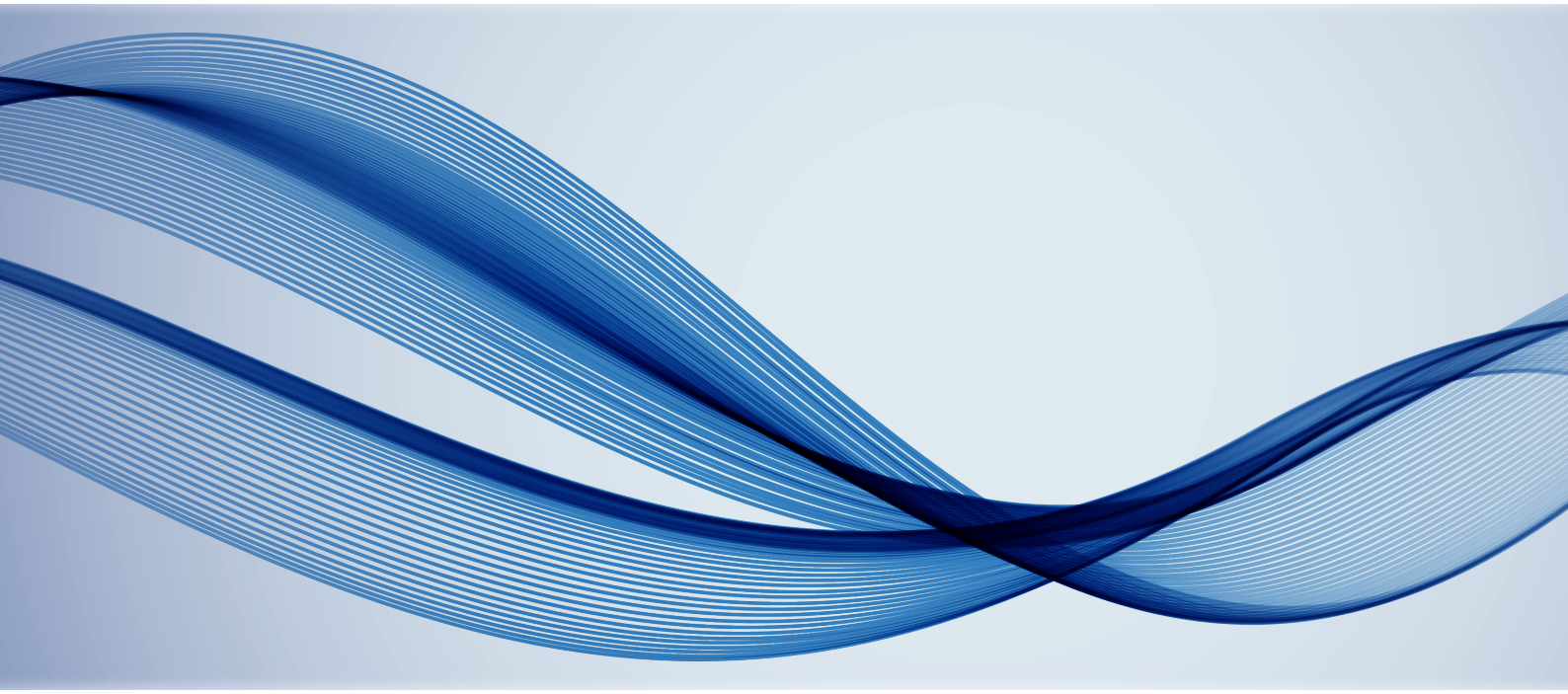
technetix

The 1.2 GHz NCI solution from Technetix:

The future of headend RF signal management



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The demand for high speed Internet and digital television means that headends are frequently modified, extended and upgraded to offer higher bandwidth to cable end-users. This is achieved with a range of new technologies or approaches, such as increasing the frequency spectrum, implementing higher modulation schemes, reducing node size (i.e., node splitting) or migrating to DOCSIS 3.1 and CCAP standards.

In the headend environment, isolation issues must be addressed without compromising power consumption, heat dissipation or valuable rack space.

New cable industry standards

DOCSIS 3.1 offers increased capacity by using channel bonding, but channel bonding reduces the carrier levels, increasing the probable need for active combining.

CCAP, the new standard from CableLabs, was designed as a cost-effective means of migrating conventional MPEG-based video delivery to IP video transport. It migrates data and video delivery to one integrated distribution path.

Evolving the headend

To cope with the new standards, more combining and dividing of signals becomes necessary. However, introducing a greater number of smaller nodes into a network necessitates additional headend equipment such as optical downstream transmitters and upstream receivers.

Operators will migrate to CCAP gradually, replacing their existing substantial investment in cable modem termination systems (CMTSs) and Edge QAMs (EQAMs) over a period of many years. The CCAP standard offers combined CMTS and EQAM functionality in one hardware solution. When all signals are provided from a CCAP platform, there is theoretically no need for a combining system. However, in reality a network migration is never completed all at once – migration takes place over a number of years and network diagnostic systems continue to be needed.

The importance of isolation

High QAM modulation schemes require high isolation for signal combining. The CCAP standard dictates 70 dB isolation between ports on a CCAP device. Existing passive headend combining systems built with splitters and directional couplers are not capable of meeting CCAP isolation requirements. Furthermore, isolation issues must be addressed without compromising power consumption, heat dissipation or rack space in the headend environment.

Active combining is the best solution to provide a future-proof system which can handle DOCSIS 3.0, DOCSIS 3.1 and CCAP.

The NCI solution

The compact, CCAP-compliant Narrowcast Inserter (NCI) solution from Technetix is the smart choice for dynamic operators seeking to overcome these challenges. Now available up to 1.2 GHz, the system provides a flexible, scalable and remotely manageable solution to support changing network requirements over time.

Next-generation, CCAP compliant RF combining

The NCI solution complies with the CCAP isolation requirement of greater than 70 dB. The system consists of up to 22 narrowcast inserters (the NCI-521), a central controller (the NCC-1222) and a 22-way broadcast splitter on the rack back plane. It has been designed to deliver maximum flexibility for minimum rack space, along with low power consumption and high isolation.

The NCI narrowcast inserters are hot swappable plug-in modules. No connections have to be made from the back, as everything is accessible from the front. Each input port on the narrowcast inserter has gain control from 0 dB to 30 dB in 0.5 dB increments and slope control from 0 dB to 10 dB in 0.5 dB increments, with the combined output level also adjustable.

The central controller in the rack controls all 22 modules locally or remotely via a web browser. Setting slope and gain electronically means there are no signal disruptions while these changes are being made. The advantage is that work can be carried out from a remote location at any time during the day, cutting out the need for night shift work.

For integration into a network management system, an Ethernet data port with an SNMP interface is available as standard.

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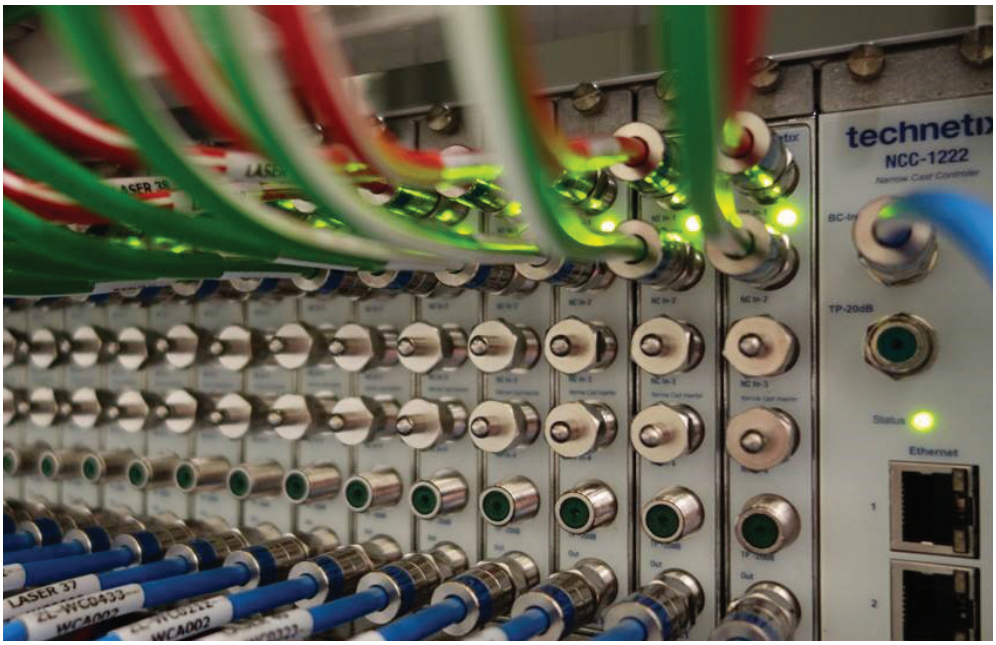


Achieve maximum flexibility for minimum rack space, along with low power consumption and high isolation.

The NCI solution consists of the following modules:

NCI-521

The **NCI-521** is compact, flexible and offers greater than 70 dB isolation between ports. The unit is used to combine up to four narrowcast services with one broadcast service. Up to 22 narrowcast modules can slot into a standard 19 inch 3 RU rack along with the NCC-1222 narrowcast controller required to control the NCI-521 modules. The system's convenient design saves space in the headend.

Every narrowcast input has a centrally operated, 30 dB electronic adjustable attenuator and 10 dB equaliser. Both the broadcast input and output have an adjustable attenuator. Adjustments are made in microseconds, minimising the risk of service interruptions.

RF connections are made with 'F' connectors, and the use of high quality ferrite ensures very low passive intermodulation, meaning the NCI-521 is fully prepared for DOCSIS 3.1 and channel bonding applications. Narrowcast Input 4 has a separate switch and can be used as a redundant input for future CCAP applications.

All settings are stored in non-volatile memory inside the unit; in the event of a power failure, settings are restored automatically. Changes in level and slope are completed in microseconds, avoiding potential service disruptions during the process. This significantly reduces labour costs overall.

The **NCC-1222** is a controller combined with a broadcast amplifier and splitter. The unit monitors the RF level of the broadcast signal and the alarm from the Technetix RPS-UNI power supply, and it controls up to 22 NCI-521 narrowcast inserters. Settings and controls can be operated via the built-in web browser. All functions and alarms can be operated remotely via SNMP and SNMP traps are generated. The ability to control the device remotely reduces the need for technicians to travel out to remote locations, cutting carbon footprints and saving costs for the operator.

A 20 dB broadcast test point is located on the front panel along with a single broadcast RF input. The NCC-1222 is fully prepared for DOCSIS 3.x and channel bonding applications.

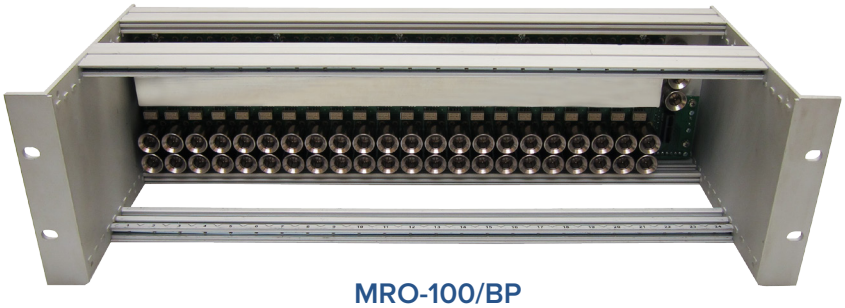
Technetix' webserver is built-into the NCC-1222 and automatically detects system modules, offering easy online access to all settings from the operator's preferred location. When the RPS-UNI redundant power supply is connected, monitoring is achieved via the NCC-1222 and results are displayed on the webserver. SNMP and network settings are selected via a menu screen, and NCC-1222 and NCI-521 settings are adjusted via the webserver. For ease of operation, each node can be assigned a name which appears on screen when the associated unit is selected.

The webserver has a built-in calculator to gauge the CSO and CTB values of the unit, signalling the amplifiers' load to the technician. When an amplifier is overloaded, a fault alarm indication is generated. A more complex system calculator can be downloaded as an Excel file from the controller to also calculate the carrier-to-noise ratio and the isolation between ports at all settings.

NCC-1222

The MRO-100/BP is a 3 RU height, 19 inch mounting rack for the Technetix NCI solution, housing a single NCC-1222 controller and up to 22 narrowcast inserters (NCI-521s).

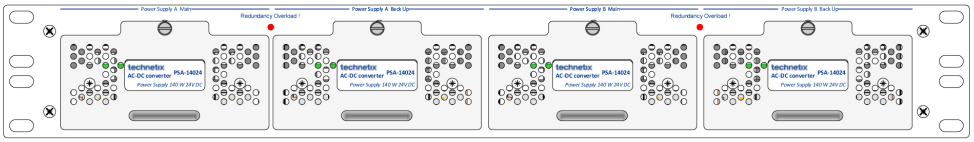
The rack contains a backplane with a 22-way broadcast splitter. All powering, addressing and control signals are integrated; no connections have to be made from the back. The broadcast feed is automatically terminated when a module is removed, allowing the narrowcast inserters to be hot-swapped.



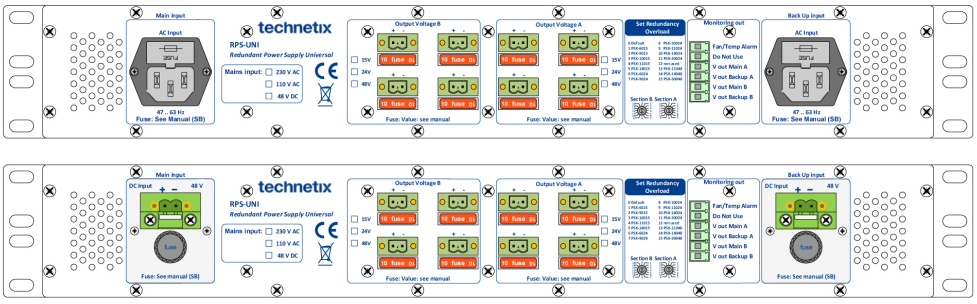
MRO-100/BP

The RPS-UNI is a universal fully redundant power supply featuring four slots for hot-swappable power supply modules. With its 1.5 RU housing, the RPS-UNI uses minimal rack space and can be placed in a standard 19 inch cabinet.

Redundancy overload protection is built-in and realised via load sharing. If redundancy is jeopardized an alarm is emitted via the NCC-1222. Monitoring of the temperature, fans and output voltages is also possible.



RPS-UNI



RPS-UNI (back panel with connections)

The PSA-14024 plug-in power supply for the RPS-UNI provides 140 W, which is enough power to feed two NCI racks. The system achieves redundancy with the use of two plug-ins. Up to four PSA-14024 power supplies can be placed in the 1.5 RU 19 inch housing to redundantly feed up to four full racks.

The NCI solution from Technetix was developed by experts in the field to help operators address isolation challenges in the headend while meeting the growing demand for high capacity applications.

Features and benefits of the NCI solution

Total cost of ownership is reduced with the following features and benefits:

1. Easy installation saves time and costs.
2. System scalability enables operators to upgrade equipment and services in a gradual, controlled way.
3. High isolation between ports enables the solution to be CCAP compliant.
4. Compact design optimises space in headends and hub sites.
5. Local or remote system access simplifies network management.
6. Software remote control saves journeys to remote locations, reducing the technician's carbon footprint.
7. Real-time adjustments eliminate the need for night shift work.
8. Real-time adjustments prevent service disruptions.
9. Built-in monitoring generates alarms (SNMP traps).
10. Integrated web browser offers convenient control of up to 22 x NCI-521s.
11. Modular system design renders the solution headend/field upgradable to 1.2 GHz.
12. The use of high-quality ferrite ensures very low passive intermodulation, preparing the solution for DOCSIS 3.x and channel bonding applications.

Operators migrating to CCAP must consider the NCI solution. The system can replace legacy vendor equipment in the headend while offering scalability to meet future needs – providing a stepped approach to CAPEX investment over time.

The NCI solution from Technetix was developed by experts in the field to help operators address isolation challenges in the headend while meeting the growing demand for high capacity applications. The solution can be customised to meet the needs of MSOs of all sizes.

System compliances include the FCC, USA and Cenelec EN European standards.

Full detailed specification sheets are available for the NCI solution.

Planned additions to the NCI solution

The **NCI-521-12** is a new narrowcast inserter with an extended frequency range of 1220 MHz, developed to maximise the benefits of DOCSIS 3.1. The unit is hardware and software compatible, and can be used in the same MRO-100/BP rack in combination with the NCI-521 and the NCC-1222.

The new **NCC-2222** controller offers two broadcast inputs to feed the system from an A and B optical feed when used in a redundantly fed hub site. Automatic broadcast detection makes the NCC-2222 redundant for the broadcast input. Signal failures will generate an alarm and an SNMP trap. The controller is compatible with the NCI-521, the NCI-521-12 and the RPS-UNI.

The new **PSA-30024** is a plug-in power supply developed for the new RPS-UNI-1200. The unit is a 230 V AC to 24 V DC converter with a max power of 300 W feeding up to four racks, and is fully redundant when used in a double setting. Placing four plug-ins of 300 W can feed up to eight racks. The power supply can be monitored via the NCC-x222.

Technetix' **Systems Setting Database** copies all settings from a rack to the database using an SNMP connection, providing a backup facility for deployed systems. From the database, settings can be uploaded to the racks for easy installations.

Technetix' new **Cabling System** is a bundled mini coax cable assembly designed to make installation easier for the operator. Assemblies can be made to customer specifications and are available in 10 or 12 cable bundles. The coax cable is a quad shield mini coax available in 12 colours. One end of the cable is fitted with high quality 'F' connectors and cable lengths are optimised for connection to the NCI rack. The other end of the cable bundle can remain without connectors, or can be fitted with 'F' or MCX connectors. Cable length is a standard 5 meters but can be customised to suit any length required.

Check back with Technetix to see how we keep the NCI product line up to date.

The NCI solution can be customised to meet the needs of MSOs of all sizes.

Contact information

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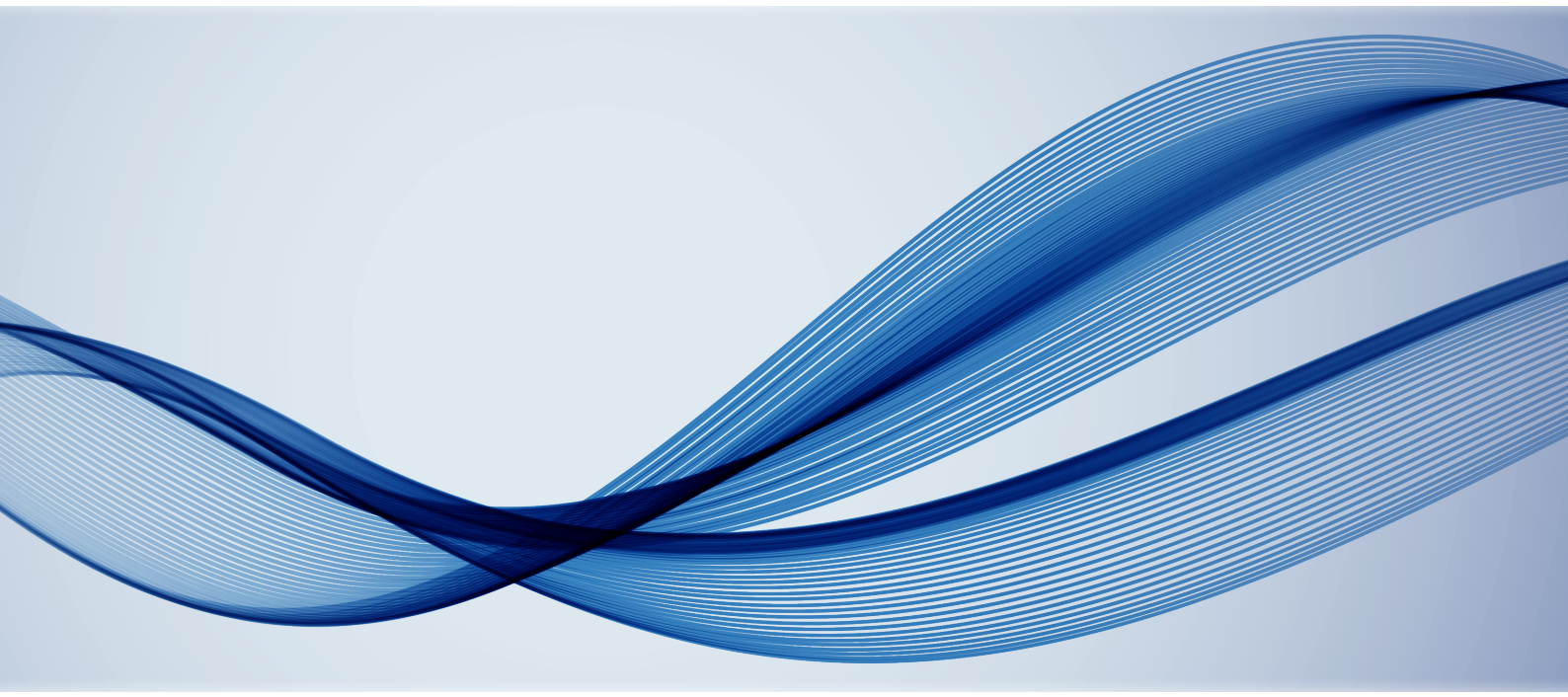
Technetix: a trusted partner

Technetix works in partnership with broadband cable network operators to truly understand their needs and to provide intelligent, customized solutions that help them deliver reliable, innovative services to their customers.
Our Headend solutions are designed for density and modularity, giving maximum flexibility, freeing up critical headend space and making future upgrades simple and cost effective. Our Access Network solutions enhance signal quality: reducing operator callouts and minimizing maintenance costs. Our Connected Home solutions enable high quality signals to be received at multiple points within a home: reducing or eliminating operator installation and maintenance costs.

An industry leader since 1990, Technetix is the tried, tested and trusted supplier to over 1,800 customers, operating out of 20 countries and selling into 75.



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