

# HCO-3901

3Gbps/HD/SD/ASI change-over with clean switch and ALC



## DESCRIPTION

The HCO-3901 is a 3 x 1 3Gbps/HD/SD/ASI change-over which support 16 channels of embedded audio and Metadata. The module can perform a video and audio "Clean and Silent Switch" between sources using the CS option. In the event of a power failure, the PGM signal is protected by relays fitted on the rear module, maintaining the integrity of the selected signal at the output. Relays are fully controllable via GPI.

Input selection can be performed automatically or manually. In automatic mode, the card will perform input selection between IN 1 and IN 2 based on internal signal analysis with alarm parameters, and the status of the inputs. In manual mode, any three sources can be selected from the Densité controller, the iControl software, or simply by using a GPI (3DRP rear only). A GPI can be connected to an automation system or any simple GPI control panel. The GPI outputs give status of the selected source allowing tallies to be triggered.

The preview outputs are user selectable to follow the main program output, video inputs IN 1, IN 2 or IN 3.

The HCO-3901 generates audio/video fingerprints. In combination with other cards streaming fingerprints for the same signals, an optional module in iControl can measure and report lip sync errors through the entire chain of a broadcast facility.

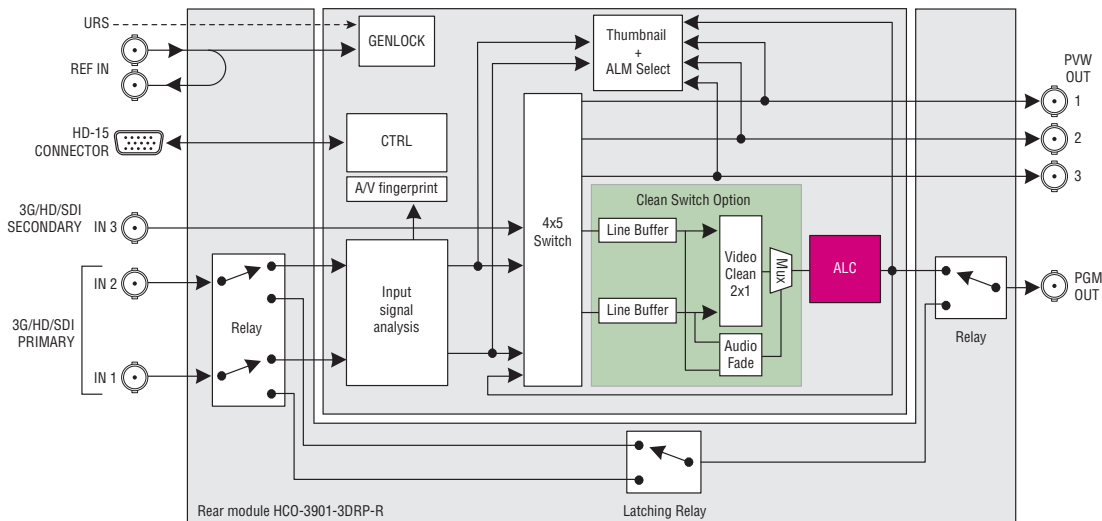
Miranda's Automatic Loudness Control (ALC) option can eliminate objectionable loudness variations between programs and commercials.

The module provides streaming video and audio level metering so an operator can remotely and effectively monitor the signal path using Miranda's iControl facility monitoring and control system.

The HCO-3901 is a 3RU card and is available with a 1 or 2 slots rear module. Up to 20 modules can fit in a 3RU Densité frame with 1-slot rear module (or 19 with REF-1801).

## KEY FEATURES AND BENEFITS

- Two Primary inputs: IN 1 and IN 2 plus one Secondary: IN 3
  - Four outputs: main program and three previews
  - Supports 3G\*, HD (1080i50/59.94, 720p50/59.94), SD (525,625) or ASI input
  - Electronic switching with relay backup (on rear module) maintains selected input with power loss for Primary inputs IN 1 and IN 2
  - Automatic mode using internal signal analysis with alarm parameters for IN 1 and IN 2
  - Manual change-over by local frame controller, iControl, iControl Solo, RCP-200 or GPI (3DRP rear) for 3 inputs
  - Alarm reporting to iControl facility monitoring and control system
  - Compatible with iControl end-to-end A/V fingerprint analyzer for lip sync error detection and measurement
  - GPI in and out (IN 1, IN 2, IN 3, auto, bypass)
  - Optional clean switch function (video and 16 channels of audio) for IN 1 and IN 2
  - Optional on-board Automatic Loudness Control by Miranda
  - Reference input with passive loop through (3DRP rear only)
  - Two line timing window with CS option
  - Thumbnail and audio level meter streaming for IN 1, IN 2
- \* I/Os are 3G ready. 3G signaling will be supported at a later date with firmware update.



HCO-3901 Functional Block Diagram

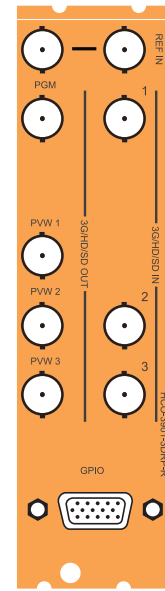
- OPTIONS
- Clean switch
  - Miranda ALC

### ALARM PARAMETERS

Video	3G	HD	SD	ASI
Loss of video	X	X	X	X
Video error	X	X	X	
Black detect	X	X	X	
Freeze detect	X	X	X	
Video format	X	X	X	
Audio				
Audio presence (per group)	X	X	X	
Silence detect (per channel)	X	X	X	



HCO-3901-3SRP-R



HCO-3901-3DRP-R

### TECHNICAL SPECIFICATIONS

#### VIDEO INPUTS (3)

Signal: SD: SMPTE-259M-C (270 Mbps)  
 HD: SMPTE-292M (1.485, 1.485/1.001 Gbps)  
 3G: SMPTE-425 (2.970, 2.970/1.001 Gbps)  
 DVB-ASI: EN 50083-9

Supported formats:

SD: SMPTE-125M: 480i59.94  
 SD: EBU: 576i50  
 HD: SMPTE-274M: 1080i59.94, 1080i50  
 HD: SMPTE-296M: 720p59.94, 720p50  
 3G: SMPT-425 level A (mapping 1): 1080p59.94, 1080p50

Cable length<sup>1</sup>: 350 m Belden 8281 at 270 Mbps  
 130m Belden 1694A at 1.485 Gbps  
 90m Belden 1694A at 2.970 Gbps

Return loss: >10 dB up to 1.5 GHz (IN 1, IN 2)<sup>2</sup>  
 >8 dB up to 3 GHz (IN 1, IN 2)<sup>2</sup>  
 >15 dB up to 1.5 GHz (IN 3)  
 >10 dB up to 3 GHz (IN 3)

#### VIDEO OUTPUT (4)

Signal: SMPTE-259-C (270 Mbps)  
 SMPTE 292M (1.485, 1.485/1.001 Gbps)  
 3G: SMPTE-425 (2.970, 2.970/1.001 Gbps)

Supported formats:

SD: 480i59.94, 576i50  
 HD: SMPTE 274M: 1080i59.94, 1080i50  
 HD: SMPTE 296M: 720p59.94, 720p50  
 3G: SMPT-425 level A (mapping 1): 1080p59.94, 1080p50

Return loss<sup>3</sup>: >15 dB up to 270 MHz (PGM out)  
 >12 dB up to 1.5 GHz (PGM out)  
 >7 dB up to 3 GHz (PGM out)  
 >15 dB up to 270 MHz (PVW out)  
 >15 dB up to 1.5 GHz (PVW out)  
 >10 dB up to 3 GHz (PVW out)  
 SD/HD <0.2UI (alignment jitter)  
 3G <0.3UI (alignment jitter)

Jitter

#### REFERENCE INPUT (1)

Signal: SMPTE 170M/SMPTE 318M/ITU 624-4/BUT 470-6 or composite sync  
 SMPTE 274M / SMPTE 296M tri-level sync  
 Return loss: >35 dB up to 5.75 MHz

#### GPI (10)

Connector: HD-15, opto-isolated, common ground  
 GPI IN (5): Contact closure to ground  
 GPI OUT (5): Contact closure to ground  
 External pull up Voltage: 3.3 V to 24 V max  
 External GPI power: 5 V nominal

#### VIDEO PROCESSING PERFORMANCE

Signal path: 10 bits  
 Latency: 0.4 ns without CS option and ALC option  
 Maximum of 2 lines with CS or ALC option

#### AUDIO PROCESSING PERFORMANCE

Quantization: 20-24 bits  
 Sampling: 48 kHz, synchronous  
 Number of channels: 16, 4 groups  
 Audio latency: 0.4 ns without CS option and without ALC option  
 Add 1ms if CS option is enabled  
 Add 1ms if ALC option is enabled

#### ELECTRICAL

Power: 10 W

Note 1: Cable length and return loss specifications will be reduced when using the output protected by the bypass relay, refer to the manual for more details

Note 2: Input protected by relay

Note 3: PGM output protected by relay



### ORDERING INFORMATION

#### DENSITÉ 3 FRAME

DESCRIPTION
HCO-3901 3Gbps/HD/SD change-over with optional clean switch and ALC
HCO-3901-3SRP-R Single rear connector with bypass relay
HCO-3901-3DRP-R Double rear connector with bypass relay

#### OPTIONS (HARDWARE)

NSH15M	HD-15 to terminal block adapter
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#### OPTIONS (SOFTWARE)

DESCRIPTION
HCO-3901-OPT-CS Clean switch option
HCO-3901-OPT-ALC-2 2 channel on-board ALC option by Miranda
HCO-3901-OPT-ALC-6 6 channel on-board ALC option by Miranda
HCO-3901-OPT-ALC-8 8 channel on-board ALC option by Miranda
HCO-3901-OPT-ALC-16 16 channel on-board ALC option by Miranda