

NETROPY® 10G1

HARDWARE GUIDE



Netropy® 10G1 Hardware Guide

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Apposite® Technologies LLC

4223 Glencoe Ave, Suite B121
Marina Del Rey, CA 90292 USA
1.310.477.9955
info@apposite-tech.com
www.apposite-tech.com

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1 OVERVIEW

This *Netropy 10G1 Hardware Guide* describes the physical hardware of the Netropy 10G1 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 10G1 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 10G1 hardware revision –T1.

2 INCLUDED ITEMS

The Netropy 10G1 shipping carton contains the following items:

- ▶ Netropy 10G1 hardware unit
- ▶ Slide rail kit and rack ear brackets
- ▶ Netropy 10G1 Quick Start Guide
- ▶ AC power cord (U.S.)
- ▶ RJ45 to DB9 serial cable

3 FRONT AND REAR PANELS

3.1 Front Panel



The front panel of the Netropy 10G1 contains, from left to right:

Power LED: Lit green when the unit is powered on.

MGMT: Gigabit Ethernet interface with a standard RJ45 connector for management of the unit over the network.

CONSOLE: Console interface using RS-232 with an RJ45 connector. See Section 7 for a pin-out of the console interface.

Reset: The small hole to the right of the console port is used to reset the system to the factory default configuration. Reset capability is only active during system boot-up. To reset the system, insert a paper clip or toothpick into the hole, reboot or power cycle the device, and continue holding the reset switch for 20-30 seconds until the system reboots again.

PORTS 1 – 2: Two 10 GbE SFP+ or RJ45 Ethernet interfaces.

The device comes standard with 1/10 Gbps dual-rate SFP+ interfaces. See Section 6 for details on supported SFP and SFP+ transceivers. The SFP+ interfaces have a single LED to indicate that link has been established and flashes to indicate activity.

The 10G1 is optionally available with copper RJ45 interfaces that support 100M/1G/10G auto-negotiate. The RJ45 interfaces have two LEDs. The LED on the left indicates that link has been established and flashes to indicate activity. If the link is up, the LED on the right glows green to indicate connectivity at 10 Gbps, amber for 1 Gbps, and off for 100 Mbps.

Jumbo frames of up to 9 KB are supported.


3.2 Rear Panel



The rear panel of the Netropy 10G1 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 10G1 to a power outlet. International customers may need to substitute a local power cord with a standard IEC C13 plug. The Netropy 10G1 handles AC power input from 100 to 240 V.

Power switch: To turn on or off, rock the switch onto the power icon  and hold for 5 seconds until power light turns on or off.



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

4 CAPACITY LIMITATIONS

The Netropy 10G1 can forward up to 10 Gbps of packets in each direction for an aggregate capacity of 20 Gbps.

Each port can forward packets at a rate of 14.5 million packets per second and an aggregate limit of 29 million pps.

These limits apply regardless of whether emulation is on or off. These limits may be reduced depending on the classification methods used.

The maximum one-way latency that the Netropy 10G1 supports depends on data throughput and packet size. The chart below summarizes a few typical examples for traffic in one direction. To calculate the maximum latency in each direction for traffic in both directions at the listed rate, divide these maximum one-way latencies values in half. 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.

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.

	Frame Size			
Aggregate Throughput	<80 bytes	500 bytes	1518 bytes	9220 bytes
100 Mbps	>20 sec	>20 sec	>20 sec	>20 sec
1 Gbps	8.0 sec	>20 sec	>20 sec	>20 sec
10 Gbps	800 ms	4.7 sec	7.0 sec	8.4 sec

Table 1: Maximum Round-Trip Latency

5 RACK MOUNTING

5.1 Ear Brackets (Optional)

Optional ear brackets can be used to secure the 10G1 to the front of the rack. Attach the ear brackets to the right and left sides of the 10G1 using the three supplied screws with each bracket as shown in the diagram below.



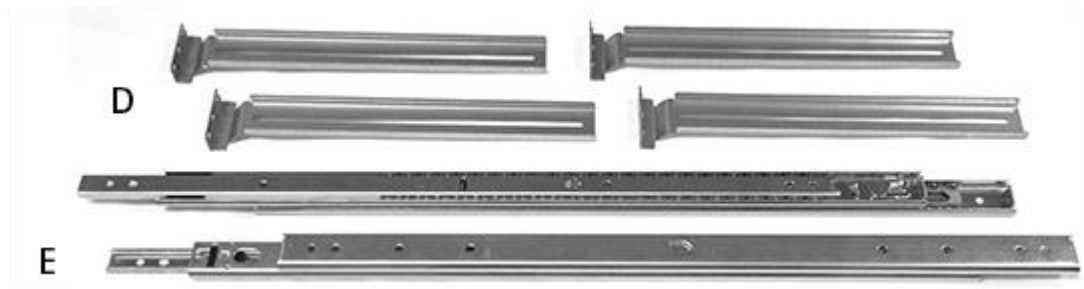
5.2 Slide Rail Installation

1. Preparation

SLIDE RAIL PARTS:



- a. M4 x 0.7 x 6mm Flat Head Screws (x8)
- b. M4 x 0.7 x 10mm Flat Head Screws and Nuts (x8)
- c. M5 x 0.8 x 10mm Flat Countersink Screws and Conical Washers (x12)



- d. L-Shaped Rail Brackets (x4)
- e. Slide Rail Assemblies (x2)

TOOLS REQUIRED:

- f. Phillips Screwdriver

2. Remove Inner Rail from Slide Rail Assembly

- a. Locate one of the slide rail assemblies (E) and extend the inner slide rail (as shown below).



- b. Press the *safety lock tab* (shown below) to release the inner rail and remove it from the slide rail assembly.



- c. Repeat on the second slide rail assembly.

3. Attach Inner Rails to Chassis

- a. Position one of the inner rails against one side of the chassis. Make sure that the *safety lock tab* faces out, and that the notched end of the rail is at the rear of the unit. Align the rearmost hole of the inner rail to the rearmost hole on the chassis.
- b. Secure the inner rail to the chassis using four 6mm screws (A).



- c. Attach the second inner rail to the other side of the chassis.

4. Attach L-Shaped Rail Brackets to Slide Rail Assembly

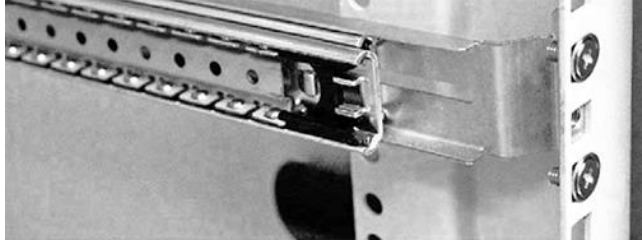
- a. The L-shaped rail brackets (D) are used to secure the slide rail assemblies to the rack.
- b. Take one of the slide rail assemblies, ensure it's in the closed position, and hold it so the outer rail is facing you. Keep the open end of the center rail to the right and the closed end on the left. Place an L-shaped rail bracket on the right side of the outer rail, position a nut (B) on any of the four holes used to connect the L-shaped bracket to the outer rail, and push a screw (B) through the inside of the slide rail assembly, the center rail, the outer rail, the L-shaped bracket, and secure it with the nut (moving the tracks out of the way if necessary). Repeat the process using another screw and nut (B), and one of the three remaining holes to secure the L-shaped bracket to the slide rail assembly. *Do not tighten the screws until Step 5.*
- c. Slide the center rail to the right to expose the screw holes at the left end of the outer rail and attach a second L-shaped bracket to the left end of the slide rail assembly.



- d. Repeat steps 4A and 4B to secure the other two L-shaped brackets to the other slide rail assembly.

5. Attach Outer Rails to Rack

- a. Position one of the slide rail assemblies with the open end of the center rail facing the front of the rack, and attach the L-shaped bracket to the front post of the rack using two 10mm screws and conical washers (C).



- b. Extend the rear bracket until you are able to secure it to the rear rack post using two 10mm screws and conical washers (C). Tighten the screws securely.
- c. Repeat steps 5A and 5B to install the second slide rail assembly to the other side of the rack.

6. Mount Chassis (With Inner Rails) to Rack

- a. Pull out the center rail from each slide rail assembly until they're locked in place.
- b. Lift the chassis, with its front facing you, and carefully slide the inner rails into the center rails until they lock securely in place.

7. (Optional) Attach Ears to Rack

8. If rack ears have been attached to the 10G1 and frequent movement of the unit isn't necessary, you can secure them to the front rack posts using the remaining countersink screws and washers (C).

6 SFP+ INTERFACES

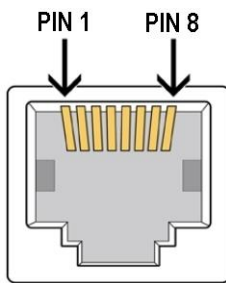
The Netropy 10G1 has two SFP+ interfaces that can accept both 10 Gbps SFP+ transceivers and 1 Gbps SFP transceivers. Standard 1 and 10 Gbps transceivers are available from a variety of vendors. Select an appropriate transceiver type based on network and cabling requirements.

The following types of transceivers may be used:

- Any standard 10 Gbps SFP+ transceiver.
- Any standard 1 Gbps SFP transceiver. Only 1 Gbps full duplex transfer mode is supported.
- Intel and Finisar 1/10 Gbps Dual Rate SFP+ transceivers.
- 10 Gbps SFP+ and 1 Gbps SFP direct attach cables.
- 10 Gbps copper RJ45 SFP+ transceivers. Only 10GBASE-T SFP+ RJ45 transceivers offered by Apposite are confirmed to operate properly, and only 10 Gbps transfer speeds are supported.

7 CONSOLE INTERFACE

Console access to the Netropy 10G1 is through the RJ45 interface on the front panel labeled "CONSOLE." An RJ45 to DB9 cable is included with the unit to connect the device to a standard PC serial port. The pin-out for the RJ45 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

8 APPOSITE SUPPORT

Netropy units with a product license receive support and maintenance for the term of the license, including hardware warranty, firmware updates, and customer support. The license expiration date for limited term product licenses is shown in the Netropy GUI on the Administration window License Key tab.

For units with an unlimited term license (purchased prior to August 2017), one year of maintenance is included with purchase, after which a yearly maintenance renewal is required for ongoing support. License and maintenance renewals are available from Apposite or your 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 10G1 contains no user serviceable parts. Opening the chassis voids the warranty.

APPENDIX A: SPECIFICATIONS

Capacity		
Max. Emulation Rate		10 Gbps
Max. Throughput		20 Gbps aggregate
Max. Packet Rate		29 million packets per second aggregate 14.5 million packets per second in each direction
Max. Frame Size		9 KB
Interfaces		
Network		2 x SFP+ (1/10 Gbps auto-negotiate) or 2 x 10GBASE-T RJ45 (100M/1G/10G auto-negotiate)
Management		1 x Gigabit Ethernet (10/100/1000baseT)
Console		1 x RS-232
Environmental and Physical		
AC Input Voltage		Auto ranging 100 VAC to 240 VAC
AC Input Frequency		50 to 60 Hz
AC Input Current		1.0 A with SFP+ ports; 1.1 A with RJ45 ports
Power Draw		121 Watts with SFP+ ports; 131 Watts with RJ45 ports
Dimensions	Product	22" D x 17" W x 1.75" H (1 RU) 56 cm D x 43 cm W x 4.4 cm H (1 RU)
	Shipping	29" D x 23" W x 8" H 73 cm x 58 cm W x 20 cm H
Weight	Product	18 lbs. (8 kg)
	Shipping	29 lbs. (14 kg)
Temperature	Operating	32° to 104°F (0° to 40°C)
	Storage	-4° to 158°F (-20° to 70°C)
Humidity		5% to 95% (non-condensing)
Certifications		FCC Class A, CE, RoHS
Warranty and Support		
Hardware warranty		included with product license
Support and Maintenance		included with product license

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 on Radio Equipment and Telecommunications Terminal Equipment and Restriction of Hazardous Substances (RoHS).

REACH Compliance Declaration

The European REACH Regulation 1907/2006 on Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH), Annex XVII entered into force in June 2009, and affects all companies producing, importing, using, or placing products on the European market. The aim of the REACH regulation is to ensure a high level of protection of human health and the environment from chemical substances.

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the requirement in REACH Article 7 (1) (b) for registration of substances contained in the product/article does not apply.

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We hereby declare, by all we know, that the information is real and integrity. We promise that the Product Name: Netropy N91 series meets the standard of REACH on SVHC and latest chemical regulation. The SVHC are still according to the publication on EU's website, please refer to the SVHC official webpage. [HTTPS://ECHA.EUROPA.EU/CANDIDATE-LIST-TABLE](https://echa.europa.eu/candidate-list-table)

RoHS Declaration of Conformity

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2	Cadmium (Cd)	0.01% (<100 ppm)	
3	Mercury (Hg)	0.1% (<1000 ppm)	
4	Hexavalent Chromium (Cr6+)	0.1% (<1000 ppm)	
5	Poly Brominated Biphenyls (PBB)	0.1% (<1000 ppm)	
6	Poly Brominated Diphenyl ethers (PBDE)	0.1% (<1000 ppm)	
7	Bis (2-ethylhexyl) phthalate (DEHP)	0.1% (<1000 ppm)	2015/863/EU
8	Butyl benzyl phthalate (BBP)	0.1% (<1000 ppm)	
9	Dibutyl phthalate (DBP)	0.1% (<1000 ppm)	
10	Diisobutyl phthalate (DIBP)	0.1% (<1000 ppm)	

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Apposite® Technologies LLC

4223 Glencoe Ave, Suite B121

Marina Del Rey, CA 90292 USA

1.310.477.9955

info@apposite-tech.com

www.apposite-tech.com