

NETROPY[®] N90 HARDWARE GUIDE



Netropy N90 Hardware Guide

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1 OVERVIEW

This *Netropy N90 Hardware Guide* describes the physical hardware of the Netropy N90 Network Emulator. The companion *User's Guide* describes the installation, configuration, and operation of the Netropy network emulation functionality. A separate *Quick Start Guide* provides a walk-through for first time configuration.



The Netropy N90 contains no user serviceable parts. Opening the chassis voids the warranty. If you believe your unit is not functioning properly, see Section 8 for information on obtaining support.

This guide is for the Netropy N90 hardware revision –A1.

2 INCLUDED ITEMS

The Netropy N90 shipping carton contains the following items:

- ▶ Netropy N90 hardware unit
- ▶ Rack mount brackets (2) and screws (16)
- ▶ Documentation CD
- ▶ Netropy N90 Quick Start Guide
- ▶ AC power cord (U.S.)
- ▶ RJ-45 to DB-9 serial cable

3 FRONT AND REAR PANELS

3.1 Front Panel



The front panel of the Netropy N90 contains:

CONSOLE: Console interface using RS-232 with an RJ-45 connector. See Section 8 for a pin-out of the console interface.

MGMT: 10/100/1000baseT Gigabit Ethernet interface with a standard RJ-45 connector for browser-based management of the unit over the network.

PORT 1 - 8: Eight Gigabit Ethernet ports consisting of eight 10/100/1000baseT Gigabit Ethernet ports with RJ-45 connectors (standard), eight modular SFP ports (optional), or four each RJ45 and SFP ports (optional), used for network emulation. Interfaces support jumbo frames up to 9 KB.

3.2 Rear Panel



The rear panel of the Netropy N90 contains:

Fan outlets: Hot air is vented through the fan outlets.

Power input: Standard IEC C14 socket for power input. U.S. and Canadian customers should use the supplied power cord to connect the Netropy N90 to a power outlet. International customers may need to substitute a local power cord with a standard IEC C13 plug. The Netropy N90 supports AC power input from 100 to 240V.

Power switch: The power switch is marked with 0 for OFF and I for the ON position.



Please ensure the space around the fan outlet on the back panel and the air intakes on the front panel remains unblocked to provide adequate airflow and prevent overheating..

4 CAPACITY LIMITATIONS

The Netropy N90 can forward up to 1 Gbps of packets in each direction across all 8 emulation interfaces at full line rate. This capacity can be reduced depending on the classification method used.

To avoid reaching these hardware limitations, high traffic links that are not being used for emulation, and are therefore not being limited by the bandwidth, latency, and other emulation constraints, should be disconnected from the device.

The maximum one-way latency that the Netropy N90 supports depends on data throughput and packet size. The chart below summarizes a few typical examples for traffic in one direction on one engine. To calculate the maximum latency in each direction for traffic in both directions at the listed rate, or to calculate the maximum latency when using multiple engines at the same rate, divide these maximum one-way latencies by the number of ports through which traffic is entering. The listed values are based on actual data throughput, not path bandwidth settings. Users who need to emulate latencies close to these limits are advised to contact Apposite to discuss their specific requirements. Maximum latencies of over 20 seconds are not specifically listed, but are not limited to 20 seconds and may be much larger than 20 seconds.

	Frame Size			
Aggregate Throughput	64 bytes	500 bytes	1518 bytes	9220 bytes
10 Mbps	>20 sec	>20 sec	>20 sec	>20 sec
100 Mbps	>20 sec	>20 sec	>20 sec	>20 sec
1 Gbps	5.1 sec	>20 sec	>20 sec	>20 sec

Table 1: Maximum Round-Trip Latency

The maximum emulation bandwidth may be limited below the hardware capacity by the device's license key. See the *Netropy User's Guide* for more details on the license key.

5 RACK MOUNTING

The Netropy N90 includes a pair of brackets for mounting the device into a standard 19" rack. Attach the brackets to both sides of the unit using eight of the supplied screws with each bracket as shown in the diagram below.



6 RJ45 INTERFACES

The standard version of the Netropy N90 includes eight RJ45 10/100/1000baseT ports for emulation and a separate RJ45 10/100/1000baseT port for management.

The ports are set by default to auto-negotiate the proper speed and duplex settings, and flow control is turned off. On the emulation ports, auto-negotiation can be disabled and the ports forced to a particular speed and duplex setting from the GUI. In nearly all cases, the default settings should be used and only changed to resolve incompatibilities with directly-connected equipment. Auto-negotiation cannot be disabled on the MGMT port.

When set to auto-negotiation, the ports are auto-MDI/MDIX and can use either crossover or straight through cables. If the interface is forced to a particular speed or duplex setting, the interfaces are MDI and require a crossover cable if connected to another MDI-only device.

7 SFP INTERFACES (OPTIONAL)

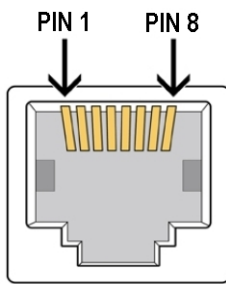
The Netropy N90 is optionally available with eight Gigabit Ethernet small form-factor pluggable (SFP) interfaces (also known as mini-GBIC) instead of the eight standard 10/1000/1000baseT copper RJ45 ports, or with 4 each of the SFP ports and RJ45 ports. SFP interfaces are modular and support both fiber-optic and copper-based cabling depending on the installed transceiver. Standard transceivers are available from a variety of vendors or can be purchased from Apposite.

If the unit is built with the optional SFP interfaces, select an appropriate transceiver type based on network and cabling requirements. Slide the transceiver into the SFP port until it clicks into place.

The SFP interfaces support 10/100/1000 Mbps auto-negotiation when using RJ45 SFP transceivers with SGMII support. Fiber SFP transceivers are only supported at 1 Gbps full duplex transfer mode.

8 CONSOLE INTERFACE

Console access to the Netropy N90 is through the RJ-45 interface on the front panel labeled "CONSOLE." An RJ-45 to DB-9 cable is included with the unit to connect the device to a standard PC serial port. The pin-out for the RJ-45 interface is shown below:



Pin	Definition	Pin	Definition
1	CTS/RTS	2	DTR
3	TxD	4	GND
5	GND	6	RxD
7	DSR	8	CTS/RTS

To connect to the console, use a terminal or a computer running terminal emulator software such as HyperTerminal or PuTTY, and set the following parameters:

- 9600 baud
- 8 data bits
- No parity
- 1 stop bit
- Disable flow control

9 APPOSITE SUPPORT

Purchase of the Netropy N90 includes one year hardware warranty and one year of support and maintenance. Extended maintenance packages are available from Apposite or your local Netropy reseller.

If you believe your unit is not functioning properly and is under warranty, please upgrade to the latest firmware release. If the problem persists, please contact Apposite Support at:

support@apposite-tech.com
1.310.477.9955 ext. 2

When contacting Apposite Support, please include the following information:

- ▶ Netropy model
- ▶ Serial number
- ▶ Your e-mail address and phone number
- ▶ Installed firmware version
- ▶ A detailed description of the problem



Do not attempt to fix any hardware problem yourself. The Netropy N90 contains no user serviceable parts. Opening the chassis voids the warranty.

APPENDIX A: SPECIFICATIONS

Capacity		
Max. Emulation Rate		Up to 1 Gbps in each direction on each port (depending on license)
Max. Aggregate Rate		8 Gbps
Max. Packet Rate		1.488 million packets per second per port (full line rate) 11.9 million packets per second aggregate
Interfaces		
Network		8 x 10/100/1000baseT copper Gigabit Ethernet (standard) or 8 x SFP Gigabit Ethernet (optional) or 4 x copper Gigabit Ethernet + 4 x SFP Gigabit Ethernet
Management		1 x 10/100/1000baseT copper Gigabit Ethernet
Console		1 x RS-232
Environmental and Physical		
AC Input Voltage		Auto ranging 100 VAC to 240 VAC
AC Input Frequency		47 to 63 Hz
AC Input Current		1.1 A
Power Draw		130 Watts
Dimensions	Product	17" W x 18" D x 1.75" H (1 RU) 43 cm W x 45 cm D x 4.35 cm H (1 RU)
	Shipping	24" x 22" x 7" 61 cm x 55 cm x 18 cm
Weight	Product	16 lbs. (8 kg)
	Shipping	21 lbs. (10 kg)
Temperature	Operating	32° to 104°F (0° to 40°C)
	Storage	-4° to 167°F (-20° to 75°C)
Humidity		10% to 90% (non-condensing)
Certifications		FCC, CE, RoHS
Warranty and Support		
Hardware warranty		1 year
Support and Maintenance		1 year, including all firmware upgrades

APPENDIX B: REGULATORY

Federal Communications Commission Notice

This equipment has been tested and verified to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause harmful interference, in which case the user will be required to take whatever measures may be required to correct the interference at their own expense.

Canadian Notice / Avis Canadien

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

CE Certification

The product described in this manual complies with all applicable European Union (CE) directives, including EU Directives 1999/5/EC Radio Equipment and Telecommunications Terminal Equipment and 2002/95/EC Restriction of Hazardous Substances (RoHS).

APPENDIX C:

NETROPY END USER LICENSE AGREEMENT

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