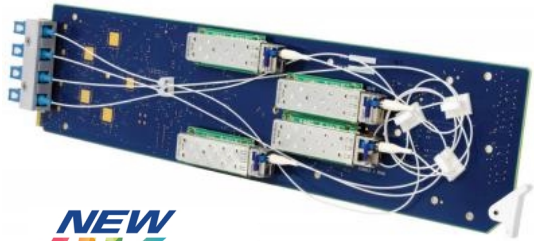COBALT

9400 Series · 4K/3G/HD/SD-SDI / ASI / MADI Multi-Channel 1310nm Fiber Optic Transports with Router Features

NEW 4K SOLUTION

The 9400-series Coax/Fiber transport cards provide a card-based solution for high-density distribution and multiplexing between discrete coaxial ("BNC") signals (such as 3G/HD/SD-SDI, ASI, and MADI) and fiber buses. Utilizing the openGear® open-architecture platform, the 9400-series offers scalable incorporation and the easy-to-use DashBoard™ setup and control operator interface.

The 9400-series cards offer I/O crosspoints, allowing easy to configure and flexible routing between card inputs and outputs. Up to 10 of any 9400-series cards can be installed in our 20-Slot frame, offering support for up to 40 BNC input/outputs and 40 fiber input/outputs in a single frame. In addition to SD/HD-SDI support, the cards support a wide range of signals/standards from 5 Mb/s to 3 Gb/s. The scalability of the 9400-series offers a high degree of flexibility and density, maximizing economy of both space and costs. Full user remote and card-edge monitor/control allows full card status and control access locally or across a standard Ethernet network.

BNC-to-Fiber (EO)		Fiber-to-BNC (OE)	
9401-EO	4 BNC In x 1 Fiber Out; 4x1 Router	**9411-OE**	1 Fiber In x 4 BNC Out; 1x4 DA
9402-EO	4 BNC In x 2 Fiber Out; 4x2 Router	**9412-OE**	2 Fiber In x 4 BNC Out; 2x4 Router
9403-EO	4 BNC In x 3 Fiber Out; 4x3 Router	**9413-OE**	3 Fiber In x 4 BNC Out; 3x4 Router
9404-EO	4 BNC In x 4 Fiber Out; 4x4 Router	**9414-OE**	4 Fiber In x 4 BNC Out; 4x4 Router

FEATURES

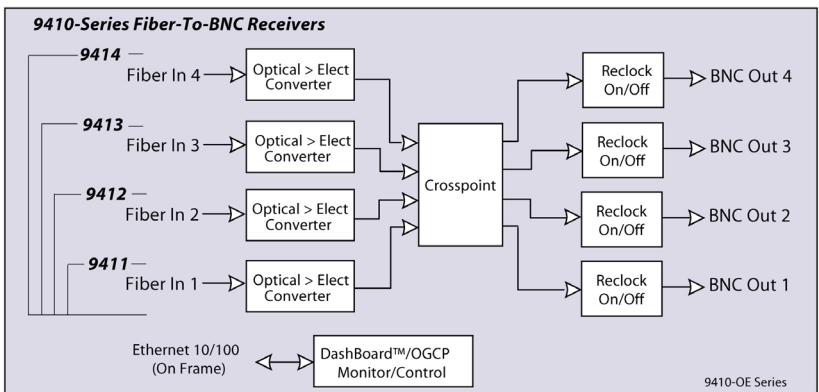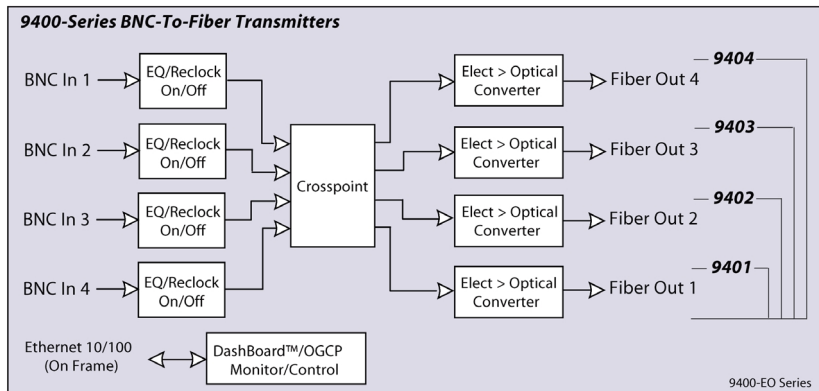Card-based design allows scalability with up to 40 BNC/Fiber interfaces per frame

Low power/high-density design; only 10 Watts max. per card

Full support of SMPTE 424M, 292M, 259M and SMPTE 310M, SMPTE 344M, SMPTE 305M, M2S, DVB-ASI, and MADI standards/formats
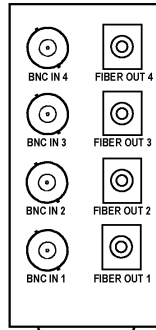
I/O router crosspoints on all models allow selectable and flexible crosspoint distribution and DA functions on same card

Remote control/monitoring via DashBoard™ software, with soft-configurable crosspoint, EQ on/off, and reclock on/off

Five year warranty

9400-Series BNC-To-Fiber Transmitters

BNC In 1 → EQ/Reclock On/Off → Crosspoint → Elect > Optical Converter → Fiber Out 4 — 9404
BNC In 2 → EQ/Reclock On/Off → Crosspoint → Elect > Optical Converter → Fiber Out 3 — 9403
BNC In 3 → EQ/Reclock On/Off → Crosspoint → Elect > Optical Converter → Fiber Out 2 — 9402
BNC In 4 → EQ/Reclock On/Off → Crosspoint → Elect > Optical Converter → Fiber Out 1 — 9401
Ethernet 10/100 (On Frame) ↔ DashBoard™/OGCP Monitor/Control
9400-EO Series

9410-Series Fiber-To-BNC Receivers

9414 — Fiber In 4 → Optical > Elect Converter → Crosspoint → Reclock On/Off → BNC Out 4
9413 — Fiber In 3 → Optical > Elect Converter → Crosspoint → Reclock On/Off → BNC Out 3
9412 — Fiber In 2 → Optical > Elect Converter → Crosspoint → Reclock On/Off → BNC Out 2
9411 — Fiber In 1 → Optical > Elect Converter → Crosspoint → Reclock On/Off → BNC Out 1
Ethernet 10/100 (On Frame) ↔ DashBoard™/OGCP Monitor/Control
9410-OE Series

openGear®

DashBoard

9400 Series • 4K/3G/HD/SD-SDI / ASI / MADI Multi-Channel 1310nm Fiber Optic Transports with Router Features

Note: FIBER OUT 4, 3, and 2 positions progressively depopulated on models 9403, 9402, and 9401, respectively.

RM20-9401-B thru RM20-9404-B
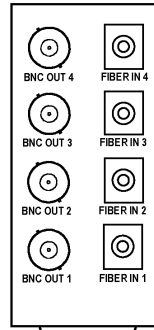
Note: FIBER IN 4, 3, and 2 positions progressively depopulated on models 9413, 9412, and 9411, respectively.

RM20-9411-B thru RM20-9414-B

SPECIFICATIONS

Electrical
Power: 10 watts (max)

General
Tx/Rx Fiber Range:
  Single-Mode optics; rates thru SD: 40 km (24.8 mi) max
  Single-Mode optics; rates thru HD: 24 km (14.9 mi) max
Fiber Connector:
  LC, ST, SC, or FC
Standards:
  SMPTE 259M-C, SMPTE 292M, SMPTE 425M, SMPTE 297M, DVB/ASI, HD-SDI (SMPTE 292M), SD-SDI (SMPTE 259M) with EDH, MADI (AES10-2003) (Not compatible with AES-3id (standard AES PCM))

9400-Series (EO)
Input Type: BNC, 75Ω
Input/Output Loop Return Loss:
  >15 dB up to 1.5 GHz
  >10 dB up to 3 GHz
Transmitter Wavelength:
  1310 nm Single Mode
Optical Power: -5 dBm to 0 dBm
Laser Power Range: Laser Class 1
Added Jitter: <0.03 UI under 1 MHz

9410-Series (OE)
Input Type: Fiber LC, ST, SC, or FC
Wavelength: 1100 to 1600nm
Optical Sensitivity:
  Pathological 3Gbps: -18 dBm
  Pathological HD-SDI: -20 dBm
Output Type: BNC, 75Ω
Output Return Loss:
  >15 dB up to 1.5 GHz
  >10 dB up to 3 GHz
Added Jitter: <0.03 UI under 1 MHz

ORDERING INFORMATION

9404-EO 4K/3G/HD/SD-SDI/ASI/MADI Quad-Channel 1310 nm Fiber Optic Transmitter with 4 BNC In/4 Fiber Out 4x4 Router

9403-EO 4K/3G/HD/SD-SDI/ASI/MADI Triple-Channel 1310 nm Fiber Optic Transmitter with 4 BNC In/3 Fiber Out 4x3 Router

9402-EO 4K/3G/HD/SD-SDI/ASI/MADI Dual-Channel 1310 nm Fiber Optic Transmitter with 4 BNC In/2 Fiber Out 4x2 Router

9401-EO 4K/3G/HD/SD-SDI/ASI/MADI Single-Channel 1310 nm Fiber Optic Transmitter with 4 BNC In/1 Fiber Out 4x1 Router

9414-EO 4K/3G/HD/SD-SDI/ASI/MADI Quad-Channel Fiber Optic Receiver with 4 Fiber In/4 BNC Out 4x4 Router

9413-EO 4K/3G/HD/SD-SDI/ASI/MADI Triple-Channel Fiber Optic Receiver with 3 Fiber In/4 BNC Out 3x4 Router

9412-EO 4K/3G/HD/SD-SDI/ASI/MADI Dual-Channel Fiber Optic Receiver with 2 Fiber In/4 BNC Out 2x4 Router

9411-EO 4K/3G/HD/SD-SDI/ASI/MADI Single-Channel Fiber Optic Receiver with 1 Fiber In/4 BNC Out 1x4 DA

RM20-9404-B 20-Slot Frame Rear I/O Module (Standard Width) 4 BNC In, 4 Fiber Out

RM20-9403-B 20-Slot Frame Rear I/O Module (Standard Width) 4 BNC In, 3 Fiber Out

RM20-9402-B 20-Slot Frame Rear I/O Module (Standard Width) 4 BNC In, 2 Fiber Out

RM20-9401-B 20-Slot Frame Rear I/O Module (Standard Width) 4 BNC In, 1 Fiber Out

RM20-9414-B 20-Slot Frame Rear I/O Module (Standard Width) 4 Fiber In, 4 BNC Out

RM20-9413-B 20-Slot Frame Rear I/O Module (Standard Width) 3 Fiber In, 4 BNC Out

RM20-9412-B 20-Slot Frame Rear I/O Module (Standard Width) 2 Fiber In, 4 BNC Out

RM20-9411-B 20-Slot Frame Rear I/O Module (Standard Width) 1 Fiber In, 4 BNC Out

Note: Add fiber connector suffix to part numbers above to specify fiber connection type (LC, ST, SC, FC). (For example, RM20-9404-B fitted with LC connectors is ordered as "RM20-9404-B-LC".)

COBALT

9400-EO-CWDML Series • 4K/3G/HD/SD-SDI/ASI/MADI EO CWDM Transmitters with Built-In Looping Fiber Mux

Coarse Wave Division Multiplexing (CWDM) offers a cost-effective, scalable, and convenient solution for multiplexing and de-multiplexing discrete coaxial channels onto a shared fiber trunk. The 9400-EO-CWDML series Coax-To-Fiber CWDM Transmitters with Built-In Fiber Mux allow up to four separate SDI, ASI, or MADI streams (per card) to be multiplexed onto a fiber-optic trunk using CWDM (the 9404 Quad-Wavelength EO card provides a ready solution for sending 4K quadrant-division content over a fiber transport). Available in numerous wavelength divisions and fiber connector types, the 9400-EO-CWDML series provide a card-based solution for high-density distribution and multiplexing between discrete coax signals and a fiber trunk. With up to four coaxial channels accommodated per card and 18 available discrete fiber wavelengths, the 9400-CWDML series can accommodate up to 18 discrete coax channels over a single fiber trunk. Utilizing the openGear® open-architecture platform, the 9400-EO-CWDML series offers scalable incorporation and the easy-to-use DashBoard™ setup and control operator interface.

NEW 4K SOLUTION

The CWDML series multiplexes up to four fiber wavelengths onto a shared fiber daisy-chain fiber in/fiber out path (the 9404 Quad-Wavelength EO card provides a ready solution for transporting 4K quadrant-division content over a single fiber path). With a single CWDML card multiplexing up to 4 BNC inputs onto a single fiber path, additional 9400-EO-CWDML transmitter cards with different wavelengths can also be daisy-chained into the same shared fiber path. **Requiring no external fiber muxes**, up to five CWDML-EO cards can be directly fitted into the daisy chain, providing muxing of **up to 18 discrete BNC inputs onto a single fiber path**. In addition to 3G/HD/SD-SDI support, the cards support a wide range of signals/standards from 5 Mb/s to 3Gb/s. Full user remote and card-edge monitor/control allows full card status and control access locally or across a standard Ethernet network using DashBoard remote control.

FEATURES

Card-based design allows scalability with up to 40 BNC/Fiber interfaces per frame

Available in quad, triple, dual, and single-wavelength E-to-O muxing versions (4-, 3-, 2-, or 1- coax muxing to shared fiber trunk). 9404 Quad-Wavelength version provides a ready solution for transporting 4K quadrant-division content over a single fiber path.

Low power/high-density design; only 10 Watts max. per card

Full support of 5Mbps thru 3Gbps transport conversions, with seamless auto-mode reclocking. No switches to set for different payloads.

Compatible with SMPTE 425, 292M, 259M, 310M, M2S, DVB-ASI, and MADI audio
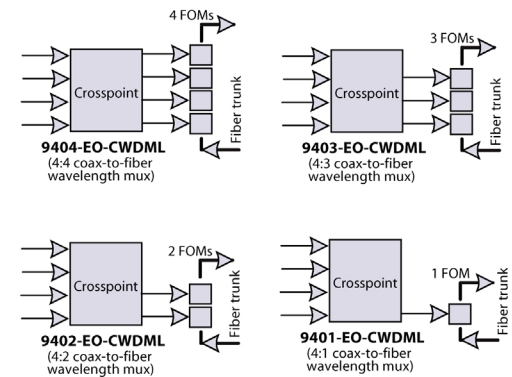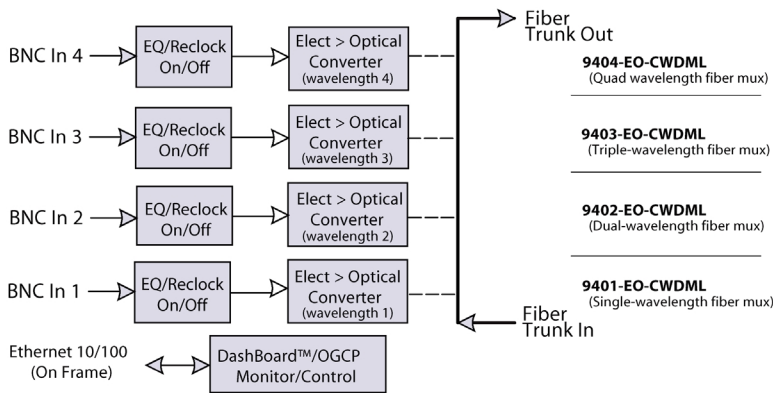
Status indicators for data rate and lock

Error-free pathological support

Available with LC, ST, SC, or FC fiber termination

Remote control/monitoring via DashBoard™ software, with soft-configurable crosspoint, EQ on/off, and reclock on/off.

Five year warranty

9400-EO-CWDML Series — CWDM Coax-To-Fiber Transmitters

SPECIFICATIONS

Electrical
Power: 10 watts (max)

General
Tx/Rx Fiber Range:
  Single-Mode optics; rates thru SD: 40 km (24.8 mi) max
  Single-Mode optics; rates thru HD: 24 km (14.9 mi) max
Fiber Connector Type:
  LC, ST, SC, or FC (see Ordering Information)

Input Type: (4) BNC, 75Ω
Standards:
  SMPTE 259M-C, SMPTE 292M, SMPTE 425M, SMPTE 297M, DVB/ASI, HD-SDI (SMPTE 292M), SD-SDI (SMPTE 259M) with EDH, MADI (AES10-2003) (Not compatible with AES-3id (standard AES PCM))
Input Loop Return Loss:
  >15 dB up to 1.5 GHz
  >10 dB up to 3 GHz

Fiber In/Out Loop: (2) fiber connector I/O pair
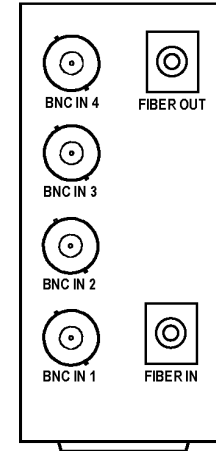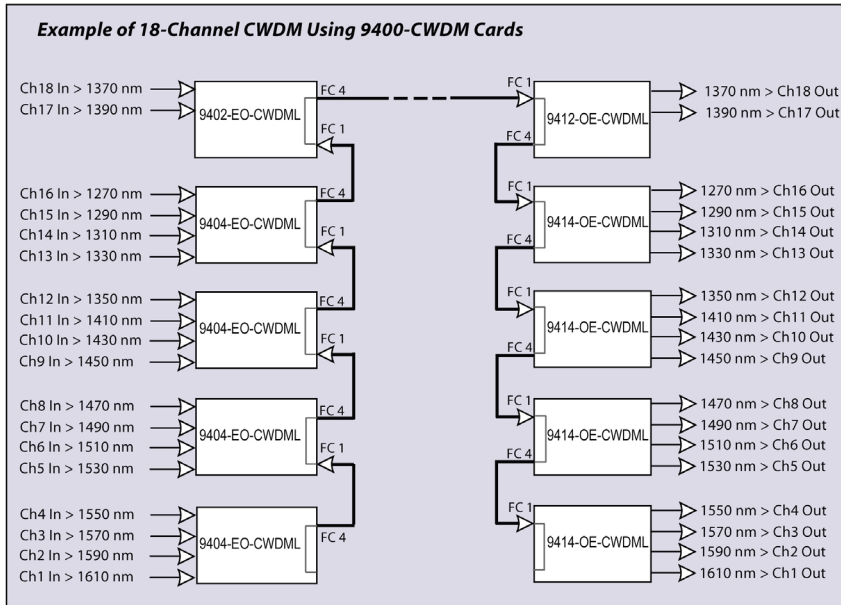Fiber Loop Input Optical Sensitivity:
  Pathological 3Gbps: -18 dBm
  Pathological HD-SDI: -20 dBm
Fiber Loop Optical Power: -5 dBm to 0 dBm
Laser Power Range: Laser Class 1
Added Jitter: <0.03 UI under 1 MHz

9400-EO-CWDML Series • 4K/3G/HD/SD-SDI/ASI/MADI EO CWDM Transmitters with Built-In Looping Fiber Mux

Example of 18-Channel CWDM Using 9400-CWDM Cards

Note: All models have four BNC IN connectors (as shown) which are routable to card fiber channels. On models with less than 4 fiber channels, not all four BNCs can be routed simultaneously to the fiber trunk.

RM20-9401-B-XX-CWDML
thru
RM20-9404-B-XX-CWDML

The orderable wavelengths provide for a simple "building-block" approach to provisioning channel mux/de-mux onto a single fiber pipeline. Shown here is the maximum wavelength complement available accommodating 18 channels. Provisioning is as simple as using one or more card transmitter models, and then using the companion receiver models having the same fiber-channel count and wavelengths. (For example, an 8-channel setup can use two 9404-EO-CWDM transmitter cards, and then use two companion 9414-OE-CWDM receiver cards ordered with the same wavelength blocks (for example, "1270-1290-1310-1330" and "1350-1410-1430-1450" respectively for the two TX and RX cards.)

ORDERING INFORMATION

9404-EO-CWDML-WX-WX-WX-WX 4K/3G/HD/SD-SDI/ASI/MADI CWDM Quad-Wavelength/Channel Transmitter with 4 BNC In, Looping Fiber I/O, and 4x4 Router Feature (please substitute wavelength code in place of each "-WX" in part number when ordering; see Note (2) below)

9403-EO-CWDML-WX-WX-WX 4K/3G/HD/SD-SDI/ASI/MADI CWDM Triple-Wavelength/Channel Transmitter with 4 BNC In, Looping Fiber I/O, and 4x3 Router Feature (please substitute wavelength code in place of each "-WX" in part number when ordering; see Note (2) below)

9402-EO-CWDML-WX-WX 4K/3G/HD/SD-SDI/ASI/MADI CWDM Dual-Wavelength/Channel Transmitter with 4 BNC In, Looping Fiber I/O, and 4x2 Router Feature (please substitute wavelength code in place of each "-WX" in part number when ordering; see Note (2) below)

9401-EO-CWDML-WX 4K/3G/HD/SD-SDI/ASI/MADI CWDM Single-Wavelength/Channel Transmitter with 4 BNC In, Looping Fiber I/O, and 4x1 Router Feature (please substitute wavelength code in place of "-WX" in part number when ordering; see Note (2) below)

RM20-9404-B-XX-CWDML 20-Slot Frame Rear I/O Module (Standard Width) 4 BNC In, Fiber I/O Loop (please substitute fiber connector type in place of "-XX" in part number when ordering; see Note (3) below)

RM20-9403-B-XX-CWDML 20-Slot Frame Rear I/O Module (Standard Width) 4 BNC In, Fiber I/O Loop (please substitute fiber connector type in place of "-XX" in part number when ordering; see Note (3) below)

RM20-9402-B-XX-CWDML 20-Slot Frame Rear I/O Module (Standard Width) 4 BNC In, Fiber I/O Loop (please substitute fiber connector type in place of "-XX" in part number when ordering; see Note (3) below)

RM20-9401-B-XX-CWDML 20-Slot Frame Rear I/O Module (Standard Width) 4 BNC In, Fiber I/O Loop (please substitute fiber connector type in place of "-XX" in part number when ordering; see Note (3) below)

Notes:

(1) Rear modules for all models are equipped with four input BNCs which are cross-routable to the muxing Fiber Optic Module(s). For example, the 9403-EO-CWDML model has four BNC inputs which are routable to any three fiber muxing FOMs (with one input being left unused).

(2) Use fiber wavelength codes for card Fiber Optic Modules (FOMs) when ordering. Available wavelengths (in nm) are as follows: 1270, 1290, 1310, 1330, 1350, 1410, 1430, 1450, 1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610. In "WX" places in part number, substitute code for wavelengths in each place as listed below:

-27: 1270nm   -29: 1290nm   -31: 1310nm   -33: 1330nm
-35: 1350nm   -41: 1410nm   -43: 1430nm   -45: 1450nm
-47: 1470nm   -49: 1490nm   -51: 1510nm   -53: 1530nm
-55: 1550nm   -57: 1570nm   -59: 1590nm   -61: 1610nm   (Example: For wavelengths 1270-1290-1310-1330 for 9404 card, order as "9404-EO-CWDML-27-29-31-33")

(3) Add fiber connector suffix to part numbers to specify fiber connection type (LC, ST, SC, FC) when ordering. (Example: For RM20-9404-B-XX-CWDML with type LC fiber connectors, order as "RM20-9404-B-LC-CWDML".)

(4) Make certain when ordering companion OE (Receiver) cards that the same wavelength groupings are correspondingly also specified.

9410-OE-CWDML Series • 4K/3G/HD/SD-SDI/ASI/MADI OE CWDM Receivers with Built-In Looping Fiber De-Mux

NEW 4K SOLUTION

Coarse Wave Division Multiplexing (CWDM) offers a cost-effective, scalable, and convenient solution for multiplexing and de-multiplexing discrete coaxial channels onto a shared fiber trunk. The 9400-EO-CWDML series Coax-To-Fiber CWDM Transmitters with Built-In Fiber Mux allow up to four separate SDI, ASI, or MADI streams (per card) to be multiplexed onto a fiber-optic trunk using CWDM (the 9414 Quad-Wavelength OE card provides a ready solution for retrieving 4K quadrant-division content from fiber transports). Available in numerous wavelength divisions and fiber connector types, the 9400-EO-CWDML series provide a card-based solution for high-density distribution and multiplexing between discrete coax signals and a fiber trunk. With up to four coaxial channels accommodated per card and 18 available discrete fiber wavelengths, the 9400-CWDML series can accommodate up to 18 discrete coax channels over a single fiber trunk. Utilizing the openGear® open-architecture platform, the 9400-EO-CWDML series offers scalable incorporation and the easy-to-use DashBoard™ setup and control operator interface.

The CWDML series multiplexes up to four fiber wavelengths onto a shared fiber daisy-chain fiber in/fiber out path. With a single CWDML card multiplexing up to 4 BNC inputs onto a single fiber path, additional 9400-EO-CWDML transmitter cards with different wavelengths can also be daisy-chained into the same shared fiber path. **Requiring no external fiber muxes**, up to five CWDML-EO cards can be directly fitted into the daisy chain, providing muxing of **up to 18 discrete BNC inputs onto a single fiber path**. In addition to 3G/HD/SD-SDI support, the cards support a wide range of signals/standards from 5 Mb/s to 3Gb/s. Full user remote and card-edge monitor/control allows full card status and control access locally or across a standard Ethernet network using DashBoard remote control.

FEATURES

Card-based design allows scalability with up to 40 BNC/Fiber interfaces per frame

Available in quad, triple, dual, and single-wavelength O-to-E de-muxing versions (4-, 3-, 2-, or 1- coax de-muxing from shared fiber trunk). 9414 Quad-Wavelength version provides a ready solution for retrieving 4K quadrant-division content from a single fiber path.

Low power/high-density design; only 10 Watts max. per card

Full support of 5Mbps thru 3Gbps transport conversions, with seamless auto-mode reclocking. No switches to set for different payloads.

Compatible with SMPTE 425, 292M, 259M, 310M, M2S, DVB-ASI, and MADI audio
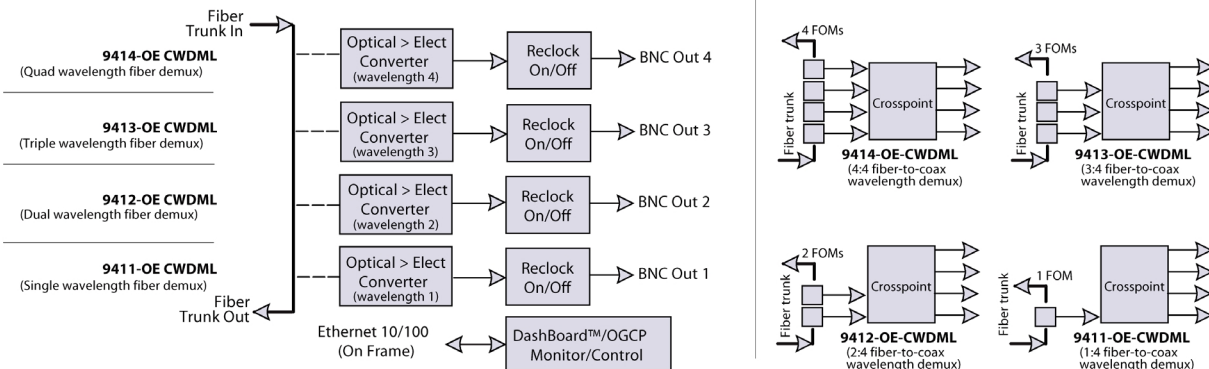
Status indicators for data rate and lock

Error-free pathological support

Available with LC, ST, SC, or FC fiber termination

Remote control/monitoring via DashBoard™ software, with soft-configurable crosspoint, EQ on/off, and reclock on/off.

Five year warranty

9410-OE-CWDML Series — CWDM Fiber-To-Coax Receivers

SPECIFICATIONS

Electrical
Power: 10 watts (max)

General
Tx/Rx Fiber Range:
  Single-Mode optics; rates thru SD: 40 km (24.8 mi) max
  Single-Mode optics; rates thru HD: 24 km (14.9 mi) max
Fiber Connector Type:
  LC, ST, SC, or FC (see Ordering Information)

Output Type: (4) BNC, 75Ω
Standards:
  SMPTE 259M-C, SMPTE 292M, SMPTE 425M, SMPTE 297M, DVB/ASI, HD-SDI (SMPTE 292M), SD-SDI (SMPTE 259M) with EDH, MADI (AES10-2003) (Not compatible with AES-3id (standard AES PCM))
Input Loop Return Loss:
  >15 dB up to 1.5 GHz
  >10 dB up to 3 GHz

Fiber In/Out Loop: (2) fiber connector I/O pair
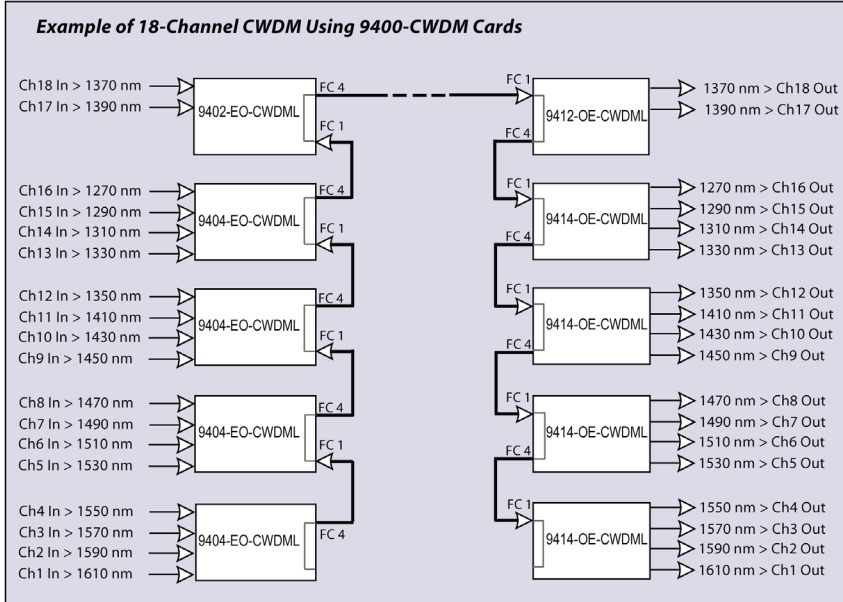Fiber Loop Input Optical Sensitivity:
  Pathological 3Gbps: -18 dBm
  Pathological HD-SDI: -20 dBm
Fiber Loop Optical Power: -5 dBm to 0 dBm
Laser Power Range: Laser Class 1
Added Jitter: <0.03 UI under 1 MHz

COBALT

Example of 18-Channel CWDM Using 9400-CWDM Cards

The orderable wavelengths provide for a simple "building-block" approach to provisioning channel mux/de-mux onto a single fiber pipeline. Shown here is the maximum wavelength complement available accommodating 18 channels. Provisioning is as simple as using one or more card transmitter models, and then using the companion receiver models having the same fiber-channel count and wavelengths. (For example, an 8-channel setup can use two 9404-EO-CWDML transmitter cards, and then use two companion 9414-OE-CWDML receiver cards ordered with the same wavelength blocks (for example, "1270-1290-1310-1330" and "1350-1410-1430-1450" respectively for the two TX and RX cards.)

Note: All models have four BNC OUT connectors (as shown) which are routable from card fiber channels. On models with less than 4 fiber channels, "extra" BNCs can serve as DA outputs for a particular fiber channel.

RM20-9411-B-XX-CWDML
thru
RM20-9414-B-XX-CWDML

ORDERING INFORMATION

9414-OE-CWDML-WX-WX-WX-WX 4K/3G/HD/SD-SDI/ASI/MADI CWDM Looping Quad-Wavelength/Channel Fiber Optic Receiver with 1 Looping Fiber I/O, 4 BNC Out, and 4x4 Router Feature (please substitute wavelength code in place of each "-WX" in part number when ordering; see Note (2) below)

9413-OE-CWDML-WX-WX-WX 4K/3G/HD/SD-SDI/ASI/MADI CWDM Looping Triple-Wavelength/Channel Fiber Optic Receiver with 1 Looping Fiber I/O, 4 BNC Out, and 3x4 Router Feature (please substitute wavelength code in place of each "-WX" in part number when ordering; see Note (2) below)

9412-OE-CWDML-WX-WX 4K/3G/HD/SD-SDI/ASI/MADI CWDM Looping Dual-Wavelength/Channel Fiber Optic Receiver with 1 Looping Fiber I/O, 4 BNC Out, and 2x4 Router Feature (please substitute wavelength code in place of each "-WX" in part number when ordering; see Note (2) below)

9411-OE-CWDML-WX 4K/3G/HD/SD-SDI/ASI/MADI CWDM Looping Single-Wavelength/Channel Fiber Optic Receiver with 1 Looping Fiber I/O, 4 BNC Out, and 1x4 DA Feature (please substitute wavelength code in place of "-WX" in part number when ordering; see Note (2) below)

RM20-9414-B-XX-CWDML 20-Slot Frame Rear I/O Module (Standard Width) Fiber I/O Loop, 4 BNC Out (please substitute fiber connector type in place of "-XX" in part number when ordering; see Note (3) below)

RM20-9413-B-XX-CWDML 20-Slot Frame Rear I/O Module (Standard Width) Fiber I/O Loop, 4 BNC Out (please substitute fiber connector type in place of "-XX" in part number when ordering; see Note (3) below)

RM20-9412-B-XX-CWDML 20-Slot Frame Rear I/O Module (Standard Width) Fiber I/O Loop, 4 BNC Out (please substitute fiber connector type in place of "-XX" in part number when ordering; see Note (3) below)

RM20-9411-B-XX-CWDML 20-Slot Frame Rear I/O Module (Standard Width) Fiber I/O Loop, 4 BNC Out (please substitute fiber connector type in place of "-XX" in part number when ordering; see Note (3) below)

Notes:
(1) Rear modules for all models are equipped with four output BNCs which are cross-routable from the de-muxing Fiber Optic Module(s). For example, the 9413-OE-CWDML model has four BNC outputs which can receive de-muxed outputs from any three fiber de-muxing FOMs. ("Extra" or "leftover" BNCs can be used as copy DA channels if desired).
(2) Use fiber wavelength codes for card Fiber Optic Modules (FOMs) when ordering. Available wavelengths (in nm) are as follows: 1270, 1290, 1310, 1330, 1350, 1410, 1430, 1450, 1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610. In "WX" places in part number, substitute code for wavelengths in each place as listed below:
-27: 1270nm   -29: 1290nm   -31: 1310nm   -33: 1330nm
-35: 1350nm   -41: 1410nm   -43: 1430nm   -45: 1450nm
-47: 1470nm   -49: 1490nm   -51: 1510nm   -53: 1530nm
-55: 1550nm   -57: 1570nm   -59: 1590nm   -61: 1610nm   (Example: For wavelengths 1270-1290-1310-1330 for 9414 card, order as "9414-OE-CWDML-27-29-31-33")
(3) Add fiber connector suffix to part numbers to specify fiber connection type (LC, ST, SC, FC) when ordering. (Example: For RM20-9414-B-XX-CWDML with type LC fiber connectors, order as "RM20-9414-B-LC-CWDML".)
(4) Make certain when ordering companion EO (Transmitter) cards that the same wavelength groupings are correspondingly also specified.

9400-EO-CWDM Series • 4K/3G/HD/SD-SDI/ASI/MADI EO CWDM Transmitters

NEW 4K SOLUTION

Coarse Wave Division Multiplexing (CWDM) offers a cost-effective, scalable, and convenient solution for multiplexing and de-multiplexing discrete coaxial channels onto a shared fiber trunk. The 9400-EO-CWDM series Coax-To-Fiber CWDM Transmitters allow up to four separate SDI, ASI, or MADI streams (per card) to be multiplexed onto fiber-optic trunks using CWDM. Available in numerous wavelength divisions and fiber connector types, the 9400-EO-CWDM series provide a card-based solution for high-density distribution and multiplexing between discrete coax signals and fiber trunks. With up to four coaxial channels accommodated per card and 18 available discrete fiber wavelengths, the 9400-CWDM series can accommodate up to 18 discrete coax channels. Utilizing the openGear® open-architecture platform, the 9400-EO-CWDM series offers scalable incorporation and the easy-to-use DashBoard™ setup and control operator interface.

The CWDM series provides E-O conversion of up to four BNC inputs to up to four fiber CWDM wavelengths. An external mux/de-mux (such as our BBG-4490-CWDM Modular Multi-Channel Fiber Optical Multiplexers/De-Multiplexer) can combine the card individual CWDM fiber outputs onto a single shared fiber trunk, if desired. In addition to 3G/HD/SD-SDI support, the cards support a wide range of signals/standards from 5 Mb/s to 3Gb/s. Full user remote and card-edge monitor/control allows full card status and control access locally or across a standard Ethernet network using DashBoard remote control.

FEATURES

Card-based design allows scalability with up to 40 BNC/Fiber interfaces per frame

Available in quad, triple, dual, and single-wavelength E-to-O versions

Low power/high-density design; only 10 Watts max. per card

Full support of 5Mbps thru 3Gbps transport conversions, with seamless auto-mode reclocking. No switches to set for different payloads.

Compatible with SMPTE 425, 292M, 259M, 310M, M2S, DVB-ASI, and MADI audio

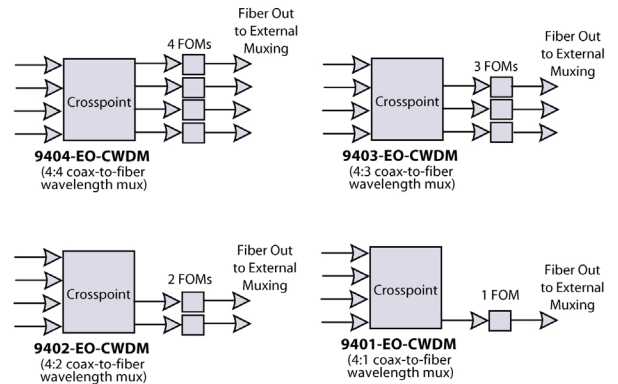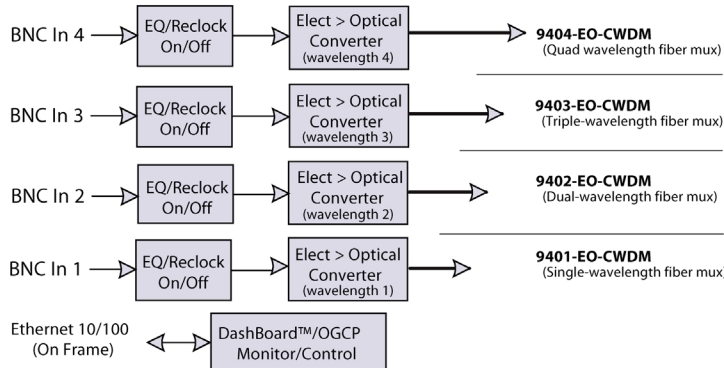Status indicators for data rate and lock

Error-free pathological support

Available with LC, ST, SC, or FC fiber termination

Remote control/monitoring via DashBoard™ software, with soft-configurable crosspoint, EQ on/off, and reclock on/off.

Five year warranty

9400-EO-CWDM Series — CWDM Coax-To-Fiber Transmitters

SPECIFICATIONS

Electrical
Power: 10 watts (max)

General
Tx/Rx Fiber Range:
Single-Mode optics; rates thru SD: 40 km (24.8 mi) max
Single-Mode optics; rates thru HD: 24 km (14.9 mi) max
Fiber Connector Type:
LC, ST, SC, or FC (see Ordering Information)

Input Type: (4) BNC, 75Ω
Standards:
SMPTE 259M-C, SMPTE 292M, SMPTE 425M, SMPTE 297M, DVB/ASI, HD-SDI (SMPTE 292M), SD-SDI (SMPTE 259M) with EDH, MADI (AES10-2003) (Not compatible with AES-3id (standard AES PCM))
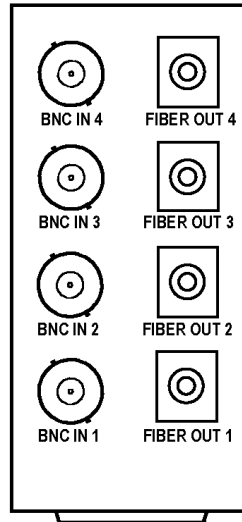Fiber Outputs:
9401-EO-CWDM: (1)
9402-EO-CWDM: (2)
9403-EO-CWDM: (3)
9404-EO-CWDM: (4)
For wavelengths, see Ordering Information

Fiber Loop Optical Power: -5 dBm to 0 dBm
Laser Power Range: Laser Class 1
Added Jitter: <0.03 UI under 1 MHz

COBALT

BNC IN 4 **FIBER OUT 4**

BNC IN 3 **FIBER OUT 3**

BNC IN 2 **FIBER OUT 2**

BNC IN 1 **FIBER OUT 1**

Note: FIBER OUT 4, 3, and 2 positions progressively depopulated on models 9403, 9402, and 9401, respectively.

RM20-9401-B-XX-CWDM thru
RM20-9404-B-XX-CWDM

ORDERING INFORMATION

9404-EO-CWDM-WX-WX-WX-WX 4K/3G/HD/SD-SDI/ASI/MADI CWDM Quad-Wavelength/Channel Transmitter with 4 BNC In, 4 Fiber Out, and 4x4 Router Feature (please substitute wavelength code in place of each "-WX" in part number when ordering; see Note (2) below)

9403-EO-CWDM-WX-WX-WX 4K/3G/HD/SD-SDI/ASI/MADI CWDM Triple-Wavelength/Channel Transmitter with 4 BNC In, 3 Fiber Out, and 4x3 Router Feature (please substitute wavelength code in place of each "-WX" in part number when ordering; see Note (2) below)

9402-EO-CWDM-WX-WX 4K/3G/HD/SD-SDI/ASI/MADI CWDM Dual-Wavelength/Channel Transmitter with 4 BNC In, 2 Fiber Out, and 4x2 Router Feature (please substitute wavelength code in place of each "-WX" in part number when ordering; see Note (2) below)

9401-EO-CWDM-WX 4K/3G/HD/SD-SDI/ASI/MADI CWDM Single-Wavelength/ Channel Transmitter with 4 BNC In, 1 Fiber Out, and 4x1 Router Feature (please substitute wavelength code in place of "-WX" in part number when ordering; see Note (2) below)

RM20-9404-B-XX-CWDM 20-Slot Frame Rear I/O Module (Standard Width) 4 BNC In, 4 Fiber Out (please substitute fiber connector type in place of "-XX" in part number when ordering; see Note (3) below)

RM20-9403-B-XX-CWDM 20-Slot Frame Rear I/O Module (Standard Width) 4 BNC In, 3 Fiber Out (please substitute fiber connector type in place of "-XX" in part number when ordering; see Note (3) below)

RM20-9402-B-XX-CWDM 20-Slot Frame Rear I/O Module (Standard Width) 4 BNC In, 2 Fiber Out (please substitute fiber connector type in place of "-XX" in part number when ordering; see Note (3) below)

RM20-9401-B-XX-CWDM 20-Slot Frame Rear I/O Module (Standard Width) 4 BNC In, 1 Fiber Out (please substitute fiber connector type in place of "-XX" in part number when ordering; see Note (3) below)

Notes:
(1) Rear modules for all models are equipped with four input BNCs which are cross-routable to the Fiber Optic Module(s). For example, the 9403-EO-CWDM model has four BNC inputs which are routable to any three fiber FOMs (with one input being left unused).
(2) Use fiber wavelength codes for card Fiber Optic Modules (FOMs) when ordering. Available wavelengths (in nm) are as follows: 1270, 1290, 1310, 1330, 1350, 1410, 1430, 1450, 1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610. In "WX" places in part number, substitute code for wavelengths in each place as listed below:
-27: 1270nm   -29: 1290nm   -31: 1310nm   -33: 1330nm
-35: 1350nm   -41: 1410nm   -43: 1430nm   -45: 1450nm
-47: 1470nm   -49: 1490nm   -51: 1510nm   -53: 1530nm
-55: 1550nm   -57: 1570nm   -59: 1590nm   -61: 1610nm   (Example: For wavelengths 1270-1290-1310-1330 for 9404 card, order as "9404-EO-CWDM-27-29-31-33")
(3) Add fiber connector suffix to part numbers to specify fiber connection type (LC, ST, SC, FC) when ordering. (Example: For RM20-9404-B-XX-CWDM with type LC fiber connectors, order as "RM20-9404-B-LC-CWDM".)
(4) Make certain when ordering companion OE (Receiver) cards that the same wavelength groupings are correspondingly also specified.

9410-OE-CWDM Series • 4K/3G/HD/SD-SDI/ASI/MADI OE CWDM Receivers

Coarse Wave Division Multiplexing (CWDM) offers a cost-effective, scalable, and convenient solution for multiplexing and de-multiplexing discrete coaxial channels onto a shared fiber trunk. The 9410-OE-CWDM series Fiber-To-Coax CWDM receivers receive up to four separate SDI, ASI, or MADI streams (per card) from de-multiplexed fiber-optic CWDM sources. Available in numerous wavelength divisions and fiber connector types, the 9410-OE-CWDM series provide a card-based solution for high-density distribution between discrete coax signals and fiber trunks. With up to four coaxial channels accommodated per card and 18 available discrete fiber wavelengths, the 9410-CWDM series can accommodate up to 18 discrete coax channels. Utilizing the openGear® open-architecture platform, the 9410-OE-CWDM series offers scalable incorporation and the easy-to-use DashBoard™ setup and control operator interface.

NEW 4K SOLUTION

The 9410-OE-CWDM series provides O-E conversion of up to four BNC outputs from up to four fiber CWDM wavelengths per card. An external mux/de-mux (such as our BBG-4490-CWDM Modular Multi-Channel Fiber Optical Multiplexer/De-Multiplexer) can provide the de-multiplexed fiber inputs to these cards. In addition to 3G/HD/SD-SDI support, the cards support a wide range of signals/standards from 5 Mb/s to 3Gb/s. Full user remote and card-edge monitor/control allows full card status and control access locally or across a standard Ethernet network using DashBoard remote control.

FEATURES

Card-based design allows scalability with up to 40 BNC/Fiber interfaces per frame

Available in quad, triple, dual, and single-wavelength O-to-E versions. All models have four BNC connectors which provide DA or router functions from the fiber input(s) to the four BNCs.

Low power/high-density design; only 10 Watts max. per card

Full support of 5Mbps thru 3Gbps transport conversions, with seamless auto-mode reclocking. No switches to set for different payloads.

Compatible with SMPTE 425, 292M, 259M, 310M, M2S, DVB-ASI, and MADI audio
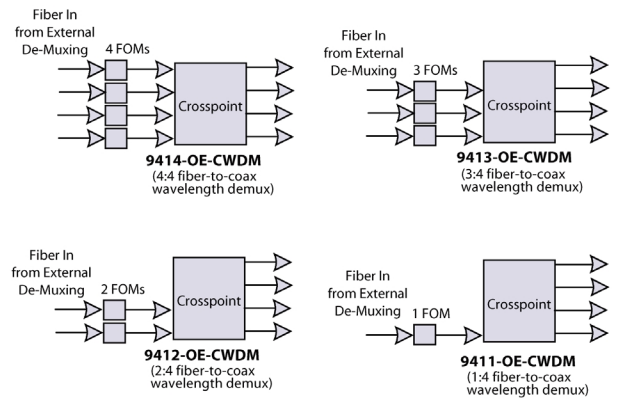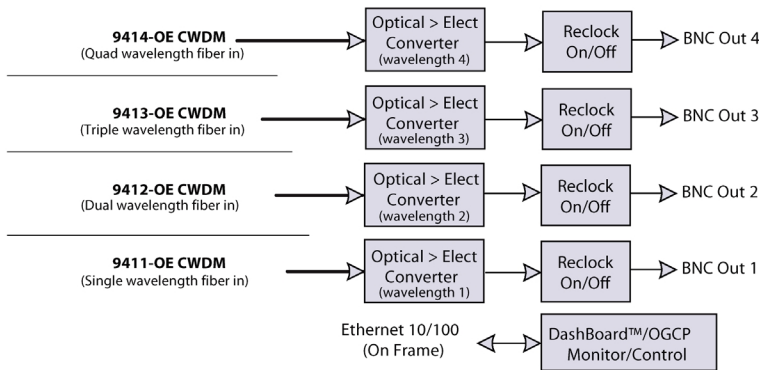
Status indicators for data rate and lock

Error-free pathological support

Available with LC, ST, SC, or FC fiber termination

Remote control/monitoring via DashBoard™ software, with soft-configurable crosspoint, EQ on/off, and reclock on/off.

Five year warranty

9410-OE-CWDM Series— CWDM Fiber-To-Coax Receivers

SPECIFICATIONS

Electrical
Power: 10 watts (max)

General
Tx/Rx Fiber Range:
 Single-Mode optics; rates thru SD: 40 km (24.8 mi) max
 Single-Mode optics; rates thru HD: 24 km (14.9 mi) max
Fiber Connector Type:
 LC, ST, SC, or FC (see Ordering Information)

Output Type: (4) BNC, 75Ω
Standards:
 SMPTE 259M-C, SMPTE 292M, SMPTE 425M, SMPTE 297M, DVB/ASI, HD-SDI (SMPTE 292M), SD-SDI (SMPTE 259M) with EDH, MADI (AES10-2003) (Not compatible with AES-3id (standard AES PCM))

Fiber Inputs:
 9411-OE-CWDM: (1)
 9412-OE-CWDM: (2)
 9413-OE-CWDM: (3)
 9414-OE-CWDM: (4)
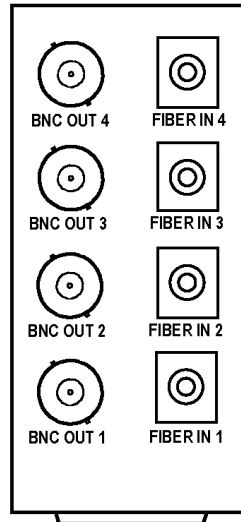 For wavelengths, see Ordering Information
Fiber Input Optical Sensitivity:
 Pathological 3Gbps: -18 dBm
 Pathological HD-SDI: -20 dBm
Input Return Loss:
 >15 dB up to 1.5 GHz
 >10 dB up to 3 GHz
Added Jitter: <0.03 UI under 1 MHz

BNC OUT 4   FIBER IN 4

BNC OUT 3   FIBER IN 3

BNC OUT 2   FIBER IN 2

BNC OUT 1   FIBER IN 1

Note: FIBER IN 4, 3, and 2 positions progressively depopulated on models 9413, 9412, and 9411, respectively.

RM20-9411-B-XX-CWDM thru
RM20-9414-B-XX-CWDM

ORDERING INFORMATION

9414-OE-CWDM-WX-WX-WX-WX 4K/3G/HD/SD-SDI/ASI/MADI CWDM Quad-Wavelength/Channel Fiber Optic Receiver with 4 Fiber In, 4 BNC Out, and 4x4 Router Feature (please substitute wavelength code in place of each "-WX" in part number when ordering; see Note (2) below)

9413-OE-CWDM-WX-WX-WX 4K/3G/HD/SD-SDI/ASI/MADI CWDM Triple-Wavelength/Channel Fiber Optic Receiver with 3 Fiber In, 4 BNC Out, and 3x4 Router Feature (please substitute wavelength code in place of each "-WX" in part number when ordering; see Note (2) below)

9412-OE-CWDM-WX-WX 4K/3G/HD/SD-SDI/ASI/MADI CWDM Dual-Wavelength/Channel Fiber Optic Receiver with 2 Fiber In, 4 BNC Out, and 2x4 Router Feature (please substitute wavelength code in place of each "-WX" in part number when ordering; see Note (2) below)

9411-OE-CWDM-WX 4K/3G/HD/SD-SDI/ASI/MADI CWDM Single-Wavelength/Channel Fiber Optic Receiver with 1 Fiber In, 4 BNC Out, and 1x4 DA Feature (please substitute wavelength code in place of "-WX" in part number when ordering; see Note (2) below)

RM20-9414-B-XX-CWDM 20-Slot Frame Rear I/O Module (Standard Width) 4 Fiber In, 4 BNC Out (please substitute fiber connector type in place of "-XX" in part number when ordering; see Note (3) below)

RM20-9413-B-XX-CWDM 20-Slot Frame Rear I/O Module (Standard Width) 3 Fiber In, 4 BNC Out (please substitute fiber connector type in place of "-XX" in part number when ordering; see Note (3) below)

RM20-9412-B-XX-CWDM 20-Slot Frame Rear I/O Module (Standard Width) 2 Fiber In, 4 BNC Out (please substitute fiber connector type in place of "-XX" in part number when ordering; see Note (3) below)

RM20-9411-B-XX-CWDM 20-Slot Frame Rear I/O Module (Standard Width) 1 Fiber In, 4 BNC Out (please substitute fiber connector type in place of "-XX" in part number when ordering; see Note (3) below)

Notes:

(1) Rear modules for all models are equipped with four output BNCs which are cross-routable from the Fiber Optic Module(s). For example, the 9413-OE-CWDM model has four BNC outputs which can receive outputs from any three fiber FOMs. ("Extra" or "leftover" BNCs can be used as copy DA channels if desired).

(2) Use fiber wavelength codes for card Fiber Optic Modules (FOMs) when ordering. Available wavelengths (in nm) are as follows: 1270, 1290, 1310, 1330, 1350, 1410, 1430, 1450, 1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610. In "WX" places in part number, substitute code for wavelengths in each place as listed below:

-27: 1270nm   -29: 1290nm   -31: 1310nm   -33: 1330nm
-35: 1350nm   -41: 1410nm   -43: 1430nm   -45: 1450nm
-47: 1470nm   -49: 1490nm   -51: 1510nm   -53: 1530nm
-55: 1550nm   -57: 1570nm   -59: 1590nm   -61: 1610nm   (Example: For wavelengths 1270-1290-1310-1330 for 9414 card, order as "9414-OE-CWDM-27-29-31-33")

3) Add fiber connector suffix to part numbers to specify fiber connection type (LC, ST, SC, FC) when ordering. (Example: For RM20-9414-B-XX-CWDM with type LC fiber connectors, order as "RM20-9414-B-LC-CWDM".)

(4) Make certain when ordering companion EO (Transmitter) cards that the same wavelength groupings are correspondingly also specified.