



**DESCRIPTION**

The iConverter X21 is a X.21 or RS-530 serial to fiber media converter featuring several configuration modes.

The X21 can auto-detect and configure itself to match the baud rate of the connected device up to 8.192Mbps. The X21 supports standard DCE-sourced timing and terminal timing. The X21 also supports RS-530 DCE and DTE co-directional timing, Tx and Rx data, and two control lines. An adapter cable is included to accommodate different gender connectors. The X21 features local loopback on the serial and fiber ports to facilitate testing and installations.

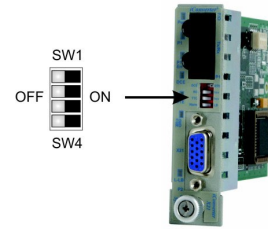
See data sheet for available models.

The X21 modules 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](#).

**DIP-SWITCH SETTINGS**

**Front Panel DIP-switches**



**SW1 - DCE/DTE**

When this DIP-switch is in the OFF “DCE” (default) position, the serial port is configured to connect to a DCE device. When the DIP-switch is in the ON “DTE” position, the serial port is configured to connect to a DTE device.

**SW2 - Receive Clock Polarity “RC/Inv”**

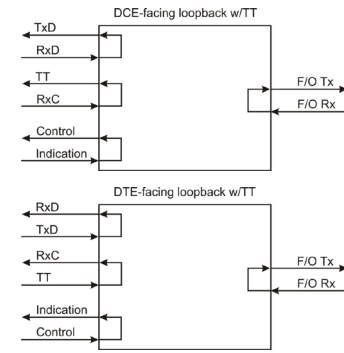
When this DIP-switch is in the OFF “RC” (default) position, the clock edge used to sample the data on the serial port is defined by the TIA/EIA-334-C specification. When the DIP-switch is in the ON “Inv” position, the data on the serial port is sampled on the inverted clock edge.

**SW3 - DTE Terminal Timing Clock Polarity “TTC/Inv”**

When Terminal Timing mode is enabled, this DIP-switch will determine the clock edge used to transfer data. When the DIP-switch is in the OFF “TTC” (default) position, the clock edge used to sample the data on the serial port is defined by the TIA/EIA-334-C specification. When the DIP-switch is in the ON “Inv” position, the data on the serial port is sampled on the inverted clock edge.

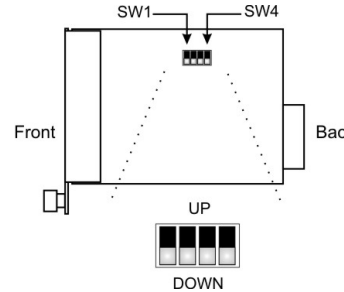
**SW4 - Loopback “Norm/LB”**

When the DIP-switch is in the ON “LB” position, the serial port data signals are looped back to the attached device. At the same time, the fiber port is looped. If the module has Terminal Timing enabled (see On-Board DIP-switches), the clock signals are also looped back to the attached device.



Loopback modes showing Terminal Timing

**On Board DIP-Switches**



Printed on the PCB are the call outs for each DIP-switch. Please refer to the PCB for clarification.

UP and DOWN refer to the direction for the settings. Setting the switch to UP would set the switch towards the edge of the board. Setting the switch to DOWN would set the switch towards the center of board.

**SW1 -Terminal Timing**

When this DIP-switch is in the DOWN (default) position, Terminal Timing is disabled. When this DIP-switch is in the UP position, Terminal Timing is enabled.

When Terminal Timing disabled, it uses the ‘Signal Element Timing’ clock (SET clock, circuit S, X.21 pin pair 6, 13) as supplied by the DCE device to time Transmit data (TXD) and Receive data (RXD). This is called Contra-directional Timing. When Terminal Timing is enabled, it uses ‘DTE Signal Element Timing’ clock (DTE SET clock, circuit X, X.21 pin pair 7, 14) as supplied by the DTE device to time TXD, and uses ‘Signal Element Timing’ clock to time RXD. This is called Co-directional Timing.

When Terminal Timing is used, both the local and remote media converter must be set to use Terminal Timing, as well as the devices connected to each converter.

**SW2, SW3 and SW4 - Reserved**

Leave these DIP-switches in the DOWN (factory default) position.

**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.**

a. 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).

b. When using a model with a SFP port, insert the SFP fiber transceivers into the SFP receptacles on the module.

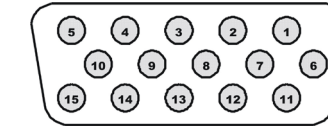
**NOTE: The release latch of the SFP transceiver must be in the closed (up) position before insertion.**

c. Connect the included adapter cable to the serial port on the X21 converter. Use the appropriate gender plug to attach the X.21 device.

d. Connect an appropriate multimode or single-mode fiber cables to the fiber ports of the installed module. It is important to ensure that the transmit (TX) is attached to the receive side of the device at the other end and the receive (RX) is attached to the transmit side. Single-fiber (SF) media converter models operate in pairs. 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.

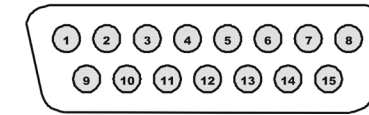
**Serial Connector**

The serial port on the module is a DE-15 female connector with the following pin-out configuration:



Serial Port DE-15 Connector

The X.21 interface is a 2 row DB-15 connector.



X.21 DB-15 Interface

A pinout cross reference table is provided showing the relationship between the serial port and the X.21 interface. A DE-15 to DB-15 adapter cable is provided.

**LED INDICATORS**

LED	Color	Description
Pwr	Amber	<b>OFF:</b> Module is not powered <b>ON:</b> Module has power
Fiber Act “P1”	Green	<b>OFF:</b> No signal detected <b>ON:</b> Signal detected <b>Blinking:</b> Data received
Fiber Error “Er”	Amber	<b>OFF:</b> No error detected <b>ON:</b> Error detected on fiber No clock or corrupted messages
Serial Port “DCE”	Green	<b>OFF:</b> Not configured for DCE-facing <b>ON:</b> Configured for connection to DCE
Serial Port “DTE”	Green	<b>OFF:</b> Not configured for DTE-facing <b>ON:</b> Configured for connection to DTE
Timing “TD/RD”	Green	<b>OFF:</b> No activity. No clock detected <b>Blinking:</b> Activity
Loopback “LB”	Green	<b>OFF:</b> Loopback not enabled <b>Blinking:</b> Module in loopback

**SPECIFICATIONS**

Standard	ITU-T X.21	
<b>Regulatory</b>	Safety: UL, CE, UKCA EMI: FCC Class A ACT: TAA, BAA, NDAA	
<b>Environmental</b>	RoHS, WEEE, REACH	
<b>Data Rate</b>	up to 8,192Mbps	
<b>Port Types</b>	Serial: High-Density 15 Pin Female DB-15 male and female adapters included Fiber: ST, SC, LC or SFP (depending on model)	
<b>Cable Types</b>	Serial: 24 gauge (typical) Fiber: Multimode: 50/125µm, 62.5/125µm Single-mode: 9/125µm	
<b>DC Power Requirements</b>	DC Input: (Backplane)	3.3VDC, 0.5A @ 3.3VDC
<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>	8.0 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>	500,000	
<b>Warranty</b>	Lifetime warranty with 24/7/365 free Technical Support	

**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™, FlexSwitch™, iConverter®, miConverter™, NetOutlook®, OmniLight®, OmniConverter®, RuggedNet®, Omnitron Systems Technology, Inc.™, OST™ 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 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.

**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.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).



DB-15 Pin	DE-15 Pin	Description	Circuit Name	Direction	
				DTE	DCE
2	11	Transmit +	T (TXD)	In	Out
9	1	Transmit -	C (RTS)	In	Out
3	2	Control +	C (RTS)	In	Out
10	7	Control -	C (RTS)	In	Out
4	8	Receive +	R (RXD)	Out	In
11	12	Receive -	R (RXD)	Out	In
5	13	Indication +	I (CTS)	Out	In
12	3	Indication -	I (CTS)	Out	In
6	4	Signal Element Timing +	S (RXC)	Out	In
13	9	Signal Element Timing -	S (RXC)	Out	In
7	10	DTE Signal Element Timing +	X (TXC)	In	Out
14	14	DTE Signal Element Timing -	X (TXC)	In	Out
1	6	Shield Ground	Shield	N/A	
8	15	Signal Ground	G (GND)	N/A	
15		N/A			

**SOFTWARE CONTROLLED SETTINGS**

Additional settings are available via software control when a X21 is installed in an iConverter chassis with a Management Module.

The following software settings can be controlled via Serial Console/Telnet Console, NetOutlook Management Software or other third-party SNMP-based clients:

- DTC/DTE configuration
- Clock Polarities
- Loopback
- Terminal Timing

Software controlled settings can be selected to override DIP-Switch settings.

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

**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](mailto:support@omnitron-systems.com)

URL: [www.omnitron-systems.com](http://www.omnitron-systems.com)