



**INSTRUCTION MANUAL**

## **Versatile Brix Cards**

**MultiDyne**  
*Harnessing The Power of Light*

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## Introduction

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The Versatile Brix Series of stand-alone SMPTE 4K video Serial Digital Interface (UHD-SDI) with audio, Ethernet and data transport systems extends the range limits of electrical interfaces. It combines all the signals along with a single optical fiber link. The system will transport digital signals from 5 Mbps up to 12Gbps video, analog audio, and AES digital audio, serial data, tally, and General Purpose I/O (GPIO) signals.

Applications include transmission links for high definition or digital television, studio to transmitter; studio-to-studio, robotic studio cameras, studio to CATV head-end and backhaul feeds from special events.

## Features and Operation

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The VB series video cards supports all popular standards for digital video transport such as SMPTE ST 2082, SMPTE ST 2081, SMPTE 424M, SMPTE 292M, and SMPTE 259M working at 12G-SDI, 6G-SDI, 3G-SDI, HD-SDI, SD-SDI respectively. In addition, the SDI interface also will transport signals compatible with DVB/ASI, and SMPTE 297M interfaces at the defined rates. The units include a digital re-clocked DA and repeater for the SMPTE SDI standards mentioned above. For other standards and rates, the signal is automatically or manually passed thru without re-clocking. For all SDI input, the units include automatic cable equalization based on the data rate detected.

The VB series also transports 4x4 analog audio channels with maximum configurable levels of 4dBu, 10dBu, 16dBu, or 28 dBu; 2 digital AES pairs up to 96 KHz that cross convert with the 4 analog channels; and a bidirectional stereo channel for intercom applications with maximum level of 4dBu.

The VB series data card supports 1 bidirectional tally and 1 GPIO bidirectional channel and 2 data channel with RS232 or RS422/ RS485 transport up to 3Mbps.

The VB series can also be ordered with an Ethernet card. The Ethernet card can also be ordered with 2 Ethernet ports. That can be used to extend gigabit Ethernet connectivity over fiber. Rates of 10/100/1000 Mbps are supported for Ethernet.

The VB series also sports a Sync transport option. It supports sync formats are NTSC, PAL, and HD Tri-Level.

## Different Cards

### 3.1. VIDEO CARD

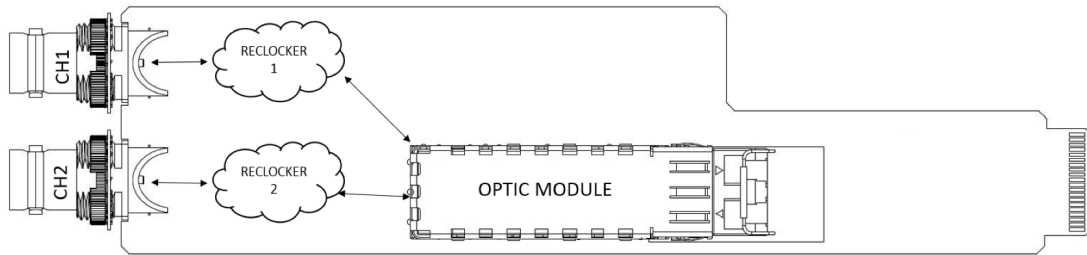


Figure 3.1: VIDEO CARD

The video cards are dual channel cards. They can be ordered in 2 options based on the data rate required.

- 1) 3G option
- 2) 12G option

The video cards can be configured into single\dual transmitter or single\dual receiver options only. The configuration is based on the SFPs plugged into the module. The SFPs have to be NON-MSA, and SDI video SFPs. When in transmit configuration is used the board configures to receive video over copper. So the video is equalized and re-clocked before transmitting over fiber. In receive configuration they are received over fiber and re-clocked and driven over copper by the cable driver. The data rates are indicated over the front led panel. The 3G video board indicates SD, HD and 3G for both the channels. The 12G video board indicates 3G, 6G or 12G option.

### 3.2. AUDIO CARD

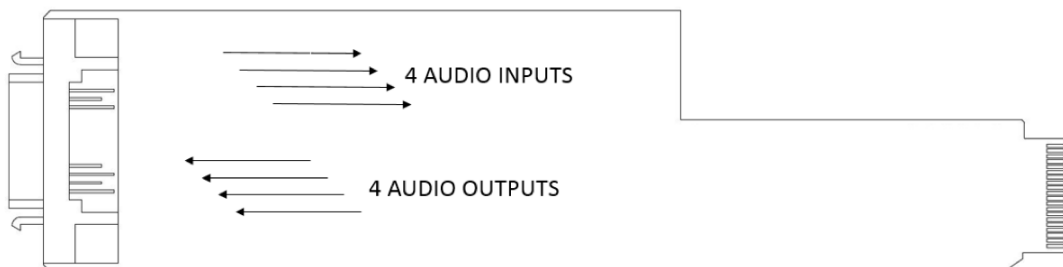


Figure 3.2: AUDIO CARD

The audio cards support 2 stereo inputs and 2 stereo outputs on each side. So, the link supports two balanced stereo pairs, or two AES channels of high quality audio. In the RX side, for each stereo pair, and whatever signal either analog or digital was configured on the TX side, is sent simultaneously to the analog and digital AES ports. The system has to be ordered either as analog or AES or a combination of both. This feature effectively can convert an analog signal in the TX side to digital in the RX side, or the reverse case. The AES channels can be ordered to 75ohms single ended or 110 ohms balanced. The audio LEDs indicate three possible statuses: constant blinking green indicates AES signal is present, green indicates analog level is present.

Table 1: AUDIO CARD PIN DESCRIPTION

PIN NUMBER	PURPOSE
1	GND
2	AUD_IN-
3	AUD_IN+
4	GND
5	AUD2_IN+
6	AUD2_IN-
7	GND
8	AUD3_IN+
9	AUD3_IN-
10	GND
11	AUD4_IN+
12	AUD4_IN-
13	GND
14	GND
15	AUD1_OUT+
16	AUD1_OUT-
17	GND
18	AUD2_OUT+
19	AUD2_OUT-
20	GND
21	AUD3_OUT+
22	AUD3_OUT-
23	GND
24	AUD4_OUT+
25	AUD4_OUT-
26	GND

### 3.3. DATA CARD

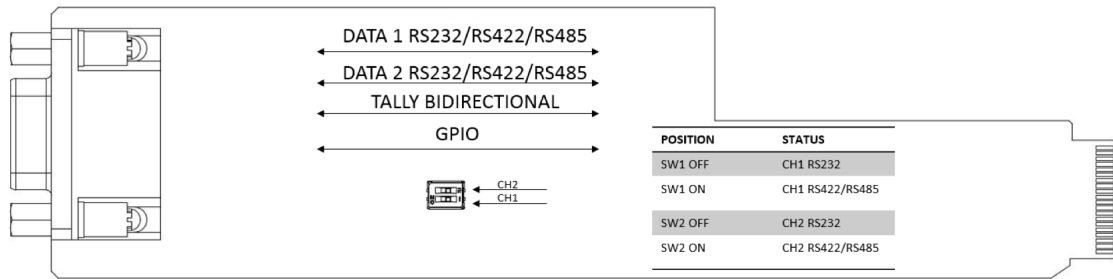


Figure 3.3: DATA CARD

The data card support one channel of bidirectional Tally and one bi-directional general purpose input output. It also supports 2 channel of bidirectional data. The data can be set in different configuration. The channels are set to by default RS232. The cards can be ordered with RS422 or RS485 by changing the switch on the card as shown above in the image. The LEDS in the front will turn on showing the data paths are active.

The interface is through a HD15 connector. The pinouts of the connector are as shown below.

PIN NUMBER	FUNCTION
1	CH1 RX-
6	CH1 RX+
7	CH1 TX-
11	CH1 TX+
2	CH2 RX+
8	CH2 RX-
12	CH2 TX+
3	CH2 TX-
9	TALLY IN
10	TALLY OUT
13	GPO
4	TALLY OUT
14	GND
15	GND

Table 2: DATA CARD PIN DESCRIPTION

### 3.4. ETHERNET CARDS

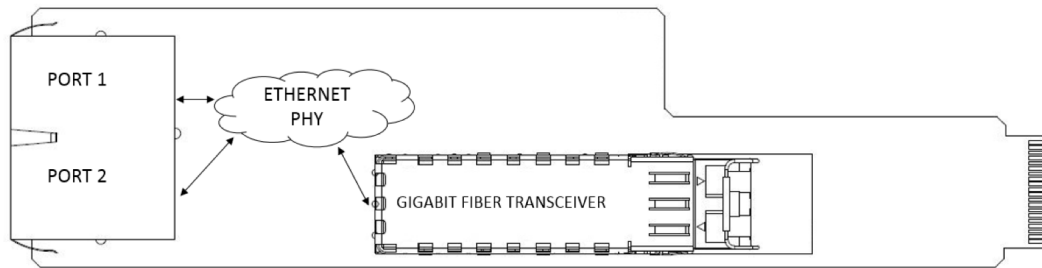


Figure 4: ETHERNET CARD

The Gigabit Ethernet includes a copper to fiber Ethernet media converter. Data rates of 10/100/1000 Mbps are supported. When a link is established between 2 units. The green LED in the front will turn on. Then as the ports are connected the lights will flicker.

## Front Panel

### 4.1 VB6 SERIES FRONT PANEL

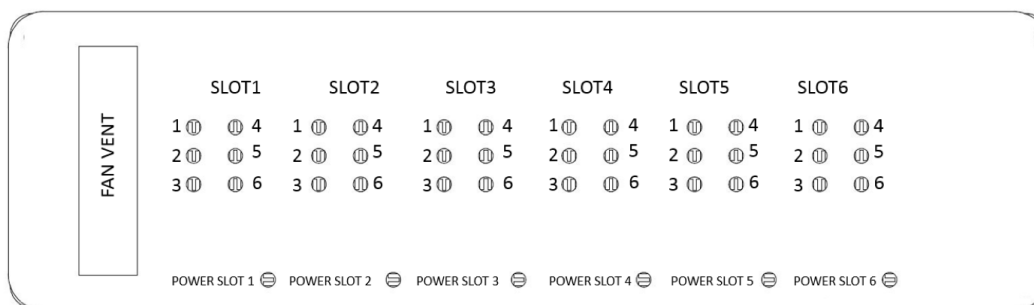


Figure 4.1: VB6 SERIES FRONT PANEL VIEW

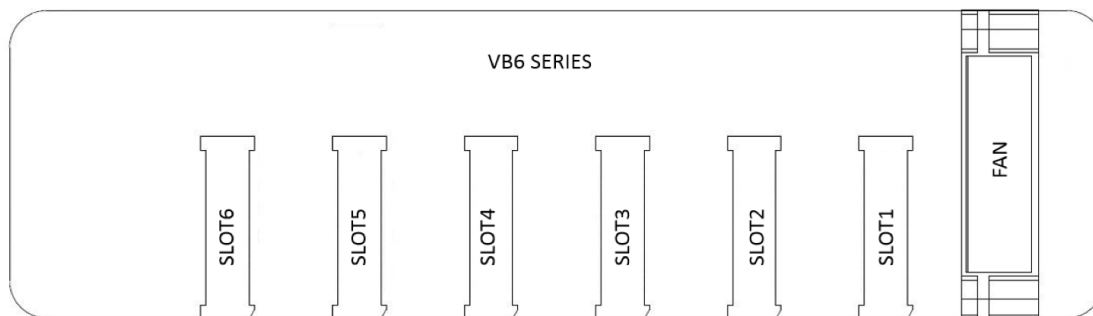


Figure 4.1: VB6 SERIES REAR PANEL VIEW

The front panel of a standard VB6 box has 6 slots. Each slots have capabilities of driving 6 green color LEDs for signals as shown in the image above. The slot have an opening in the front to mount a centrifugal fan that pushes air outside. When the box is populated with more than 3 cards it is a standard feature to mount it with a fan to keep the box temperature.



The below table talks about what are the capabilities of different slots.

Table 3: VB6 SERIES SLOTS FUNCTIONALITY WITH DIFFERENT CARDS

CARD TYPE	SLOT1	SLOT2	SLOT3	SLOT4	SLOT5	SLOT6
VIDEO CARD	YES	YES	YES	YES	YES	YES
ETHERNET CARD	YES	YES	YES	YES	YES	YES
DATA CARD	NO	YES	NO (ALLOCATED FOR SERIALIZER)	YES	YES(2 DATA AND TALLY)	YES
AUDIO CARD	NO	YES	NO (ALLOCATED FOR SERIALIZER)	YES	YES	YES
SYNC(SERIALIZER)	YES	YES	YES	YES	YES	YES

#### 4.2 VB3 SERIES FRONT PANEL

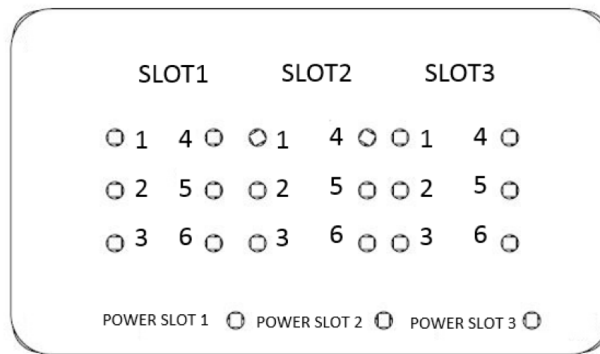


Figure 4.2: VB3 SERIES FRONT PANEL VIEW

Similar to the VB6 Series front panel. The VB3 series front panel can accommodate to 3 cards. Below shown are the card slots and their adaptability.

Table 4: VB3 SERIES SLOTS FUNCTIONALITY WITH DIFFERENT CARDS

CARD TYPE	SLOT1	SLOT2	SLOT3
VIDEO CARD	YES	YES	YES
ETHERNET CARD	YES	YES	YES
DATA CARD	NO	NO (ALLOCATED FOR SERIALIZER)	YES
AUDIO CARD	NO	NO (ALLOCATED FOR SERIALIZER)	YES
SYNC(SERIALIZER)	YES	YES	YES

## 5. Appendix

The products changes are based on the configuration ordered, and there is no consistent front panel. The front panel changes are based on the configuration ordered and the box ordered.

The below shows what fashion of LEDs to expect for different cards.

### 5.1 VIDEO CARD

The front top of the led panel shows the channel number and the rear shows the BNC number. It also shows the data rate of the signal and whether it is an input or output.

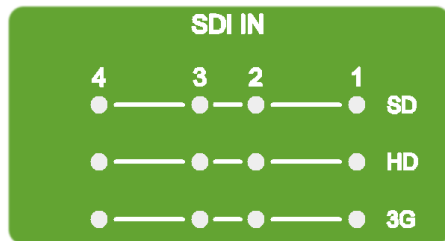


Figure 5.1: SDI INPUT FRONT

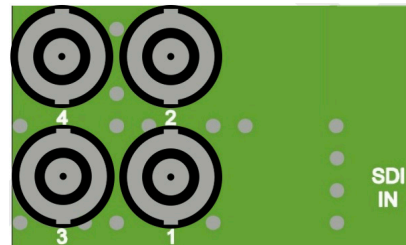


Figure 5.1: SDI INPUT REAR

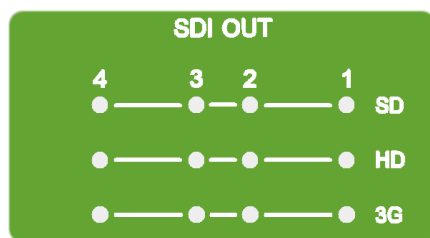


Figure 5.1: SDI OUTPUT FRONT

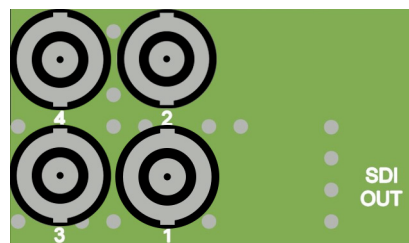


Figure 5.1: SDI OUTPUT REAR

### 5.2 DATA CARD

The data light remains on when the channels are active.

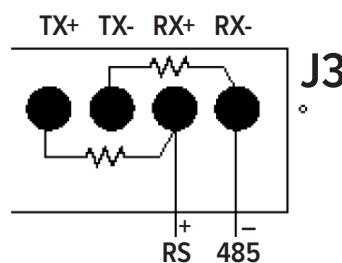


Figure 5.2: DATA CARD FRONT



Figure 5.2: DATA CARD REAR

\* For RS485 applications connect together TX and RX with a small 680 Ohm resistor as shown below



### 5.3 SYNC SIGNAL



Figure 5.3: FRONT SERIALIZER CARDS

The SYNC card has 2 LEDs. One of the signal shows that the link has been established. Once the link light is on, it means the audio card and data card also has the attained link. The second LED is the SYNC OUT or SYNC IN. Usually the camera side has SYNC OUT and the base side is SYNC IN. Presence of SYNC in either boxes illuminates the LED. The output on the rear is just LED.



Figure 5.3: REAR SERIALIZER CARDS

### 5.4 ETHERNET CARD



Figure 5.4: FRONT ETHERNET CARD

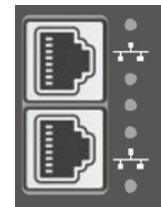


Figure 5.4: REAR ETHERNET CARDS

The Ethernet LED is represented with the standard LAN symbol. It glows green when the Link has been established and it starts flickering as the data is being transmitted. The rear has 2 ports with an inbuilt Ethernet switch.

### 6.1 POWER



Figure 6.1: REAR ST POWER INPUT



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