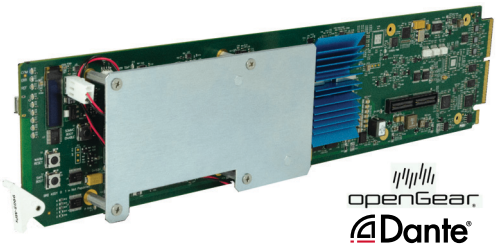
9905-MPx • 3G/HD/SD Quad-Path Up/Down/Cross Converter / Frame Sync / Embed/De-Embed Audio Processor



The Multi-Path **9905-MPx 3G/HD/SD Quad-Path Up/Down/Cross Converter/Frame Sync/Embed/De-Embed Audio Processor** is a Cobalt® next-generation advanced scaler/frame synchronizer for the openGear® platform. The 9905-MPx provides **four independent signal paths** of UDX / frame sync / audio embedding and de-embedding on a single open-Gear® card. Using our HPF-9000 20-slot frame, this provides up to 24 channels (6 cards) of processing in a single frame. The 9905-MPx represents a new level of openGear packaging density!

The 9905-MPx provides high-density that offers unprecedented multi-input support and flexibility. Independent up/down/cross convert scalers are specifically designed for broadcast video formats, with full ARC control suitable for conversions to or from 4:3 and 16:9 aspect ratios. Discrete AES and MADI audio embedding/routing/mixing/de-embedding to any of four processing paths is supported. Standard 3D LUT feature and available color correction provide accommodation of SDR and HDR processing for downstream HDR systems.

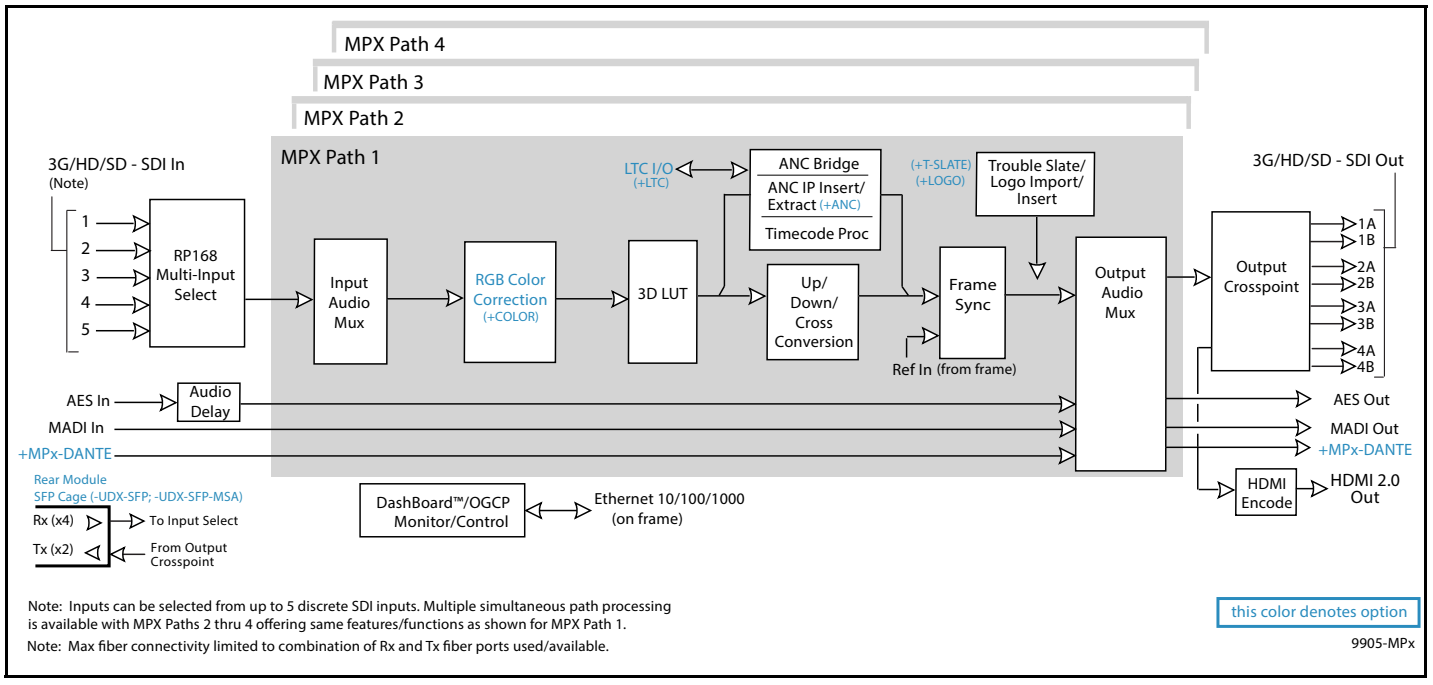
Card control/monitoring is available via DashBoard user interface or Cobalt's RESTful-based Reflex protocol. The 9905-MPx can be software-converted to a 4K Quad-Link Input SDM/2SI 4K UDX/Frame Sync card with an option software license.

FEATURES

- Multi-Path design offers four independent UDX /frame sync paths (channels) per card
- Flexible AES and MADI embed/de-embed for each path
- Up/Down/Cross Conversion with user ARC control. 3D-LUT is standard feature for all paths.
- Supports all popular formats: 480i, 576i, 720p, 1080i, 1080pSF, 1080p
- Independent four-path ANC bridging, including closed-captioning processing
- Noise Reduction and Detail Enhancement provide image quality optimization
- Remote control/monitoring via Dashboard™ software, OGCP-9000 remote control panels or Cobalt's RESTful-based Reflex protocol
- Five year warranty

OPTIONS

- Color Correction (**+COLOR**) – Provides full RGB color corrector (offset, gain, gamma) with extended YCbCr proc controls with white hard clip, white soft clip, black hard clip, and saturation clip.
- Logo Insertion (**+LOGO**) – Allows uploading of user logo graphic file to card, with automated insertion controlled by GPI or other events
- Clean & Quiet Switching (**+CQS**) – Provides automatic audio ramp-down and up during input switching events for noise-free audio between input switches
- Dante Option (**+MPx-DANTE-64x64**) – Adds DANTE support of 64x64 channels to the quad path 9905-MPx. Software option to be added per card.
- BBC LUTS (**+3D-LUT-BBC**) – Licensed product developed by the BBC, provides BBC 3D LUTS for SDR-to-HDR and HDR-to-SDR
- Serial-To-Embedded Audio LTC In (**+LTC**)
- ANC IP Insert/Extract (**+ANC**) (Internal ANC Bridge is standard)
- Software-Defined Convert Card to 4K Quad-Link Input SDM/2SI 4K UDX/Frame Sync (**+2K-TO-4K-9905**) – Software-defined option license that converts card to Quad-Link Input SDM/2SI 4K UDX/Frame Sync model
- **-UDX-SFP** Options – Adds daughter card supporting externally-accessible dual SFP cage. (See Ordering Information for SFP types available, descriptions, and further info.)



Note: Inputs can be selected from up to 5 discrete SDI inputs. Multiple simultaneous path processing is available with MPX Paths 2 thru 4 offering same features/functions as shown for MPX Path 1.

Note: Max fiber connectivity limited to combination of Rx and Tx fiber ports used/available.

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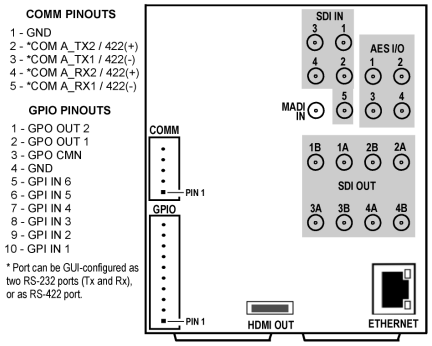
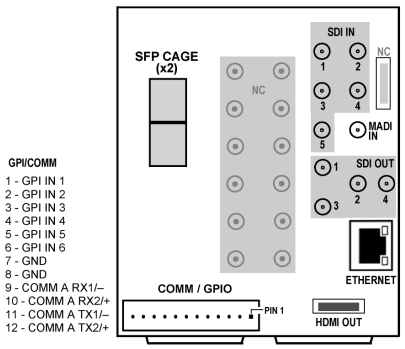
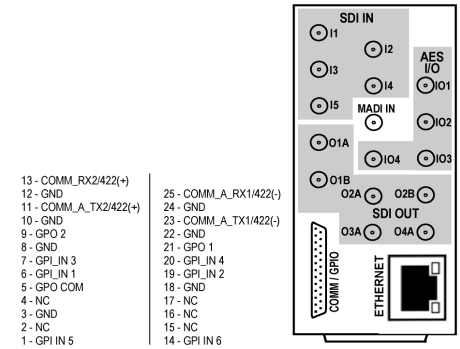


RM20-9905-A-HDBNC



RM20-9905-C-HDBNC

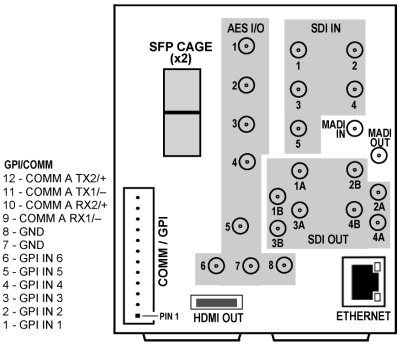


RM20-9905-D-HDBNC

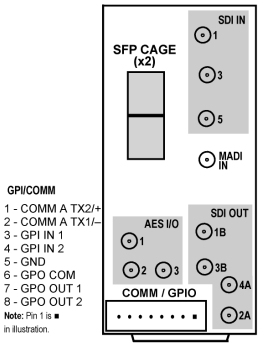
Note: Rear modules with SFP access do not come standard with any SFP functionality. Appropriate SFP option must be provisioned for rear module SFP functionality.

Note: Due to the alignment of the 9905-MPx card and the -D rear module, the combination of the card and rear module will consume the adjacent odd frame slot in addition to the even slot occupied by the card.

Note: This rear module cannot be installed in frame slots 19/20 location. The 9905-MPx card, when installation is attempted, will clash/interfere with the frame network controller card.

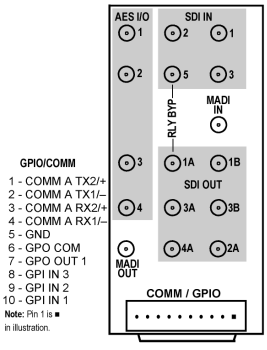


RM20-9905-F-HDBNC



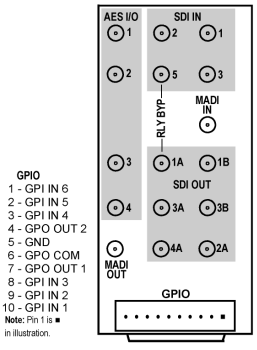
RM20-9905-G-HDBNC

Note: Mates to card in **odd** slot.



RM20-9905-H-HDBNC

Note: 12G signals over relay bypass path stipulates maximum cable length not to exceed 10m for **total** of both input **and** output cable lengths.



RM20-9905-J-HDBNC

9905-MPx • 3G/HD/SD Quad-Path Up/Down/Cross Converter / Frame Sync / Embed/De-Embed Audio Processor

SPECIFICATIONS

3G/HD/SD-SDI Input/Outputs
(4) 75Ω inputs (max); (4) inputs can be simultaneously routed to the four UDX/FS paths.
(2x4) 75Ω outputs (max)
SDI Formats Supported: SMPTE 259M, SMPTE 292M, SMPTE 424M
Return Loss:
> 15 dB up to 1.485 GHz
> 10 dB up to 3 GHz
Input Cable Length:
120m Belden 1694A cable at 2.97 Gbps
240m Belden 1694A cable at 1.485 Gbps
400m Belden 1694A cable at 270 Mbps
Output Signal Level: 800 mV ± 10%
DC Offset: 0 V ± 50 mV
Alignment Jitter (3G/HD/SD): < 0.3/0.2/0.2 UI

Frame Sync Audio/VIdeo Delay
Max offset: 20 frames
Latency (min): 1 frame

User Audio Delay Offset from Video
Bulk delay control: -33 msec to +3000 msec
Per-channel delay controls: -800 msec to +800 msec

AES Audio Inputs/Outputs
(8) AES-3id 75Ω coaxial ports (max); port direction assignable as inputs or outputs in groups of 4 ports.

MADI Audio Inputs/Outputs
(2) 75Ω coaxial ports (max)
Note: Not all rear modules support full MADI I/O. MADI I/O is a function of Rear Module used. See Rear Module illustrations for specific information.

MPx-DANTE-64x64 Audio Inputs/Outputs
(64) Input Channels
(64) Output Channels
Note: This is an optional feature.

HDMI Output
HDMI 2.0 Output; type A standard connector. Crosspoint-selectable program source as Path 1, 2, 3, or 4.

GPIO
(6) GPI (max); (2) GPO (max)
Note: GPIO max capacity is a function of Rear Module used. See Rear Module illustrations for specific information.

Frame Reference Input
(2) reference from frame bus. SMPTE 170M/318M “Black Burst”, SMPTE 274M/296M “Tri-Level”

Frame Loading (Max. recommended number of 9905 cards supported per Frame Model)
· OG3 Frame: (5) cards
· HPF-9000 Frame: (5) cards
· oGx Frame: (7) cards
Note: In all cases, it is recommended to leave a 1RU gap above the frame and set frame Network Controller Card to run the frame cooling fans at full (max.) speed.

9905-MPx • 3G/HD/SD Quad-Path Up/Down/Cross Converter / Frame Sync / Embed/De-Embed Audio Processor

ORDERING INFORMATION

9905-MPx 3G/HD/SD Quad-Path Up/Down/Cross Converter/Frame Sync/Embed/De-Embed Audio Processor

Rear Modules:

Note: · Rear modules with SFP access do not come standard with any SFP functionality. Appropriate SFP option must be provisioned for rear module SFP functionality.

· SFP port-type availability depends upon SFP Type, rear IO module, and 9905-UDX host card rev as follows:

- **Option -UDX-SFP (non-MSA); Card Rev E and earlier with -C, -F, -G rear IO module:**
  - Top SFP port supports up to 2 Fiber inputs and up to 2 Fiber outputs.
  - Bottom SFP port supports up to 2 Fiber inputs.
- **Option -UDX-SFP (non-MSA); Card Rev F and later with -C, -F, -G rear IO module:**
  - Top SFP port supports up to 2 Fiber inputs and up to 2 Fiber outputs.
  - Bottom SFP port supports up to 2 Fiber inputs and up to 2 Fiber outputs.
- **Option -UDX-SFP-MSA (no card restictions):**
  - Top SFP port supports 1 Fiber input and 1 Fiber output.
  - Bottom SFP port supports 1 Fiber input and 1 Fiber output.

RM20-9905-A-HDBNC 20-Slot Frame Rear I/O Module (Double-Width) (5) 3G/HD/SD/SD-SDI Inputs, (8) 3G/HD/SD/SD-SDI Processed Outputs, (4) AES I/O (User Selectable), (1) MADI Input, GPIO/COMM, HDMI 2.0 Output (type A standard connector), 100/1000 BaseT Ethernet Port (All coaxial connectors HD-BNC.)

RM20-9905-C-HDBNC 20-Slot Frame Rear I/O Module (Double-Width) (5) 3G/HD/SD/SD-SDI Inputs, (4) 3G/HD/SD/SD-SDI Processed Outputs, (1) MADI Input, GPI/COMM, HDMI 2.0 Output (type A standard connector), (2) SFP cage receptacles (when used in conjunction with option –UDX-SFP or -UDX-SFP-MSA), 100/1000 BaseT Ethernet Port (All coaxial connectors HD-BNC.)

RM20-9905-D-HDBNC 20-Slot Frame Rear I/O Module (Standard-Width) (5) 3G/HD/SD/SD-SDI Inputs, (6) 3G/HD/SD/SD-SDI Processed Outputs, (4) AES I/O, (1) MADI Input, GPIO/COMM, 100/1000 BaseT Ethernet Port (All coaxial connectors HD-BNC.)

RM20-9905-F-HDBNC 20-Slot Frame Rear I/O Module (Double-Width) (5) 3G/HD/SD/SD-SDI Inputs, (8) 3G/HD/SD/SD-SDI Processed Outputs, (8) AES I/O, (1) MADI Input, (1) MADI Output, GPI/COMM, HDMI 2.0 Output (type A standard connector), (2) SFP cage receptacles (when used in conjunction with option –UDX-SFP or -UDX-SFP-MSA), 100/1000 BaseT Ethernet Port (All coaxial connectors HD-BNC.)

RM20-9905-G-HDBNC 20-Slot Frame Rear I/O Module (Standard-Width) (3) 3G/HD/SD/SD-SDI Inputs, (4) 3G/HD/SD/SD-SDI Processed Outputs, (3) AES I/O, (1) MADI Input, (2) SFP cage receptacles (when used in conjunction with option –UDX-SFP or -UDX-SFP-MSA), GPIO/COMM (All coaxial connectors HD-BNC.) (**Note:** Mates to card in odd frame slot.)

RM20-9905-H-HDBNC 20-Slot Frame Rear I/O Module (Standard-Width) (4) 3G/HD/SD/SD-SDI Inputs, (6) 3G/HD/SD/SD-SDI Processed Outputs (one 3G/HD/SDI Output with relay bypass failover), (4) AES I/O, (1) MADI Input, (1) MADI Output, GPIO/COMM (All coaxial connectors HD-BNC.) (**Note:** Mates to card in odd frame slot.)

RM20-9905-J-HDBNC 20-Slot Frame Rear I/O Module (Standard-Width) (4) 3G/HD/SD/SD-SDI Inputs, (6) 3G/HD/SD/SD-SDI Processed Outputs (one 3G/HD/SDI Output with relay bypass failover), (4) AES I/O, (1) MADI Input, (1) MADI Output, GPIO (All coaxial connectors HD-BNC.) (**Note:** Mates to card in odd frame slot.)

Options:

Note: · Options denoted as **"+"** are **software-based** options which are available on new product when ordered or can be customer field-installed as a software upload upgrade. Unless otherwise noted, software options are per-card based. Options which are **per-path** based are identified as such.

· Options or ordering line items denoted as "**-**" are **hardware-based** options/items. These options are available as factory-installed only on new product, or product returned to Cobalt for factory installation.

+3D-LUT-BBC BBC 3D LUTS Option

+COLOR Color Correction Option (**per-path** based)

+LTC RS-485 Serial-To-Embedded Audio LTC In Option

+ANC IP ANC Insert/Extract Option (**per-path** based)

+LOGO Logo Insertion Option (**per-path** based)

+CQS Clean & Quiet Switching Option

+MPx-DANTE-64x64 Adds DANTE support of 64x64 channels to the quad path 9905-MPx. Software option to be added per card.

+2K-TO-4K-9905 Software-Defined Convert Card to 4K Quad-Link Input SDM/2SI 4K UDX/Frame Sync Option

ORDERING INFORMATION (cont.)

-UDX-SFP-MSA Adds daughter card supporting externally-accessible dual MSA SFP cage; orderable as new option. **Note:** To support SFP option(s), this option is required in addition to desired specific SFP options below. The SFP modules listed below are available for the 9905-MPx card when also fitted with SFP option -UDX-SFP-MSA.

- **-UDX-SFP-MSA-2S** is required where **2-slot** ("Standard-Width") rear module (such as RM20-9905-G-HDBNC) is to be fitted with SFP option.
- **-UDX-SFP-MSA-4S** is required where **4-slot** ("Double-Width") rear module (such as RM20-9905-C-HDBNC or RM20-9905-F-HDBNC) is to be fitted with SFP option.

Rear modules RM20-9905-C-HDBNC, RM20-9905-F-HDBNC, or RM20-9905-G-HDBNC and option -UDX-SFP-MSA-2S or -UDX-SFP-MSA-4S are purchased and available separately.

-SFP-E0OE-MSA-12G 12G/6G/3G/HD/SD-SDI UHD Transceiver (LC female connectors)

-SFP-E0-MSA-12G 12G/6G/3G/HD/SD-SDI UHD Transmitter (LC female connector)

-SFP-0E-MSA-12G 12G/6G/3G/HD/SD-SDI UHD Receiver (LC female connector)

-SFP-E0OE-MSA Single-Channel Video Optical Transceiver (LC female connectors)

-SFP-E0-MSA Single-Channel Video Optical Transmitter (LC female connector)

-SFP-0E-MSA Single-Channel Video Optical Receiver (LC female connector)

-SFP-IP-SWD-MSA Software-Defined MSA SFP 2011/2022-6 Encap/De-Encap Host. 10GigE Multi-Mode Optical Interface with Female LC Duplex Connectors. The following I/O purposing software options are available for cards using SFP type -SPF-IP-SWD-MSA (Up to 3 software licenses can be added to the -SFP-IP-SWD-MSA, but only 1 license can be active at a time):

+ADD-SFP-IP-T0-SDI-2022-6 SFP Software License; Single-Channel De-Encapsulator IP-2022-6-to-SDI
+ADD-SFP-IP-T0-SDI-2110 SFP Software License; Single-Channel De-Encapsulator IP-2110-to-SDI
+ADD-SFP-SDI-T0-IP-2022-6 SFP Software License; Single-Channel Encapsulator SDI-to-IP-2022-6
+ADD-SFP-SDI-T0-IP-2110 SFP Software License; Single-Channel Encapsulator SDI-to-IP-2110

-UDX-SFP Adds daughter card supporting externally-accessible dual SFP cage; orderable as new option. **Note:** To support SFP option(s), this option is required in addition to desired specific SFP options below. The SFP modules listed below are available for the 9905-MPx card when also fitted with SFP option -UDX-SFP.

- **-UDX-SFP-MSA-4S** daughter card is used with 4-slot ("Double-Width") rear module (such as RM20-9905-C-HDBNC or RM20-9905-F-HDBNC). UDX-SFP-MSA is **only** available for use in conjunction with **4-slot** rear modules and daughter card -UDX-SFP-MSA-4S). Rear modules RM20-9905-C-HDBNC, RM20-9905-F-HDBNC and option -UDX-SFP-MSA-4S are available separately.

-SFP-E0OE-12G 12G/6G/3G/HD/SD-SDI UHD Transceiver (LC female connectors)

-SFP-E0-12G 12G/6G/3G/HD/SD-SDI UHD Transmitter (LC female connector)

-SFP-0E-12G 12G/6G/3G/HD/SD-SDI UHD Receiver (LC female connector)

-SFP-2E0-12G 12G/6G/3G/HD/SD-SDI UHD Dual Transmitter (LC female connector)

-SFP-20E-12G 12G/6G/3G/HD/SD-SDI UHD Dual Receiver (LC female connector)

-SFP-E0OE Single-Channel Video Optical Transceiver (LC female connectors)

-SFP-E0 Single-Channel Video Optical Transmitter (LC female connector)

-SFP-0E Single-Channel Video Optical Receiver (LC female connector)

-SFP-2E0 Dual-Channel Video Optical Transmitter (LC female connector)

-SFP-20E Dual-Channel Video Optical Receiver (LC female connector)

-SFP-IP-SWD Software-Defined EmSFP; 2011/2022-6 Encap/De-Encap Host. 10GigE Multi-Mode Optical Interface with Female LC Duplex Connectors. The following I/O purposing software options are available for cards using SFP type -SPF-IP-SWD (Up to 3 software licenses can be added to the -SFP-IP-SWD, but only 1 license can be active at a time):

+ADD-SFP-2SDI-T0-IP-2022-6 SFP Software License; Dual-Channel Encapsulator 2SDI-to-IP-2022-6
+ADD-SFP-2SDI-T0-IP-2110 SFP Software License; Dual-Channel Encapsulator 2SDI-to-IP-2110
+ADD-SFP-IP-T0-2SDI-2022-6 SFP Software License; Dual-Channel De-Encapsulator IP-2022-6-to-2SDI
+ADD-SFP-IP-T0-2SDI-2110 SFP Software License; Dual-Channel De-Encapsulator IP-2110-to-2SDI
+ADD-SFP-IP-T0-SDI-2022-6 SFP Software License; Single-Channel De-Encapsulator IP-2022-6-to-SDI
+ADD-SFP-IP-T0-SDI-2110 SFP Software License; Single-Channel De-Encapsulator IP-2110-to-SDI
+ADD-SFP-SDI-T0-IP-2022-6 SFP Software License; Single-Channel Encapsulator SDI-to-IP-2022-6
+ADD-SFP-SDI-T0-IP-2110 SFP Software License; Single-Channel Encapsulator SDI-to-IP-2110