

XtremeAV-SDI

UserGuide
Version 1.0.3



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Introduction

The XtremeAV-SDI has three independent video capture channels – one supporting HD capture, a second decoding Standard Definition composite video and the third, a HD-SDI capture supporting SD-SDI, HD-SDI and 3G-SDI, all channels can be captured simultaneously. The XtremeAV-SDI also adds HDMI audio capture which can be perfectly synchronised with either video capture channel. Analog audio is available by using the optional Audio Module (AM2)

- A single card solution for distance learning, lecture capture and web casting
- Viewing sources from a wide range of PCs, MACs, Industrial/Medical equipment, cameras and other video equipment
- Videoconferencing
- Multi-display presentation software
- Broadcasting
- Digital Signage

DirectShow drivers for WDM Streaming driver supports the following applications to encode, record and stream video over networks or the Internet:

- Windows Media Encoder®
- VLC
- StreamPix
- VirtualDub
- Adobe Flash Encoder
- AMCap
- Any other DirectShow encoding software

Hardware Overview

Triple Channel Video

- Channel 1: Digital or Analog HD Video
- Channel 2: Single SD/Composite Video
- Channel 3: SDI

Flexible Audio Capture

- HDMI audio through HD Video Channel

Analog Audio

- Through optional Audio Module AM2

EMS Unified Xtreme Driver

- Multiple cards per system
- Frame sync and time stamping
- Direct Show interface
- EMS RGBEasy API

Models:

XtremeAV-SDI

Optional Accessories:

Audio Module

Specification

Board Format	PCI-Express x4 half length, full height card
Connectors	DVI-I , RCA and 2 x BNC connectors (Input (Green LED) and Loop through output (Blue LED))
HDMI Capture	<ul style="list-style-type: none"> • Supports HDMI 1.3 to 225MHz (including deep colour modes). For HDCP support, contact the Sales Dept at EMS for more information • HDMI audio can be selected as source for audio streaming • Incorporates TMDS equalizer to support up to 20m cables
DVI Capture	Supports DVI 1.0 RGB 24BIT capture to 165MHz Incorporates TMDS equalizer to support up to 20m cables
VGA / YPbPr Capture	Triple ADCs sampling up to 170MSPS. Full 4:4:4 sampling, 8 bits per colour 5-wire, 4-wire or sync-on-green signal formats
DVI-I Modes	1920x1200/60fps. 32 bit colour, up to 4096x4096 resolution
Composite Video Capture	CCIR601 SAMPLING. PAL, NTSC, SECAM formats automatically detected
SDI Capture	<ul style="list-style-type: none"> • SD-SDI (480i/576i), HD-SDI to 1080i, 3G-SDI up to 1080P and 2K Digital cinema modes • SDI audio can be selected as source for audio streaming
Analog Audio Capture	Balanced and unbalanced analog Audio Capture (through optional Audio Module)
Video Capture Memory	256MB high bandwidth frame buffer supports triple buffering of HD and SD video Local storage of complex scatter-gather tables for DMA engine (eliminates read overhead)
Video Processing	<p>Polyphase FIR scaling engine (7x5) for hardware downscaling and upscaling</p> <p>Colour space conversion allows captured data to be transferred in any format:</p> <ul style="list-style-type: none"> • RGB 16 bit (5-5-5, 5-6-5), 24 bit (8-8-8) or 32 bit (8-8-8-alpha) • YUV 16 bit (4:2:2) • Mono: 8bit
DMA Engine	<p>Direct DMA to physical or virtual memory buffers with full scatter-gather support</p> <p>DMA bandwidth : up to 800MB/s</p> <p>16 independent DMA streams:</p> <ul style="list-style-type: none"> • Any mix of HD and SD sources, colour space, cropping and scaling parameters
Operating System Support	Windows XP, Windows Server 2003, Windows Vista, Windows Server 2008, Windows Server 2012, Windows 7, Windows 8 and Linux support See www.EMS.co.uk for updates

We are continuously developing the technology used within our product ranges delivering outstanding innovative solutions, therefore the specification may change from time to time.

Power Requirements	Max current at 12V – 0.5A Max current at 3.3V – 0.8A Thermal dissipation – 6.5W (typical)
Operating Temperature	0 to 35 °C (32 to 96°F)
Storage Temperature	-20 to 70 °C (-4 to 158°F)
Relative Humidity	5% to 90% non-condensing
Warranty	3 years

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Unpacking

Note:

All plug-in cards are static sensitive and are packed in anti-static material. Please keep the card in its packaging until you are ready to install.

It is recommended that you do not discard the packing box until you are completely satisfied with the XtremeAV-SDI capture card and it is fully installed and working correctly. We also recommend that you make a note of the serial number of the card in a prominent place before the card is plugged into the computer. This should hasten any query should you need to contact our Technical Support Department. The serial number is displayed on the card itself and the box label.

Installing the Capture Card

You are likely to need a flat blade and/or a cross head screwdriver for the installation of the XtremeAV-SDI card; it would be useful to have these to hand before you begin.

- Power down the PC (including peripherals), switch off at the mains and disconnect all the cables connected to the computer, noting the positions for accurate reconnection
- Remove the PC cover
- Locate a vacant PCI Express slot (x4 or higher) on the motherboard and remove the blanking plate (retain all screws)

If you are in doubt consult your motherboard documentation to correctly identify a PCI Express slot. If the card is forced into a 32 or 64 bit PCI or PCI-X slot it will be irreparably damaged when the system is powered up and the warranty will be void

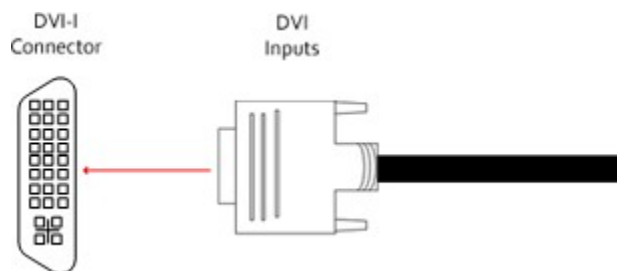
- Reconnect all cables to the PC then connect a DVI cable (not supplied) distributing the DVI source signal to the connector on the XtremeAV-SDI capture card
- A standard definition signal can be connected to the RCA connector on the XtremeAV-SDI
- An SDI signal can be connected to the BNC connector
- Power up the PC and commence the software installation

How to Connect Input Sources

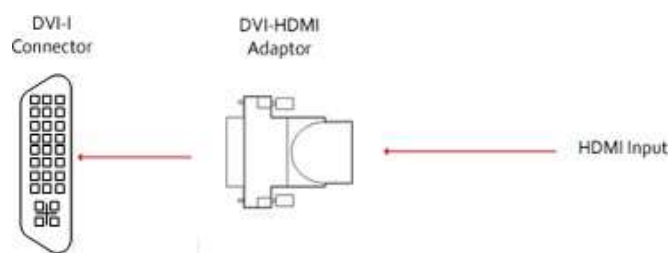
The XtremeAV-SDI card has one DVI-I, one RCA (female) connector and one BNC (Green LED) connector.

The DVI-I connector supports DVI, HDMI, Component and RGB (VGA) inputs using adapters where required.

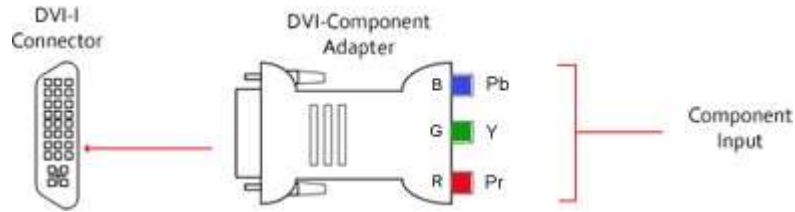
A DVI input is connected directly into the DVI-I connector which accepts DVI-D (digital) or DVI-A (analog) inputs:



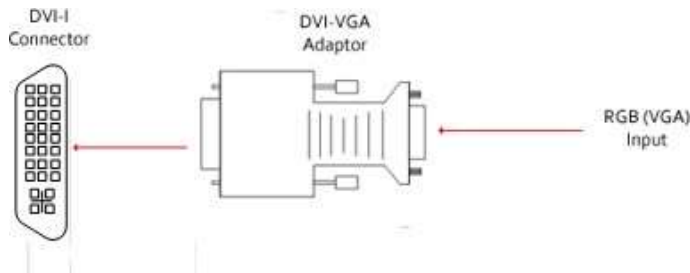
An HDMI input is connected to the DVI-I connector using a DVI-HDMI Adaptor:



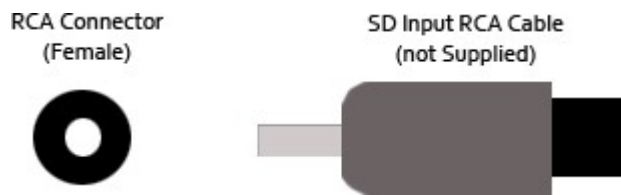
A Component input is connected to the DVI-I connector using a DVI-Component Adapter:



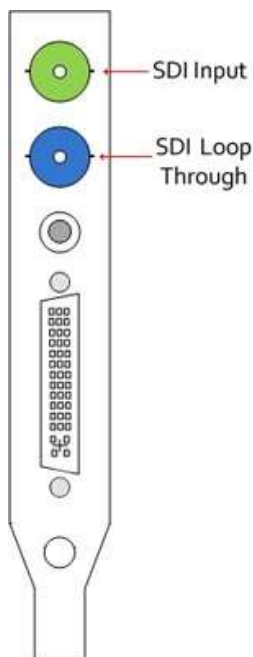
An RGB (VGA) input is connected to the DVI-I connector using a DVI-VGA Adapter:



A Standard Definition input is connected directly into the RCA (female) connector on the XtremeAV-SDI card:



SDI input is connected to the XtremeAV-SDI using the BNC connector (cable not supplied):

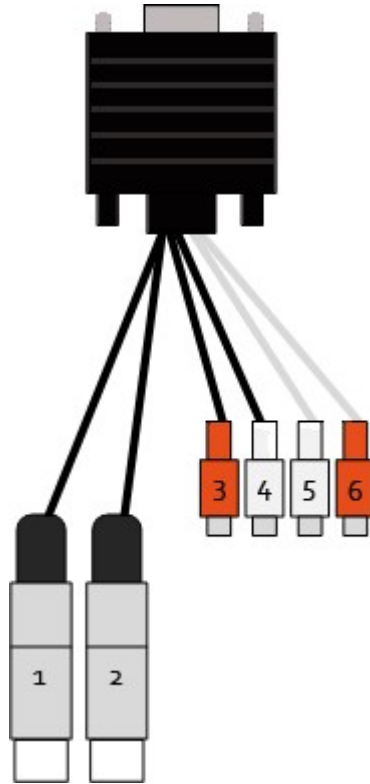


Cable Length

The XtremeAV-SDI supports cable lengths of up to 150m. for 3G-SDI. This figure is based on using low loss co-ax cable (Belden 1694A).

Using the Optional Audio Module (AM2)

Audio is connected to the AM2 using the Audio Break Out cable provided with the AM2:

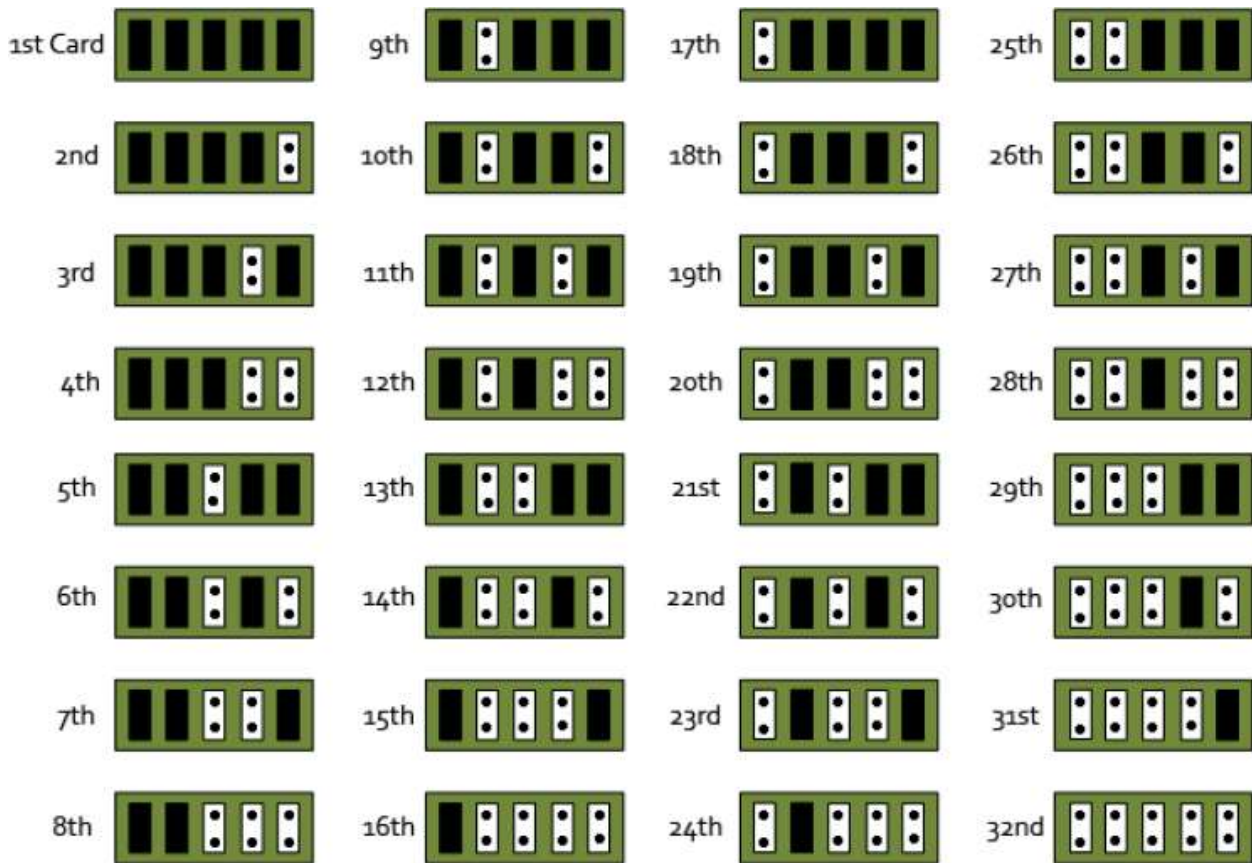


1	Balanced (XLR) Input Left
2	Balanced (XLR) Input Right
3	Unbalanced Input Left
4	Unbalanced Input Right
5	Audio Out Left
6	Audio Out Right

Installing Multiple Cards

Multiple cards can be installed in a system providing a large number capture channels. Combinations of Xtreme capture cards in the same machine are supported by the Xtreme driver.

In order to control the order in which the driver uses the cards, it is recommended when installing multiple cards that the J6 links on the XtremeAV-SDI are configured. The example below shows the jumper link settings for up to 32 cards in a single system. When two cards share the same link settings, their order is determined by the PCIe bus.



DirectShow

If you change the link ordering after installation you must run **dplinks.exe**. This program will update the existing input names used by the windows DirectShow interface.

To run the dplinks program open the **Run** by clicking on **Start/Run** and type dplinks and then press **Enter**.

The program will run, however no notifications are displayed.

Firmware Upgrades

The XtremeAV-SDI cards allow firmware upgrade to be completed on site rather than returning the card to EMS. Whenever a firmware upgrade is performed, the J8 Link **MUST BE FITTED on the** XtremeAV-SDI. To perform the upgrade, follow the step-by-step instructions provided by the upgrade application.

In the unlikely event that something goes wrong during the upgrade process (e.g. System power outage) it is possible to revert to the factory settings by powering down the system, temporarily removing the J8 link then powering up the system with the link removed. Once the system has rebooted, replace the J8 link (whilst the system is powered up) and restart the firmware upgrade process.

It should be noted that the latest driver installation program includes an automatic firmware update, if required. Therefore, prior to installing the application and driver, ensure that J8 link is fitted.

Software Installation

Software Installation

The Xtreme software (driver and application) is installed from www.ems-imaging.com/downloads

The installation process should start automatically.

Follow the installation wizard instructions as prompted.

Regular software updates are available from our website:
www.ems-imaging.com/downloads

Application Overview

The application displays the connected source in a window; it has the following features:

- Scales the data to fit in the window
- Ability to set up sources accurately (settings automatically saved)
- Save a single frame to a file in one of the following formats:
BMP, JPEG, GIF, TIFF, PNG
- Print a single frame
- Maintain the aspect ratio of the displayed captured data
- Cropping
- Display text over the data (on-screen display)
- Command line interface
- Help file documenting all features

Note:

The supplied drivers and software require that you are using:

- **Windows® XP, Windows® Vista, Windows® Server 2003, Windows® Server 2008 or Windows® 7 (x86 and x64 Operating Systems) or Linux**
- **CD / DVD ROM Drive**

Using the card with other EMS products

The XtremeAV-SDI captures data and stores it in an on-board video buffer. This data is then copied using DMA to the host system for display, storage or streaming.

When a EMS graphics card is used, XtremeAV-SDI transfers the data directly to the graphics card thereby increasing performance. The XtremeAV-SDI sends the relevant portions of each captured image to each display channel and instructs each channel to use its graphics engine to render the data. This fully utilises the hardware and dramatically increases performance.

When a Direct3D compatible graphics card is used the data can be transferred direct to the graphics card in a similar manner to the EMS graphics card with the same benefit of non-tearing captures.

When the data is displayed on a non EMS graphics card, the XtremeAV-SDI sends the data to system memory or direct to the graphics card, dependant on the software used for display.

Technical Support

Registered Users can access our technical support line using, email, and the Support page on the EMS Web Site, usually with a response within 24 hours (excluding weekends).

Via Email

Send an email to support@ems.imaging.com with as much information about your system as possible. To enable a swift response we need to know the following details:

- Specification of the PC - including processor speed
- Operating System
- Application Software
- EMS Hardware / Software
- The exact nature of the problem - and please be as specific as possible

Please quote version and re Xtreme numbers of hardware and software in use wherever possible.

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