording purposes as well as the incorporation of a monitor power amplifier or an active monitor speaker system. Since the SEND outputs are unbalanced, cable length matters. Using long cables is not recommended.

4.3.3 DIRECT OUTPUTS

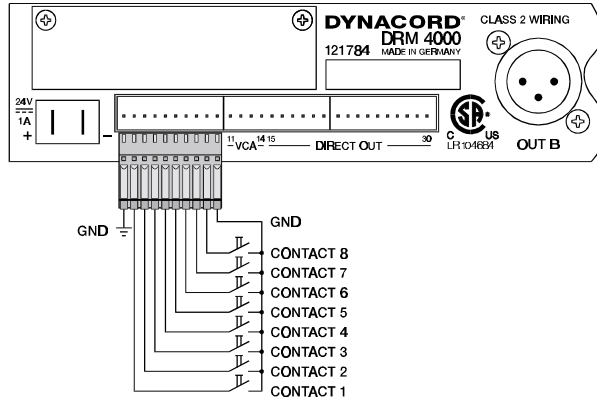
The eight input channels provide DIRECT OUTPUTS (18) each. 12 unbalanced, low-impedance outputs are provided via the Phoenix-type terminal on the rear of the appliance (4 x MIC/LINE and 4 x 2 AUX), allowing separately outputting the input signals for pre-listening / monitoring or other signal-routing purposes. Internal Jumper provide the possibility to individually select for each input channel whether its DIRECT OUT signal path is split PRE - before entering the tone control and volume setting stage - or POST. For details on the location of the wire-bridges that are used for PRE/POST-switching, please refer to chapter 9.1.2. For details on the pin-assignment of the DIRECT OUT connectors, please refer to the following diagram. Make sure to use shielded LF-cables.



4.4 Control Inputs

4.4.1 CONTROL INPUTS

The CONTROL INPUTS (16) are eight freely configurable control inputs, which are provided via Phoenix-type terminals on the rear of the appliance. Closing (connection to ground) a control contact switches to the corresponding configuration (preset). Simultaneously closing several contacts selects the preset with the highest priority setting. When all control inputs are open (idling mode), the DRM 4000 is set to its BASIC CONFIGURATION.

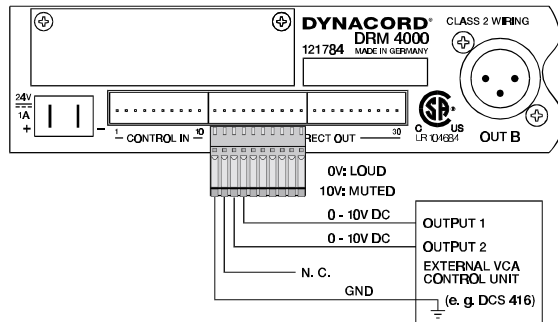
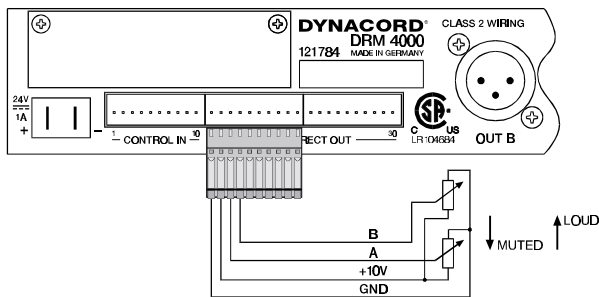


As shipped, the configurations of the eight control inputs have been factory-pre-programmed for using the DRM 4000 in a multitude of applications. For further detail, please refer to chapter 8 and to the additional information sheet "DRM 4000 FACTORY CONFIGURATION".

Employing the optionally available interface boards (NRS 90256 for RS-485 or NRS 90258 for RS-232) together with the "DRM 4000 Editor" software lets you freely configure and store the 8 control inputs according to your personal requirements; accessible parameters are: routing, ducking control, muting and VCA. Additionally, assigning individual priorities to each contact is possible. This allows you to establish security-relevant settings using the "Priority Override" function; e.g. routing for alert announcements. For an exact description of all possibilities and programming examples, please refer to chapter 7.4 "Software Description".

4.4.2 External VCA-Control

The two VCA-control inputs (17) that are carried out as Phoenix-type terminals on the rear panel of the appliance allow accomplishing voltage-controlled volume setting of the two output channels, which provides the possibility to individually and remotely set the volume levels for different rooms or areas. Volume setting is accomplished either via externally connected potentiometers or switchable resistors or via an externally generated DC-voltage (0V - 10V), where at 0V the output signal is not attenuated and at 10V the output audio signal is attenuated by 90 dB. The following example shows the wiring for remotely controlling the volume via external potentiometer as well as a second example, which shows how to remotely control the volume setting via control voltage that is generated in an external unit (DCS 416).



INITIAL OPERATION

5. INITIAL OPERATION

5.1 Power-On Operation

The POWER-switch (12) switches the power of the DRM 4000 on. The ON-LED (13) starts to light and after a short period of initialization (approx. two seconds), the DRM 4000 is ready for operation. When switching the DRM 4000 on for the first time, it is factory-pre-configured for 8-in-2-mixer operation. If the appliance had previously been operated, it may start-up in another configuration.

Make sure to set the MASTER A / B volume controls to their counterclockwise margin before switching the appliance's power on, to prevent unintentionally outputting extreme high signal levels or even feedback noise. For configuring the DRM 4000 according to your system setup, please consult the enclosed information sheet "DRM 4000 FACTORY CONFIGURATION" for a matching configuration. If so, you can easily select the configuration by establishing the corresponding assignment of the CONTROL INPUTS at the DRM 4000 (see chapter 4.4.1). Alternatively, you can use the DRM 4000 Editor software together with an optionally available remote interface, to create and store your own configurations. For further detail, please refer to chapter 7.

5.2 Level Settings

The DRM 4000 needs to match the gain-structure of the entire audio system to achieve maximum headroom as well as minimal noise interference. One of the most important facts is that the DRM 4000 is optimally modulated starting with its first stage. Achieving the desired output volume by use of the MASTER controls while at the same time leaving the input channels under-modulated, means not optimally utilizing the unit's outstanding S/N-ratio and might lead to an increase in the audible system noise. The following chapters explain how to optimally set the levels of MIC/LINE and AUX inputs.

5.2.1 Level Adjustment for MIC/LINE-inputs

- The four MIC/LINE-inputs are provided via balanced XLR-type connectors. To optimally match a signal source to a channel input, please proceed as follows:
- Set the according channel control (4) on the unit's front panel as well as its gain control (24) on the rear of the appliance to their counterclockwise minimal positions.
- When connecting a microphone, make sure that the correspondent channel's PAD-switch (26) is not engaged (high input gain). In case you want to connect a balanced Line-level signal source, engage the PAD-switch (low input gain).
- When utilizing a microphone that needs phantom power, engage the correspondent channel's +24V-switch (27). For all other cases, the 24V-switch has not to be engaged. Especially when connecting unbalanced signal sources, do not activate phantom power. Your external units may otherwise be damaged.
- Now, connect the desired audio signal source to the DRM 4000.
- Start the playback of your external signal source with the highest signal level or talk / sing into the microphone at the loudest pitch possible, while holding the microphone as close as possible.
- Use the gain control (25) to control the level, so that even at the loudest signal peaks the red PEAK-LED just does not light, while the SIGNAL-LED lights constantly.
- In doing so, you have established the basic setting, where the channel is well modulated, leaving at the same time sufficient headroom of at least 6dB as a reserve.
- Completing your settings, use the channel control (3) to adjust the desired volume of the individual channel and use an input channel's balance control to position the corresponding audio signal in the stereo mix. Ideally, volume controls are set to a position somewhere in the area of their center mark (0 dB), leaving you enough reserve for compensating level differences between the audio signals of various input channels.

NOTE: If the input signal is not present at the master outputs, check the following:

- Are the master controls (10) open?
- Has the corresponding MIC/LINE input been assigned to one or both output channels? Please mind and compare your actual setting and the selected configuration!
- Is ducking control active (see ducking indicators (9)) and does this maybe affect your input signal?

5.2.2 Level Adjustment for AUX-inputs

The four AUX-inputs are provided via two unbalanced RCA-type sockets each, which lets you connect either one stereo signal source (e.g. CD-Player) or two monaural signal sources per input channel. For optimally matching the signal source to the channel input, please proceed as follows:

- Set the corresponding channel control (7) on the front panel of the appliance to its counterclockwise margin.
- Now, connect the desired audio signal source using common RCA-type cables.
- When now playing the signal source with the highest signal level (e.g. loudest passage in a musical piece), the SIGNAL-LED has to light and/or blink in the rhythm of the music. The AUX-inputs are factory pre-set to a nominal sensitivity of +4 dBu, which, in combination with the channel control, is suitable for most AUX-signal sources. In case you want to connect an extremely low-output AUX-signal source, it may happen that the green signal-LED does not light up. Additionally it is possible that you are not able to gain the required volume level using the channel control. In these cases setting the AUX-input's nominal sensitivity to -6 dBu (via internal bridges) is recommended. This measure will increase the input's sensitivity by 10 dB. For further detail, please refer to chapter 9.1.3 "AUX Sensitivity Selection".
- At last, the channel's volume setting has to be achieved using the corresponding channel control (4). Ideally, volume controls are set to a position somewhere in the area of their center mark (0 dB), leaving you enough reserve for compensating level differences between the audio signals of various input channels.

6. SPECIAL FEATURES OF THE DRM 4000

6.1 Using Ducking Control

The ducking control allows the unaltered passage of audio signals of prioritized channels (MIC/LINE 1 and / or MIC/LINE 2), while at the same time the audio signals of any other non-prioritized input channels (e.g. background music) are attenuated to a pre-adjustable level value. The background music audio signal fades in smoothly upon finishing the announcement.

For using the ducking function, you have to choose a configuration that includes the option PRIORITY OVERRIDE ENABLED for one or both input channels MIC/LINE 1 and 2 (see enclosed information sheet "DRM 4000 FACTORY CONFIGURATION").

Owning one of the two optionally available interface boards lets you configure the DRM 4000 according to your personal requirements.

Please keep in mind that the ducking control automatically affects the corresponding output channel(s), to which the prioritized input channel is assigned. Using the gain control for setting the input level of a prioritized channel and while talking into the connected microphone, depending on the channel's routing, you should be able to see one or both yellow ducking-LED's (9) lighting, which indicates that the ducking function has been activated for either output channel (A or B) or for both. Otherwise, re-adjust the ducking control's threshold setting via the Ducking Threshold control (DUCK THR) (5). Turning the control in the counterclockwise direction decreases the set value while turning it clockwise increases the threshold setting.

Once the ducking threshold has correctly been adjusted (ducking-LED lights while talking into the microphone, but stays dimmed otherwise; i.e. is not automatically activated by environmental noise), use the two ducking controls (8) for setting the attenuation level of the non-prioritized input channels in the setting range between 0 dB to -40 dB. The factory pre-set value is -40 dB.

6.2 LIMITER OPERATION

The two input channels MIC/LINE 1 and 2 employ an internal limiter, which provides the extremely useful function of automatically confining the dynamic range when using the DRM 4000 in microphone applications. Peak levels are trimmed down to a pre-set value (threshold), effectively avoiding distortion and clipping like it might occur in close-miking applications. The limiter threshold is factory pre-set to +5 dBu, which in return provides a maximum output level of +15 dBu (10 dB amplification with the channel's volume control set to its clockwise margin) at the channel output. This setting is most useful for a majority of applications. Changing the limiter threshold in a range between -10 dBu and +20 dBu is possible via an internal trimmer.

For further detail, please refer to chapter 9.2.

Please keep in mind that the limiter is meant for equalizing drastic dynamic changes in microphone applications. However, correctly setting the gain control of the input stage is mandatory.

6.3 Cascading Several Units via MIX IN and SEND

Connecting the SEND output of a DRM 4000 to the MIX IN input of a second DRM 4000 doubles the amount of available input channels. The master signal of all input channels is controlled using the master controls at the DRM 4000 that is last in chain. The corresponding outputs are OUT A and OUT B of that "last" DRM 4000. When employing the MIX IN input for this special purpose, set the MIX IN control to its 0 dB-mark. This ensures that the level-ratio is maintained over all units in the chain. Following this principle it is possible to cascade up to 8 DRM 4000 units.

However, when cascading several DRM 4000 units, because of their unbalanced design, make sure not to use long cables for connecting the SEND outputs to the MIX IN inputs. Ideally, all cascaded DRM 4000 units are installed underneath each other in a single rack.

6.4 Using The Unit Together With The DPM 4000

The DRM 4000 is an ideal inputs extension for the DPM 4000. Audio connections between the two units are established using balanced cables with XLR-type connectors.

Using the optionally available RS-485 remote-interface NRS 90256 allows connecting the DRM 4000 to the DPM 4000 for control purposes. This allows using the DPM 4000's Designer software to comfortably control, configure and save the following parameters: routing, ducking control, preset switching, output levels control.

7. SOFTWARE EDITOR DRM 4000

The Software Editor DRM 4000 is shipped together with the optionally available extension-kit RS-232 interface (NRS 90258). The DRM 4000 editor software runs under Windows and offers possibilities to comfortably program and monitor the DRM 4000 on-line.

7.1 System Requirements

- PC with Pentium processor
- Microsoft Windows™ 95 / 98 / ME / 2000 / NT
- 32 MB RAM
- Hard disk with at least 5 MB of free storage
- Mouse
- VGA-type monitor (The software is optimized for a monitor resolution of 1024x768 pixels)
- Graphic-board, 256 colors
- RS-232 interface for serial connection to the DRM 4000

7.2 Installation Notes

- Insert the setup disk "1" into the floppy drive "A".
- Select "EXECUTE" in the Windows start menu.
- Enter the command "a:\DRM4000 Editor.exe".
- Follow the instructions during the installation routine.

7.3 PC - DRM 4000 Connection

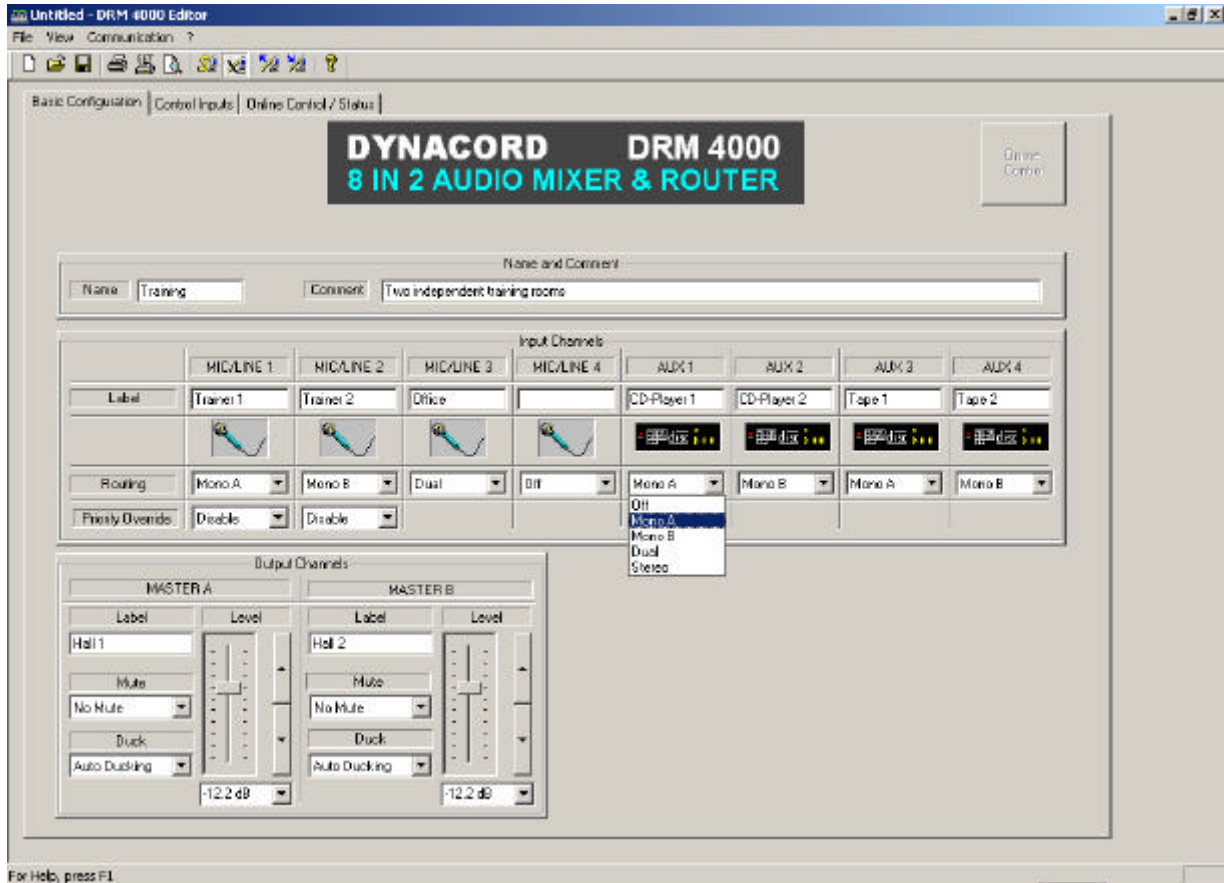
Check your PC for available COM-ports that are not assigned to any other application. The DRM 4000 Editor Software allows choosing between COM1 to COM8.

Use a custom RS-232 cable (5-pin D-type, plug-socket, 1:1) for connecting the chosen COM-port on your computer to the RS-232 interface-port on the rear panel of the DRM 4000. Before establishing the connection, make sure to switch off the power of both appliances. Otherwise, this could lead to severe hardware damage.

7.4 Software Description

7.4.1 General

The DYNACORD DRM 4000 Editor software provides an extremely easy and comfortable manner for configuring, controlling and monitoring the DRM 4000. It is possible to load, save or transfer any number of DRM 4000 configurations. Additionally, reading the actual configuration of a DRM 4000 and storing it on disk is possible as well.










The software's structure and operation is as simple as possible and mostly self-explanatory. To learn more about every aspect of the software, please read the following parts of this manual carefully.

7.4.2 Menus And The Toolbar

File Menu

New	Ctrl+N
Open...	Ctrl+O
Save	Ctrl+S
Save As...	
Print...	Ctrl+P
Print Preview	
Print Setup...	
1 dancing school.drm	
2 test.drm	
3 hotel bar.drm	
4 conference room.drm	
Exit	

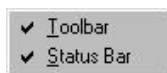
-  - Create a new file
-  - Open an already existing file
-  - Save a file
-  - Save an already existing file under a new name
-  - Print all parameters of the momentarily opened file
-  - Preview of the page to print
-  - Printer settings

- Open the last modified file

- Quit the program

SOFTWARE EDITOR DRM 4000

View Menu



- Change the status of the symbol bar - visible / invisible
- Change the status of the status bar - visible / invisible

Note:

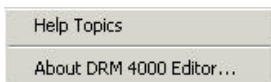
For low-resolution monitors (800 x 600 pixels or less), turning off the display of the symbol and status bars might be advantageous, leaving more space for displaying the main window and therefore might lessen the need for scrolling.

Communication Menu



- Select the desired COM-port
- Open the RS-232-monitor
- Establish data-communication with the DRM 4000
- Quit data-communication with the DRM 4000
- Transfer data from the PC to the DRM 4000
- Receive data from the DRM 4000
- Display the DRM 4000's firmware version (only possible when in on-line mode)

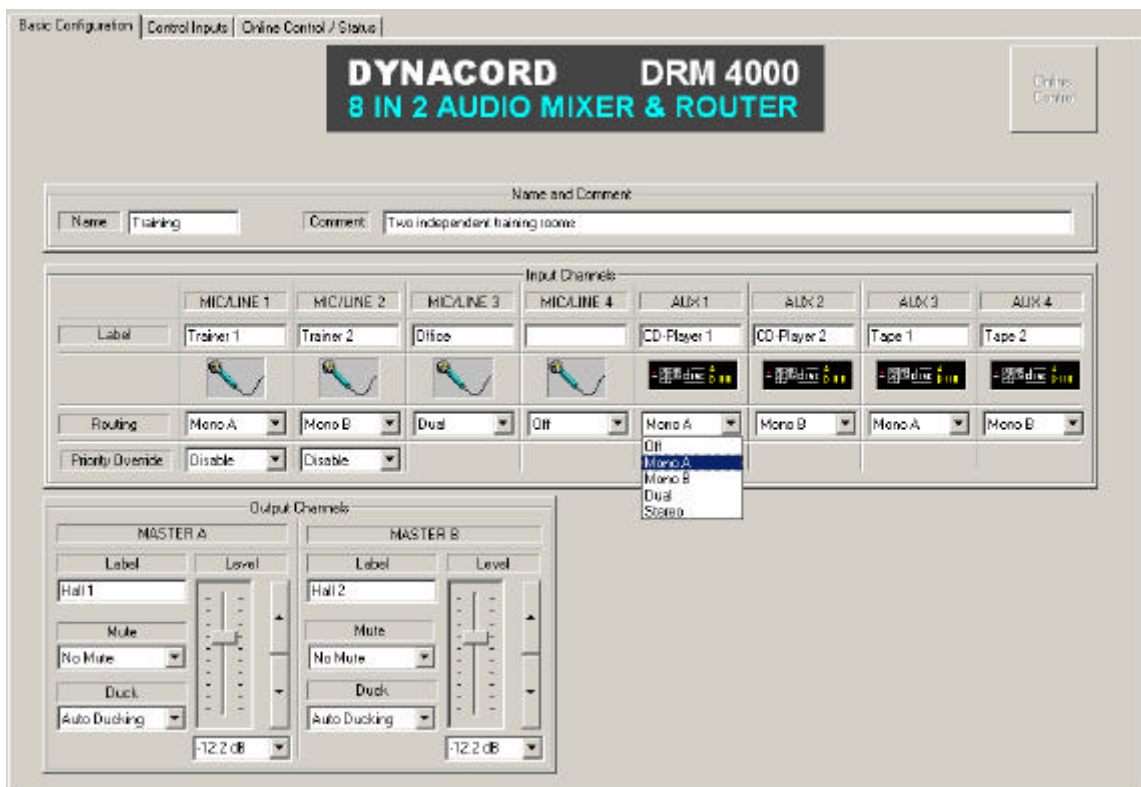
About Menu



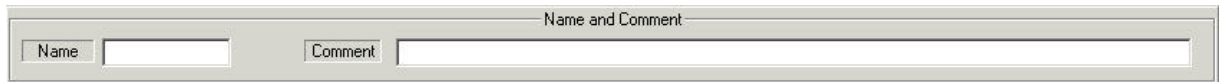
- Provides general information about the DRM 4000 Editor software

7.4.3 Basic Configuration

The parameters to be set here represent the mixer's basic configuration, which is always active when none of the DRM 4000's contact inputs are engaged. When the DRM 4000 is connected to your PC, using the "Online Control"-soft key allows establishing any settings in real-time.



Name and Comment



Here one can provide each contact and the basic configuration with a name and with a comment.

MIC/LINE-inputs



- **Label:** provides the possibility to assign individual names to corresponding the MIC/LINE-inputs.
- **Routing:** allows assigning the microphone/Line-level input signal to output A (Mono A), output B (Mono B), both outputs (Dual) and none of the outputs (Off).
- **Priority Override:** the first two microphone/Line-level inputs offer the possibility for automatically controlled attenuation of the input channels that are assigned to the identical output (ducking control); i.e. the input signal of the first two input channels controls the output level of the other channels. Enabling or disabling the function is possible.

Note:

Ducking and Priority Override settings can be made on the front panel of the DRM 4000. For further detail, please refer to the corresponding chapter of this owner's manual.

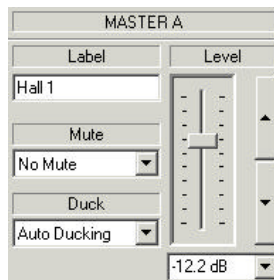
Aux-inputs



- **Label:** provides the possibility to assign individual names to the corresponding Aux-inputs.
- **Routing:** allows assigning the Aux-signal to the outputs A and B in stereo quality. Assigning the monaural summed L/R-signals to output A (Mono A), output B or to both outputs (Dual) is likewise possible. The input signal is not assigned at all when set to OFF.

Outputs

- **Label:** provides the possibility to assign individual names to the corresponding outputs.
- **Mute:** allows muting / un-muting the corresponding output signal.
- **Duck:** activating this function (ducking) attenuates the levels of the non-prioritized channels by a value previously set value on the front panel of the DRM 4000.



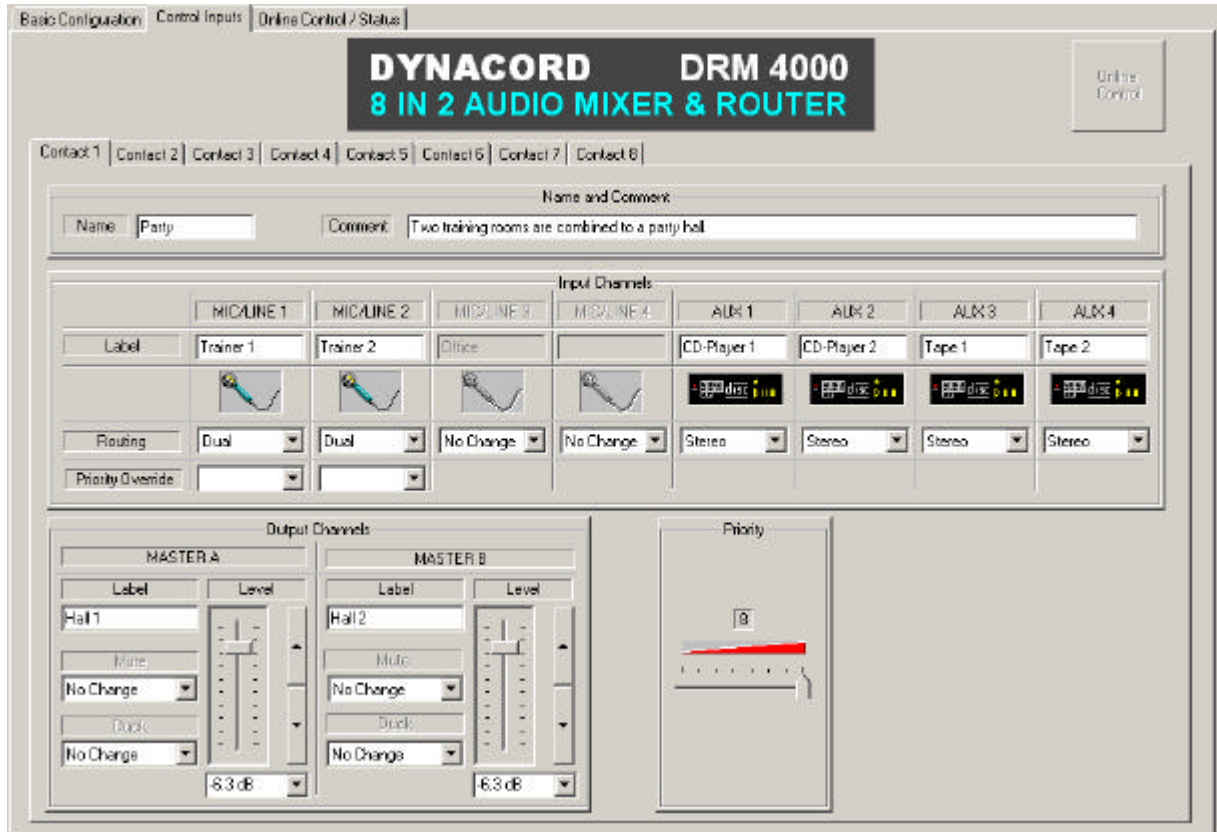
- **Level:** allows lowering a corresponding channel's level by a value of up to 90 dB. Setting is possible via soft fader or using the UP/DOWN buttons.

7.4.4 Control Inputs

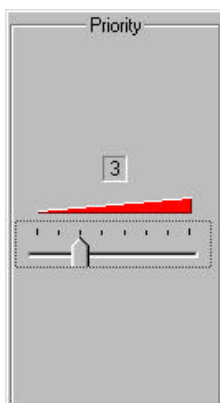
This offers the possibility for individually programming the parameters of the corresponding control input (contact 1 to contact 8). For details on individual parameters, please refer to chapter 8 "CONFIGURING THE DRM 4000".

Setting each control input parameter to "No Change" is also possible. When activating a control input, all parameters that are set to "No Change" are not altered.

When the DRM 4000 is connected to your PC, using the "Online Control"-soft key allows establishing any settings in real-time.



Priority



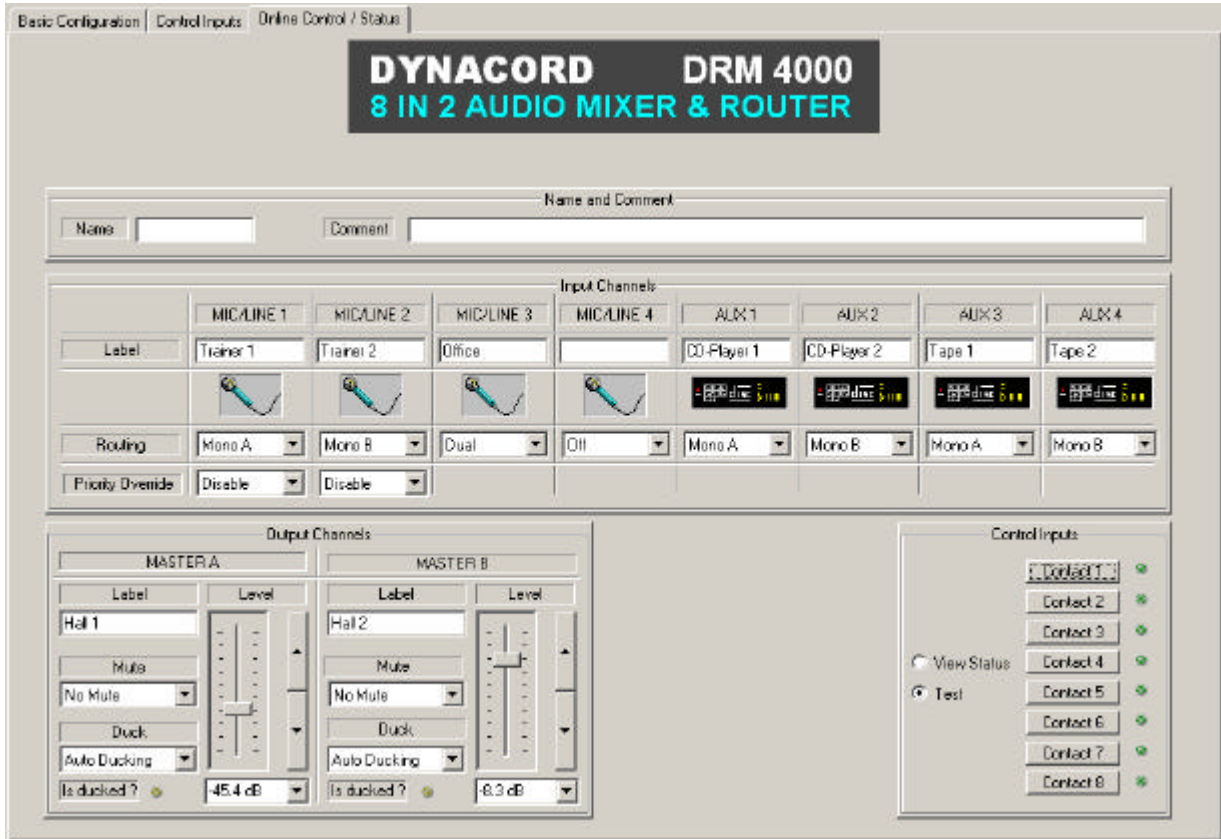
The possibility for assigning priorities to the control input is provided here. Priority 8 represents the highest priority setting while priority 1 represents the lowest setting. The control input with the highest priority setting overrules the others whenever several control inputs are active.

The BASIC CONFIGURATION always has the lowest priority (priority 0). Therefore it is active with no control input being activated.

When assigning identical priorities to two or more control inputs, the last set overrules the others.

7.4.5 Online Control / Status

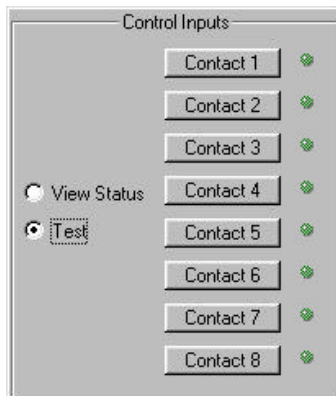
This window allows remotely controlling and monitoring the DRM 4000 in real-time. It also offers the possibility to test the active control input configuration without the need for additional hardware. An active RS-232-connection between your computer and the DRM 4000 is necessary to be able to access this functionality. For details on individual parameters, please refer to chapter 8 "BASIC CONFIGURATION".



Control Inputs

View Status

Activating "View Status" displays for all parameters the momentarily active state of the DRM 4000. The green LED's next to the corresponding soft keys indicate the momentarily active control inputs.



Test

Activating "Test" allows the simulation of setting control inputs by pressing the according soft keys. The green LED's next to the corresponding soft keys indicate the momentarily active control inputs and parameter fields as well show the actual active status of the DRM 4000. The mixer behaves as if a control input had been set via hardware. As long as the DRM 4000's test mode is active, actually setting control inputs via hardware does not show any effect. When canceling the RS-232-connection between computer and DRM 4000, automatically cancels the test mode after approximately 3seconds. The DRM 4000 returns to normal operation mode.

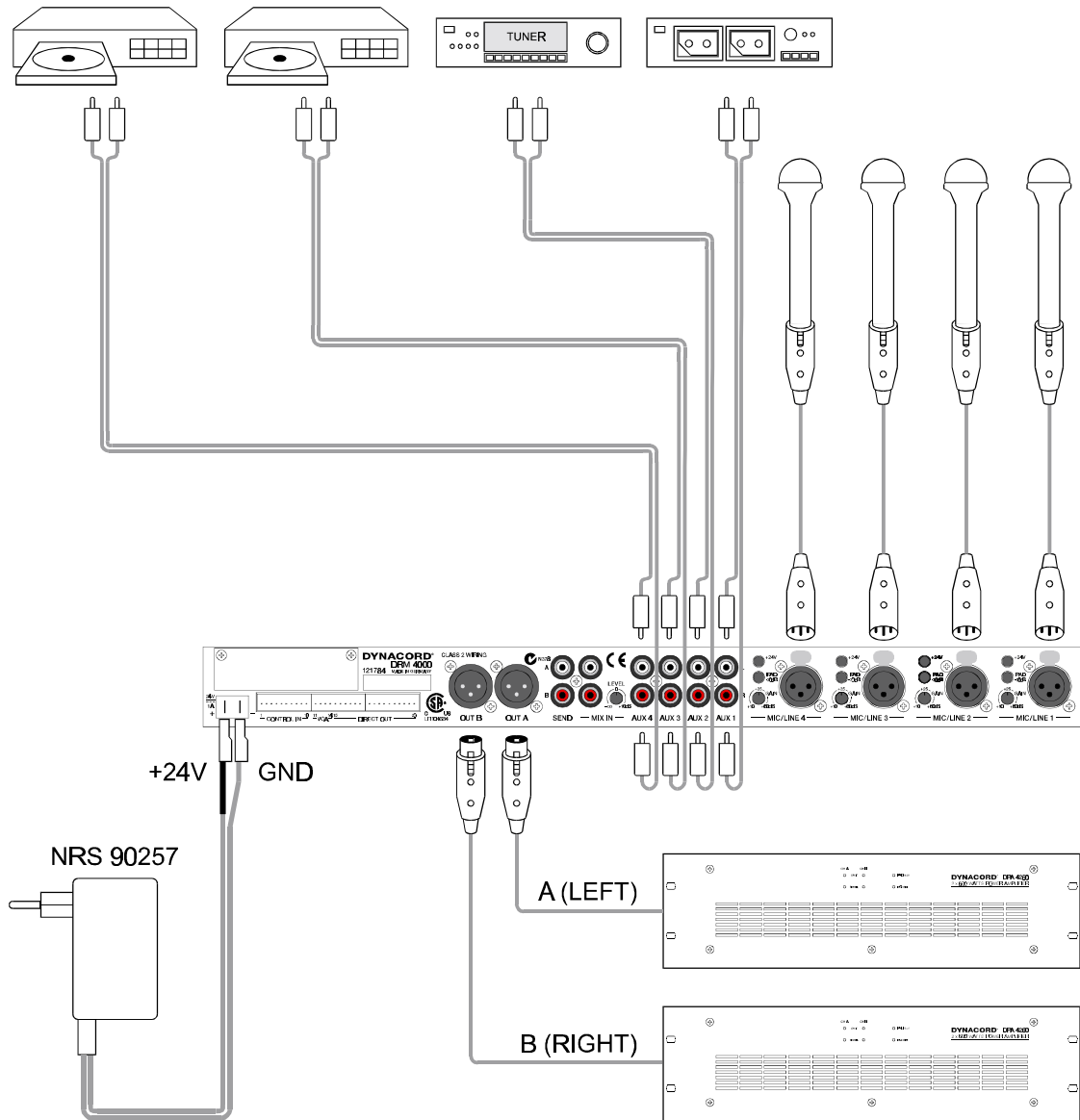
Remotely controlling the DRM 4000 is independent of the fact whether "View Status" or "Test" has been activated or not, as long as the RS-232 connection is active.

CONFIGURING THE DRM 4000

8. CONFIGURING THE DRM 4000

The DRM 4000's BASIC CONFIGURATION is active whenever no CONTROL INPUT is connected to ground. The DRM 4000's factory-pre-set BASIC CONFIGURATION is 8-in-2 mixer.

The following example shows the wiring for a typical 8-in-2 mixer application of the DRM 4000.



The freely programmable CONTROL INPUTS allow switching to other configurations. Therefore, the corresponding CONTROL INPUT needs to be connected to ground. The eight CONTROL INPUTS are factory-pre-set to the empirically most frequently used configurations. In most cases, using the configurations described in the additionally supplied leaflet **DRM 4000 FACTORY CONFIGURATION** will provide a solution for most common applications. For individually programming BASIC CONFIGURATION and CONTROL INPUTS, please refer to chapters 6.4 and 7.

Legend to the table on the DRM 4000 FACTORY CONFIGURATION leaflet:

BASIC CONFIGURATION:		The BASIC CONFIGURATION is active when no CONTROL INPUT is connected to ground. The BASIC CONFIGURATION always has the lowest priority.
CONTACT 1-8:		The DRM 4000's active configuration accords to the CONTROL INPUT, which is connected to ground, as long as no other CONTROL INPUT with a higher priority setting is connected to ground.
PRIORITY:		Each CONTROL INPUT has an assigned PRIORITY between 1 and 8. PRIORITY 0 - the lowest priority level - relates to the BASIC CONFIGURATION. The CONTROL INPUT with the highest priority setting is the active one (PRIORITY 8 represents the highest priority level) when several CONTROL INPUTS are connected to ground.
Routing:	Off	The input signal is not assigned to any output.
	Mono A	The input signal is only assigned to output A. AUX-inputs are summed for monaural output.
	Mono B	The input signal is only assigned to output B. AUX-inputs are summed for monaural output.
	Dual	The input signal is assigned to the outputs A and B. AUX-inputs are summed for monaural output via the outputs A and B.
	Stereo	AUX-input L is assigned to output A while AUX-input R is assigned to output B. (this option is only available for AUX-inputs)
	No Change	The control input parameters are not changed from the BASIC CONFIGURATION.
Mute:	No Mute	The output signal is connected through to the masters A resp. B.
	Mute On	Output relays switch the output signal off of masters A resp. B.
	No Change	The control input parameters are not changed from the BASIC CONFIGURATION.
VCA:		The MASTER outputs A resp. B are attenuated by the according value in dB.
Priority Override:	Enable	MIC/LINE-input activates ducking control.
	Disable	MIC/LINE-input does not activate ducking control.
Ducking:	Ducking Active	Ducking control is activated by the contact.
	Auto Ducking	Ducking control is automatically activated, when the level in MIC/LINE 1 or 2 is exceeding the Ducking Threshold (automatic level detection function). Please note, that is a precondition routing MIC/LINE 1 or 2 to the corresponding Master output and setting the parameter Priority Override to Enable.
	No Change	The control input's parameters are not changed from the BASIC CONFIGURATION.

INTERNAL SETTINGS

9. INTERNAL SETTINGS / EXTENSIONS

CAUTION: The following instructions for installing and setting extensions are meant for the qualified service technician only. In case you are not qualified for carrying out the described tasks, please contact your dealer for further assistance.

Do not perform any maintenance that is not explained in this owner's manual. Otherwise you will risk injury through shock hazard. Leave all servicing and maintenance to the experienced and qualified service technician.

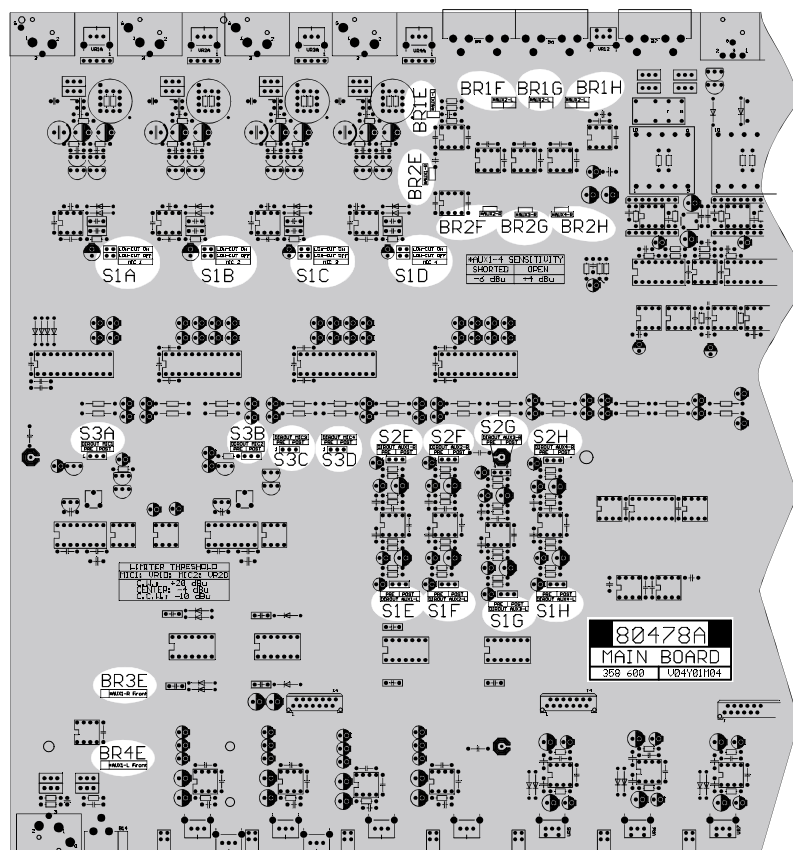
To be able to make changes to internal settings or retrofit extension you have to open the DRM 4000. To do so, please proceed as follows:

1. Switch off the power of the DRM 4000 and disconnect the mains cord.
2. Loosen the screws of the cover plate (2 frontal screws on the top plate, 2 rear screws on the top plate) and remove the cover by lifting the rear and pulling the entire plate off in the rear direction.
3. When changing settings and/or installing extensions, painstakingly follow the provided instructions.
4. Reattach the cover plate by fitting its front while slightly lifting the rear. Now, slide the cover plate to the front, so that it slides approximately 7 mm under the front panel. While lowering the cover plate's rear, make sure that the frontal lug fixes the small, upright indicators printed board assembly in place while the cover plate's rear notch fixes the small, upright printed board assembly in the area of the MIC/LINE-inputs in place. Afterwards, tighten the four cover plate locking screws again.

9.1 Internal Configuration Possibilities

Several internal configurations of the DRM 4000 have to be carried out inside of the enclosure - either by jumper setting or via Cut&Solder-bridges on the main-PCB. The following table provides an overview of the internal configuration possibilities and corresponding factory settings.

Funktion	Settings	Factory Settings
Low Cut Filter (MIC/LINE 1 - 4)	ON / OFF	ON
DIRECT OUTPUTS (Kanäle 1 - 8)	PRE / POST	POST
AUX Empfindlichkeit (AUX 1 - 4)	-6 / +4 dBu	+4 dBu



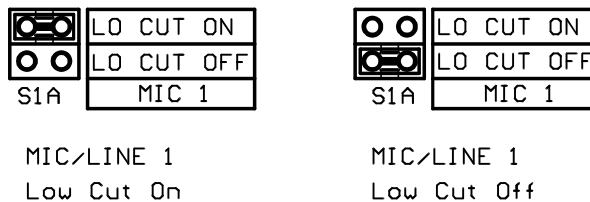
9.1.1 Low Cut Filter

The four MIC/LINE-inputs provide switch-able Low Cut filter (85 Hz / 12 dB per octave), which cut-off frequencies below 85 Hz. The use of the Low Cut filters is especially recommendable for microphone applications, effectively eliminating low-frequency feedback and ambient sound as well as popping sounds, which results in increased vocal intelligibility. An additional side-effect is that your power amplifier and loudspeaker systems do not have to handle unwanted low-frequency signals cluttering your entire sound system.

The Low Cut filters in the MIC/LINE-input channels are enabled in the factory pre-set state. They can be disabled via internal jumpers when, for instance, connecting LINE-level signal source.

MIC/LINE Channel	Jumpers
1	S1A
2	S1B
3	S1C
4	S1D

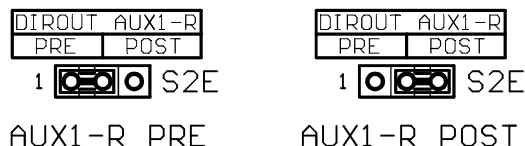
The following diagram exemplarily shows the jumper settings of the MIC/LINE 1 Low Cut filter.



9.1.2 DIRECT OUTPUTS

The DIRECT OUTPUTS of the eight input channels are factory pre-set to POST, e.g. the input signals are present at the DIRECT OUTPUTS after passing through the corresponding channel's control stage (tone control, volume setting). If you would like to have the signals not being affected from the channel controls, you may want to change the DIRECT OUTPUTS setting to PRE. To do so, refer to the diagram on page 9.1 (overview - jumpers and Cut&Solder-bridges) for locating the corresponding jumper on the printed board assembly and set the corresponding jumper(s) according to the following table. Refer to the diagram below the table for an example of the PRE / POST jumper settings of AUX1-R.

Input Channel	Jumpers
MIC/LINE 1	S3A
MIC/LINE 2	S3B
MIC/LINE 3	S3C
MIC/LINE 4	S3D
AUX1	L: S1E, R: S2E
AUX2	L: S1F, R: S2F
AUX3	L: S1G, R: S2G
AUX4	L: S1H, R: S2H

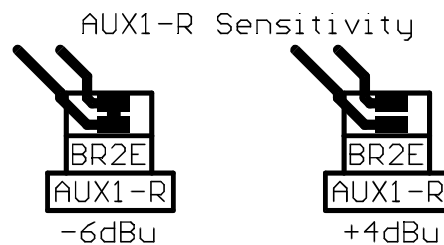


INTERNAL SETTINGS

9.1.3 AUX Sensitivity Selection

If necessary, changing the sensitivity of the AUX-input channels from the factory pre-set of +4 dBu (1,23 V) to -6 dBu (0,39 V) is possible via Cut&Solder-bridges. This may be desirable when using low-level signal sources (e.g. older open-reel tape decks). In those cases, the control range of the channel control resulting from the factory setting may not be sufficient because the channel control is already set to its maximum clockwise position and the outputted signal still is not loud enough. Refer to the following table for selecting the corresponding Cut&Solder-bridge of the AUX-channel, for which you want to change the sensitivity setting to -6 dBu. Refer to the diagram on page 9.1 (overview - jumpers and Cut&Solder-bridges) to locate the bridge on the printed board assembly. Use a low-power soldering iron to close the corresponding Cut&Solder-bridge. Refer to the diagram below the following table showing the Cut&Solder-bridge of AUX1-R and the two settings, +4 and -6 dBu.

Input Channel	Cut&Solder Bridges
AUX1 frontseitig	L: BR3E, R: BR4E
AUX1 rückseitig	L: BR1E, R: BR2E
AUX2	L: BR1F, R: BR2F
AUX3	L: BR1G, R: BR2G
AUX4	L: BR1H, R: BR2H



9.2 Limiter Settings

For adjusting the limiters in the input channels MIC/LINE 1 and 2, please proceed as follows:

- Open the DRM 4000 by following the description provided in the preamble to chapter 9.
- Locate the trimmers VR1D (MIC/LINE 1) and VR2D (MIC/LINE 2) on the left-hand side of the main printed board assembly.
- Adjust the limiter threshold according to your personal requirements. Let the following points be to your guidance:
 - * left margin: -10 dBu
 - * center position: -4dBu
 - * right margin: +20 dBu (Limiter deactivated)
- Reattach the cover plate by following the description provided in the preamble to chapter 9.

9.3 HOW TO INSTALL EXTENSIONS

9.3.1 How to install the Input Transformer (NRS 90233, EDP-No. 121 682)

Contents NRS 90233:

1 x Input Transformer DCN340955

Installation Instructions NRS 90233:

1. Turn off the power of the DRM 4000 and open the cover plate as described before.
2. For installation of the transformer you first have to remove the printed board assembly 80478 (MAIN BOARD). Start with removing the EQ-board 82228.1 by loosening its three locking-screws and tipping the small board over to the rear. Now, loosen all screws of the printed board assembly 80478 (15 screws on the rear panel and 3 screws on the front panel, which lock the sockets in place, 7 screws and 3 bolts on the printed board assembly itself). Also loosen the two locking screws of the front panel on the bottom plate of the appliance. Remove the potentiometer-caps from the 8 channel controls and the 2 master controls by pulling them off to the front. Detach the front panel. If an interface-board has previously been installed, remove it temporarily. After slightly lifting the front of the printed board assembly 80478, pull it to the front of the appliance so that the connectors are free of the rear panel. Now, you are able to remove the printed board assembly 80478 so that it is accessible for installing the transformer.
3. Remove the two resistors of the corresponding input channel (MIC/LINE 1: R1A / R2A, MIC/LINE 2: R1B / R2B, MIC/LINE 3: R1C / R2C, MIC/LINE 4: R1D / R2D).
4. Using a suction pump, clean the holes for installing the transformer (9 holes per transformer) as well as the holes of the previously removed resistors from soldering tin.
5. Insert the transformer into the prepared holes (position T1A for MIC/LINE 1, position T1B for MIC/LINE 2, position T1C for MIC/LINE 3 and position T1D for MIC/LINE 4)
6. Solder the contacts of the corresponding transformer to the printed board assembly (9 soldering points per transformer).
7. Reinsert all printed board assemblies and reattach the front panel following the opposite manner of their removal. Make sure to fit all connectors and LED's into the according holes in the front and rear panel. Tighten all locking-screws. Reinsert the interface-board, if you have previously removed it.
8. Re-install the cover plate as described above.

INTERNAL SETTINGS

9.3.2 How to install the Output Transformer (NRS 90227, EDP-No. 121 679)

Contents NRS 90227:

1 x Output Transformer DCN354596

Installation Instructions NRS 90227:

1. Turn off the power of the DRM 4000 and open the cover plate as described before.
2. For installation of the transformer you first have to remove the printed board assembly 80478 (MAIN BOARD). Start with removing the EQ-board 82228.1 by loosening its three locking-screws and tipping the small board over to the rear. Now, loosen all screws of the printed board assembly 80478 (15 screws on the rear panel and 3 screws on the front panel, which lock the sockets in place, 7 screws and 3 bolts on the printed board assembly itself). Also loosen the two locking screws of the front panel on the bottom plate of the appliance. Remove the potentiometer-caps from the 8 channel controls and the 2 master controls by pulling them off to the front. Detach the front panel. If an interface-board has previously been installed, remove it temporarily. After slightly lifting the front of the printed board assembly 80478, pull it to the front of the appliance so that the connectors are free of the rear panel. Now, you are able to remove the printed board assembly 80478 so that it is accessible for installing the transformer.
3. Remove the two resistors of the corresponding output channel (OUT A: R21R / R22R, OUT B: R61R / R62R).
4. Using a suction pump, clean the holes for installing the transformer (10 holes per transformer) as well as the holes of the previously removed resistors from soldering tin.
5. For OUT A insert the transformer into the prepared holes at position T1R, for OUT B insert it at position T2R. Make sure that the transformer's pin marked as pin 1 fits into the hole on the printed board assembly, which is also marked as hole 1.
6. Solder the contacts of the corresponding transformer to the printed board assembly (10 soldering points per transformer).
7. Reinsert all printed board assemblies and reattach the front panel following the opposite manner of their removal. Make sure to fit all connectors and LED's into the according holes in the front and rear panel. Tighten all locking-screws. Reinsert the interface-board, if you have previously removed it.
8. Re-install the cover plate as described above.

9.3.3 How to install Interface-Boards:

RS-485 Interface (NRS 90256, EDP-No. 121 785)

RS-232 Interface (NRS 90258, EDP-No. 121 790)

Contents NRS 90256:

1 x Notes leaflet NRS 90256

1 x Printed board assembly 80475 including blind for the rear panel and connection cord

2 x Locking-screws

Contents NRS 90258:

1 x Notes leaflet NRS 90258

1 x Printed board assembly 80479 including blind for the rear panel and connection cord

1 x 3,5" Disk with Software DRM 4000 Editor

2 x Locking-screws

Installation Instructions NRS 90256, NRS 90258:

1. Turn off the power of the DRM 4000 and open the cover plate as described before.
2. Loosen the blind on the rear panel (2 screws on the rear).
3. Install the extension printed board assembly replacing the blind.
4. Tighten the two screws on the rear panel.
5. Connect the printed board assembly to the connection board CN10 on the printed board 80478 (MAIN BOARD) using the supplied 20-pole connection cord.
6. Reinstall the cover plate as described above and switch the power on. Upon switching the power on, the newly installed interface-board is automatically recognized.

SPECIFICATIONS

10. SPECIFICATIONS

10.1 Specifications

Supply Voltage	24 V DC (21.6 .. 31.2 V DC)
Nom. Power Consumption (24 V)	700 mA
Max. Power Consumption (24 V)	975 mA
Audio Inputs	4 x MIC / LINE, 4 x AUX, 1 X MIX IN
MIC/LINE Inputs	XLR-type connectors, electronically balanced, transformer optionally available
Nom. Input Level	MIC: -60 .. -10 dBu / 0.8 mV .. 245 mV LINE: -30 .. +20 dBu / 25 mV .. 7.75 V
Max. Input Level	MIC: +11 dBu / 2.75 V LINE: +30 dBu / 24.5 V
Input Impedance	MIC: 3.6 k ohms LINE: 10 k ohms
Common Mode Rejection	> 50 dB
Limiter Operating Range	-10 dBu .. +20 dBu (MIC/LINE 1 & 2)
AUX Inputs	2 x RCA-type connectors each, unbalanced
Nom. Input Level	-6 dBu respectively +4 dBu / 390 mV respectively 1.23 V, internally configurable
Max. Input Level	+15 dBu respectively +25 dBu / 4.4 V respectively 13.8 V
Input Impedance	> 19 k ohms
MIX Input	2 x Cinch, unbalanced
Nom. Input Level	0 dBu / 775 mV
Max. Input Level	+21 dBu / 8.7 V
Input Impedance	22 k ohms
Audio Outputs	
Master Output A/B	XLR-type connectors, electronically balanced, transformer optionally available
Nom. Output Level	0 dBu / 775 mV
Max. Output Level	+21 dBu / 8.7 V
Output Impedance	< 120 ohms
Nom. Load Impedance	600 ohms
Send Output	2 x RCA-type connectors, unbalanced
Nom. Output Level	0 dBu / 775 mV
Max. Output Level	+21 dBu / 8.7 V
Output Impedance	< 100 ohms
Direct Outputs	Phoenix Micro-Combicon pin terminal, unbalanced
Nom. Output Level	0 dBu / 775 mV
Max. Output Level	+21 dBu / 8.7 V
Output Impedance	< 100 ohms
Frequency Response	20 Hz - 20 kHz (- 1.0 dB)
S/N Ratio	> 100 dB
THD MIC/LINE	< 0.03 % (without transformer) < 0.08 % (with transformer)
THD AUX	< 0.01 %
Tone Control	LO ± 15 dB / 60 Hz HI ± 15 dB / 13 kHz
Low Cut	85 Hz / 12 dB per octave slope
Environmental temperature	+5°C.....+40°C
Dimensions	483 x 43.6 x 351 (W x H x D in mm), 19", 1HU
Weight	4.7 kg / 10.4 lbs
Extensions	NRS 90233 input transformer (121 682) NRS 90227 output transformer (121 679) NRS 90257 mains adapter (121 789) NRS 90256 RS-485 interface (121 785) NRS 90258 RS-232 interface (121 790)

Subject to change without prior notice

10.2 User Configuration

DRM 4000 USER CONFIGURATION

	INPUT CHANNELS								OUTPUT MASTER		BLOCK DIAGRAM
	MIC/LINE 1	MIC/LINE 2	MIC/LINE 3	MIC/LINE 4	AUX 1	AUX 2	AUX 3	AUX 4	A	B	
BASIC CONFIGURATION (NO CONTACT CLOSED)											
ROUTING											
PRIORITY OVERRIDE			-	-	-	-	-	-			
VCA											
DUCKING											
MUTE											
CONTACT 1											
ROUTING											
PRIORITY OVERRIDE			-	-	-	-	-	-			
VCA											
DUCKING											
MUTE											
CONTACT 2											
ROUTING											
PRIORITY OVERRIDE			-	-	-	-	-	-			
VCA											
DUCKING											
MUTE											
CONTACT 3											
ROUTING											
PRIORITY OVERRIDE			-	-	-	-	-	-			
VCA											
DUCKING											
MUTE											
CONTACT 4											
ROUTING											
PRIORITY OVERRIDE			-	-	-	-	-	-			
VCA											
DUCKING											
MUTE											

SPECIFICATIONS

DRM 4000 USER CONFIGURATION

	INPUT CHANNELS								OUTPUT MASTER		BLOCK DIAGRAM
	MIC/LINE 1	MIC/LINE 2	MIC/LINE 3	MIC/LINE 4	AUX 1	AUX 2	AUX 3	AUX 4	V	B	
CONTACT 5											
ROUTING											
PRIORITY OVERRIDE			-	-	-	-	-	-			
VCA											
DUCKING											
MUTE											
CONTACT 6											
ROUTING											
PRIORITY OVERRIDE			-	-	-	-	-	-			
VCA											
DUCKING											
MUTE											
CONTACT 7											
ROUTING											
PRIORITY OVERRIDE			-	-	-	-	-	-			
VCA											
DUCKING											
MUTE											
CONTACT 8											
ROUTING											
PRIORITY OVERRIDE			-	-	-	-	-	-			
VCA											
DUCKING											
MUTE											

SPECIFICATIONS

10.4 RS-232 Interface - Programmer's Instructions

Controlling the DRM 4000 from a media control desk or from an intercom system is possible via the serial RS-232 interface (NRS 90258, 121 790) using simple ASCII-commands.

The serial RS-232 interface is set to a baud rate of 19200 with 8 data bits, 1 stop bit, no parity, Xon/Xoff protocol. The string ***** DRM4000 command mode entered ***** is outputted after switching the power on and upon initialization.

The ASCII-commands are organized in a tree structure and are separated from each other by slashes (/). Single commands can be entered using uppercase or lowercase letters. Always leave a space between ASCII-commands and values or control words respectively. Reading out parameters is initiated by entering an interrogation mark (?). A command line needs to be terminated with a Carriage Return / Line Feed (CRLF) command.

In the following, please find the descriptions of appropriate commands to be used in a variety of applications.

10.4.1 Switching Contacts Via Software

The factory pre-set configuration of the DRM 4000 (refer to the supplied leaflet: DRM 4000 FACTORY CONFIGURATION) can be used for most applications. Next to manually switching contacts on the hardware itself, switching contacts via the following software commands is possible as well.

In case, the DRM 4000 FACTORY CONFIGURATION does not provide any configuration example that suits your particular application, custom configuring of the DRM 4000 is possible. Therefore, connect the DRM 4000 to your PC and use the DRM 4000 EDITOR software, which is supplied together with each extension-kit. For detailed explanation, please refer to chapter 7. Connect the DRM 4000 with your media control afterwards and utilize the contact control commands as described in the following:

ASCII-command	Comment
/SERVICE/HB value e.g.: /SERVICE/HB OFF ;power off /SERVICE/HB 20 ;20s timeout /SERVICE/HB ? ;value query	Value: 60 ... 0, OFF / ? Allows writing or reading a heartbeat-timeout-value. This function is for monitoring the connection between central control unit and DRM 4000. It can be compared to a watchdog function. Once the connection is interrupted or the heartbeat is not re-triggered in time, the DRM 4000 is set back to its default condition. If periodically sending the heartbeat signal for monitoring the connection is not possible or not desired, writing the value OFF at the start of a control sequence is mandatory to deactivate the heartbeat. Write access: enter the desired heartbeat-timeout-value(values 60 ... 0, equivalent to 60s - 0s) or OFF Read access: time span in seconds until the expiration of the heartbeat is returned.
/SERVICE/CC/ON value e. g.: /SERVICE/CC/ON 1,2-4 /SERVICE/CC/ON NONE /SERVICE/CC/ON ?	Value: NONE, 1-8 / ? Write access: one or more hardware contacts are activated via software. Read access: the actual status of contacts is returned. Remark: when utilizing the heartbeat (see above), after expiration of the timeout-value (= value 0) the entry is automatically set to NONE.
/SERVICE/CC/OFF value e. g.: /SERVICE/CC/OFF 1,2,6 /SERVICE/CC/OFF NONE /SERVICE/CC/OFF ?	Value: NONE, 1-8 / ? Write access: one or more hardware contacts are deactivated via software. Read access: the actual status of contacts is returned. Remark: when utilizing the heartbeat (see above), after expiration of the timeout-value (= value 0) the entry is automatically set to NONE.

10.4.2 Online-Access to all Parameters

Via RS-232 connection and using REMOTE-commands provides direct access to all DRM 4000 parameters, like routing, VCA, priority override, ducking, mute, etc. Controlling the unit is possible parallel to any other control method (hardware contact switching, software contact switching, external VCA-control), with any individual priority being recognized. For example, activating an external contact with a higher priority setting overrides actual remote settings. As soon as deactivating the contact again, all previous remote are regained.

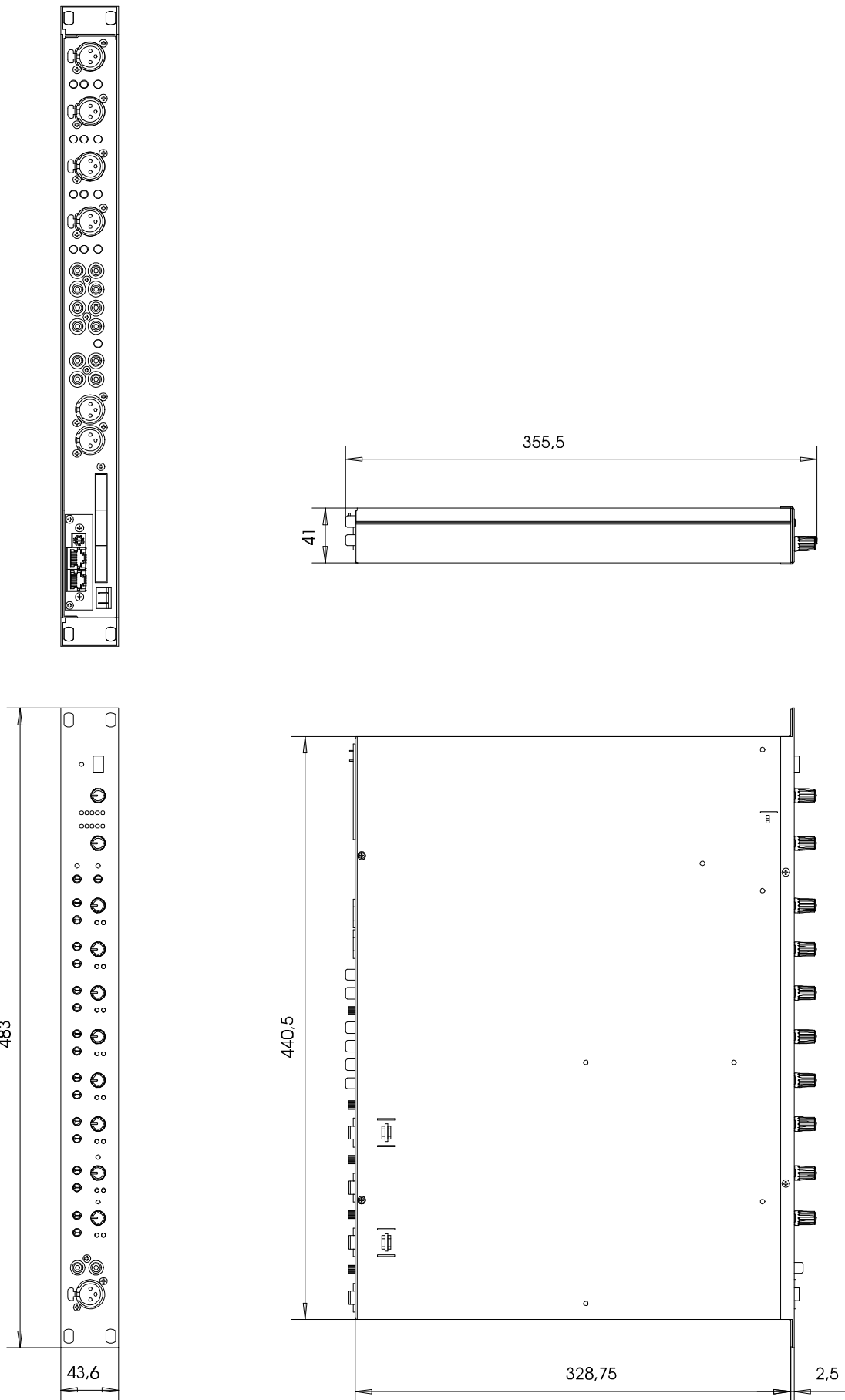
Generally, all REMOTE-commands have the lowest priority (0) and all entries are set to NO_CHANGE. The following table lists all REMOTE-commands and their corresponding parameter values.

Please be aware of the fact that all REMOTE-commands are transient and are set back to their default values (NO_CHANGE, priority 0) upon switching the unit's power on or after resetting the device.

ASCII-command	Comment
/SERVICE/HB <i>value</i>	Value: 60 ... 0, OFF / ? (see above)
/SERVICE/CC/ON <i>value</i>	Value: NONE, 1-8 / ? (see above)
/SERVICE/CC/OFF <i>value</i>	Value: NONE, 1-8 / ? (see above)
/REMOTE/PRIO <i>value</i> e. g.: /REMOTE/PRIO 100 /REMOTE/PRIO ?	Value: 0 ... 255 / ? (0 = lowest, 255 = highest priority) Write access: assigns a priority to REMOTE-commands. Read access: reads a REMOTE-command's actual priority.
/EDIT/REMOTE/MIC_LINE1/ROUTING <i>value</i> e. g.: /EDIT/REMOTE/MIC_LINE1/ROUTING MONO_A /EDIT/REMOTE/MIC_LINE1/ROUTING ?	Value: NO_CHANGE, OFF, MONO_A, MONO_B, DUAL / ? Write access: sets the routing of MIC/LINE 1 via remote (mind priorities!) Read access: reads the routing of MIC/LINE 1, which has been set via remote.
/EDIT/REMOTE/MIC_LINE1/OVERRIDE <i>value</i> e. g.: /EDIT/REMOTE/MIC_LINE1/OVERRIDE ON /EDIT/REMOTE/MIC_LINE1/OVERRIDE ?	Value: ON, OFF / ? Write access: activates or deactivates priority override of MIC/LINE 1 via remote (mind priorities!) Read access: returns the actual status.
...	ROUTING for MIC_LINE2 ... MIC_LINE4 see MIC_LINE1 OVERRIDE for MIC_LINE2 see MIC_LINE1
/EDIT/REMOTE/MIC_LINE4/...	...
/EDIT/REMOTE/AUX1 <i>value</i> e. g.: /EDIT/REMOTE/AUX1 STEREO /EDIT/REMOTE/AUX1 ?	Value: NO_CHANGE, OFF, MONO_A, MONO_B, DUAL, STEREO / ? Write access: sets the routing of AUX 1 via remote (mind priorities!) Read access: reads the routing of AUX 1, which has been set via remote.
...	...
/EDIT/REMOTE/AUX4 <i>value</i>	ROUTING for AUX2 ... AUX4 see AUX1
/EDIT/REMOTE/OUT_A/MUTE <i>value</i> e. g.: /EDIT/REMOTE/OUT_A/MUTE OFF /EDIT/REMOTE/OUT_A/MUTE ?	Value: NO_CHANGE, ON, OFF / ? Write access: sets the status output relay in the MASTER A output via remote (mind priorities!) Read access: reads the actual status.
/EDIT/REMOTE/OUT_A/DUCK <i>value</i> e. g.: /EDIT/REMOTE/OUT_A/DUCK ON /EDIT/REMOTE/OUT_A/DUCK ?	Value: NO_CHANGE, ON, OFF / ? Write access: sets the status of the ducking control in the MASTER A output via remote (mind priorities!) Read access: reads the actual status.
/EDIT/REMOTE/OUT_A/LEVEL <i>value</i> e. g.: /EDIT/REMOTE/OUT_A/LEVEL -10 /EDIT/REMOTE/OUT_A/LEVEL ?	Value: NO_CHANGE, -90 ... 0 / ? Write access: sets the VCA of the MASTER A output via remote to the desired value (mind priorities!) Read access: reads the actual status.
...	...
/EDIT/REMOTE/OUT_B/...	OUT_B settings see OUT_A
/EDIT/ACTUAL/... e.g.: /EDIT/ACTUAL/MIC_LINE1/ROUTING?	Reads the actual states of the DRM 4000 like routing etc. Only read access is recommended.

SPECIFICATIONS

10.5 Dimensions



GARANTIE

Das Werk leistet Garantie für alle nachweisbaren Material- und Fertigungsfehler für die Dauer von 36 Monaten ab Verkauf. Garantieleistungen werden nur dann anerkannt, wenn gültige, d.h. vollständig ausgefüllte Garantieunterlagen vorliegen.

Von der Garantie ausgenommen sind alle Schäden, die durch falsche oder unsachgemäße Bedienung verursacht werden. Bei Fremdeingriffen oder eigenmächtigen Änderungen erlischt jeder Garantieanspruch.

WARRANTY

The manufacturer's warranty covers all substantial defects in materials and workmanship for a period of 36 months from the date of purchase.

Liability claims are accepted solely, when a valid – correctly and completely filled out – Warranty Registration form is presented by the original owner of the product. The warranty does not cover damage that results from improper or inadequate treatment or maintenance. In case of alteration or unauthorized repairs, the warranty is automatically terminated.

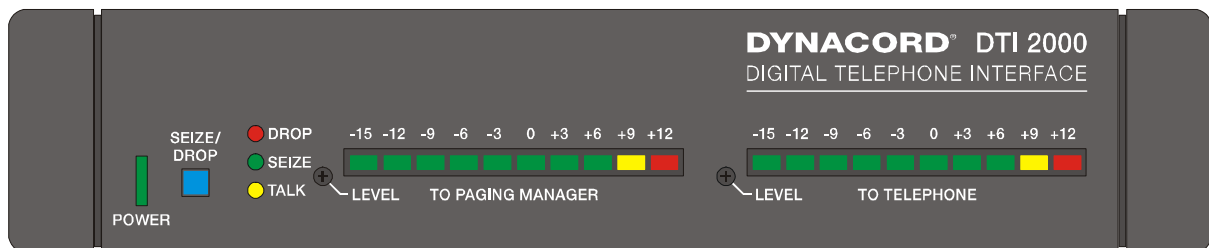




Owner's Manual

DTI 2000

DIGITAL TELEPHONE INTERFACE



Contents

*** Inhaltsverzeichnis

Introduction

This owner's manual covers the installation, programming, and operation of DYNACORD's DTI 2000 Digital Telephone Interface. Since operating and programming the DTI 2000 is similar to the operation and programming of a paging console, the DPM 4000 System handbook, the DPC 4000 paging console owner's manual, and the Help Files of the PC Designer software may also be useful information sources.

Characteristics

The DTI 2000 is a micro processor-controlled, completely configurable telephone interface for DYNACORD PA-systems and sound reinforcement systems. The DTI 2000 is used for connecting the DPM 4000 System Manager to a telephone line or network to launch announcements from each telephone set over the loudspeaker network and to trigger signals, pre-recorded text messages and control functions (macros) of the DPM 4000 System Manager using a telephone set.

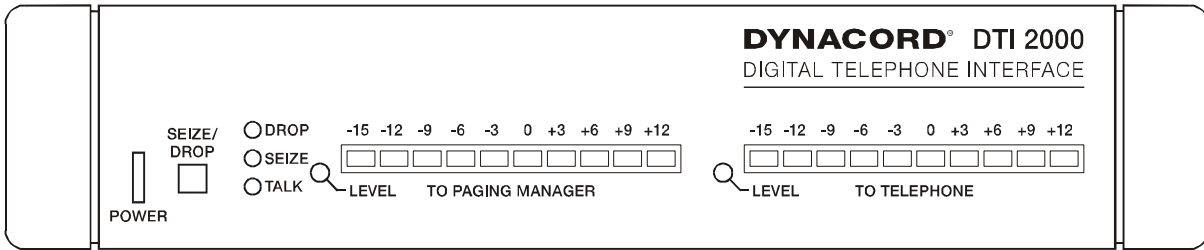
The DTI 2000 needs to be connected to an analogue phone line and is controlled via tone-dial (multi-frequency dialling). Using the supplied cable, the telephone interface has to be connected to a paging console input on the DPM 4000. The interface transmits serial control data as well as LF-audio signals. The DTI 2000 appears at the DPM 4000 as a special paging console allowing it to be programmed via the PC Designer Software in paging console dialog mode.

The DTI 2000 offers 100 call numbers (from 00 to 99). Any function can be assigned to any call number. Possible functions include zone or group selection, live-announcements with pre-programmable priority and pre-chime signal, playback of pre-recorded text messages and triggering of DPM 4000 macros. The DTI 2000 offers two different access authorisations with individual password protection. Depending on the actual application and desired operation, the DTI 2000 allows initiating any possible function from a standard telephone set – from making a simple announcements up to triggering a sound reinforcement installation's most complex sequential control procedures.

Features

- Selection of up to 100 zones for announcements
- Programming of up to 20 call groups for group calls and collective calls
- Configuration of a call number organisation chart of up to 100 numbers (0 ... 99) for announcements and arbitrary control functions
- Selecting several zones or groups for announcements
- Initiating the playback of pre-recorded text messages
- Triggering of special functions (macros, erase zone / group selection)
- Assigning priorities for announcements and message playback
- Two level password protection
- Acknowledgement signals for O.K., faulty entry, busy, outgoing text message, etc.
- Automatic hang up: to specify the duration of announcements via internal Dip switches
- Trimmer on the front panel for setting the audio signal level
- Programming via PC Designer Software equivalent to DPC 4000 paging consoles
- Configuration possibility for world telephone standards (country-specific settings)

Controls and Connections



front view

1. POWER indicator

The POWER LED lights when the DTI 2000 receives power input from the supplied power supply unit, which allows worldwide connection and use because it accepts input voltages between 85V AC and 250V AC.

2. SEIZE / DROP key (*SELECT*)

This key allows manually accepting or cancelling phone calls and is mostly used for testing. When an incoming phone call is present (ringing), pressing the SEIZE / DROP key establishes the connection (picks up). Pressing the SEIZE / DROP key again cancels (hangs up) a live connection. Since the DTI 2000 automatically picks up any incoming call respectively automatically hangs up when the remote call is terminated, this key is basically not needed during normal operation.

3. DROP and SEIZE indicators

The red DROP LED indicates that there are no live connections (i.e. the DTI 2000 is on-hook). The green SEIZE LED indicates that the DTI 2000 established a connection to the calling party (i.e. the DTI 2000 is off-hook). The DTI 2000 automatically connects to incoming phone calls. Using the internal DIP-switch S202 allows specifying the number of rings prior to accepting a call.

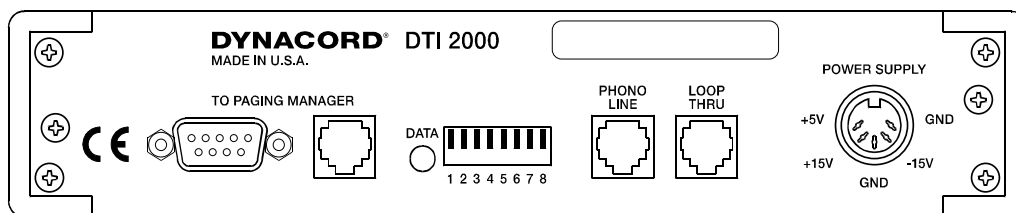
4. TALK indicator

The orange TALK LED lights whenever the DTI 2000 is in announcement mode (i.e. when an announcement into a single or several zones of the PA-system has been initiated via telephone connection).

5. LEVEL control / meter bars

Audio signals that are transmitted from the DTI 2000 to the DPM 4000 System Manager can be monitored using the TO PAGING MANAGER meter bar. Level adjustment is possible via the associated LEVEL control on the front panel using a small screwdriver. The level setting range is between ***dB (counter clockwise stop) and ***dB (clockwise stop).

Currently, the TO TELEPHONE indicator and the associated level control are not used.



Rear

6. TO PAGING MANAGER connectors, female

The two TO PAGING MANAGER connectors represent the interface to the DPM 4000 System Manager. Using either the 9-pole D-Sub connector or the 6-pole RJ-12 socket (simultaneous use of both terminals is not possible) to establish audio and data connection to the DPM 4000 is possible. The DTI 2000 needs to be connected to one of the paging console inputs (DPC IN, RJ-45 socket) on the DPM 4000. The needed interface cable (RJ-12 to RJ-45) with a length of 3.5m is supplied.

7. DATA indicator

The DATA LED indicates that data is being transmitted between DTI 2000 and DPM 4000 System Manager. Therefore, it serves as main monitoring indicator for correct data connections.

8. DIP switch for address and operation mode settings

The DTI 2000 allows setting an address between 1 and 16. CAUTION: Make sure never to connect two or more appliances with identical address settings to the DPM 4000 System Manager, since this would inevitably result in data conflicts. This also includes the address settings of the connected paging consoles.

Please refer to the chapter DIP-switch settings for further details.

9. Phone sockets

Two telephone connectors are located on the rear panel of the DTI 2000. Connect the PHONE LINE socket with your telephone wall outlet. The LOOP THRU socket offers connection for a telephone set.

10. POWER SUPPLY connector

Connect the supplied power supply unit to this connector by inserting the round plug of power supply unit into the POWER SUPPLY socket on the rear panel of the DTI 2000. Turn the plug's locking ring in clockwise direction to establish a reliable connection. Afterwards, connect the supplied mains cord to the power supply unit before inserting the mains plug into a mains wall outlet.

Se Up and Connections

1. Unpacking

The DTI 2000 package contains the following parts:

- 1 DTI 2000 Digital Telephone Interface
- 1 power supply unit, 100 – 240V AC
- 1 IEC mains cord
- 1 interface cable for DPM 4000 connection, RJ-12 to RJ-45
- 1 telephone cable, RJ-11 to TAE
- 1 owner's manual

Make sure that everything is complete and that nothing is damaged. Otherwise, immediately contact your dealer or the TELEX / EVI Audio service department.

2. DIP switch settings

The DTI 2000 provides a single DIP-switch on the rear panel and two internal DIP-switches. These switches are meant for making specific basic settings, which have to be made before operating the appliance for the first time. Generally, no changes need to be made during the later operation.

2.1 DIP switch for address and operation mode settings on the rear panel (S201)

A switch is "OFF" when it is set to its upper position. Consequently the ON-position is down.



The following table shows how to set addresses using the switches 1 – 4:

SW1	SW2	SW3	SW4	ADDRESS
OFF	OFF	OFF	OFF	1
ON	OFF	OFF	OFF	2
OFF	ON	OFF	OFF	3
ON	ON	OFF	OFF	4
OFF	OFF	ON	OFF	5
ON	OFF	ON	OFF	6
OFF	ON	ON	OFF	7
ON	ON	ON	OFF	8
OFF	OFF	OFF	ON	9
ON	OFF	OFF	ON	10
OFF	ON	OFF	ON	11
ON	ON	OFF	ON	12
OFF	OFF	ON	ON	13
ON	OFF	ON	ON	14
OFF	ON	ON	ON	15
ON	ON	ON	ON	16

CAUTION:

Make sure never to connect two or more appliances with identical address settings to the DPM 4000 System Manager, since this would inevitably result in data conflicts. This also includes the address settings of the connected paging consoles.

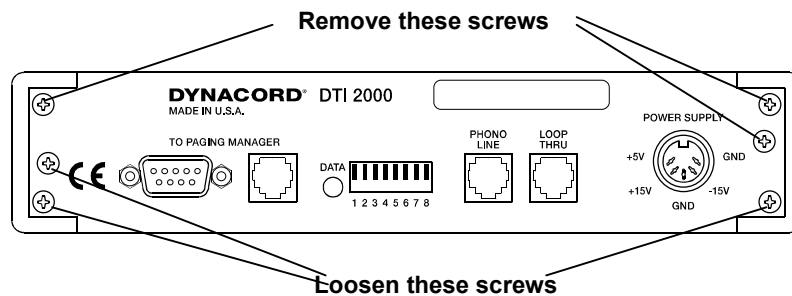
Switches 5 – 7 provide no function and should be left in their OFF-position (up).

Switch 8 serves for switching between normal operation and download mode. Leave this switch (SW8) in its OFF-position (up) for normal operation. Download mode is meant for updating the software and loading country-specific settings by DYNACORD or one of its service centers.

SW8	DTI 2000 MODE
OFF	Normal
ON	Download

2.2 Internal DIP switches (S202 and S203)

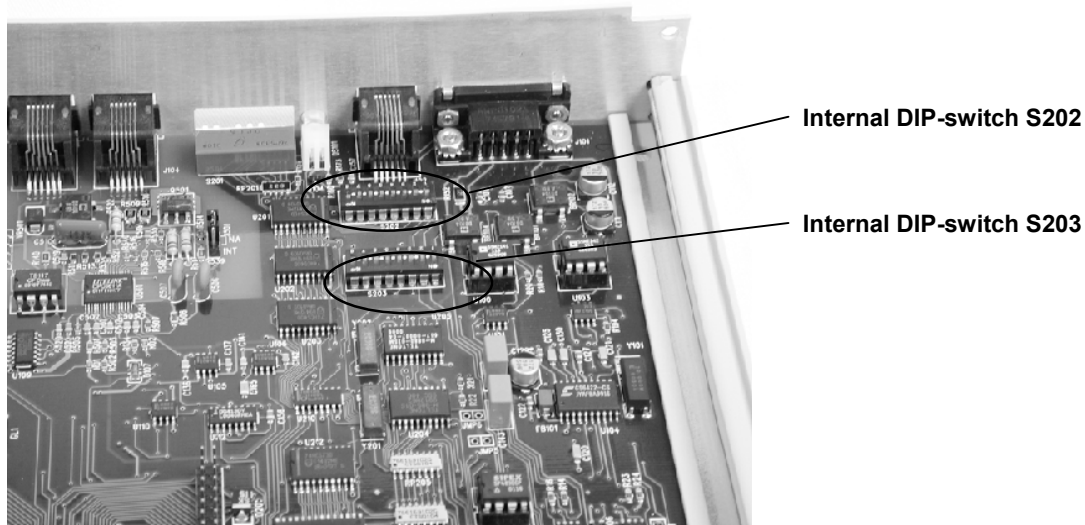
To make any changes to the internal DIP-switch settings, you first have to remove the cover plate by loosening/removing the screws on the rear panel, as indicated in the diagram below.



Slightly lift the cover plate at the rear and remove it. Now you are able to change the DIP-switch settings.

For installing the cover plate back in place, first position the case top in the guidance slots of the case bottom and slide it in as far to the front until it rests in place. Put the screws back in place and tighten them. Do not forget to tighten the previously loosened screws.

The following picture shows the positions of DIP-switches S202 and S203:



DIP-switch S202 allows setting the ring count, which controls the number of rings before the DTI 2000 automatically picks up and establishes a connection. To change the ring count use the switches 1 - 2. The DTI 2000 is factory pre-set to accept an incoming call after one ring (SW1 & SW2 = OFF).

SW1	SW2	RING COUNT
OFF	OFF	1
ON	OFF	2
OFF	ON	4
ON	ON	8

Switches 3 – 8 are not used and should be left in their OFF-position.

The setting of DIP-switch S203 determines the timeout of a connection (i.e. before the DTI 2000 automatically hangs up). This ensures that phone line and PA-system are not blocked any longer

than the specified maximum connection timeout setting allows. If the caller does not enter any new selection during the connection timeout, the DTI 2000 automatically finishes the momentary announcement and releases the PA-system. Afterwards, the telephone connection is disconnected as well.

Switches 1 – 4 are used to set the maximum timeout for a connection as indicated in the following table:

SW1	SW2	SW3	SW4	TIMEOUT
OFF	OFF	OFF	OFF	OFF
ON	OFF	OFF	OFF	20 sec.
OFF	ON	OFF	OFF	30 sec.
ON	ON	OFF	OFF	45 sec.
OFF	OFF	ON	OFF	60 sec.
ON	OFF	ON	OFF	75 sec.
OFF	ON	ON	OFF	1.5 min.
ON	ON	ON	OFF	2 min.
OFF	OFF	OFF	ON	2.5 min.
ON	OFF	OFF	ON	3 min.
OFF	ON	OFF	ON	3.5 min.
ON	ON	OFF	ON	4 min.
OFF	OFF	ON	ON	5 min.
ON	OFF	ON	ON	6 min.
OFF	ON	ON	ON	8 min.
ON	ON	ON	ON	10 min.

CAUTION:

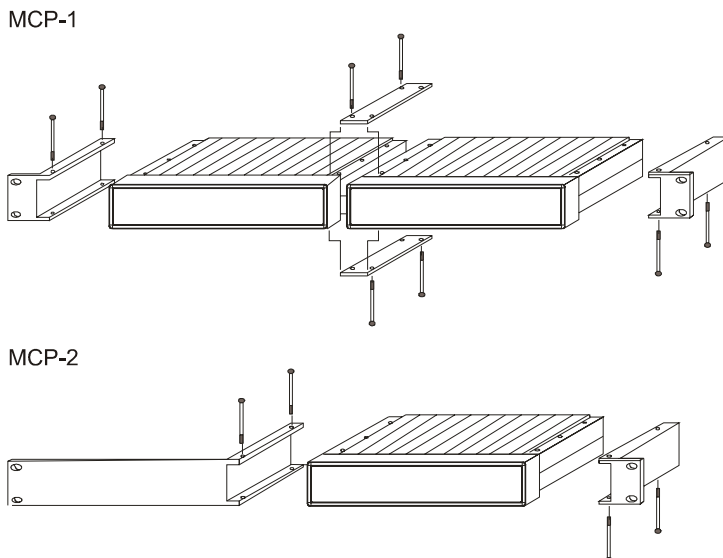
The DTI 2000 is factory pre-set to a maximum connection timeout of 1.5 minutes (SW1 = OFF, SW2 = ON, SW3 = ON, SW4 = OFF).

Setting the switches 1 – 4 to their OFF-position specifies an infinite timeout, i.e. the connection is not automatically disconnected.

Switches 5 – 8 are not in use and should be left in their OFF-position.

3. Rack installation

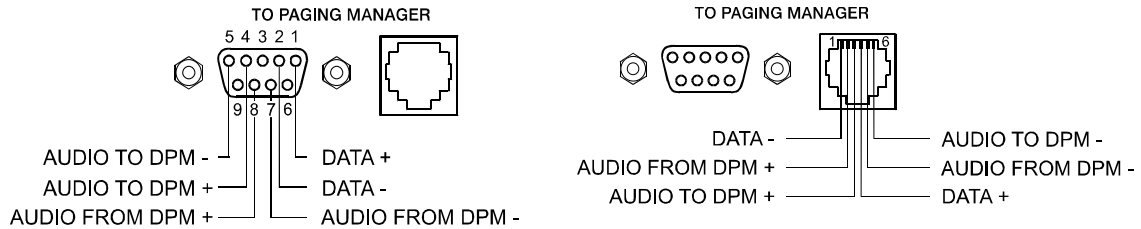
There are two rack-mounting options for the DTI 2000. Use the MCP-2 rack installation kit for installing a single DTI 2000 and the MCP-1 for installing two units next to each other in a rack system. The following diagram shows both options.



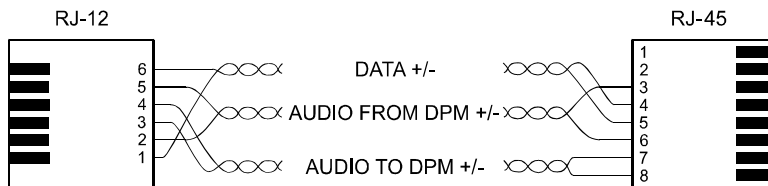
4. Connections

4.1 Connecting the DPM 4000 System Manager

Use one of the TO PAGING MANAGER sockets (not both simultaneously) for connecting the DTI 2000 to the DPM 4000. The DTI 2000 needs to be connected to a paging console input (DPC IN, RJ-45 socket) of the DPM 4000 using the supplied, 3.5m long interface cable (RJ-12 to RJ-45). The following diagrams show the pin-assignment of sockets and cables. The LED labelled DATA is located next to the sockets. This LED lights during active data transmission between DTI 2000 and DPM 4000 System Manager providing indication of a correct connection.



TO PAGING MANAGER connector's pin-assignment



Interface cable RJ-12 / RJ-45

4.2 Connecting Phone Lines or a Telephone set

Two phone connectors are located on the rear panel of the DTI 2000. Connect the PHONE LINE socket with the telephone wall outlet. The LOOP THRU socket provides a connection facility for an optional telephone set.

NOTE: The LOOP THRU signal is disconnected whenever the DTI 2000 picks up a phone call via the PHONE LINE socket.

4.3 Power Supply

Insert the supplied power supply unit's round plug into the POWER SUPPLY socket on the rear panel of the DTI 2000. Turn the plug's safety lock clockwise to establish a securely locked connection. Afterwards, connect the supplied mains cord to the power supply unit before inserting the mains plug into the mains wall outlet. The DTI 2000 is immediately operational upon establishing accurate connection.

5. Adjusting the Audio Level

Adjusting the level of the audio signal that is transmitted to the DPM 4000 System Manager is possible via the LEVEL TO PAGING MANAGER trimmer. Doing so, use a small, flat screwdriver to first set the trimmer to its centre position. Call the DTI 2000 and speak with a normal voice into the receiver while adjusting the audio signal level for best transmission quality. The level meter should not indicate any signals in the red area.

The TO TELEPHONE indicator and the corresponding control are not currently used.

6. Country settings

Different countries and regions have different telephone standards, which may differ in e.g. signal level and dial tones. The DTI 2000 can be and should be configured to meet those individual requirements. Not doing so can result in faulty operation of the DTI 2000.

Generally, the DTI 2000 is factory pre-set prior to shipping. In case of problems, please contact the nearest service-centre or the technical support.

Operating the DTI 2000

First, make sure that the DTI 2000 has been correctly installed and connected, as described before. Be sure to check the address and DIP-switch settings.

The DTI 2000 has a Default Configuration, which suits most standard applications. Custom configuration of the DTI 2000 is possible using the PC Designer Software, which is explained in detail in the chapter "Configuring the DTI 2000".

DTI 2000 Default Configuration:

DTI 2000 Parameters	Default Configuration	Remarks
NAME	DTI-2000	Default Name
COMP	OFF	No meaning in the DTI 2000
BUZZER	OFF	No meaning in the DTI 2000
PRECHIME	OFF	No meaning in the DTI 2000
GERMAN	OFF	No meaning in the DTI 2000
DOSCHAR	OFF	No meaning in the DTI 2000
PTTPRIO	INT	No meaning in the DTI 2000
EXT	4350	No meaning in the DTI 2000
PASSW	111,2222	Level 1 / Level 2 passwords
GROUP0	NONE	No groups programmed
...	...	
GROUP20	NONE	
KEY1	SELECT 1	Call number table: No. 1 (01) = Zone 1 No. 2 (02) = Zone2
KEY2	SELECT 2	
...	...	
...	...	No .99 = Zone 99 No. 0 (00) = Zone 100
KEY99	SELECT 99	
KEY100	SELECT 100	
KEY101 ... KEY107	DISABLED	No meaning in the DTI 2000
KEY108	TALK,255,0,20	Talk in actual selection with priority 2
KEY109 ... KEY112	DISABLED	No meaning in the DTI 2000

The DTI 2000 decodes all DTMF dial tones as well as signal tones for the recognition of incoming phone calls, pressed keys and determination whether a connection has been dropped or if the calling party hung up. Each one or two-digit number between 0 (00) and 99 represents an individual function, which is assigned in a calling numbers table (either in the Default Configuration or via user configuration). Three or four-digit numbers are used for entering passwords. The asterisk (*) and hash mark (#) keys offer special functions; e.g. as separator, for clearing faulty entries (Clear), as talk button, or to drop a connection.

1. Telephone call to the DTI 2000

Simply dial the number of the telephone line to which the DTI 2000 is connected. You are presented either with a ring signal when the line is not busy, or otherwise with a busy signal when the line is already busy. After the specified ring count (refer to DIP-switch S202) the DTI 2000

accepts the call and establishes a connection. First, you will hear a short noise (DTI 2000 line test) followed by different tone signals, which indicate that the DTI 2000 expects further entries.

2. Password Entry

The DTI 2000 answers an incoming phone call with different tone signals, depending on its actual status. When not password-protected, a single tone signal indicates that the DTI 2000 is ready to accept a function command (via entering a one or two-digit function number). If protected by a password, the appliance answers incoming calls with a two-tone signal. Entering the password for the desired access level is necessary. To enter access level 1 you have to enter a three-digit password, for entering access level 2 a four-digit password is needed. While level 1 only provides access to zone and group selection plus launching announcements via the * key, level 2 allows accessing all functions (announcements, text message playback, macros, stop, etc.). After entering the correct password, the DTI 2000 acknowledges a request with a single tone signal. The DTI 2000 sends a two-tone signal when entering the wrong password. After entering the incorrect password three times in a row the DTI 2000 drops the connection.

3. Zone / Group Selection and Announcements

Once the DTI 2000 is ready to accept a command (indicated by a single tone signal) and access level 1 (or 2) has been activated, selecting a single or several zones, groups or the ALL-group and then making an announcement in the selected areas is possible. Selecting a single zone, group or ALL is possible through entering the one or two-digit code that represents the according selection function in the call number table. Selecting further zones / groups is possible by using the hash mark key (#) as a separator before entering the next number, and so on. Numbers not representing a selection or clear-function are ignored. Announcements are initiated via the asterisk key (*). The DTI 2000 indicates with a single tone signal that a selection has been made and that you can start making your announcement. A “Low Busy” signal (two-tone sequence – tones with different key) indicates that one or several low priority zones are busy. It is your decision whether you want to wait (enter #), or to interrupt the current announcement (enter * once again). A “High Busy” signal (rapid, high-pitch sequence of tone signals) indicates that one or several high priority zones are busy. Once the announcement is finished, you can enter an announcement end mark through using the hash mark key (#). The connection is not dropped, which enables you to select new zones or groups for making further announcements. Pressing the asterisk key after an announcement is finished drops the connection – the DTI 2000 “hangs up”.

4. Direct Call

The DTI 2000 allows making announcements in permanently pre-selected zones or groups (Direct Call). This function can only be accessed from access level 2. No other number selection is accepted if the selected one or two-digit number represents a talk function. Press the asterisk key (*) to launch an announcement. The DTI 2000 acknowledges this request with a single tone signal, indicating that it is operational and ready to accept your announcement. The DTI 2000 outputs a “High Busy” signal when one or several high priority zones are busy. After the announcement is finished, pressing the hash mark key (#) allows selecting other functions. Using the asterisk key (*) drops the connection.

5. Text Playback

The DTI 2000 offers the ability to playback pre-recorded text messages in permanently pre-selected zones. This function can only be accessed from access level 2. No other number selection is accepted if the selected one or two-digit number represents a text message function. Press the asterisk key (*) to launch text message playback. The DTI 2000 acknowledges this request with a single tone signal, indicating that it is operational and ready to accept desired function command.

The DTI 2000 outputs a “High Busy” signal when one or several high priority zones are busy. A tone-sequence indicates that a text message is being played back. Text message playback normally stops automatically but manually stopping the function is possible as well by entering the STOP-function number code (default setting = 0 respectively 00).

6. Macros

The DTI 2000 allows launching macros that are programmed in the DPM 4000 System Manager, thus providing access to special functions. For example: switching relays, starting and stopping signals, entering parameters, launching test sequences, and many others. The macro function can only be accessed from access level 2. No other number selection is accepted if the selected one or two-digit number represents a macro function. Pressing the asterisk key (*) launches a macro. The DTI 2000 acknowledges this request with a single tone signal, indicating that it is operational and ready to accept desired macro command. It sends a two-tone signal, when entering an incorrect command or if there is any other problem.

7. Cancelling a Function (Break)

Cancelling an announcement is possible using the hash mark key (#) (Break). The current zone selection is cancelled as well, while the connection to the DTI 2000 is not interrupted. The appliance acknowledges the request with a single tone signal and it is ready for new entries (a new zone selection, launching text message playback, triggering macros).

The hash mark key (#) can also be used to clear erroneously made entries. Using the hash mark key (#) directly after selecting a text, announcement, macro or stop function prohibits the function from being executed, but erases it instead. The DTI 2000 is ready for new entries.

8. Hang Up / Cancelling a Connection

Using the asterisk key (*) directly after making an announcement or pressing the hash mark key (#) forces the DTI 2000 to drop the connection and “hang up”. The DTI 2000 also interrupts the connection when the calling party hangs up. However, in that case, a few busy tone signals are output via the PA-system, which can be rather disturbing. Therefore, dropping the connection through the use of the asterisk key (*) is always preferable.

The DTI 2000 can also be configured to automatically drop a connection after a definable period of time. This is especially useful to prevent the PA-system from being blocked by a telephone announcement over longer periods or that it is constantly blocked because of malfunction or faulty connections. The period of time after which the DTI 2000 automatically drops a connection can be set in a range between 20 seconds and 10 minutes via the internal DIP-switch S203.

Configuring the DTI 2000

The PC Designer software allows custom configuration for the DTI 2000 to match any specific application. The programming procedure is equivalent to configuring a paging console. Programming a paging console’s function keys relates to the programming of a call number table for the DTI 2000. This table holds the assigned functions of up to 100 one or two-digit numbers (0 to 99). The buttons 1 to 99 on a console correspond to the call numbers and the table entries 1 to 99. The 100-key represents the call number or table entry 0 (respectively 00) and, as standard, another entry in the table is reserved for the talk function, which can be activated from a telephone set using the asterisk key (*). Using a DPC 4550 + DPC 4350 paging console in the PC Designer software for configuring the DTI

2000 is recommended, because this is the only way to gain access to the total amount of 100 call numbers (accordingly to 100 paging console keys).

Connect a DPC 4550 + DPC 4530 to the corresponding input at the DPM 4000 in the PC Designer Software, give it a meaningful name (e.g. telephone interface), and open the paging console dialog with a double-click on the paging console icon.

The paging console dialog allows assigning one of the following functions per each call number (0 ... 99) respectively for each entry in the table:

1. Disabled:

The call number #nn has no function.

2. Stop:

Stops the actually active audio signals (chime, text message playback, alarm) depending on the programmed stop function and priority.

3. Clear:

Clears the actual zone or group selection.

4. Select:

This function selects a zone, group (groups may include up to 100 zones) or all zones (collective call) for an announcement or text message playback.

5. Text:

This function starts text message playback in permanently pre-selected zones or groups or in the actual zone selection. Assigning priorities is possible.

6. Talk:

This function starts an announcement in selected zones or groups. It also provides the possibility to initiate a collective call in all zones. A permanently assigned zone or group as well as the actual zone selection can be defined as a target. Assigning priorities as well as programming a pre-chime signal is possible.

A special entry in the table is reserved for the standard talk function (corresponds to the talk button #108) , which can be activated from a telephone set using the asterisk key (*).

7. Macro:

This function starts a macro via its pre-defined macro number, which of course is only possible when a corresponding macro has been programmed in the DPM 4000.

A typical call number table might look like that:

Phone No. / Tone Dial Code	Function	Parameters	Priority	Remarks
1 (or 01)	SELECTION	Zone 1	0	Selects Zone 1
2 (or 02)	SELECTION	Zone 2	0	Selects Zone 2
3 (or 03)	SELECTION	Zone 5	0	Selects Zone 5
...
9 (or 09)	SELECTION	Group 2	0	Selects group 2
10	SELECTION	Group 5	0	Selects group 5
11	SELECTION	ALL groups	0	Selects all zones / groups
...
30	EMPTY	0	0	No function
...
49	EMPTY	0	0	No function
50	TEXT	Group 3, Text 2	4	Starts text No. 2 in group 3 with priority 4
...
59	TEXT	All groups, Text 3	7	Starts text No. 3 in all zones with priority 7

60	TALK	All groups	9	Starts an announcement in all zones with priority 9
...
70	MACRO	Nr. 15	0	Triggers macro No. 15
71	MACRO	Nr. 16	0	Triggers macro No. 16
...
99	CLEAR	0	0	Clears the actual zone / group selection
0 (or 00)	STOP	0	5	Stops audio signals with a lower priority than 5, which have been launched from the DTI 2000
*	TALK	Current selection	3	Starts an announcement in the current selected zone(s) with priority 3

Setting the DTI 2000's password codes is possible in the general paging console dialog. The two access levels have individual passwords. The default password settings are 111 (3-digit for user level 1) and 2222 (4-digit for expert level 2). Access level 1 only allows zone / group selection and making announcements through the use of the asterisk key (*) while the expert level 2 provides access to all functions (announcements, text message playback, macros, stop, etc.). Password-protection is inactive, so that anybody has access to the functions of the corresponding level, when entering "0" as a password.

In the DTI 2000, the attributes microphone compressor, tone signal and German date have no function and should be left at their default setting.

DTI 2000 Operation Example

Based on the configuration example of the previous chapter, the following commands can be carried out through the DTI 2000:

Function	Dial Numbers	Remarks
Connection number	0123 456789	Select the phone number of the DTI 2000 connection
Password	111 or 2222	Select the password for access level 1 or 2
Announcement in a single zone	1*	Selects zone 1, starts an announcement with priority 3
Announcement end	#	Stops an announcement while keeping the connection
Announcement in several zones / groups	2#3#9*	Selects zones 2, 5 and group 2, starts an announcement with priority 3
Hang up	*	Stops an announcement and drops the connection
Collective call	11*	Selects all zones, starts an announcement with priority 3
Clear incorrect selection	1#2#3#99	Selects zones 1, 2 and 5, clears the selection
Start text message playback	50*	Starts text No. 2 in group 3 with priority 4
Stops text message playback	0*	Stops text No. 2 (if launched from the DTI 2000)
Direct call	60*	Starts an announcement with 9 in all zones
Start macro	70*	Starts macro No. 15
Clear incorrect function entry	71#	Clears an erroneously made entry of macro No. 16 (does not start the macro)
Hang up	*	Stops an announcement and drops the connection

*** DTI 2000 tone signals (table)

Test Functions

The processor system automatically runs an initial self-test whenever the DTI 2000 is connected to the mains. During this procedure, first the red DROP LED should light. Afterwards, the orange TALK LED blinks for approximately 3 seconds. In case faulty operation is being recognized, the processor system stops and the DROP and TALK LEDs light. Otherwise the **DROP LED** is dimmed and only the red **DROP LED** lights as long as a telephone connection has not been established.

Pressing the SEIZE / DROP button on the front panel manually establishes a connection (pick up) or drops a connection (hang up). When the button is used to “take a call”, the green SEIZE LED should light and the red DROP LED should be dimmed. Pressing the key once again drops the connection and the red LED lights while the green LED is dimmed.

The orange TALK LED lights when the DTI 2000 is in announcement mode (i.e. when a telephone announcement in a single or several zones of the PA-system has been activated).

Specifications

Audio Output level	0 dBu ... +20dBu
Telephone Input Level	-30 dBu ... +6 dBu
S/N Ratio	> 60 dB (200 Hz ... 3.8 kHz)
Frequency Response	300 Hz ... 3.8 kHz (+0 / -6 dB)
Phone Line Connectors	2 x RJ-11 (Line / Loop Thru)
DPM 4000 Interface	RJ-12, DB-9 sockets
Power Supply	100 ... 240 V AC, 50 / 60 Hz
Temperature Range during Operation	0 °C ... 50 °C
Dimensions	208 x 44 x 203 mm (B x H x T), ½ 19“ / 1 HU
Weight	2.0 kg
Certifications	CE, UL, FCC

- Design and specifications are subject to changes without further notice -



PRO ANNOUNCE™
S Y S T E M

1. INTRODUCTION

Preamble

Thank you for choosing the DYNACORD PROANNOUNCE System. With the PROANNOUNCE System you purchased a high-quality product which is going to satisfy your highest demands. This extraordinarily flexible and versatile system allows the configuration of either small or complex installations as well. Most functions are realized through software modules, which - when compared to conventional PA-systems – not only reduces the amount of cabling but also the costs. Next to extensive audio signal generating and distribution functions, the PROANNOUNCE system provides ample control functions. On one hand, these functions offer the possibility to register and rate external events, as well as to control different external components, on the other hand. Boolean operations and relations to the internal state of the system can be programmed as well.

To be able to take advantage of all possibilities that are offered by the PROANNOUNCE system, we would like to ask you to read this handbook carefully. For getting a quick overview about the PROANNOUNCE system's components and functions, we recommend consulting the chapter *System Description*.

Owner's Manual

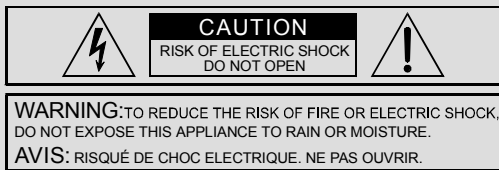
This handbook provides all the information that is necessary for planning and installing a PROANNOUNCE system. The handbook is structured in different chapters, each explaining a specific component or function. Thus, you can skip a section, if it is of no relevance for your particular application. The following table lists all chapters included in the handbook. It is meant as a guide for finding relevant information as quickly as possible.

1. Introduction	Notes on how to use the handbook
2. Operation Instructions	Precautions, operational conditions, environmental conditions, location, initial operation, maintenance and service
3. System Description	Overview of all components (appliances), audio and control functions of the PROANNOUNCE system
4. Installation	Notes on how to install the PROANNOUNCE DESIGNER configuration software
5. Single Device Descriptions	Detailed descriptions of all PROANNOUNCE components: central unit with modules, paging stations, power amplifiers, monitoring system
6. Appendix	Notes on how to configure the hardware, wiring, and initial operation

2. Operation Instructions

2.1 Safety Instructions

IMPORTANT SAFETY INSTRUCTIONS



The symbol of a flash within an equilateral triangle is to alert the user to the presence of uninsulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The symbol of an exclamation mark within an equilateral triangle is to alert the user's attention to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance

1. Please carefully read all instructions.
2. Keep the instructions at a safe place, so that they are at hand for further reference.
3. Observe all warnings and precautions, whether attached to the appliance or within the owner's manual.
4. Do not expose or operate the appliance next to water or in environments with high humidity.
5. Do not cover any ventilation louvers. Mind manufacturer's instructions when installing the appliance.
6. For maintenance and servicing, please refer to qualified service personnel only.



CAUTION !

1. To prevent the risk of fire and shock hazard, do not expose any appliance or module high humidity or water.
2. Make sure that no alien objects enter the appliances or get in contact with the modules – especially no metal parts – since this would very likely cause dangerous electric shock and/or malfunctioning. There are no user-serviceable parts located inside the appliances or on the modules. Opening appliance enclosures and/or rack shelf systems can lead to dangerous shock hazard. Do not open or try to reach inside the enclosures of appliances. Leave installation, servicing, maintenance, and any other works on the appliances or the rack shelf system to qualified service personnel only.
3. When exposing appliances/modules to extreme temperature changes, i. e. when moving them from the outside into a warm room, condensation may occur. If so, it is necessary to wait before use until the devices gained room temperature.
4. Under no circumstance place any liquid-containing cans, glasses, mugs, etc. on top of an enclosure. In case any liquids or foreign obstacles entered the enclosure of an appliance, immediately unplug the device from the mains supply and have it serviced.
5. Make sure that appliances/modules are always provided with sufficient ventilation. Do not expose devices to direct sunlight or any other heat-radiating source.
6. Do not expose appliances/modules to extreme dust or humidity. Operating the system under environmental conditions like these can lead to severe damage through fire or cause bodily harm to the operator.
7. Make sure that the stated mains voltage is in accordance to the specifications of your mains supplier. Mismatching will cause severe damage to all appliances/modules.
8. Make sure that mains cords and/or any other cabling are not damaged or being jammed by the turning frame or any other movable parts of the rack shelf. Damaged cables can lead to fire hazard and/or can be the cause for electric shock.
9. The mains cord of the rack shelf installation is supplied with a 3-pole plug to minimize the risk of electric shock. It should only be connected to a grounded wall outlet. Under no circumstances insulate the ground contact. When using an extension cord, always use a 3-pole grounded cable. When using multi-outlets for distributing, make sure that the wall outlet's capacity is not exceeded, since this could lead to fire hazard and/or can be the cause for electric shock.
10. The DPM 4000 contains a lithium-type battery to provide the internal clock with power. The lifetime of this battery-type spans approximately 10 years. When the battery's voltage drops below a certain minimum, an according message appears on the paging station display. In this case, the battery has to be exchanged by an EVI Audio GmbH authorized service technician. Under no circumstances try to exchange the battery yourself!

CAUTION! There is a severe risk of explosion when incorrectly exchanging the battery. Only replace with the same type of battery or one especially recommended by the manufacturer. For environmental awareness: Take care of used batteries following the manufacturer's advice.

11. Obeying the VDE-regulation DIN VDE 0800 is necessary when installing and operating 100V-loudspeaker systems. Especially with 100V-loudspeaker systems that are part of an emergency alert installation, protection measures have to be in accordance with safety class 3 regulations.

CAUTION! During operation, speaker group connectors (POWER OUTPUT) may carry shock hazard output voltages (>34V peak value). Thus, the installation of the connected loudspeaker groups has to in accordance to security standards and regulations as stated above.

12. Make sure to establish all connections before operating the system. Connecting/disconnecting cables during operation can cause malfunctioning or damage to the correspondent appliances.

2.2 Operation Instructions

2.2.1 Central Unit DPM 4000

According to its specified capabilities and specifications, the DPM 4000 central unit can be used to control and monitor PA- and paging systems in buildings, but also to operate professional audio systems.

The DPM 4000 central unit is not an independent device. For its operation, at least the following is necessary:

1. A power supply unit (24 V / 4 A) (24 V / 12 A), preferably of the DPP 4000 – Series, depending on the power consumption of the entire system.
2. When the installation includes paging stations:
 - the desired amount of paging stations of the DPC 4000 – Series (max. 16)
 - all required cables.
3. When the unit's audio section is utilized:
 - power amplifiers, preferably of the DPA 4000 – Series, including cabling
 - loudspeaker systems including cabling
4. When the integrated real-time clock is going to be synchronized to the DCF77–timesync-signal:
 - an active DCF77–antenna for reception (NRS 90193) including cablesThis feature is only available in areas where DCF77-reception is strong enough.
5. When slave clocks need to be synchronized:
 - the required amount of slave clocks (max. 40) including cabling

Additionally, a PC providing the following features is needed for configuration purposes and operation:

- PC computer system with Pentium processor (min. 90 MHz) and Windows 95/98/NT
- 16 MB of RAM
- 1 hard disk offering free space of at least 5 MB
- 1 x 3.5" floppy drive, 1.44 MB
- 1 mouse
- 1 monitor (with a resolution of at least 800 x 600 pixels) with VGA-graphics board, 256 colors
- 1 serial port RS-232 with serial cable
- PROANNOUNCE Designer configuration software
- 1 CD ROM drive

All necessary cables, plugs, connectors or adapters for establishing connections are available through EVI Audio GmbH. Our entire accessory assortment with order-numbers is included in the corresponding owner's manuals as well as in the PA-systems price lists.

2.2.2 DPA 4000 Power Amplifier

Especially designed for it, the DPA 4000 Series power amplifiers optimally match the PROANNOUNCE system. Thus guaranteeing trouble-free installation and operation.

The power amplifiers are "stand alone" devices, offering the opportunity for them to be operated together with several other pieces of equipment, as long as all valid specifications and applicable instructions for the installation are being observed.

2.2.3 DPC 4000 Paging Stations

Especially designed for it, the DPC 4000 Series paging stations optimally match the PROANNOUNCE system. Thus guaranteeing trouble-free installation and operation.

The paging stations cannot be used as "stand alone" devices. At least a DPM 4000, a 24 V power supply plus all necessary cabling is needed to build-up a minimal installation.

Configuration and operation is accomplished through the DPM 4000 central unit.

2.2.4 DCS 400 Control System

The DCS 400 control system – consisting of a DCS 401 control module, a DCS 408 relay module 100V, a DCS 409 control-relay module, DCS 412 logic input module and DCS 416 analog I/O module – cannot be used as a "stand alone" system. At least a DPM 4000, a 24 V power supply plus all necessary cabling is needed to build-up a minimal installation.

According to their technical specifications, it is possible to incorporate the modules of the DCS 400 system as follows:

- DCS 401: control module for all other DCS 400 modules
query of 2 rotary encoders
- DCS 408: 5 floating switches for 100 V loudspeaker lines
- DCS 409: 5 floating switches for control signals (DC voltages, 24 V)
or for audio signals at line level
- DCS 412: query and monitoring of 12 floating control voltages
(logic signals up to ± 31 V)
- DCS 416: 8 analog inputs for the query of control voltages (0 – 10 V)
8 analog outputs to output control voltages (0 – 10 V)
- DCS 420: Monitor Manager with loudspeaker, headphones socket,
7-segment display, and metering instrument

Configuration and operation is accomplished through the DPM 4000 central unit.

2.2.5 DPP 4000 Power Supply Units

Especially designed for it, the DPP 4000 Series power supply units optimally match the PROANNOUNCE system, guaranteeing trouble-free installation and operation.

The power supplies are "stand alone" units, which offers the possibility to utilize them to feed other equipment with 24 V supply voltage, as long as all valid specifications and applicable instructions for the installation are being observed.

2.3 Operation Location

The appliances are exclusively meant for the installation in 19" rack shelf systems while the modules can also be installed in an appropriate wall junction box. When installing the system, the safety regulations that are mentioned in chapter 2.1 have to be observed.

It is particularly important that the following environmental conditions are provided:

- ambient temperature at the installation site – which also includes inside the rack shelf system – is not to exceed 40° C. If necessary, the rack shelf system has to be supplied with forced ventilation or air conditioning. Heat sources like power amplifiers, etc. – especially when they are mounted underneath the appliance – can increase the ambient temperature to an exceeding degree, although the average temperature within the rack shelf system may stay below 40° C.
- The installation site should not suffer from increased dust and moisture.
- The radiation of direct sunlight or other heat sources should be avoided.
- During operation, rear connectors have to be covered, since they partly conduct voltages that could endanger your life.
- Ventilation louvres are not to be covered by any other installed gear. Therefore, it is reasonable to install a 1 HU ventilation blind above the correspondent appliance.
- The installation site should not be subject to vibration.

2.4 Excluded From Warranty

Damages, malfunction, or obstruction of certain performance features resulting from the following causes are excluded from the warranty.

- improper or erroneous maintenance by the customer
 - changes or alterations without written consent
 - operation outside of the environmental conditions specified for this product
 - operation outside of electrical specifications
 - improper installation
 - damage during transportation because of improper packaging by the customer
- Repair, replacing used batteries, altering, and retrofitting extensions is only admissible if EVI Audio GmbH or one of its authorized service centers or maintenance technicians carry out these tasks.

3. System Description

This chapter provides an overview of the general configuration of the PROANNOUNCE system and its most important functions. The following block diagram shows a typical PROANNOUNCE system installation including the DPM 4000 central unit, paging stations, audio equipment, amplifiers, power supply unit, relay board assemblies, loudspeaker lines, and control board assemblies for external signals.

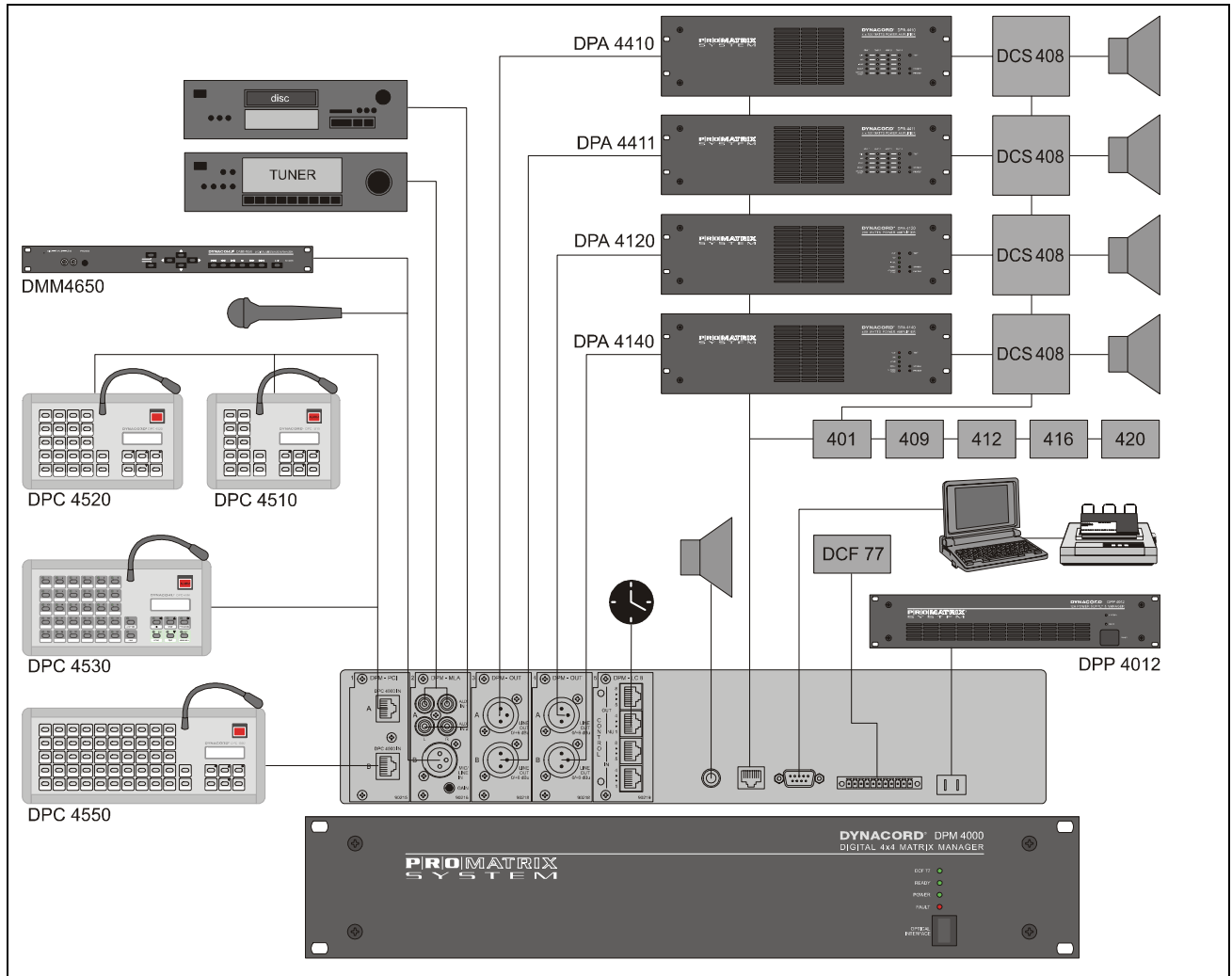


figure 3.1 PROANNOUNCE System

3.1 General Overview

The digital PROANNOUNCE manager DPM 4000 represents the central unit of the system. It is used to control and monitor all connected components via several serial interfaces. The chapter *Single Device Descriptions* contains all necessary information about the DPM 4000 and its available modules.

The kind and amount of connected audio sound sources, amplifiers, and relay board assemblies are extremely variable. This allows configuring the system to basically match any requirement. The system is capable of managing up to 16 paging stations and up to 100 output lines. More than 150 control inputs and outputs are available for controlling and monitoring purposes providing the possibility to generate and manage logic levels and analog levels as well. For detailed information, please refer to the chapter *DCS 400 Control System*.

Configuration and documentation of a PROANNOUNCE system installation is established through the use of the PROANNOUNCE Designer software – a comfortable graphical user interface that runs on a PC under Windows 95/98/NT. This allows changing the system's setup at any time to meet new requirements, without the need to alter the actual installation. The PC has to be connected to the system only when loading or changing its configuration. During

normal operation, PC-interaction is not necessary. Anyway, in most cases the permanent connection of a computer bears benefits, like displaying detailed status reports or the printing of protocols. It also offers the possibility for remote diagnosis and remote maintenance via modem.

3.2 Audio Routing

The DPM 4000 employs a digital audio matrix providing 4 inputs and 4 outputs. Additional matrix junctions for the integrated gong and alarm signal generators, the vocal recording/playback unit, and the lock-on of the pilot tone and its evaluation are incorporated. All input signals and internally generated signals can be freely mixed inside the matrix and outputted through the 4 amplifier channels. Routing speaker lines to these amplifier channels is achieved via the relay-matrix, which offers up to four separate audio buses simultaneously, while the DPM 4000 takes over the management of all these signals according to their priority.

Next to connecting paging stations, the audio inputs also serve for the connection of other audio sound sources, like microphones, mixers, CD-players, cassette decks and DAT-recorders, tuners, etc. Several different input modules are available to optimally adjust and match signal levels and connections.

3.3 Volume And Tone Controls / Delays

The PROANNOUNCE system provides individual volume controls for each input, output, and paging station. Even the internal audio sources, like gong/alarm tone generators, voice message playback, and pilot tone generator employ individual level controls, each. Additionally, it is possible to set an attenuation that unanimously affects the inputs. This value determines the degree, by which the input signal is attenuated during the reproduction of messages or other signals with a higher priority setting. This allows to smoothly fade-out and fade-in background music during the transmission of important messages.

Besides, each of the four inputs embodies three fully parametric digital filters allowing for optimal tone control. The filters provide different filter types like Hi-/Lo pass filters, shelving filters, and peak-dip-filters providing the possibility for adjusting the sound within the entire audio transmission range. Factory-preset filter settings for the DPC 4000 Series paging stations are already provided.

Setting volume levels and filter parameters is accomplished via PC during the configuration procedure. Further, it is possible to alter any volume setting during the later operation of the system via special-function keys on the paging stations or through external controls that are connected to analog or digital control inputs.

All four outputs employ digital delays allowing signal delays of up to 330 ms per channel. Natural delays, resulting from loudspeaker positioning which causes time differences in the traveling of sonic events or environmental circumstances related to architectural characteristics of the location, can be equalized without additional effort.

3.4 Signal Generators / Voice Message Memory

The DPM 4000 provides a variety of tone generators for the generation of gong, alarm, and text signals. Signal generation is realized through DSP-algorithms, which are extremely flexible in use, so that they can be adjusted to match nearly any possible application. Factory presets include 6 different gong signals, 18 different alarm signals, plus sine cycle at any frequency. Other than in comparable equipment, the PROANNOUNCE signal generating DSP-algorithms do not take up any extra storage of the voice message memory.

In addition, a voice message recording/playback module providing CD-quality sound is optionally available. With a total recording time of approximately 6 minutes, 25 different messages are being managed. The DPM 4000 provides the possibility to install up to four optional FLASH-memory modules, depending on individual desires or requirements.

3.5 Paging Stations

The DPC 4000 Series paging consoles are mainly meant for transmitting voice messages and calls but also to manually control the PROANNOUNCE system. Available paging station functions are: line/group selection, voice messages, program assignment, launching gong and alarm signals, and reproduction of voice message memory announcements. Additionally, special commands include volume control, monitor selection, preset switching, lighting control, function status indication, etc. Thus, it is possible to configure the paging consoles to serve as operation panels for general control purposes.

If a voice call is being launched into a speaker line that is already busy with other audio transmissions, the caller gets a busy-sign, i. e. the BUSY-LED blinks. In case the calling terminal has a higher priority it will interrupt any messages from other paging stations or audio signals with lower priority levels. Interruption does not take place uncontrolled anymore. Before actually interrupting a transmission, the blinking LED indicates that a line or group is busy when selecting a destination, leaving the choice to the operator, whether he/she immediately wants to interrupt or wait upon the conclusion of the momentary reproduced program.

3.6 Control Inputs And Outputs

By using the control inputs, it is possible to link the PROANNOUNCE system to fire alert systems, burglary alert systems, or to a central operating desk. It is also possible to connect external switches, breakers, rotary controls or rotary encoders, respectively to query control outputs of external units (power supplies, power amplifiers, ...).

The control outputs allow switching external devices ON or OFF, trigger signals and events, switch monitor sources, remote control doors, gates or shutters, generate analog signals for the control of multimedia systems, etc.

A total of 130 control inputs for logic levels, 128 control inputs for analog levels, 16 inputs for rotary encoders, 127 logic-control outputs, and 128 analog-control outputs are usable.

3.7 Clock / Calendar

The PROANNOUNCE manager DPM 4000 has an integrated quartz-controlled real-time clock which can be set for radio-controlled DCF 77 operation using the optional antenna (DCF 77 tuner NRS 90193). The system clock automatically recognizes leap years and, if in DCF 77 mode, automatically switches between daylight saving time and standard time.

The system clock provides the possibility to control up to 40 external slave clocks. For this purpose, the DPM 4000 employs a special, short-circuit-proof output for pole changing impulses. Slave clocks are automatically re-synchronized whenever a time difference to the system clock is detected; like for instance in cases of power outage or when time values were entered manually.

It is possible to activate pre-set functions like break-gong signals, background music, remotely controlled gates, switch lights ON/OFF, etc. when using system clock and calendar function together. All the functions mentioned before can be programmed for specific days; but also hourly, daily, weekly, monthly, and yearly activation is possible. Up to 500 time-controlled events can be programmed.

3.8 Monitoring

The PROANNOUNCE manager DPM 4000 embodies a monitor amplifier with headphones/speaker output. The integrated logic-switching circuit provides the opportunity to listen to the signals of any internal input and output. Assigning external sound sources to the monitor bus is possible as well. This additionally allows monitoring amplifier outputs or pre-listen to the contents of external voice message memories and other audio devices.

The remote control's wiring already includes all the cabling necessary for the pre-/post-listen feature when using remote-controlled amplifiers.

When using the DCS 420 PROANNOUNCE MONITOR MANAGER, easy programming and operating is available. See also chapter 5.4.7

3.9 Macros

Macro is defined as the combination of several commands, functions, and their parameters in an internal consecutive sequence. For example a gong signal with specific volume and priority settings has to be transmitted in different calling zones, while simultaneously activating a control output. In that case the macro consists of the functions "gong" and "control" with the parameters gong-type, volume setting, priority number, calling zone numbers, and the type and id-number of the control output.

It is possible to initiate a macro via the special function keys on the paging consoles or to trigger it via control input. It is also possible to combine a macro with the internal clock or calendar.

The PROANNOUNCE system provides a number of pre-programmed macros, where only individual parameters still have to be entered. Additionally, it is possible to combine several macros in a sequence. Using pre-defined macros and sequences lets you create new, user-specified and application-related macros, which basically are capable of managing any control function imaginable. A total of up to 250 user-macros can be programmed.

3.10 Interfaces

Besides its control inputs and control outputs, the PROANNOUNCE system provides additional interface ports. The connection of paging consoles to the PROANNOUNCE manager DPM 4000 is performed via serial RS-485 ports. This allows connecting up to four terminals at a single port. Power amplifiers and the DCS 400 controller are connected to another independent RS-485 port, which allows direct management of up to 64 power amplifiers and 8 DCS 401.

Connecting a PC is established via serial RS-232 port on the rear panel of the DPM 4000. It is not necessary for the PC to be permanently connected to the DPM 4000.

An additional RS 485-interface offers the possibility to operate several DPM 4000 in a network.

3.11 Safety Standards

The PROANNOUNCE system complies with all applicable requirements of the IEC 849 standard – electro acoustics emergency alert PA-systems. The digital PROANNOUNCE manager DPM 4000 guards and monitors its entire internal functions. All connected paging stations and power amplifiers, including the wiring, are monitored via polling and pilot tone functions. Using the remote control units in the power amplifiers, it is also possible to monitor the loudspeaker lines. Of course, the PROANNOUNCE system is also prepared for operation with emergency power supply. In case of a power outage, the DPM 4000 takes over the entire power management; i. e. all internal and external power consuming components are switched to stand-by mode. Only when necessary, they are turned on again. This minimizes the total power consumption efficiently and guarantees maximum operational reliability when the system is operated from a battery power source.

Fault messages are being displayed in plain text on the paging console displays and a floating contact is provided for collective fault messages. An automatic protocol facility of the system's individual state of operation is optionally possible. This protocol is stored in the DPM 4000's internal memory. If necessary, it can be displayed on the screen of a connected computer or printed out via a printer.

4. Installation

The PROANNOUNCE Designer software has been designed for use on computers running Microsoft Windows95/98/NT and utilizes all typical features of these operating systems. Therefore it is important that the user is familiar with using application software running under Windows.

4.1 Installation And Program Start

4.1.1 System Specifications

The software can be used on a desktop or laptop PC running Windows95/98/NT as operating system. To guarantee satisfactory working with the PROANNOUNCE Designer software, the computer should provide the following features:

- PC computer system with pentium processor (at least 90 MHz) and Windows95/98/NT
- 16 MB of RAM
- 1 hard disk with at least 5 MB available disk space
- 1 x 3.5" floppy drive
- 1 mouse
- 1 monitor (800 x 600) incl. VGA graphics board, 256 colors
- 1 RS-232 serial port with interface cable
- 1 CD-ROM drive

4.1.2 Software Installation

To install the PROANNOUNCE Designer on your PC you have to:

insert the PROANNOUNCE Designer CD into CD-ROM or DVD drive on your PC.

- in the Windows menu select the entry Execute
- enter the correct names for the floppy drive, directory and the software:
D:\PROANNOUNCE Designer\Disk1\SETUP.EXE
- First, the setup-software prepares the Install Shield Wizard for the installation of the PROANNOUNCE software. During the following installation process, the program will ask you to acknowledge several specific notes and preferences. To accept the standard preferences, you simply confirm the Next button. In general, the PROANNOUNCE software is installed in the directory C:\PROGRAMS\PROANNOUNCE. Additionally, the sub directories C:\PROGRAMS\PROANNOUNCE\EXAMPLES and C:\PROGRAMS\PROANNOUNCE\PROJECTS are being installed. Anyway, it is possible to change the installation paths at your liking and you can also cancel the installation process at any time.
- Now it comes to copying the files.
- After successfully finishing the installation, you can "quit" the installation software and "open" the PROANNOUNCE Designer application by "double clicking" the program icon.

4.1.3 Starting PROANNOUNCE Designer

Windows95/98/NT offers several choices to start the PROANNOUNCE Designer software:

- Select *EXECUTE* within the Windows95/98/NT start menu, enter the command line "**C:\programs\PROANNOUNCE\PROANNOUNCE.exe**" and confirm with **OK**.
- In the Windows95/98/NT start menu, select programs/PROANNOUNCE and click onto PROANNOUNCE Designer.
- Link the "PROANNOUNCE.exe" file onto your desktop and start the program by double clicking the PROANNOUNCE Designer icon.
- By dragging & dropping a configuration file (suffix .pmx) onto the PROANNOUNCE Designer icon on the desktop, the PROANNOUNCE Designer software starts using the corresponding project.

4.1.4 Uninstalling PROANNOUNCE Designer

For removing the PROANNOUNCE Designer software from your hard disk, using the Windows95/98/NT software uninstall-procedure is recommended.

To do so, you have to open the windows *my system* and *system controls* and select the entry *software*. Now, you are presented with a list of software that Windows95/98/NT is able to automatically uninstall. Click onto the entry "PROANNOUNCE" and confirm your selection with the button *install/uninstall*. After confirming the uninstalling procedure again, all components of the PROANNOUNCE Designer software including its .dll and registration files are automatically removed from your hard disk.

5. Description Of Individual Devices

5.1 Digital PROANNOUNCE Manager DPM 4000

5.1.1 Features

The Digital PROANNOUNCE Manager DPM 4000 represents the central unit of the PROANNOUNCE system incorporating all primary functions that are needed in advanced PA-system installations. The DPM 4000's most important characteristics are listed below:

- 4 audio inputs; universally configurable; connection of up to 16 paging consoles
- 4 audio outputs
- Digital 4 x 4 audio mixing matrix with volume controls in all inputs and outputs
- Parametric 3-band equalizer for all 4 inputs
- Delay processor for all 4 outputs
- Multi-chime gong signal
- Alarm generator
- Signal generator and evaluation used for pilot tone surveillance
- Voice message recording and playback (optional)
- Floating control inputs with freely definable functions
- Floating control outputs for general control purposes with freely definable functions
- Linking of internal and external control inputs and outputs
- System clock with DCF-77 receiver for radio-controlled operation (optional)
- Monitor output to control slave clocks via pole change impulse
- Monitoring facility for all inputs and outputs as well as DPA 4000 Series power amplifiers and other external audio sources
- Integrated monitoring amplifier with loudspeaker respectively headphones connector
- RS-485 remote interface for DPA 4000 Series power amplifiers and the DCS 400 control system
- RS-232 interface for PC-connection
- Optional RS-485 interface for network-based operation of several DPM 4000
- Electronically programmable fuses for all power supply outputs
- READY relay for remote indication of malfunctions
- Power management of the entire PROANNOUNCE system (optional)
- Surveillance and protocol of all internal and external functions (optional)

DEVICE DESCRIPTIONS

The following block diagram outlines the features once again. It shows a DPM 4000 equipped with a 2-channel paging station module (NRS 90215), a MIC/LINE + 2 AUX inputs module (NRS 90216), two 2-channel LINE output modules (NRS 90218) and an 8 I/O control module (NRS 90219). The ports of the interface block are standard. Their functioning is explained in detail on the following pages. The "Optional" port allows for retrofitting an additional serial port for the intercommunication between several DPM 4000s or connecting external devices / entire installations.

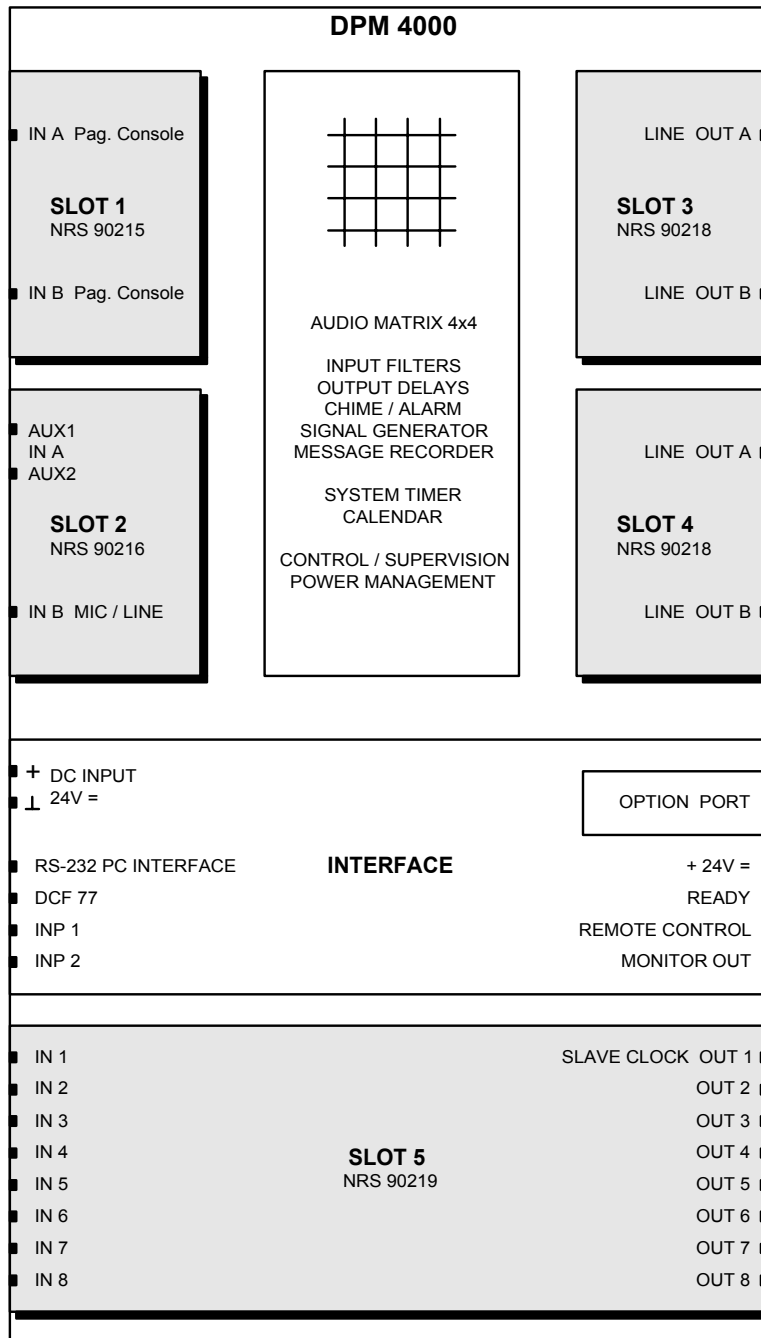


figure 5.1 DPM 4000 block diagram

5.1.2 Front View



figure 5.2 DPM 4000 front view

The following controls and indicators are located on the DPM 4000's front panel:

1. LED DCF 77

This LED indicates the operation mode of the DCF 77 radio-controlled-signal receiver. The following table shows the different indications and explains their corresponding status:

LED indication	status
OFF	No radio control signal detected or no DCF 77 antenna connected. The system clock is quartz-synchronized.
ON	The radio control signal is received. The system clock is synchronized to the DCF 77 signal.
Blinking, one cycle per second	The radio control signal is present and the system clock is being synchronized. This procedure can take up to 2 minutes. After synchronization is complete, the DCF 77 LED light continuously.
Blinking, fast	The radio control signal is detected but its reception is jammed. Re-adjusting the DCF 77 antenna or choosing a location with improved reception is recommended.

2. LED READY

This LED indicates the operation mode of the PROANNOUNCE System. After switching the power on, the READY LED blinks while the system boots. Depending on the complexity of the installation blinking can take several seconds. After successful initialization, the LED lights, signaling that the system is ready for operation. Whenever erroneous operation – either in the DPM 4000 or in one of the connected components – is detected, the LED goes out indicating that a system error occurred. When the system power is OFF, the READY LED is OFF as well.

3. LED POWER

This LED lights as soon as a power source (24 V =, power supply or battery) is connected to the DPM 4000. The LED does not light when the DPM 4000's power supply is disconnected, switched off or fails.

4. LED FAULT

This LED lights during a reset or when an internal watchdog error is being detected within the DPM 4000. It also indicates erroneous operation of external system components (power amplifiers, paging stations, relay boards, ...). The LED is connected to the READY relay on the rear of the appliance, which allows remote indication of system errors.

5.1.3 Rear View

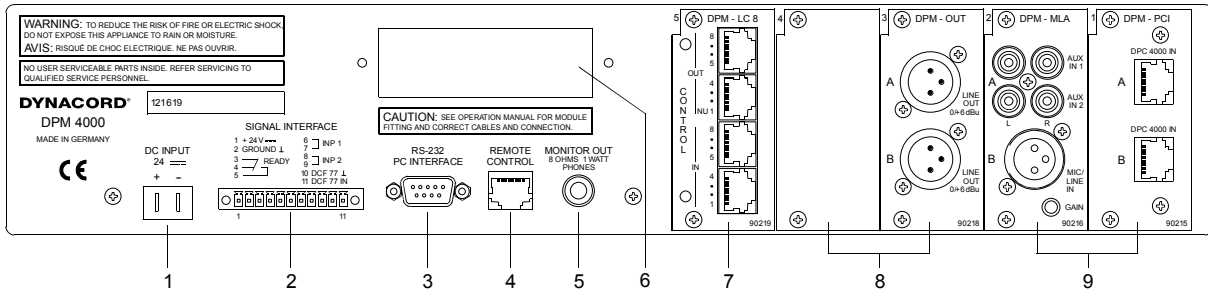


figure 5.3 DPM 4000 rear view

The following module ports and connections are located on the rear panel of the DPM 4000:

1. DC INPUT 24V ==

The DPM 4000's power supply source has to be connected here; a 24 VDC power supply or a PROANNOUNCE system battery module using insulated AMP flat-connector plugs 6.3 x 0.8 mm. The DPM 4000 is protected against polarization mismatch and all positive and negative conductors within the device are fuse-protected. The fuses are located inside the enclosure on the printed board assembly 80430. The connection cables have to be 1,5 mm² in diameter at least. With this diameter the cable length of a single path should not exceed 4.0 m (max. drop in voltage <1V).

CAUTION: Using the DPM 4000 is only permissible with batteries that are not grounded or provide a grounded negative pole. Operation with grounded positive pole is not admissible.

2. SIGNAL INTERFACE

Signal	Pins	Description
+24V ==	1	24 V== voltage output for the supply of external components. The maximum current handling capacity is 400 mA.
GROUND	2	Ground connector of the 24 V== voltage output.
READY	3, 4, 5	Floating output for the indication of the system's operation mode. In the normal ready mode the READY relay is activated. When internal errors occur or external devices show faulty behavior, the READY-relay drops. The relay is connected to the FAULT LED indicator on the front panel of the DPM 4000 providing indication of the operational status directly on the appliance.
INP1	6, 7	Floating input for monitoring / remote controlling the battery power supply, usually connected to a battery module or battery charging unit. Since this input can be freely programmed, using it for any other 24 V control signal is possible as well.
INP2	8, 9	Floating input for monitoring / remotely controlling the power supply, usually connected to the 24 V== system power supply. Since this input can be freely programmed, using it for any other 24 V control signal is possible as well.
DCF77	10, 11	Socket for connecting an external DCF 77 antenna. This input provides the supply voltage and simultaneously serves as input for the decoded DCF 77 signal. Only connecting the NRS 90193 DCF 77 receiver is admissible while polarity is not a critical factor. However, according to CE regulations, shielded cabling has to be used. Connect the shield to the connector's pin 10 and the signal line to pin 11.

3. RS-232 PC INTERFACE

This 9-pole PC-interface is meant for connecting a computer (female, pin 4 = TXD, pin 3 = RXD, pin 1 = ground). It is used to transfer data between the PC and the DPM 4000 during system configuration as well as for control, monitoring, and remote diagnosis purposes. The PC is connected to the DPM 4000 utilizing a standard 1:1 D-sub extension cord with male connectors on one end and female connectors on the other.

As an alternative to the RS-232 port, an optical IrDA interface is provided on the front panel of the appliance offering the possibility for wireless data transmission.

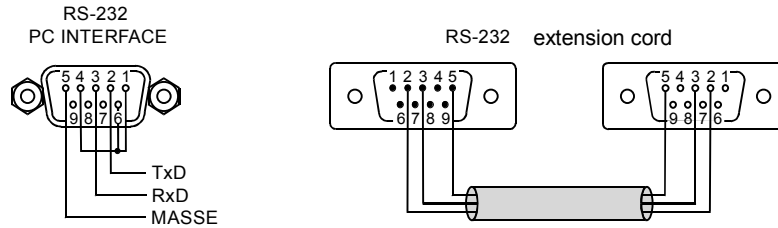


figure 5.4 pin-assignment of the RS-232 PC INTERFACE connector, D-Sub extension cord

4. REMOTE CONTROL socket

This 8-pole RJ-45-type socket is meant for connecting DCS 401 control modules or DPA 4000 power amplifiers with remote interface. The connector provides a RS-485 interface for communicating with control modules and power amplifiers (pins 4 / 5), a balanced audio input for the insertion of external monitor signals (pins 7 / 8), and a 24 V== supply voltage output for the supply of external modules (pin 1 = +24 V, 1 A max., pin 2 = GND). A programmable electronic fuse (adjustable to 330 mA, 660 mA, 990 mA) protects the voltage output against short-circuit and overload. External devices are connected through common RJ-45 extension cords. For additional information, please refer to the corresponding chapters of the individual device.

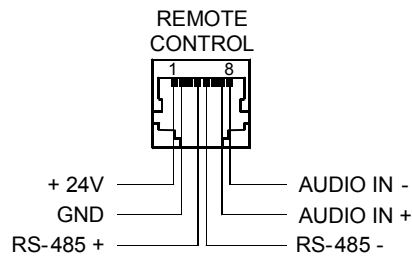


figure 5.5 pin-assignment of the REMOTE CONTROL socket

The RS-485 bus may not exceed a maximum length of 1,000m and must follow a line-structure (short stub cables are permissible). Cabling has to be carried out using twisted pair cables (38.400 Bd, 8N1)

5. MONITOR OUTPUT socket

The audio signal of the integrated monitor amplifier is outputted via this connector. In standard configuration, this output is set for the connection of headphones. It is also possible to directly connect a loudspeaker with minimum load impedance of 8 Ohms. To achieve higher output capacity it is possible to set the internal monitor amplifier to bridged operation. Thus some internal jumpers have to be re-set as shown in the figure below.

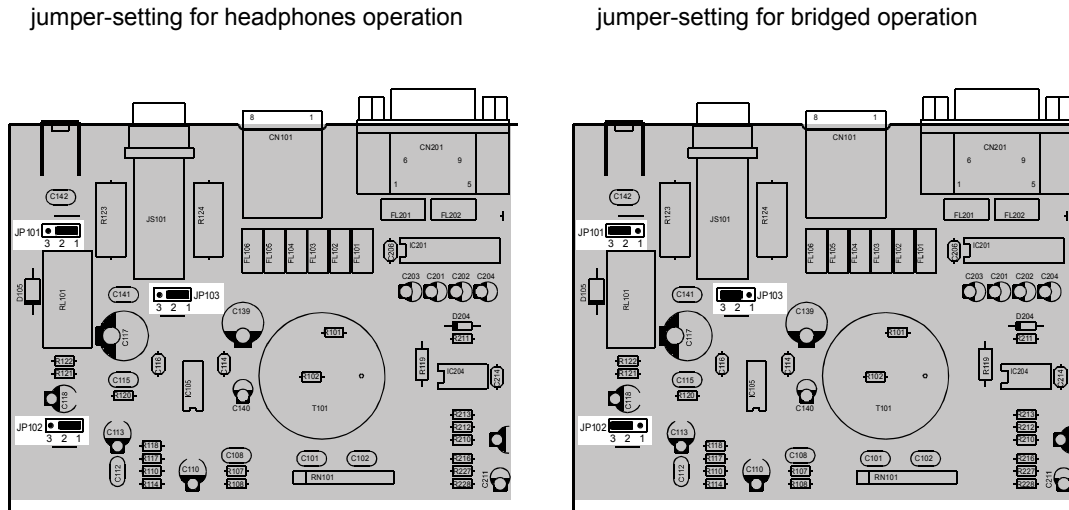


figure 5.6 adjusting the monitor amplifier's output power via jumpers on the printed board assembly 80430

6. Extension slot

The DPM 4000 extension slot allows retrofitting additional serial ports, which can be used for the inter-communication amongst DPM 4000 managers or to connect additional external devices. For detailed information, please refer to the owner's manuals of the individual extensions or modules.

7. Control Module Slot

Slot 5 is a control slot, which can be equipped with control modules for general control and query purposes. Control modules provide different kinds of control inputs and outputs. For detailed description, please refer to the following chapters. The DPM 4000 is shipped with one 8 I/O control module installed.

8. Slots for Audio Output Modules

The slots 3 and 4 are the DPM 4000's audio output slots providing two audio outputs per slot. Each slot can be equipped with a 2-channel audio output module. The DPM 4000 is shipped with a 2-channel audio output module installed in slot 3; described in detail at a later stage. Slot 4 is empty.

9. Audio Input Module Slots

The slots 1 and 2 are the DPM 4000's audio input module slots providing two audio inputs per slot. Each slot can be equipped with any suitable audio input module. A detailed description of available audio input modules can be found in the following chapters. The DPM 4000 is shipped with no audio input modules installed.

5.1.4 Specifications

Supply voltage	24 V DC (21.6 ... 31.2 V DC)
Nominal power consumption	500 mA
Maximum power consumption	6.7 A
Audio section	
Inputs	see specifications of the corresponding input module
Outputs	see specifications of the corresponding output module
Frequency Response	20 Hz ... 20 kHz, ± 0.5 dB
S/N ratio	> 100 dB (A-weighted)
Distortion	< 0.01 %
24 V output	24 V DC / 400 mA max. (21.6 ... 31.2 V DC)
Ready output	floating relay contacts, 1 A / 24 V DC
Logic inputs	2, floating via opto-coupler, bi-pole
Voltage with input OFF (LOW)	$U_{IN} < \pm 5$ V
Voltage with input ON (HIGH)	$U_{IN} > \pm 10$ V
Maximum input voltage	$U_{IN \max} = \pm 31$ V
DCF77 input	2-pole, for the NRS 90193, DCF 77 receiver
RS-232 interface	19,200 Baud, 8 data bits, 1 stop bit, no parity, Xon/Xoff
Remote interface	
Serial port	RS-485 standard
Supply output	short-circuit-proof, electronically programmable fuse
Supply voltage	24 V DC (21.6 ... 31.2 V DC)
Nominal current	330 mA, 660 mA, 990 mA (selectable, electronic fuse)
Monitor input	electronically balanced, transformer optionally available
Nominal input level	+2.2 dBu / 1 V
Max. input level	+10 dBu / 2.5 V
Input balance	> -30 dB
Monitor output	6.3 mm phone jack, either for the connection of headphones or speakers
Output level	with headphones: 650 mV / -1.5 dBu with loudspeakers: 1.8 V / 7.2 dBu
Output power handling	with headphones: 50 mW / 8 Ω with loudspeakers: 380 mW / 8 Ω
Operating temperature range	+5 °C ... +40 °C
Dimensions W x H x D	19", 2 HE 483 x 88 x 337 mm
Installation depth	340 mm (410 mm incl. connectors)
Weight	6.4 kg
Optionally available extensions	NRS 90208 input transformer for 1 monitor input, order no. 121 641

5.1.5 2-Channel Paging Station Module (NRS 90215)

This 2-channel audio input module is meant for the connection of DPC 4000 Series paging consoles. Each of the two input channels provide RJ-45 sockets allowing the connection of up to 4 paging stations plus paging station extensions per input. The microphone terminals are interconnected via 6-conductor parallel cables. The module can be installed in slot 1 and slot 2.

Next to the electronically balanced audio input, each input connector provides a serial RS-485 interface port and the power supply connection for the paging stations (see also: pin-assignment of the RJ-45 connector). The paging stations' power supply employs an electronic, programmable fuse, through which the maximum output current can be matched to meet actual system accommodations. This prevents the entire installation from malfunction, in case of short-circuit occurring in a single paging station only.

Input channels can be switched separately onto the monitor bus and you can monitor the audio signal via headphones or loudspeaker, either which is connected to the monitor output. Automatic pilot tone surveillance of the entire input stage is integrated as well. If necessary, retrofitting the audio inputs with transformers is possible.

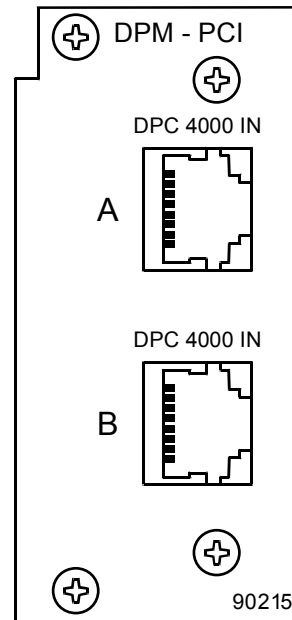


figure 5.7 2-channel paging station module

Note: When connecting several paging consoles to a single input, please keep in mind that line interruption or short-circuit can cause malfunction of several or even all paging stations of that specific line. In emergency alert installation, connecting security-related consoles to individual inputs is therefore of major importance.

Specifications:

description	DPM-PCI 2-channel paging station module, NRS 90215
connections	2 x RJ-45 sockets
audio	
inputs	2, electronically balanced, transformers are optionally available
nominal input level	0 dBu / 775 mV
max. input level	+12 dBu / 3 V
input impedance	20 kΩ
input balancing	> -30 dB
frequency response	20 Hz ... 20 kHz, ± 0.5 dB
S/N ratio	> 100 dB (A-weighted)
distortion	< 0.01 %
A/D-conversion	18-bit linear, Sigma-Delta
control interfaces	2 x RS-485 standard
power supply outputs for the DPC 4000	2, short-circuit-proof, electronically programmable fuses
supply voltage	24 V DC (21.6 ... 31.2 V DC)
nominal current	330 mA, 660 mA, 990 mA (adjustable, electronic fuse)
power consumption	2 W
operational temperature range	+5 °C ... +40 °C
dimensions W x H x D	37.5 x 81 x 248 mm
weight	152 g (220 g including 2 x NRS 90208)
extensions	NRS 90208 input transformer for 1 paging station input, order-No. 121 641

Pin-Assignment Of DPC 4000 Connectors And The Extension Cord:

Connecting DPC 4000 paging stations to the DPC 4000 IN connector is established through the use of common RJ-45 extension cords, where the conductors are twisted in pairs as follows: pair 1 = 1/2 (24 V/GND), pair 2 = 3/6 (free), pair 3 = 4/5 (RS-485), pair 4 = 7/8 (AUDIO).

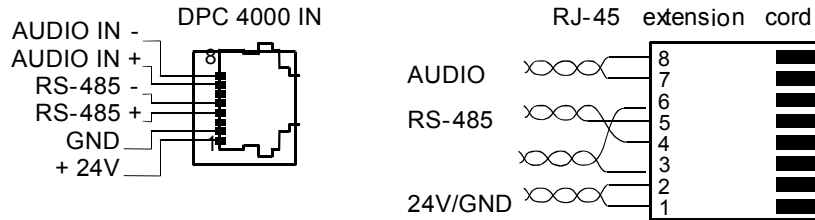


figure 5.8 pin-assignment of the DPC 4000 connectors, RJ-45 extension cords

The RS-485 bus may not exceed a maximum length of 1,000m (mind the voltage drop for operation voltage) and must follow a line-structure (short stub cables are permissible). Twisted-pair wiring is of special importance.

Using IY(ST)Y wiring is allowable (38400 Bd, 9N1)

Block Diagram:

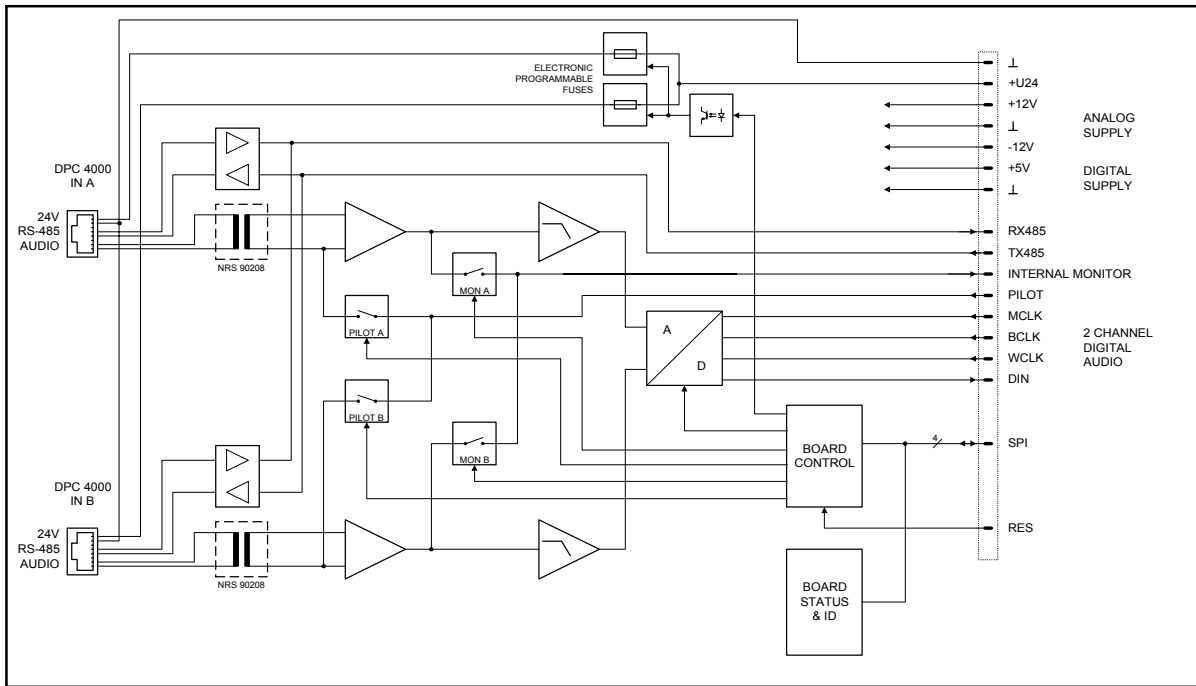


figure 5.9 block diagram 2-channel paging station module

Retrofitting Input Transformers:

In case galvanic separation of the audio signal is necessary, the module is prepared for retrofitting two input transformers. Separate NRS 90208 extensions consisting of audio transformer and insulation plate each are needed per input channel.

When retrofitting the transformers, please proceed as follows:

1. Disconnect the DPM 4000 from the mains power supply.
2. Loosen the two locking screws and carefully slide the module out of the slot.
3. Remove the two resistors of the corresponding input channel (IN A: R6 / R7, IN B: R3 / R8).
4. Place the insulation plate between the transformer and the printed board assembly and solder the transformer to position T1 for IN A or to position T2 for IN B.
5. Re-insert the module into the slot and carefully push it into the DPM 4000 until it firmly locks in place.
6. Fix the module in place using the two locking screws and reconnect the power supply.

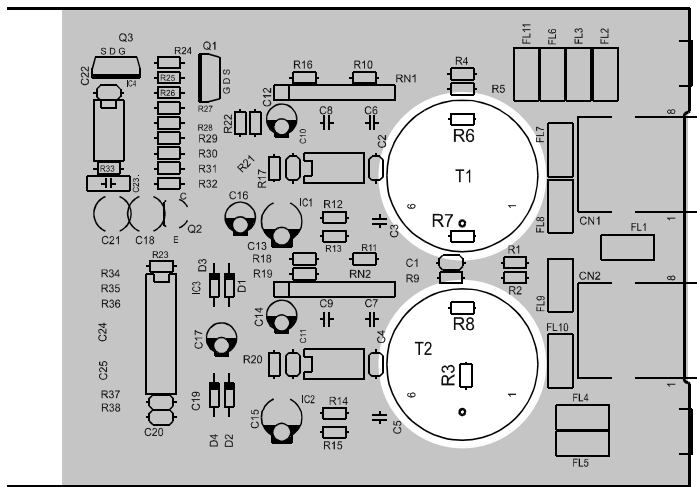


figure 5.10 retrofitting the input transformers, location of parts (NRS 90215)

5.1.6 MIC/LINE + 2 AUX Input Module (NRS 90216)

This 2-channel audio input module is meant for the connection of external audio sources of any kind. Channel A employs two switched AUX-inputs with 4 RCA-type connectors (2 x L / R) for CD players, tape decks, tuners, DAT decks, etc. The MIC / LINE-input of channel B is provided through an XLRF-type connector allowing the connection of microphones, mixers and other similar sources. The module can be inserted in slot 1 and slot 2.

Input levels of both AUX-inputs can be separately adjusted via internal potentiometers in a range between -10 dBu to +12 dBu.

The MIC / LINE-input's sensitivity can also be adjusted through an internal MIC / LINE switch (PAD) providing 30 dB attenuation. The GAIN-control on the appliance's rear panel offers additional control within a range of 40 dB. The MIC / LINE input is electronically balanced and can be retrofitted with a transformer. Phantom power can be switched via a jumper. If necessary, it is also possible to incorporate a compressor / limiter into the audio path via jumper setting.

The input channels can be switched separately to the monitor bus and you can listen to the signal via headphones or loudspeaker, either which is being connected to the monitor output. Automatic pilot tone surveillance of the entire input stage is integrated as well.

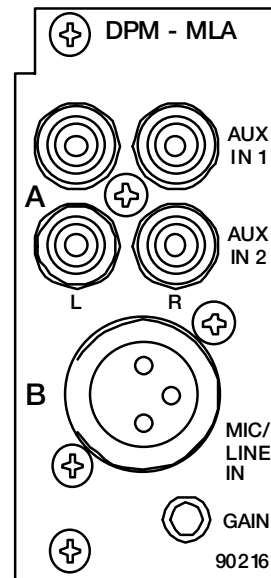


figure 5.11 MIC/LINE + 2 AUX input module

Specifications:

description	DPM-MLA MIC/LINE + 2 AUX input module, NRS 90216
connections	1 x XLRF-type / 4 x RCA-type connectors
input A	2 x AUX, unbalanced, internally summed
nominal input level	-10 dBu ... +12 dBu / 250 mV ... 3 V
max. input level	+12 dBu / 3 V
input impedance	10 kΩ
input B	MIC/LINE, electronically balanced, transformers are optionally available
nominal input level	MIC: -54 dBu ... -14 dBu / 1.5 mV ... 155 mV LINE: -24 dBu ... +16 dBu / 50 mV ... 5 V
max. input level (in limiter operation)	MIC: +5 dBu / 1.4 V LINE: +30 dBu / 25 V
input impedance	MIC: 3.6 kΩ LINE: 10 kΩ
input balancing	> -30 dB
phantom power	24V / 20 mA, switched via jumper
audio	
frequency response	20 Hz ... 20 kHz, ± 0.5 dB
S/N ratio	> 95 dB (A-weighted)
distortion	< 0.01 %
A/D-conversion	18-bit linear, Sigma-Delta
power consumption	2.3 W
operational temperature range	+5 °C ... +40 °C
dimensions W x H x D	37.5 x 81 x 252 mm
weight	160 g (173 g including NRS 90233)
extensions	NRS 90233 input transformer for 1 MIC/LINE input, order-No. 121 682

Pin-Assignment Of XLR-Type Connectors:

The pin-assignment of the MIC/LINE input's XLR-type connector is as follows: pin 1 = screen, pin 2 = positive conductor, pin 3 = negative conductor. In unbalanced configuration, the pins 3 (-) and 1 (screen) have to be bridged inside the connection plug.

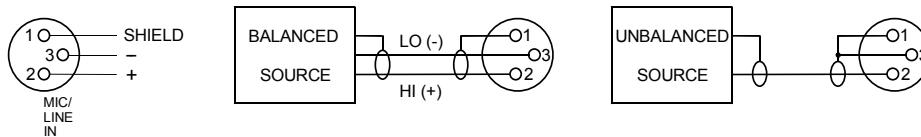


figure 5.12 pin-assignment of the MIC/LINE IN XLR-type connector

Block diagram:

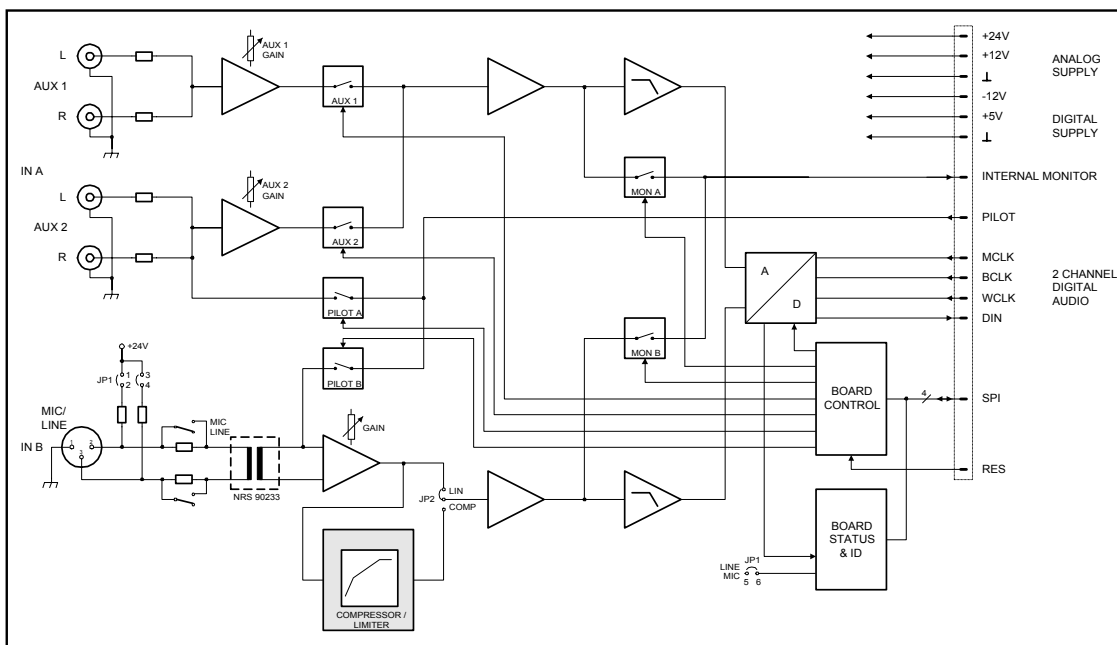


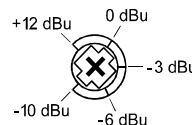
figure 5.13 block diagram MIC/LINE + 2 AUX input module

Internal Settings:

1. AUX input sensitivity

The input levels can be set in a range of -10 dBu to +12 dBu using trimmers VR2 (AUX 1) and VR3 (AUX 2). The trim-potentiometers' coarse scales are meant for your convenience, helping you in adjusting the levels.

Potentiometer setting	Input level
Left margin	+12 dBu
Center position	-3 dBu
Right margin	-10 dBu



2. MIC / LINE switching and sensitivity setting for the MIC / LINE input

The MIC / LINE input's internal PAD-switch (S1) allows switching the channels' sensitivity between microphone and line level (30 dB). The GAIN-control on the module's front panel is provided to precisely adjust the input sensitivity (range 40 dB).

In addition, a MIC/LINE jumper (JP1, pins 5-6) is located on the printed board assembly, which allows correctly configuring the input. When changing the MIC/LINE switch it is important to change the jumper correspondingly (open = LINE, closed = MIC).

When shipped, the factory preset is: switch S1 in the LINE position and jumper JP1 open.

GAIN setting	MIC / LINE setting	MIC / LINE jumper	Input level
Left margin	MIC	Closed	-14 dBu
	LINE	Open	+16 dBu
Center position	MIC	Closed	-28 dBu
	LINE	Open	+2 dBu
Right margin	MIC	Closed	-54 dBu
	LINE	Open	-24 dBu

3. Phantom Power

By closing the jumper JP1, pins 1-2 and pins 3-4, engage 24 V phantom power is possible for microphones that are directly connect. When shipped, the jumpers' factory preset position is "open" (no phantom power).

4. Compressor / Limiter

The MIC / LINE input channel embodies a compressor / limiter circuit which can be incorporated into the signal path via jumper JP2 (position 1-2, COMP). Normally, the compressor / limiter should be used to eliminate the risks of overdrive and clipping, when directly connecting a microphone. When shipped, the jumper is set to its "Linear" position (2-3, LIN).

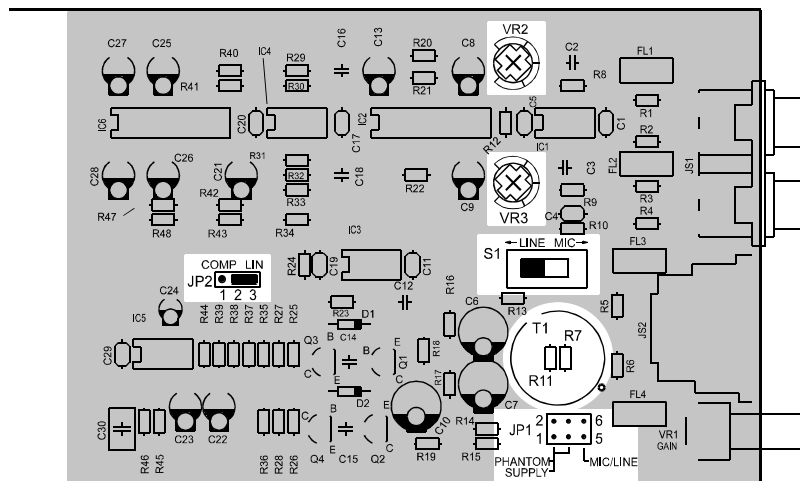


figure 5.14 retrofitting the input transformer, internal settings, location of parts (NRS 90216)

Retrofitting Input Transformers:

In case galvanic separation of the audio signal is necessary, an input transformer can be retrofitted to channel B of the MIC / LINE module. This is accomplished using the extension kit NRS 90233.

When retrofitting input transformers, please proceed as follows:

1. Disconnect the DPM 4000 from the mains power supply.
2. Loosen the two locking screws and carefully slide the module out of the slot.
3. Remove the two resistors of input channel B (R7 / R11).
4. Solder the transformer in position T1 onto the printed board assembly.
5. Re-insert the module into the slot and carefully push it into the DPM 4000 until it firmly locks in place.
6. Fix the module in place using the two locking screws and reconnect the power supply.

5.1.7 2-Channel MIC/LINE Input Module (NRS 90217)

This 2-channel audio input module is meant for the connection of external audio sources, like microphones, mixers, etc. Both channels are furnished with XLR-type connectors. The module can be installed into slot 1 and slot 2.

The sensitivity of the MIC / LINE inputs can be adjusted in a wide range. The internal MIC / LINE switches (PADs) provide 30 dB attenuation. The separate GAIN-controls for each channel provide additional control in a range of 40 dB. The MIC / LINE inputs are electronically balanced and can be retrofitted with transformers. Phantom power can be switched via jumper setting. If necessary, compressors / limiters can also be incorporated in the audio paths via jumpers.

Input channels can be switched separately onto the monitor bus and you can listen to the signal via headphones or loudspeaker, either which is being connected to the monitor output. Automatic pilot tone surveillance of the entire input stage is integrated as well.

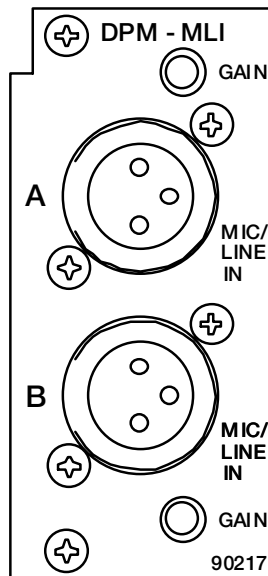


figure 5.15 2-channel MIC/LINE input module

Specifications:

description	DPM-MLI 2-channel MIC/LINE input module, NRS 90217
connections	2 x XLR-type connectors
audio	
inputs	2 x electronically balanced, transformers are optionally available
nominal input level	MIC: -54 dBu ... -14 dBu / 1.5 mV ... 155 mV LINE: -24 dBu ... +16 dBu / 50 mV ... 5 V
max. input level (in limiter operation)	MIC: +5 dBu / 1.4 V LINE: +30 dBu / 25 V
input impedance	MIC: 3.6 kΩ LINE: 10 kΩ
Input balancing	> -30 dB
phantom power	24V / 20 mA, switched via jumper
frequency response	20 Hz ... 20 kHz, ± 0.5 dB
S/N ratio	> 95 dB (A-weighted)
distortion	< 0.01 %
A/D-conversion	18-bit linear, Sigma-Delta
phantom power	24V / 20 mA, switched via jumper
power consumption	3 W
operational temperature range	+5 °C ... +40 °C
dimensions W x H x D	37.5 x 81 x 252 mm
weight	160 g (186 g including 2 x NRS 90233)
extensions	NRS 90233 input transformer for 1 MIC/LINE input, order-No. 121 682

Pin-Assignment Of XLR-Type Connectors:

The pin-assignment of the MIC/LINE input's XLR-type connector is as follows: pin 1 = screen, pin 2 = positive conductor, pin 3 = negative conductor. In unbalanced configuration, the pins 3 (-) and 1 (screen) have to be bridged inside the connection plug.

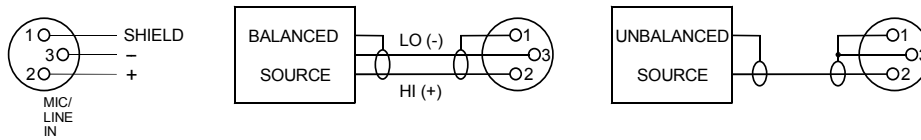


figure 5.16 pin-assignment of the MIC/LINE IN XLR-type connectors

Block diagram:

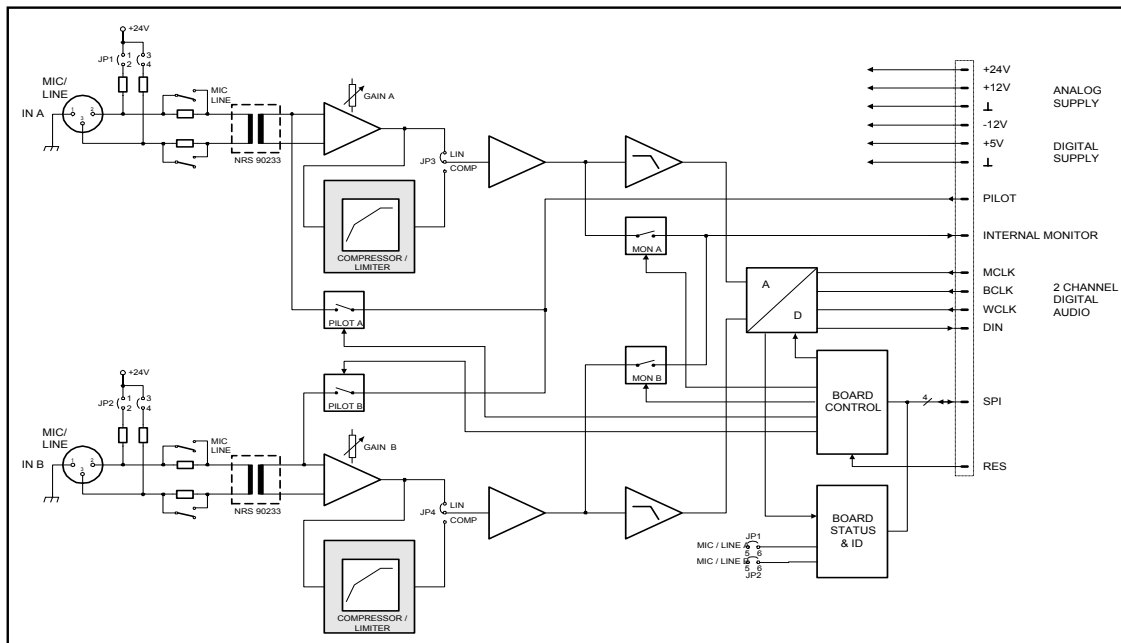


figure 5.17 block diagram of the 2-channel MIC/LINE input module

Internal Settings:

1. MIC / LINE switching and sensitivity setting for the MIC / LINE inputs

The MIC / LINE input's internal PAD-switches (IN A: S1, IN B: S2) allow switching the channels' sensitivity between microphone and line level (30 dB). The two GAIN-controls on the module's front panel are provided to precisely adjust the input sensitivity (range 40 dB).

In addition, two MIC/LINE jumpers (IN A: JP1, pins 5-6, IN B: JP2, pins 5-6) are located on the printed board assembly allowing the correct configuration of the inputs. When changing a MIC/LINE switch it is important to change the related jumper correspondingly (open = LINE, closed = MIC).

When shipped, the factory presets are: switches S1 and S2 set to LINE and jumpers JP1 and JP2 are open.

GAIN setting	MIC / LINE setting	MIC / LINE jumper	Input level
Left margin	MIC	Closed	-14 dBu
	LINE	Open	+16 dBu
Center position	MIC	Closed	-28 dBu
	LINE	Open	+2 dBu
Right margin	MIC	Closed	-54 dBu
	LINE	Open	-24 dBu

2. Phantom Power

By closing the jumpers JP1, pins 1-2 and pins 3-4 (IN A) respectively JP2, pins 1-2 and pins 3-4 (IN B), it is possible to (separately) engage 24 V phantom power when a microphone is connected to the corresponding input. When shipped, jumpers are set to “open” (no phantom power).

3. Compressor / Limiter

The MIC / LINE input channels embody compressor / limiter circuits, which can be incorporated in the signal paths via the jumpers JP3 for IN A and JP4 for IN B (position “COMP”), if needed. Normally, the compressors / limiters should be used to eliminate the risks of overdrive and clipping, when directly connecting microphones. When shipped, the jumpers are set to “LIN”.

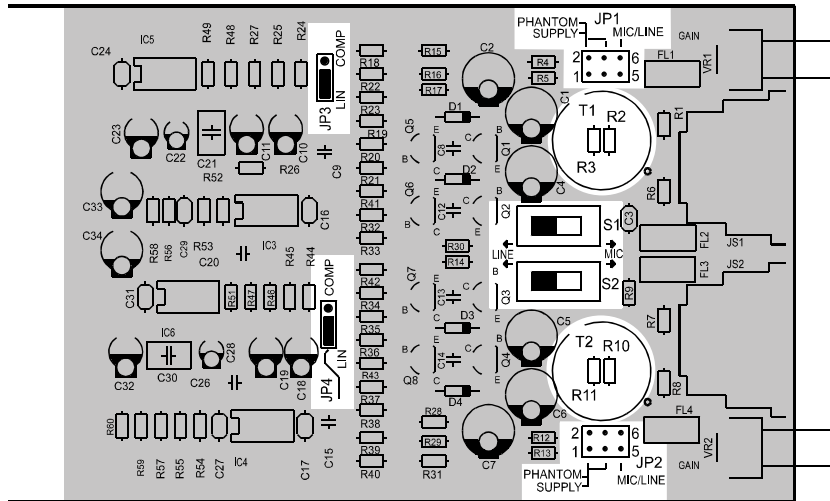


figure 5.18 retrofitting the input transformers, internal settings, location of parts (NRS 90217)

Retrofitting Input Transformers:

In case galvanic separation of the audio signals is necessary, the module can be retrofitted with two input transformers. This is accomplished by using an extension kit NRS 90233 per input channel.

When retrofitting input transformers, please proceed as follows:

1. Disconnect the DPM 4000 from the mains power supply.
2. Loosen the two locking screws and carefully slide the module out of the slot..
3. Remove the two resistors of the correspondent input channel (IN A: R2 / R3, IN B: R10 / R11).
4. Solder the transformer for IN A in position T1 and for IN B in position T2 onto the printed board assembly.
5. Re-insert the module into the slot and carefully push it into the DPM 4000 until it firmly locks in place.
6. Fix the module in place using the two locking screws and reconnect the power supply.

5.1.8 2-Channel AUX Input Module (NRS 90228)

This 2-channel audio input module provides 8 RCA-type connectors (4 x L / R) for connecting external audio sources such as CD-players, tape decks, tuners, DAT decks, etc. The module can be installed into slot 1 and slot 2.

The input levels of the four AUX inputs can be independently adjusted in a range between -10 dBu and +12 dBu via internal trim-potentiometers.

Input channels can be switched separately to the monitor bus and you can listen to the signal via headphones or loudspeaker, either which being connected to the monitor output. Automatic pilot tone surveillance of the entire input stage is integrated as well.

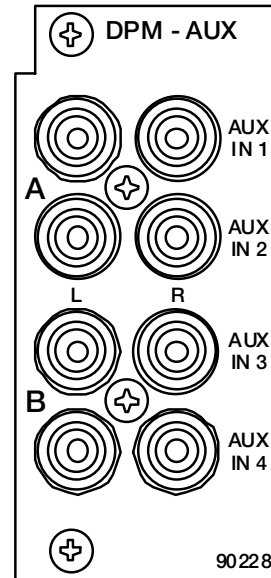


figure 5.19 2-channel AUX input module

Specifications:

description	DPM-AUX 2-channel AUX input module, NRS 90228
connections	8 x RCA-type connectors
audio	
inputs	4 x AUX, unbalanced, internally summed
nominal input level	-10 dBu ... +12 dBu / 250 mV ... 3 V
max. input level	+12 dBu / 3 V
input impedance	10 kΩ
frequency response	20 Hz ... 20 kHz, ± 0.5 dB
S/N ratio	> 100 dB (A-weighted)
distortion	< 0.01 %
A/D-conversion	18-bit linear, Sigma-Delta
power consumption	1.4 W
operational temperature range	+5 °C ... +40 °C
dimensions W x H x D	37.5 x 81 x 252 mm
weight	150 g

Block Diagram:

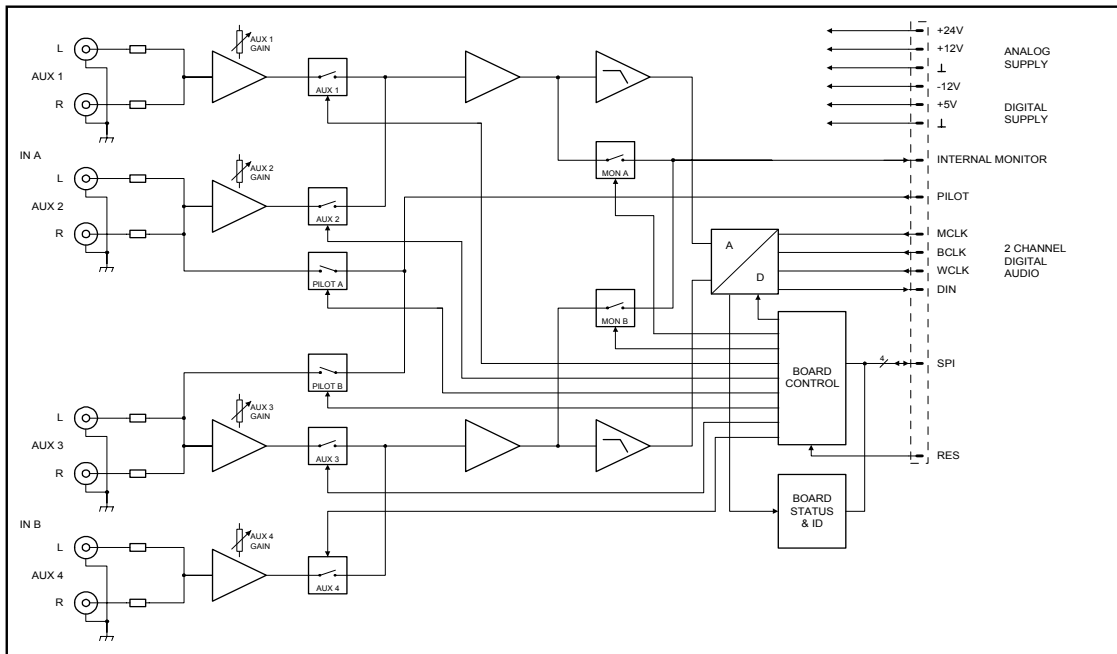


figure 5.20 block diagram 2-channel AUX input module

Internal Settings:

AUX input sensitivity setting

Using trimmers VR1 (AUX 1), VR2 (AUX 2), VR3 (AUX 3) and VR4 (AUX 4), adjusting input levels is possible in a range between -10 dBu and +12 dBu. The trim-potentiometers' coarse scales are meant for your convenience, helping you in adjusting the levels.

Potentiometer setting	Input level
Left margin	+12 dBu
Center position	-3 dBu
right margin	-10 dBu

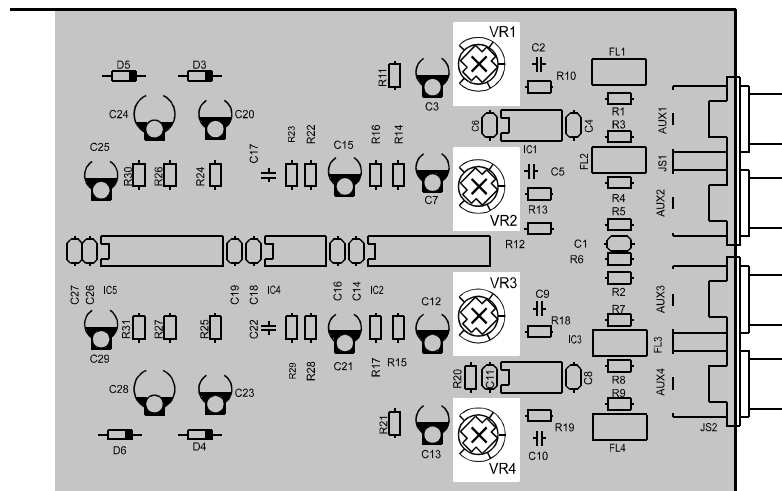
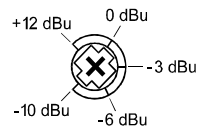


figure 5.21 internal settings, location of parts (NRS 90228)

5.1.9 MIC/LINE + Paging Station Module (NRS 90234)

This 2-channel audio input module is meant for the connection of DPC 4000 Series paging stations and other external audio sources. The RJ-45 socket of channel A allows the connection of up to 4 microphone terminals plus paging station extensions. The MIC / LINE input of channel B is furnished through an XLRF-type connector allowing the connection of microphones, mixers and other audio signal sources. The module can be installed into slot 1 and slot 2.

Next to the electronically balanced audio input, the DPC 4000 input connector provides a serial RS-485 interface and the power supply for the connected paging consoles (see also pin-assignment of the RJ-45 connector). The paging stations' power supply employs an electronic, programmable fuse, through which the maximum output current can be matched to meet actual system accommodations.

The MIC / LINE input employs an internal switch (PAD) providing 30 dB of attenuation. The GAIN-control located on the appliance's rear panel offers additional control in a range of 40 dB. The input is electronically balanced and prepared for retrofitting a transformer. Phantom power can be switched via jumper. If necessary, a compressor / limiter circuit can be incorporated in the audio path.

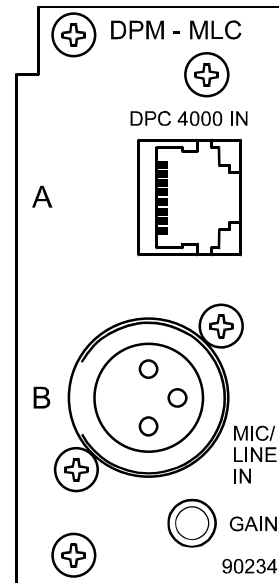


figure 5.22 MIC/LINE + paging station module (NRS 90234)

Input channels can be switched separately to the monitor bus and you can listen to the signal via headphones or loudspeaker, either which being connected to the monitor output. Automatic pilot tone surveillance of the entire input stage is integrated as well.

Note: When connecting several paging consoles to a single input, please keep in mind that line interruption or short-circuit can cause malfunction of several or even all paging stations of that specific line. In emergency alert installation, connecting security-related consoles to individual inputs is therefore of major importance.

Specifications:

description	DPM-MLC MIC/LINE + paging station module, NRS 90234
connections	1 x RJ-45 socket; 1 x XLRF-type connector
input A	DPC 4000, electronically balanced, transformers are optionally available
nominal input level	0 dBu / 775 mV
max. input level	+12 dBu / 3 V
input impedance	20 kΩ
input B	MIC/LINE, electronically balanced, transformers are optionally available
nominal input level	MIC: -54 dBu ... -14 dBu / 1.5 mV ... 155 mV LINE: -24 dBu ... +16 dBu / 50 mV ... 5 V
max. input level (in limiter operation)	MIC: +5 dBu / 1.4 V LINE: +30 dBu / 25 V
input impedance	MIC: 3.6 kΩ LINE: 10 kΩ
Phantom power	24V / 20 mA, switched via jumper
audio	
input balancing	> -30 dB
frequency response	20 Hz ... 20 kHz, ± 0.5 dB
S/N ratio	> 95 dB (A-weighted)
distortion	< 0.01 %
A/D-conversion	18-bit linear, Sigma-Delta
control interface	1 x RS-485 standard

supply output for the DPC 4000	1, short-circuit-proof, electronic, programmable fuse
supply voltage	24 V DC (21.6 ... 31.2 V DC)
nominal current	330 mA, 660 mA, 990 mA (set via electronic fuse)
power consumption	2.5 W
operational temperature range	+5 °C ... +40 °C
dimensions W x H x D	37.5 x 81 x 252 mm
weight	165 g (215 g including NRS 90208 + NRS 90233)
extensions	NRS 90208 input transformer for 1 paging station input, order No. 121 641 NRS 90233 input transformer for 1 MIC/LINE input, order No. 121 682

Pin-Assignment Of RJ-45 Socket And Extension Cord:

Connecting DPC 4000 paging stations to the DPC 4000 IN connector is performed using common RJ-45 extension cords, where the conductors are twisted in pairs as follows: pair 1 = 1/2 (24 V/GND), pair 2 = 3/6 (free), pair 3 = 4/5 (RS-485), pair 4 = 7/8 (AUDIO).

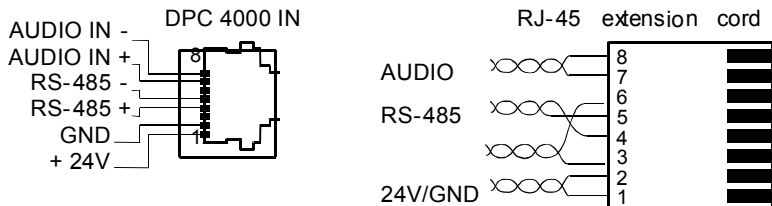


figure 5.23 pin-assignment of the DPC 4000 socket, RJ-45 extension cord

The RS-485 bus may not exceed a maximum length of 1,000m (mind the voltage drop for operation voltage) and must follow a line-structure (short stub cables are permissible). Twisted-pair wiring is of special importance.

Using IY(ST)Y wiring is allowable (38400 Bd, 9N1)

Pin-Assignment Of XLR-F-Type Connectors:

The pin-assignment of the MIC/LINE input's XLR-F-type connector is as follows: pin 1 = screen, pin 2 = positive conductor, pin 3 = negative conductor. In unbalanced configuration, the pins 3 (-) and 1 (screen) have to be bridged inside the connection plug.

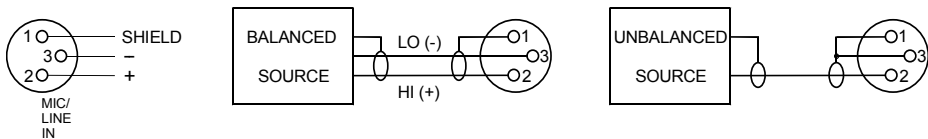


figure 5.24 pin-assignment of the MIC/LINE IN XLR-F-type connector

Block Diagram:

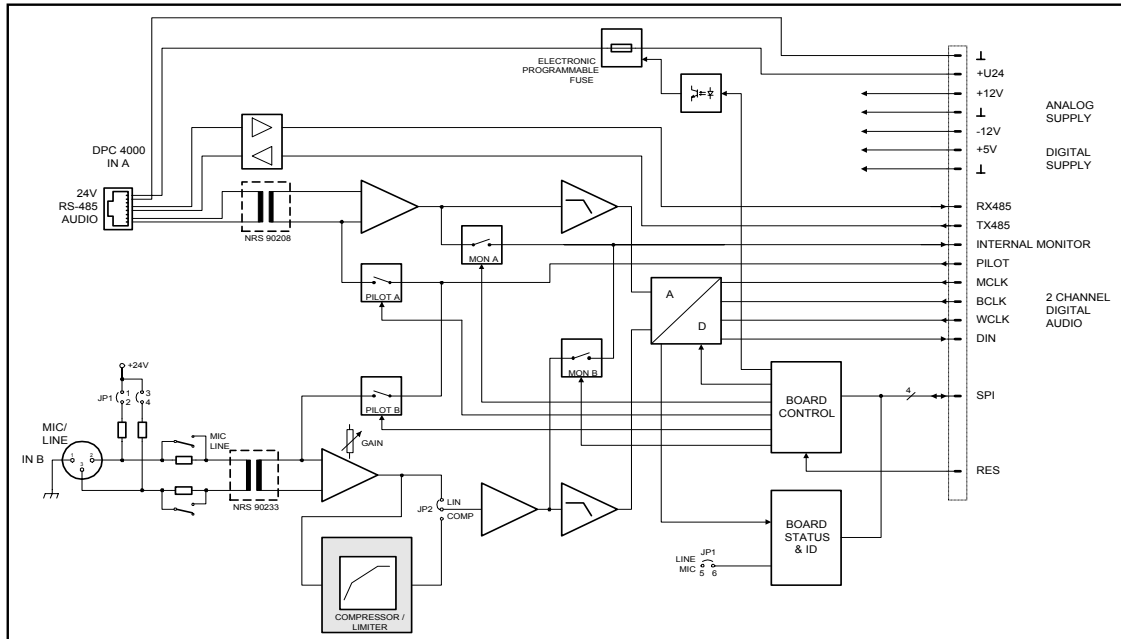


figure 5.25 block diagram MIC/LINE + paging station module

Internal Settings:

1. MIC / LINE switching and sensitivity of the MIC / LINE input

The MIC / LINE input's internal PAD-switch (S1) allows switching the channels' sensitivity between microphone and line levels (30 dB). The GAIN-control on the module's front panel is provided to precisely adjust the input sensitivity (range 40 dB).

In addition, a MIC/LINE jumper (JP1, pins 5-6) is located on the printed board assembly, which allows correctly configuring the input. It is important to change the jumper accordingly (open = LINE, closed = MIC) when changing the MIC/LINE switch.

When shipped the switch S1 is pre-set to LINE and the jumper JP1 to its open position.

GAIN setting	MIC / LINE setting	MIC / LINE jumper	Input level
Left margin	MIC	Closed	-14 dBu
	LINE	Open	+16 dBu
Center position	MIC	Closed	-28 dBu
	LINE	Open	+2 dBu
Right margin	MIC	Closed	-54 dBu
	LINE	Open	-24 dBu

2. Phantom power

Closing the pins 1-2 and 3-4 of the jumper JP1 offers the possibility to engage 24 V phantom power for microphones that are connected directly. When shipped, the jumper is factory pre-set to its "open" position (no phantom power).

3. Compressor / Limiter

The MIC / LINE input channel embodies a compressor / limiter circuit which can be incorporated into the signal path via jumper JP2 (position COMP). Normally, the compressor / limiter should be used to eliminate the risks of overdrive and clipping, when directly connecting a microphone. When shipped, the jumper is pre-set to its "Linear" position (LIN).

Retrofitting Input Transformers:

Retrofitting two input transformers onto the module is possible for the case that galvanic separation of the audio signals is needed. For the DPC 4000 input a NRS 90208 extension is needed, which consists of an audio transformer and an insulation plate. For the MIC/LINE input a NRS 90233 extension is needed.

When retrofitting input transformers, please proceed as follows:

1. Disconnect the DPM 4000 from the mains power supply.
2. Loosen the two locking screws and carefully slide the module out of its slot.
3. Remove the two resistors of the corresponding input channel (IN A: R8 / R9, IN B: R3 / R4).
4. With the DPC 4000 input (IN A), you have to place the insulation plate between the transformer and the printed board assembly. Then solder the transformer in position T2; with the MIC/LINE input (IN B), you have to solder the transformer in position T1.
5. Re-insert the module into the slot and carefully push it into the DPM 4000 until it firmly locks in place.
6. Fix the module in place using the two locking screws and reconnect the power supply.

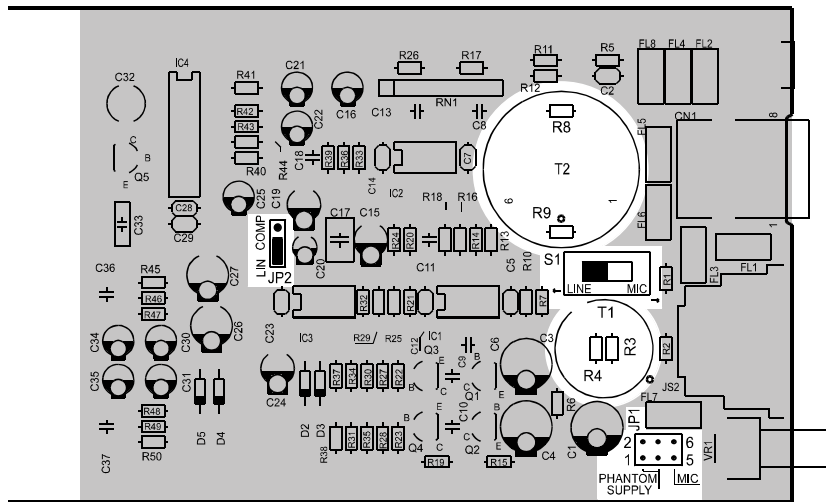


figure 5.26 retrofitting the input transformers, internal settings, location of parts (NRS 90234)

5.1.10 2-Channel LINE Output Module (NRS 90218)

The output module is meant for the connection of power amplifiers with an input sensitivity of 0 dB or +6 dB. Two XLRM-type connectors allow the connection of up to 20 power amplifiers each. The audio signal is electronically balanced; if necessary, transformers can be retrofitted. The module can be installed in slot 3 or slot 4.

The output channels can be switched separately to the monitor bus and you can listen to the signal via headphones or loudspeaker, either which is connected to the monitor output. Automatic pilot tone surveillance of the two output channels is also integrated. The jumpers for adjusting the output voltage to 0 dB or +6 dB are located on the printed board assembly. At the same time you have to alter the jumper setting of the monitor signal correspondingly.

The output module employs integrated output relays that prevent switching noise from being heard. When switching the system on, the output signal is put through after the system is been initialized (power-on delay); the contacts are immediately interrupted when switching the power off.

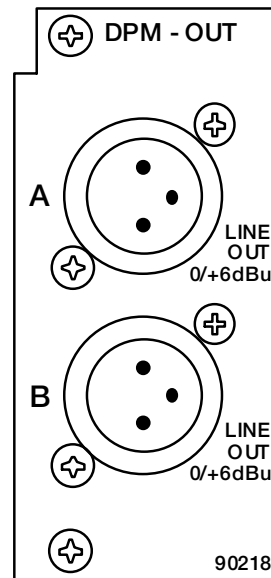


figure 5.27 2-channel LINE output module

Specifications:

description	DPM-OUT 2-channel LINE output module, NRS 90218
connections	2 x XLRM-type connectors
audio	
outputs	2, electronically balanced, transformers are optionally available
nominal output level	0 dBu / 775 mV or +6 dBu / 1.55 V, switched via jumper
output impedance	115 Ω
frequency response	20 Hz ... 20 kHz, ± 0.5 dB
dynamic range	> 97 dB (A-weighted)
S/N ratio	> 109 dB (A-weighted)
distortion	≤ 0.005 %
D/A-conversion	20-bit linear, Sigma-Delta
power consumption	1.5 W
operational temperature range	+5 °C ... +40 °C
dimensions W x H x D	37.5 x 81 x 247 mm
weight	160 g (255 g including 2 x NRS 90227)
extensions	NRS 90227 output transformer for 1 output order-No. 121 679

Pin-Assignment Of XLRM-Type Connectors:

The LINE output XLR-connectors' pin-assignment is as follows: pin 1 = screen, Pin 2 = positive conductor, pin 3 = negative conductor. In unbalanced configuration the pins 3 (-) and 1 (screen) have to be bridged inside the connected plug.

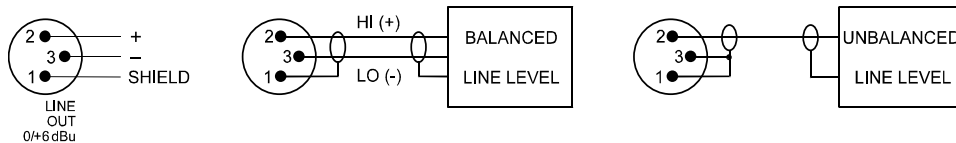


figure 5.28 pin-assignment of the OUT XLR-connectors

Block diagram:

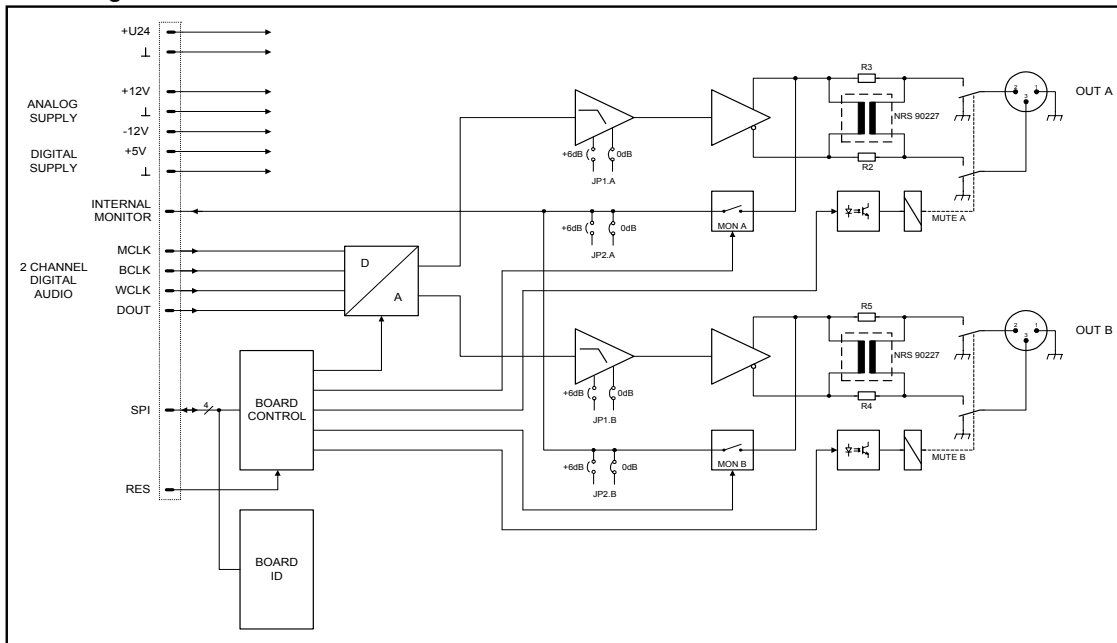


figure 5.29 block diagram of the 2-channel LINE output module

Setting Output Levels Via Jumpers:

Each of the two outputs' output level can be set to 0 dB or +6 dB using the jumpers JP1 and JP2. Please make sure to set both jumpers of an output channel (A / B) to the desired position.

When shipped, the output levels for both output channels are factory pre-set to 0 dB (all jumpers are closed).

Jumper setting	Output level
JP1, 2-4 / JP2, 2-4 Open	+6 dB
Closed	0 dB

Jumper setting	Output level
JP1, 1-3 / JP2, 1-3 Open	+6 dB
Closed	0 dB

Jumper setting for the output assignment: To be used in network installations. When used in a network environment, the following jumpers have to be open:

OUT A **LK10, LK11** (applies to printed board assemblies starting with index C!)
OUT B **LK 8, LK 9**

Retrofitting Output Transformers:

Retrofitting two output transformers onto the module is possible for the case that galvanic separation of the audio signals is needed. Therefore, separate NRS 90227 extensions are needed per output channel.

When retrofitting output transformers, please proceed as follows:

1. Disconnect the DPM 4000 from the mains power supply.
2. Loosen the two locking screws and carefully slide the module out of its slot.
3. Remove the two resistors of the correspondent output channel (OUT A: R2 / R3, OUT B: R4 / R5).
4. Close the two bridges of the correspondent output channel (OUT A: LK1 / LK2, OUT B: LK3 / LK4). The soldering pads on the printed board assembly have to be short-circuited (closed).
5. Solder the transformer onto the printed board assembly: for OUT A in position T1 and for OUT B in T2.
6. Re-insert the module into the slot and carefully push it into the DPM 4000 until it firmly locks in place.
7. Fix the module in place using the two locking screws and reconnect the mains power supply.

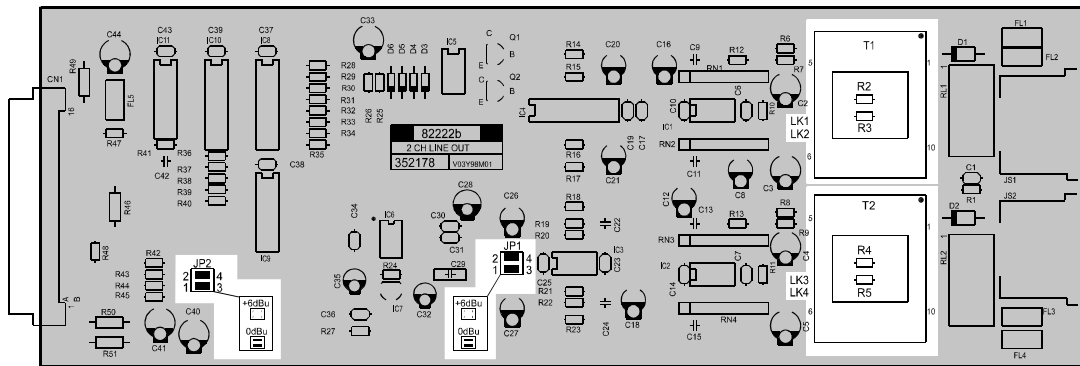


figure 5.30

output level jumpers, retrofitting transformers, location of parts (NRS 90218)

5.1.11 8 I/O Control Module (NRS 90219)

This control module provides 8 floating control inputs and 7 floating logic level outputs (0 V, 24 V). An additional output provides pole change impulses for controlling slave system clocks. Contact is established via 4 x RJ-45 sockets providing 8 contacts each. The module can be installed in slot 5.

The slave clock output (NU, OUT 1) is short-circuit proof; up to approximately 40 slave clocks can be connected. Please make sure to connect all slave clocks according to their correct polarity.

The control outputs (OUT 2 - 8) are capable of switching voltages of either polarity and up to a maximum current of 1 A.

The control inputs (IN 1 - 8) are capable of handling voltages of either polarity between -31 V and +31 V; for voltages between 0 and 5 V the inputs are not active (low), for voltages between 10 V and 31 V the inputs are active (high). The control inputs can ignite switching functions or macros either during a change of state or in any stationary state. This offers the possibility to monitor line idling currents (e. g. in fire alert system installations).

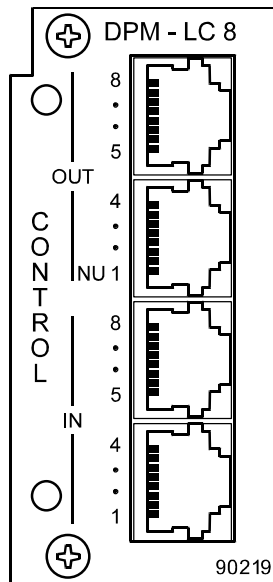


figure 5.31 8 I/O control module

Note: The opto-coupler inputs are primarily meant to prevent noise loops that can result from dropping voltages in long distance cabling. They are not suitable for separating networks from each other. Therefore, only floating sources should be connected.

Specifications:

description	DPM-LC8 8 I/O control module, NRS 90219
connections	4 x RJ-45 sockets
logic inputs	8, floating via opto-coupler, bi-polar
voltage when the input is LOW	$U_{IN} < \pm 5 \text{ V}$
voltage when the input is HIGH	$U_{IN} > \pm 10 \text{ V}$
maximum input voltage	$U_{IN \text{ max}} = \pm 31 \text{ V}$
logic outputs	7, floating via relay contacts
contact capacity	1 A / 24 V DC
slave clock output	pole change impulse / turning impulse
output voltage	24 V DC
maximum output current	500 mA, electronically protected against overload
power consumption	3.2 W (12 W with the maximum amount of slave clocks connected)
operational temperature range	+5 °C ... +40 °C
dimensions W x H x D	37.5 x 81 x 247 mm
weight	195 g

Pin-Assignment Of RJ-45 Connectors:

The floating control inputs and outputs provide 2 adjacent contacts, each. The following diagram shows the assignment of RJ-45 contacts to inputs / outputs.

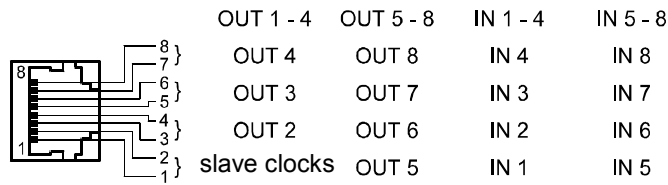


figure 5.32 pin-assignment of the IN / OUT connectors

Block diagram:

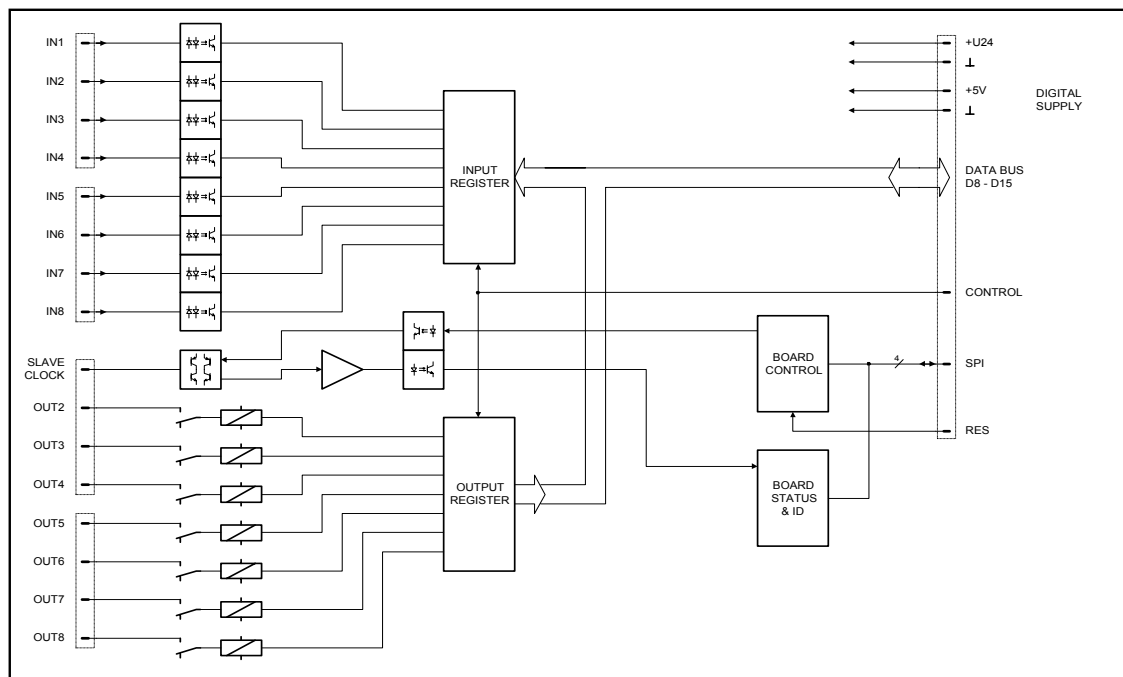


figure 5.33 block diagram of the 8 I/O control module

5.1.12 Flash Memory for Voice Recording/Playback (NRS 90205)

Internal Message Recorder

For using the internal message memory at least one voice message module NRS 90205 (121648) needs to be installed in the DPM 4000 and the SW-Message (121709) needs to be enabled. Up to maximally 4 memory modules can be retrofitted. The memory modules need to be formatted before the first use.

The Message Stacking Function is available together with the recorder.

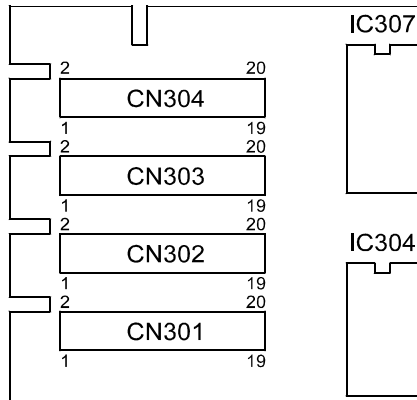
Data:

- number of internal texts (messages) 25
- sampling frequency 48kHz
- sampling format 16-bit linear at a bandwidth of 20kHz
8-bit compressed at a bandwidth of 10kHz
- maximum recording time 16-bit, 20kHz, 1 message memory: 22,5 sec.
16-bit, 20kHz, 4 message memory: 90 sec.
8-bit, 10kHz, 1 message memory: 90 sec. (1,5 min.)
8Bit, 10kHz, 4 message memory: 360 sec. (6 min.)
- signal sources DPM 4000 inputs IN1 – IN4

Instructions for retrofitting the Message Memory Extension (NRS 90205) into the DPM 4000

- contents: 1 printed board assembly 86237
1 manual

1. Disconnect the appliance from any power supply.
2. Remove the cover (7 screws).
3. Insert the printed board 86237 on the main pcb 80249C
- Insert the printed board 86237 into an empty slot, starting with CN301, CN302, CN303 or CN 304.
4. Format the inserted memory boards (only possible using the PROANNOUNCE Designer software).



5.2 PROANNOUNCE – DPC 4000 Paging Consoles

5.2.1 System Overview

The PROANNOUNCE system includes 5 different models of DPC 4000 Series paging stations and one paging station extension. All microphone terminals employ gooseneck microphones, 6 or 8 function keys and a covered alarm key. An additional alarm key and a key-locked switch can be retrofitted. The paging stations are available with 10, 20, 30, or 50 selection keys. All models also employ LC-displays (2 lines with 16 characters each).

The following list provides you with an overview of available paging station models:

DPC 4106	6 function keys
DPC 4510	8 function keys + 10 selection keys + alarm key
DPC 4520	8 function keys + 20 selection keys + alarm key
DPC 4530	8 function keys + 30 selection keys + alarm key
DPC 4550	8 function keys + 50 selection keys + alarm key
DPC 4350	paging console extension with 50 selection keys

All paging consoles include the following common features:

- all functions are processor-controlled
- configuration data is stored in non-volatile FLASH RAM
- condenser microphone with pre-amplifier and compressor / limiter circuitry
- freely programmable key-assignment
- easy key-labeling through label-strips and MS WORD™ templates
- analog circuitry surveillance via integrated pilot tone generator
- processor surveillance via watchdog function
- line surveillance via pilot tone and polling functions
- covered alarm key (not with DPC 4106)
- additional alarm keys or key-locked switches can be optionally retrofitted
- connection of an external PTT-microphone or audio source
- piezo buzzer for acoustical alerts
- an optional loudspeaker can be retrofitted
- setup-mode allows direct parameter setting at the paging station
- two-line LC-display

All paging consoles are processor-controlled and extensive monitoring functions are provided. The watchdog function monitors the processor system while a switchable pilot tone generator monitors the audio section. Additionally, the internal supply voltage is constantly measured. When it falls below a critical threshold an alert message is being displayed. The line surveillance function recognizes any line-interruption and/or short-circuits in the audio and RS-485 control cabling. Upon the detection of failure a corresponding message is displayed.

The PROANNOUNCE Designer software allows comfortably configuring the paging stations. Its graphic, dialogue-oriented user interface offers effortless assign of key functions, priorities, options, and many other paging station functions.

Note: Up to four paging consoles can be connected to a single input of the central unit. However, it is important to keep the fact in mind that in case of line interruption and short-circuit several microphone terminals may fail. Despite, one input allows only launching one message at a time. All other connected paging stations are presented with a busy-message. If these restrictions are not acceptable, every microphone terminal – or at least all directing stations and other important paging stations – should have its own input at the central unit.

5.2.2 Paging Console Functions

Next to elementary messaging, the paging stations offer several additional functions, which in summation are shown in the following diagram. Which functions a microphone terminal can initiate depends on its configuration and priority setting.

Table of all functions

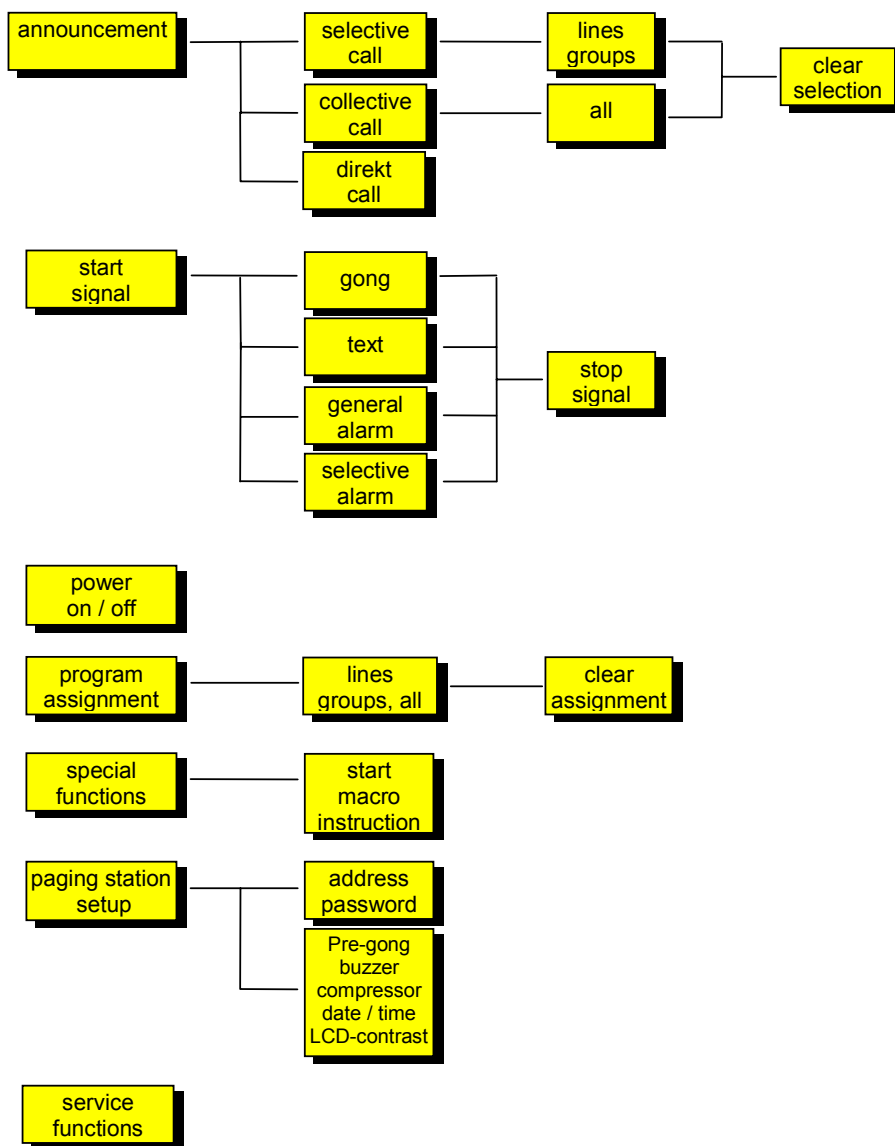


figure 5.34 overview of possible paging console functions

Detailed information on the different functions is provided within the following chapters of this handbook.

5.2.3 Control Panel Of The DPC 4550

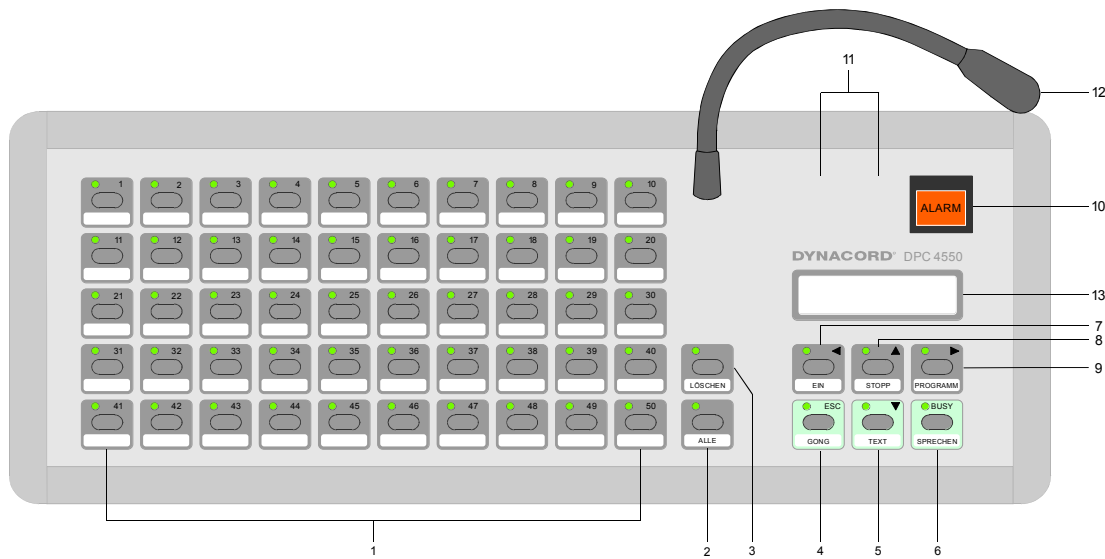


figure 5.35 control panel of the DPC 4550

1 Selection Keys and LED's

Depending on the individual paging station model, 10, 20, 30, or 50 selection keys with corresponding LED's are provided. The selection keys are used to pre-select areas or groups for the reproduction of messages, gong or alarm signals, vocal messages, or to assign programs (pressed once = ON, subsequently pressed = OFF). The LED's indicate the momentary selection status (also refer to the paragraph "indications"). It is also possible to assign special functions or no function at all (no function assigned) to the selection keys. Assigning functions is performed during the configuration procedure via PC.

Note: When shipped, these keys are factory pre-set as area selection keys, where key 1 – area 1, key 2 – area 2, ..., key n – area n.

2 ALL key and LED

The ALL key allows the selection of all programmed areas at once for transmitting messages, gong or alarm signals, vocal messages, or to assign programs. One time pressing selects all areas. The corresponding LED's and the ALL LED are lit. Subsequent pressing cancels the selection.

3 CANCEL key

This key offers different functions, depending on the actually selected operation mode, e.g. cancel calling pattern or cancel program-assignment. Which function is carried out at times is explained in detail in the paragraph OPERATION.

4 GONG key (ESC) and LED

Pressing this key starts the transmission of a gong signal in the pre-selected areas or groups. The GONG LED lights or blinks during the transmission of a gong signal. What kind of gong signal is being transmitted is defined during the configuration procedure. Pressing the STOP key cancels the reproduction of the gong signal.

While in setup-mode, this key is used to return to 'normal' user mode (ESCAPE = leaving setup-mode).

5 TEXT key (v) and LED

Pressing the TEXT key starts a prerecorded message (optional voice reproduction), which is transmitted into pre-selected areas or groups. The TEXT LED lights or blinks during the transmission of a prerecorded message. The desired text message is selected during the configuration procedure. Pressing the STOP key cancels the reproduction of a text message.

While in setup-mode, pressing the TEXT key decreases the selected parameter value (parameter entry).

6 TALK key and BUSY-LED

This key activates a message for pre-selected areas or groups. The BUSY LED lights during transmission. The TALK key has to be pressed until the end of a message. The BUSY LED blinks when one or several areas are busy or when an event with higher priority setting interrupts the output message (see paragraph indications). In the latter, it is necessary to repeat the message.

7 ON key (<) and LED

This key turns the system's power on or off. Turning the power on can take several seconds. The ON LED blinks while the system boots. The ON LED lights steadily when the system is operational. To prevent inadvertent erroneous operation pressing the key for at least 1 second is necessary when turning the power off. It is also possible to prohibit the operation of the ON key during the configuration procedure.

In setup-mode this key is used to select the previous parameter (parameter selection).

8 STOP key (^)

Pressing the STOP key cancels an output alarm signal or text message. Terminating an alarm signal is also possible by subsequently pressing the ALARM key. Only events that were triggered from a specific paging console can be stopped from the exact terminal with the exception of the directing station. This terminal allows canceling all signals.

While in setup-mode, this key increases the selected parameter value (parameter entry).

9 PROGRAM key (>) and LED

Pressing the PROGRAM key selects the program assign mode. The selection keys are used in this mode to assign a program (background music) to the desired areas or groups. The PROGRAM LED lights while being in the program assign mode. In this case the selection LED's indicate the areas / groups the program is being transmitted into.

Keeping this key pressed and simultaneously pressing the STOP key selects the setup-mode and the PROGRAM LED starts blinking. Now you can alter preferences or make other changes as described in the chapter 5.2.7 *Paging Station Configuration In Setup Mode*.

When in setup-mode, this key is used to select the following parameter (parameter selection).

10 ALARM key and Indicator

Pressing the ALARM key starts an alarm signal that is transmitted into all areas. The alarm indicator lights when launching an alarm. Pressing the STOP key or subsequently pressing the ALARM key terminates the alarm signal. What kind of alarm signal is being transmitted is defined during the configuration procedure of the PROANNOUNCE system.

11 Optional Key-Slots

These slots allow retrofitting an additional covered key and a key-locked switch. The front panel is already prepared for the installation of two 18 mm pushbuttons / switches. You only have to cut suitable holes into the front panel foil. Internal fittings and cables are also already prepared. The newly installed switches' functions are assigned during the configuration procedure via PC; e.g.: second alarm-pushbutton for transmitting an alarm signal into specific areas (selective alarm), or assigning the system ON / OFF function to the key-locked switch.

Detailed information and installation instructions are provided in the chapter 5.2.13 *Optionally Available Accessories*.

12 Microphone

After pressing the TALK button and after the BUSY LED lights making announcements in pre-selected areas or groups is possible using the integrated gooseneck microphone. The optimum distance from the microphone is approximately 20 to 35 cm. The microphone pre-amplifier embodies a limiter to control signal peaks and protect the system against overdrive.

The extension socket (EXT) allows connecting a second microphone with TALK button. Assigning the function (area, group) of the external microphone is performed during the configuration via PC.

13 Display

Depending on the actual operational status of the system, the LC-display with 2 lines of 16 characters each, shows information on time, operation mode, user notes, setting up, fault messages including precise device / module specification, etc.

5.2.4 Connections

1 LAN socket

This is the interface for connecting DPC 4000 Series paging stations to the PROANNOUNCE system. The 8-pole RJ-45 connector provides power supply, control interface RS-485, and audio connections. The microphone terminal has to be connected to a corresponding RJ-45 wall outlet using the supplied connection cord (3 m). The following figure shows the pin-assignment of LAN socket and RJ-45 network cable. Please also pay attention to chapter 5.2.14 *Cable Lengths*.

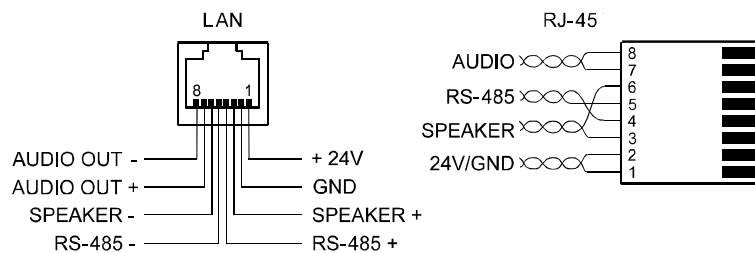


figure 5.36 LAN socket and RJ-45 network cable pin-assignment

2 EXT socket

Mostly, this socket is used for connecting a DPC4350 paging station extension. Use the supplied network cable (0.5 m) to connect the DPC4350 to the paging console's EXT socket.

In case no paging station extension is being connected, utilizing the EXT socket for connecting a second microphone with TALK button or other external audio signal sources to the paging console is possible as well. Detailed information is provided in chapter 5.2.13 *Optionally Available Accessories*.

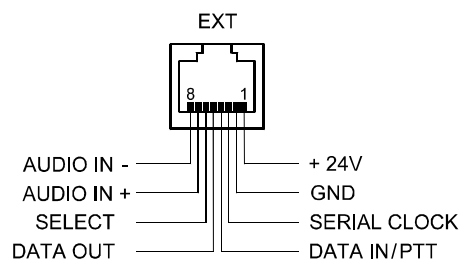


figure 5.37 EXT socket pin-assignment

5.2.5 Key-Labeling

Labeling the keys of paging consoles is done using label-strips, which can be slid in from the side. The label-strips for the 6 or 8 function keys are slid in from the right while the selection key strips – for 10, 20, 30, or 50 selection keys – are inserted from left. Therefore, you have to detach the correspondent side panel (2 screws) and insert the labeled strip into the gap between the front panel and the front panel foil.

The most convenient way of printing the labels is to utilize the word processing software MS-WORD. A suitable MS-WORD template file is supplied. Please note that with different printer models margin-settings may vary. Please adjust the layout form according to the individual specifications of your printer model.

Tested printer models are: **HP LaserJet 6P**
 HP LaserJet 5
 HP LaserJet II

The recommended paper thickness is between 120 g/m² and 200 g/m².

Also supplied with this handbook are prepared label-strips in German, English and French as well as empty strips which only have to be cut out. You can label the empty strips in handwriting or by using Letraset[®] letters.

5.2.6 Operation

This chapter explains all functions that are used during general operation.

Selective Call

The user can launch calls or announcements into freely selectable areas or groups.

Pressing a single or several selection keys defines areas or groups where a call is launched into – corresponding LED's will light. By pressing the key of an already pre-selected line once again deactivates that line and the corresponding LED goes out.

After making a selection, pressing the TALK-button ignites the call. Prior hereto, the BUSY LED allows checking whether all lines and the paging station input are actually free. If single lines or the terminal input are busy with lower priority transmissions, the BUSY LED will blink slowly. Whilst making an announcement is possible, this will interrupt any other transmitted event. If single lines or the terminal input are busy with higher priority signals, the BUSY LED will vastly blink and the calling attempt is ignored (also refer to the description of indications).

The BUSY LED lights during the transmission of an announcement. The TALK button has to be pressed during the whole message. Until the user makes any changes, the defined selection stays memorized, even after releasing the TALK button. Pressing the CANCEL key de-selects the entire selection.

Additionally and in case of a pre-gong signal has previously been programmed, the GONG LED will light during the transmission of the pre-gong signal.

Collective Call

The announcement is launched into all areas of the entire installation.

The procedure is similar to making a selective call. First, all areas of the installation are selected by pressing the ALL key. Pressing the TALK button activates the collective call. During the transmission of a call, all area and/or group LED's as well as the ALL LED will light (also refer to the paragraph "indications"). The TALK button has to be pressed down until the end of the announcement. BUSY LED indication and the behavior of the pre-gong signal are equivalent to the selective call.

Direct Call

Principally, assigning a direct call to any selection key (area key, group key, ALL key) is possible via PC during the configuration procedure. This allows making an announcement directly by pressing the desired selection key – without need to press the TALK key. For direct calls the BUSY LED also signals the status of correspondent areas (free, busy with lower priority signal, busy with higher priority signal; see "indications"). When shipped, there is no factory pre-set direct call programmed.

Gong (Chime) Signal

By factory the Gong key is programmed as a general call

A gong signal can also be transmitted into any selectable area or group of the entire installation (if programmed).

First, the desired areas / groups have to be selected; either by use of the selection keys (selective gong) or with the ALL key (general gong). Pressing the GONG key releases the gong signal. While the gong signal is being transmitted, the GONG LED lights continuously or blinks (also refer to indications). The gong's priority can be set to 6 or 7. Therefore it has priority over announcements from any paging station, except for the directing terminal (priority 10).

Pressing the STOP key cancels the transmission of a gong signal.

During setup mode this key is used to go back to the normal operating mode (escape).

Text Message

A text message recorded via the optional message module or using an external recording/playback device can be transmitted into any selectable area or group of the entire installation.

First, the desired areas / groups have to be selected; either by use of the selection keys or via the ALL key. Pressing the TEXT key starts the reproduction of a prerecorded message that had been assigned during configuration. While the text message is being transmitted, the TEXT LED lights steadily or blinks (also refer to indications). The text message priority can be set to values between 2 and 8.

Pressing the STOP key cancels the transmission of a text message.

General Alarm

A general alarm signal is always transmitted to all lines of the entire installation.

Pressing the covered ALARM key launches the integrated alarm. The key lights during the transmission of the alarm signal. The priority of the alarm can be set between 7 and 9. Therefore it has priority over any announcement or other event, except for those that were ignited from the directing paging station (priority 10).

Pressing the STOP key or subsequently pressing the ALARM key cancels the alarm.

Selective Alarm

When a paging station is equipped with a second ALARM key providing the option for selective alarms, it is possible to transmit alarm signals into selected lines.

Similar to the procedure for making a selective call you first have to select areas or groups to which the alarm signal shall be transmitted. Afterwards, pressing the covered ALARM key starts the selective alarm. The key lights during the transmission of an alarm. Already now, you are able to enter the lines for the following alarm.

Pressing the STOP key or subsequently pressing the ALARM key cancels the alarm.

When shipped, there is no factory pre-set selective alarm pre-programmed.

Note:	The launch of an alarm does not depend on a paging console's priority setting it had been activated from. Launching an alarm is possible from any microphone terminal at any time, even when the system is in stand-by mode. A running alarm is optically and occasionally also acoustically indicated at every paging station.
--------------	---

Canceling Signals

Pressing the STOP key cancels alarms, gong signals and text message transmissions. Events can only be terminated at the paging station they were launched from with the exception of the directing terminal (paging console with the highest priority possible 10). Through the directing station it is possible to cancel any signal in progress.

System ON / OFF

The ON key switches a PROANNOUNCE system ON or OFF. Mostly, it is not intended that any paging station be provided with the possibility to do so. Thus, this function can be programmed via PC-configuration.

When the system is in stand-by mode, the ON LED is off. Pressing the ON key turns the PROANNOUNCE system's power on which can take up to 10 seconds, while the ON LED is blinking. Once the system is ready for operation, the ON LED lights continuously (which also applies for all paging stations of the entire installation).

To switch the system OFF, you have to press the ON key for approximately 1 second. This is to prevent inadvertently turning off the system.

Pressing an ALARM key or igniting an alarm sequence at external terminals automatically switches the PROANNOUNCE system's power on and boots the system.

Program Assignment

Activating this feature allows the assignment of programs to individual areas and groups of the entire installation during the PC-configuration procedure.

First, by pressing the PROGRAM key, the paging station has to be set to program-assign mode. Pressing a single or several selection keys assigns the outputted program (background music) to the selected areas and groups. The corresponding LED's are lit. Program transmission has always the lowest priority (1). The signal level is determined during system configuration. The assignment stays memorized until the selection keys are pressed again. Pressing the CANCEL key erases the entire assignment-pattern.

Subsequently pressing the PROGRAM key or any other function key cancels program-assign mode. It is also automatically canceled after approximately 15 seconds.

In single-program configuration the music reproduction into all areas of the installation is attenuated for the time of an announcement. In double-program configuration parallel transmission of a background music program into rooms that are not part of an actual announcement selection is possible as well. If every line incorporates its own LF-output and separate power amplifiers, mixing announcements and background programs is possible in any way.

Special Functions

Generally, assigning a function to each selection key is possible. This allows utilizing a paging station to control the lighting, door openers, blinds, etc.; even controlling volume settings is possible through the use of the UP / DOWN keys.

When shipped, there are no special functions assigned.

5.2.7 Paging Console Configuration In Setup Mode

Configuring paging consoles is preferably performed on the central unit via computer and using the PROANNOUNCE Designer software. This represents the most convenient way without any limitation, while a paging terminal itself offers only limited programming ability.

Several key functions differ between setup-mode and operation mode. Alternate functions are marked on the right top corner of the individual key area.

Pressing PROGRAM key and STOP key simultaneously for at least 1 second – the PROGRAM LED starts blinking – engages a paging station's setup-mode.

Note: Paging stations where program-assignment has been activated indicate the program assignment-pattern for a short period of time.

Using the '<' and '>' keys lets you step through the setup menu items in forward and backward direction (parameter selection). Parameter number and name are shown on the display.

The following table shows an overview of parameters and their meaning:

Parameter number	Parameter name	Description
1	Address	Paging station address-assignment (addresses 1 - 16)
2	Password	Unwanted access protection in two levels via code numbers: - 3-digit = normal operation - 4-digit = setup-mode
3	Pre-gong signal	Message pre-gong ON / OFF
4	Buzzer	Acoustic signal (buzzer) on failure or as alert and during an outgoing alarm signal
5	Compressor	Microphone pre-amplifier compressor ON / OFF
6	Date / Time	Entry of date and time in the formats: tt.mm.yy hh:mm
7	LCD contrast	Setting the LCD-contrast and/or view angle

The '^' and 'v' keys activate / deactivate corresponding parameters or increment / decrement according parameter values. For directly entering numerical parameters, use selection keys 1 to 10, where the 10-key represents the "0".

Pressing the ESC key returns to 'normal' operation. The setup-mode is also automatically canceled when for approximately 15 seconds no entry or change has been made. All parameters are automatically stored.

1 Address

Paging consoles accept the assignment of addresses between 1 and 16. The setting is generally performed using the numerical keys 1 to 10, where the 10-key represents the "0". For paging stations without selection keys, the address has to be set using the '^' and 'v' keys.

CAUTION: When shipped all paging station addresses are set to OFF (no address). Therefore it is important to assign a correct address to a microphone terminal, before the first operation. Within an installation terminal addresses have to be assigned exclusively; a specific address can exist only once!

When applying operation voltage for the first time, paging consoles start up in entry mode right away.

2 Password (does not apply to paging consoles without selection keys)

3 or 4-digit passwords provide protection for paging consoles against unauthorized operation. Password protection can be established in two levels. The first level is the 'normal' user-level. In case this level is password-protected, the paging station cannot be operated except for launching an alarm. The second level is the setup-level. If this level is password-protected, the setup-mode is not accessible while unlimited 'normal' operation is possible.

Level 1 and 2 passwords are assigned and transferred to the individual paging stations during the PC-configuration procedure. As factory preset the level 1 password is set to '111' and the level 2 password is '2222'; level 2 (setup-mode) is password-protected (factory pre-set).

To prevent a paging station from unwanted access, you have to enter setup-mode and select parameter 2 "password". Depending on which function of the paging console you want to protect, by using the selection keys you have to enter either the 3-digit level 1 password or the 4-digit level 2 password. Protection is now activated and operation (1st level) and/or programming (2nd level) are not possible anymore. The blinking PROGRAM LED indicates this status.

The protection is canceled by re-entering the correct password while being in setup-mode.

3 Pre-Gong Signal

It is possible to program a pre-gong signal that is heard before an announcement. The pre-gong signal is transmitted into the selected areas when pressing the TALK-button. You can begin with your announcement during the transmission of the pre-gong signal; you can talk "into" the pre-gong.

Using the arrow keys (<>) first select parameter 3. Now, you can ignite the pre-gong signal with the '^' key or cancel it by using the 'v' key. The pre-gong function can also be activated or deactivated during PC-configuration.

4 Buzzer

The integrated buzzer can be programmed as acoustic alert signal. During failure, malfunction, or as general alert a buzzing sound is heard. When an alarm has been launched, the buzzing can be heard for the whole period of the alarm.

First, select parameter 4 using the arrow keys (<>). Now, you can activate the buzzer by pressing the '^' key. Pressing the 'v' key deactivates the buzzer. The buzzer function can also be activated during PC-configuration.

5 Compressor

The paging stations' microphone pre-amplifier incorporates compressor / limiter circuitry. While the limiter is constantly activated, the compressor can be switched ON or OFF. When the compressor is engaged, low-level signals are amplified to a higher degree, which results in constant talking levels although the distance between the announcer and the microphone varies. Besides, you have to keep in mind that also environmental noise is amplified. Thus, on-site testing with and without compressor will reveal which results in the better performance.

First, by using the arrow keys (<>), select parameter 5. Pressing the '^' key activates the compressor. Pressing the 'v' key deactivates the compressor. It is also possible to activate the compressor during the PC-configuration procedure.

6 Time / Date (does not apply to paging consoles without selection keys)

The connected paging stations allow setting the date and time of the PROANNOUNCE system.

First, by using the arrow keys (<>), select parameter 6. Using the selection keys 1 to 10 – with the 10-key representing the "0" – you can enter the correct time. Date and time are indicated in the following format: tt.mm.yy hh:mm. They have to be entered in that sequence

7 LCD-Contrast

Paging consoles with display allow the user to individually adjust LCD-contrast and viewing angle. This allows optimum legibility from the user's location.

First, by using the arrow keys (<>), select parameter 7. Now, you can adjust the LCD-contrast via the '^' or 'v' keys.

5.2.8 Indications

The following table provides you with an overview of the most important LED-indications.

LED	Status	Description
Selection LED (not with DPC 4106)	OFF	No group or area selected
	Lights green	Area or group selected / special function activated / direct call activated
ALLE LED (not with DPC 4106)	OFF	No collective call selected
	Lights green	Collective call pre-selected / direct collective call activated
BUSY LED	OFF	System not busy, clear for call
	Lights green	During own message
	Slow blinking, green	Low priority paging station launches a call in selected areas; interruption on cost of the momentary microphone terminal is possible
	Fast blinking, green	System is busy with a higher priority transmission (message, gong, alarm), interruption is not possible, already launched call is interrupted by events with higher priority setting
GONG LED	OFF	No gong signal started
	Lights green	Gong signal in progress; manually started or pre-programmed pre-gong signal
	Lights green	Gong signal in progress, ignited from another source or time-controlled
ON LED	OFF	System is OFF (stand-by mode)
	Lights green	System is ON and ready for operation
	Blinks green	System has been turned on and is booting (initialization)
PROGRAMM LED	OFF	Paging console is in message-mode
	Lights green	Paging console is in program assign mode
	Slow blinking, green	Paging console is password-protected
	Fast blinking, green	Paging console is in setup-mode
TEXT LED	OFF	No text message launched
	Lights green	Text message in progress, manually launched
	Blinks green	Text message in progress, launched from another source or time-controlled
ALARM	OFF	No alarm signal launched
	Lights red	Alarm signal has been launched from any source
	Blinks red	Alarm signal has already been stopped, but keeps running until signal-end

5.2.9 Priorities

The PROANNOUNCE system allows setting 10 priority levels (highest priority = 10, lowest priority = 1) that include announcements, as well as alarm and gong signals, and vocal message reproduction. A higher prioritized event principally interrupts any other event with a lower priority setting. For events with equal priority the earlier launched signal is continued; has priority over the latter.

Priority level	Assigned	Description
10	Directing station	Highest priority; can ignite any type of events and interrupt all other signals.
7 - 9	Alarm signal	Can only be interrupted from the directing station; but interrupts all other signals that have not been launched from the directing terminal.
6 - 7	Gong signal (manual / time-controlled)	Interrupts all signals that are not coming from the directing terminal. Time-controlled gong signals can be delayed/pre-delayed by a pre-defined period of time.
2 - 8	Recorded message	These priorities can be freely assigned to text messages during the configuration procedure.
2 - 6	Message from a paging console without / with pre-gong signal	These priorities can be freely assigned to any 'normal' paging console. A pre-gong signal has the priority of the launching microphone terminal.
1	Program	Background music always has the lowest priority level.

5.2.10 DPC 4350 Paging Station Extension

The DPC 4350 paging station extension provides selection keys only. It is employed whenever a higher amount than 50 lines need to be accessed or when an installation's requirement of group and special function keys exceeds the existing amount of selection keys. The DPC 4350 can be easily combined with any other paging station model. The following list shows the amounts of maximally accessible lines for various combinations:

Combination	Maximum amount of lines
DPC 4106 + DPC 4350	50
DPC 4510 + DPC 4350	60
DPC 4520 + DPC 4350	70
DPC 4530 + DPC 4350	80
DPC 4550 + DPC 4350	100

The extension unit is directly connected to the extension interface of the main paging station using the supplied 8-pole RJ-45 cable and plugging it into the EXT-socket. A single paging station then consists of two devices that report to a common address. Therefore the central unit recognizes them as one single microphone terminal with an increased amount of selection keys. Also from the viewpoint of the user the two devices act as only one paging station; i.e. the selection keys of the main and the slave paging station provide equal access to their assigned areas, groups and special functions.

Note: During the configuration of the system using the PROANNOUNCE Designer software, it is important that the main paging station's EXT-socket is configured for the connection of a DPC 4350 extension.

The extension unit can only be operated together with DPC 45.. or DPC 40.. Series paging console models!

5.2.11 Factory Presets

When shipped, the selection keys 1 – n are assigned to the corresponding areas 1 – n offering real plug ‘n’ play; the paging station is ready for operation directly after connection and switching the system power ON.

CAUTION: When operating several paging consoles within one installation, setting every single one to its individual, exclusive address (1 - 16) is of major importance.

The paging stations provide the following factory pre-set functions and characteristics:

Parameter		Setting / Description
Address		OFF
Priority		5 (priority for messages)
Name		Untitled DPC4xxx (Type)
Password		Level 1 not protected Default password level 1: 111 Level 2 password-protected Default password level 2: 2222
Pre-gong signal		OFF
Buzzer		ON (acoustic alert signal)
Compressor		OFF
Extension socket	EXT	OFF
Options	2 nd alarm key	Not programmed
	Key-lock switch	Not programmed
	PTT-microphone	Call in pre-selected areas, priority 5
Key-assignment	Selection keys 1 – n	Selecting areas 1 – n (key 1 → area 1, key 2 → area 2, ..) (not with DPC 4106)
	TALK	Call in pre-selected areas, priority 5 (DPC 4106: calls in all areas)
	TEXT	Text message in pre-selected areas; text 1, priority 2 (DPC 4106: text message transmission in all areas)
	GONG	4-stroke gong signal in pre-selected areas, priority 8 (DPC 4106: gong signal transmission in all areas)
	ALL	Selecting collective call
	CANCEL	Cancel selection / call-pattern (not with DPC 4106)
	ON	Switching the system ON / OFF, priority 5
	STOP	Terminates any locally launched signal (gong, text, alarm)
	PROGRAM	Assigns a program to pre-selected areas (not with DPC 4106)
	ALARM	DIN-alarm in all areas, priority 9 (not with DPC 4106)
Special functions		Not programmed

5.2.12 Specifications

	DPC 4106	DPC 4510	DPC 4520	DPC 4530	DPC 4550	DPC 4350
Operation voltage	24 V DC (21,6 V – 31,2 V)					
Power consumption (24 V)	80 mA	80 mA	85 mA	90 mA	90 mA	90 mA
Min. operation voltage	15 V DC					
Max. power consumption (15 V)	120 mA	120 mA	120 mA	120 mA	135 mA	95 mA
NF - input external						
Line (default)	0 dBu					-
PTT – microphone (A & B bridged)	-52 dBu					-
NF-output (electrically balanced)	+6 dBu					-
Covered alarm key, sealable	Option	Yes				-
DPC 4350 extension connection provided	Yes					-
Connections	RJ-45					
Supplied connection cord	3 m					0,5 m
LC-display	2 x 16 characters	2 x 16 characters	2 x 16 characters	2 x 16 characters	2 x 16 characters	-
Environmental temperature	5 ... 40° C					
Enclosure dimensions (W x D x H, in mm)	170x160x65	225x160x65	270x160x65	320x160x65	405x160x65	335x160x65
Gooseneck	Ø 8 x 200 mm					-
Weight	1,0 kg	1,5 kg	1,7 kg	1,8 kg	2,5 kg	1,9 kg
Finish	Grey-white RAL 9002, micro-structure					
Accessories						
Monitor speaker	-	NRS 90209				-
Pushbutton / switch Selectable, Ø18 mm	NRS 90230					-
Key-lock switch Ø 18 mm	NRS 90231					-
Transformer balanced	NRS 90232					-

5.2.13 Optionally Available Accessories

Optional Alarm Key (NRS 90230)

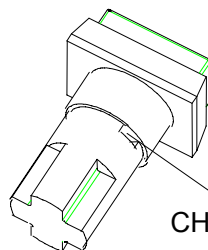
The paging stations employ two empty slots for retrofitting optional alarm keys or key-lock switches (also refer to chapter 5.2.3 *Control Panel DPC 4550*). For installing an additional alarm key you should only use the NRS 90230 extension kit.

Brief description: optional pushbutton or switch for retrofitting DPC 4xxx-type paging stations to work as idling current-controlled opener. The pushbutton - switch function can be configured on the hardware.

Supplied with the NRS 90230: 1 switch – pushbutton, complete with label field and cover
 1 connection cord, 4-pole
 1 resistor 10 k ohms
 1 lamp 6 volts
 1 selable cover

installation instructions:

1. Disconnect the paging console from the power supply.
2. Detach the bottom plate (6 to 8 screws, depending on the paging console model).
3. Prepare the installation site for the insertion:
 - Use a sharp, pinpoint tool (thick needle, pointed rat-tailed file, knife, etc.) to carefully pierce the pre-punched holes through – from the enclosure’s outside to the inside.
 - Configure the switch to operate as switch or pushbutton.
 - CAUTION: Install the switch so that the gap for changing the switch’s operation points towards the TALK key. This allows for easy changing its function even after it has been inserted.



**CHANGE FROM:
 SWITCH to PUSHBUTTON**

figure 5.38 optional pushbutton/ switch

Note: Please make sure to solder the cables after the switch has been installed. Otherwise it is virtually impossible to slide the counter-nut over the body of the switch!

4. Adjust the switch and tighten it using the supplied milled nut.
5. Connect the cables and the resistor according to the circuit diagram on this page.
6. Please mind the sequence in which you connect the flat wire cables. The two outside wires 1(rt) and 4(gr) need to be soldered to the contacts of the lamp. The two inner wires 2(gr) and 3(gr) need to be soldered to contacts 1 and 2 of the switch. Polarity of either pair of wires is not critical.
7. Afterwards, you have to connect the 4-pole female plug to the corresponding OPTION 1 or OPTION 2 - terminal strip on the basic printed board assembly.
8. Re-attach the bottom plate.
9. Software configuration with the PROANNOUNCE Designer

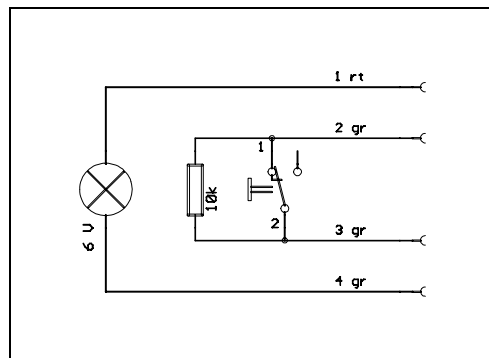


figure 5.39 circuit diagram pushbutton / switch

Optional Key-lock Switch (NRS 90231)

The paging consoles employ two empty slots for the incorporation of optional alarm keys or key-locked switches (also refer to chapter 5.2.3 *Control Panel DPC 4550*). For retrofitting an additional key-lock switch you should only use the NRS 90231 extension kit.

Brief description: optional key-lock switch for retrofitting DPC 4xxx-type paging stations to work as idling current-controlled opener.

Supplied with the NRS 90231: 1 key-lock switch, complete with front frame and 2 keys
 1 connection cord, 4-pole
 1 resistor 10 k ohms

Installation instruction:

1. Disconnect the paging console from the power supply.
2. Detach the bottom plate (6 to 8 screws, depending on the paging station model).
3. Prepare the installation site for the insertion:
 - Use a sharp, pinpoint tool (needle, pointed rat-tailed file, knife etc.) to carefully pierce the pre-punched holes through – from the front panel’s outside to the inside.

Note: Please make sure to solder the cables after the switch has been installed. Otherwise it is virtually impossible to slide the milled nut over the body of the switch!

4. Adjust the switch and tighten it using the supplied milled nut.
5. Please refer to the circuit diagram on this page when connecting the supplied 4-pole wire and the resistor.
6. Please mind the sequence in which you connect the flat wire cables. The two outside wires 1(rt) and 4(gr) have to be cut off as short as possible and need to be insulated. The two inner wires 2(gr) and 3(gr) need to be soldered to contacts 1 and 2 of the switch. Polarity is not a critical factor.
7. Afterwards, you have to connect the 4-pole female plug to the corresponding OPTION 1 or OPTION 2 - terminal strip on the basic printed board assembly.
8. Re-attach the bottom plate.
9. Software configuration with the PROANNOUNCE Designer

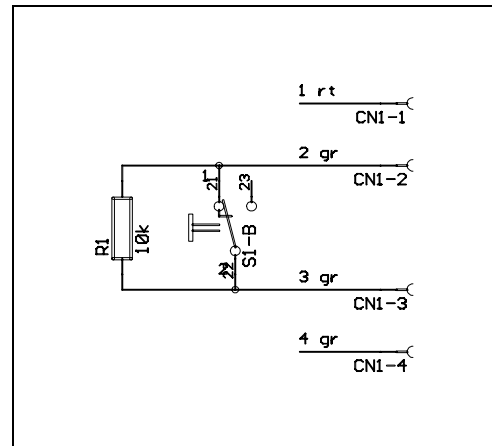


figure 5.40 circuit diagram key-lock switch

Input / Output Transformer (NRS 90232)

If need is, the paging consoles provide the possibility for with either an input transformer – in case you would like to connect audio devices to the EXT-socket – or an output transformer. For retrofitting transformers, please only use the NRS 90232 extension kit.

Brief description: optional Audiotransformer for alternative integration to serve as input or output transformer in DPC 4xxx Series paging consoles.

Supplied with the NRS 90232: 1 transformer DCN-337387
1 cable binder with a length of 142mm

CAUTION: Using the device as an input transformer is only permissible for external devices (CD-Player, cassette tape deck etc.) with an output level ≥ 775 mV. The NRS 90232 extension cannot be used as a microphone input transformer.

Installation instructions:

1. Disconnect the paging console from the power supply.
2. Detach the bottom plate (6 to 8 screws, depending on the paging station model).
3. Installing the transformer on the output socket printed board assembly:

- When utilized as input transformer

Prior to installing you have to disconnect the bridges that are marked with an "X" in the diagram on this page.

The transformer has to be inserted at the position marked as T1 (1a, 6a, 3a, 4a) and fixed in place using the supplied cable binder. The yellow point on the transformer marks pin 1.

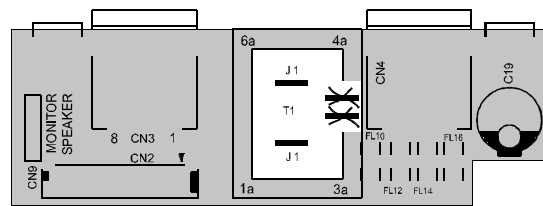


figure 5.40 retrofitting input transformers

- When utilized as output transformer

Prior to installing you have to remove the bridges that are marked with an "X" in the diagram on this page.

The transformer has to be inserted at the position marked as T2 (1, 6, 3, 4) and fixed in place using the supplied cable binder. The yellow point on the transformer marks pin 1.

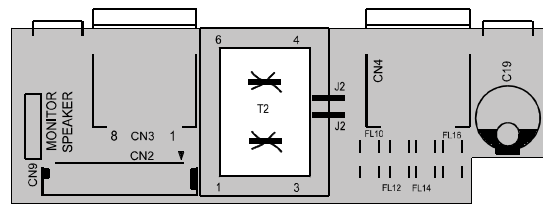


figure 5.41 retrofitting output transformers

4. Re-attach the bottom plate.

Optional Monitor Loudspeaker (NRS 90209)

Brief description: Installing the extension-kit NRS 90209, each DPC 4000 paging console (excluding the DPC 4106) can be retrofitted with a monitor loudspeaker. To prevent acoustic feedback between speaker and microphone, the first is muted whenever the TALK key is pressed. Also included is a 100V-transformer that is installed inside of a wall outlet and is used for low-impedance operation of the loudspeaker.

Supplied parts: 1 prepared printed board assembly 89022 including 100V transformer and connection cords
1 bottom plate with printed board assembly 89021; connection cords and loudspeaker are pre-mounted

Note: For being able to ship the correct bottom plate, please specify your paging console model in which the extension is going to be installed when ordering the NRS 90209!

Installation instructions:

1. Disconnect the paging console from the power supply.
2. Detach the bottom plate (6 to 8 screws, depending on the paging station model).
3. Slide the 4 rubber feet off the side of the bottom plate and attach them to the new bottom plate with the pre-mounted printed board assembly 89021.
4. Connect the plug of the printed board assembly 89021 to the terminal strip CN9 (on the little connection printed board) – refer to figure 5.42:

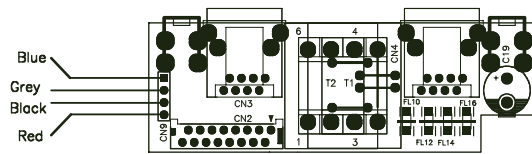


figure 5.42 connecting the NRS 90209 in a paging console

5. Attach the new bottom plate.
6. Reconnect the paging station to the LAN.
7. Mount the printed board assembly 89022 (including 100V transformer) inside of a standard wall outlet and connect it between the 100V line and the RJ45-wall junction box, refer to the circuit diagram. 100V loudspeaker cabling needs to be kept separated from all other paging console wiring!

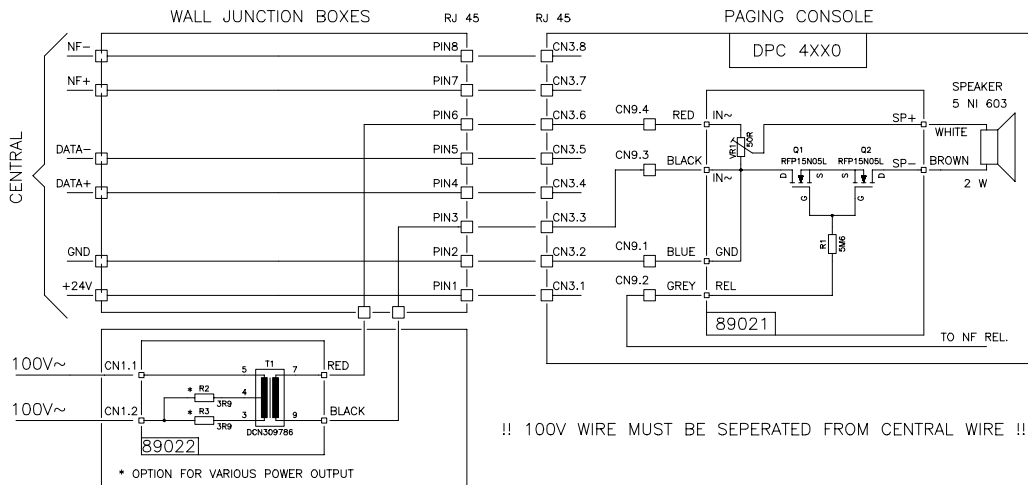


figure 5.43 circuit diagram for the monitor loudspeaker extension-kit (NRS 90209)

Connecting A PTT-Microphone

Connecting an external PTT-microphone to the EXT-socket is possible using a special purpose cable (not supplied) and in accordance to the diagram on this page.

Therefore, it is necessary to change the input sensitivity to microphone level, as described below, by closing the two soldering-bridges "A" and "B".

The PTT-function of the corresponding paging station has to be configured during system configuration via the PROANNOUNCE Designer software.

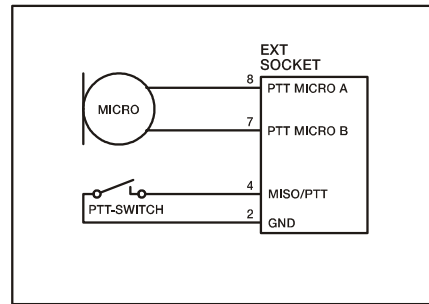


figure 5.44 connecting a PTT-microphone

Connecting External Audio Signal Sources

Connecting CD-Players, tape decks, etc. to the EXT-socket is possible using a special purpose cable (not supplied) and in accordance to the diagram on this page.

The input sensitivity is factory pre-set to a level of 0 dBu.

The corresponding paging console has to be configured during system configuration for the "external audio signal source"-function using the PROANNOUNCE Designer software.

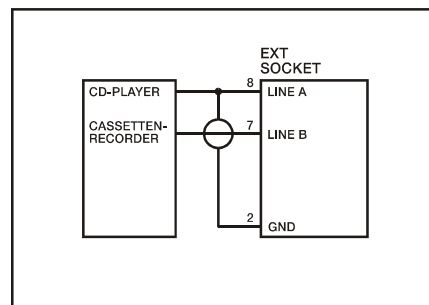


figure 5.45 connecting external audio signal sources

External MIC / LINE Input (EXT socket)

As shipped, the external MIC / LINE input is set to a sensitivity of 0 dBu. Switching the input sensitivity to -45 dBu for the connection of a PTT-microphone is only possible by closing two internal soldering-bridges. Therefore, you have to perform the following steps:

1. Disconnect the paging console from the power supply.
2. Detach the bottom plate (6 to 8 screws, depending on the paging station model).
3. Close the soldering-bridges "A" and "B" according to the diagram on this page.
4. Re-attach the bottom plate.

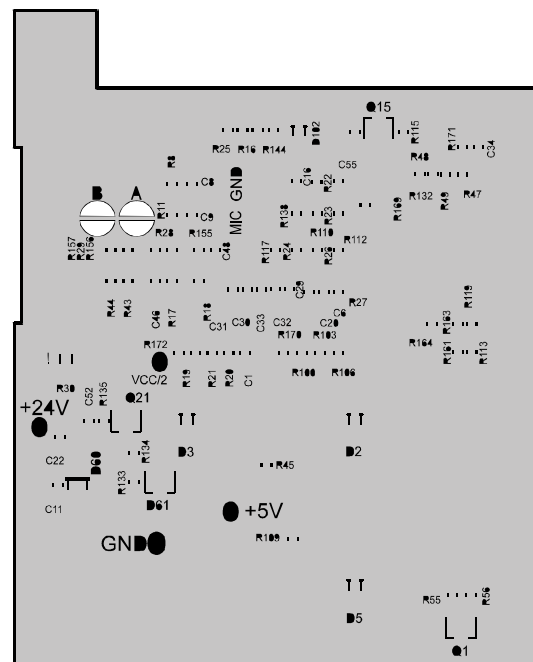


figure 5.46 setting the input sensitivity

5.2.14 Cable Length

Depending on the utilized paging station model and amount, and in relation to minimal supply voltage and cable-diameter, different maximum cable lengths are possible. The following tabulations show some examples for cable-diameters of 0.6 mm and 0.8 mm and with supply voltages of 24 V, respectively of 21.6 V in emergency supply operation. For precise calculation, a calculation-chart running under MS-EXCEL 97 is provided.

A Single Paging Station On A Single DPM-Line:

Cable type	Paging console model	Cable length (m) 21.6 V emergency supply	Cable length (m) 24 V
JY(St)Y 4x2x0,6	DPC4510/4106	230	395
	DPC4520	225	385
	DPC4550	220	375
JY(St)Y 4x2x0,8	DPC4510/4106	410	700
	DPC4520	400	690
	DPC4550	390	670

A Single Paging Station + Extension On A Single DPM-Line:

Cable type	Paging console model	Cable length (m) 21.6 V emergency supply	Cable length(m) 24 V
JY(St)Y 4x2x0,6	DPC4510 + DPC4350	150	260
	DPC4520 + DPC4350	150	255
	DPC4550 + DPC4350	145	250
JY(St)Y 4x2x0,8	DPC4510 + DPC4350	270	460
	DPC4520 + DPC4350	265	455
	DPC4550 + DPC4350	260	450

Four Paging Stations DPC4550 (+ Extensions) On A Single DPM-Line:

Cable type	Paging console model	Cable length (m) 21.6 V emergency supply	Cable length (m) 24 V
JY(St)Y 4x2x0,6	4 x DPC 4550	55	95
	4 x DPC4550 + 4 x DPC4350	25	40
JY(St)Y 4x2x0,8	4 x DPC 4550	95	165
	4 x DPC4550 + 4 x DPC4350	40	75

5.3 DPA 4000 PROANNOUNCE Power Amplifier

5.3.1 Characteristics

The PROANNOUNCE system includes four DPA 4000 Series power amplifiers, offering common features as listed below:

- 4 models:

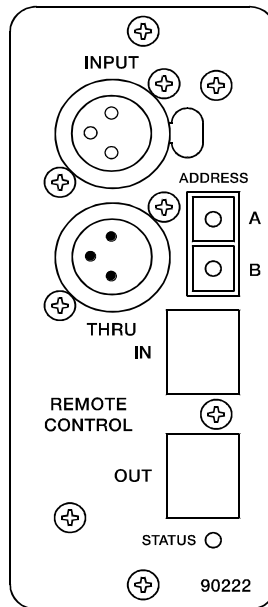
DPA 4410	4 x 100 W
DPA 4411	4 x 100 W Remote Control
DPA 4120	1 x 200 W
DPA 4140	1 x 400 W
- floating 100 V power outputs (internally configurable to 70 V / 50 V or 4 Ω)
- outputs are protected against idling and short-circuit
- mains operation at 115 / 230 V AC and 24 V DC (emergency power supply)
- mains and battery remote on/off
- electronically balanced inputs, transformers are optionally available
- input level controls
- monitor outputs
- temperature-controlled operation
- pilot tone and ground fault surveillance (optionally available)
- fault indication and fault messaging via floating READY-contact
- remote control module for DPA 4120 / DPA 4140 (optionally available)

Note: Detailed description of individual characteristics, features, functions, and specifications of these power amps are provided in the corresponding owner's manual supplied with the appliance.

5.3.2 Instructions For Using Remote-Power Amps:

1. Each power amplifier has to be set to the exact address as it is specified in the PROANNOUNCE Designer software (A=low value part, B=high value part). Address setting is performed using hexadecimal code.
2. An RS-485 connection needs to be established between the DPM 4000 (remote socket) and maximally eight DCS 401, and maximally 64 amplifiers (DPA 4411 counts as a single unit). The RS-485 bus may not exceed a maximum length of 1,000m and must follow a line-structure with stub cables being as short as possible. When including more than 30 amplifiers, both ends of the bus have to be terminated with 120 ohms resistors. This bus is also used for monitor signal transmission.
3. Connect the amplifier(s) to an operation voltage source.
4. Perform a Netscan procedure via the PROANNOUNCE Designer software. In 'normal' operation the status-LED's on the rear panel of the amplifiers have to light periodically, depending on the number of participants on the bus (communication with the DPM 4000).
5. Within the communication window of the PROANNOUNCE Designer software checking which addresses are registered as participants is possible using the command "/AMP/AVLBL ?".
6. Once a participant on the bus had been disconnected from the DPM 4000 for a short term (e.g. because the RS-485 line had temporarily been disconnected), it is included again in the query sequence after 10 sec.

5.3.3 Remote Module for Single-Channel-Amplifiers DPA 4120 and DPA 4140 NRS 90222



This single-channel input module provides DPA 4120 or DPA 4140 power amplifiers with remote functionality.

(For detailed information on DPA 4120 and DPA 4140 power amplifiers, please refer to the owner's manual 355768.)

The module allows connecting balanced XLR-input and XLR-thru lines as well as connection to the remote control bus of the DPM 4000 (RS-485). Prior to connecting the amplifier to the operating voltage, the unit's address has to be set using the switches "A" and "B" (A=low value part)

The following remote functions are available:

Control:

- Level control, Mute
- Monitor activation (Input / Output)
- Mains operation ON/OFF
- Battery operation ON/OFF
- Pilot tone ON/OFF (optionally available)

Messages:

- Output level
- Pilot tone detection
- Ground fault detection
- Thermal overload amplifier / mains transformer
- Configuration
- Measured values of current and voltage at the power output
- Extension-kits

5.3.4 Four-Channel Power Amplifier DPA 4411

Features:

- Power amplifier with 4x100 W output power capacity according to IEC 283-3, 19" - Chassis (3 HU)
- Mains operation 115/230 V AC and emergency power supply operation 24 V DC
- Output transformers for balanced, floating 100 V speaker networks; 70 V, 50 V or 4 ohms low impedance operation selectable
- All outputs are protected against idling and short-circuit
- Integrated remote module for control and surveillance via the PROANNOUNCE Manager DPM 4000
- Electronic level controls, electronically balanced inputs and electronically balanced MONITOR output
- Input transformers for balanced, floating operation are optionally available
- Monitor output transformer offering a balanced, floating MONITOR output is optionally available
- Routing-switch for parallel input operation of amplifiers
- Integrated standby-power supply
- Mains function switch POWER
- Ground-lift switch
- Remote start in mains and battery operation with initial inrush current limiter
- Switching noise suppression
- Status-LED indication: operation (READY), STANDBY, thermal overload (PROTECT), and GROUND FAULT at the power output
- Fault-messaging according to DIN EN 60849 via the PROANNOUNCE Manager DPM 4000
- TEST-button for installations with emergency switching, RESET for ground fault

- LED-meter instrument; indication in the range of –13 dB to 0 dB and CLIP
- Mains voltage selector switch 115/230 V AC
- Active, temperature-controlled fans
- Modules for pilot tone surveillance and ground fault surveillance according to DIN VDE 0800 (optionally available)

The appliance allows connecting four balanced XLR-type input lines as well as connection to the remote control bus of the DPM 4000 (RS-485). Prior to connecting the amplifier to the operating voltage, the unit's address has to be set using the switches "A" and "B" (A=low value part).

For detailed information on the four-channel power amplifier DPA 4411, please refer to the owner's manual 356810.

The following remote functions are available:

Control:

- Level controls, Mute of all channels
- Monitor activation (Input / Output) for all channels
- Mains operation ON/OFF
- Battery operation ON/OFF
- Pilot tone ON/OFF (optionally available)

Messages:

- Output level (all channels)
- Pilot tone detection (all channels)
- Ground fault detection (all channels)
- Thermal overload amplifier / mains transformer
- Configuration
- Measured values of current and voltage at the power outputs
- Extension-kits

5.4 DCS 400 Control System

5.4.1 Characteristics

DCS 400 Series modules increase the PROANNOUNCE system's control functionality in miscellaneous ways. These printed board assemblies in the Europe standard format are usually inserted at the rear of a PA-system rack-shelf or installed in suitable distribution boxes. The DCS 400 system consists of five different modules and additional extensions:

- DCS 401 control module for controlling relays, logic inputs, analog inputs and outputs, and rotary encoders
- DCS 408 relay module with 5 line relays for 100 V systems
- DCS 409 relay module with 5 NF or control relays
- DCS 412 logic input module with 12 floating, bi-polar inputs that are linked via opto-couplers
- DCS 416 analog I/O module offering 8 inputs and 8 outputs for 0 V DC to 10 V DC
- DCS 420 monitor module with 7-segment display, meter instrument and monitor loudspeaker
- NRS 90240 rotary encoder

A PROANNOUNCE installation allows integrating a maximum of up to 8 DCS 401 control modules. A single control module can host up to 12 relay boards of the types DCS 408 / DCS 409 in any sequence. Besides, it is possible to connect up to 5 logic input modules, 2 analog I/O modules, and 2 rotary encoders.

The PROANNOUNCE operating system defines the total amount of supported control inputs and outputs. The PROANNOUNCE system can manage following amounts of different cards:

- Control module DCS 401 max. 8 boards = 16 rotary encoders
- Relays modules DCS 408 / DCS 409 max. 48 boards = 240 relays
- Logic input module DCS 412 max. 10 boards = 120 logic inputs
- Analog I/O module DCS 416 max. 8 boards = 128 analog inputs / outputs
- Monitor module max. 1 per DCS 401

Note: The power supply of individual boards can be provided either via RJ-45 connection (DCS 401), flat-wire cables (DCS 408, DCS 409, DCS 412, DCS 416) or via 2 binding posts (± 24 V) that are located on each board. The current that runs through the RJ-45 connection or the flat-wire cables has not to exceed **1 A max.** The current for modules that are connected to the DCS 401 via flat-wire cables may not exceed **700 mA max.** The connectors CN7, CN8, CN9 share an electronic fuse. For higher currents, it is important that under all circumstances the binding posts are used instead. When cascading several modules, it is necessary to provide the power supply anew via binding post connection. Directly cascading up to 7 or 10 modules is admissible while taking power consumption features of the different types of incorporated modules into consideration. All modules need to be fed from a single power source! Data inter-exchange amongst modules has to be established via flat-wire cabling.

CAUTION: For safety reasons, DCS 400 modules may only be installed in rack-shelf systems or enclosures that are locked and may only be opened by means of a tool (e.g. screw-driver, special key, etc.).

When installing modules, make sure to follow all requirements of the EN60065:1993 regulation.

Obeying the regulations for interference-emission (EN55022, class B) and interference-stability (EN50082-2), DCS 400 module printed board assemblies need to be grounded at their fixing points (e.g. using a metal bolt).

5.4.2 DCS 401 CONTROL MODULE

The module is to be mounted on the rear of a PA-system rack-shelf or inside of a suitable distribution box. It serves as an interface for the connection of relay boards, logic input boards, analog I/O boards, and rotary encoders. The module is controlled via the RS-485 remote port of the DPM 4000.

A single DCS 401 control module can host a maximum of 12 relay modules DCS 408 / DCS 409, five logic input modules DCS 412, two analog input / output modules DCS 416, and two rotary encoders. Relay modules are connected to the CN7 connector using the supplied flat-wire cable. DCS 408 or DCS 409 boards can be installed in any order. Logic input modules are connected to the CN8 connector while analog I/O modules have to be connected to CN9. The CN12 connector allows the connection of two rotary encoders.

Features

- Two RJ-45 connectors for connecting the DPM 4000 and for cascading several DCS 401 control modules
- Galvanic separation of the RS-485 interface port
- One connector each for relay modules, logic input modules and analog signal modules
- One connector for two rotary encoders
- Internal monitoring via watchdog circuitry
- Line surveillance via polling
- Two binding posts for the connection of an external supply voltage source
- Service functions and testing software for all connected modules
- Binary switch for address setting (0 - 7)

CAUTION: Each participant connected to the DPM 4000 remote port has to have an exclusive address. Each address can be used only once.

Installation Note

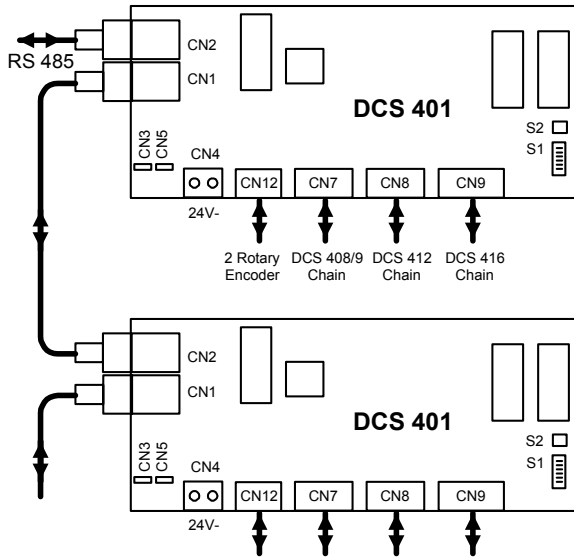
Mounting the module and establishing the connections are solely admissible when performed in accordance to VDE 0100 and EN 60065 regulations.

DCS 401 module printed board assemblies need to be grounded at their fixing points (e.g. using a metal bolt).

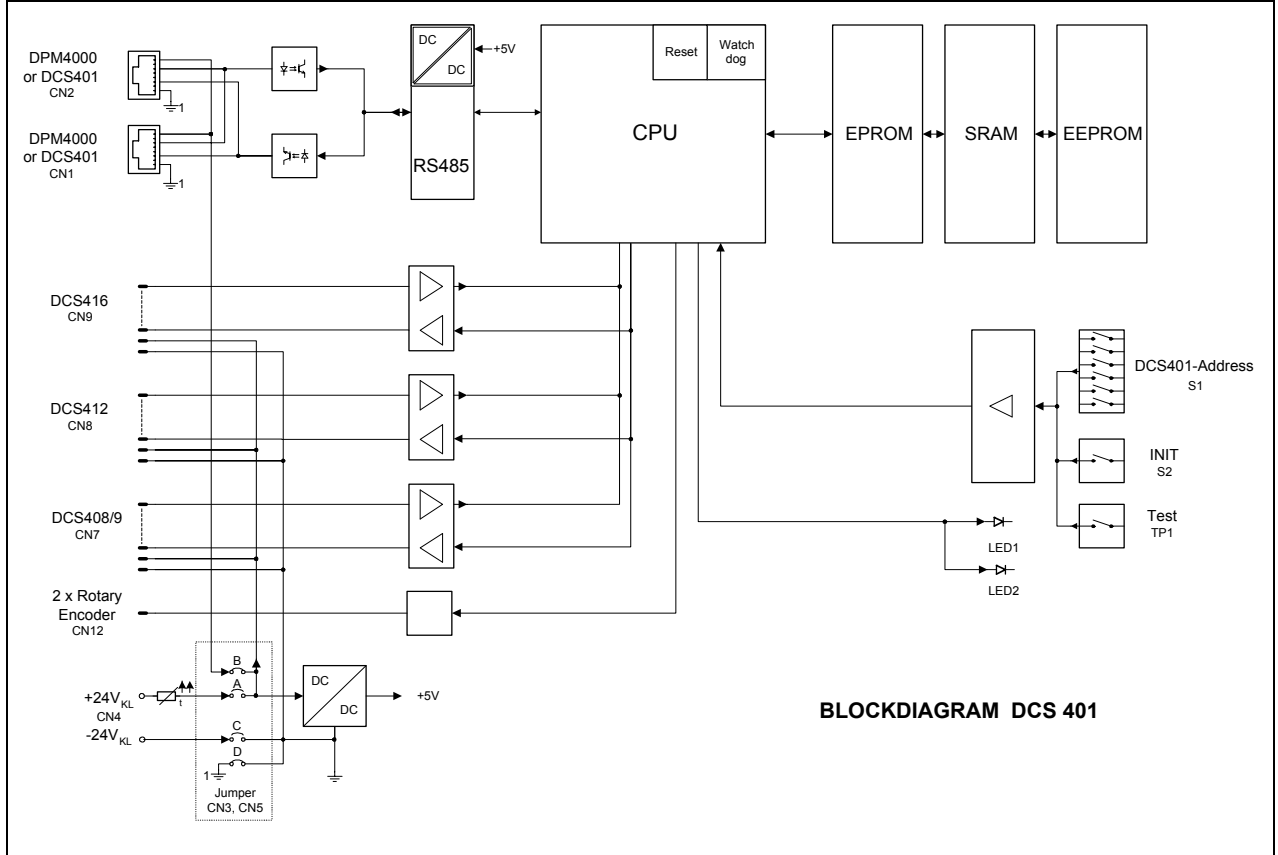
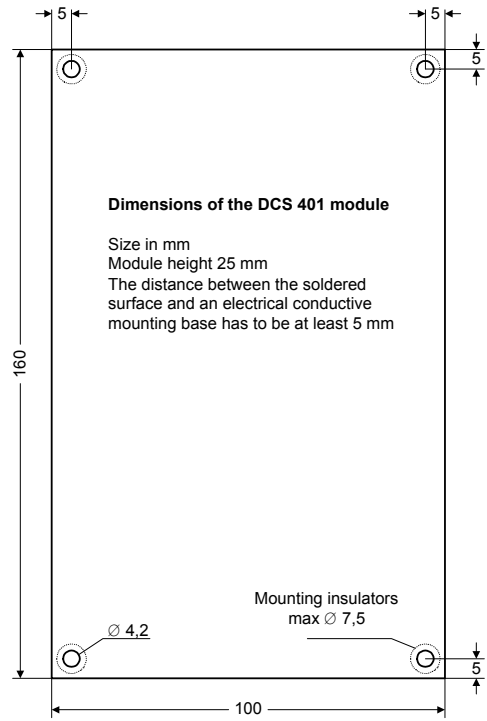
Specifications:

Description	DCS 401 control module
Operating voltage	24 V DC, -10 / +30 %
Operating current	25 mA .. 65 mA
Operating current at 24 V	35 mA
Operating temperature range	+5° C .. +40° C
Dimensions (W x H x D)	160 x 25 x 100 mm
Weight	135 g

DEVICE DESCRIPTIONS



Maximally 8 DCS 401 modules can be cascaded. Use jumpers CN3 and CN5 to select the supply voltage source connector (CN1/CN2 or CN4). S1 sets the address for each DCS 401. The modules are initialized by pressing the pushbutton S2



5.4.3 DCS 408 RELAY MODULE 100 V

The module is to be mounted on the rear of a PA-system rack-shelf or inside of a suitable distribution box. It is primarily used for switching 100 V loudspeaker lines. The relays can also be used for collective calls, obligatory reception, as E-relays and D-relays, or for general control purposes.

Features

- Five 100 V line relays, 2 switching contacts each, binding post per contact
- 5 output binding posts, each with 3 screws and label fields
- 5 relay control-LED's
- Configuration of the output distributor is performed through opening wire bridges
- 2 connectors for cascading up to 12 modules
- 2 binding posts for the connection of an external supply voltage source

Installation Note

For safety reasons, DCS 400 modules may only be installed in rack-shelf systems or enclosures that are locked and may only be opened by means of a tool (e.g. screw-driver, special key, etc.).

Mounting the module and establishing the connections are solely admissible when performed in accordance to VDE 0100 and EN 60065 regulations.

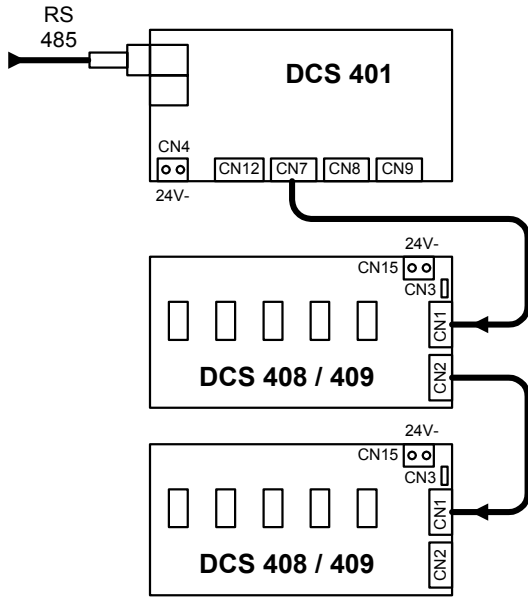
DCS 408 relay module printed board assemblies need to be grounded at their fixing points (e.g. using a metal bolt).

The module has to be protected against dropping or splashing water.

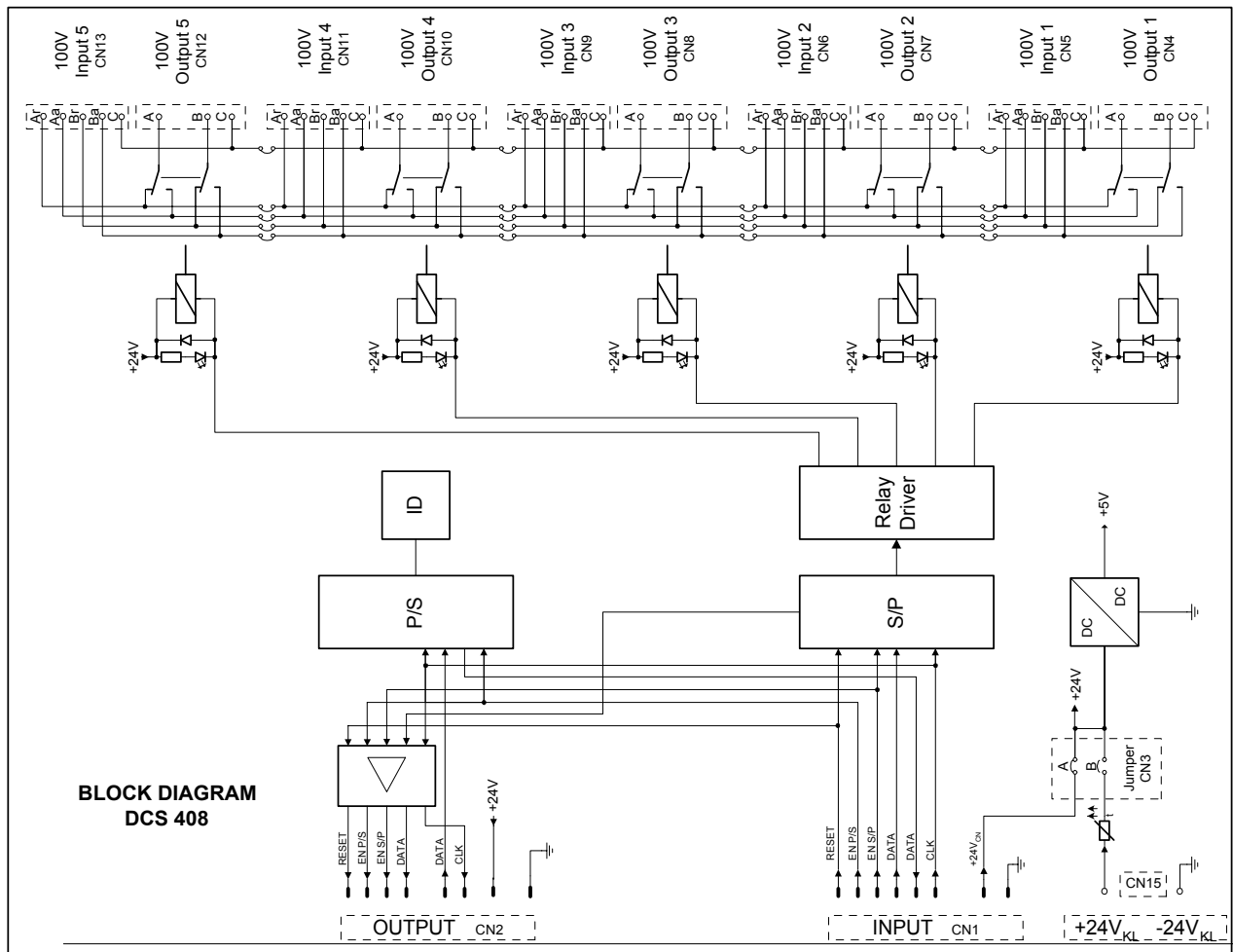
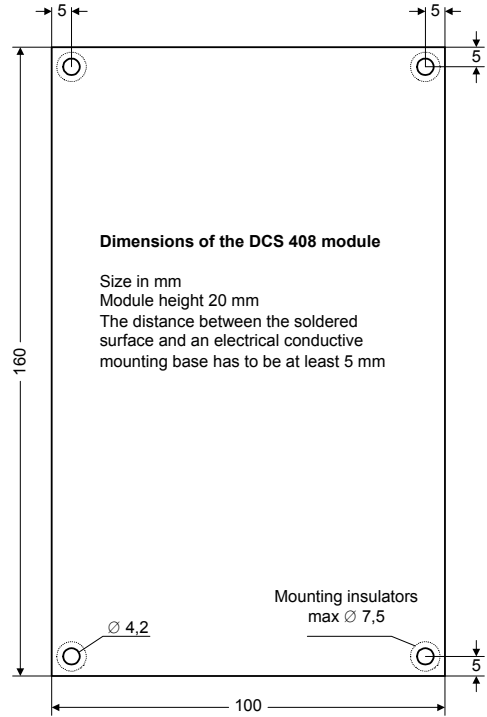
Specifications:

Description	DCS 408 relay module 100 V
Operating voltage	24 V DC, -10 / +30 %
Operating current, relay dropped	5.2 mA .. 7,8 mA
Operating current, relay dropped, at 24 V	5.5 mA
Operating current, all relays pulled	87 mA .. 130 mA
Operating current, all rel. pulled, at 24 V	96 mA
Relay contacts:	
Contact components	2 changers/ 2 SPDT
Contact material	AgNi 90/10
Contact load (ohmic load)	2000 VA
Contact current	8 A
Contact voltage	100 V AC
Operating temperature range	+5° C .. +40° C
Dimensions (W x H x D)	160 x 20 x 100 mm
Weight	200 g

DEVICE DESCRIPTIONS



Maximally 12 DCS 408 / DCS 409 modules can be cascaded. Using the insertion bridge CN3, select the connection of the supply voltage (CN1/CN15).



5.4.4 DCS 409 CONTROL RELAY MODULE

The module is for mounting on the rear of PA-system rack-shelves or inside of suitable distribution boxes. It is utilized for switching audio signals (at line level) or for control outputs.

Features

- 5 LF-relays, 2 switching contacts each, binding post for each contact
- Gold-plated contacts
- Additional ground potential binding posts for each relay's primary and secondary end
- 5 relay control-LED's
- Configuration of the output distributor is performed through opening wire bridges
- 2 connectors for cascading up to 12 modules
- 2 binding posts for the connection of an external supply voltage source

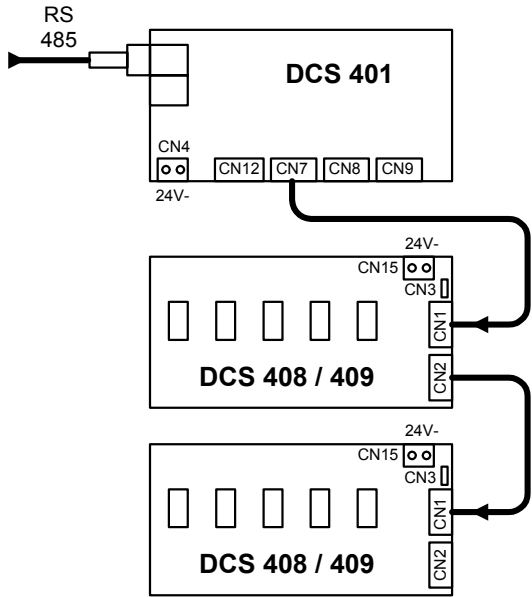
Installation Note

Mounting the module and establishing the connections are solely admissible when performed in accordance to VDE 0100 and EN 60065 regulations.

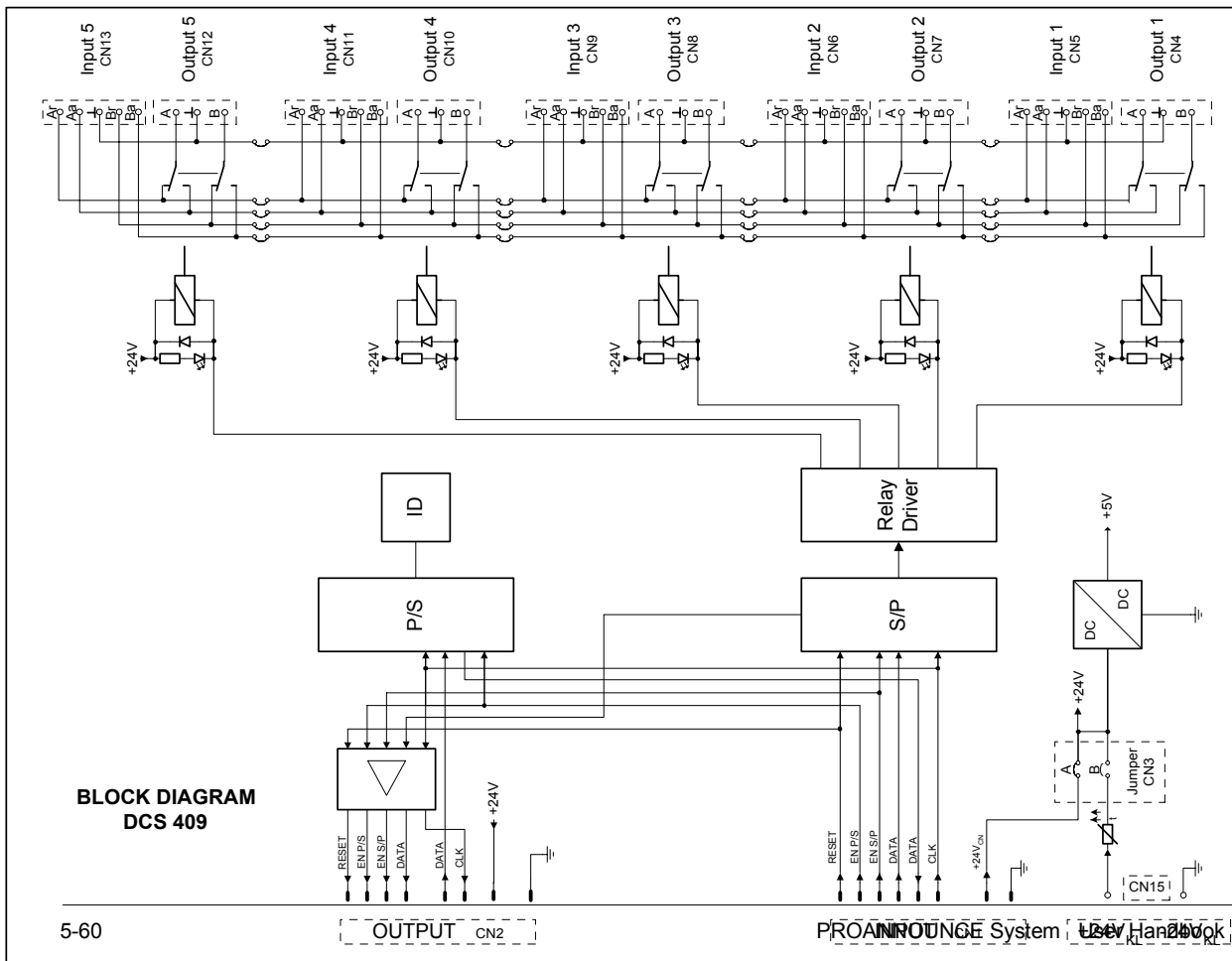
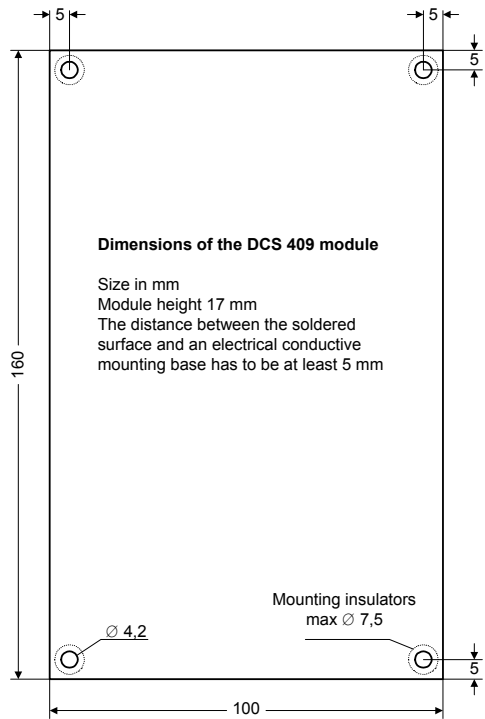
DCS 409 control relay module printed board assemblies need to be grounded at their fixing points (e.g. using a metal bolt).

Specifications:

Description	DCS 409 control relay module
Operating voltage	24 V DC, -10 / +30 %
Operating current, relay dropped	5.2 mA .. 7.8 mA
Operating current, relay dropped, at 24 V	5.5 mA
Operating current, all relays pulled	55 mA .. 80 mA
Operating current, all relays pulled, at 24 V	60 mA
Relay contacts:	
Contact components	2 changers/ 2 SPDT
Contact material	AgPd + 10µ Au
Contact load (ohmic load)	1 A / 24 V DC
Contact current, maximum	2 A
Operating temperature range	+5° C .. +40° C
Dimensions (W x H x D)	160 x 17 x 100 mm
Weight	155 g



Maximally 12 DCS 408 / DCS 409 modules can be cascaded. Using the insertion bridge CN3, select the connection of the supply voltage (CN1/CN15).



5.4.5 DCS 412 LOGIC INPUT MODULE

The module is to be mounted on the rear of PA-system rack-shelves or inside of suitable distribution boxes. It is for the connection of control lines, pushbuttons, switches and sensors to be able to evaluate their individual status (ON, OFF) within the PROANNOUNCE system.

Features

- 12 inputs with 2 binding posts each
- Polarity of each input is freely acceptable
- Each input can be used as floating input by disconnecting wire-bridges
- 2 binding posts provide the voltage source for supplying pushbuttons, contacts and sensors
- 2 connectors for cascading up to 5 modules
- 2 binding posts for the connection of an external supply voltage source

Installation Note

Mounting the module and establishing the connections are solely admissible when performed in accordance to VDE 0100 and EN 60065 regulations.

DCS 412 logic input module printed board assemblies need to be grounded at their fixing points (e.g. using a metal bolt).

Specifications:

Description	DCS 412 logic input module
Operating voltage	24 V DC, -10 / +30 %
Operating current, all inputs open	2.6 mA .. 8.2 mA
Operating current, all inputs at 24V	60 mA .. 83 mA
Input level:	
Voltage with the input being LOW	$U_{IN} < \pm 5 \text{ V}$
Voltage with the input being High	$U_{IN} > \pm 10 \text{ V}$
Input current at $U_{IN} = 24 \text{ V}$	4.8 mA
Maximum input voltage	$U_{IN \text{ max}} = \pm 31 \text{ V}$
Power source 24V (CN6):	
Maximum output current	90 mA
Operating temperature range	+5° C .. +40° C
Dimensions (W x H x D)	160 x 17 x 100 mm
Weight	110 g

5.4.6 DCS 416 ANALOG INPUT / OUTPUT MODULE

The module can be mounted on the rear of PA-system rack-shelves or inside of suitable distribution boxes. For once, it serves for connecting analog control lines and potentiometers, with their levels being utilized within the PROANNOUNCE system installation to control volume controls or other continuous parameters. Additionally, it allows controlling external devices with analog inputs.

Features

- 8 analog inputs with 2 binding posts each
- Voltages of 0 V to 10 V or potentiometers can be connected to each input
- Reference voltage 10V - binding post
- 8 analog outputs with 2 binding posts each
- Two DCS 416 modules can be cascaded
- 2 binding posts for the connection of an external supply voltage source or galvanic separation of inputs, outputs and the PA-system

Installation Note

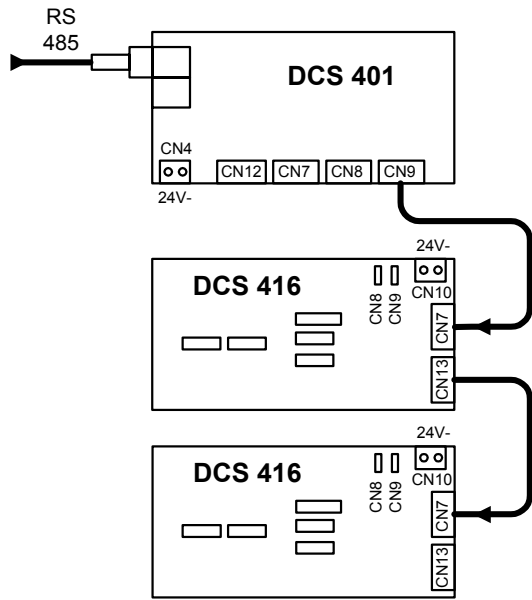
Mounting the module and establishing the connections are solely admissible when performed in accordance to VDE 0100 and EN 60065 regulations.

DCS 416 analog I/O module printed board assemblies need to be grounded at their fixing points (e.g. using a metal bolt).

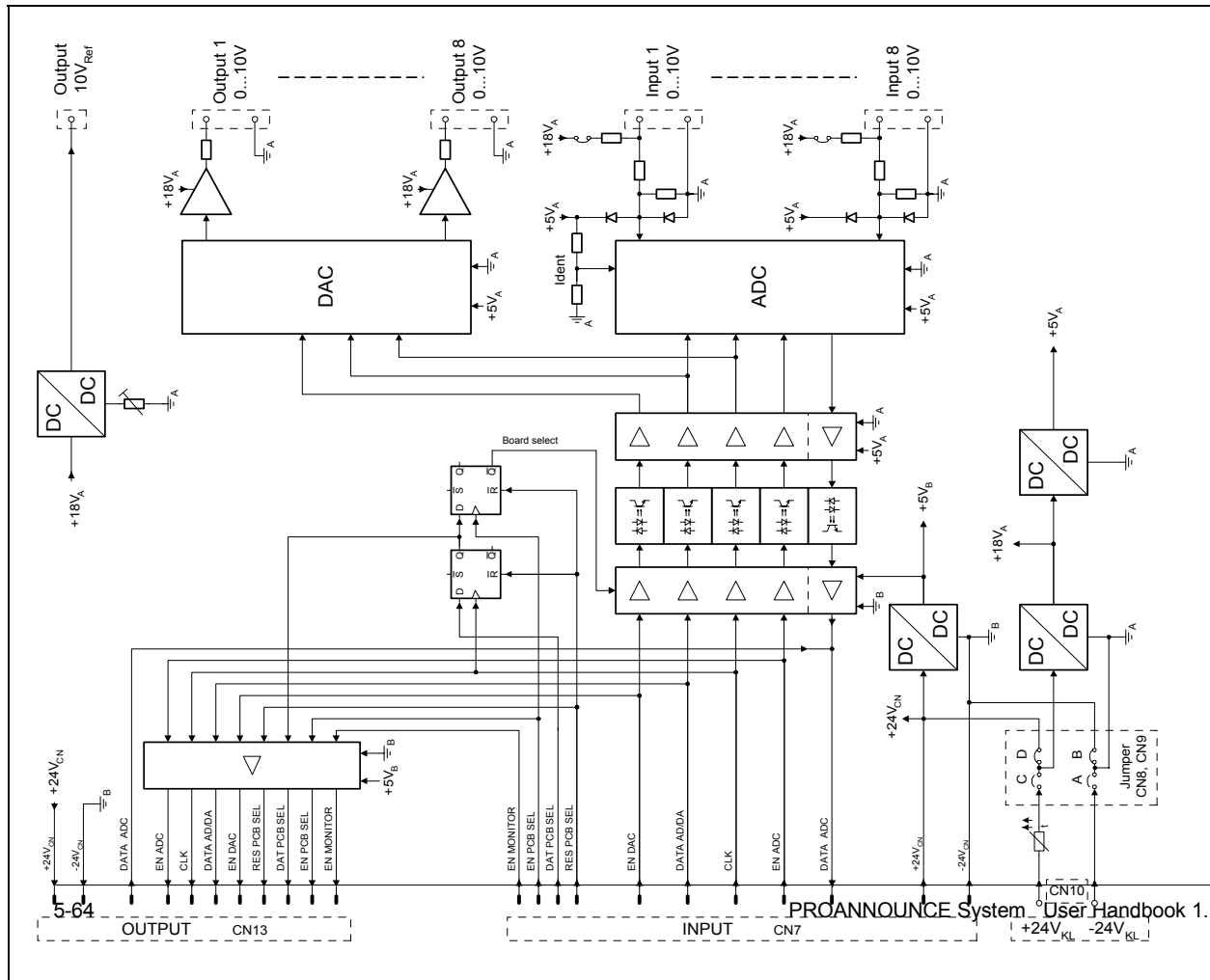
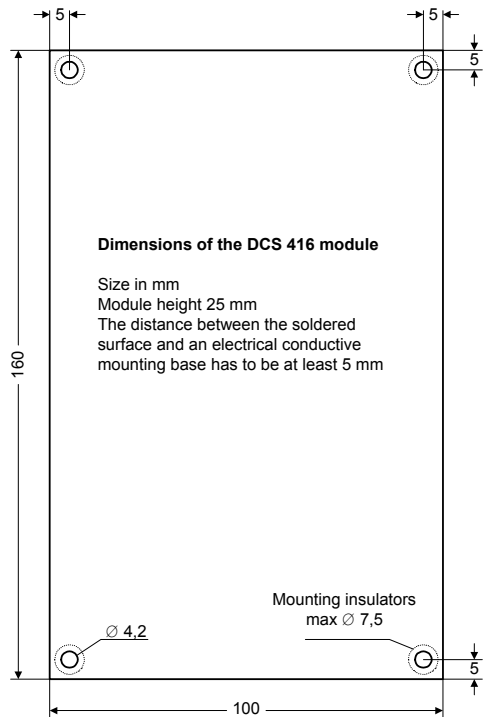
Specifications:

Description	DCS 416 analog I/O module
Operating voltage	24 V DC, -10 / +30 %
Operating current (max.)	160 mA
Operating current, all inputs at 24V	72 mA
Inputs:	
Voltage range (min. .. max.)	0 V .. 10 V
Impedance range ext. (min. .. max.)	0 Ω .. 10 kΩ
Maximum input voltage	50 V
Outputs:	
Voltage range(min. .. max.)	0 V .. 10 V
Output impedance	47 Ω
Minimum load impedance	2 kΩ
Reference voltage source:	
Output voltage	10 V
Maximum output current	30 mA
Accuracy of I/O signals	8 Bit
Operating temperature range	+5° C .. +40° C
Dimensions (W x H x D)	160 x 25 x 100 mm
Weight	140 g
Retrofit kits	
NRS 90245 Potentiometer	10 kOhms

DEVICE DESCRIPTIONS

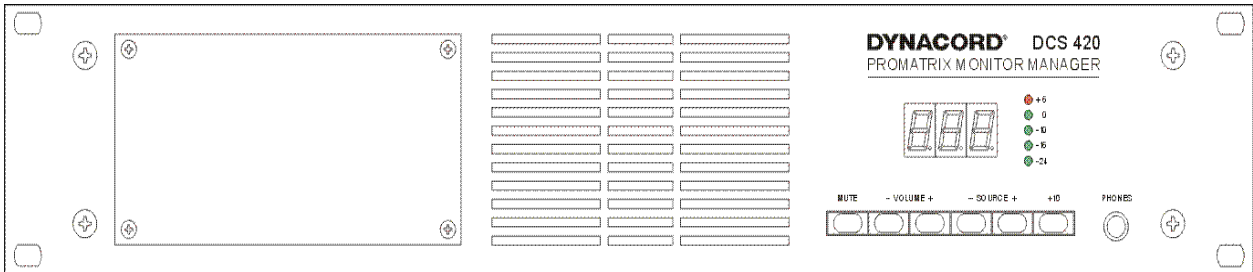


Maximally 2 DCS 416 modules can be cascaded. Using the insertion bridge CN8, CN9, select the connection of the supply voltage (CN7/CN10).



5.4.7 DCS 420 PROANNOUNCE MONITOR MANAGER

This monitor module (2 HU) is for mounting in PA-system rack-shelves. It is used for acoustically and optically monitoring power amplifier outputs (monitoring) as well as for pre-listening to DPM 4000 input signals in a PROANNOUNCE system installation. The DCS 401 controller controls the DCS 420.



Features

- Loudspeaker 1W
- 6.3 mm stereo phone-type headphones jack
- 3-digit 7-segment display for source selection and volume setting
- LED-bar graph meter instrument for monitoring and setting audio levels
- Input transformers allow galvanic separation of the audio signal path
- Detachable mounting plate for installing different connectors of the PA-central unit
- Selector switch for selecting external or internal (from the DCS401) supply voltage sources

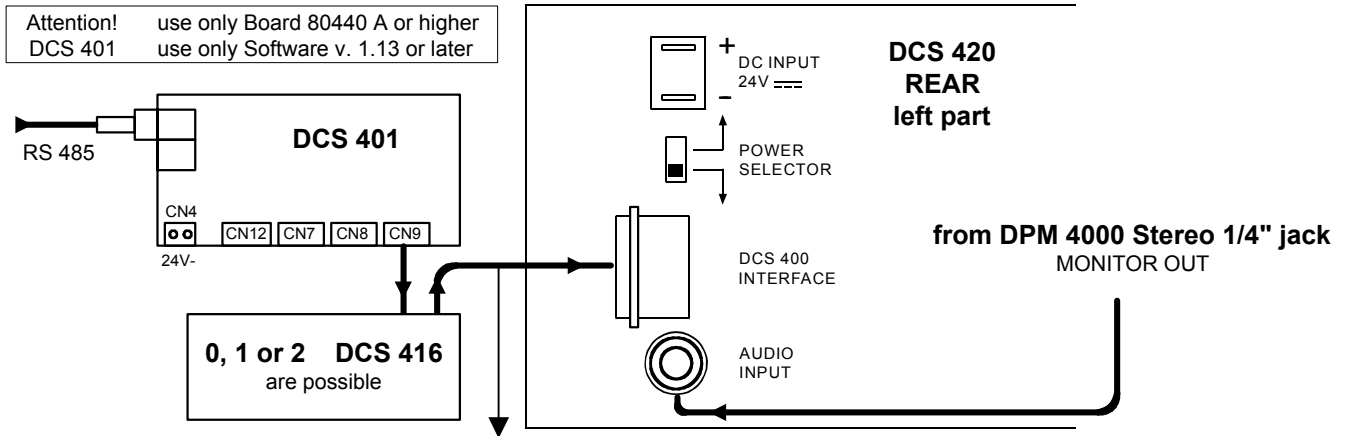
Installation Note

Mounting the module and establishing the connections are solely admissible when performed in accordance to VDE 0100 and EN 60065 regulations.

Specifications:

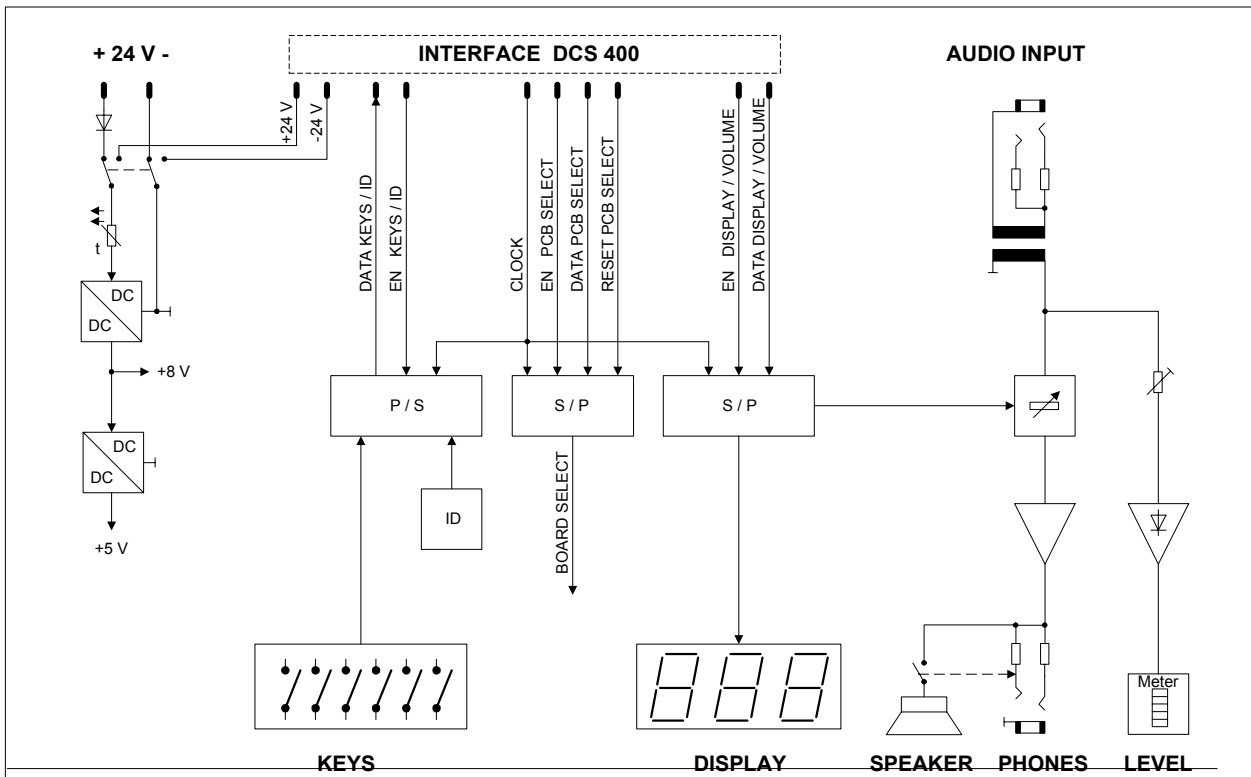
Operating voltage	24V DC, -10 / +30%
Operating current	250 mA (max)
Standby operating current (dark)	75 mA
Operating temperature range	+5° C ... +40° C
Dimensions (W x H x D) 19" 2HU	483 x 88 x 103 mm
Weight	2.1 kg
Audio input:	
Input voltage (0 dB LED)	650 mV / -1.5 dBu
Max. input voltage	5.0 V / +16 dBu
Input impedance	2 k ohms
Audio output:	
Monitor loudspeaker	1 W
Output voltage, phones max.	2 V / 8.2 dBu
Output impedance, phones	10 Ohm
Frequency response, phones jack	20Hz ... 20kHz, -3dB
S/N ratio	> 80 dB
Distortion	1% (1kHz)

DEVICE DESCRIPTIONS



The connection has to be established using flat-wire cables with a maximum length of 4m!

Operation keys	Function
MUTE	Loudspeaker of headphones ON/OFF
-VOLUME+	10-step loudspeaker / headphones volume setting
-SOURCE+	1-step monitor source selection
+10	10-step monitor source selection



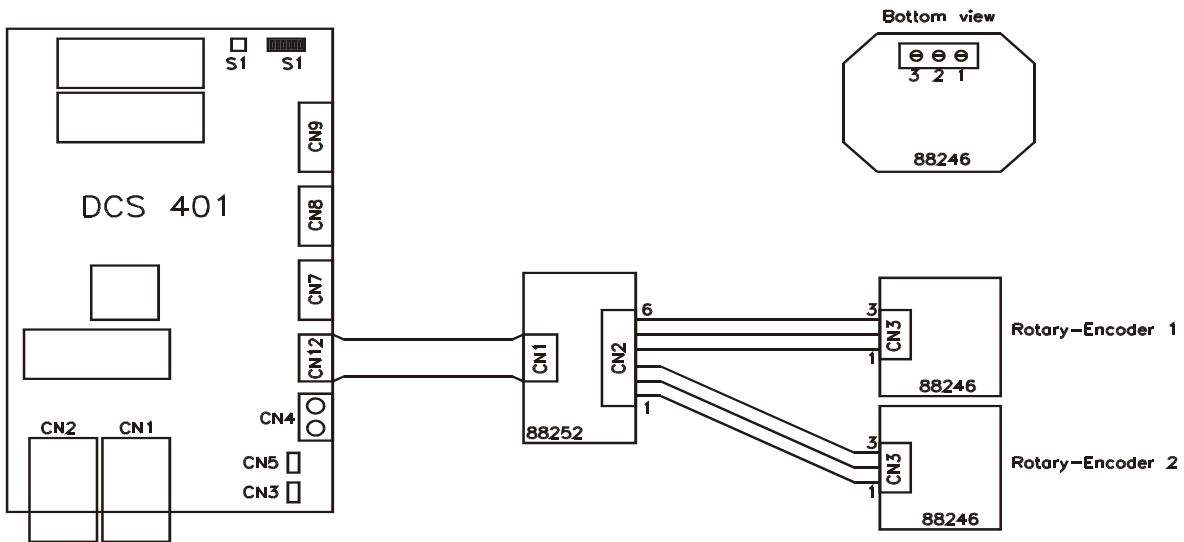
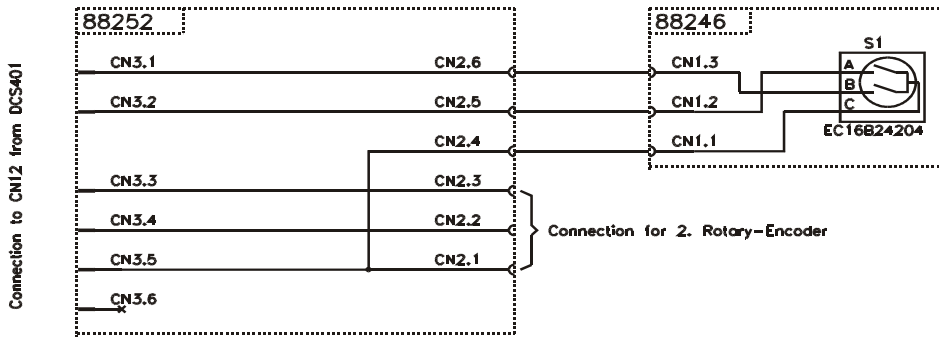
5.4.8 NRS 90240 ROTARY ENCODER

Description:

The NRS 90240 includes a rotary encoder and connection board with mounting accessories for remotely controlling level controls, delays, and control voltages of a PROANNOUNCE system.

Features:

- Rotary encoder
- Connection board
- Mounting accessories
- Knob



Note: The cover frame needs to be ordered separately.

6. Appendix

6.1 PROANNOUNCE Hardware Configuration

6.1.1 DCS 400

When configuring and initially operating the DCS 400 system, please proceed as follows:

1. Cabling

- Use the supplied flat-wire cable for connecting the relay modules DCS 408, DCS 409 in the desired order to the control module DCS 401. Mixed installation of relay modules is possible; numbering the relays is type-specific and has to be performed according to their sequence.

example:

Sequence	Module	Line relay No.	Control relay No.
1	DCS 408	1 - 5	
2	DCS 408	6 - 10	
3	DCS 409		1 - 5
4	DCS 408	11 - 15	
5	DCS 409		6 - 10
6	DCS 408	16 - 20	
...

- Use the supplied flat-wire cable for connecting the logic input module DCS 412 to the control module DCS 401. Numbering the logic inputs has to be performed according to their sequence.

example:

Sequence	Module	Logic input No.
1	DCS 412	1 - 12
2	DCS 412	13 - 24
3	DCS 412	25 - 36
...

- Use the supplied flat-wire cable for connecting the analog input / output modules DCS 416 to the control module DCS 401. Numbering the analog inputs and outputs has to be performed according to their sequence.

example:

Sequence	Module	Analog input No.	Analog output No.
1	DCS 416	1 - 8	1 - 8
2	DCS 416	9 - 16	9 - 16

- Connect the control module DCS 401 via RJ-45 cable to the REMOTE CONTROL socket on the DPM 4000.

2. Voltage Supply

- Insert bridges serve to select the voltage supply connector of different modules. Please refer to the corresponding description of individual modules or to their block diagrams.

CAUTION: The maximum current handling capacity of RJ-45 connections and flat-wire cables has to be observed under all circumstances!

3. DCS 401 Addresses

- Using the Dip switch S1, the addresses of all connected control modules DCS 401 have to be set to different numbers (addresses 0 - 7).

Dip switch S1						Address
1	2	3	4	5	6	
OFF	OFF	OFF	OFF	OFF	OFF	0
ON	OFF	OFF	OFF	OFF	OFF	1
OFF	ON	OFF	OFF	OFF	OFF	2
ON	ON	OFF	OFF	OFF	OFF	3
OFF	OFF	ON	OFF	OFF	OFF	4
ON	OFF	ON	OFF	OFF	OFF	5
OFF	ON	ON	OFF	OFF	OFF	6
ON	ON	ON	OFF	OFF	OFF	7

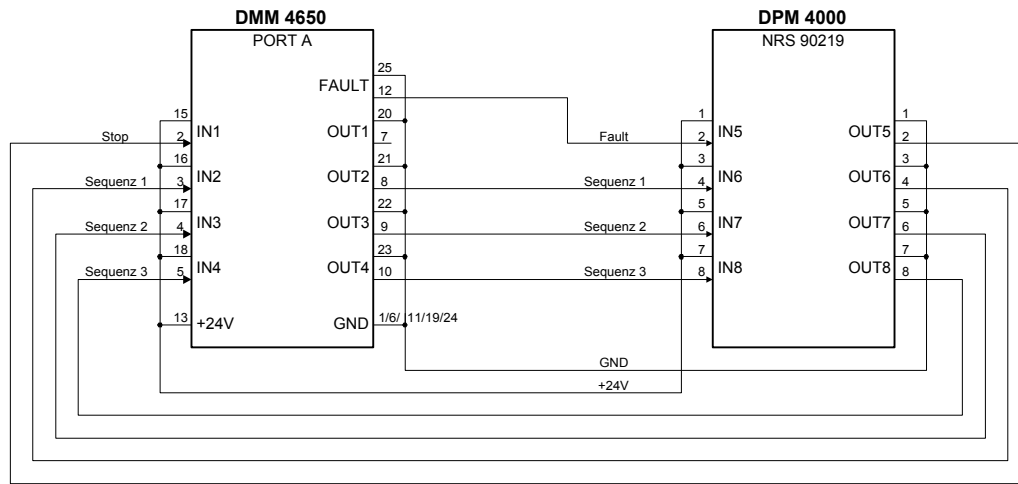
4. Before initial operation

- Connect a 24V source. Now, each DCS 401 control module verifies whether any local modules (DCS 408, DCS 409, DCS 412, DCS 416) are connected, and if so, how many. The red LED blinks when the initialization process has not been performed yet.
- Only for DCS 401 control modules with software version previous to V1.1: Each DCS 401 control module is initialized by pressing the S2 button for approximately 3 seconds. Afterwards, the red LED has to light continuously signaling that initialization was successfully completed.
- Launch netscan (menu communication / netscan within the PROANNOUNCE Designer software). Now, the DCS 401 modules are being initialized. Afterwards, the DPM 4000 runs a test verifying all addresses and recognizes the amount of DCS 401 control modules installed in the system. All components sharing the network are listed in the component list. This procedure takes approximately 20 seconds. Afterwards, the system is ready for operation.

6.2 DMM 4650 Interconnection

Interconnecting the DMM 4650 is established through control inputs and outputs on the DPM 4000 or on the DCS 400 monitoring system (DCS 408, DCS 409, DCS 412).

Every single sequence needs a control output for the start / stop command and a control input for the transmission of the return signal. The control output starts the DMM 4650 sequence with a positive slope and stops it with a negative slope. The return signal's control input reacts to the negative slope and activates the macro "Message Stop". Additionally, in most cases a control input is needed for the DMM 4650 READY / FAULT signal. The following cabling example offers a possibility for controlling three different sequences including fault recognition. This is accomplished by utilizing Port A on the DMM 4650 and the 8 I/O control module (IN 5 - 8 and OUT 5 - 8) of the DPM 4000.



Using an adapter cable (2 x RJ-45 to 25-pole D-Sub), the shown cabling is established with relative little effort.

For a larger amount of sequences, it is necessary to additionally utilize Ports B, C, and D on the DMM 4650. Triggering the sequence start / stop is accomplished through additional control outputs on the DPM 4000 control module (OUT 2 - 4) or via relay contacts on the DCS 408 respectively on the DCS 409 modules. The return signal is present at the control inputs IN 1 - 4 of the DPM 4000 control module; additional control inputs can be provided via DCS 412 modules.

For controlling a DMM 4650 sequence, first you have to assign the start / stop and return message lines in the PROANNOUNCE Designer software. Afterwards, defining the audio signals in the window "External Audio Signals DMM 4650" is possible (the window opens when double-clicking onto the DMM 4650 symbol), where start / stop and return message lines are assigned to individual audio signals. When this is done, starting a DMM 4650 sequence from a paging console is already possible. Individual zones are assigned in the paging console dialog (key-assignment).

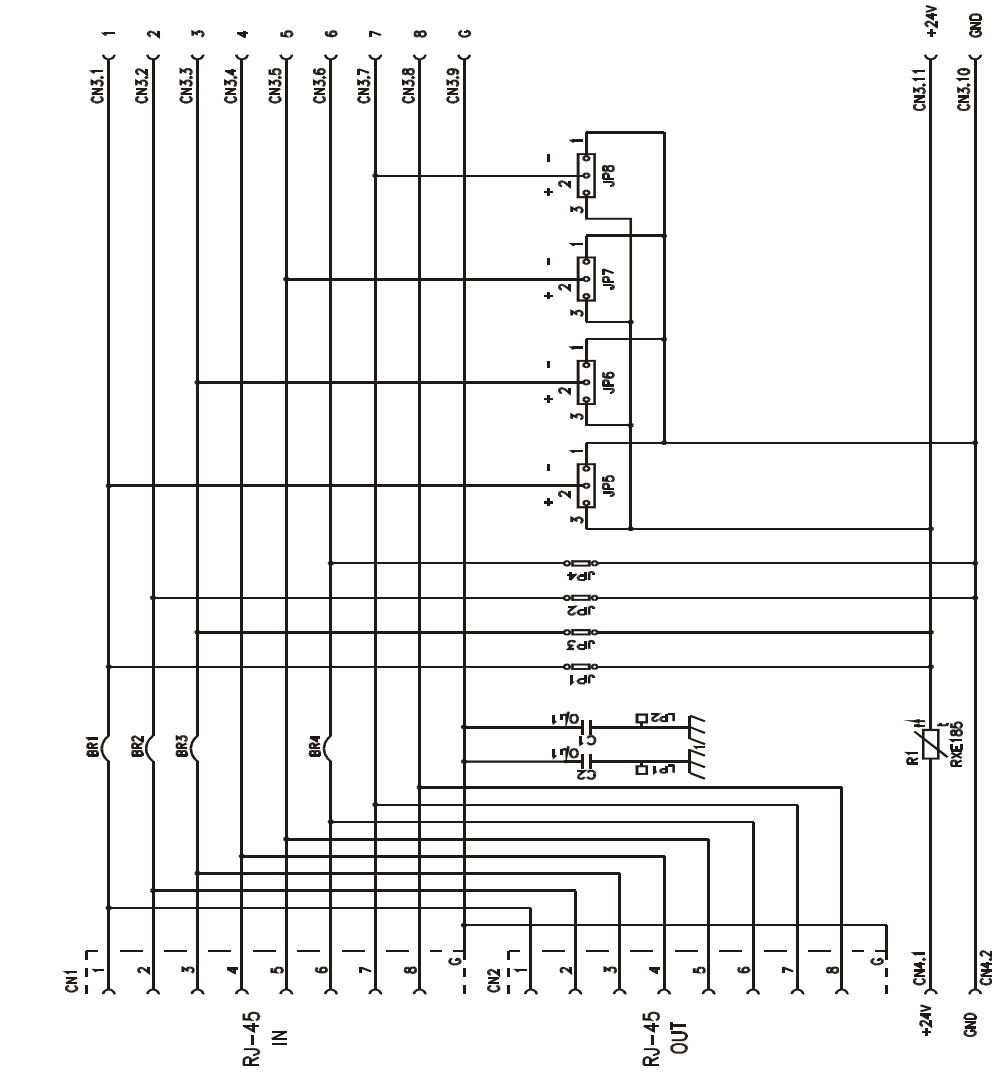
Defining additional triggers and zones is possible for the case that different events than a paging station keystroke (external triggers, timer) are used to start a DMM 4650 sequence. Displaying text on the LCD during the output of a DMM 4650 sequence is possible as well.

Programming examples for interconnecting the DMM 4650 are provided in the file **Demo99_2.pmx**, which is installed during the installation of the PROANNOUNCE Designer software within the following directory: /proannounce/examples/.

6.3 NRS 90226 Adapter Printed Board Assembly

Adapter printed board assembly for connecting RJ45 lines and single conductors to be used with paging consoles, I/O-lines (slot 5), remote lines (DCS), and monitoring.

characteristics: 2 x RJ-45 sockets, 8-pole binding post.



PIN ASSIGNMENT			
	LOGIC OUTPUTS	LOGIC INPUTS	REMOTE INTERFACE
CPA2000	OUT1a	IN1a	+24V
EP5205	OUT1b	IN1b	GND
	OUT2a	IN2a	(+24V)
	OUT2b	IN2b	RS485+
	OUT3a	IN3a	RS485-
	OUT3b	IN3b	(GND)
	OUT4a	IN4a	AUDIO+
	OUT4b	IN4b	AUDIO-
			DPC INTERFACE
			+24V
			GND
			(+24V)
			RS485+
			RS485-
			(GND)
			AUDIO+
			AUDIO-

if power supply via CN4:
 BR1-4 open
 JP1 - JP4 closed
 JP5 - JP8 only used for logic inputs