

23.5 Commissioning

23.5.1 Settings in handheld unit

Displaying the HHU's software version

The software version of the HHU is displayed after booting as long as the HHU is not communicating with the PLC.

Example: HHU display

Waiting for PLC

V04.01.01 F / 1.5 M *)

- SW version of HHU is V04.01.01
- Bus address of HHU is F_{hex} (15_{dec})
- Baud rate of HHU is 1.5 MBaud

*) Display changes between F and 1.5 M

DIP switch

To set the bus parameters and the IDLE time, two quadruple DIP switches are provided on the basic module of the HHU.

The HHU must be opened for access to the DIP switches.

Note

Open the device only if the HHU connector has been previously removed!

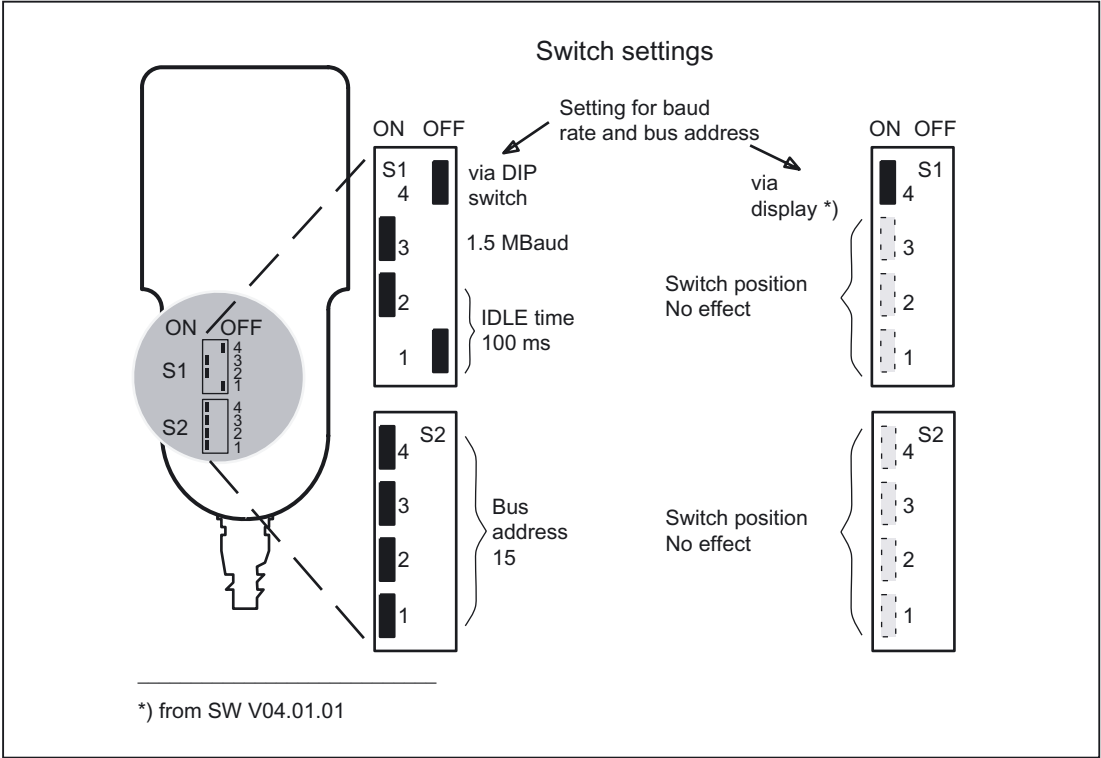


Figure 23-6 DIP switches in the HHU

Meaning of DIP switches

Table 23-1 Settings on switches S1 and S2 in HHU

Meaning		S1 1	S1 2	S1 3	S1 4	S2 1	S2 2	S2 3	S2 4
Baud rate and bus address setting	via display (only SW 4.1.1)				on				
	via DIP switches (all SW versions)				off				
IDLE time *)	100 ms	off	on						
Baud rate	1.5 Mbaud			on					
	187.5 kbaud			off					
Bus address *)	15					on	on	on	on
	14					on	on	on	off
	13					on	on	off	on
	12					on	on	off	off
	11					on	off	on	on
	10					on	off	on	off
	9					on	off	off	on
	8					on	off	off	off
	7					off	on	on	on
	6					off	on	on	off
	5					off	on	off	on
	4					off	on	off	off
	3					off	off	on	on
2					off	off	on	off	
1					off	off	off	on	
0					off	off	off	off	
Delivery condition (default)	SW V01.01.02	off	on	on	off	on	on	on	on
	SW V04.01.01	off	on	on	on	on	on	on	on

*) If S1.4 = **on** and SW version ≥ V04.01.01: Switch has no function

Note

The maximum possible transmission rate for SINUMERIK 810D is 187.5 kbaud. Therefore set switch S1.3 to "off" before start-up.

With switch position S1.4 = **on** and software version ≥ V04.01.01, bus addresses from 0 to 31 can be set, i.e. up to 32 nodes can be supported on the OPI/MOI.

Bus addresses that are already assigned are preceded by the * character on the display.

23.5.2 Configuring

It is necessary to set the GD parameters for the sub module to communicate via the MPI interface. The setting can be undertaken during the powering up phase (while waiting for the first GD telegram) of the the PLC ("Waiting for PLC" status) via the HHU interface using the key combination



Jog (top left, outside) and



T2 (top right, outside) are activated. The individual parameters are then interrogated via the HHU display and entered via the HHU keyboard.

The default values can be changed within the permissible value range by means of keys + and -.



The Automatic key selects the next parameter. Selection of the next parameter causes the preceding parameter to be stored in the flash EPROM. The parameters need therefore only be set during start-up and when interfaces are changed. If interface parameter assignment is not activated after power On, the stored values are accepted or the default values (see table) are loaded.

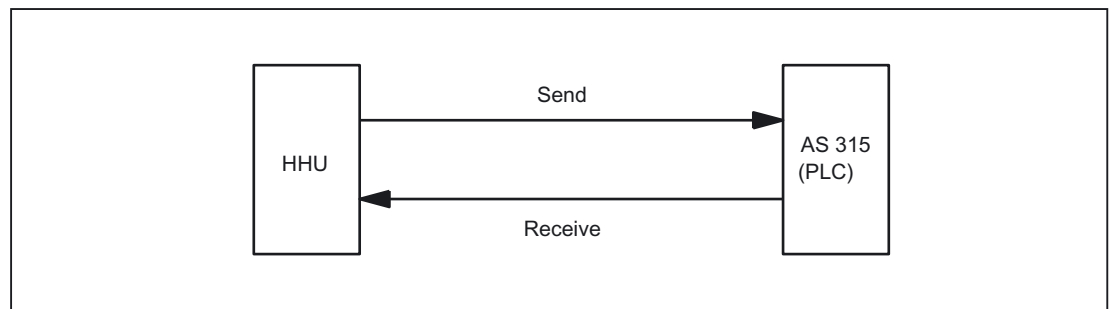


Figure 23-7 Sending and receiving seen from the HHU

Meaning of GD parameters

There are separate GD parameters for sending and receiving.

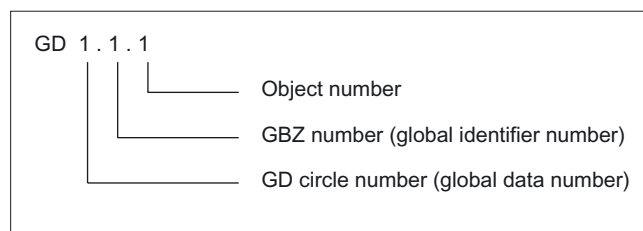


Figure 23-8 Meaning of GD parameters

Note

The GD parameters of the HHU and AS315 or PLC block FB1/0B100 must be set identically.

	Name	Display	Default value	Range of values
	Receive GD circle no.	Rec-GD-No:	2	1-16
	Receive global identifier number	Rec-GI-No	1	- (fixed)
	Object number for receive global identifier number	Rec-Obj-No:	1	- (fixed)
	Transmit GD circle no.	Transmit-GD-No:	2	- (fixed)
	Transmit GI no.	Transmit-GI-No:	2	- (fixed)
	Object number for send global identifier number	Transmit-Obj-No:	1	- (fixed)
SW 4 and higher	Baud rate	Baud rate:	1.5 M (Baud)	187,5 / 1.5 M
	Bus address	Bus address:	15	0-31

23.5.3 Interface signals

PLC module

The FC13 "HHUDisp" supports operation of the LCD display. For a detailed description, please refer to:

Literature: /FB/, P3, "Basic PLC Program".

Note

The customer is responsible for programming the transfer of key signals to the interface in a PLC user program.

HHU rotary switch positions

Setting	%	EDCBA
1	0	00001
2	10	00100
3	20	01100
4	30	01101
5	40	01111
6	50	01110
7	60	01010
8	70	01011
9	80	01000
10	90	11001
11	100	11010
12	110	11111

HHU keyswitch

- → 0 (horizontal position)
- → 1 (vertical position)

Output image of handheld unit

The signals for controlling the LEDs, HHU mode, display signals and digital display are present at the output area.

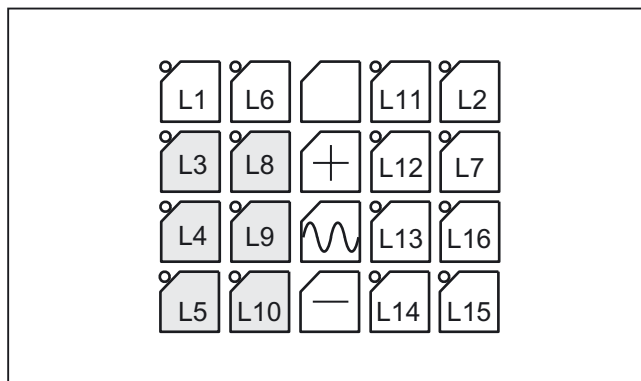


Figure 23-10 Control keys with integrated LEDs in HHU

Byte no.	Output signals to PLC							
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
AB m	1							
AB m + 1	New data for selected line							Selection line
AB m + 2	L8	L7	L6	L5	L4	L3	L2	L1
AB m + 3	L16	L15	L14	L13	L12	L11	L10	L9

Lx = 1 → LED lights up

Output image of digital display

Control of the digital display in the HHU

Byte no.	Output signals to HHU							
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
AB m + 4	Default setting of 1st character (right) of selected line							
AB m + 5	Default setting of 2nd character of selected line							
AB m + 6	Default setting of 3rd character of selected line							
AB m + 7	Default setting of 4th character of selected line							
AB m + 8	Default setting of 5th character of selected line							
AB m + 9	Default setting of 6th character of selected line							
AB m + 10	Default setting of 7th character of selected line							
AB m + 11	Default setting of 8th character of selected line							
AB m + 12	Default setting of 9th character of selected line							
AB m + 13	Default setting of 10th character of selected line							
AB m + 14	Default setting of 11th character of selected line							
AB m + 15	Default setting of 12th character of selected line							

Byte no.	Output signals to HHU						
AB m +16	Default setting of 13th character of selected line						
AB m +17	Default setting of 14th character of selected line						
AB m +18	Default setting of 15th character of selected line						
AB m +19	Default setting of 16th character (left) of selected line						

Note

Output byte ABm bit 7 must always have the value 1!
This sets the display's output mode.

Display

The digital display is used as a 2-line alphanumeric display with 16 digits per line.

The display data is coded according to the character set given in the ASCII code table for the digital display via the QBm + 4...19 bytes. The decimal point is a separate character. The display always starts line by line right-justified with the byte QBm + 4 and is built up towards the left up to QBm + 19.

Selecting the line

ABm + 1, bit 0
This bit is used to select the line to be written.
Bit 0 = 0: The 1st line is selected
Bit 0 = 1: The 2nd line is selected.

New data for selected line

ABm + 1, bit 7
This bit is used to request writing in of new data into a line. The bit is set by the user program and can be reset on detection of the acknowledgment bit IBm + 5, bit 7.
Bit 7 = 0: Reset request.
Bit 7 = 1: Set request

Acknowledgement digital display

EBm + 5, bit 7
This bit is set by the system after the new data has been accepted.
Bit 7 = 0: No new data
Bit 7 = 1: New data has been accepted

Example of signal chart

Example of a signal chart when writing data for two lines

1. Selecting the line with QBm + 1, bit 0.
2. Writing new data with QBm + 4...19.
3. Set request: New data for selected line QBm + 1, bit
4. Acknowledgment digital display IBm + 5, bit 7, via system.
5. Reset request

Note

The request must be reset before a new line is written!

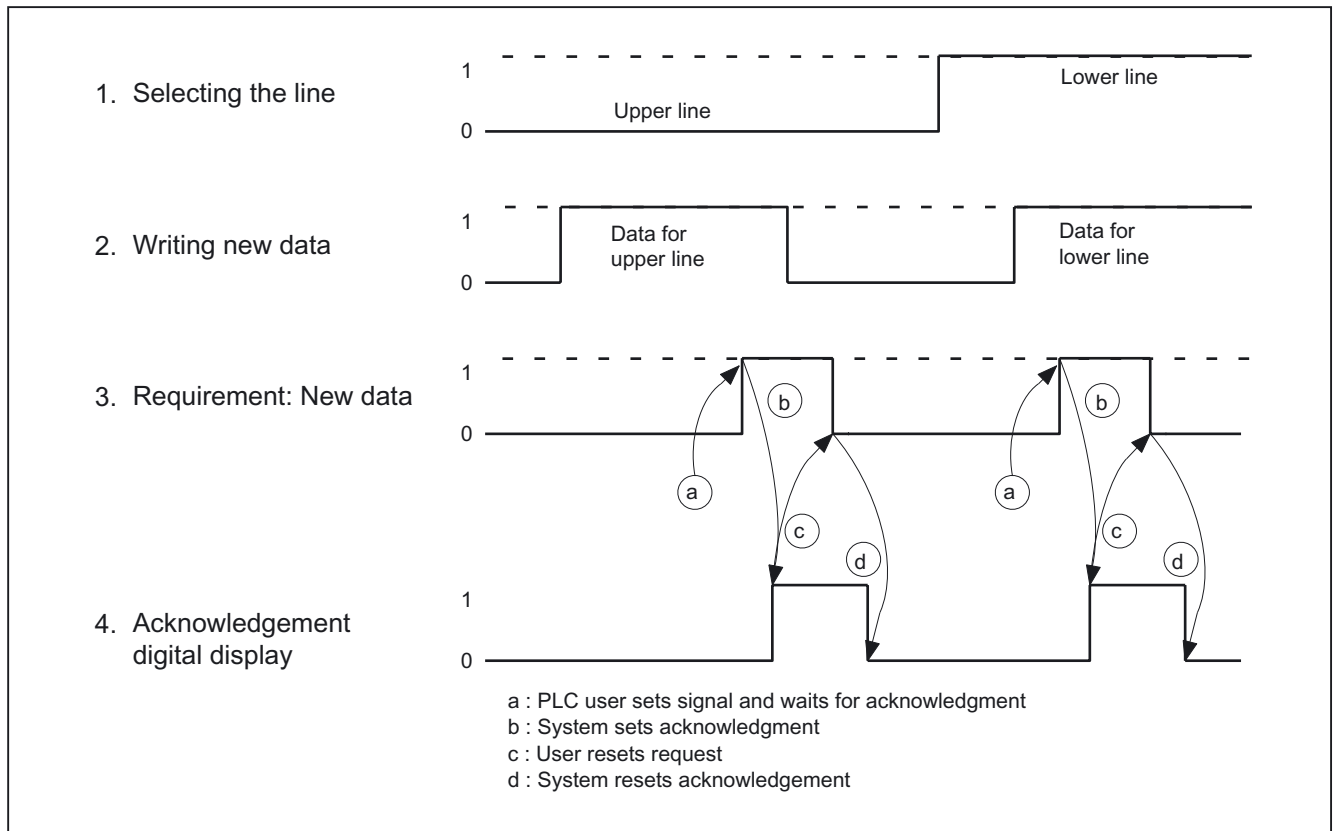


Figure 23-11 Signal chart example for writing data into the HHU display

ASCII code for digital display

Representation of characters on specifying the corresponding bit pattern or hexadecimal format in the bytes QBm + 4...19. The characters from Hex 20 to Hex 7F are default values.

0010	0011	0100	0101	0110	0111	1010	1011	1100	1101	1110	1111	² ← Bits 7... 4
20H	30H	40H	50H	60H	70H	A0H	B0H	C0H	D0H	E0H	F0H	Bit 3 0 ↓ 0000
												0001
21H	31H	41H	51H	61H	71H	A1H	B1H	C1H	D1H	E1H	F1H	
												0010
22H	32H	42H	52H	62H	72H	A2H	B2H	C2H	D2H	E2H	F2H	
												0011
23H	33H	43H	53H	63H	73H	A3H	B3H	C3H	D3H	E3H	F3H	
												0100
24H	34H	44H	54H	64H	74H	A4H	B4H	C4H	D4H	E4H	F4H	
												0101
25H	35H	45H	55H	65H	75H	A5H	B5H	C5H	D5H	E5H	F5H	
												0110
26H	36H	46H	56H	66H	76H	A6H	B6H	C6H	D6H	E6H	F6H	
												0111
27H	37H	47H	57H	67H	77H	A7H	B7H	C7H	D7H	E7H	F7H	
												1000
28H	38H	48H	58H	68H	78H	A8H	B8H	C8H	D8H	E8H	F8H	
												1001
29H	39H	49H	59H	69H	79H	A9H	B9H	C9H	D9H	E9H	F9H	
												1010
2AH	3AH	4AH	5AH	6AH	7AH	AAH	BAH	CAH	DAH	EAH	FAH	
												1011
2BH	3BH	4BH	5BH	6BH	7BH	ABH	BBH	CBH	DBH	EBH	FBH	
												1100
2CH	3CH	4CH	5CH	6CH	7CH	ACH	BCH	CCH	DCH	ECH	FCH	

												1100
2DH	3DH	4DH	5DH	6DH	7DH	ADH	BDH	CDH	DDH	EDH	FDH	1101
2EH	3EH	4EH	5EH	6EH	7EH	AEH	BEH	CEH	DEH	EEH	FEH	1110
2FH	3FH	4FH	5FH	6FH	7FH	AFH	BFH	CFH	DFH	EFH	FFH	1111

23.6 Distributor box for handheld unit

23.6.1 Overview

Distributor box and HHU

The handheld unit is connected to the distributor box. The distributor box is intended for mounting in the switch cabinet or in a separate casing. The distributor box has an interface to the MPI bus and a terminal block for connecting EMERGENCY STOPS, enabling buttons, handwheels and the 24V power supply. The equipotential bonding connector is also arranged at the distributor box. Equipotential bonding has to be made using a low-resistance connection between the distributor box and the ground potential. The equipotential bonding conductor should be a stranded cable having a cross-section of at least 10 mm² and a length of < 30 cm.

Literature: /PHF/ Configuring, Manual
 /PHD/ Configuring, Manual

Versions of the distributor box

The distributor box is available both in standard version and in a UL-certified version. The UL-certified distributor box with power limitation is only needed for UL-conform HPU operations because this does not have UL certification.

The HHUs are UL-certified and can therefore be operated on standard distributor boxes.

The distributor box must be designed for 3-core or 4-core connection of the enabling keys, depending on the HHU used.