



**DESCRIPTION**

The iConverter Redundant Fast Ethernet modules are intended for use in networks that require fiber or copper link redundancy. The following models are described:

- Tx/2Ffx** 100BASE-TX RJ-45 to dual 100BASE-FX dual fiber
- Tx/2Ffx SF** 100BASE-TX RJ-45 to dual 100BASE-FX single-fiber
- Tx/2Tx** 100BASE-TX RJ-45 to dual 100BASE-TX RJ-45

The fiber ports operate in full-duplex manual mode. The RJ-45 ports support Half or Full-Duplex operation, and can auto-negotiate or be manually set to a required configuration.

[See data sheet for available models.](#)

The Redundant module can be used in an unmanaged or managed applications. To be managed, an Network Management Module (NMM2) or a module with integrated management must be installed in the same chassis.

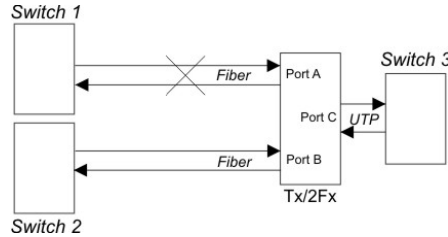
For more information on management software and hardware options, see [Comprehensive Network Management Solution product page.](#)

**Redundant Operation**

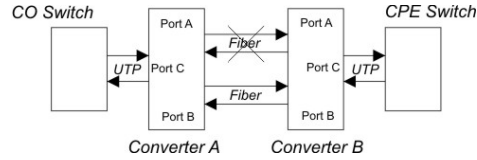
During normal operations Port A is the active primary and Port B is the backup secondary. When loss of link on Port A is detected, the module automatically switches to transmitting on Port B. With a switch over time of less than 100 microseconds, these modules provide the rapid response time required for ultra critical applications.

Note: After the link is switched, there will be a 5 second delay before that link can be reestablished.

**Application Examples**



In the example above, redundant Switches 1 and 2 are connected to Switch 3 via a Tx/2Ffx converter. If power fails in Switch 1, or if there is a loss of link in the fiber cable, the Tx/2Ffx converter switches to transmitting on port B and routes data flow to Switch 2.



In the example above, data flow from a core switch at the Central Office is converted from copper to redundant fiber, and converted back to copper, where it is connected to an edge switch at the Customer Premises. If there is a loss of link in fiber Port A, the Tx/2Ffx converter switches to transmitting on fiber Port B, without a service disruption to the mission-critical customer.

**SOFTWARE CONTROLLED SETTINGS**

Additional settings are available via software control when the Redundant module is installed in an iConverter chassis with a Management Module, such as a Network Management Module (NMM2) or a 10/100M2 Media Converter with Integrated Management. The following settings can be controlled via the Serial Console, Telnet or SNMP Management Software such as *NetOutlook®* Management Software or other third-party SNMP-based clients:

- RJ-45 Auto/Manual and Duplex Configuration
- Redundant Operation
- Link Modes

For more information on using and configuring the software features, register for access to the [NetOutlook Management Software user manual.](#)

**LED INDICATORS**

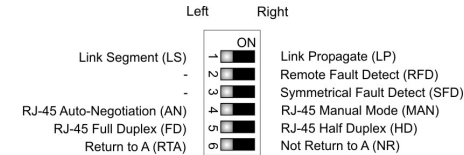
LED	Color	Description
Pwr	Yellow	Module has power
Port A "A Sel"	Green	ON: Active port Blinking: Remote side broken
Port A "A Lk Act"	Green	ON: Port is linked Blinking: Port activity Steady Blinking: Standby mode
Port C "AN"	Green	OFF: Manual mode enabled ON: Auto-negotiation is enabled
Port C "C Lk Act"	Green	ON: RJ-45 port is linked Blinking: RJ-45 activity
Port C "FDX"	Green	OFF: Half Duplex ON: Full Duplex
Port C "100"	Green	OFF: Not linked at 100Mbps ON: Linked at 100Mbps
Port B "B Sel"	Green	ON: Active port Blinking: Remote side broken
Port B "B Lk Act"	Green	ON: Port is linked Blinking: Port activity Steady Blinking: Standby mode

**SPECIFICATION**

<b>Standard Compliances</b>	IEEE 802.3	
<b>Regulatory Compliances</b>	Safety: UL, CE, NEBS Level 3, UKCA EMI: FCC Class A ACT: TAA, BAA, NDAA	
<b>Environmental</b>	RoHS, WEEE, REACH	
<b>Frame Size</b>	Up to 1,536 bytes	
<b>Port Types</b>	Copper: 100BASE-T (RJ-45) Fiber: 100BASE-FX (ST, SC, LC)	
<b>Cable Types</b>	Copper: EIA/TIA 568A/B, Cat 5 UTP and higher Fiber: Multimode: 50/125µm, 62.5/125µm Single-mode: 9/125µm	
<b>DC Power Requirements</b>	DC Input: 3.3VDC, 1.1A @ 3.3VDC (Tx/2Ffx) (Backplane) 3.3VDC, 0.7A @ 3.3VDC (Tx/2Tx)	
<b>Dimensions W x D x H</b>	0.85" x 4.5" x 2.8" (21.6 mm x 114.3 mm x 71.1 mm)	
<b>Weight</b>	8 oz. (226.8 grams)	
<b>Temperature</b>	Commercial: 0 to 50°C Wide: -40 to 60°C Storage: -40 to 80°C	
<b>Humidity</b>	5 to 95% (non-condensing)	
<b>Altitude</b>	-100m to 4,000m	
<b>MTBF (hrs)</b>	520,000	
<b>Warranty</b>	Lifetime warranty and 24/7/365 free Technical Support	

**DIP-SWITCH SETTINGS**

**On-Board DIP-Switches**

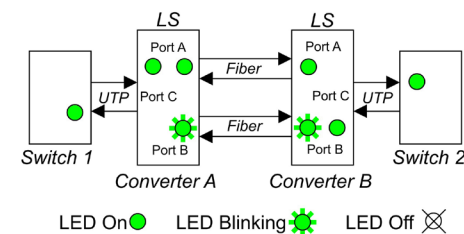


**SW1, SW2 and SW3: Link Modes**

SW1	SW2	SW3	Function
LEFT	LEFT	LEFT	Link Segment (LS)
RIGHT	LEFT	LEFT	Link Propagate (LP)
LEFT	RIGHT	LEFT	Remote Fault Detect (RFD)
LEFT	LEFT	RIGHT	Symmetrical Fault Detect (SFD)

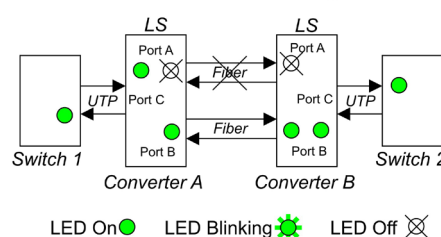
In order to accommodate different user needs, the Redundant modules support four different linking modes. It is recommended keeping the Redundant modules in the factory default Link Segment (LS) setting until the circuits have been verified and operational.

**Normal Operation**



The Link Segment (LS) mode transmits a link signal independently of any received link at any port. Utilizing this configuration, a loss of a receive link signal will only affect the port detecting the loss of signal. All the other ports will continue to generate a link signal.

**Fiber Fault with Link Segment**



The Link Propagate (LP) mode transmits a link signal only when a link signal is detected. Utilizing this configuration, a loss of a receive link signal will continue to propagate through to the next port in the network. (not shown).

In Remote Fault Detection (RFD), the RJ-45 port transmits a link signal only when receiving a link on both fiber ports. The fiber port transmits a link only when receiving link signals on both the fiber port and the RJ-45 port. As a result, fiber faults (no link received on the fiber) are looped-back and can be reported to the network core switch (not shown).

**Configuring RFD on both modules will cause a "deadly embrace" lockup.**

In Symmetrical Fault Detection (SFD), the RJ-45 port transmits a link signal only when receiving a link on both fiber ports. The fiber port transmits a link only when receiving link signal on both the fiber ports and the RJ-45 port. As a result, fiber faults (no link received at the fiber) are looped back and can be reported to the network core. In addition, connecting two back-to-back converters set to SFD, facilitates dual-loop-back where fiber faults are reported to both ends of the network (not shown).

In the example below, the RJ-45 transmits a link regardless of either fiber receiving a link (normal operation). Figure 3(a) shows the state when all links are functioning correctly.

Port A LEDs indicate link and activity, while the Port B LEDs are blinking indicating they are in standby mode

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**Warranty**

This product is warranted to the original purchaser (Buyer) against defects in material and workmanship for a period of two (2) years from the date of shipment. A lifetime warranty may be obtained by the original purchaser by registering this product at [www.omnitron-systems.com/support](http://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.

(Port A is the active link). When a fiber fault on Port A occurs, the modules will switchover to the standby link, restoring the connection.

**When using SFD, both modules must be configured with the same link mode.**

**SW4: RJ-45 Auto/Manual "AN/MAN"**

When this DIP-Switch is in the "AN" position (factory setting), the module auto-negotiates and matches the duplex mode of a mating auto-negotiating device connected to the RJ-45 port.

When this DIP-Switch is in the "Man" position, the module does not auto-negotiate and operates in the duplex mode selected by the RJ-45 Full/Half-Duplex DIP-Switch.

**SW5: RJ-45 Full/Half-Duplex "FD/HD"**

When the RJ-45 Auto/Manual Negotiate "AN/Man" DIP-Switch is in the Manual "Man" position, the RJ-45 Full/Half-Duplex "FD/HD" DIP-Switch determines the duplex mode for the module.

When this DIP-Switch is in the "FD" position (factory setting), the module operates in Full-Duplex mode. When in the "HD" position, it operates in Half-Duplex mode. Set the duplex mode to match the connecting device and check for link status.

**Attaching an auto-negotiating RJ-45 port to a non-auto-negotiating (manual / forced / hard-coded) RJ-45 port will result in an unpredictable port setting with poor performance.**

**When operating in Manual mode both connected ports MUST be set manually to the same speed and duplex mode.**

**SW6: Return to Port A "RTA/NR"**

During normal operations Port A is the active primary and Port B is the backup secondary. When loss of link on Port A is detected, the module automatically switches to transmitting on Port B. The module can be configured to return to Port A (RTA) when the fault condition has been resolved or stay on Port B (NR)

**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](http://www.omnitron-systems.com/support) or e-mail to Omnitron at [intlinfo@omnitron-systems.com](mailto:intlinfo@omnitron-systems.com).



When this DIP-Switch is in the Return to Port A "RTA" position (factory default), the module is configured to return to Port A after the fault has been resolved,

When this DIP-Switch is in the Not Return to A "NR", Port B continues to be used for transmitting data even after the fault has been resolved on Port A.

When the modules are connected back-to-back, both modules must be configured the same (RTA or NR).

**On-Board Slide Switch**

**RJ45 Crossover "= / X" Switch (Not Shown):**

When connecting the RJ-45 port to a hub or switch, set this front-panel switch to Straight-Through "=" (factory setting). When connecting to a workstation, set it to Crossover "X".

**MOUNTING AND CABLE ATTACHMENT**

The iConverter modules are hot-swappable and can be installed into [any iConverter chassis.](#)

**Caution: Use proper ESD protection to reduce the risk of damage to your equipment.**

1. Carefully slide the module into an 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. Verify the "Pwr" LED is ON (indicating the chassis is powered).

2. Using a Category 5 or better Ethernet cable, attach the RJ-45 port (or ports) to a 100BASE-TX Ethernet device.

3. Using a multimode or single-mode dual-fiber cable as required per the module type, attach the fiber port to a 100BASE-FX mating Ethernet device. The transmit (Tx) must attach to the receive side of the mating device and the receive (Rx) must attach to the transmit side.

4. Single-fiber (SF) modules must be used in matched pairs. The transmit (Tx) and receive (Rx) wavelengths of one converter must match the receive (Rx) and transmit (Tx) wavelengths of the mating converter. For example, an 8430-1 must be connected to an 8431-1.

**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**

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