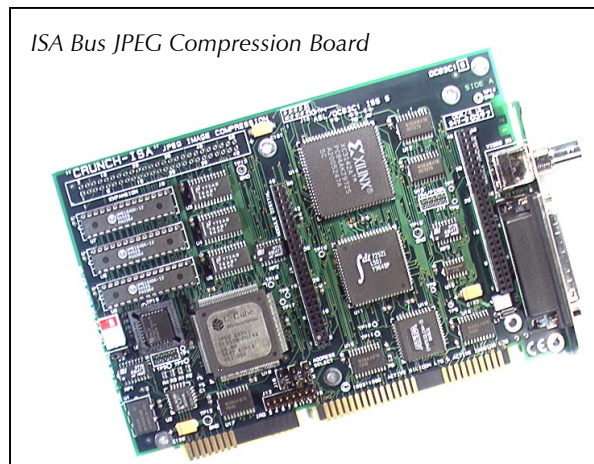## 16 BIT ISA JPEG COMPRESSION BOARD

- ISA Bus Interface Board with JPEG compression.
- Accepts standard analogue Snapper modules.
- Colour and grayscale compression and decompression.
- Implements the Baseline Sequential (DCT based) process.
- Implementation optimised for maximum throughput - on-board image strip buffer and compressed data buffer.
- Images sizes up to 4096 by 4096.
- Downloadable Q-tables and Huffman tables.
- Supports many pixel formats in hardware.
- Half length single slot 16 bit ISA board.
- Software Development Kit (SDK) available for rapid system development and integration.
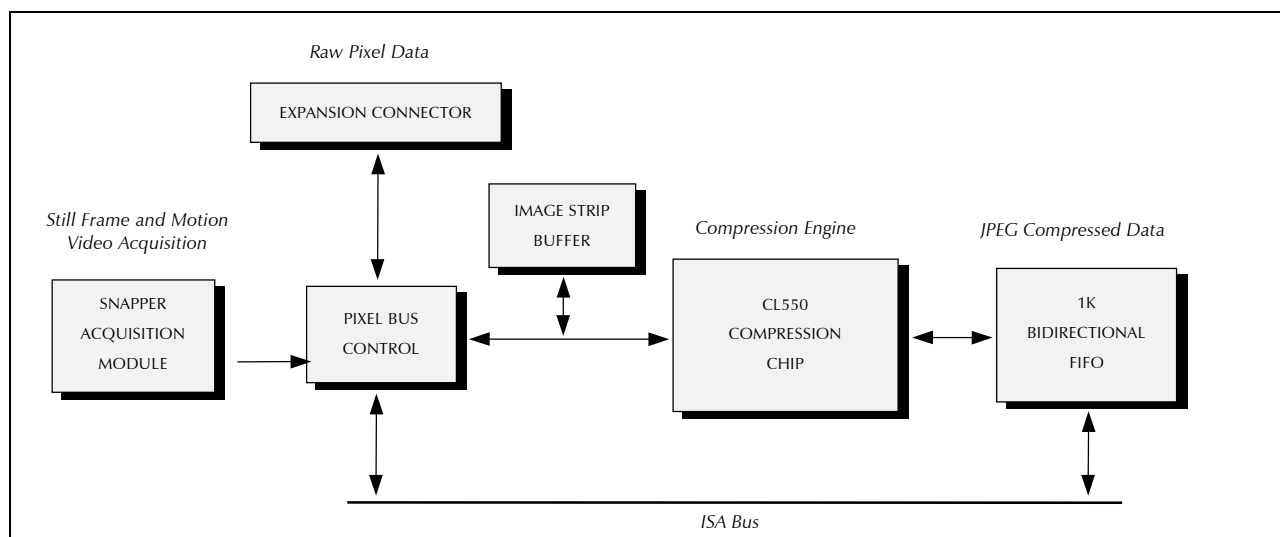
ISA Bus JPEG Compression Board

OVERVIEW

ISA-JPG is a Bus Interface Board with hardware JPEG compression and decompression. It is designed to be used as a stand alone compression engine or with an analogue Snapper module (e.g. **Snapper-16**). With a Snapper acquisition module fitted, compression of the video images can be direct from the module. Alternatively the combination can be used as a high quality frame grabber. C-Cube's CL550/CL560 is used to implement JPEG compression along with supporting buffers for optimum data throughput.

Sequence acquisition is also supported: Running in sub-sampled mode (SIF resolution) using **Snapper-16**, colour or grayscale sequences may be recorded to disk at 12.5 Hz. Full resolution colour images can be compressed and saved to disk in 120ms. The board also has a Pixel Bus Expansion Connector which allows connectivity to other digital pixel hardware, such as frame grabbers or display cards.

Full hardware interface information is available to OEMs and system integrators wishing to design their own plug-on modules. By using this off-the-shelf hardware with its full software support on multiple operating systems, product design time can be significantly reduced.

The Software Developer's Kit (SDK), available as a separate item, allows rapid system development and integration. It provides comprehensive example applications and optimised libraries, and is available for a variety of operating systems including Windows 3.1x/95/98/NT, MacOS 7/8, MS-DOS, Solaris 2, LynxOS and VxWorks. As well as functions that control the hardware, the libraries include general purpose functions for the manipulation and display of images. A separate datasheet describes the SDK in detail.

ISA-JPG Block Diagram

SPECIFICATION

Data Modes:	• ISA Bus/Expansion Bus to CL550 to ISA Bus (compression engine mode).
	• Snapper acquisition module to ISA Bus (standard frame grabber mode).
	• Snapper acquisition module to CL550 to ISA (still frame and motion video compression mode).
CL550 Speed:	30 MHz.
Interface:	PC 16 bit ISA (Industry Standard Architecture).
Address Range:	Board mapped to I/O space. Selectable 300..3E0 requiring 32 bytes of address space.
Interrupts:	Interrupt level selectable from 3,4,5,7,9,10,11 and 12.
Data Formats:	Each ISA bus read/write involves transferring 16 bits of data:

- Monochrome data (8 bit grayscale) is read/written as two pixels per read.
- 24 bit RGB data is read as one pixel every two reads resulting in 32 bit data format RGBX.
- 16 bit YCbCr/YUV (4:2:2) is read as YCb followed by YCr.

Connectors: A BNC which connects to Analogue Input 1 on the Snapper Module.
A 25 way D type socket connects signals to the Snapper Module with the following pinout.

Pin Number	Generic Name	Snapper-8	Snapper-16	Snapper-24
1	Analogue GND	*GND*	*GND*	*GND*
2	Analogue 2	N/C	*Luma 2*	*Green 1*
3	Analogue 4	*Mono 2*	*Chroma 1*	Red 2
4	Analogue 6	N/C	Chroma 3	Blue 2
5	Analogue 8	N/C	N/C	Green 3
6	Analogue 10	*Mono 4*	N/C	Red 4
7	Analogue 12	N/C	N/C	Blue 4
8	+12V out	+12V out	+12V out	+12V out
9	Trigger -	Trigger -	N/C	Trigger -
10	VSYNC -	VSYNC -	N/C	VSYNC -
11	HSYNC -	HSYNC -	N/C	HSYNC -
12	Pixel Clock -	Pixel Clock -	N/C	Pixel Clock -
13	Control GND	GND	GND	GND
14	Analogue 1	*Mono 1*	*Luma 1*	*Red 1*
15	Analogue 3	N/C	*Luma 3*	*Blue 1*
16	Analogue 5	N/C	Chroma 2	Green 2
17	Analogue 7	*Mono 3*	N/C	Red 3
18	Analogue 9	N/C	N/C	Blue 3
19	Analogue 11	N/C	N/C	Green 4
20	CSYNC	*CSYNC*	N/C	*CSYNC*
21	Trigger +	*Trigger +*	*Trigger*	*Trigger +*
22	VSYNC +	VSYNC +	N/C	VSYNC +
23	HSYNC +	HSYNC +	N/C	HSYNC +
24	Pixel Clock +	Pixel Clock +	N/C	Pixel Clock +
25	Spare	N/C	N/C	N/C

NOTES:

1. The signal names in bold italics are available on the standard cables (part number CBL-25D-SNP-8 for **Snapper-8**, and CBL-25D-SNP for **Snapper-16** and **Snapper-24**).

2. *Luma 1, 2* and *3* accept composite or monochrome inputs.

PHYSICAL AND ENVIRONMENTAL DETAILS

Dimensions:	120mm high by 177mm long (197mm long including BNC socket).
Approximate weight:	180g.
Maximum component height:	13mm including Snapper module. (End bracket 15.5mm above the board).
Snapper connectors:	Two 50 way, 0.1″ pitch connectors, each arranged as two rows of 25.
Power consumption:	+5V @ 1 Amp. +12V can be used to supply camera, maximum 0.4A.
Storage Temperature:	-15°C to +70°C.
Operating Temperature:	0°C to +55°C.
Relative Humidity:	10% to 90% non-condensing (operating and storage).
EMC Approvals:	C€ mark for compliance with EN 55022:1994 (class B) and EN 50082-1:1992 in accordance with EU directive 89/336/EEC. FCC Class A.

Full mechanical drawings are available on request.

ORDERING INFORMATION

PART NUMBER	DESCRIPTION
ISA-JPG	16 bit ISA JPEG compression and decompression board.
-	For cable requirements see the relevant Snapper datasheet.
-	Software Developer's Kit. For a full list of all supported operating systems, support contracts and other options, please refer to the SDK datasheet, or contact Active Silicon directly. Currently supported operating systems include Windows NT, Windows 95, Windows 98, Windows 3.1x, MS-DOS, Solaris 2, VxWorks, LynxOS and MacOS.

ORDERING NOTES

- **ISA-JPG** has one PCB mounted BNC, so for users requiring just a single composite/monochrome input, a cable is not necessary.
- Please contact Active Silicon for latest information on other Snappers, Bus Interface Boards, and supported operating systems.

SPECIAL NOTES

- **ISA-JPG** supports direct JPEG compression from **Snapper-16** in colour and grayscale, and **Snapper-24** in colour. It does not support direct JPEG compression from **Snapper-24** in grayscale (or from **Snapper-8**). However images may be acquired (as raw image data) and then compressed.
- **ISA-JPG** does not support linescan cameras when used with **Snapper-24**. For linescan support, the PCI Bus Interface Board is required (**PCI-BIB**).
- **ISA-JPG** does not have any built-in data mapping or packing functions, therefore when used with early versions of **Snapper-24** and **Snapper-8**, grayscale data is read as one pixel per ISA bus read, rather than two pixels per ISA bus read as is the case with **Snapper-16**. Note that application software written using the **Snapper SDK** is 100% compatible between hardware revisions.