

iConverter[®] 5 Port GM4 Network Interface Devices



Quick Start Guide

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The foregoing warranty shall not apply to product malfunctions resulting from improper or inadequate use and/or maintenance of the equipment by Buyer, Buyer-supplied equipment, Buyer-supplied interfacing, unauthorized modifications or tampering with equipment (including removal of equipment cover by personnel not specifically authorized and certified by Omnitron), or misuse, or operating outside the environmental specification of the product (including but not limited to voltage, ambient temperature, radiation, unusual dust, etc.), or improper site preparation or maintenance.

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Environmental Notices

The equipment covered by this manual must be disposed of or recycled in accordance with the Waste Electrical and Electronic Equipment Directive (WEEE Directive) of the European Community directive 2012/19/EU on waste electrical and electronic equipment (WEEE) which, together with the RoHS Directive 2015/863/EU, for electrical and electronic equipment sold in the EU after July 2019. Such disposal must follow national legislation for IT and Telecommunication equipment in accordance with the WEEE directive: (a) Do not dispose waste equipment with unsorted municipal and household waste. (b) Collect equipment waste separately. (c) Return equipment using collection method agreed with Omnitron.



The equipment is marked with the WEEE symbol shown to indicate that it must be collected separately from other types of waste. In case of small items the symbol may be printed only on the packaging or in the user manual. If you have questions regarding the correct disposal of equipment go to www.omnitron-systems.com/support or e-mail to Omnitron at intlinfo@omnitron-systems.com.

Safety Warnings and Cautions



ATTENTION: Observe precautions for handling electrostatic discharge sensitive devices.



WARNING: Potential damage to equipment and personal injury.



WARNING: Risk of electrical shock.

iConverter[®] 5 Port GM4 Quick Start Guide

Product Overview

The iConverter GM4 is an intelligent Network Interface Device (NID), that delivers advanced Carrier Ethernet services and provides demarcation at the edges of a network. The GM4 enables rapid service deployments, Service Level Agreement (SLA) assurance and protection switching.

The GM4 supports carrier-class Ethernet Service OAM standards. IEEE 802.1ag Connectivity Fault Management (CFM) proactively monitors service availability and provides tools for rapid fault isolation. ITU-T Y.1731 adds Performance Monitoring to monitor key SLA parameters including frame delay, frame delay variation, and frame loss.

For Ethernet Service Activation Testing, the GM4 supports ITU-T Y.1564 and IETF RFC 2544. These standards allow Service Providers to rapidly verify the configuration and performance of Ethernet services prior to customer hand off. The GM4 can also be configured to respond to 3rd party test equipment (JDSU and VeEX) and initiate or respond to RFC 5357 Two-Way Active Measurement Protocol (TWAMP) protocol.

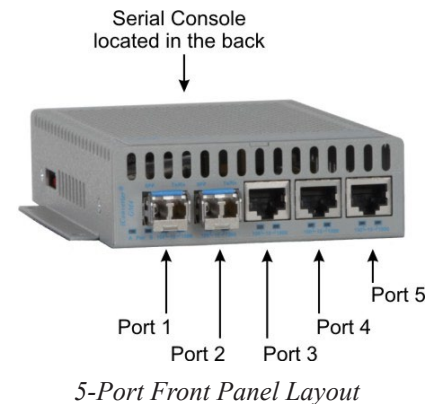
To access the user manuals for the Menu Interface (xxxxUM-02x Menu Interface iConverter GM4 NIDs) and Command Line Interface (xxxxUM-01x Command Line Interface iConverter GM4 NIDs), access the product pages at: www.omnitron-systems.com.

Recovering Access to the GM4

In the event the username and/or password is unknown, the GM4 will revert to its factory default username and password for 60 seconds after a power cycle. Using the factory default IP address, username and password, access the GM4. A recovery prompt will be displayed, allowing the username and/or password to be modified.

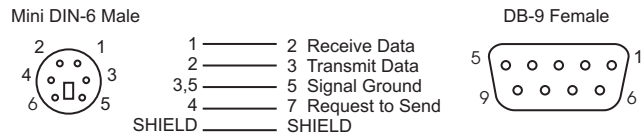
Front Panel

The front of the GM4 provides access to the RJ-45 and SFP ports. The SFP ports support 100/1000BASE-X SFP fiber and 10/100/1000BASE-T copper transceivers. The serial console (management) is accessed from the rear of the module.



Serial Console Port

The module can be configured by attaching the serial port to a DB-9 serial (RS-232) equipped computer with terminal emulation software such as ProComm or Putty. The Serial Console Port (DCE) is a mini DIN-6 female connector which can be changed to a DB-9 connector with the included adapter. Attach the ends of a serial cable to the serial port of the PC and the Serial Console Port of the module. The port is a standard RS-232 asynchronous serial interface. The pin-outs are illustrated below.



Serial Connector Pin Outs

Some computers do not come with DB-9 serial port connectors and may require a USB-to-serial port adapter.

The port is a standard RS-232 asynchronous serial interface. The serial ports is configured for 57,600bps, 1 stop, 8 data, parity none.

RJ-45 and SFP Ports

The RJ-45 Ethernet port supports 10BASE-T, 100BASE-TX and 1000BASE-T protocols, auto-negotiation, auto MDI/MDI-X crossover and can be manually forced to a specific speed and duplex mode.

The SFP interfaces support SERDES 100BASE-FX or 1000BASE-X fiber transceivers and SGMII 10/100/1000BASE-T copper transceivers. The SFP interfaces operate in manual mode or auto-negotiation and support full duplex operation.

NOTE: When using 100BASE-FX SGMII SFPs, the port must be manually configured using the Command Line Interface (CLI). Interface settings can be changed using the *port* command.

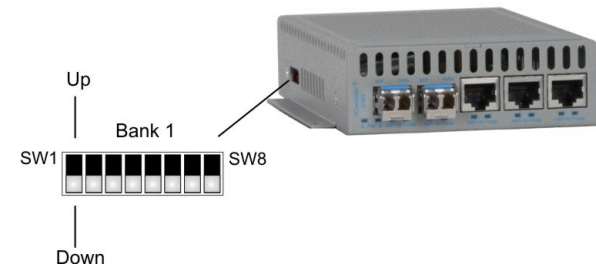
All ports can be enabled or disabled via network management. A port disabled with Port Access Control Setup will still connect and allow 802.3ah Link OAM monitoring, but blocks normal data traffic.

Installation Procedure

- 1) Configure DIP-switches
- 2) Installing the Module
- 3) Apply Power
- 4) Connect Cables
- 5) Verify Operation

1) Configure DIP-switches

The GM4 has two banks of DIP-switches. The location of the DIP-switches is illustrated below.



5 Port DIP-switch Location

DIP-switch Bank 1 Settings:

The function of DIP-switch Bank 1 is outlined in the table below.

Switch Position	Description	DOWN (Off)	UP (On)
1	P1 AN/MAN	AN	MAN
2	P2 AN/MAN	AN	MAN
3	P3 AN/MAN	AN	MAN
4	Return to Primary	RTP	OFF
5	Redundancy	NORM	1:1
6	Reserved	OFF	-
7	Reserved	OFF	-
8	Zero Touch	NORM	ON

DIP-switch Bank 1 Description

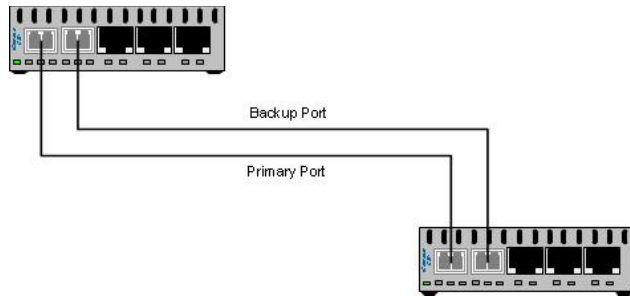
SW1, SW2, SW3 - P1, P2, P3 Auto/Manual Negotiation “AN/MAN”

When these DIP-switches are in the Auto-Negotiation “AN” position (factory default), the port automatically determines the duplex and pause modes of the connected device. If the connected device cannot provide the proper signal to indicate its own mode of operation, the DIP-switch should be set to the Manual “MAN” position. When in manual mode, no capabilities are advertised and the port will operate in full-duplex mode. When Port 2 and/or Port 3 is copper, the port will operate at 100Mbps full-duplex when configured for Manual operation.

SW4 and SW5 - Port Redundancy

The module can be configured for port redundancy. When configured for port redundancy, the module will transmit and receive traffic on the primary port (Port 1) and no traffic on the backup port (Port 2). When a fiber failure occurs on the primary port, the module will switch over to the backup port within 50msec.

NOTE: 50msec failover is only supported on the fiber ports.



Port Redundancy

DIP-switches SW4 and SW5 control the port redundancy mode of the module. When SW5 is in the “NORM” (factory default) position, the ports operate in a non-redundant (independent) mode. When SW5 is in the “1:1” position, the module is configured for port redundancy and operates based on the position of SW4. When SW4 is in the “RTP” (factory default) position, the module will switch back to the primary port (Port 1) once a stable connection has been established. When SW4 is in the “OFF” position, the module will remain on the backup port (Port 2) even when a stable connection has been established on Port 1. See Port Redundancy Modes table for more information.

NOTE: The ports must have MAC learning disabled to perform a 50msec switch over.

SW4 RTP/OFF	SW5 NORM / 1:1	Function
RTP (DOWN)	NORM (DOWN)	Non-redundant mode - independent mode
OFF (UP)	NORM (DOWN)	Non-redundant mode - independent mode
RTP (DOWN)	1:1 (UP)	Redundant mode - return to primary (RTP)
OFF (UP)	1:1 (UP)	Redundant mode - no return to primary

Port Redundancy Modes

SW6 and SW7 - Reserved

This DIP-switch is reserved and must be in the DOWN (default) position.

SW8 - Zero Touch Provisioning

Zero Touch Provisioning (ZTP) utilizes DHCP and TFTP to automatically configure the module during the initial setup.

Zero Touch is disabled by default. The Zero Touch Provisioning (ZTP) process is configured by setting this DIP-switch to the UP position (ON). When ZTP is turned ON, the module will start the DHCP process on power up or module reboot. Through the process, the module will request an IP address and the IP address of the TFTP Server. After the DHCP process has been completed and a TFTP Server IP address has been obtained, the module will request configuration files from the TFTP Server. When the files have been received, the module will load the configuration files and restart.

2) Installing the Module

Wall Mounting

The wall mounting height of the module should be less than or equal to 2 meters (6.6 feet) from the floor. Use the four mounting holes on the module to secure the module to the wall. The module can accommodate #6 screws (not included).

Installation of the module should be such that the air flow in the front, back, side and top vents of the switch are not compromised or restricted.

The accessory cables should have their own strain relief and do not pull down on the module.

Rack Mounting

The standalone modules with integrated mounting brackets or using the optional mounting bracket kit can be rack mounted using the optional Rack Mount Shelf (8260-0). Refer to the Rack Mount Shelf user manual (040-08260-001x) for the proper installation guidelines.

Follow the same guidelines above when rack mounting the module.

3) Apply Power

AC Power

Secure the ground wire to the ground screw located on the back of the module.

Route the power cord through the provided strain relief for additional support and connect the barrel connector at the end of the wire on the AC/DC adapter to the barrel connector on the module. Connect the AC/DC adapter to the AC outlet. Confirm that the module has powered up properly by checking the Power LED located on the front of the module.



AC Models Rear View: Barrel Connector for AC/DC Power Adapter

WARNING!!!
NEVER ATTEMPT TO OPEN THE CHASSIS OR SERVICE THE POWER SUPPLY. OPENING THE CHASSIS MAY CAUSE SERIOUS INJURY OR DEATH. THERE ARE NO USER REPLACEABLE OR SERVICEABLE PARTS IN THIS UNIT.

DC Power

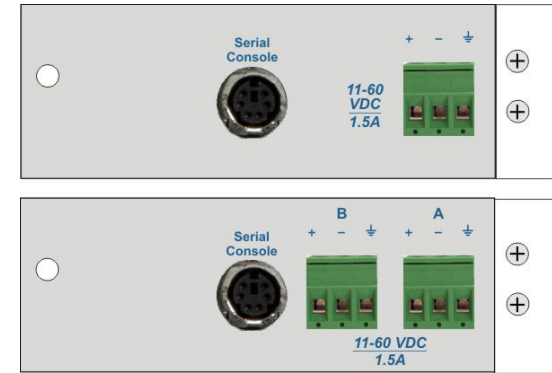
This module is intended for installation in restricted access areas. (“Les matériels sont destinés à être installés dans des EMBLEMES À ACCÈS RESTREINT”). A restricted access area can be accessed only through the use of a special key, or other means of security.

The over current protection for connection with centralized DC shall be provided in the building installation, and shall be a UL listed circuit breaker rated 20 Amps, and installed per the National Electrical Code, ANSI/NFPA-70.

Appropriate overloading protection should be provided on the DC power source outlets utilized.

The standalone module requires +/-11 to +/-60VDC inclusive of tolerances (1.5A @ 12VDC max rated power). See specification table for specific model requirements.

Appropriate overloading protection should be provided on the DC power source outlets utilized.



DC Models Rear View: 2-Pin Terminal for DC Power

WARNING: Only a DC power source that complies with safety extra low voltage (SELV) requirements can be connected to the DC-input power supply.

WARNING REGARDING EARTHING GROUND:

- This equipment shall be connected to the DC supply system earthing electrode conductor or to a bonding jumper from an earthing terminal bar or bus to which the DC supply system earthing electrode is connected.
- This equipment shall be located in the same immediate area (such as adjacent cabinets) as any other equipment that has a connection between the earthed conductor of the same DC supply circuit and the earthing conductor, and also the point of earthing of the DC system. The DC system shall not be earthed elsewhere.
- The DC supply source is to be located within the same premises as this equipment.
- There shall be no switching or disconnecting devices in the earthed circuit conductor between the DC source and the earthing electrode conductor.

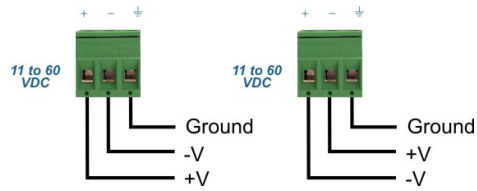
Locate the DC circuit breaker of the external power source, and switch the circuit breaker to the OFF position.

Prepare a power cable using a three conductor insulated wire (not supplied) with 12AWG to 14AWG thickness. Cut the power cable to the length required.

Strip approximately 3/8 of an inch of insulation from the power cable wires.

Connect the power and ground cables to the module by fastening the stripped ends to the DC power connector.

WARNING: The positive lead of the power source must be connected to the “+” terminal on the module, the negative lead of the power source to the “-” terminal on the module and ground lead to ground.



Power Options

WARNING: Note the wire colors used in making the positive, negative and ground connections. Use the same color assignment for the connection at the circuit breaker.

Connect the power wires to the circuit breaker and switch the circuit breaker ON. If any module are installed, the Power LED will indicate the presence of power.

During the installation, ensure that the ground potentials are maintained throughout the system connections. This includes but not limited to the power source ground and any shielded cabling grounds.

WARNING!!!
 NEVER ATTEMPT TO OPEN THE CHASSIS OR SERVICE THE POWER SUPPLY. OPENING THE CHASSIS MAY CAUSE SERIOUS INJURY OR DEATH. THERE ARE NO USER REPLACEABLE OR SERVICEABLE PARTS IN THIS UNIT.

Make sure to disconnect the power and ground cables before removing the equipment.

4) Connect Cables

- a. When using SFP models, insert the SFP fiber transceiver into the SFP receptacle on the front of the module (see the SFP Data Sheet 091-17000-001 for supported Fast/Gigabit transceivers).

NOTE: The release latch of the SFP fiber transceiver must be in the closed (up) position before insertion.

The module has the ability to detect the speed and automatically configure the port to match the speed of approved SFP transceivers. Some SFP fiber transceivers will need to be configured using the CLI *port* commands to configure the speed of the port to match the speed of the installed SFP transceiver.

- b. Connect an appropriate multimode or single-mode fiber cable to the fiber port on the front of the module. It is important to ensure that the transmit (TX) is attached to the receive side of the transceiver at the other end and the receive (RX) is attached to the transmit side. When using single-fiber (SF) models, the TX wavelength must match the RX wavelength at the other end and the RX wavelength must match the TX wavelength at the other end.
- c. Connect the Ethernet 10/100/1000 RJ-45 port using a Category 5 or better cable to an external 10BASE-T, 100BASE-TX or 1000BASE-T Ethernet device.

5) Verify Operation

Once the module has been installed and the DIP-switches have been configured, verify the module is operational by viewing the status of the LED indicators.

The Power LEDs indicate the module is receiving power from the external power source.

The P1, P2, P3, P4 and P5 LEDs indicate the connection between link partners has been established. See the table below to determine the connection speed.

LED Function "Legend"	Color	OFF State	ON/Blinking State
Power "PWR" (single power supply models)	Green	No power	ON: Module has power
Power "PWR A" (dual power supply models)	Green	No power from input A	ON: Module has power
Power "PWR B" (dual power supply models)	Green	No power from input B	ON: Module has power
P1 Link Activity "100"	Green	Port not linked at 100M	ON: Port linked at 100M Blinking: Data activity
P1 Link Activity "1000"	Green	Port not linked at 1000M	ON: Port linked at 1000M Blinking: Data activity
P1 Link Activity "100" and "1000"	Green	Port not linked at 10M	ON: Port linked at 10M Blinking: Data activity
P2 Link Activity "100"	Green	Port not linked at 100M	ON: Port linked at 100M Blinking: Data activity
P2 Link Activity "1000"	Green	Port not linked at 1000M	ON: Port linked at 1000M Blinking: Data activity
P2 Link Activity "100" and "1000"	Green	Port not linked at 10M	ON: Port linked at 10M Blinking: Data activity
P3 Link Activity "100"	Green	Port not linked at 100M	ON: Port linked at 100M Blinking: Data activity
P3 Link Activity "1000"	Green	Port not linked at 1000M	ON: Port linked at 1000M Blinking: Data activity
P3 Link Activity "100" and "1000"	Green	Port not linked at 10M	ON: Port linked at 10M Blinking: Data activity
P4 Link Activity "100"	Green	Port not linked at 100M	ON: Port linked at 100M Blinking: Data activity
P4 Link Activity "1000"	Green	Port not linked at 1000M	ON: Port linked at 1000M Blinking: Data activity
P4 Link Activity "100" and "1000"	Green	Port not linked at 10M	ON: Port linked at 10M Blinking: Data activity
P5 Link Activity "100"	Green	Port not linked at 100M	ON: Port linked at 100M Blinking: Data activity
P5 Link Activity "1000"	Green	Port not linked at 1000M	ON: Port linked at 1000M Blinking: Data activity
P5 Link Activity "100" and "1000"	Green	Port not linked at 10M	ON: Port linked at 10M Blinking: Data activity

LED Indicators

LED Legend/State		Link Speed
"1000"	"100"	
OFF	OFF	Port not linked
OFF	ON	Port linked at 100Mbps
ON	OFF	Port linked at 1000Mbps
ON	ON	Port linked at 10Mbps

Port Speed LED Indicators

Specifications

Description	<i>iConverter</i> 5 Port GM4 10/100/1000BASE-TX Copper and 100/1000BASE-X SFP NID	
Management	IPv4, IPv6, Telnet, SNMPv1, SNMPv2c, SNMPv3, SSH, Serial Console	
Frame Size	Up to 10,240 bytes	
Port Types	Copper: RJ-45: 10/100/1000BASE-T Fiber: SFP: 10/100/1000BASE-T SGMII Copper Transceiver 100BASE-X or 1000BASE-X Fiber Transceiver Serial: Mini DIN-6 female (RS-232); adapter included	
Cable Types	Copper: EIA/TIA 568A/B, Cat 5 and higher Fiber: Multimode: 50/125, 62.5/125µm Single-mode: 9/125µm Serial: Category 3 and higher	
AC Power Requirements	US AC Adapter:	100 - 240VAC/60Hz, 0.2A @ 120VAC
	Universal AC Adapter:	100 - 240VAC/50 - 60Hz, 0.2A @ 120VAC
DC Power Requirements	Terminal:	3-Pin Terminal (isolated) +/-11 - +/-60VDC inclusive of tolerance 1.5A @ 12VDC (typical), 0.4A @ 48VDC (typical)
	AC Adapter:	2.5mm Barrel Connector +/-11 to +/-60VDC inclusive of tolerance 1.5A @ 12VDC (typical), 0.4A @ 48VDC (typical)
Dimensions (W x D x H)	4.8" x 6.0" x 1.325" (121.92 mm x 152.4 mm x 33.66 mm)	
Weight	Module Only: 1.5 lbs. (0.680 kg) Module w/ AC adapter: 2.0 lbs. (0.907 kg)	
Operating Temperature	Commercial: 0 to 50°C Wide: -40 to 60°C (-20°C AC cold start) Extended: -40 to 75°C (-20°C AC cold start) Storage: -40 to 80°C	
Humidity	5% to 95% (non-condensing)	
Altitude	-100m to 4,000m (operational)	
MTBF (hours)	Module Only: 102,000 AC/DC Adapter: 100,000	
Warranty	2 year warranty (3 year with product registration)	

Standard Compliances	IEEE 802.1Q, 802.1ad, 802.1ax, 802.1p, 802.3, 802.3ad, 802.3ah*, 802.1ag, 1588v2 RFC 2819 (RMON), 2863 (IF-MIB), 2131 (DHCP), 2544, 5357 ITU-T G.8031, G.8032, G.8262, Y.1731, Y.1564 MEF 9, 14, 21, 30, 31, Carrier Ethernet 2.0	
Regulatory Compliances	Safety: EMI: ACT:	UL, CE, NEBS Level 3, UKCA FCC Class A TAA, BAA, NDAA
Environmental	REACH, RoHS and WEEE	

*IEEE 802.3ah Link OAM with Dying Gasp
Supported on all standalone models.

Customer Support Information

If you encounter problems while installing this product, contact Omnitron Technical Support:

Phone: (949) 250-6510
 Fax: (949) 250-6514
 Address: Omnitron Systems Technology, Inc.
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 Irvine, CA 92618, USA
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