



NC316-144PMC

Media Cross-Connect 144



Overview

The Fiber Driver® Media Cross Connect 144 (NC316-144PMC) is a 4-blade, 144-port digital cross-connect that allows you to program physical layer connectivity from any port to any other port. The system can support any data rate from DC to 4.25 Gbps (depending on model) with 2R signal regeneration, and is compatible with all major data, storage, voice and video protocols. This allows a single cross-connect to be used for a wide variety of applications.

The NC316-144PMC delivers all the capabilities of SFP-based optical interfaces as well, including hot-swap, flexibility, inventory control and Digital Diagnostics.

Features and Benefits

- **Any-port to any-port programmable connectivity** - allows the network to be configured and reconfigured at will, without rewiring
- **Wide range of applications** - fiber exchange points, wire-once Enterprise, test and simulation labs, video distribution via physical layer multicasting
- **High-density form factor** - 144 data ports in 5U of rack space
- **36-port SFP interface blades for greater flexibility and inventory control, and reduced down-time:**
 - Supports any data rate from DC to 4.25 Gbps
 - Fiber (850/1310/1550nm) SFPs available
 - Copper (RJ45/Coax) SFPs available
 - CWDM & DWDM (ITU grids) SFPs available
- **36-port RJ-45 interface Ethernet blades:**
 - Auto negotiate 10/100/1000 Ethernet connections
 - Auto sense full/half duplex
 - Auto MDI/MDIX
- **Network monitoring features:**
 - Select a port to monitor data transparently from any other port - allows a bit-level protocol analyzer to watch over any port
 - SFP Digital Diagnostics (SFF-8472) for monitoring all optical parameters

Figure 1: NC316-144PMC in a test lab environment allowing multiple workstations to share access to expensive test equipment

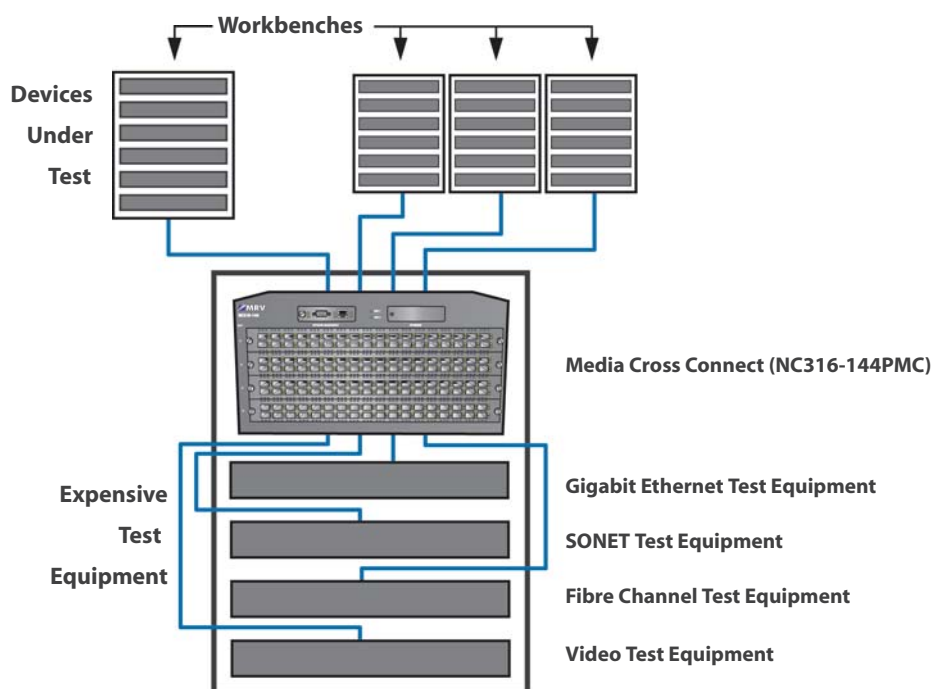
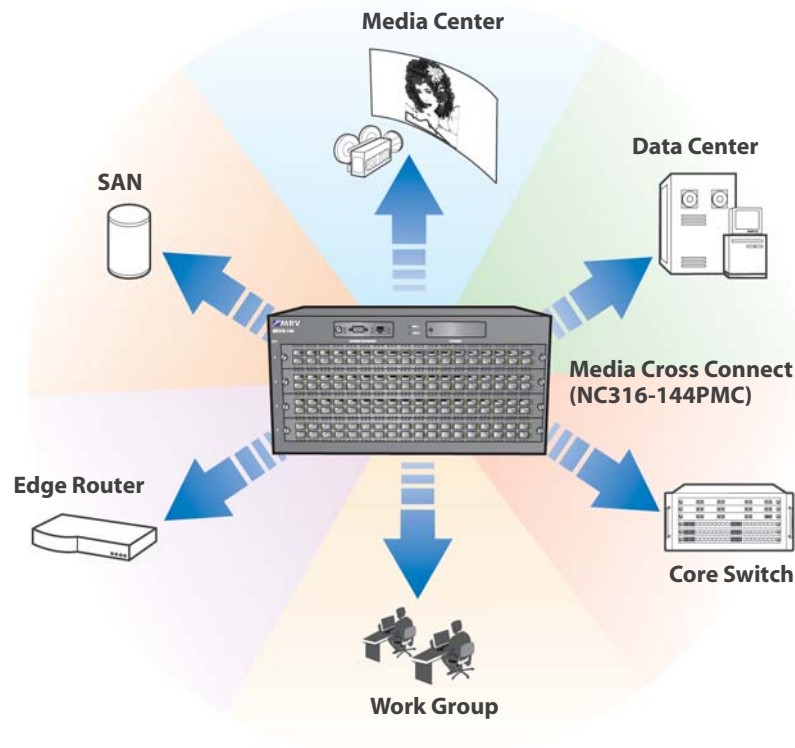




Figure 2: NC316-144PMC as a digital patch panel creating a wire-once network infrastructure



A cross-connect is used primarily as an intelligent patch panel. Whereas with a typical patch panel, wires must be physically disconnected, moved, and reconnected to change the network configuration, the NC316-144PMC, allows the network administrator to make any desired configuration changes without touching the physical wires. This is accomplished by providing a fully programmable path between all the ports.

Establishing a data connection with the Media Cross-Connect is simple and straightforward. Place the desired blades/interfaces into the chassis and via software management set the port-to-port connections. Changing connections is easily done at any time through the management interface, either CLI, Telnet, SNMP or via MegaVision Web®.

The NC316-144PMC utilizes a chassis and blade architecture that provides an easy and cost-effective way to expand the cross-connect as needs grow. The system chassis can accommodate up to four (4) hot-swappable interface blades, each with thirty-six (36) SFP or RJ-45 ports. As the blades all connect to a common backplane, the cross-connect functionality extends across any combination of blades and ports.

Applications

Test Labs

Test labs administrators face several challenges that are eased with the NC316-144PMC. Test operators need to use expensive test equipment efficiently. The NC316-144PMC allows operators to share interfaces on a piece of test equipment that is located centrally. Additionally, someone constantly has to rewire or move cables around from place to place, which is cumbersome and can interfere with test results. A programmable cross-connect allows total control over the entire test lab infrastructure, and enables the test operators quickly and easily to change the test setup.

Network Simulation

The NC316-144PMC dramatically simplifies network simulation setup and reconfiguration by simply allowing a software programmable connection between the various devices on simulated network. Each device is attached to the NC316-144PMC via as many connections as necessary, and the cross-connect is programmed and reprogrammed to create the desired network topology. The cross-connect can easily be used to simulate network outages or cable breaks as well. Ports on the NC316-144PMC can also act as network analysis (or mirror) ports, allowing a single network analysis device to be used for any given protocol (Gigabit Ethernet or ATM, for example).



Figure 3: NC316-144PMC as high-density, multi-rate transponder for WDM applications



Wire-Once Enterprise

In many network wiring closets, the state of change is the normal state of affairs. Here, the NC316-144PMC can be used to replace the optical or copper patch panels so that any change in fundamental topology (for example, if a router or switch is added or removed, or simply needs a different connection) can be achieved by simply reprogramming the cross-connect, and without the administrator having to physically touch any of the cables.

Fiber Exchange Points

Wherever large numbers of fiber strands come together in a junction place, the NC316-144PMC can be used to connect all the fibers together, allowing complete programmable connections.

In many cases these fiber strands are using WDM technology to transport many streams or customers across each fiber. In this case, the NC316-144PMC can be used together with passive Muxes/Demuxes and WDM 'colored' SFP optical interfaces to provide a completely configurable wavelength and fiber switch, allowing total control over which wavelength from each fiber is connected to which other fiber and wavelength.

Video Distribution Via Physical Layer Multicasting

The NC316-144PMC can be used in a digital video distribution environment, such as an educational video network on a campus. The cross-connect broadcasts the video from a single source to all the other ports, using the port-to-multipoint physical layer multicasting feature. In doing this, the digital signal is regenerated which allows a better quality signal than the traditional 'vampire-tap' approach.

Additionally, using optical SFPs, fiber optic cabling can be used to reach long distances between devices, allowing a Metro-wide deployment of a single digital video source.

Interface Blades

SFP Interface Blade

The Media Cross-Connect 144 provides unmatched flexibility in network environments where many types of networking protocols and interfaces coexist. Its protocol independent, 36-port SFP interface blade (EMPMC-36SFP)

supports the system's full data rate range of DC to 4.25 Gbps. This includes any protocol from E1/T1 to Gigabit Ethernet and even 4-Gig Fibre Channel. The data rate is dependent on the SFP used.

Delivering connectivity for all these protocols at the same time has, in the past, been an extremely difficult task. With SFPs, though, the physical interface-specific part of the equipment is a tiny, hot-swappable module, allowing a simple, flexible equipment configuration supporting an enormous variety of protocols, physical interfaces (both fiber and copper), and distances (120+ km).

As SFP transceivers are portable they can be re-used for different applications, thus maximizing the investment in optics and equipment, and reducing the need for on-hand parts inventory. With SFPs, changing a connection type requires only changing the SFP transceivers and setting the new data rate. With the hot swappable functionality of SFP transceivers there is virtually no down time involved.

MRV provides a wide variety of SFP transceivers, enabling flexible solutions for virtually any protocol in existence, and virtually any physical interface in existence, including single mode, multimode, extended multimode, RJ-45, Coax, FireWire, CWDM and DWDM.

RJ-45 Interface Blade

The RJ-45 interface blade (EMPMC-36RJ) for the Media Cross-Connect 144 provides thirty-six (36) independent 10/100/1000Base-TX Ethernet ports that support speed auto negotiation, duplex auto sensing, and auto MDI/MDIX. The interfaces also support jumbo Ethernet packets, perform 3R signal regeneration and feature front panel status LEDs.

Both the SFP and RJ-45 blades support Link Integrity Notification (LIN) via the Media Cross-Connect 144 chassis. With LIN enabled, a loss of link on an input port results in any associated output port(s) being deactivated. This ensures that a change in connection status is propagated from one end device to the other.



Management

The NC316-144PMC provides a variety of advanced management features, including Digital Diagnostics, and full programmability of the cross-connect, as well as port monitoring capability. These management features are accessible either via a command line interface (serial or Telnet) or through MRV's MegaVision Web® Network Management Platform.

SFP Digital Diagnostics (SFF-8472) provides real-time access to information such as transceiver type (protocol, range, vendor, etc.), transceiver temperature, transmit and receive optical power, and transceiver supply voltage. It also provides a means for generating management alerts and warnings, when system parameters fall outside of the normal operating range. This feature allows a network

administrator to preemptively reroute, repair or replace optical interfaces before problems actually start occurring on the network.

Any port on the NC316-144PMC can be configured as a monitoring port, which can be used to monitor any combination of active ports, providing network administrators with a powerful network diagnostic tool.

The management card of the NC316-144PMC provides a serial interface (DB-9) and an Ethernet interface for SNMP management.

For additional information, including pricing and availability on these or any of the full line of MRV Communications products, contact your nearest authorized MRV representative.

Physical Specifications: Media Cross-Connect	
Operating Temperature Range:	0°C to 50°C (32°F to 122°F)
Storage Temperature:	-40°C to 95°C (-40°F to 203°F)
Relative Humidity:	85% maximum, non-condensing
Physical Dimensions:	221 mm high x 438 mm wide x 305 mm deep (8.7" x 17.25" x 12")
Weight:	14.2 kg (31.2 lbs) including power supplies
Mounting:	19" rack, 5 U

	Part Number	Description
Ordering Info	NC316-144PMC-4	144-port SFP Media Cross-Connect chassis supporting any data rate from DC to 4.25 Gbps with 2R signal regeneration. Chassis can be configured with up to four 36-port interface blades
	NC316-144PMC-3	144-port SFP Media Cross-Connect chassis supporting any data rate from DC to 3.2 Gbps with 2R signal conditioning. Chassis can be configured with up to four 36-port interface blades
	NC316-144RPSAC	90-240 VAC Power supply
	EMPMC-36SFP	Protocol independent interface blade with thirty-six (36) SFP ports
	EMPMC-36RJ	10/100/1000Base-TX Ethernet interface blade with thirty-six (36) RJ-45 ports. performs 3R signal regeneration
	EM316NM-MCC144	SNMP Management Module for 144-Port Chassis

MRV has more than 50 offices throughout the world. Addresses, phone numbers, and fax numbers are listed at www.mrv.com. Please e-mail us at sales@mrv.com or call us for assistance.

MRV (West Coast USA)
20415 Nordhoff St.
Chatsworth, CA 91311
800-338-5316
818-773-0900

MRV (East Coast USA)
295 Foster St.
Littleton, MA 01460
800-338-5316
978-952-4700

MRV (International)
Business Park Moerfelden
Waldeckerstrasse 13
64546 Moerfelden-Walldorf
Germany
Tel. (49) 6105/2070
Fax. (49) 6105/207-100

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