DATA SHEET

SERIAL CONNECTIVITY NETWORK MODULES (NM-1HSSI, NM-4T, NM-4A/S, NM-8A/S, NM-16A/S, NM-16A, NM-32A)

Cisco Multi-Service Access Routers and Integrated Services Routers offer a wide variety of serial connectivity modules to accommodate the range of application needs in customer networks. The serial network module family assures customers that they can choose a serial connectivity solution that fits their requirements. Serial connectivity options offer several port densities, synchronous and asynchronous alternatives. As modular components, they are easily and inexpensively field upgradeable as customer requirements change.

Available serial connectivity Network Modules include:

- NM-1HSSI: One-port High Speed Serial Interface (HSSI)
- NM-4T: Four-port serial
- NM-4A/S: Four-port asynchronous/synchronous serial
- NM-8A/S: Eight-port asynchronous/synchronous serial
- NM-16A/S: 16 port asynchronous/synchronous serial
- NM-16A: 16 port high-density asynchronous
- NM-32A: 32 port high-density asynchronous

Figure 1. Serial Applications

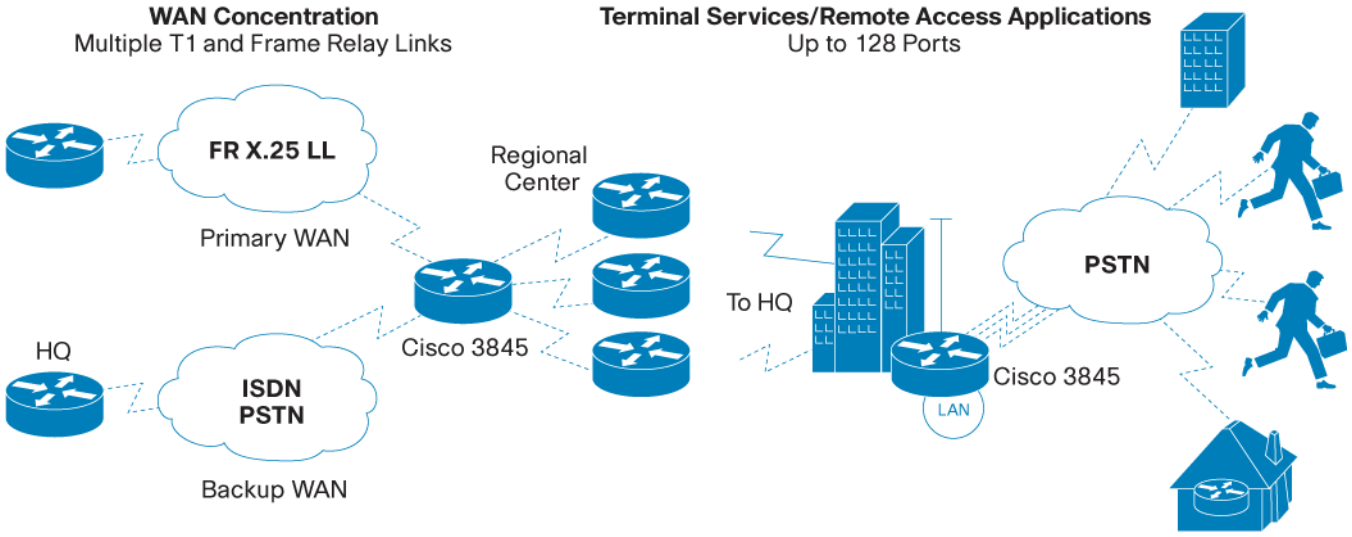


Figure 2. High Speed Serial Interface (HSSI) Network Module NM-1HSSI

The NM-1HSSI is a single port, high-speed network module that provides connectivity to a Wide Area Network. Demand for high capacity corporate backbones, high-speed Internet access, Virtual Private Networks (VPNs), and trunking connections for service provider internetworking has led to an increase demand for clear channel DS3 and E3 connections. Also see the NM-1T3/E3 clear channel T3/E3 Network Module (http://www.cisco.com/warp/public/cc/pd/ifaa/ps4909/prodlit/ttnp_ds.htm).

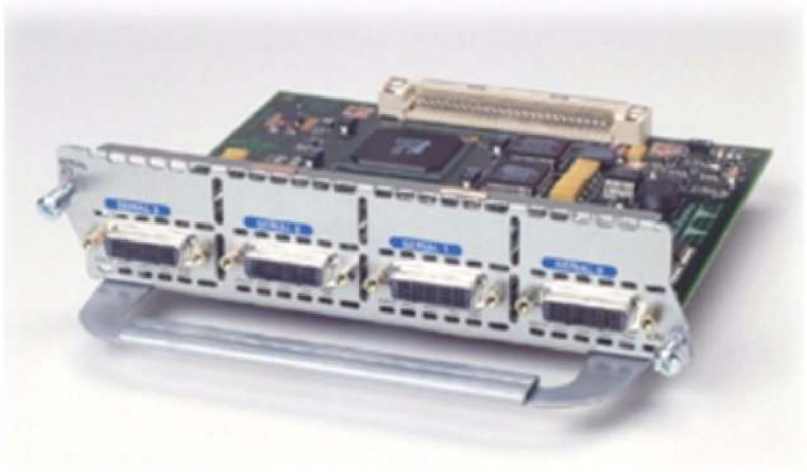
The NM-1HSSI Network Module supports speeds up to 52 Mbps. The NM-1HSSI also supports fractional T3/E3 speeds from 56 kbps to 52 Mbps.

Table 1. Cable Options for NM-1HSSI

Product Number	Cable Type	Length	Connector Type
CAB-HSI1=	HSSI	10 feet (3 meters)	Male-to-male
CAB-HNUL=	HSSI Null modem	10 feet (3 meters)	Male-to-male

FOUR-PORT NETWORK MODULE (NM-4T)

Figure 3. Four-Port Serial Network Module NM-4T



The NM-4T serial network module has four synchronous serial interfaces. The network module supports a total full-duplex throughput of 8 megabits per second (Mbps), which can be realized over one port (at 8 Mbps) or across all four ports (at 2 Mbps on each port).

The NM-4T module in any network environment delivers very low price per port and provides higher performance than comparable third-party solutions. For instance, a small or medium-sized Internet service provider (ISP) with high serial density requirements may find this solution very cost-effective per subscriber.

LEDs

Network module status indicator, five Status LEDs for each serial port, including data send/receive indication.

Network Interfaces

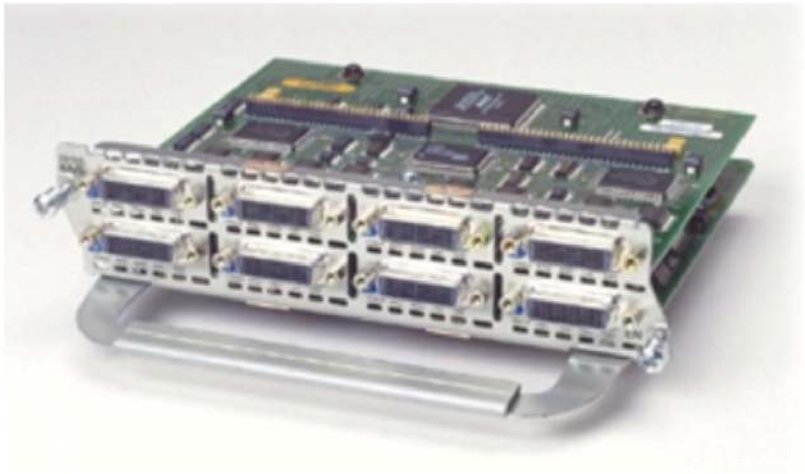
The Network Module has four serial interfaces using DB-60 connector. See Table 2 for the available cables.

Table 2. Cable Options for DB-60 Connectors

Product Number	Cable Type	Length	Connector Type
CAB-V35MT	V.35 DTE	10 feet (3 meters)	Male
CAB-V35FC	V.35 DCE	10 feet (3 meters)	Female
CAB-232MT	EIA/TIA -232 DTE	10 feet (3 meters)	Male
CAB-232FC	EIA/TIA -232 DCE	10 feet (3 meters)	Female
CAB-449MT	EIA/TIA -449 DTE	10 feet (3 meters)	Male
CAB-449FC	EIA/TIA -449 DCE	10 feet (3 meters)	Female
CAB-X21MT	X.21 DTE	10 feet (3 meters)	Male
CAB-X21FC	X.21 DCE	10 feet (3 meters)	Female
CAB-530MT	EIA/TIA-530 DTE	10 feet (3 meters)	Male

FOUR- AND EIGHT-PORT ASYNCHRONOUS/SYNCHRONOUS SERIAL NETWORK MODULES (NM-4A/S, NM-8A/S)

Figure 4. Eight Port Asynchronous/Synchronous Network Module NM-8A/S



The asynchronous/synchronous serial network modules provide flexible multi-protocol support, with each port individually configurable in synchronous or asynchronous mode, offering mixed-media dial support in a single chassis. Applications for Asynchronous/Synchronous support include:

- Low speed WAN aggregation (up to 128 Kbps)
- Dial-up modem support
- Async or Sync connections to management ports of other equipment
- Transport of legacy protocols such as Bi-sync and SDLC

LEDs

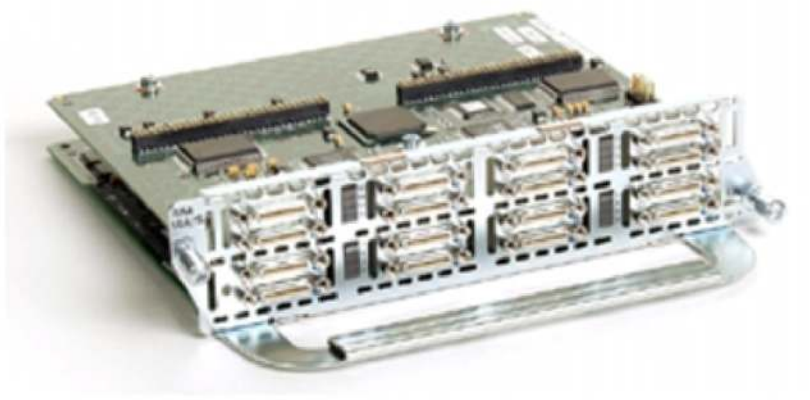
Network Module status indicator, five status LEDs for each serial port, including data send/receive indication.

Network Interfaces

Each Network Module has four or eight low-speed serial interfaces using DB-60 connectors. See Table 2 for the available cables.

SIXTEEN-PORT ASYNCHRONOUS/SYNCHRONOUS SERIAL NETWORK MODULE (NM-16A/S)

Figure 5. Sixteen-Port Async/Sync Network Module (NM-16A/S0



The NM-16A/S combines the rich multi-protocol support of the NM-4A/S and NM-8A/S with higher densities to provide compelling price-per-port solutions for networking applications. In addition to the features of the NM-4A/S and NM-8A/S, the NM-16A/S adds EIA-530A support, and support for physical lead manipulation in the IOS configuration. Lead manipulation allows the user to configure the router to ignore input signals, view the state of input signals, and to monitor the transitions of input signals.

LEDs

The Network Module has one Network Module status indicator, plus one status LEDs for each serial port.

Network Interfaces

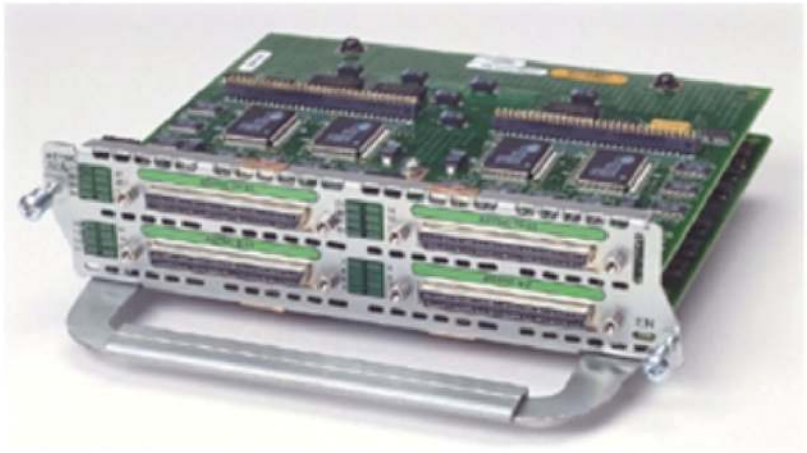
Each Network Module has 16 low-speed serial interfaces using Smart Serial connectors. See Table 3 for the available cables.

Table 3. Smart Serial Cables

Product Number	Cable Type	Length	Connector Type
CAB-SS-V35MT	V.35 DTE	10 feet (3 meters)	Male
CAB-SS-V35FC	V.35 DCE	10 feet (3 meters)	Female
CAB-SS-232MT	EIA/TIA-232 DTE	10 feet (3 meters)	Male
CAB-SS-232FC	EIA/TIA-232 DCE	10 feet (3 meters)	Female
CAB-SS-449MT	EIA/TIA-449 DTE	10 feet (3 meters)	Male
CAB-SS-449FC	EIA/TIA-449 DCE	10 feet (3 meters)	Female
CAB-SS-X21MT	X.21 DTE	10 feet (3 meters)	Male
CAB-SS-X21FC	X.21 DCE	10 feet (3 meters)	Female
CAB-SS-530MT	EIA/TIA-530 DTE	10 feet (3 meters)	Male
CAB-SS-530AMT	EIA/TIA-530A DTE	10 feet (3 meters)	Male

HIGH-DENSITY ASYNCHRONOUS NETWORK MODULES

Figure 6. High Density Asynchronous Network Module NM-32A



The NM-16A and NM-32A network modules provide flexible, high-density asynchronous connectivity at a competitive price per port and higher performance than comparable third-party solutions. The modules support V.34 speeds at up to 4x compression (134.4 kbps) over the asynchronous connection. Three examples where this module can be deployed follow:

- Small to medium-sized power branch offices where remote users require modem dial access; a fully configured Cisco 3845 chassis with four async network modules connected to the modem rack enables connectivity for up to 128 dial-in users
- Medium-sized branch offices that require a high-density terminal server; a fully configured Cisco 3845 chassis with four async network modules connected to the modem rack (with optional custom cables) enables connectivity for up to 128 terminal connections
- Telemetry applications, connecting a NM-32A module to private branch exchange (PBX) serial ports, data collection equipment, or router consoles

Cabling

The NM-16A and NM-32A modules support two or four Cisco "octopus" cables. Each cable terminates eight ports, with optional physical endpoints of RJ-45 or DB-25. A NM-16A module requires two cables, and the NM-32A requires four cables. Table 4 shows the available cables and end connectors for use with the NM-16A and NM-32A.

Table 4. Asynchronous Cables for the NM-16A and NM-32A

Product Number	Cable Type	Length	Connector Type
Network Module Cables			
CAB-OCTAL-ASYNC	High density connector to eight RJ-45	40 inches (1 meter)	Eight RJ-45 Plugs. Requires an end connector to make a device connection
CAB-OCTAL-MODEM	High density connector to eight DB-25	40 inches (1 meter)	Eight DB-25 male connectors
CAB-OCTAL-KIT	High density connector to eight RJ-45 plus eight CAB-25AS-MMOD	40 inches (1 meter)	Eight DB-25 male connectors
End Connectors			
CAB-25AS-MMOD	RJ-45 to DB-25 adapter to connect to a modem	N/A	DB-25 Male
CAB-25AS-FDTE	RJ-45 to DB-25 adapter to connect to a terminal	N/A	DB-25 Female

LEDs

The Network Modules have a Network Module status indicator, and one status LED for each asynchronous port.

Network Interfaces

Each Network Module has 16 or 32 asynchronous interfaces.

SUMMARY

Serial Network Connectivity Network Modules Specifications

Table 5. Technical Specifications

Specification	NM-1HSSI, NM-4T, NM-4A/S, NM-8A/S, NM-16A/S, NM-16A, NM-32A
Dimensions (H x W x D)	1.55 x 7.10 x 7.2 inches, 4 x 18 x 18.3 cm
Weight	2 lbs., 1 Kg Max
Environmental Conditions	• Operational temp. 32-104°F (0-40°C), • Nonoperational temp -13-158°F (-2 - 70°C)
Relative Humidity	5-95% non-condensing
EMI	FCC Class A EMI

Table 6. Supported Features of Serial Network Modules

Network Module	Connector	Synchronous	Sync Max. Speed	Asynchronous	Full Duplex	Half Duplex	Bisync
NM-1HSSI	HSSI	Yes	52 Mbps	No	Yes	No	No
NM-4T	DB-60	Yes	8 Mbps	No	Yes	No	No
NM-4A/S, NM-8A/S	DB-60	Yes	128 Kbps	Yes	Yes	Yes	Yes
NM-16A/S	Smart Serial	Yes	128 Kbps	Yes	Yes	Yes	Yes
NM-16A, NM-32A	High Density Async	No	N/A	Yes	Yes	No	No

Table 7. Serial Protocols Supported

Network Module	HSSI	EIA-232D	EIA-449	EIA-530*	EIA-530A*	V.35	X.21
NM-1HSSI	Yes	No	No	No	No	No	No
NM-4T	No	Yes	Yes	Yes	No	Yes	Yes
NM-4A/S, NM-8A/S	No	Yes	Yes	Yes	No	Yes	Yes
NM-16A/S	No	Yes	Yes	Yes	Yes	Yes	Yes
NM-16A, NM-32A	No	Yes	No	No	No	No	No

* EIA-530 and EIA-530A are supported in DTE mode only.

Table 8. Supported Platforms

Network Module	2600XM Series	2691	2811, 2821, 2851	3700 Series	3800 Series
NM-1HSSI*	No	Yes	Yes	Yes	Yes
NM-4T	No	Yes	No	Yes	Yes
NM-4A/S, NM-8A/S	Yes	Yes	Yes	Yes	Yes
NM-16A/S	Yes	Yes	Yes	Yes	Yes
NM-16A, NM-32A	Yes	Yes	Yes	Yes	Yes

* Cisco recommends a maximum of one NM-1HSSI in a 2691, 2800,3725, or a 3825 and a maximum of two NM-1HSSIs in a 3745 or 3845.

Note: Please see the Software Advisor for minimum IOS versions required to support a specific network module in a specific router.

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