



DELTA-3G-ELP DATASHEET

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Issue 3.5

This document contains confidential information

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1 Technical Description

1.1 Features

The DELTACAST DELTA-3G-elp cards are a set of **low profile** multi-channel 3G SDI cards, with DIN connectors or BNC connectors.

These cards provide a gateway between up to four 3G/HD/SD-SDI links (SMPTE 424M / SMPTE 292M / SMPTE 259M-C), and a standard PC with four-lane PCI Express Gen 2 bus. See the family table for more details on available input and output configurations.

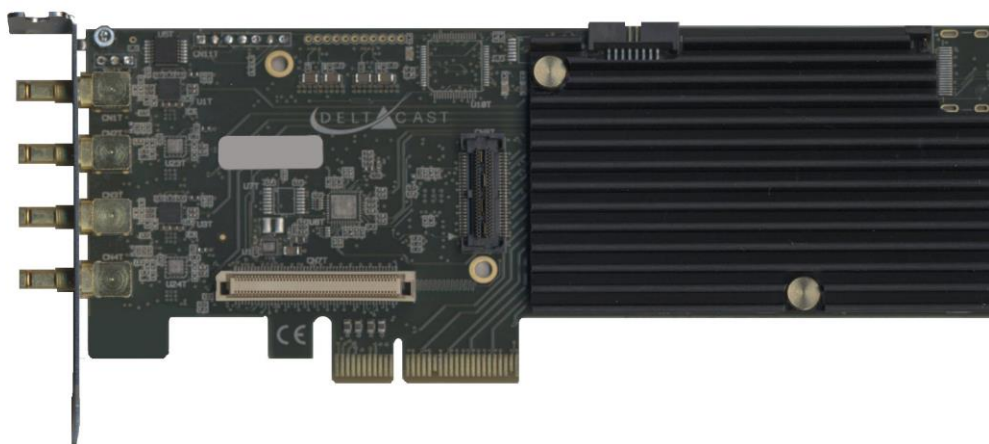


Figure 1 DELTA-3G-elp-d 40

Uncompressed 270Mb/s (SMPTE 259M-C), 1.5Gb/s (SMPTE 292M) and 3Gb/s (SMPTE 424M) SDI video capture and playout cards.

Supported image formats:

- **4K and UHD TV** formats in 4-quadrant SDI (Square Division).
Only available on 4-input or 4-output cards :
 - 3840x2160, 8/10-bit, in p60/59.94/50/48/47.95/30/29.97/25/24/23.976, PsF30/29.97/25/24/23.976, i60/59.94/50).
 - 4096x2160, 8-bit, in p50/48/47.95/30/29.97/25/24/23.976, PsF30/29.97/25/24/23.976, i60/59.94/50).
- **2K** formats as per SMPTE 2048-2 (2048x1080 in p60/59.94/50/48/47.95/30/29.97/25/24/23.976, PsF30/29.97/25/24/23.976).
- **HD** formats. SMPTE 274M and 296M.
 - 1920x1080 p60/59.94/50 mapped in Dual Link HD (SMPTE 372M) or 3G Level A or 3G Level B-DL (SMPTE 425-1)
 - 1920x1080 p30/29.97/25/24/23.976, PsF30/29.97/25/24/23.976, i60/59.94/50 HD SDI (SMPTE 292-1)
 - 1280x720 p60/59.94/50/30/29.97/25/24/23.976 HD SDI (SMPTE 292-1)

- **SD** formats: NTSC 525i59.94, PAL 625i50.
- “RAW” stream (270Mb/s, 1485Mb/s or 2970Mb/s) capture and playout.

Card Features:

- Hardware **proxy down-scalers** for channel monitoring (on input only cards).
- **Stereoscopic** (3D) capture and/or playout on two HD-SDI links.
- Ancillary data as per SMPTE 291M (Ancillary Data Packet and Space Formatting) and generic VBI data (de-)multiplexing
- Audio (de-)embedding as per SMPTE 299M & SMPTE 272M up to 16 channels.
 - Time code (VITC, LTC, ATC) (de-)embedding as per SMPTE RP188.
 - Video Payload Identification as per SMPTE 352M.
- Flexible clocking (on cards with SDI outputs) :
 - External Black Burst or Tri Level sync reference input.
 - Use of one SDI SD or HD input as alternate reference.
 - Local clock for stand-alone output and fail safe support. Output rate fixed or dynamically adjustable around default frequency.
 - VCXO for SDI output dynamic rate control.
- **Fill & key generator**, YUVK 4:2:2:4 on two SDI outputs.
- HDMI™ **monitoring output**. (all part number except 4-input config).
- 512-Mbytes on-board SDRAM memory buffer.
- The half-length, low profile PCIe add-in card form factor allows easy integration in a 2U platform with horizontal or vertical slots.
- OEM dedicated features such as unique card ID and optional hardware security mechanism to restrict application access to a specific series of cards.

Software package:

- Drivers for Linux, Windows (10/8/7/Vista®) and macOS.
- Unified OEM VideoMasterHD SDK (Windows, macOS and Linux) for quick system integration and compatibility with other Deltacast product families.
- Support for AMD SDI-Link and NVidia GPUDirect technologies.
- DirectShow I/O filters for multi-channel ingest and playout.
- dCARE application for easy test and support.
- dREC application for multi-channel ingest and playout.
- dMOSAIC application for easy multi-channel monitoring station.
- dSCOPE SDI signal analyzer application.

1.2 Ordering information

DELTA-3G-elp(-d)xx family Table								
Ordering part number	SDI INPUT CH	SDI OUTPUT CH	CN Type	Height	Proxy Scalers	HDMI™ Monitoring	Genlock input	Loopback Relays
DELTA-3G-elp 40	4	0	BNC	Low profile ⁽¹⁾⁽²⁾	YES	NO	NO	NO
DELTA-3G-elp-d 40	4	0	DIN	Low profile ⁽¹⁾	YES	NO	NO	NO
DELTA-3G-elp 20	2	0	BNC	Low profile ⁽¹⁾	YES	YES	NO	NO
DELTA-3G-elp-d 20	2	0	DIN	Low profile ⁽¹⁾	YES	YES	NO	NO
DELTA-3G-elp 10	1	0	BNC	Low profile ⁽¹⁾	YES	YES	NO	NO
DELTA-3G-elp-d 10	1	0	DIN	Low profile ⁽¹⁾	YES	YES	NO	NO
DELTA-3G-elp-d 04	0	4	DIN	Low profile ⁽¹⁾	NO	YES	YES	NO
DELTA-3G-elp 02	0	2	BNC	Low profile ⁽¹⁾	NO	YES	YES	NO
DELTA-3G-elp-d 02	0	2	DIN	Low profile ⁽¹⁾	NO	YES	YES	NO
DELTA-3G-elp 01	0	1	BNC	Low profile ⁽¹⁾	NO	YES	YES	NO
DELTA-3G-elp-d 01	0	1	DIN	Low profile ⁽¹⁾	NO	YES	YES	NO
DELTA-3G-elp 11	1	1	BNC	Low profile ⁽¹⁾	NO	YES	YES	YES
DELTA-3G-elp-d 11	1	1	DIN	Low profile ⁽¹⁾	NO	YES	YES	NO
DELTA-3G-elp-d 22	2	2	DIN	Low profile ⁽¹⁾	NO	YES	YES	NO
DELTA-3G-elp-d 21	2	1	DIN	Low profile ⁽¹⁾	NO	YES	YES	NO
DELTA-3G-elp-d 12	1	2	DIN	Low profile ⁽¹⁾	NO	YES	YES	NO
A-DIN2BNC-0200	DIN 1.0/2.3 to BNC (f) cable, 200mm length. Cable for 3G SDI (Type BELDEN 1855A)							

Table 1 Part Numbers table

(1) Cards are available with low profile PC bracket and/or standard height PC bracket.

(2) Not fully compliant with PCIe mechanical specification. Card may not fit in some PC chassis due to the 4BNC connectors on the low profile bracket.

1.3 SDI interfaces

The board provides coaxial cable-based serial transmission links compliant with either SMPTE 424M, SMPTE 292M “Bit-Serial Digital Interface for High-Definition Television Systems” or SMPTE 259M-C standard “SDTV Digital Signal/Data — Serial Digital Interface”.

3G mapping supported: SMPTE ST 425-1 Level A and Level B-DL (dual link). 3G Level B-DS (dual stream) will be supported in a future software release.

All channels are independent and can work concurrently in 3G, HD or SD formats.

Adaptive cable equalization on inputs and cable drivers on outputs.

1.4 PCI Express interface

Four-lanes PCI Express Gen 2 (5Gbit/s) adapter, compliant with PCI Express Base Specification, Revision 2.0.

Compatible with PCIe Gen 1, Gen 2 or Gen 3 motherboards.

On-board full-duplex, scatter-gather, 64-bit master DMA engine to off-load host processor and support the high data rate required by simultaneous operation of up to four 3G-SDI channels.

PCIe transfer bandwidth around 1400 MB/s. Note that actual bandwidth will depend on PC hardware configuration and usage.

1.5 HDMI Monitoring outputs

Some card models (See Part Numbers table) provide an **HDMI™** 1.4a monitoring output. These are video only monitoring output. No audio support yet.

Any TX or RX channel can be monitored on the HDMI output, up to 1080p60 formats.

HDMI outputs are electrically compatible with single-link DVI-D.

1.6 Power supply / consumption

Power supplies: 12V DC/3.3V DC from PCIe slot.

Power consumption: max 15 W.

1.7 Mechanical drawings

1.7.1 DELTA-3G-elp 40 (4x BNC)

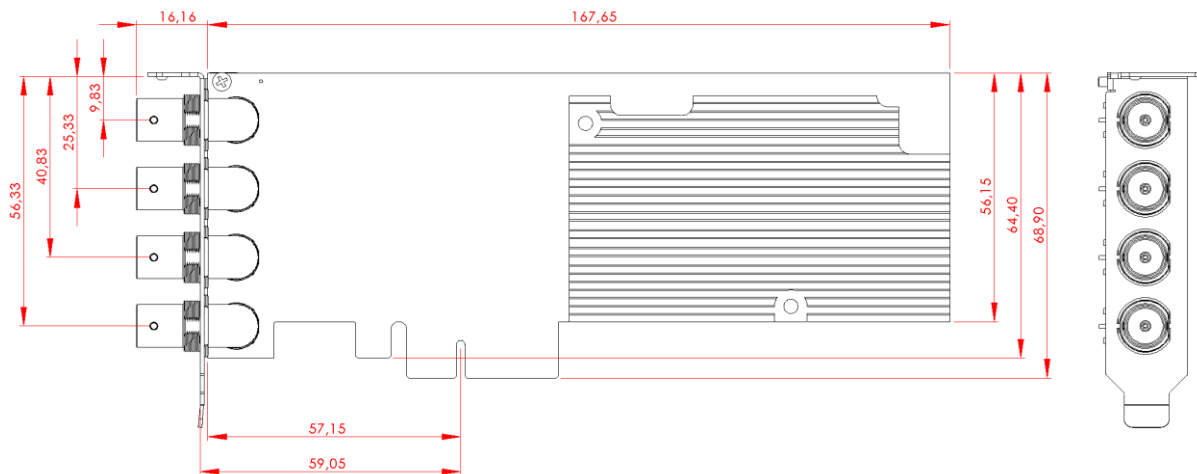


Figure 2: DELTA-3G-elp 40 with low profile bracket (mm)

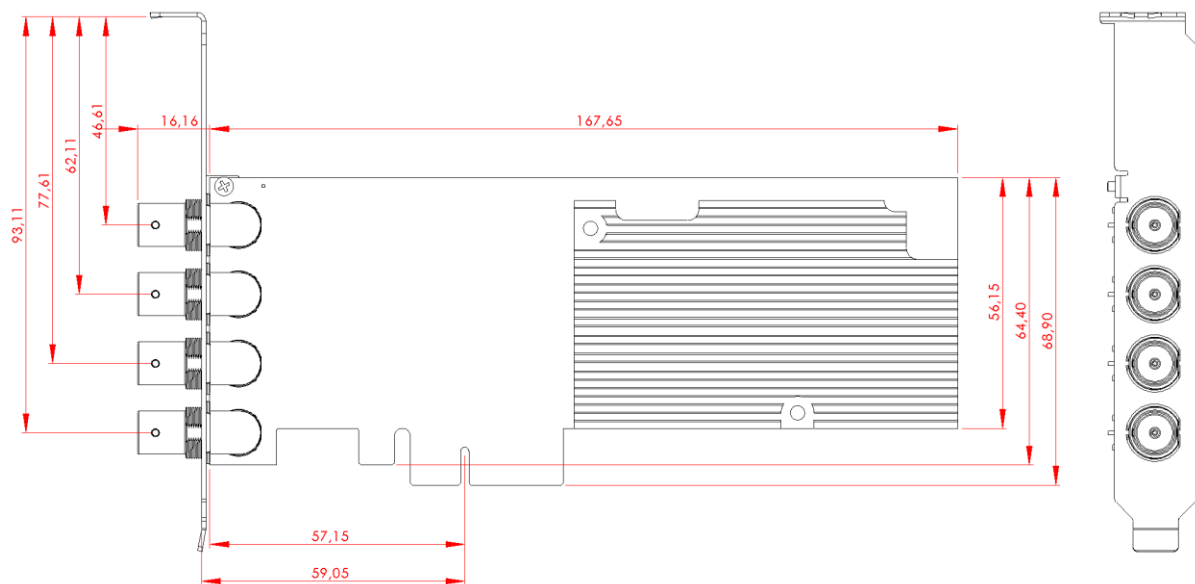


Figure 3 DELTA-3G-elp 40 with standard height bracket (mm)

Card weight: ~ 160 g

1.7.2 DELTA-3G-elp 10/20/01/02/11 (up to 3x BNC)

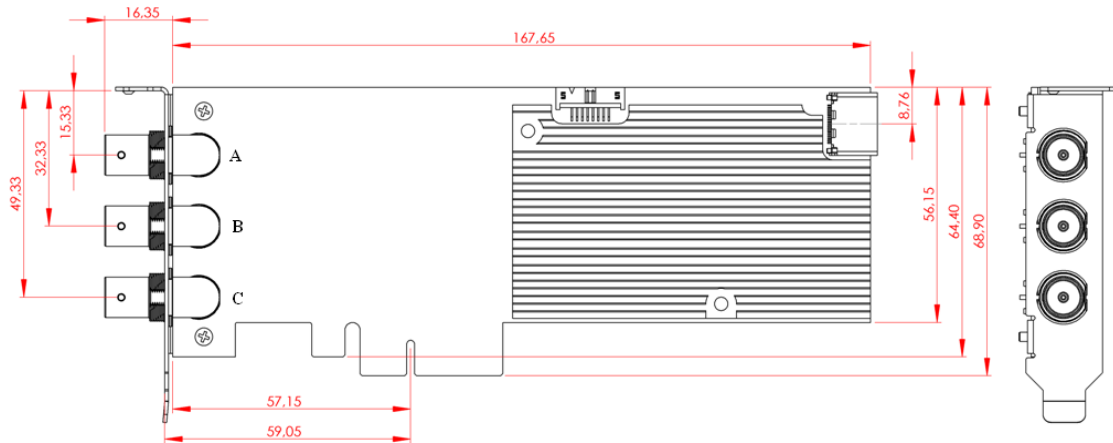


Figure 4 DELTA-3G-elp 10/20/01/02/11 with low profile bracket

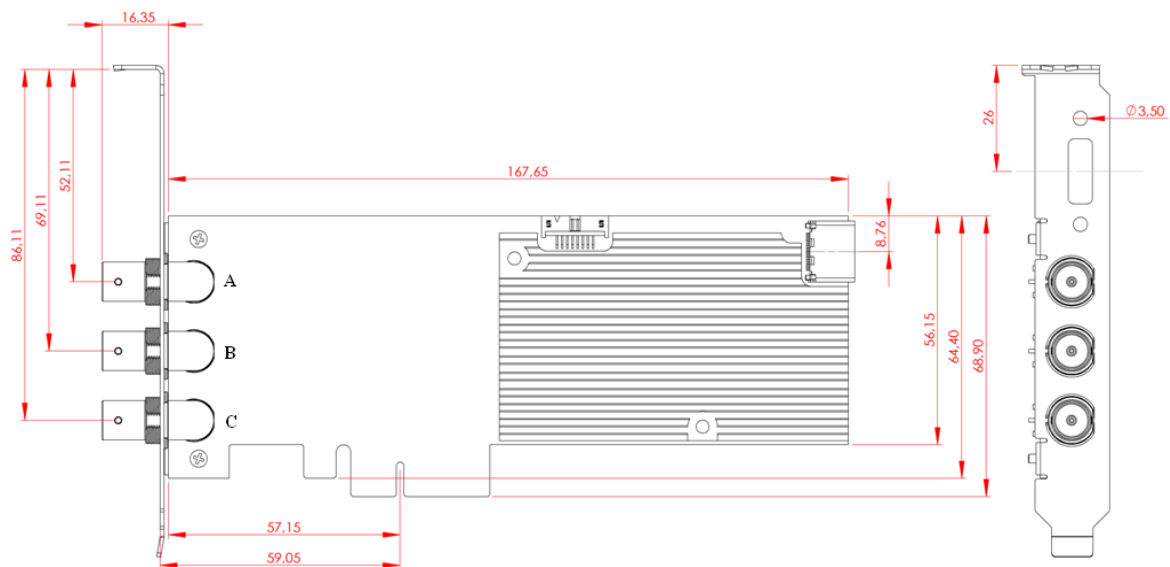


Figure 5 DELTA-3G-elp 10/20/01/02/11 with standard height bracket

Card weight : ~160g

DELTA-3G-elp 10/20/01/02/11 cards (with BNC connectors) are mechanically identical. Except for the BNC connectors. Cards are not all equipped with three BNC connectors, it depends on the part number. See the table below for a description of which BNC connectors are present or not on the different part numbers. (N.P. when connector not present).

BNC connector table (N.P. when BNC not present)				
Ordering part number	A	B	C	HDMI
DELTA-3G-elp 11	TX1	RX1	REF	YES
DELTA-3G-elp 10	N.P.	RX1	N.P.	YES
DELTA-3G-elp 20	RX2	RX1	N.P.	YES
DELTA-3G-elp 01	TX1	N.P.	REF	YES
DELTA-3G-elp 02	TX2	TX1	REF	YES

Table 2 BNC connector mapping vs part numbers

1.7.3 DELTA-3G-elp-d xx (up to 5x DIN)

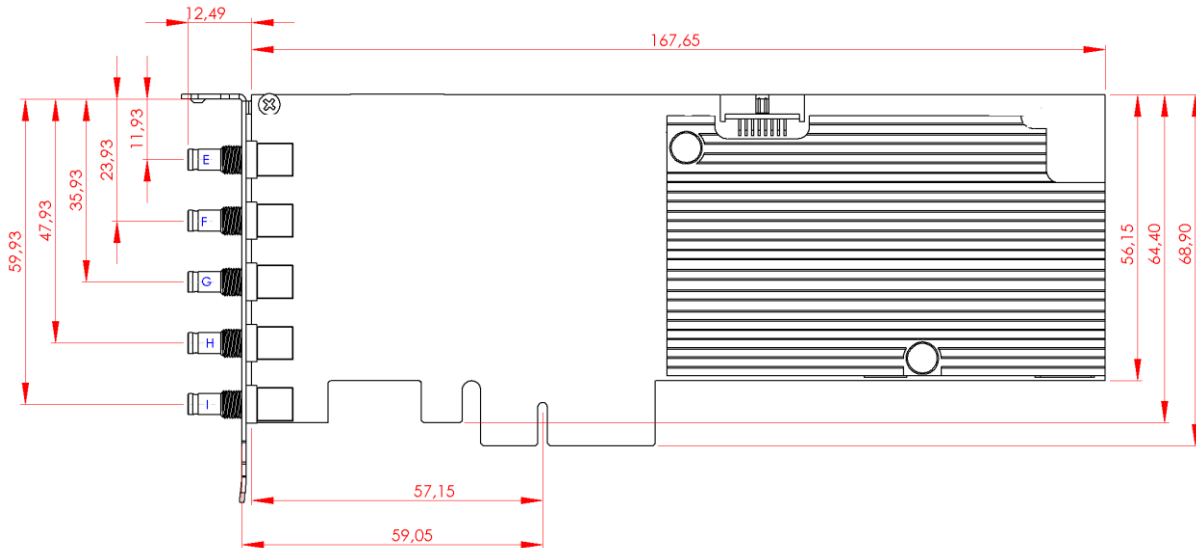


Figure 6: DELTA-3G-elp-d xx with low profile bracket (mm)

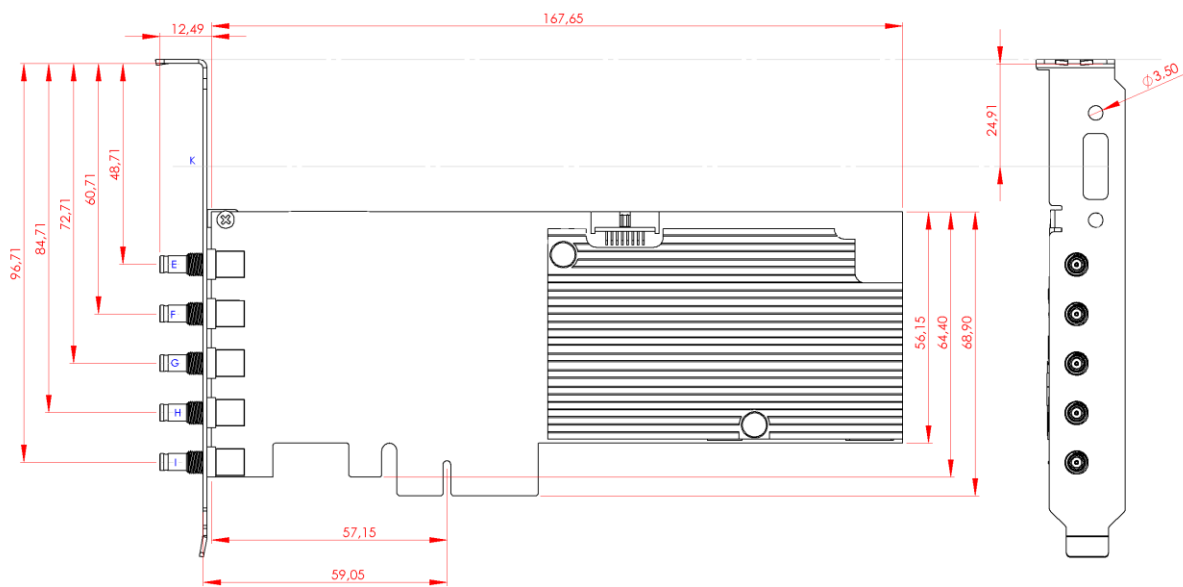


Figure 7 DELTA-3G-elp-d xx with standard height bracket (mm)

Card weight: : ~ 150 g

DELTA-3G-elp-d xx cards (with DIN connectors) are mechanically identical to the DELTA-3G-elp-d 22 card described above. Except for the DIN connectors. Cards are not all equipped with five DIN connectors, it depends on the part number. See the table below for a description of which DIN connectors are present or not on the different part numbers. (N.P. when connector not present).

DIN connector table (N.P. when DIN not present)						
Ordering part number	E	F	G	H	I	HDMI
DELTA-3G-elp-d 40	RX3	RX2	RX1	RX0	N.P.	N.P.
DELTA-3G-elp-d 20	N.P.	RX1	N.P.	RX0	N.P.	YES
DELTA-3G-elp-d 10	N.P.	N.P.	N.P.	RX0	N.P.	YES
DELTA-3G-elp-d 04	TX3	TX2	TX1	TX0	REF	YES
DELTA-3G-elp-d 02	TX1	N.P.	TX0	N.P.	REF	YES
DELTA-3G-elp-d 01	N.P.	N.P.	TX0	N.P.	REF	YES
DELTA-3G-elp-d 22	TX1	RX1	TX0	RX0	REF	YES
DELTA-3G-elp-d 11	N.P.	N.P.	TX0	RX0	REF	YES
DELTA-3G-elp-d 21	TX1	N.P.	TX0	RX0	REF	YES
DELTA-3G-elp-d 12	N.P.	RX1	TX0	RX0	REF	YES

Table 3 DIN connector mapping vs part numbers

1.8 Environmental

Operating temperature: 0 – 40°C.

Humidity: 20% to 80% non-condensing.

The card is equipped with a passive heatsink.

User should ensure adequate airflow over the heatsink inside the PC enclosure.

1.9 Certification

CE, FCC, WEEE.

1.10 Cabling Guide

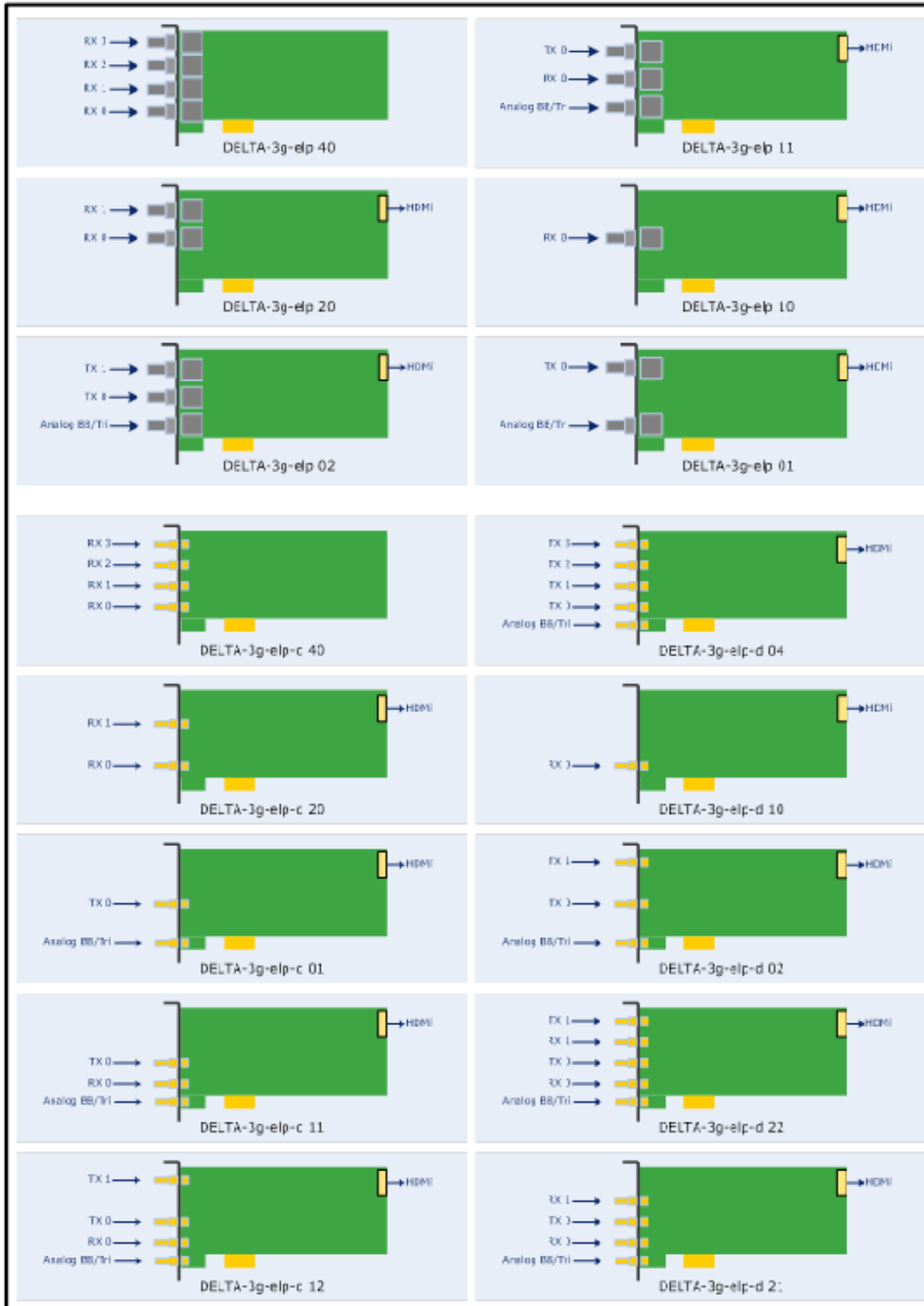


Figure 8 Cabling Guide

2 Electrical interfaces

2.1 SDI I/Os (rear bracket)

2.1.1 DIN card models

- Type: DIN 1.0/2.3 – 75 Ohm – Right angle– 3GHz
- Number of connectors: 1 to 4.
- Connector pitch on bracket: 8.5 mm.
- Electrical standard : HD SDI (SMPTE 292M) or SD SDI (SMPTE 259M-C)

2.1.2 BNC card models

- Type: BNC 75 Ohm – Right angle – 3GHz
- Number of connectors: 1 to 4.
- Connector pitch on bracket: 15.5 mm.
- Electrical standard: 3Gbit/s SDI (SMPTE 424M), 1.5Gbit/s SDI (SMPTE 292M) or 270 Mbit/s SDI (SMPTE 259M-C).

2.2 Genlock reference input (rear bracket)

- Type: DIN 1.0/2.3 – 75 Ohm – Right angle or BNC 75 Ohm – Right angle
- Number of connectors: 1.
- Connector pitch on bracket: 8.5 mm for DIN or 15.5mm for BNC.
- Electrical standard: Analog Black Burst or Tri Level sync input.

2.3 GPIO connector (on-board)

- Type: 16 pins, 2x8, 1.27mm pitch, right angle.
- 8x bi-directional GPIOs.
- Electrical standard: LVCMOS25. Not 3.3V tolerant.
- Reserved for specific request. (LTC, Audio, external clocks, multi-card sync, etc.)

2.4 DIN to BNC patch cable (A-DIN2BNC-0200)

- Type: Belden 1855A cable
- Connectors : DIN 1.0/2.3 to BNC (female)
- Length: 200mm.

2.5 HDMI monitoring Output connectors

2.5.1 Connector characteristics

- Type: HDMI – Type A – Right angle.

2.5.2 Pin assignment

Pin #	Name	Pin #	Name
1	TMDS Data2+	11	TMDS Clock Shield
2	TMDS Data2 Shield	12	TMDS Clock-
3	TMDS Data2-	13	CEC
4	TMDS Data1+	14	Reserved
5	TMDS Data1 Shield	15	SCL (DDC clock)
6	TMDS Data1-	16	SDA (DDC data)
7	TMDS Data0+	17	DDC/CEC Ground
8	TMDS Data0 Shield	18	+5 V Power (max 50mA)
9	TMDS Data0-	19	Hot Plug Detect
10	TMDS Clock+		

Table 4: HDMI connector pin-out

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