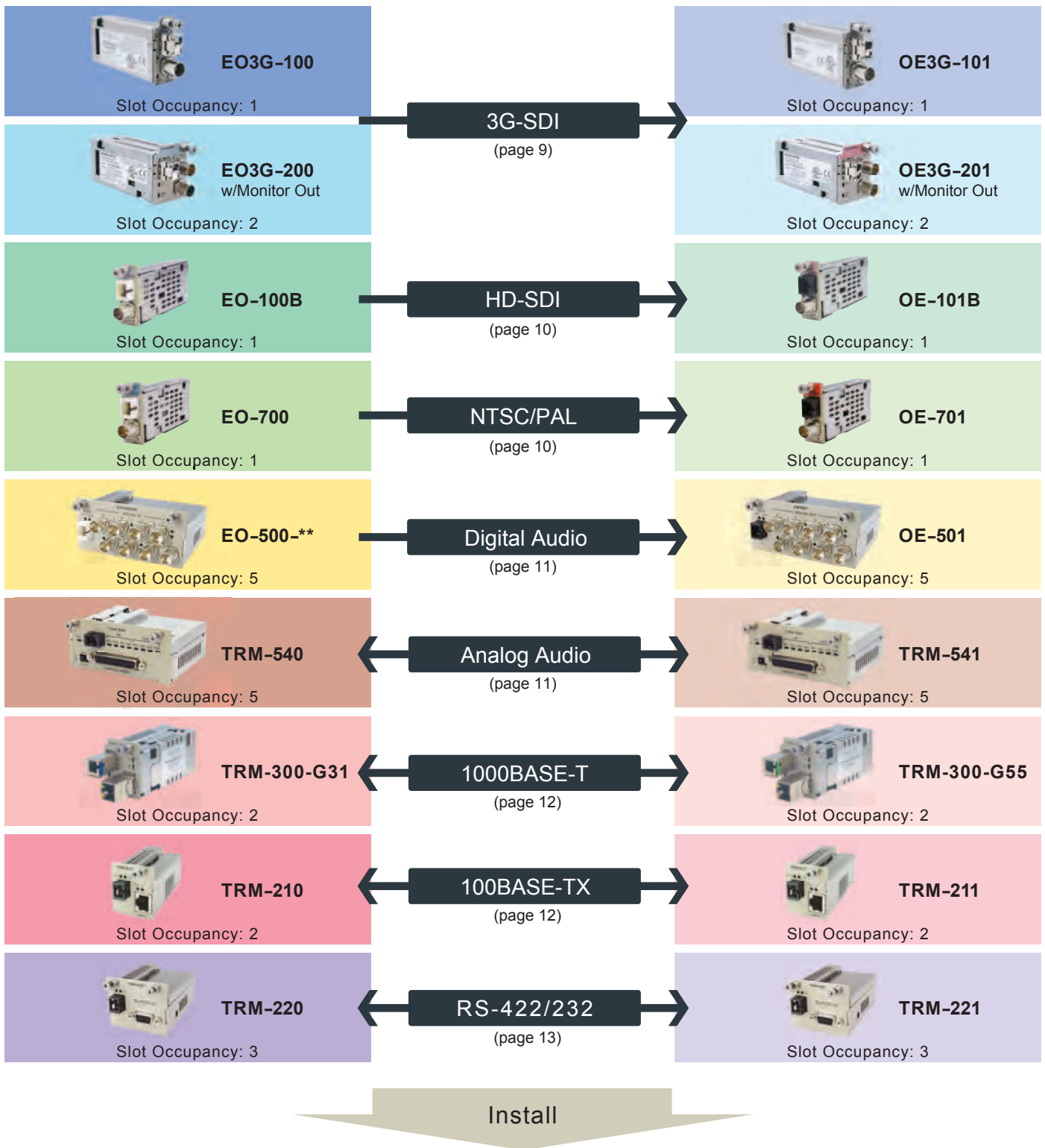


EO/OE Converter Line-up

Canare's EO/OE product line-up has expanded. A large variety of signals can be sent over fiber-optic cables with a simple set-up. Canare EO/OE will break your system free from distance limitations, signal delays, and noise problems.



Platforms (page 15)



Wavelength Multiplexing Systems

Multiplexing

“Multiplexing” is a technology that allows multiple signals with different wavelengths to be transmitted together over a single optical fiber. Three general types of multiplexing — WDM, CWDM and DWDM — offer increasing signal-carrying capacities, as described below.

Wavelength Division Multiplexing (WDM)

WDM is the simplest form of multiplexing and uses two wavelengths of 1310nm and 1551nm. Unlike when using an optical divider, insertion loss can be kept below 0.5dB.

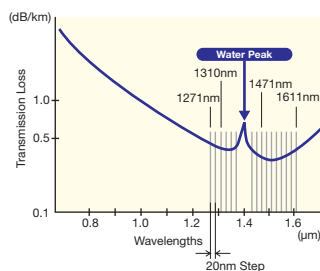
Coarse Wavelength Division Multiplexing (CWDM)

CWDM systems use 8 wavelengths (20nm grid) primarily between 1471nm and 1611nm. To these it is also possible to add 8 more between 1271nm and 1451nm to allow a maximum of 16 wavelengths to be carried as a single multiplexed transmission. An ultra-thin membrane filter on the optical multiplexer/demultiplexer (mux/demux) keeps insertion loss at just 2-3dB. *CWDM standardized through ITU G695.

Optical Converter (TX for CWDM)

Canare's CWDM optical converter uses a DFB laser, which offers a much tighter spectrum than FP lasers. Up to 16 different wavelengths fall within 1271nm and 1611 nm in 20nm intervals. The wavelengths in the 20nm grid between 1391nm and 1411nm are not used because their proximity to the water peak results in too much attenuation.

Optical Fiber Transmission Loss Characteristics



Optical Multiplexer/Demultiplexers

The optical signals output from the optical converter (TX) are combined into a single signal by the multiplexer (mux) and transmitted along a single optical fiber. At the receiving end, these combined optical signals are demultiplexed (demux) to split them back into their original component 8 signals.

Optical mux/demuxes are bi-directional, so the same model can be used for transmitting and receiving on each end. It's also possible to use 4 wavelengths out of the 8 for transmitting and the remaining four for receiving. Both 8-wavelength and 16-wavelength models are available, and combining these with an optical converter allows a variety of system constructions with many uses.

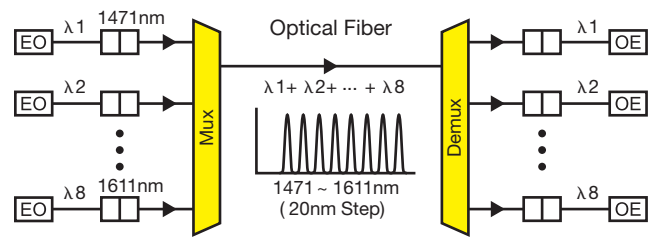
Optical Converter (RX)

Canare's optical converter (RX) converts an optical signal comprised of 8 different wavelengths into electrical signals. This converter is common to all wavelengths and one converter is required for each wavelength.

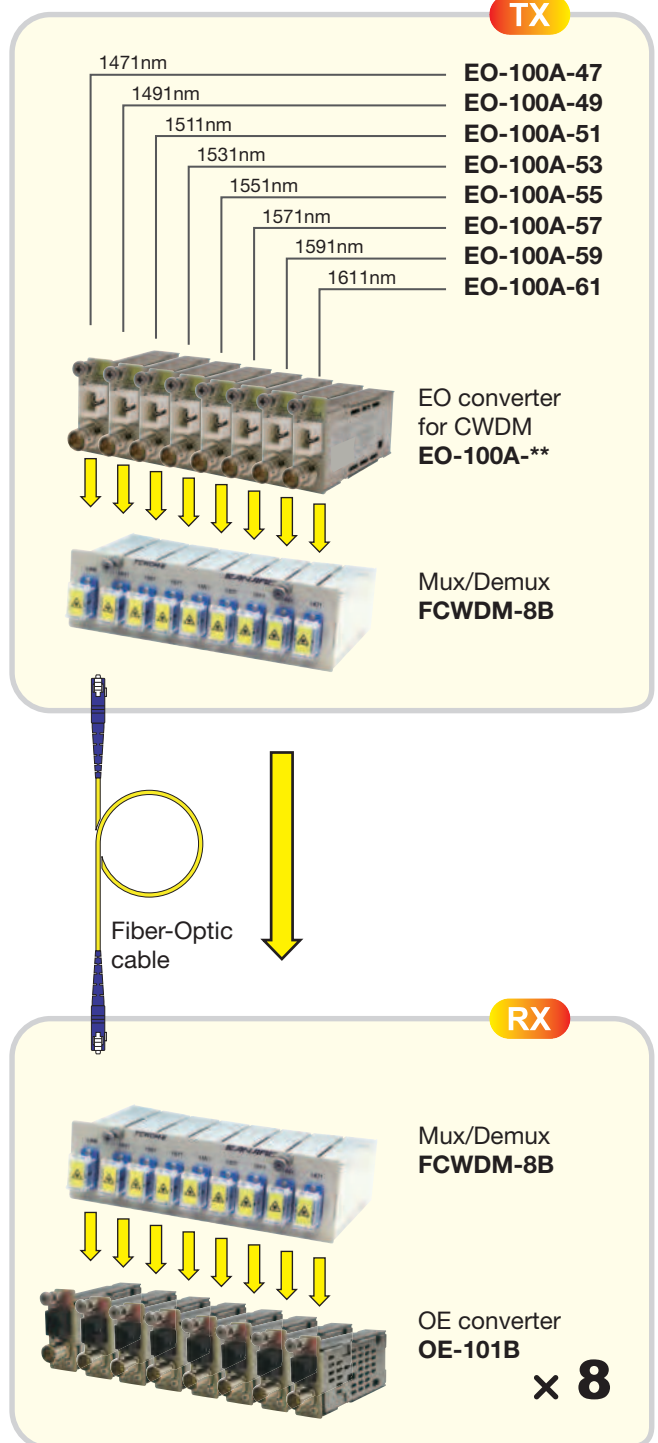
Once optical fiber cables have been laid, multiplexing the transmissions carried on them eliminates the need to purchase and install new cables when more transmission lines are needed.

Eight Canare optical converters and an FCWDM-8B mux/demuxer can be installed compactly on a single 161UPSC 1RU-size platform, effectively allowing an 8-wavelength transmission system to be achieved in just 1RU of space.

Multiplexing (CWDM)



8-wavelength CWDM system example



Note: Please use with Canare platform.

3G-SDI EO/OE Converters

Canare EO3G/OE3G series, the new line of 3G-SDI capable optical converters are ideal for applications that require the signal quality and integrity to be at its best over long distance transmissions such as in mobile productions, event venues, and within or between broadcast facilities.

Electric to Optic Converter (TX)

Model	Wavelength	Emission	Monitor Out	Occupancy
EO3G-100	1310 nm	-5 dBm	No	1 slot
EO3G-200			Yes	2 slots
EO3G-100A-**	1271-1611 nm for CWDM*	+2.5 dBm	No	1 slot

*Refer to the following information to specify the wavelength and the model number.

Optic to Electric Converter (RX)

Model	Wavelength	Sensitivity	Monitor Out	Occupancy
OE3G-101	1200-1620 nm	-22 dBm	No	1 slot
OE3G-201			Yes	2 slot

Key Features and Benefits

- Multi format - 3G-SDI, HD-SDI, SD-SDI, and DVB-ASI
- EO3G-200 and OE3G-201 are equipped with Monitor output port.
- Super low-latency
- Compact size
- Easy to use; requires no complicated settings.
- Supports pathological test pattern
- Cost effective

Specifications

Model	EO3G-100	EO3G-200	EO3G-100A	OE3G-101	OE3G-201
Convertibility	Electric to Optic			Optic to Electric	
Optical Connector	1 x LC (output)			1 x LC (input)	
Fiber Type	Single Mode				
SDI Input	1 x 75 Ω BNC	1 x 75 Ω BNC	1 x 75 Ω BNC	N/A	N/A
SDI Output	N/A	1 x 75 Ω BNC (no-relocked)	N/A	1 x 75 Ω BNC	2 x 75 Ω BNC
Dimensions (mm)	17 x 43.4 x 78.4	35.5 x 43.4 x 78	17 x 43.4 x 78.4	17 x 43.4 x 78.4	35.5 x 43.4 x 78
Weight (approx.)	100 g	150 g	95 g	100 g	150 g
Typical Compliances	SMPTE 259M, 292M, 297-2006, 424M, EN50083-9				

3G-SDI Repeater

Equalizes and reclocks 3G/HD/SD-SDI signals to extend the transmission distance over a coaxial cable.

Model	Support Formats/Rates	Occupancy
EE3G-100	3G-SDI, HD-SDI, SD-SDI, DVB-ASI	1 slot

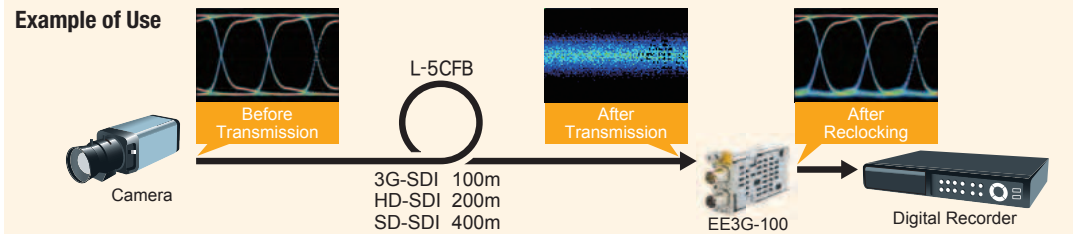
Key Features and Benefits

- Typical cable equalization: 100 m of L-5CFB in 3G-SDI
- Supports 3G/HD/SD-SDI and DVB-ASI
- Passes embedded audio
- Allows for efficient use of existing cable infrastructure.

Specifications

I/O Connector	2 x 75 Ω BNC
Typical Compliances	SMPTE 424M, 292M, 259M, EN50083-9

Example of Use



Note: Platform (power supply) is required to use Canare optical converters (see page15).



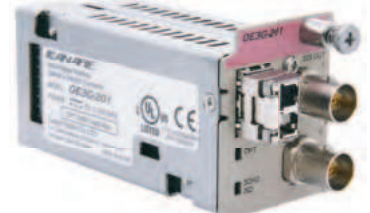
EO3G-100 (TX)



EO3G-200 (TX with Monitor Output)



OE3G-101 (RX)



OE3G-201 (RX with Monitor Output)

Ordering Information for EO3G-100A-**

EO3G-100A- []	Wavelength
27	1271 nm
29	1291 nm
31	1311 nm
33	1331 nm
35	1351 nm
37	1371 nm
43	1431 nm
45	1451 nm
47	1471 nm
49	1491 nm
51	1511 nm
53	1531 nm
55	1551 nm
57	1571 nm
59	1591 nm
61	1611 nm



EO3G-100A-** (TX)



EE3G-100

Dimensions : 17 x 43.4 x 78.4 mm
Weight : 85g

Technical Trend

Fiber-Optic Systems

Connectors

Cables

Panels & Patchbays

Multichannel Systems

Cable Assemblies

HD-SDI EO/OE Converters

Electric to Optic Converters (TX)

Model	Wavelength	Emission	Reclocker	Occupancy
EO-100B	1310 nm	-3.5 dBm	Yes	1 slot
EO-160			N/A	
EO-100A-**	1271-1611 nm for CWDM*	-2.5 dBm	Yes	

*Refer to the following information to specify the wavelength and the model number.

Optic to Electric Converters (RX)

Model	Wavelength	Sensitivity	Reclocker	Occupancy
OE-101B	1200-1620nm	-24 dBm	Yes	1 slot
OE-151			N/A	

Key Features and Benefits

- Multi format - HD-SDI (up to 1.485 Gbps), SD-SDI and DVB-ASI
- Embedded audio capable
- Handles pathological test pattern
- No-reclocker models support wide bit rate range. (50 Mbps to 1485 Mbps)
- Compact design - Maximum 16 modules within 1RU
- Hot swappable
- Cost effective
- Easy to use - BNC and SC-type connector.

Specifications

Model	EO-100B, EO-160	EO-100A-**	OE-101B, OE-151
Convertibility	Electric to Optic		Optic to Electric
Fiber Type	Single Mode		
Optical Connector	1 x SC (output)		1 x SC (input)
SDI Connector	1 x 75 Ω BNC (input)		1 x 75 Ω BNC (output)
Dimensions	17 x 43.4 x 78.4 mm		
Weight	77 g	58 g	77 g
Typical Compliances	SMPTE 259M, 292M, 297-2006, EN50083-9		



EO-100B

EO-160



EO-100A-**

Ordering Information for EO100A-**

EO-100A - 47	Wavelength
27	1271nm
29	1291nm
31	1311nm
33	1331nm
35	1351nm
37	1371nm
43	1431nm
45	1451nm
47	1471nm
49	1491nm
51	1511nm
53	1531nm
55	1551nm
57	1571nm
59	1591nm
61	1611nm



OE-101B

OE-151

Analog Video Optical Converters

Model	Wavelength	Emission	Sensitivity	Occupancy
EO-700	1310 nm	-3.5 dBm	N/A	1 slot
EO-700A-**	1471-1611 nm for CWDM*	-2.5 dBm	N/A	
OE-701	1200-1620 nm	N/A	-26 dBm	

*Refer to the following information to specify the wavelength and the model number.

Key Features and Benefits

- Supports both NTSC and PAL video signals.
- Tri-level sync can be transmitted.
- SNR: 60 dB, Bandwidth: 6 MHz

Specifications

Model	EO-700, EO-700A	OE-701
Convertibility	Electric to Optic (TX)	Optic to Electric (RX)
Fiber Type	Single Mode	
Optical Connector	1 x SC (input)	
Video Connector	1 x 75 Ω BNC (output)	
Dimensions	17 x 43.4 x 78.4 mm	
Weight	84 g	
Typical Compliances	SMPTE 170M, ITU-R BT.470	



EO-700

OE-701

Ordering Information for EO-700A-**

EO-700A - 47	Wavelength
47	1471 nm
49	1491 nm
51	1511 nm
53	1531 nm
55	1551 nm
57	1571 nm
59	1591 nm
61	1611 nm

Note: Platform (power supply) is required to use Canare converters (see page15).

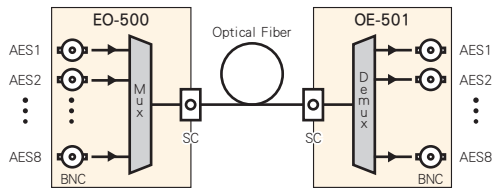
AES 3id Optical Converters

Model	Wavelength	Emission	Sensitivity	Occupancy
EO-500-**	1471-1611 nm for CWDM*	-3 dBm	N/A	5 slots
OE-501	1200-1620 nm	N/A	-26 dBm	

* Refer to the following information to specify the wavelength.

Key Features and Benefits

- Multiplex and optically convert AES signals from up to 8 ports (16 audio channels) to allow them to be transmitted over long distance.
- Supports 8 wavelengths CWDM; enables max. 64 ports (128 audio channels) signals to transmit over a single optical fiber.
- AES-3id-1995 and SMPTE 276M
- Fully asynchronous multiplex transmission.
- Word clock can be transmitted (30kHz to 50kHz).
- Dolby-E compatible



Specifications

Model	EO-500-**	OE-501
Convertibility	Electric to Optic	Optic to Electric
Fiber Type	Single Mode	
Optic Connector	1 x SC (output)	1 x SC (input)
AES I/O Connector	8 x 75Ω BNC (input)	8 x 75Ω BNC (output)
Dimensions	91 x 43.4 x 76.2 mm	
Weight	174 g	
Typical Compliances	AES-3id-1995, SMPTE 276M	

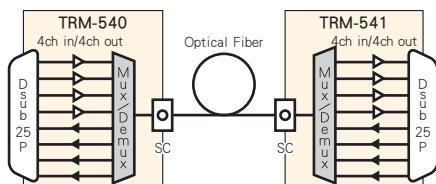
Analog Audio Optical Converters

Model	Wavelength	Occupancy	Remark
TRM-540	1310 nm	5 slots	Work with TRM-541.
TRM-541	1550 nm		Work with TRM-540.
TRM-540A-**	1471-1611 nm for CWDM (*1)		Work with TRM-540A-** of a different wavelength (*2).

*1) Refer to the following information to specify the wavelength and the model number.)
 *2) TRM-540A-** does not work with TRM-540 or TRM-541.

Key Features and Benefits

- Enables line level audio signals to transmit long distance over a fiber-optic cable.
- 8 channel transmission (4-channel inputs/4-channel outputs)
- Maximum input/output voltage: +24 dBu (balanced)
- Supports 600 ohm input by each channel with selector switches.



Block Diagram of TRM-540 and TRM541

Specifications

Model	TRM-540, TRM-541	TRM-540A-**
Fiber Type	Single Mode	
Optic I/O Connector	1 x SC	2 x LC
Audio I/O Connector	1x D sub 25 pin (F)	
Frequency Response	20 Hz - 40 kHz (-3 dB, +0.1 dB)	
Dimensions	91 x 43.4 x 78.4 mm	
Weight	265 g	



EO-500-55



OE-501

Ordering Information for EO-500-**

EO-500- [47]	Wavelength
47	1471 nm
49	1491 nm
51	1511 nm
53	1531 nm
55	1551 nm
57	1571 nm
59	1591 nm
61	1611 nm



TRM-540



TRM-541

Ordering Information for TRM-540A-**

TRM-540A- [47]	Wavelength
47	1471 nm
49	1491 nm
51	1511 nm
53	1531 nm
55	1551 nm
57	1571 nm
59	1591 nm
61	1611 nm

Note: Platform (power supply) is required to use Canare converters (see page15).

1000BASE-T Optical Converters

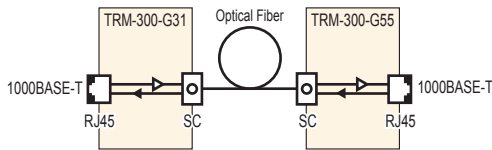
Model	Wavelength	Occupancy	Remark
TRM-300-G31	1310 nm	2 slots	Work with TRM-300-G55.
TRM-300-G55	1550 nm		Work with TRM-300-G31.
TRM-300A-G**	1471-1611 nm for CWDM (*1)		Work with TRM-300A-G** of a different wavelength (*2).

*1) Refer to the following information to specify the wavelength and the model number.

*2) TRM-300A-G** does not work with TRM-300-G31 or TRM-300-G55.

Key Features and Benefits

- Media converters for Gigabit Ethernet 1000BASE-T*
*No backwards compatibility with other Ethernet standards such as 100BASE-TX.
- Super-low latency: less than 1 micro-second.
- Extends communications up to 20 km (condition: line loss 0.5 dB/km)
- Bi-directional optical communication



Block Diagram of TRM-300-G31 and TRM-300-G55

Specifications

Model	TRM-300-G31, TRM-300-G55	TRM-300A-G**
Fiber Type	Single Mode	
Optic I/O Connector	1 x SC	2 x LC
Ethernet I/O Connector	1 x RJ45	
Dimensions	35.5 x 43.4 x 76 mm	
Weight (approx.)	155 g	
Typical Compliances	IEEE 802.3ab (1000BASE-T)	



TRM-300-G31



TRM-300-G55

Ordering Information for TRM-300A-G**

TRM-300A-G	Wavelength
47	1471 nm
49	1491 nm
51	1511 nm
53	1531 nm
55	1551 nm
57	1571 nm
59	1591 nm
61	1611 nm

100BASE-TX Optical Converters

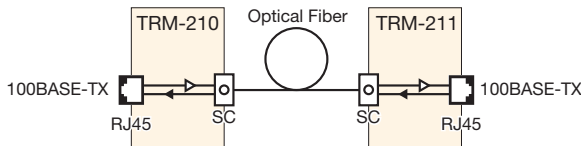
Model	Wavelength	Occupancy	Remark
TRM-210	1310 nm	2 slots	Work with TRM-211.
TRM-211	1550 nm		Work with TRM-210.
TRM-210A-**	1471-1611 nm for CWDM (*1)		Work with TRM-210A-** of a different wavelength (*2).

*1) Refer to the following information to specify the wavelength and the model number.

*2) TRM-210A-** does not work with TRM-210 or TRM-211.

Key Features and Benefits

- Media converters for Fast Ethernet 100BASE-TX*
*No backwards compatibility with other Ethernet standards such as 10BASE-T.
- Auto MDI/MDX
- Extends communications up to 30 km (condition: line loss 0.5 dB/km)
- Bi-directional optical communication



Block Diagram of TRM-210 and TRM-211

Specifications

Model	TRM-210, TRM-211	TRM-210A-**
Fiber Type	Single Mode	
Optic I/O Connector	1 x SC	2 x LC
Ethernet I/O Connector	1 x RJ45	
Dimensions	35.5 x 43.4 x 76.2 mm	
Weight (approx.)	103 g	110 g
Typical Compliances	IEEE 802.3u (100BASE-TX)	



TRM-210



TRM-211

Ordering Information for TRM-210A-**

TRM-210A-	Wavelength
47	1471 nm
49	1491 nm
51	1511 nm
53	1531 nm
55	1551 nm
57	1571 nm
59	1591 nm
61	1611 nm

Note: Platform (power supply) is required to use Canare converters (see page15).

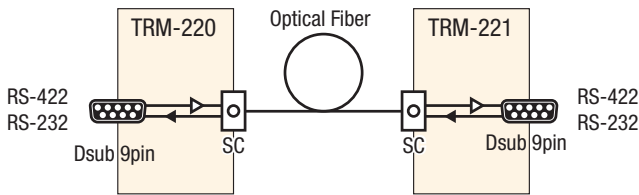
RS-422/RS-232 Optical Converters

Model	Wavelength	Occupancy	Remark
TRM-220	1310 nm	3 slots	Work with TRM-221.
TRM-221	1550 nm		Work with TRM-220.
TRM-220A-**	1471-1611 nm for CWDM (*1)		Work with TRM-220A-** of a different wavelength (*2).

*1) Refer to the following information to specify the wavelength and the model number.
 *2) TRM-220A-** does not work with TRM-220 or TRM-221.

Key Features and Benefits

- TIA-422, SMPTE 207M, RS-232
- Usable in a case of RS-422 <=> RS-232
- Extends communications up to 30 km (condition: line loss 0.5 dB/km)
- Bi-directional optical communication



Block Diagram of TRM-220 and TRM-221

Specifications

Model	TRM-220, TRM-221	TRM-220A-**
Fiber Type	Single Mode	
Optic I/O Connector	1 x SC	2 x LC
Serial I/O Port	1 x Dsub 9 pin (F)	
Max. Data Rate	RS-422: 10 Mbps, RS-232: 1 Mbps	
Dimensions	54 x 43.4 x 76.2 mm	
Weight (approx.)	110 g	120 g
Typical Compliances	TIA-422, SMPTE 207M, RS-232C	



TRM-220

TRM-221

Ordering Information for TRM-220A-**

TRM-220A- [47]	Wavelength
47	1471 nm
49	1491 nm
51	1511 nm
53	1531 nm
55	1551 nm
57	1571 nm
59	1591 nm
61	1611 nm

Note: Platform (power supply) is required to use Canare converters (see page15).

More Converters

Model	Occupancy
TRM-100	3 slots
TRM-101	

Multiplex and optically convert HD-SDI and RS-485 signal to transmit long distance over a fiber-optic cable. Suited for HD surveillance camera system.



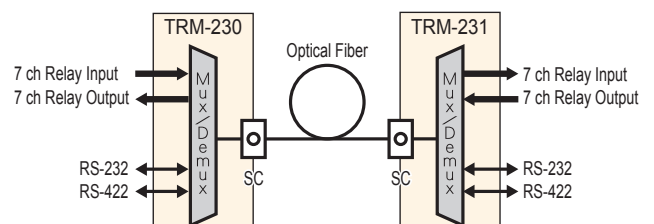
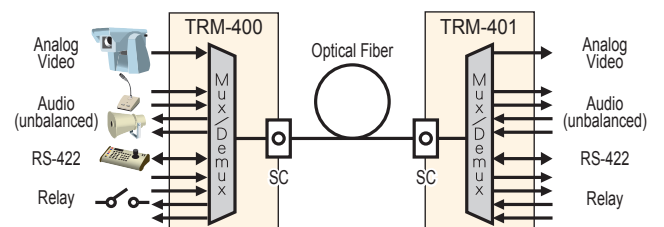
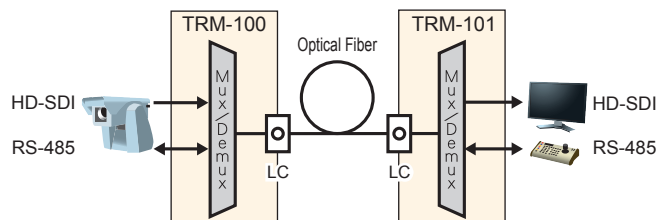
Model	Occupancy
TRM-400	3 slots
TRM-401	

Multiplex and optically convert analog video, stereo audio, RS-422, and relay signals to transmit long distance over a fiber-optic cable.



Model	Occupancy
TRM-230	3 slots
TRM-231	

Multiplex and optically convert 7 of each input/output relay signal and RS-422/232 signals to transmit long distance over a fiber-optic cable.



Note: Platform (power supply) is required to use Canare converters (see page15).

CWDM Mux/Demux

Slot-in Module Types

Model	Ch.	Wavelengths	Occupancy
FCWDM-8B	8	1471-1611 nm	8 slots
FCWDM-8B-13	8	1271-1451 nm	

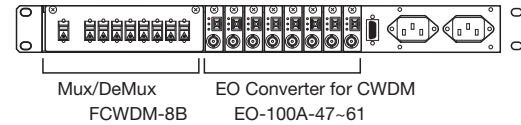
Rack Mount Types

Model	Ch.	Wavelengths	Size
FCWDM8/1A	8	1471-1611 nm	1RU
FCWDM8/1A-13	8	1271-1451 nm	
FCWDM8/2A	2 each of 8	2 each of 1471-1611 nm	
FCWDM8/2A-13	2 each of 8	2 each of 1271-1451 nm	
FCWDM16A	16	1271-1611 nm	

Key Features and Benefits

- Bi-directional 8 or 16 wavelengths.
- Passive and stand-alone products.
- Easy to use - Just plug in SC-type connectors.
- FCWDM-8B(-13) can be loaded into 161UPSC; enables 8-wavelength CWDM within 1RU frame.

<Loading example (rear view of 161UPSC)>



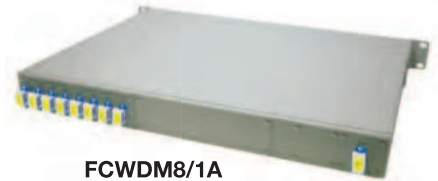
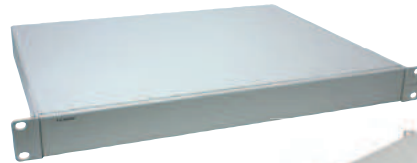
Specifications

Model	FCWDM-8B (-13)	FCWDM8/1A (-13)	FCWDM8/2A (-13)	FCWDM16A
Connectors	SC			
Passband	+/- 6.5 nm (ITU-T G.695)			
Min. Passband Ripple	0.5 dB			
Max. Insertion Loss*	2.0 dB		3.3 dB	
Min. Isolation	30 dB			
Dimensions (mm)	146 x 43.4 x 94.2	482.6 x 44 x 362.3		
Weight (approx.)	210 g	1700 g	1800 g	1890 g
Wavelengths Details (nm)	1271-1451: 1271/1291/1311/1331/1351/1371/1431/1451 1471-1611: 1471/1491/1511/1531/1551/1571/1591/1611			

* Insertion loss includes ripple, PDL, and connector loss



FCWDM-8B



FCWDM8/1A (Rear View)



FCWDM8/2A (Rear View)



FCWDM16A (Rear View)

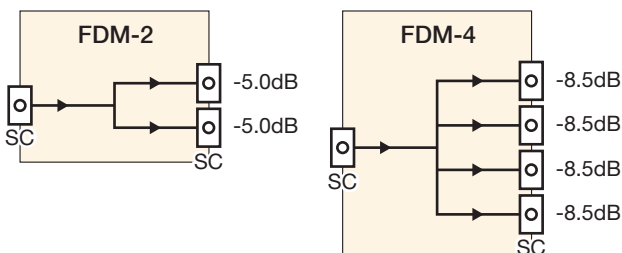
Optical Splitter

Model	Wavelength	Description
FDM-2	1261-1611 nm	1x2 Splitter for Single Mode Fiber
FDM-4		1x4 Splitter for Single Mode Fiber

Key Features and Benefits

- Divides single optical input into multiple optical output.
- Passive and stand-alone products.
- Can be loaded into platform for Canare plug-in unit.
- Easy to use - Just plug in SC-type connectors.
- Low insertion loss.

Insertion Loss



FDM-2

Slot Occupancy : 3 slots
Dimensions : 54 x 43.4 x 82 mm
Weight : 83g



FDM-4

Slot Occupancy : 4 slots
Dimensions : 72 x 43.4 x 82 mm
Weight : 110g

Platform

Power supply for Canare plug-in modules. The robust 1RU rack mountable and space efficient portable types are available.

Model	Description	Number of Slots
161UPSC-**	1RU rack mount type	16
6PSC-**	Portable type	6
2PSC	Palm size	2
PSM2-**	Redundant power supply module for 161UPSC	N/A

* Please fill in the ** using the following Region Code.


Type	161UPSC - AU	Region to use (see specifications below)
161UPSC	AU	Oceania
6PSC	C	China
PSM2	EU	EU
	GB	United Kingdom
	JP	Japan
	K	South Korea, no power cord attached
	UC	North America
	N	No power cord attached

* Please contact us for more detail.

Key Features and Benefits

- Compact design - Maximum 16 modules within 1RU
- Hot swappable
- 161UPSC can be output 4 types of alarm signals via Dsub 9P (F).
- 161UPSC will require a PSM2 for power supply redundancy.

Specifications

Model	161UPSC	6PSC	2PSC
Number of Slots	16	6	2
AC Input Voltage	100 to 240V 50/60Hz 0.35A		N/A
DC Input Voltage	N/A	10 to 18V	10 to 18V
Max Power Consumption (exclusive of modules)	22W	4.5W (AC) 2.2W (DC)	2.2W
Power Connector	AC3P Jack	AC3P Jack (AC) XLR4 Male (DC)	XLR4 Male
Supply Voltage to Module	DC 5V		
Operating Temperature	-10 to 40°C		
Typical Compliance	CB, CE, UL/cUL, KC (161UPSC-K, 6PSC-K, PSM2-K), FCC15B Class A, RoHS		
AC Power Cord Plug Type		N/A	N/A

3G-SDI SFP Optical Transceiver

The Small Form-factor Pluggable transceiver module specified by MSA (Multi-Source Agreement). TRP-300 improves 3G/HD-SDI camera quality through its superior performance in wide range temperature.

Model	Wavelength	Emission	Sensitivity
TRP-300-LN13	FP-LD 1310nm	-5 dBm	-23 dBm

Please contact us for ordering lot.

Key Features and Benefits

- Supports 3G/HD/SD-SDI
- Canare's exclusive "TC Tech" (Temperature-Compensation Technology)
- Log scale optical power monitoring
- Internal status monitoring via I2C bus

Specifications

Number of I/O ports	Input: 1, Output: 1
I/O Connector	LC
Fiber Type	Single Mode
Extinction Ratio	9 dB
Transmission Rate	50 Mbps to 2.97 Gbps
Pin Assignment	SFP MSA Compatible
Supply Voltage	3.3 V
Current Consumption	200 mA
Operating Temperature	-25 to 85 deg C
Complians	SMPTE 259M, 292M, 297-2006, 424M BTA S-004B, SFP MSA FDA 21 CFR Part 1040.10, 11 with Laser Notice No.50, IEC 60825-1: 2007, UL/cUL, DEMKO, CE, RoHS



161UPSC-**

Dimensions : 434 x 44 x 340 mm
Weight : 4500g



6PSC-**

Dimensions : 210 x 44 x 165 mm
Weight : 650g



2PSC

Dimensions : 90 x 44 x 110 mm
Weight : 200g

10-slot portable platform is also available.



10PSA-JP

Dimensions: 210 x 44 x 280 mm
Weight: 1200 g



TRP-300-LN13

Dimensions: 13.9 x 11.85 x 56.5 mm
Weight: 22g