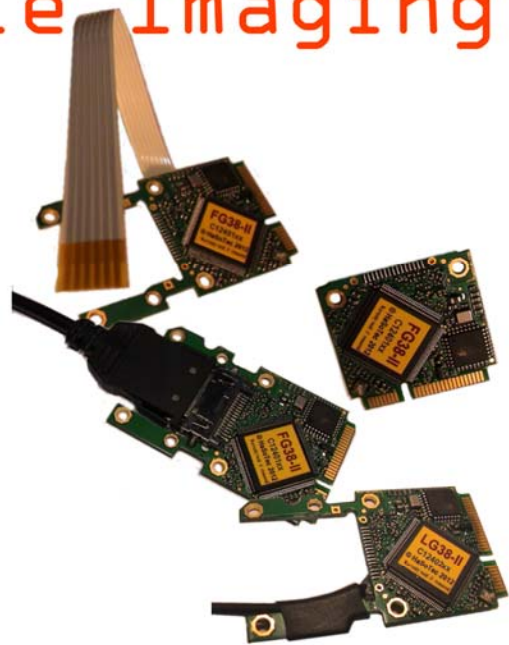


HC-33-II CardBus CameraLink Frame Grabber 32-Bit-PCMCIA PC-Card August, 14 2012

HaSoTec Mobile Imaging



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HaSoTecs HC-3x digital frame grabbers are compatible with CameraLink standard and have a lot of useful additional features. The newest ExpressCards HC-37 have both a CameraLink interface and 4 video inputs. It saves development costs to write software for a first HC3x card and to know that this software is portable to different target systems.



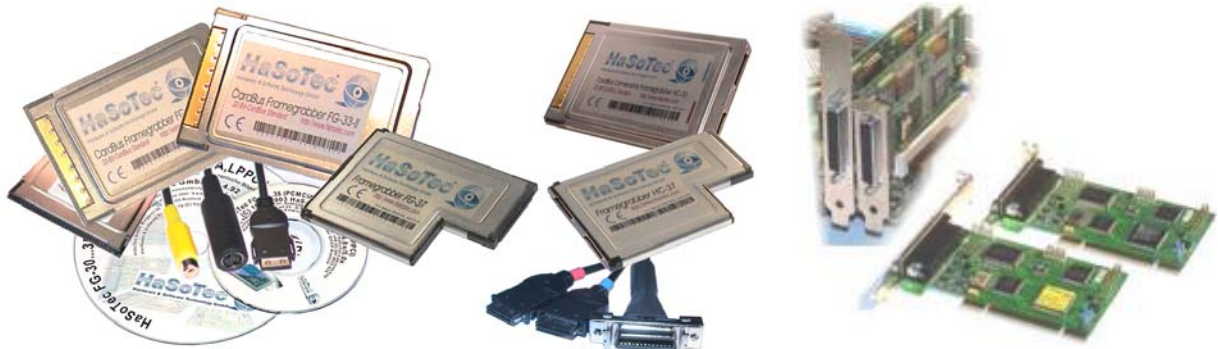
HC-37 ExpressCard

HC-35 PCI



HC-33-II CardBus

HaSoTec offers custom specified electronics design and product design/development services through which you can have circuits and electronic products designed as per custom specifications. HaSoTec is specialized in low cost electronic designs with minimal possible component count with carefully chosen, low cost, cheapest available components with great quality and support. HaSoTec will design your product such that your profits are maximized. HaSoTecs strength lies in high density, small size, low cost board design.



-analog-

FG-38-II half size miniPClexpress Frame Grabber
FG-38 miniPClexpress Frame Grabber 8x analog
FG-37 ExpressCard Frame Grabber 8x analog
AD-37 ExpressCard 4x analog, LVDS,I/O,ADC
FG-36 PCI express Frame Grabber
FG-35 Low profile conventional PCI Frame Grabber
FG-34 PCI Frame Grabber
FG-33-II CardBus (32-bit-PCMCIA) Frame Grabber
FG-30-II PCMCIA (16-bit-5V) Frame Grabber

-digital-

HC-38 miniPCIExpress CameraLink (PoCL)
HC-37 ExpressCard Frame Grabber CameraLink
HC-37-II ExpressCard CameraLink (PoCL)+4x analog
HC-36 PCI express CameraLink
HC-35 conventional PCI CameraLink
HC-33-II CardBus (32-bit-PCMCIA) CameraLink (PoCL)

Hardware

HaSoTecs Digital Frame Grabber product line started 1997, when HaSoTec developed a **H**igh-speed **C**amera Interface **HC-32** for Daimler Chrysler Aerospace. This was a customer specific solution based on the ChannelLink Interface. 1998 HC-33LVDS CardBus and HC-34 PCI was available with support for more than 15 of the most popular LVDS cameras.

CameraLink 1.0 specification was published in the year 2000 and is now a trademark of AIA (American Imaging Association). Specification 1.1 (2004) and 1.2 (2009) was a free and accessible standard. These specifications declared the standard from existing Camera and Frame Grabber solutions, such as the widely used Honda and 3M MDR26 connectors, the SDR26 connector as used for small Sony Cameras and the next generation of National Semiconductor LVDS Chipsets.

Unfortunately there is no Mobile CameraLink specification. HC-33-CL, the first CameraLink CardBus solution available since 2000 has implemented full Hotplugging and Power saving support.

The CameraLink specification alone makes still no real-time solution.

HaSoTec combined low latency support with API 9707. This is the same real-time API and Hardware already proven with the FG3x line of analog frame grabber cards.



HC-33-I (2000-2004)

HC-33-II is the redesigned Version available since 2004. The new features are:



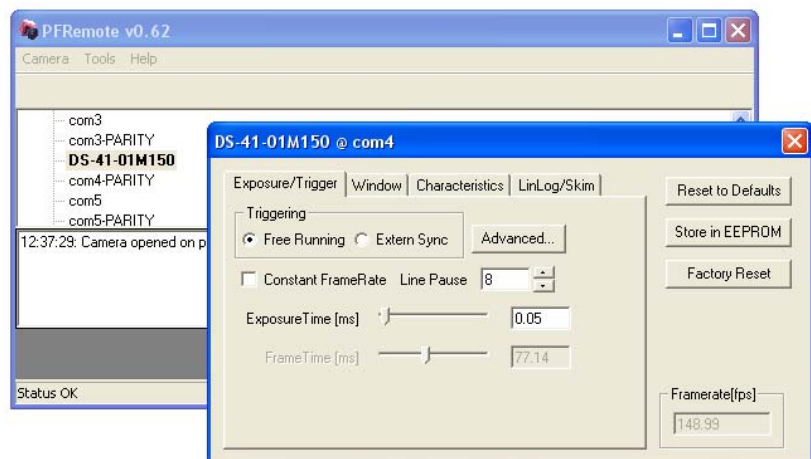
- full compatibility with CL 1.2 specification
- 85MHz support
- Fastest available Dual-port-RAM 85 MHz writeable and simultaneously at full bus speed readable.
- Flash upgrade support
- Since 2012: 64-bit signed Windows7 drivers

Software

HC-33 has signed drivers for 32-bit and 64-bit Microsoft Windows. The HaSoTec Real-Time API 9709 adds low latency and ring buffer support. The supplied video application HC3xVIEW allows to capture full resolution film sequences with up to 120 MByte/s transfer speed. A Camera Setup-Window with Camera-Preview allows to adjust camera parameters over virtual RS232 or I²C ports.

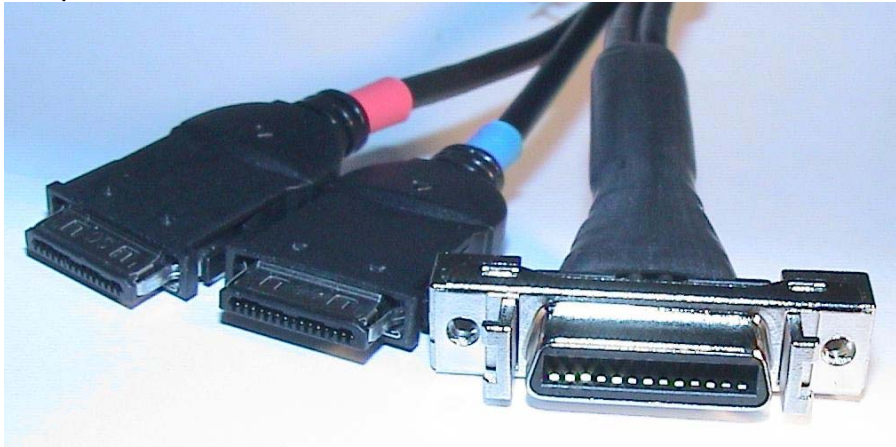
The Software basically has two operation modes. The first mode is memory based and uses a predefined amount of available RAM to collect frames into a ring buffer. A trigger signal or key can be used to stop collecting frames after a defined number of frames. The whole sequence can be watched in different speeds and on a frame by frame basis. The second mode records longer sequences to disk. High speed disks and Raid arrays are recommended, however, the frame rate of the camera can be exactly adjusted to fit to the disks transfer rate. A Microsoft C/C++ Source code example shows how to handle the driver functions in customer made software.

The software for camera adjustments may also be a manufacturer supplied tool. It communicates with the help of a virtual RS-232 over CameraLink interface.



Digital Input

HC-33-II has a CameraLink base interface. A short cable with MDR-26 Panel-mount Connector is supplied to connect the PCMCIA card with two 15-pin color-marked connectors.



This cable is also available with SDR26 connector

HC-33-II is available in 2 different temperature ranges.

HC-33-II	Standard temperature range		Extended temperature range	
	Lower limit	Higher limit	Lower limit	Higher limit
	Chip surface		Chip surface	
recommended	0 °C	70 °C	-20°C *)	70°C
samples tested	-20°C	80°C	-20°C	80°C
burn-in tested each HC-33-II	ca. 25°C	70°C	ca.-10°C	70°C
Heat sink thermal pads	No No		No Inside *) -20°C cold start: BIOS configuration immediately possible, Image data may not be valid for the first 2 minutes (including Windows boot time)	

HC-33-II power supply data			
Supply line		3.3V	3.3V auxiliary supply
		+/- 5%	
system start		220mA	Max. 220mA
Driver loaded (Windows booted)		140mA	Max. 180mA
Live Video full size full framerate		550mA	Max. 180 mA
Power consumption	0.7 ... 1,8 W		

All values based on worst case measurements and peak currents at 25°C

Connectors

		SDR-26		(optional)
Blue	15pol	MDR-26	CAT6A-1	CAT6A-2 CAT6A-3
1	GND	13,14	brown/white+shield	shield
2	3P3	-	brown	
3	RxIn3+	8	green	
4	RxIn3-	21	green/white	
5	RxClkIn+	9	blue	
6	RxClkIn-	22	blue/white	
7	RxIn2+	10	orange	
8	RxIn2-	23	orange/white	
9	RxIn1+	11		green
10	RxIn1-	24		green/white
11	RxIn0+	12		blue
12	RxIn0-	25		blue/white
13	test0	-		
14	test1	-		
15	test2	-		
Red				
1	GND	13,14		(shield) shield
2	test3	-		
3	test4	-		
4	CC1-	18		green/white
5	CC1+	5		Green
6	CC2+	17		Blue
7	CC2-	4		blue/white
8	CC3-	16		orange/white
9	CC3+	3		Orange
10	CC4+	15		Brown
11	CC4-	2		brown/white
12	SerTFG-	19		(orange/white)
13	SerTFG+	6		(orange)
14	SerTC-	7		(brown/white)
15	SerTc+	20		(brown)

Estimated cable costs

including 5m Camera Cable excl. Camera side adoption (e.g. CAT6A -> MDR26)

costs	15pin blue	15pin red	MDR26	SDR26	CAT6A -1	CAT6A -2	CAT6A -3	trigger?	rs232?	incl. 5m CamCable
lowest	yes	no	no	no	yes	yes	no	no	no	30\$
	yes	yes	no	no	yes	yes	no	yes	no	55\$
	yes	yes	no	no	yes	yes	yes	yes	yes	60\$
highest	yes	no	yes	no	no	no	no	no	no	40\$ + 250\$
	yes	no	no	yes	no	no	no	no	no	50\$ + 270\$
	yes	yes	yes	no	no	no	no	yes	yes	70\$ + 250\$
	yes	yes	no	yes	no	no	no	yes	yes	85\$ + 270\$