

# *iConverter*® 1-Module Redundant Power Chassis



# **User Manual**

# **General and Copyright Notice**

This publication is protected by U.S. and international copyright laws. All rights reserved. The whole or any part of this publication may not be reproduced, stored in a retrieval system, translated, transcribed, or transmitted, in any form, or by any means, manual, electric, electronic, electromagnetic, mechanical, chemical, optical or otherwise, without prior explicit written permission of Omnitron Systems Technology, Inc.

The following trademarks are owned by Omnitron Systems Technology, Inc.: FlexPoint<sup>™</sup>, FlexSwitch<sup>™</sup>, HybridNID<sup>®</sup>, iConverter<sup>®</sup>, miConverter<sup>™</sup>, NetOutlook<sup>®</sup>, OmniLight<sup>®</sup>, OmniConverter<sup>®</sup>, RuggedNet<sup>®</sup>, Omnitron Systems Technology, Inc.<sup>™</sup>, OST<sup>™</sup> and the Omnitron logo.

All other company or product names may be trademarks of their respective owners.

The information contained in this publication is subject to change without notice. Omnitron Systems Technology, Inc. is not responsible for any inadvertent errors.

## Warranty

This network product and the included AC/DC power adapter are warranted to the original purchaser (Buyer) against defects in material and workmanship for a period of two (2) years from the date of shipment. The warranty for the network product can be extended to lifetime by registering the product at www.omnitron-systems.com/support within ninety (90) days from the date of shipment. During the warranty period, Omnitron will, at its option, repair or replace a product which is proven to be defective with the same product or with a product with at least the same functionality.

For warranty service, the product must be sent to an Omnitron designated facility, at Buyer's expense. Omnitron will pay the shipping charge to return the product to Buyer's designated US address using Omnitron's standard shipping method.

# Limitation of Warranty

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.

No other warranty is expressed or implied. Omnitron specifically disclaims the implied warranties of merchantability and fitness for any particular purpose.

The remedies provided herein are the Buyer's sole and exclusive remedies. Omnitron shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any legal theory.

#### **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.omniton-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.

# **Customer Support Information**

Phone:	(949) 250-6510
Fax:	(949) 250-6514
Address:	Omnitron Systems Technology, Inc.
	38 Tesla
	Irvine, CA 92618, USA
Email:	support@omnitron-systems.com
URL:	www.omnitron-systems.com

# *iConverter*<sup>®</sup> 1-Module Redundant Power Chassis User Manual

## **Product Overview**

The iConverter 1-Module chassis features a number of redundant power inputs, RJ-45 port and alarm options. It supports primary and secondary power input options and variety of power connection types. By utilizing the optional RJ-45 ports, the chassis can be powered from a connected Power Sourcing Equipment (PSE). Optional contact closure sensors are provided for connection to external alarm indicators. By installing a managed iConverter module into the chassis, the chassis functions can be remotely managed by Telnet and SNMP software such as Omnitron's NetOutlook<sup>®</sup> Management software.

This User Manual describes the following models:

	Тжо		Primary Power Input				Backup Power Input	
Model Number	Contact Closure	RJ-45 Ports	DC Input Barrel	DC Input 2-Pin Terminal	DC Input 3-Pin Terminal	PoE Power RJ-45	DC Input Barrel	DC Input 2-Pin Terminal
8245-11pt			Х				Х	
8246-11pt		Х	Х				Х	
8246-51pt		Х				Х	Х	
8247-11pt	Х		Х				Х	
8247-12pt	Х		Х					Х
8247-220t	Х			Х				Х
8247-31pt	Х				Х		Х	
8247-320t	Х				Х			Х
8248-11pt	Х	Х	Х				Х	
8248-12pt	Х	Х	Х					Х
8248-220t	Х	Х		Х				Х
8248-31pt	Х	Х			Х		Х	
8248-320t	Х	Х			Х			Х
8248-51pt	Х	Х				Х	Х	
8248-520t	Х	Х				Х		Х

Use the Power Calculator to verify the iConverter chassis power supplies will meet the requirements of the installation.

## **Backplane Architecture**

The chassis features two Ethernet backplane buses (A and B) that operate at 10/100Mbps. Both buses are enabled by default. When an iConverter module that supports Ethernet backplane connectivity is installed in the chassis, the A bus connects directly to the RJ-45 Port A, and the B bus connects directly to the RJ-45 Port B.



iConverter 1-Module Redundant Power Chassis Backplane Architecture

The data traversing across the Ethernet backplane can be controlled by configuring the installed iConverter module. See the specific iConverter module's User Manual for additional details.

# Wall and Rack Mounting

The 1-Module Redundant Power chassis can be wall/rack mounted by attaching the optional wall/rack mount brackets (8249-0). A 19" Rack Mount Shelf (8260-0) is available to install two 1-Module chassis.

The operating temperature of this equipment is 0 to 50°C or -40 to 60°C depending on the model number. If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack must not exceed the maximum rated temperature for the chassis used.

Installation of the equipment should be such that the air flow in the front and back of the unit is not compromised or restricted.

Installing this equipment into a rack in such a way as to make it unstable **may cause injury or death**. Always make sure that the rack you are installing this equipment into is properly secured, stable, balanced and designed to carry the weight and weight distribution of this equipment.

Never use this equipment to carry any weight except its own. Never use it as a shelf to support the weight of other equipment.

# **Installing Module**

Carefully slide the module into the open slot in the chassis. Align the module with the installation guides and ensure that the module is firmly seated against the backplane. Secure the module by fastening the front panel thumbscrew (push in and turn clockwise to tighten) to the chassis front.

# **Redundant Power Configurations**

The chassis support multiple redundant load sharing power configurations. The power is connected to the back of the chassis with connectors labeled "Pwr1" and "Pwr2". "Pwr1" is the primary power connection and "Pwr2" is the backup. There are four primary power options and two backup options. The combinations of primary and backup power include low voltage barrel connector, low voltage terminal, high voltage terminal and PoE from the RJ-45 ports. The manner in which the power is connected will depend on the model selected.

# AC Powered Chassis and Cabling

Secure the ground wire to the ground screw (located on the rear of the chassis).

To power the module using the included AC power adapter, route the power cord through the provided strain relief (depending on the model) for additional support. 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 unit has powered up properly by checking the Power LED located on the front of the installed module. Use only the supplied AC/DC power adapter to power the chassis.



If installing with the NEBS Mounting Kit, secure the grounding wire to the ground lug. See the figure below for the location of the grounding lug.







Rear of 1-Module Redundant Power Chassis, Dual AC/DC, AC/DC with 2 Pin Terminal and AC/DC with 3 pin Terminal

# DC Powered Chassis (3 Pin Terminal) and Cabling

This module is intended for installation in restricted access areas. ("Les matériels sont destinés à être installés dans des EMPLACEMENTS 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 the connection with centralized DC shall be provided in the building installation and shall be a UL listed breaker rated at 20 Amps, and installed per the National Electrical Code, ANSI/NFPA-70.

This equipment requires 20-60VDC/0.6Amp rated power. Appropriate overloading protection should be provided on the DC power source outlets utilized.

NOTE: The DC power battery return (BR) terminal or positive terminal must be grounded at the source end (power feed or DC mains power end). The DC power BR input terminal is not connected to the equipment frame (chassis), so it is configured as DC-I according to the GR-1089-CORE, Issue 4 (sec 9.8.3) definitions.

**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 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 ground wire to the ground terminal on the chassis by fastening the stripped end to the DC power connector (ground).

Connect the power cables to the chassis by fastening the stripped ends to the DC power connector.

**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.



*Rear of 1-Module Redundant Power Chassis, AC/DC with 3 Pin Terminal DC Power Connector* 

#### 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 Powered Chassis (2 Pin Terminal) and Cabling

This module is intended for installation in restricted access areas. ("Les matériels sont destinés à être installés dans des EMPLACEMENTS 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 equipment requires +9 to +24 VDC @1.5 Amps power input. See specification table for specific model requirements.

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

**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 ground wire to the grounding screws on the back of the module.

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



Rear View 1-Module Redundant Power Chassis AC/DC with 2 Pin Terminal

WARNING: The positive lead of the power source must be connected to the "+" terminal on the module and the negative lead of the power source to the "-" terminal on the module as shown above.

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.

#### **PoE Powered Chassis**

supported by this product

On models with the PoE power feature, the RJ-45 Port A (the left port on the front of the chassis) can be configured as a PoE Powered Device (PD). It accepts power from a UTP-based Power Sourcing Equipment (PSE) and supports the following PoE standards:



Front View 1-Module Redundant Power Chassis PoE RJ-45 (left most RJ-45 port)

- IEEE 802.3af-2003 Alternative A power over data wires
- IEEE 802.3af-2003 Alternative B power over spare wires
- Pre-Standard Cisco PoE power over spare wires, with reversed polarity (older Cisco switches)

The following table summarizes the RJ-45 pinouts for each of the three PoE Standards

IEEE Standard	PSE Voltage Range (VDC)	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
802.3af	46.0 to 57.0	RX, DC+	RX, DC+	TX, DC-	Spare	Spare	TX, DC-	Spare	Spare
802.3at	51.0 to 57.0	RX	RX	ТΧ	DC+	DC+	ТΧ	DC-	DC-
Pre-standard Cisco	51.0 to 57.0	RX	RX	тх	DC-	DC-	тх	DC+	DC+

RJ-45 Port B does not support the PoE feature.

# **Contact Closure Sensors**

On models with the contact closure sensor feature, the chassis provides an optional 8-pin connector (4 contact sensors) on the back of the chassis that can be used to sense the state of external alarm conditions. Each of the four sensor pins can detect if the wired circuit is open or closed, or has high or low voltage from the external equipment. A DIP-switch located on the back of the chassis enables or disables alarm reporting. If no external equipment is connected to the 8-pin connector, it is important to disable the alarm reporting by configuring each DIP-switch to the DISABLE position. See the figure below for the location of the switch and terminal connector.



Rear view 1-Module Redundant Power Chassis Contact Closure Connector and DIP-switches



Rear view 1-Module Redundant Power Chassis Contact Closure and DIP-switch Details

NOTE: Internally, all signal return ("Rt") pins are connected.

The table describes the function of each DIP-switch.

Switch Position	Function	Down (Default)	Up
1	Alarm 1	Disabled alarm reporting	Enabled alarm reporting (SNMP)
2	Alarm 2	Disabled alarm reporting	Enabled alarm reporting (SNMP)
3	Alarm 3	Disabled alarm reporting	Enabled alarm reporting (SNMP)
4	Alarm 4	Disabled alarm reporting	Enabled alarm reporting (SNMP)

DIP-switch Configuration

The 8-pin connector has the following pin configuration:

Pin #	Description	Closed	Open
1	Sensor 1 "+"	No Alarm	Alarm
2	Signal Return "RT"	-	-
3	Sensor 2 "+"	No Alarm	Alarm
4	Signal Return "RT"	-	-
	Sensor 3 "+"	No Alarm	Alarm
	Signal Return "RT"	-	-
	Sensor 4 "+"	No Alarm	Alarm
	Signal Return "RT"	-	-

Contact Closure Sensors Pinout Configuration

# **LED** Indicators

The following table details the LED status indicators:

LED Function "Legend"	Color	OFF State	ON/Blinking State
Power "PWR1"	Green	No power on PS1	ON: Power applied to PS1
Port A Link Activity "Lnk/Act"	Green	Port not linked	ON: Port linked at 10 or 100M Blinking: Data activity
Port A Speed "10/100"	Green	If Port A "Lnk/Act" is ON, linked at 10M	ON: Port linked at 100M
Power "PWR2"	Green	No power on PS2	ON: Power applied to PS2
Port B Link Activity "Lnk/Act"	Green	Port not linked	ON: Port linked at 10 or 100M Blinking: Data activity
Port B Speed "10/100"	Green	If Port B "Lnk/Act" is ON, linked at 10M	ON: Port linked at 100M

# **Chassis Management**

The 1-Module Redundant Power chassis features configurable options and status information depending on the model. Configurable parameters and status information is only available through the serial console port on the installed iConverter Management Module (such as 10/100M2 and GXTM2). The available options are:

- Contact Closure Alarm notification Enable/disable (physical DIP-switches)
- Port A/B Control RJ-45 auto-negotiation, 10/100 and Full/Half-Duplex
- Pause Control Enable/disable
- Port Access Control Enable/disable
- Power Supply 1/2 Voltage, current and temperature

#### Serial Console Port on Installed Management Module

To configure the module using the serial port, attach a DB-9 serial (RS-232) equipped computer with terminal emulation software such as Procomm or Putty to the serial port on the module using the included serial adapter. 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.

Access to the configuration options for the 1-Module Redundant Power Chassis can be accomplished by selecting option *1* from the *Management Options* screen. From the *Chassis View* screen, select the 1-Module Redundant Chassis option 2. The chassis configuration options will be displayed.

The *Module Screen* (DIP-switch control shown) provides general information concerning the configuration and status of the module. The screen displays the model and serial numbers, hardware and software revisions, as well as the condition of the LEDs, Alarm Indicators and DIP-switches. The DIP-switches *1 - 4* correspond with the physical switches on the back of the chassis. These switches can be changed from the *Module Screen* by selecting the appropriate switch number. DIP-switches *9 - 15* can only by configured from the *Module Screen* options. Select the appropriate option to change the DIP-switch setting.

The *Module Screen* also provides access to the status and control screen. To select the *Status Screen*, enter *S*.

For models with UTP ports, the Control Screen is available to enable or disable Port A and Port B. To select the *Control Screen*, enter *C*.

# Applications

#### **Battery Backup with Alarms**

When the chassis is used with a battery backup power system, the alarm contact sensor can be used to report conditions associated with the backup power system. In this configuration, the chassis can provide a managed power fault detection system.

The figure below depicts an APC PowerShield battery backup unit connected to the chassis using the 8-pin terminal connector on the back of the chassis, In this configuration, the chassis is monitoring the power conditions of the APC units and will report any failures to the network management system.

APC PowerShield



Alarm Indicators

The four sensors are compatible with APC PowerShield product. The table below defines the pinouts for both units.

APC Pin #	Chassis Pin #	Description	Closed Circuit	Open Circuit
3	2	Signal Return	N/A	N/A
4	1	Power Source	Utility Power	Battery Power
5	3	Battery Reserve	Full-Charge	Failed Self Test
6	5	Battery Condition	Battery Present	Battery Missing
7	7	Low Battery	Battery Near Capacity	Battery <20% Capacity

APC PowerShield Alarm Contact Configuration

Redundant Chassis Power Utilizing the Contact Closure Sensors

# **Contact Closure Sensor Configuration**

The contact closures can be used to alert the network management system of problems associated with the remote location. The contact closure sensor can also detect the opening and closing of a switch, such as a equipment door being opened or closed. The figure below illustrates this application.



Chassis Configured for Open Door Alarm

# Specifications

Description	<i>iConverter</i> 1-Module Redundant Power Chassis				
Standard Compliances	IEEE 802.3, 802.3af				
Regulatory Compliances	Safety: EMI: ACT:	UL, CE, UKCA FCC Class A, AS/NZS 3548, VCC1 Class A TAA, BAA, NDAA			
Environmental	RoHS, WEEE and RI	EACH			
Management*	Telnet, SNMPv1, SNI	MPv2c, SNMPv3, Serial Console			
Frame Size	Up to 1,536 bytes				
Dort Turnee	Copper:	10/100BASE-T (RJ-45)			
Port Types	Sensors:	4 Contact Closures (8-Pin Terminal)			
	Copper:	EIA/TIA 568 A/B, Category 5 and higher			
Cable Types	Sensors:	16 to 24 gauge			
AC Power Requirements	AC Adapter: 100 - 240VAC/50 - 60Hz 0.2A @ 120VAC (typical)				
	DC Input: (Terminal Block)	9 - 24VDC, 1.5A @ 9VDC (typical) 2-Pin Terminal (non-isolated)			
DC Power	DC Input: (Terminal Block)	24 - 60VDC, 0.3A @ 48VDC 3-Pin Terminal (isolated)			
Requirements	DC Input: (AC Adapter)	9 - 24VDC, 1.5A @ 9VDC (typical) 2.5mm Barrel Connector			
	DC Input: (PoE)	44 - 57VDC, 0.27A @ 48VDC (typical) RJ-45 (Alternative A & B)			
Output Power	3А	@ 3.3VDC (per power input)			
Dimensions (W x L x H)	5.4" x 6.8" x 1.0" (137.16 mm x 172.72 mm x 25.4 mm)				
Weight	Chassis: 1.5 lbs. (0.68 kg) w/ AC Adapter: 2.0 lbs. (0.91 kg)				
Temperature	Commercial: 0 to 50°C   Wide: -40 to 60°C   Storage: -40 to 80°C				
Humidity	5% to 95% (non-condensing)				
Altitude	-100m to 4,000m (op	erational)			
MTBF (hours)	Chassis: 540,000   US AC Adapter: 250,000   w/ Univ AC Adapter: 100,000				
Warranty	Lifetime warranty with 24/7/365 free Technical Support				

\* Management is available when an iConverter module with integrated management (such as the 10/100M2) is installed in the chassis.