

# HFM-2004

## 3G/HD/SD-SDI Analog Audio Multiplexer with Frame Sync

The HFM-2004 is a 3G/HD/SD-SDI analog audio multiplexer with frame sync which is used in i-MOD series frames. The HFM-2004 multiplexer offers one 3G/HD/SD-SDI (2.97Gbps, 2.97/1.001Gbps, 1.485Gbps, 1.485/1.001Gbps, 270Mbps) digital video input, 1 fiber signal input, four analog audio inputs and provides one fiber signal output and two 3G/HD/SD-SDI digital video outputs with audio embedded.

The HFM-2004 multiplexer performs 24-bit A/D conversion of four balanced analog audio inputs and then embeds them into 3G/HD/SD-SDI outputs. Embedding channels are selectable and input audio can be embedded to designated channel. Embedding modes are selectable, including L/R swap, copy and mix. Input audio gain is adjustable within  $\pm 20$ dB. The HD/SD-SDI input signal supports 328 ft (100 m)/656 ft (200 m)/984 ft (300 m) cable equalization compensation (Belden 1694A cable or equivalent cables).

Status presence indication and parameters manual adjustment are provided via the LED indicators, selector and paddle switches located on the module edge. 1RU and 2RU back modules are provided for HFM-2004 modules when used in 1RU and 2RU i-MOD series frames, respectively.

### SPECIFICATIONS

Specifications are subject to change without notice.

#### DIGITAL VIDEO INPUT

Signal Format.....	1080P/50,1080P/59.94,1080P/60; 1080I/50,1080I/59.94,1080I/60; 720P/23.98,720P/24, 720P/25,720P/29.97,720P/30, 720P/50,720P/59.94,720P/60; 1080P/25,1080P/29.97,1080P/30; 525i/59.94,625i/50
Signal Standard.....	SMPTE 259M, SMPTE 272M, SMPTE 292M, SMPTE 424M
Connector.....	BNC (x1)
Impedance.....	75 ohms
Return Loss.....	SD > 18 dB @ 270 MHz HD > 15 dB @ 1.485 GHz/2.97 GHz
Cable EQ.....	SD<984 ft (300 m) HD<656 ft (200 m) 3Gbps<328 ft (100 m) (Belden 1694A or equivalent cables)

#### REF VIDEO INPUT

Signal Format.....	BB/HD tri-level Sync
Connector.....	BNC(x2),hi-z loop-thru supported

#### DIGITAL VIDEO OUTPUT

Signal Format.....	1080P/50,1080P/59.94,1080P/60; 1080I/50,1080I/59.94,1080I/60; 720P/23.98,720P/24, 720P/25,720P/29.97,720P/30, 720P/50,720P/59.94,720P/60; 1080P/25,1080P/29.97,1080P/30; 525i/59.94,625i/50
Signal Standard.....	SMPTE 259M, SMPTE 272M, SMPTE 292, SMPTE 424M
Connector.....	BNC (x2)
Impedance.....	75 ohms
Return Loss.....	SD > 18 dB @ 270 MHz HD > 15 dB @ 1.485 GHz/2.97GHz
Amplitude.....	800 mVp-p $\pm 10\%$
Alignment Jitter.....	100 kHz ~ 300 MHz 3Gbps: < 0.3 UI HD/SD: < 0.2 UI

### FEATURES

- Audio embedding into an 3G/HD/SD-SDI video stream
- SMPTE 259M, SMPTE 272M, SMPTE 292M and SMPTE 424M standard
- Support 1 BB or TRI-LEVEL REF input
- Four analog audio inputs
- H & V phase adjustment and automatic alignment
- 1 fiber input and output, selectable
- Audio gain selectable within  $\pm 20$ dB
- Embedding channel selectable, input audio can be embedded to designated channel
- Embedding mode selectable: L & R swap, copy and mixing
- Automatic detection of input video loss, alarm via PC software
- Automatic cable EQ for up to 328 ft (100m) (2.97Gbps)/656 ft (200 m) (1.485Gbps)/984 ft (300 m) (270Mbps)
- Stores settings in non-volatile memory
- Hot-swappable
- Computer control supported

Timing Jitter.....	10 Hz 3Gbps: <2.0 UI HD: < 1.0 UI SD: < 0.2 UI
Rise/Fall Time.....	SD:400~1500ps; HD: <270 ps 3Gbps:<135 ps
Overshoot.....	<10% amplitude
H Adjustment Precision.....	$\pm 1/2$ H
V Adjustment Precision.....	$\pm 1/2$ F

#### ANALOG AUDIO INPUT

Signal Format.....	Analog audio (balanced)
Connector.....	3Pin (x4)
Level.....	+20dB (maximum)
Impedance.....	>20k $\Omega$

#### FIBER INPUT

Connector.....	LC
Signal Format.....	1080P/50,1080P/59.94,1080P/60; 1080I/50,1080I/59.94,1080I/60; 720P/23.98,720P/24,720P/25, 720P/29.97,720P/30,720P/50, 720P/59.94,720P/60;1080P/25, 1080P/29.97,1080P/30;525i/59.94, 625i/50
Signal Standard.....	SMPTE 259M, SMPTE 272M, SMPTE 292M, SMPTE 424M

#### FIBER OUTPUT

Connector.....	LC
Signal Format.....	1080P/50,1080P/59.94,1080P/60; 1080I/50,1080I/59.94,1080I/60; 720P/23.98,720P/24,720P/25, 720P/29.97,720P/30,720P/50, 720P/59.94,720P/60;1080P/25, 1080P/29.97,1080P/30;525i/59.94, 625i/50
Signal Standard.....	SMPTE 259M, SMPTE 272M, SMPTE 292M, SMPTE 424M
H Adjustment Precision.....	$\pm 1/2$ H
V Adjustment Precision.....	$\pm 1/2$ F

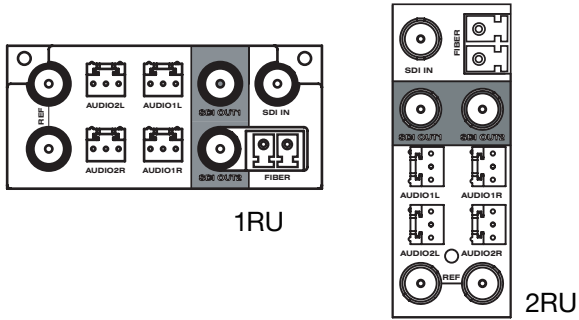
#### ELECTRICAL

Power.....	7 W
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#### ENVIRONMENTAL

Operating Temperature.....	32° ~ 104° F (0° ~ 40° C)
Relative Humidity.....	10% ~ 90%

## BACK MODULES



Note:Fiber connectors selectable.

## BLOCK DIAGRAM

