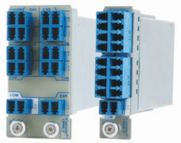
Omnitron Systems

iConverter® CWDM 4 and 8 Channel MUX User Manual



DESCRIPTION

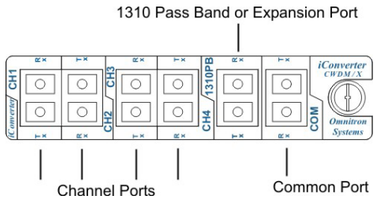
The iConverter CWDM/X Coarse Wave Division Multiplexing (CWDM) Multiplexer/Demultiplexer (MUX/DEMUX) modules support ITU-T G.694.2 wavelengths between 1270nm to 1610nm in 20nm increments.

The iConverter CWDM/X modules are available in 4 and 8-Channel models, supporting a variety of wavelengths and optional port configurations. Up to 16 channels are supported by combining two 8-Channel CWDM/X modules with a Band Splitter.

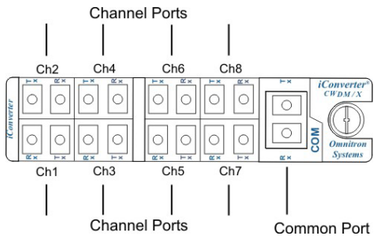
The CWDM modules can be used in an unmanaged or managed applications. To be managed, an Network Management Module (NMM2) or a module with integrated management must be installed in the same chassis.

See data sheet for available models.

Port Definitions

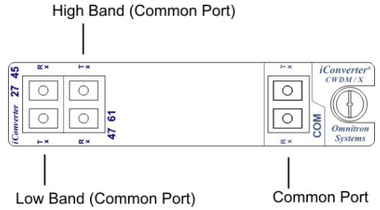


4-Channel CWDM/X Module



8-Channel CWDM/X Module

The front panel diagram for the 8-Channel CWDM module with 1310 Pass Band Port option is not shown. It is a double wide module occupying two (2) slots in a chassis. A 2-Module or 19-Module chassis will be required.



Band Splitter CWDM/X Module

Channel Port

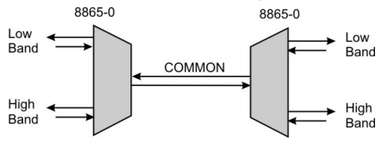
The Channel Ports transmit and receive signals on specific CWDM wavelengths. The Channel Ports are multiplexed onto and demultiplexed from the Common Port.

Common Port

The Common Port (COM) transmits and receives the aggregated wavelengths connected to the Channel, Expansion and 1310 Pass Band Ports.

Low and High Band Ports

The Low and High Band Ports, on model 8865-0, are used to cascade two 8-Channel CWDM/X modules. Model 8862-0 Common Port is connected to the Low Band Port and model 8863-0 Common Port is connected to the High Band Port. This configuration provides a 16-Channel CWDM MUX solution (see Band Splitter User Manual for more information on the different configurations).

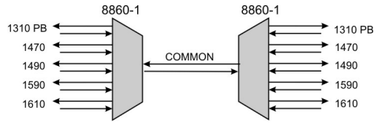


Band Splitter

1310 Pass Band Port

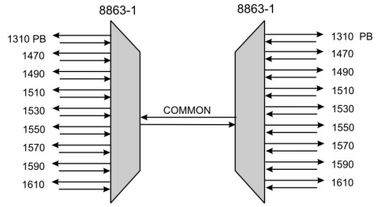
The 1310 Pass Band Port (1310 PB) allows a legacy 1310nm signal to pass through the CWDM/X module on a reserved band (1260nm to 1360nm). The port can be used to combine an existing legacy 1310nm network with up to 8 CWDM channels, allowing the CWDM channels in the range of 1470nm to 1610nm to be overlaid on the same fiber pair as the existing 1310nm network.

The figure below illustrates two 4-Channel CWDM/X modules with the 1310 Pass Band Port option.



4-Channel MUX/DEMUX

The figure below illustrates two 8-Channel CWDM/X modules with the 1310 Pass Band Port option.

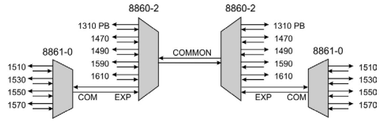


8-Channel MUX/DEMUX

Expansion Port

On the 4-Channel CWDM/X models 8860-2 and 8860-3, the Expansion Port can also be used as a 1550nm Pass Band Port to transport legacy 1550nm single-mode traffic as long as the spectral width of the 1550nm legacy network is between 1510 and 1570nm.

The Expansion Port (EXP) enables the cascading of two CWDM/X modules as shown below.



Two Cascaded 4-Channel MUX/DEMUX

On models 8860-2 and 8860-3, the Expansion Port can also be used as a 1550nm Pass Band Port to transport legacy 1550nm single-mode traffic as long as the spectral width of the 1550nm legacy network is between 1510 and 1570nm.

Only the 4-Channel CWDM/X module is available with an optional Expansion Port.

The 8-Channel CWDM/X modules can be cascaded to create a 16-Channel solution by using a Band Splitter (8865-0). See the Band Splitter User Manual for more information.

Mounting and Cable Attachment

a. Carefully slide the module into an open slot in an iConverter 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(s) (push in and turn clockwise to tighten) to the chassis front.

b. Connect a single-mode, dual fiber duplex LC cable between the Channel Port of the CWDM/X module and the attached device. It is important to ensure that the wavelength of the CWDM/X matches the wavelength of the attached device. Connect all Channel Ports in this manner. 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.

c. Connect a single-mode, dual fiber duplex LC cable between the Common Ports on the CWDM/X modules

(this connection may be made through fiber patch panels since the modules may not be co-located). 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.

d. When cascading two 4-Channel CWDM/X modules, connect a single-mode, dual fiber duplex LC cable between the Common Port on one CWDM/X module and the Expansion Port on the other CWDM/X module (see Figure 5). 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.

e. When overlaying a CWDM channel on an existing 1310nm legacy network, connect the single-mode, dual fiber duplex LC cable from the legacy network to the 1310 Pass Band Port on the CWDM/X module. 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.

NOTE: The iConverter CWDM/X modules can not be installed in slots 4, 8, 12 and 16 of a 19-Module Chassis or in the top slot of a 2-Module Chassis or in a 1-Module Redundant Power Chassis.

NOTE: The iConverter 8-Channel Double-Wide CWDM/X can only be installed in a 2-Module Chassis or 19-Module Chassis with the exception of slots 4/5, 8/9, 12/13 and 16/17.

Software Options

The CWDM modules do not have any configurable settings. If used in a managed application, the modules can be viewed and model and serial numbers are displayed.

For more information on management, register for access to the NetOutlook Management Software user manual.

Design Considerations

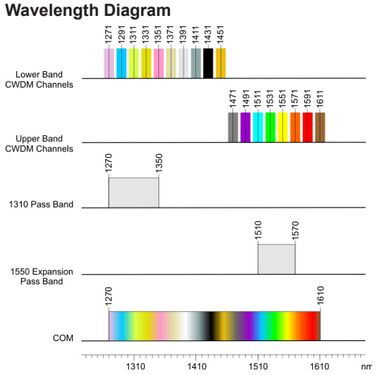
iConverter CWDM/X modules are passive devices that require no external power. Attenuation (signal loss) of less than 2.7dB will be realized through each port on

the module (see the Optical Specifications for exact loss specification for each model). Detailed calculations should be performed for each fiber optic link in the network to ensure the proper optical devices are specified with sufficient transmitter power.

When calculating optical loss, ensure that the total loss, plus a safety factor (typically 3dB) does not exceed the optical power budget. The optical power budget is the difference between the transmitter optical output power and the receiver's optical sensitivity. The transmitter optical output power and receiver optical sensitivity values can be obtained from the manufacturers of the respective equipment.

For more information, access the CWDM Resource Center to view all relevant documents.

Wavelength Diagram



Optical Specification

Optical Characteristics		
Parameter	**Units**	**Values**
Common Port Operating Wavelength	nm	1270 - 1610
CWDM Center Channel	nm	1271, 1291, 1311, 1331, 1351, 1371, 1431, 1451, 1431, 1451, 1471, 1491, 1511, 1531, 1551, 1571, 1591, 1611
CWDM Channel Spacing	nm	20
1310 Pass Band	nm	1270 - 1350
1310 Pass Band Width	nm	± 6.5
1550 Pass Band/ Expansion	nm	1510 - 1570
1550 Pass Band Width	dB	± 6.5
4-Channel Insertion Loss	dB	< 1.9
4-Channel Insertion Loss with Pass Band/Expansion	dB	< 2.0
8-Channel Insertion Loss	dB	< 2.7
Band Splitter Insertion Loss	dB	< 0.8
Adjacent Channel Isolation	dB	> 30
Non-Adjacent Channel Isolation 4 and 8-Channel	dB	> 40
Non-Adjacent Channel Isolation Band Splitter	-	N/A
Return Loss (filtered channel)	dB	≥ 45

Module Specifications

Description	**iConverter CWDM/X** 4 and 8 Channel Multiplexer/Demultiplexer
Standards	Telecordia GR-1209, GR-1221
Regulatory	UL, CE, FCC Class A, UKCA
Environmental	RoHS, WEEE, REACH
Port Types	Fiber: 4 Channels: LC/UPC 8 Channels: LC/UPC, LC/APC 1310 Pass Band: LC/UPC, LC/APC Expansion Port: LC/UPC
Cable Types	Fiber: Single-mode: 9/125µm Channel Ports: Dual Fiber Common Port: Dual Fiber
DC Power Requirements	DC Input (Backplane): 3.3VDC, 0.025A @ 3.3VDC (when management is required, otherwise passive operation)
Dimensions W x D x H	0.85" x 4.5" x 2.8" (21.6 mm x 114.3 mm x 71.1 mm)
Weight	12.0 oz. (340.2 grams)
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
MTBF (hrs)	> 1,000,000
Warranty	1 year warranty with 24/7/365 free Technical Support

(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.

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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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