



## NC316-72PMC

### Media Cross Connect™ 72



#### Overview

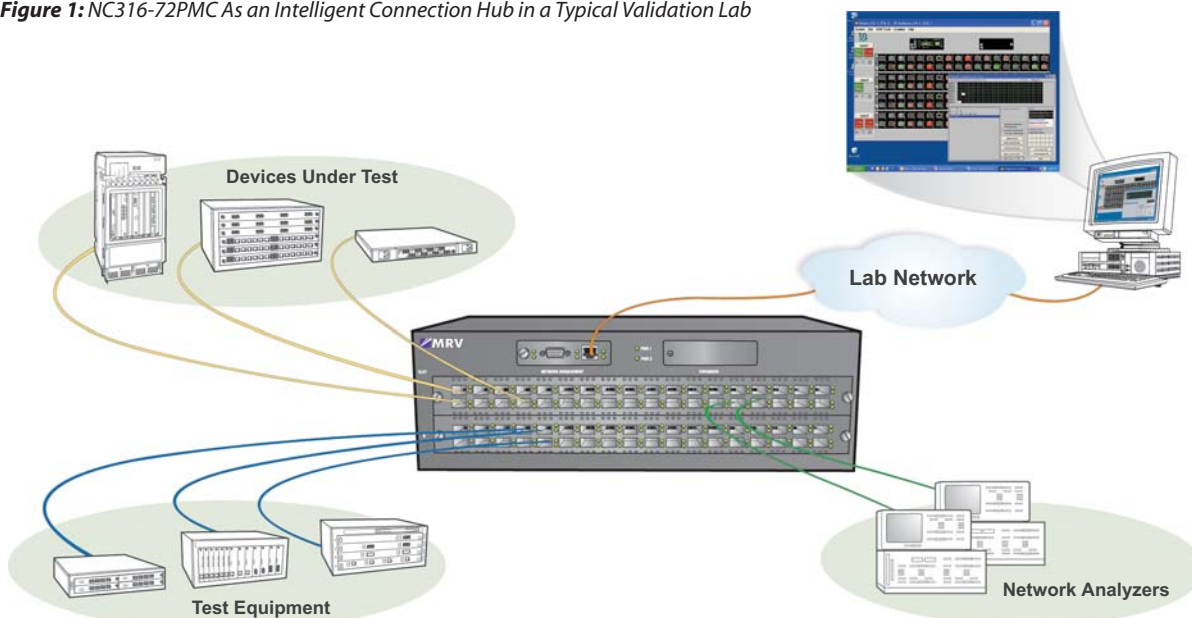
The Media Cross Connect™ 72 (NC316-72PMC) from MRV is a 2-blade, 72-port digital patch panel that allows you to program physical layer connectivity from any port to any other port. The system can support any data rate from DC to 4.25 Gbps and 10-Gbps with 2R signal regeneration, and is compatible with all major data, storage, voice and video protocols. This allows a single Media Cross Connect to be used for a wide variety of applications.

The NC316-72PMC delivers all the capabilities of SFP-based optical interfaces as well, including hot-swap, flexibility, inventory control and Digital Diagnostics.

#### Features and Benefits

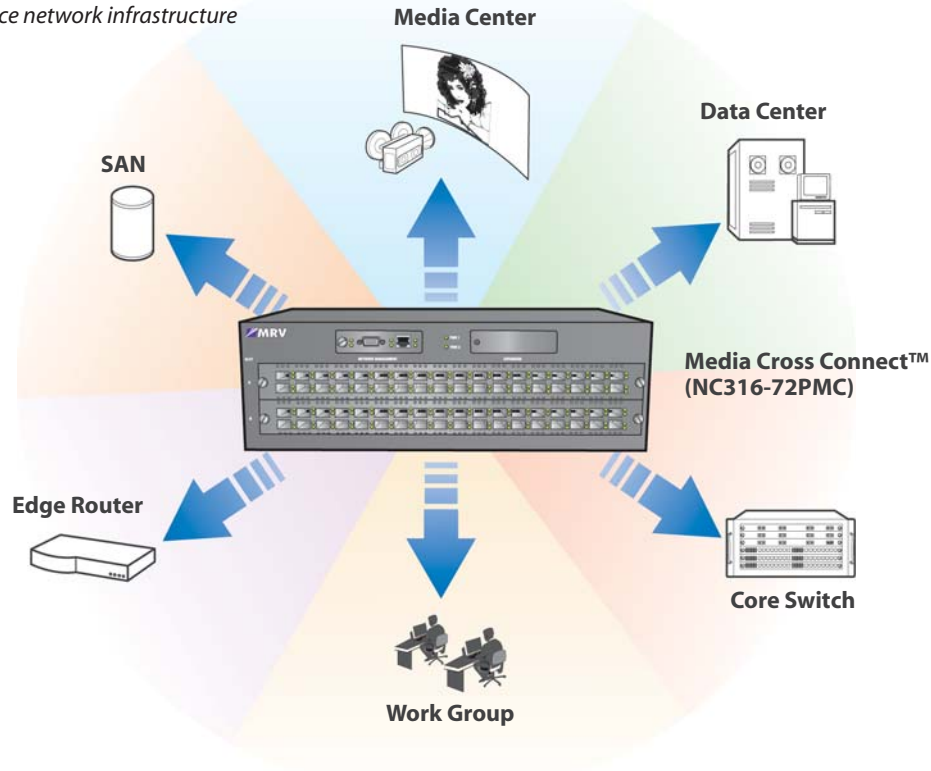
- **Any-port to any-port programmable connectivity** - allows the network to be configured and reconfigured at will, without rewiring
- **Wide range of applications** - fiber exchange points, wire-once Enterprise, test and simulation labs, video distribution via physical layer multicasting
- **High-density form factor** - 72 data ports in 3.5U of rack space
- **36-port SFP interface blades:**
  - 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 Ethernet interface blades:**
  - Auto negotiate 10/100/1000 Ethernet connections
  - Auto sense full/half duplex
  - Auto MDI/MDIX
- **9-port XFP interface blades:**
  - Supports 10-Gig Ethernet and 10-Gig Fibre Channel
- **Advanced inventory management:**
  - 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: NC316-72PMC As an Intelligent Connection Hub in a Typical Validation Lab





**Figure 2:** NC316-72PMC as a digital patch panel creating a wire-once network infrastructure



Whereas with a typical patch panel, wires must be physically disconnected, moved, and reconnected to change the network configuration, the NC316-72PMC, 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 NC316-72PMC 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 two (2) hot-swappable interface blades, each with thirty-six (36) SFP or RJ-45 ports as well as a 9-port XFP blade. 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 NC316-72PMC. Test operators need to use expensive test equipment efficiently. The NC316-72PMC 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 NC316-72PMC 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 NC316-72PMC 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. Any connection can also be mirrored to any selected port on demand, making it possible for one network analysis device to monitor the entire network.



**Figure 3:** NC316-72PMC 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 NC316-72PMC 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 NC316-72PMC 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 NC316-72PMC 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 NC316-72PMC 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 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 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. 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 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.

All, the SFP, XFP and RJ-45 blades support Link Integrity Notification (LIN) via the Media Cross Connect 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.

**XFP Interface Blade**



The 9-port XFP interface blade (EMPMC-9XFP) for the Media Cross Connect supports both 10-Gig Ethernet and 10-Gig Fibre Channel. While only slightly larger than SFP transceivers, XFP transceivers are capable of extremely high rate protocols while providing the same features and benefits of SFPs, including hot swappable plug-n-play functionality and Digital Diagnostics. In addition, XFP transceivers internally support 3R signal regeneration for the highest level of signal integrity.

MRV provides a variety of XFP transceivers for many applications, including XFPs utilizing MRV's exclusive Multimode Extender to transmit 10-Gig Ethernet or Fibre Channel to greater distances over existing multimode fiber.

**Management**

The NC316-72PMC 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 NC316-72PMC 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 NC316-72PMC 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**

<b>Operating Temperature Range:</b>	0°C to 50°C (32°F to 122°F)
<b>Storage Temperature:</b>	-40°C to 95°C (-40°F to 203°F)
<b>Relative Humidity:</b>	85% maximum, non-condensing
<b>Physical Dimensions:</b>	156 mm high x 442 mm wide x 286 mm deep (6.125" x 17.4" x 11.25")
<b>Weight (chassis):</b>	5.9 kg (12.8 lbs) including one power supply and 1 blank panel
<b>(blades):</b>	SFP blade - 0.9 kg (2.0 lb); RJ-45 blade - 1.1 kg (2.4 lb); XFP blade - 0.9 kg (2.0 lb)
<b>Mounting:</b>	19" rack, 3.5 U



	Part Number	Description
Ordering Info	<b>NC316-72PMC-4</b>	72-port 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
	<b>NC316-72RPSAC</b>	90-240 VAC power supply for 72 Media Cross Connect chassis
	<b>EMPMC-36SFP</b>	Protocol independent interface blade with thirty-six (36) SFP ports
	<b>EMPMC-36RJ</b>	10/100/1000Base-TX Ethernet interface blade with thirty-six (36) RJ-45 ports. Performs 3R signal regeneration
	<b>EMPMC-9XFP</b>	9-port XFP interface blade for 10-Gig Ethernet and 10-Gig Fibre Channel
	<b>EM316LNXM-MCC</b>	Linux Based SNMP management module for Media Cross Connect Chassis

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