Omnitron Systems

iConverter® **X21 Standalone**

User Manual

38 Tesla, Irvine, CA 92618 USA
Phone: (949) 250-6510; Fax: (949) 250-6514

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 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 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.

Technical Support:

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

040-08840-001E 7/26

Description

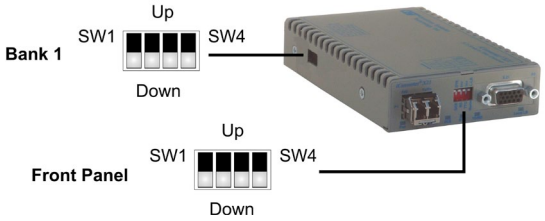
The iConverter X21 is a X.21 or RS-530 serial to fiber media converter featuring several configuration modes enabling connection to a wide variety of X.21 and RS-530 applications.

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.

The X21 supports Small Form Pluggable (SFP) transceivers, enabling adaptability to different fiber types, distances and wavelengths, providing maximum flexibility across a variety of network architectures and topologies.

See data sheet for available models.

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.

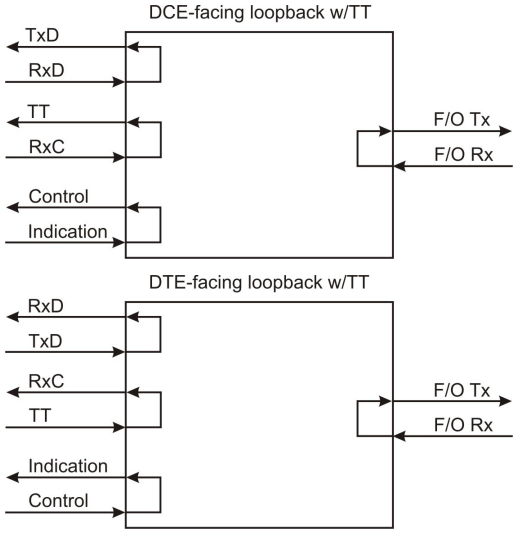
SW3 - DTE Terminal Timing Clock Polarity “TTC/Inv”

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.



Bank 1 DIP-Switches

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

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

1. The standalone module is available with or without integrated mounting brackets. When using the standalone module with integrated mounting brackets, use the four mounting holes on the module to secure the module to the wall. The module can accommodate #6 screws (not included).

Standalone modules without mounting brackets can use the optional mounting bracket kit (2x 4381). Use the four mounting holes on the module to secure the module to the wall. The module can accommodate #6 screws (not included)

A 19" Rack Mount Shelf (8260-0) is available to install four X21 modules side by side.

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.

For AC models:

To power the unit using the AC/DC adapter, connect the AC/DC adapter to an AC outlet. Then connect the barrel plug at the end of the wire on the AC/DC adapter to the 2.5mm DC barrel connector (center-positive) on the unit. Confirm that the unit has powered up properly by checking the power status LED located on the front of the unit.

For DC Models:

To power the unit using a DC power source, prepare a power cable using a two conductor insulated wire (not supplied) with 12AWG to 20AWG 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 cables to the unit by fastening the stripped ends to the DC power connector.

Connect the power wires to the DC power source. The Power LED should indicate the presence of power.

WARNING: Note the wire colors used in making the positive and negative connections. Use the same color assignment for the connection at the DC power source.

NOTE: If mounting with a safety ground attachment, use the safety ground screw at the rear of the unit.

2. Insert the SFP fiber transceivers into the SFP receptacles on the module.

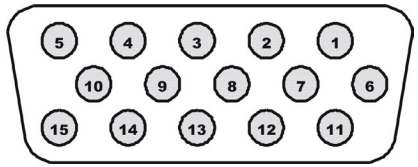
NOTE: The release latch of the SFP transceiver must be in the closed (up) position before insertion.

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

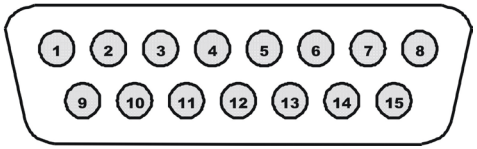
4. Connect an appropriate multimode or single-mode fiber cables to the fiber ports of the installed module. It is important to ensure that the transmit (TX) is attached to the receive side of the device at the other end and the receive (RX) is attached to the transmit side. Single-fiber (SF) media converter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



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



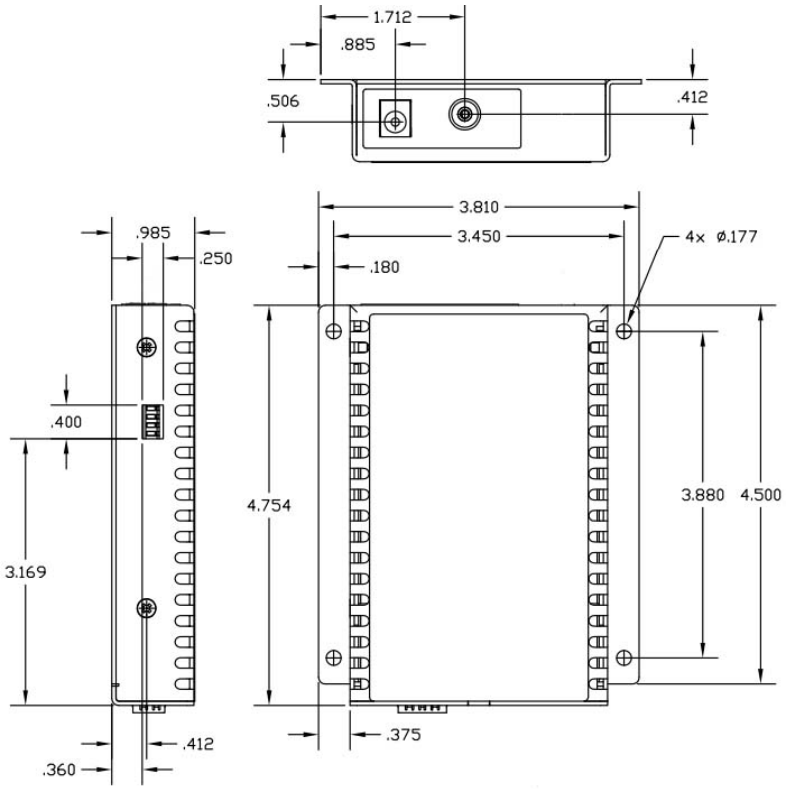
A pinout cross reference table is provided showing the relationship between the serial port and the X.21 interface. A DE-15 to DB-15 adapter cable is provided.

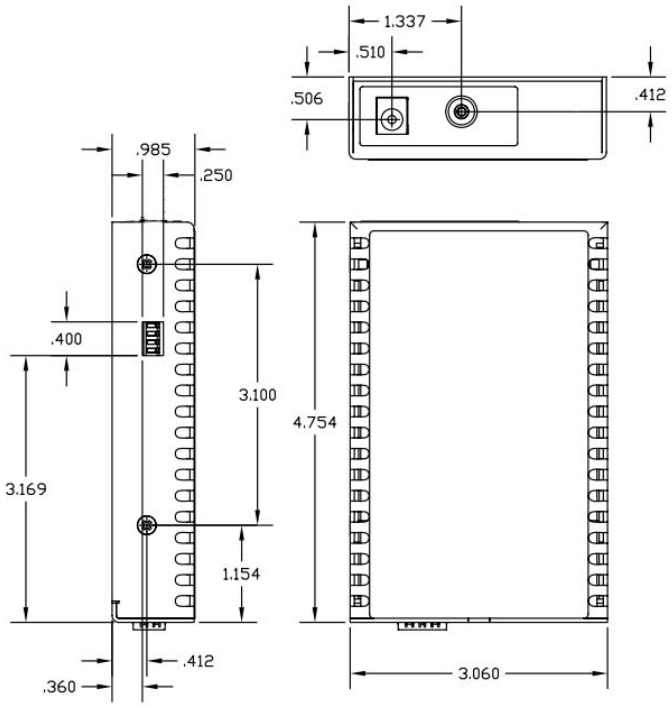
DB-15 Pin	DE-15 Pin	Description	Circuit Name	Direction	
				DTE	DCE
2 9	11 1	Transmit + Transmit -	T (TXD)	In	Out
3 10	2 7	Control + Control -	C (RTS)	In	Out
4 11	8 12	Receive + Receive -	R (RXD)	Out	In
5 12	13 3	Indication + Indication -	I (CTS)	Out	In
6 13	4 9	Signal Element Timing + Signal Element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

LED Indicators

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

Mechanical





Specifications

Standard	ITU-T X.21	
Regulatory	Safety: EM: ACT:	UL, CE, UKCA FCC Class A TAA, BAA, NDAA
Environmental	RoHS, WEEE, REACH	
Data Rate	up to 8,192Mbps	
Port Types	Serial: High-Density 15 Pin Female DB-15 male and female adapters included Fiber: ST, SC, LC or SFP (depending on model)	
Cable Types	Serial: 24 gauge (typical) Fiber: Multimode: 50/125µm, 62.5/125µm Single-mode: 9/125µm	
AC Power Requirements	AC Adapter:	100 - 240VAC/50 - 60Hz 0.05A @ 120VAC
DC Power Requirements	DC Input: (Terminal)	5 - 32VDC, 0.3A @ 9VDC 2-Pin Terminal (non-isolated)
	DC Input: (AC Adapter)	5 - 32VDC, 0.3A @ 9VDC 2.5mm Barrel Connector
Dimensions W x D x H	Standalone: 3.1” x 4.8” x 1.0” (78.7 mm x 121.9 mm x 25.4 mm) Standalone with Integrated Brackets: 3.8” x 4.8” x 1.0” (96.5 mm x 121.9 mm x 25.4 mm)	
Weight	1.0 lb. (453.6 grams) - without AC Adapter 1.5 lbs. (680.4 grams) - with AC Adapter	
Temperature	Commercial: Wide: Storage:	0 to 50°C -40 to 60°C -40 to 80°C
Humidity	5 to 95% (non-condensing)	
Altitude	-100m to 4,000m	
MTBF (hrs)	510,000 - Module 250,000 - Module with US AC Adapter 100,000 - Module with Universal AC Adapter	
Warranty	Lifetime warranty with 24/7/365 free Technical Support	