



Product Information

CompactPCI[®] Classic • CVX-DVI

Dual DisplayPort to DVI/VGA Adapter

Document No. 8335 • 7 June 2018



General

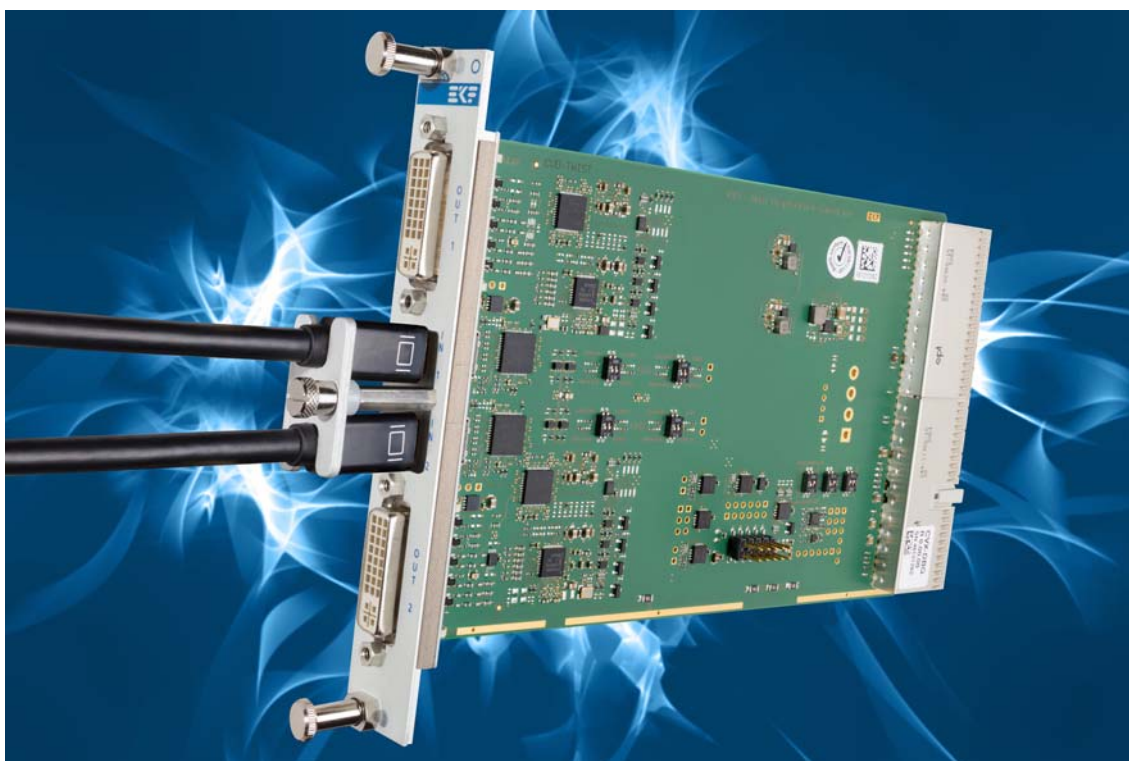
The CVX-DVI is a peripheral slot card for CompactPCI® Classic systems. The board receives one or two DisplayPort compliant video signals via front panel mDP (Mini DisplayPort) input receptacles, and converts these data to classic DVI output connectors, for legacy applications.

The DVI connectors are individually configurable as DVI-D (digital video output), or DVI-A (aka VGA analog graphics over DVI). As an option, the DVI connectors (both or one) can be replaced by classic style 15-pin D-Sub VGA connectors.

The video input signal of each mDP connector is routed to a high speed analog switch, as selectable data source for either a DP to DVI converter (DP++ to TMDS, 4 lanes up to 6Gbps), or DP to VGA adapter (DP++ to WUXGA, 2 lanes up to 2.7Gbps).

Both type of video outputs are wired to DVI-I front panel connectors. For VGA usage on a DVI-A output a suitable DVI-A to VGA adapter cable would be required.

The CVX-DVI converter can be powered via its backplane connectors, or operated stand-alone.



CVX-DVI Shown w. mDP Cable Connectors

Feature Summary

General

- ▶ PICMG® CompactPCI® Classic (CPCI 2.0) standard
- ▶ Single size Eurocard 3U 4HP 100x160mm²
- ▶ Suitable for CompactPCI® peripheral slot
- ▶ CompactPCI® backplane connector J1 for +5V supply & I2C SMBus control
- ▶ CompactPCI® backplane connector J2 for VGA rear I/O (option only)
- ▶ Stand-alone operation available as an option (on-board power connector)

Front Panel Connectors

- ▶ 2 x Mini DisplayPort receptacles (option 1 x) - video input signals DP++ compliant
- ▶ Option screw lock for mDP connectors
- ▶ 2 x DVI-I connectors (option 1 x) - selectable video output signals DVI-D or DVI-A (VGA)
- ▶ Option VGA connectors 15-pos. fem. HD-Sub (when populated will replace DVI)

DisplayPort Multiplexer

- ▶ HD3SS215 6 Gbps DisplayPort 1:2 Differential Switch
- ▶ Input from mDP receptacle
- ▶ Output path selectable either to TMDS (DVI-D) converter or to VGA adapter

DisplayPort to TMDS

- ▶ SN65DP159 6 Gbps DP++ Retimer
- ▶ Digital Video Interface (DVI) 1.0 compliant output signals
- ▶ Data rates up to UHD (4kx2k @60Hz)

VGA Converter

- ▶ PTN3355 DisplayPort to VGA adapter
- ▶ 1-lane and 2-lane input modes supported
- ▶ High bit rate (HBR 2.7Gbps) and reduced bit rate (RBR 1.62Gbps) supported
- ▶ Triple 8-bit DAC, up to 240MHz
- ▶ Wide set of display resolutions, up to 1920x1440, 60 Hz, 18 bpp, 234 MHz pixel clock
- ▶ VESA standards VGA to WUXGA supported
- ▶ Output path individually selectable to either front panel DVI connector or backplane connector J2 (option only)

Applications

- ▶ For recent CPU cards which are provided with DP or mDP graphics connectors
- ▶ DVI and VGA monitor support for legacy applications
- ▶ Railway, transportation, automation

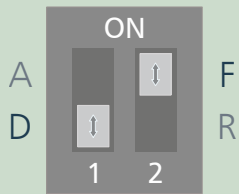
Environment & Regulation

- ▶ Designed & Manufactured in Germany
- ▶ ISO 9001 certified quality management
- ▶ Long term availability
- ▶ Rugged solution (coating, sealing, underfilling on request)
- ▶ RoHS compliant
- ▶ Operating temperature: -40°C to +85°C industrial temperature range
- ▶ Storage temperature: -40°C to +85°C, max. gradient 5°C/min
- ▶ Humidity 5% ... 95% RH non condensing
- ▶ Altitude -300m ... +3000m
- ▶ Shock 15g 0.33ms, 6g 6ms
- ▶ Vibration 1g 5-2000Hz
- ▶ MTBF 40.0 years
- ▶ EC Regulations EN55022, EN55024, EN60950-1 (UL60950-1/IEC60950-1)

Configuration Switches

Operation Mode Configuration DIP Switches (1 = Port 1, 2 = Port 2)

EKF Part No. 160.15.02.0



1=OFF 2=*

digital output to front connector (DVI-D)

1=ON 2=OFF

analog (VGA) output, routed to rear I/O connector

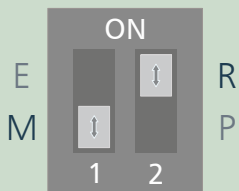
1=ON 2=ON

analog output to front connector (DVI-A or VGA)

A = analog • D = digital • F = Front I/O • R = Rear I/O

DDC Routing Configuration DIP Switches (3 = Port 1, 4 = Port 2)

EKF Part No. 160.15.02.0



1=OFF 2=*

DDC derived from monitor attached to front panel

1=ON 2=OFF

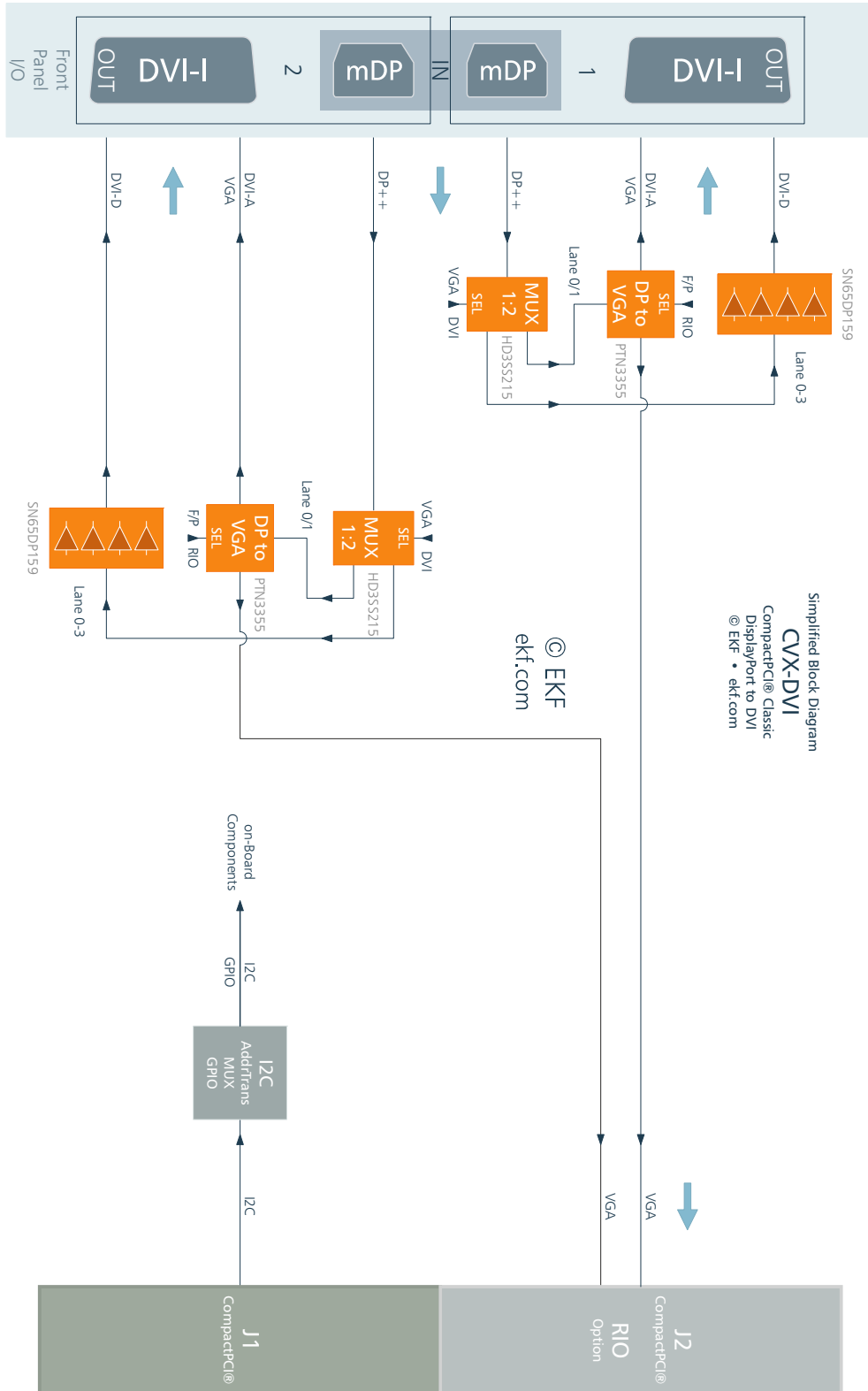
DDC derived from optional on-board EEPROM programming mode via I²C (future characteristic)

1=ON 2=ON

DDC derived from optional on-board EEPROM normal operation mode (future characteristic)

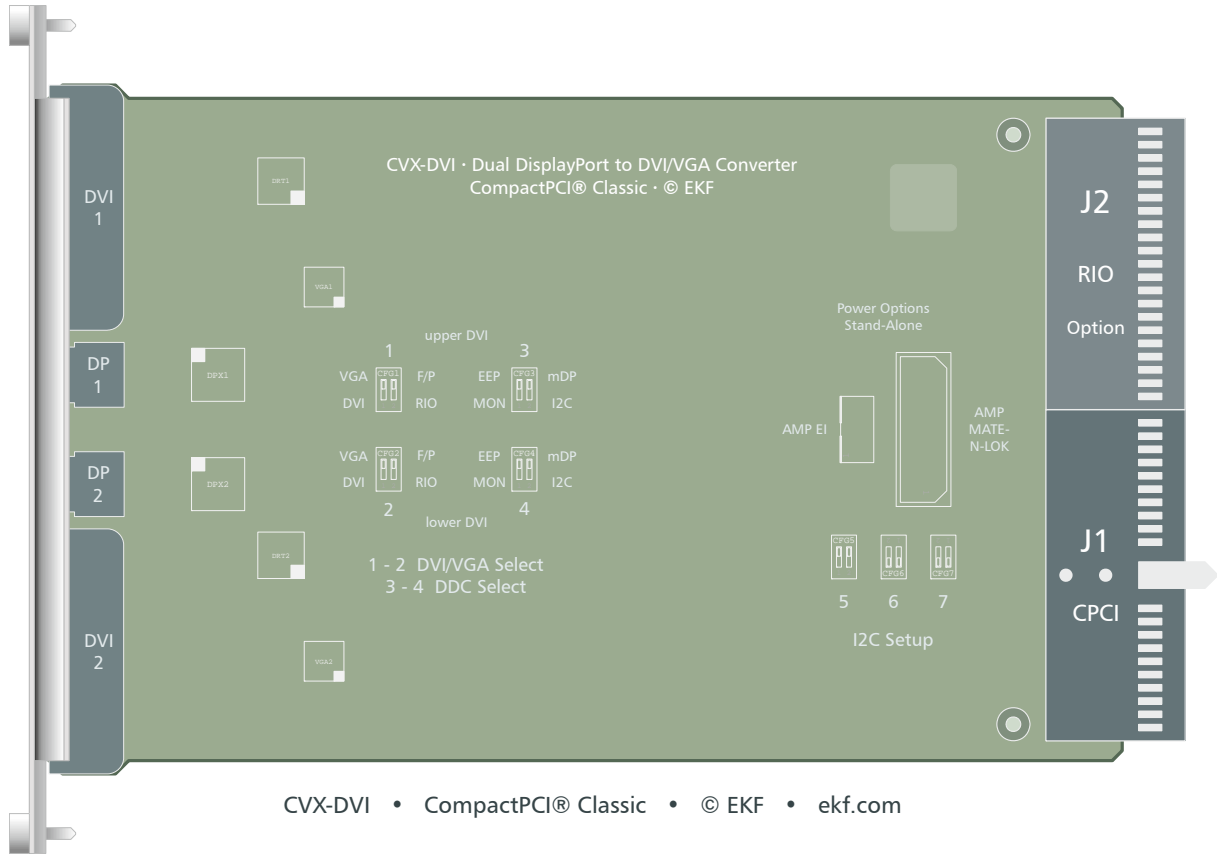
E = EEPROM • M = monitor • R = run (normal operation) • P = Program EEPROM

Block Diagram

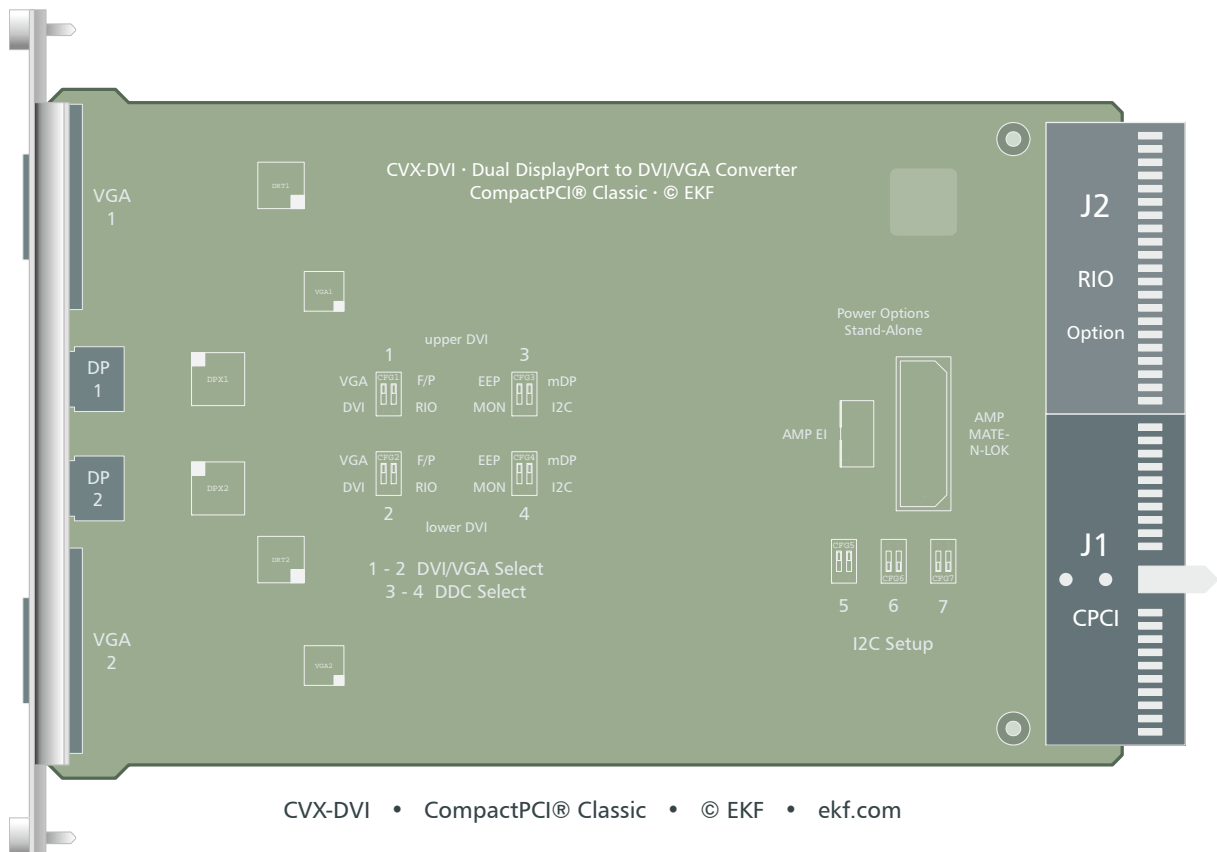


Assembly

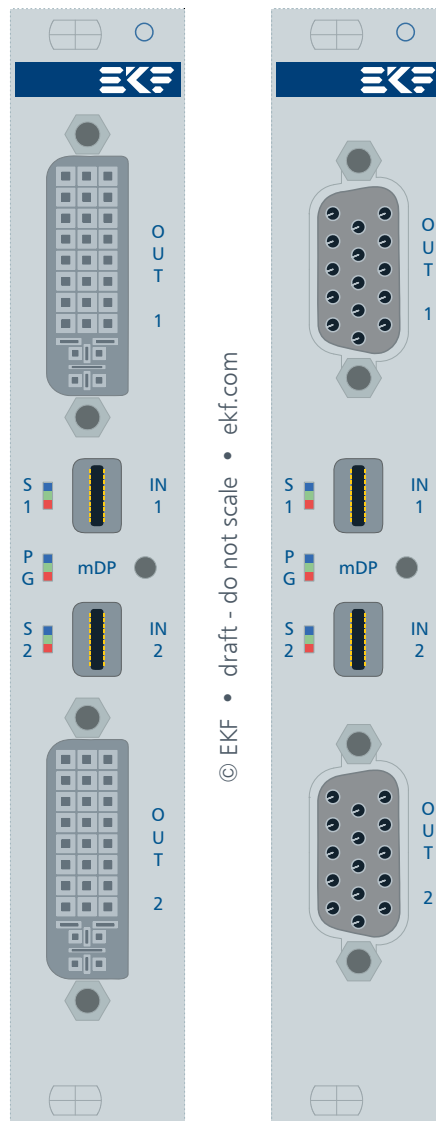
DVI



Option VGA



Front Panel



CVX-DVI

CVX-DVI
VGA

Please note: VGA connectors available as ordering option only

| R/G/B Status LEDs | |
|-------------------|---|
| S1 | dedicated to upper video port digital mode: I ² C controlled (future) • analog mode: OnePixel monitor |
| PG | I ² C controlled (future) or power good (stuffing option) |
| S2 | dedicated to lower video port digital mode: I ² C controlled (future) • analog mode: OnePixel monitor |

mDP Screw Lock Option



Option Front Panel Retainer Plate for mDP Cable Connectors

| EKF Part # | Description |
|--|--|
| 710.9.MDP.1 | H-style retainer plate |
| 440.13.025.020 | knurled-head screw |
| 440.26.030.020 | washer |
| 442.3.02xx.0 part # xx depends on required length 442.2.02xx.0 + 440.08.025.006 (alternate parts) | inside/outside threaded hexagon bolt must meet size of mDP cable connectors or inside/inside threaded bolt plus screw |

CPU Card to CVX-DVI Interconnect

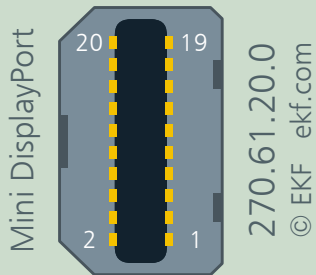


Recommended mDP Cable Assemblies

| EKF Part # | Description |
|----------------|--|
| 270.66.0.005.0 | 0.5m Mini DisplayPort (mDP) to Mini DisplayPort (mDP) plug to plug cable assembly, VESA DisplayPort 1.2 suitable e.g. for CPU Boards PC3-ALLEGRO PC4-PRESTO PC5-LARGO SC1-ALLEGRO SC2-PRESTO SC3-LARGO |
| 270.66.2.005.0 | 0.5m DisplayPort (DP) to Mini DisplayPort (mDP) plug to plug cable assembly, VESA DisplayPort 1.2 suitable e.g. for CPU Boards PC1-GROOVE PC6-TANGO SC4-CONCERTO SC5-FESTIVAL |

mDP Input Connectors (Sink-Side)

Mini DisplayPort 1/2 (Video Input) Conforming to Vesa Sink-Side Configuration

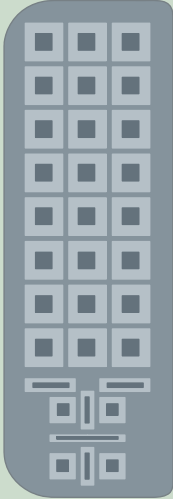


| | | | |
|----|-------------------------|----|----------|
| 20 | Power Out ¹⁾ | 19 | GND |
| 18 | AUX_CH(N) | 17 | LANE1(P) |
| 16 | AUX_CH(P) | 15 | LANE1(N) |
| 14 | GND | 13 | GND |
| 12 | LANE0(P) | 11 | LANE2(P) |
| 10 | LANE0(N) | 9 | LANE2(N) |
| 8 | GND | 7 | GND |
| 6 | CONFIG2 | 5 | LANE3(P) |
| 4 | CONFIG1 | 3 | LANE3(N) |
| 2 | Hot Plug Detect | 1 | GND |

1) +3.3V via electronic power switch 1.5A

It is recommended to use only VESA compliant cable assemblies, which provide no connection with respect to DP/mDP connector pin 20 (power output). Some manufacturers however offer proprietary cables which pass through the pin 20 in addition, maybe for powering external devices via cable. This may cause a backdriving current however between VESA compliant DP ports.

DVI Output Connectors

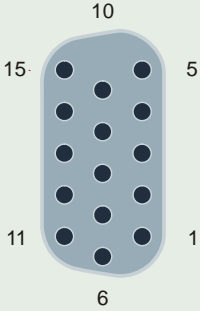
| DVI 1/2 (Video Output) | | | | | | |
|---|----|-------|------|------------------------|-----|---------|
|  | 17 | TX0- | 9 | TX1- | 1 | TX2- |
| | 18 | TX0+ | 10 | TX1+ | 2 | TX2+ |
| | 19 | GND | 11 | GND | 3 | GND |
| | 20 | TX5- | 12 | TX3- | 4 | TX4- |
| | 21 | TX5+ | 13 | TX3+ CEC ²⁾ | 5 | TX4+ |
| | 22 | GND | 14 | DDC_POW ¹⁾ | 6 | DDC_SCL |
| | 23 | TXC+ | 15 | GND | 7 | DDC_SDA |
| | 24 | TXC- | 16 | DVI_HP | 8 | VSYNC |
| | | c3 | BLUE | c1 | RED | |
| | | c6 | GND | c5 | GND | |
| | c4 | HSYNC | c2 | GREEN | | |

¹⁾+5V via self resetting fuse 0.5A

²⁾ CEC (stuffing option)

The DVI receptacles are provided with full (dual link) contacts. Nevertheless a single link DVI cable is sufficient for operation (dual link DVI cable assembly optional). As an option, the DVI receptacles may be replaced by classic style VGA connectors (ordering option).

VGA Connectors (Option)

| VGA HD-Sub 15-Pos. (Option) | | |
|---|----|-----------------------|
|  | 1 | RED |
| | 2 | GREEN |
| | 3 | BLUE |
| | 4 | NC |
| | 5 | GND |
| | 6 | GND |
| | 7 | GND |
| | 8 | GND |
| | 9 | DDC_POW ¹⁾ |
| | 10 | GND |
| | 11 | NC |
| | 12 | VGA_DDC_SDA |
| | 13 | HSYNC |
| | 14 | VSYNC |
| | 15 | VGA_DDC_SCL |

¹⁾+5V via self resetting fuse 0.5A

As an alternate to the optional on-board VGA connectors, adapters DVI to VGA can be used externally (picture below).



CompactPCI® Peripheral Slot Connector J1

The CVX-DVI is powered from the CompactPCI® backplane connector J1 (+5V only). In addition, some on-board configurations can be controlled via the I²C SMBus I/F.

| #J1 | A | B | C | D | E |
|-----|----------|----------|-----------|------------------|------------------|
| 25 | +5V | REQ64# | ENUM# | +3.3V | +5V |
| 24 | AD1 | +5V | VI/O | AD0 | ACK64# |
| 23 | +3.3V | AD4 | AD3 | +5V | AD2 |
| 22 | AD7 | GND | +3.3V | AD6 | AD5 |
| 21 | +3.3V | AD9 | AD8 | M66EN | C/BE0# |
| 20 | AD12 | GND | VI/O | AD11 | AD10 |
| 19 | +3.3V | AD15 | AD14 | GND | AD13 |
| 18 | SERR# | GND | +3.3V | PAR | C/BE1# |
| 17 | +3.3V | IPMB SCL | IPMB SDA | GND | PERR# |
| 16 | DEVSEL# | GND | VI/O | STOP# | LOCK# |
| 15 | +3.3V | FRAME# | IRDY# | BD_SEL# | TRDY# |
| 14 | | | | | |
| 13 | | | Not Keyed | | |
| 12 | | | | | |
| 11 | AD18 | AD17 | AD16 | GND | C/BE2# |
| 10 | AD21 | GND | +3.3V | AD20 | AD19 |
| 9 | C/BE3# | IDSEL | AD23 | GND | AD22 |
| 8 | AD26 | GND | VI/O | AD25 | AD24 |
| 7 | AD30 | AD29 | AD28 | GND | AD27 |
| 6 | REQ# | GND | +3.3V | CLK | AD31 |
| 5 | BRSVP1A5 | BRSVP1B5 | RST# | GND | GNT# |
| 4 | IPMB PWR | HEALTHY# | VI/O | INTP | INTS |
| 3 | INTA# | INTB# | INTC# | +5V | INTD# |
| 2 | TCK | +5V | TMS | TDO ¹ | TDI ¹ |
| 1 | +5V | -12V | TRST# | +12V | +5V |

pin positions printed grey: not connected

1 TDO - TDI internally connected

CompactPCI® Rear I/O Connector J2

The rear I/O connector J2 is stuffed as an option only. In order to avoid damages, before installing the CVX-DVI with the J2 populated, ensure that your system is not equipped with a P2 CompactPCI 64-bit expansion backplane. Otherwise, permanent damage to the board or to system components could occur.

| #J2 | A | B | C | D | E |
|-----|-----------|-----------|-------------|-------------|-------------|
| 22 | | GA3 | GA2 | GA1 | GA0 |
| 21 | | GND | 1-VGA-RED | 1-VGA-HSYNC | 1-VGA-VSYNC |
| 20 | | GND | 1-VGA-BLU | GND | 1-DDC-SCL |
| 19 | GND | GND | GND | 1-VGA-GRN | 1-DDC-SDA |
| 18 | 2-VGA_RED | 2-VGA_GRN | 2-VGA_HSYNC | GND | 2-VGA_VSYNC |
| 17 | 2-VGA_BLU | GND | | | |
| 16 | | 2-DDC_SCL | | GND | 2-DDC_SDA |
| 15 | | | | | |
| 14 | | | | GND | GND |
| 13 | | | | | |
| 12 | | | | | |
| 11 | | | | | |
| 10 | | | | | |
| 9 | | | | | |
| 8 | | | | | |
| 7 | | | | | |
| 6 | | | | | |
| 5 | +5V | | | | |
| 4 | | +5V | | GND | |
| 3 | | GND | | | |
| 2 | | | | | |
| 1 | | GND | | | |

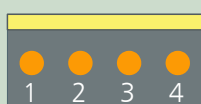
The signal assignment of the optional J2 connector matches the rear I/O transition boards CCR-RIO and CCT-RIO with respect to 2-VGA.



Stand-Alone Power Connectors (Option)

POWCON1/2 (Option) • #264.02.004.02/3 • EI-Series Header Hrз/Vrt

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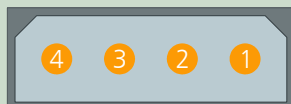


264.02.004.03
AMP EI-Series

| | |
|---|------|
| 1 | +5V |
| 2 | GND |
| 3 | GND |
| 4 | +12V |

Connector POWCON3 (Option) +5V Power • 264.02.004.13 • MATE-N-LOK

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264.02.004.13
AMP MATE-N-LOK

| | |
|---|------|
| 1 | +12V |
| 2 | GND |
| 3 | GND |
| 4 | +5V |



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