Active FCB-EH-HD-SDI INTERFACE MODULE

Active Silicon
COMPUTER IMAGING PRODUCTS

- **HD-SDI digital interface for the Sony FCB-EH series cameras (FCB-EH6500/6300/3410/3310/3150)**
- **1080p/1080i/720p high definition video**
- **Built in test pattern facility**
- **RS-232 serial communications**

FEATURES

- HD-SDI Interfacing solution for the Sony FCB-EH series of cameras.
- Includes interface module, cables and mounting kit.
- Uses the camera's digital output to give optimum image quality.
- Supports all available HD modes – 1080p, 1080i (PsF), 720p at 25, 29.97, 30, 50, 59.94 and 60Hz.
- Compliant with SMPTE 274M and SMPTE 296M.
- Video mode selection switches and built-in test pattern.
- RS-232 communications port for camera control.
- Compatible with Active Silicon's frame grabbers.
- RoHS compliant.

OVERVIEW

The **Active FCB-EH-HD-SDI** is a complete interface solution to provide real-time HD-SDI video from the Sony EH series of block cameras.

This interface module provides a cost-effective solution to take full advantage of the high definition digital video provided by the FCB-EH block cameras. The interface board connects directly to the camera's digital output to provide superior image quality. All camera HD video modes are supported, plus additional ones by custom firmware (e.g. standards conversion from 720p60 to broadcast 1080i60).

A DIP switch located on the rear of the module allows the HD video mode to be conveniently selected without the need to send serial commands to the camera.

The **Active FCB-EH-HD-SDI** has a built in test pattern which conforms to the SMPTE RP-219-2002 specification (see Figure 2). The pattern generation feature is controlled via connector J3.

The product is supplied as a kit consisting of the interface module, mounting kit and cables, though the board alone may also be ordered without the mounting kit and cables if required.

The physical outline of the **Active FCB-EH-HD-SDI** sits within the rear profile of the FCB-EH series of cameras and the supplied mounting kit allows the module to be securely and neatly attached to the camera (see Figure 1).

Figure 1: EH6500 camera with module fitted

Figure 2: SMPTE RP-219-2002 test pattern available from the module

KIT CONTENTS

The **Active FCB-EH-HD-SDI** contains the following items (listed from left to right in reference to the photo below):

1. 9-way ribbon cable for serial communication and control. (Connects to J3)
2. 3-way ribbon cable for power. (Connects to J2)
3. Interface board.
4. Mounting kit (including bracket, screws and spacers).
5. 75 Ohm MCX to BNC cable. (Other lengths are available on request).
6. 30-way micro-coax digital video cable.

Figure 4: AS-HDSDI-003-IFKIT-A

PC CONNECTIVITY

Active Silicon also manufactures and supplies a range of HD-SDI video capture cards for interfacing to this module if required. As well as zero CPU acquisition, these cards provide serial communications and access to the camera's reset line for control of standby mode. These cards are available in a range of formats – not only standard PC formats (PCI & PCI-Express) but also in embedded form-factors such as PCI/104-Express for embedded applications.

CONNECTOR SPECIFICATION

HD-SDI Connector (J1)

The **Active FCB-EH-HD-SDI** is fitted with a 75 Ohm MCX connector, allowing the use of RG179 coax cable for connection to the interface module.

Connector type: Samtec MCX7-J-P-H-RA-TH1-SKT.

Mating Cable: MCX 75 Ohm plug, typically to RG179 coaxial cable.
(MCX to 75 Ohm bulkhead BNC adapter supplied.)

Power in Connector (J2)

The **Active FCB-EH-HD-SDI** is fitted with an industry standard 3-way connector for power in.

Connector type: JST (Japan Solderless Terminals) BM03B-SRSS-TB.

Mating cable: Suitable cable supplied as part of the kit.

PIN	SIGNAL	LEVEL
1	DC IN	6.25V to 12.25V
2	GND	GND
3	GND	GND

Signal and Control (J3)

The **Active FCB-EH-HD-SDI** is fitted with an industry standard 9-way connector allowing access to the camera serial port, reset, analog video outputs and also the module's test pattern mode.

Connector type: JST BM09B-SRSS-TB.

Mating cable: Suitable cable supplied as part of the kit.

PIN	SIGNAL	LEVEL	NOTES
1	TxD	EIA/TIA-562 (Compatible with RS-232) Drive level +/- 4.5V See Note 1.	Serial Control (Output from module/camera)
2	RxD	EIA/TIA-562 (Compatible with RS-232) See Note 1.	Serial Control (Input to module/camera)
3	RESET IN	Ground short or drive low to operate (Internally pulled up to 3.3V)	Resets Camera.
4	Pattern Gen Select	Ground short or drive low to operate (Internally pulled up to 3.3V)	Enable On-board Test Pattern
5	GND	GND	GND
6	VBS-OUT	SD Composite	SD Analog Video Output (Note 2)
7	Y	HD Analog Component	
8	Pb	HD Analog Component	
9	Pr	HD Analog Component	

Note 1: The serial interface is EIA/TIA-562. This is compatible with RS-232 and also allows low voltage signalling down to +/-3.3V. TxD and RxD Tolerant to +/- 25V.

Note 2: Standard Resolution (SD) analog out is only available in SD mode (and in this mode no digital output is available).

KEL30 Connector (J4)

The **Active FCB-EH-HD-SDI** is fitted with a 30-way miniature connector to link to the matching connector on the FCB-EH camera.

Connector type: KEL USL00-30L.

Mating cable: KEL USL20-30SS-010-C.
(Suitable cable supplied as part of the kit).

Video Mode DIP Switch (SW1)

The **Active FCB-EH-HD-SDI** is fitted with a 4-way DIP switch to control the video output modes on the FCB-EH cameras. Refer to the Notes section for additional information.

Sw1	Sw2	Sw3	Sw4	Video Format	Mode #
OFF	OFF	OFF	OFF	External (VISCA)	0
ON	OFF	OFF	OFF	1080p30	1
OFF	ON	ON	ON	1080p29.97	14
OFF	ON	OFF	OFF	1080p25	2
ON	ON	OFF	OFF	1080i60 (30 PsF)	3
ON	ON	OFF	ON	1080i59.94 (29.97 PsF)	11
OFF	OFF	ON	OFF	1080i50 (25 PsF)	4
ON	OFF	ON	OFF	720p60	5
ON	OFF	ON	ON	720p59.94	13
OFF	ON	ON	OFF	720p50	6
ON	ON	ON	OFF	720p30	7
OFF	OFF	ON	ON	720p29.97	12
OFF	OFF	OFF	ON	720p25	8
OTHER				Reserved	-

Notes:

1) The DIP switch setting will only change the video output mode on cameras that natively support the video mode stated in the table. For cameras that do not support the stated video mode the DIP switch setting is ignored and the camera will continue to operate in the current video mode.
2) External (VISCA): The camera mode is changed by a VISCA serial commands, followed by a Reset.
3) The DIP switches to select the mode are read on power up only. Therefore to change mode, set the switches and then power cycle / power up the camera.

Status LED (LED1)

The **Active FCB-EH-HD-SDI** is fitted with multi-LED to indicate camera status.

Solid Green: Camera and interface board are powered and the camera is sending valid video data.

Solid Red: Interface board is powered but no valid video data is being received from the camera. This would typically indicate that the 30-way video cable (J4) is not correctly connected.

CONFORMANCE

HD-SDI:	**Active FCB-EH-HD-SDI** is compliant with SMPTE 274M and SMPTE 296M.
Approvals:	The **Active FCB-EH-HD-SDI** has been designed for inclusion in systems meeting the following regulations and standards when housed in a suitable enclosure: • EU CE mark for compliance with EMC EN 55022:1998 (class A) and EN 55024:1998 in accordance with EU directive 89/336/EEC. • USA EMC FCC Class A. RoHS Compliant. The printed circuit board is manufactured by UL recognized manufacturers and has a flammability rating of 94-V0.

PHYSICAL AND ENVIRONMENTAL DETAILS

Dimensions:	46mm by 42mm by 13.6mm high. When mounted to the camera using the supplied fixings, the depth of the camera is increased by 19.6mm.	
Weight:	10g (excluding mounting kit). Mounting kit weighs 2g.	
Power consumption:	130mA @ 9V.	Typical current consumption under normal operation conditions for the interface module. Camera and interface module combined typically draw 510 mA @ 9V.
Storage Temperature:	-20°C to +70°C.	
Operating Temperature:	-5°C to +70°C (ambient environment).	
Relative Humidity:	10% to 90% non-condensing (operating and storage).	

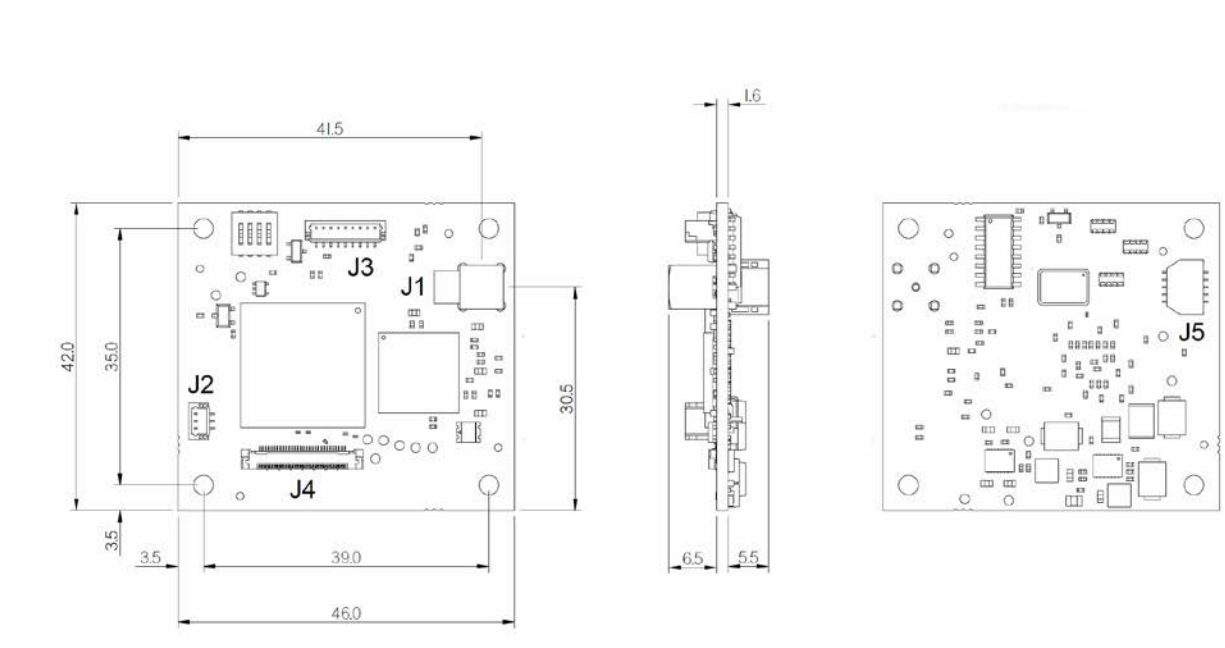

Figure 5: PCB mechanical details (top, side and bottom).

Figure 6: Module attached to EH6500 camera (top view).

Figure 7: Module attached to EH6500 camera (side view).

ORDERING INFORMATION

PART NUMBER	DESCRIPTION
AS-HDSDI-003-IFKIT-A	HD-SDI interface kit for Sony FCB-EH6500, EH6300, EH3410 and EH3310 cameras. Includes interface module, cables and mounting kit. *Note: Cameras in the EH range can also be purchased with the interface kit pre-fitted.*
AS-HDSDI-003-IF-A	Interface module only (no mounting kit) for Sony FCB-EH6500, EH6300, EH3410, EH3310 and EH3150 cameras.
AS-HDSDI-003-IFKIT-B	HD-SDI interface kit for Sony FCB-EH3150 camera. Includes interface module, cables and mounting kit. *Note: Cameras in the EH range can also be purchased with the interface kit pre-fitted.*
AS-PHX-D10HDSDI-PE1	HD-SDI frame grabber to connect to one Sony FCB-EH series camera fitted with an **Active FCB-EH-HD-SDI** module**.** PCI Express bus with single lane (x1) bus interface.
AS-PHX-D20HDSDI-PE4H	HD-SDI frame grabber to simultaneously connect to two Sony FCB-EH cameras fitted with **Active FCB-EH-HD-SDI** modules. PCI Express bus with four lane (x4) bus interface.
AS-CBL-VDM230-xM	HD-SDI and CoaXPress cable *x* meters in length. Standard stock lengths are 3m, 5m, 10m and 20m. Higher flex rating cables also available.
AS-PHX-SDK-xxx	Software Development Kit for frame grabber system integration, operating system denoted by “xxx”. (E.g. Windows, Linux, Mac OS X etc.). For a full list of all supported operating systems please refer to the SDK datasheet, or contact your distributor.

THE FCB INTERFACE RANGE

The following products are also available in the range:

- HD-SDI interface modules are also available for the Sony FCB-H11 and FCB-SE600 cameras.
- CoaXPress interface module for Sony FCB-H11. (Single coax solution carrying power, data and control all on one coax cable for up to 130m cable length.)

Active Silicon also provides a range of capture cards designed for use with the above interface modules.

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