HiPerCam® _2

Hardware Manual

Revision 1B

Revision History

Revision	Changes	Date
1A	First Edition, valid for Hardware revision 1A,	17.12.99 ABr
1B	Opto-I/O descrption valid for Hardware revision 1A	21.01.00 ABr

WARNING ! This equipment generates and can radiate radio frequencies. If not installed in accordance with the instruction manual, it may cause interference to radio communications. The equipment has not been tested for compliance with the limits for class A computing devices, pursuant to subpart J of part 15 of FCC rules, which are designed to provide reasonable protection against such interference, but temporary usage is permitted as per regulations. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense is required to take whatever measures may be required to shield the interference.

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1 Specification

1.1 Main Features

- Fully PC-compatible
- Celeron CPU, socket 370, for Pentium II compatibility.
- 32 to 128 MB SDRAM
- 128 KB on-chip second level cache
- PCI local bus, 32-bit, 33MHz
- Two USB ports
- EIDE hard disk controller
- 10/100 Mb/s network interface (10BaseT / 100BaseTX)
- On-board AGP graphics
- Serial port with hardware handshake
- General purpose Opto-I/O
- Keyboard and mouse interface
- Power saving functions
- All front panel I/O signals EMC filtered
- PMC framegrabber module (color / monochrome).

1.2 Overview

1.2.2 Technical Details

The HiPerCam_2 is an image processing computer based on the latest PC technology (Intel Celeron) in a compact design.
The board is based on the Intel 440BX PCI chip set, the reference for Pentium II and Celeron chip sets. Also, availability for longer periods than what is common in the PC market is guaranteed.

1.2.2.1 CPU

Celeron socket 370 processors at 366 or 433 MHz are supported for performance comparable to Pentium II processors. The CPU has FPU, MMU and 16 kByte first level cache. Host bus speed is 66 MHz resp. 100 MHz when available. The CPU performance index will be 11.3 SPECint95 and 9.1 SPECfp95 (300 MHz).

1.2.2.2 Memory Configuration

The 64-bit wide memory allows configurations from 32 MBytes to 256 MBytes and more (t.b.d.) using SO-DIMM modules with 66-MHz SDRAMs. The memory size is detected automatically. The second level cache, located on the Celeron chip, runs with the full CPU clock, thus compensating for its smaller size, compared to Pentium II.

1.2.2.3 Firmware

The BIOS is stored in a Boot-Block Flash-EPROM which enables easy BIOS updates. Boot from floppy, IDE, CD, LS-120 is supported. A net boot EPROM can be installed on a socket. For user-specific data and serial numbers the board has a 2 KB serial EEPROM.

1.2.2.4 Graphics Interface

The on-board AGP graphics interface consists of the SMI 810/811 single-chip VGA controller with 2 MB on-chip frame buffer for resolutions up to 1024 x 768 x 16 bpp at 85 MHz to drive analog monitors.

The graphic interface is fully compatible with the VGA standard on the hardware, register and BIOS level. Mode initialization is supported on the BIOS and register levels ensuring compatibility with most application software.

1.2.2.5 Floppy Disk

All types of common 3,5" and 5,25" Floppy drives are supported.

1.2.2.6 Hard Disks

Hard Disks are supported by the PCI-based EIDE port with Ultra DMA/33 transfer.

1.2.2.7 Ethernet Interface

The network interface uses the network controller Intel 82559 for 10/100 Mb connectivity with 10BaseT (twisted pair) or 100Base TX connectivity.

1.2.2.8 I/O Features

An asynchronous 16550 compatible serial channel (COM1) with up to 115 kbaud transfer rate and 16-byte FIFO with RS232 levels is available. PS/2-compatible keyboard and mouse interface are provided. Two USB ports allow for connecting to keyboard/mouse/scanners etc.

Four opto-coupled inputs and outputs are available.

1.2.2.9 CE Conformity

The HiPerCam_2 in a closed case (Booksize Case, 19" Case) will fulfill the requirements of the standards EN500082-2 and EN50081-1.

The Certification is in progress. ELTEC reserves the right to make changes to the product to meet the requirements for CE conformity.

1.2.2.10 Camera Interface

Two multiplexed Camera inputs are available, including power supply for the cameras.

1.2.2.11 Watchdog

The HiPerCam_2 has an on-board watchdog for operator-less environments.

1.2.2.12 Operating Systems

Windows NT is supported as well as Windows 98. Windows NT Embedded is ideal in combination with Flash drives, where only moderate disk space is available.

Support for additional operating systems is in preparation.

1.2.3 Temperature/Power Specifications

1.2.3.1 Environmental Conditions

- Storage Temperature:0° C - 70° C
- Operating Temperature:0° C - 45° C
- Maximum Operating Humidity: 85 % relative

1.2.3.2 Power Requirements (power consumption of boards without periphery)

4.5A max. 3A typ. at +5VDC ± 5 %

3A max. 2A typ. at +3.3VDC ± 5 %

(for the 366 MHz version)

100mA max. 30mA typ. at +12VDC ± 10 %

100mA max. 30mA typ. at -12VDC ± 10 %

MTBF Values

- 8356 hrs (computed after MIL-HDBK-217E)
- 111970 h (realistic value from industry standard experience)

2 Interface Connectors

2.1 Frontpanel connectors

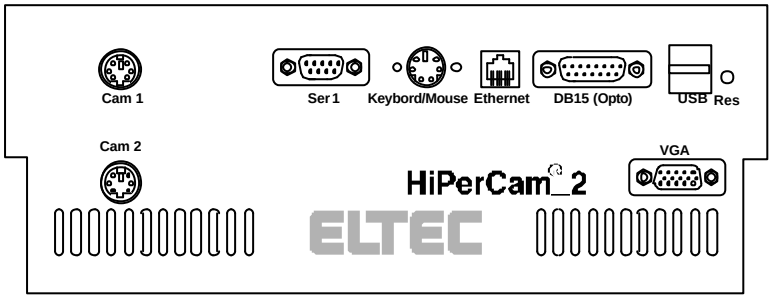

Figure 2-1: Location of frontpanel connectors

2.1.2 Serial

The HiPerCam_2 supports two serial ports COM1 is located at the front panel (9-pin D). COM2 is routed to an on-board connector.

Table 2-1: Pinout serial port COM1

Pin	Signal
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

2.1.3 Keyboard/Mouse

Table 2-2: Pinout keyboard/mouse connector

Pin	Signal	Function
1	/KBDAT	Keyboard data
2	/MSDAT	PS/2 mouse data
3	GND	Ground
4	5 V	Supply voltage (max. 0.8 A)
5	/KBCLK	Keyboard clock
6	/MSCLK	PS/2 mouse clock

2.1.4 Ethernet

Table 2-3: Pinout ethernet connector

Pin	Signal	Function
1	TD+	Transmit data positive
2	TD-	Transmit data negative
3	RD+	Receive data positive
4		not connected
5		not connected
6	RD-	Receive data negative
7		not connected
8		not connected

2.1.5 Opto I/O

Table 2-4: Pinout Opto-I/O connector

Pin	Signal	Function
1	n.c.	not connected
2	OUT0	Optocoupled Output 0
3	OUT1	Optocoupled Output 1
4	OUT2	Optocoupled Output 2
5	OUT3	Optocoupled Output 3
6	GND	I/O GND
7	GND	I/O GND
8	GND	I/O GND
9	GND	I/O GND
10	GND	I/O GND
11	IN0	Optocoupled Input 0
12	IN1	Optocoupled Input 1
13	IN2	Optocoupled Input 2
14	IN3	Optocoupled Input 3
15	n.c.	not connected

2.1.6 USB

Table 2-5: Pinout USB port

Pin	Signal
1	5 V
2	USB_P0-
3	USB_P0+
4	GND

Pin	Signal
1	5 V
2	USB_P1-
3	USB_P1+
4	GND

2.1.7 VGA connector

Table 2-6: Pinout VGA connector

Pin	Name	Function
1	PRRED	Red channel
2	PRGREEN	Green channel
3	PRBLUE	Blue channel
4	nc	not connected
5	GND	Ground
6	GND	Ground
7	GND	Ground
8	GND	Ground
9	nc	not connected
10	GND	Ground
11	nc	not connected
12	PRDDCDAT	Monitor data
13	PRHSYNC	Digital HSync
14	PRVSYNC	Digital VSync
15	PRDDCCLK	Monitor data

2.1.8 Camera connectors

Table 2-7: Pinout color camera connectors (Cam1, Cam2)

Pin	Name	Function
1	GND	Ground
2	+ 12V	Supply voltage (max. 500mA)
3	GND	Ground
4	Y / CVBS	Y / CVBS input
5	n.c.	not connected
6	n.c.	not connected
7	n.c.	not connected
8	GND	Ground
9	C	Chroma input
10	n.c.	not connected
11	n.c.	not connected
12	n.c.	not connected

For the HiPerCam_2 b/w the pinout of the camera connectors is camera specific. Please see separate camera configuration manual.

3 Board Parameters

3.1 PCI Local Bus

CPU to PCI Transfer Options:

Write post buffer

Max. 120 MB/s (peak)

PCI to Memory Transfer Options:

Max. 120 MB/s (peak)

Clock Speed:

33.3 MHz at 66.6 MHz CPU bus frequency

IRQs:

Four PCI interrupts rerouted to selectable ISA interrupts

3.2 ISA Bus

Bus Clock:

8.33 MHz at 33.3 MHz PCI frequency

Interrupt Capabilities:

IRQ(3-7, 9-12, 14-15)

DMA Channel Capabilities:

DMA slave or master mode

DMA(0,3,5,6,7)

3.3 Network

10BaseT / 100BaseTx (twisted-pair)

Transfer Speed:

max. 10/100 Mbit/s

3.4 Serial I/O

2 channels:

Full duplex, asynchronous

50 b/s - 115,2 KB/s

RS232 level

(COM1 external; COM2 on-board only)

3.5 USB

2 ports:

1.5 / 12 Mb/s

Supply current for external devices: 500 mA.

3.6 Keyboard:

MF2/AT mode

PS/2 mode

3.7 Mouse

PS/2 mode

Serial mouse at channel 1 or channel 2

3.8 Parallel I/O

Centronics bidirectional, unbuffered TTL

Transfer Rate: max. 2 MB/s

(on-board only)

excludes use of Opto-I/O

3.9 Opto I/O

The HiPerCam_2 features four optoisolated inputs and four optoisolated outputs. The outputs are open collector type and can sink up to 120mA current.

Figure 3-1: HiPerCam_2 Opto-I/O

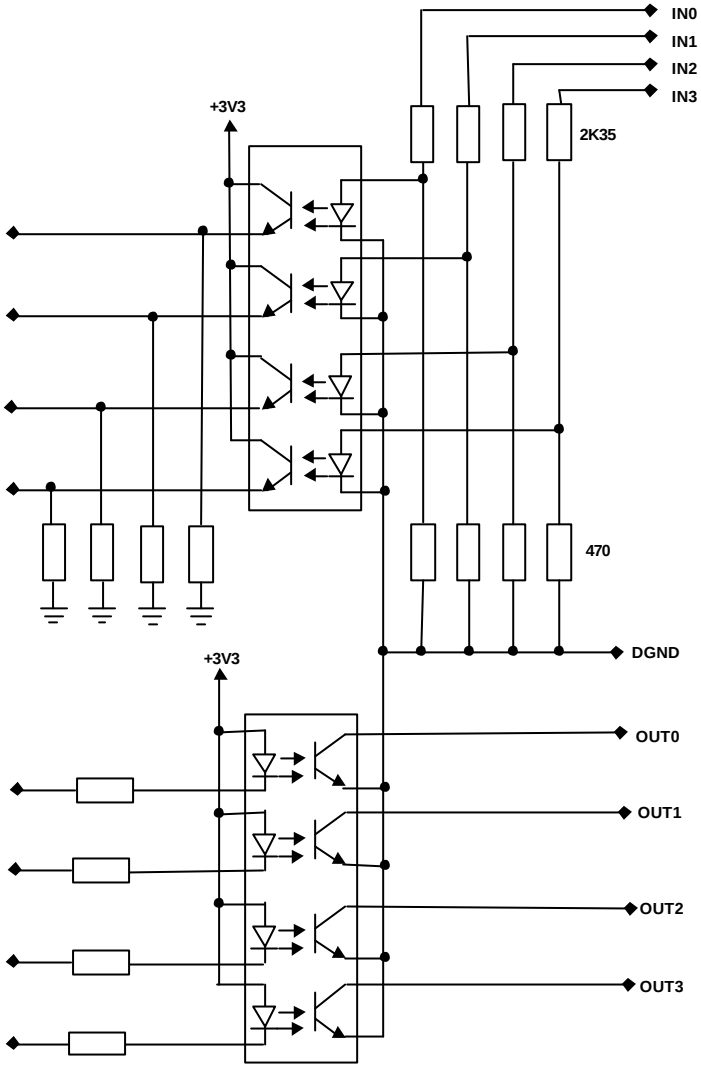

Table 3-1: Digital I/O Characteristics

Output:				
Characteristic	Min.	Typ.	Max.	Unit
Output Voltage	0		50	V
Output Current	-		120	mA

Input:				
Characteristic	Min.	Typ.	Max.	Unit
Input Voltage low	-27		+6	V
Input Voltage high	+16		+27	V
Input Current at +24V	-		11	mA

I/O:				
Characteristic	Min.	Typ.	Max.	Unit
Offset to Ground	-		50	V
Turn on Time		5		uS
Turn off Time		80		uS

3.10 Video I/O

Dotclock: max. 135 MHz

CLUT: 8/16/24 bit/pixel

Video Resolution: 320 x 200 - 1280 x 1024

Horizontal Frequencies: max. 80 kHz

Vertical Frequencies: max 85 Hz

3.11 MTBF Values

8356 h (computed after MTL HDBK-217E)

111970 h (realistic value from industry standard experience)

ESD Values: 2 kV (Human body method)

3.12 Environmental Conditions

Storage Temperature: 0 ºC - 70 ºC

Operating Temperature: 0 ºC - 45 ºC

3.13 Maximum Operating Humidity:

85% relative (higher value on request)

3.14 Power Requirements

Total Power Requirements of boards without periphery

4.5A max., 3A typ. at +5VDC ± 5 %

3A max., 2A typ. at +3.3VDC ± 5 %

(for the 366 MHz version)

100mA max., 30mA typ. at +12VDC ± 10 %

100mA max., 30mA typ. at -12VDC ± 10 %

Battery

Type CR 2032, 200mAh, 3.0V

4 Installation

4.1 Introduction

- Carefully remove the HiPerCam_2 from the shipping carton.
- Save the original shipping container and packing material for storing or reshipping the HiPerCam_2.
- Inspect the unit for any shipping damage. If undamaged, it can be prepared for system installation.
- Do the connections to the HiPerCam_2 as described below.

4.2 Installation

4.2.2 Graphics

If a CRT monitor is used, a standard VGA cable (15 pins) is connected between the monitor and connector 'VGA'. Make sure that your monitor is capable of displaying higher video resolutions. If a video mode generates horizontal frequencies much higher than the maximum value of your monitor, the monitor may be destroyed! If your monitor is not able to display a certain mode, switch off or disconnect the monitor in advance and select an appropriate video mode for the monitor.

4.2.3 Keyboard

A standard PS/2 keyboard can be connected to 'Keyboard / Mouse'. If an AT keyboard is desired, cable adapter ADAP-210 can be used. A PS/2 keyboard can be connected directly.

It is also possible to use an USB-keyboard on the USB connector, if desired.

4.2.4 Mouse

A standard PS/2 mouse can be connected to 'Keyboard / Mouse' using a split-adaptor.

You may also use an USB-mouse on the USB connector, if desired.

4.2.5 Network

A Network can be connect using 10BaseT or 100BaseTX.

4.3 BIOS Setup

The HiPerCam_2 is delivered with an AWARD BIOS. The BIOS includes a setup menu to configure basic settings. ELTEC ships the HiPerCam_2 with optimized BIOS settings. If desired, most of the BIOS settings can be changed (some settings are hardwired). Also if the battery for the CMOS RAM is weak, the RAM may loose its contents making a new setting of the setup necessary. Caution should be taken because some changes of settings may cause an erroneous system behavior.

4.4 Testing the Installation

After power is switched on the BIOS displays a message on the CRT screen. It takes some time before the BIOS is ready to display. After system boot from harddisk the keyboard should work. The driver software for the mouse should detect the mouse device. If a network is installed, other network devices (if existent) should be accessible (e.g from Windows file manager).

Support Request Form

HiPerCam_2 System	
HiPerCam_2 version:	
Serial number:	
Memory size:	
Camera interface:	
Camera type:	
Camera mode:	
Software Configuration	
Operating system:	
OS Version:	
Additional Software (Concerning the Problem):	
Error Description What must be done to reproduce the error:	
Listing of config.h file	

Send the completed form to:
ELTEC Elektronik AG
Support, Mainz/Germany
Phone: +49 (6131) 918-520
Fax: +49 (6131) 918-196
E-Mail: support@eltec.de
Web: http://www.eltec.com

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Fax +1 (609) 4 52 73 74