Janich & Klass Computertechnik GmbH

ISA96 V8/103

Technical Description

Order Numbers:

434.268400.000 2	ISA96 V8/103 with AMD Geode LX800, 512MB, 4HP
434.268401.000 0	ISA96 V8/103 with AMD Geode LX800, 512MB, 8HP
434.268402.000 8	ISA96 V8/103 with AMD Geode LX800, 512MB, 2.5"-HD, 8HP
434.268410.000 8	AT96 V8/103 with AMD Geode LX800, 512MB, 4HP
434.268411.000 6	AT96 V8/103 with AMD Geode LX800, 512MB, 8HP
434.268412.000 4	AT96 V8/103 with AMD Geode LX800, 512MB, 2.5"-HD, 8HP

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Disclaimer

The contents of this manual are checked for matching the described product. Deviation cannot be excluded, so that we cannot give any guarantee for full accuracy. The details of this manual are however regularly checked. Necessary correction will be contained in the subsequent revisions. We will be thankful for any improvement proposals.

Janich & Klass Computertechnik GmbH assume no liability for damages incurred directly or indirectly from errors in this manual, omissions, or discrepancies between this manual and the product.

Safety Hints

- This unit may not be used in any other way than described in this manual.
- Installation, putting into operation, and maintenance of this unit may exclusively be made by qualified personnel. This personnel must be familiar with the warnings and hints of this manual.
- Qualified personnel by means of this manual are persons who are familiar with installation, mounting, putting into operation and operation of this unit and who have the qualification fitting their tasks, like for example:
  - Education and instruction , respectively the authorization to switch on/off, to ground, and to tag current circuits and units or systems as per the actual standards of safety technique.
  - Education and instruction as per the actual standards of safety technique concerning maintenance and use of appropriate safety equipment.
  - Education in First Aid.
- Before you put this unit into a bus-rack, you have to check whether the required voltages are available at the specific connector pins, and whether the required currents can be fed.
- Before exchanging any units, the sub-rack must be switched off.
- This unit contains electro-statically endangered components. Electro-static discharge through the human body or similar must therefore by all means be avoided, for example, by prior touch to grounded metal parts (water pipe, etc.). This is important specially before exchanging the unit.
- You have to retighten all locking screws after every exchange.
- Protect this unit from moisture. By no means conductive matters or liquids may enter the unit.
- Do not operate the unit at higher temperatures than stated in this description.
- Connected wires may not be subject to tension load.

- Do not expose the unit to strong magnet fields, for the danger of data loss from the hard disk.
- The unit may not be exposed to strong vibration , as they might destroy the hard disk.
- In case of a defective fuse, please by all means replace it with a new one of the same type, as otherwise fire danger exists.
- This unit contains a lithium battery. **ATTENTION!** Explosion danger at inadequate battery exchange. The battery may be replaced only with the same type, or with a type recommended by Janich & Klass. Used batteries must be disposed according to legal prescription .
- At visible damages of the unit, please return it to Janich & Klass for repair. (Each unauthorized repair may lead to loss of the guarantee.)
- Do not try to repair this unit on your own. Please always address yourself to Janich & Klass in case of eventual repair.
- Guaranty repair must always be made directly by Janich & Klass.

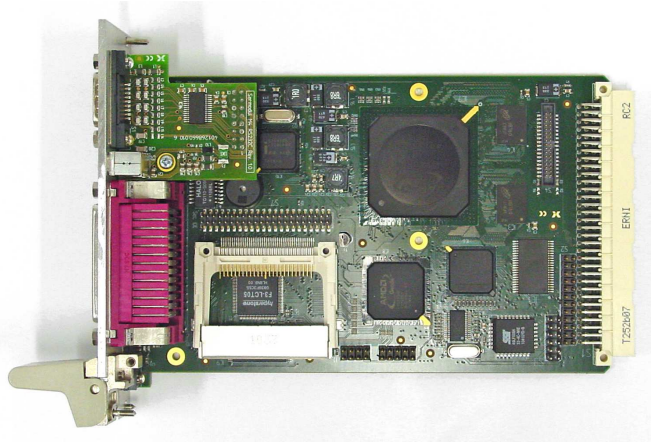
History

Revision	Date	Name	Modification	HW Revision
1.0	27.06.2011	p.b	Preliminary Description	1.0
1.1	01.12.2011	p.b	Description of Hardware Rev. 1.0	1.0
1.2	15.12.2011	p.b	Description of Hardware Rev. 1.1	up to 1.1

1 Overview

For many industrial CPU boards, an extremely low heat emission is more important than a very high clock rate. Only this way, fan-free or even hermetically encapsulated systems can be realized.

The newly developed ISA96 V8/103 was specially confectioned for such application condition . It allows to drive systems of the 500MHz class with less then 5W power consumption, without surpassing the narrow price frame of Low-Cost application .



The equipment of this CPU component is enormous, unless its low price. In addition to its firmly soldered 512MB main memory, the ISA96 V8/103 features an integrated graphics controller, an Ethernet controller, a watchdog, a FlashDisc, drive connections, and diverse interfaces for peripheral units.

Because CompactFlash modules may be used as mass storage, and thanks to the multiple possibilities for the connection of flat displays, it is ideally suited for Embedded application . We also strived to long-term availability of the component.

1.1 Technical Data in Short

- ISA96/AT96 CPU card in 3U, 4HP or 8HP
- Processor AMD Geode™ LX 800@0.9W with the following features:
  - 32Bit Processor, clock frequency 500MHz, 64KB/128KB On-Chip L1/L2-Cache, x86 compatible Ultra-Low-Power architecture
  - North- and Southbridge, 400MHz DDR Memory-Controller
  - 2D Graphics controller, connection possibilities for flat displays, resolution up to 1600x1200
- 512MByte firmly soldered mobile-DDR-SDRAM
- Fast-Ethernet controller 100Base-TX/10Base-T with RJ45 receptacle on the front panel
- Hardware-Monitor for surveillance of temperatures and supply voltages
- AWARD/Phoenix-BIOS and VGA-BIOS in 1MByte Flash-EPROM
- BIOS boots from hard disk drive, Flash and USB
- Copy of BIOS-Setup in the EEPROM
- On-Board CompactFlash socket and On-Board 512MB Flash-Disk at the IDE interface
- 44pol. 2mm-header for 2,5" hard disk drive also at the IDE interface
- 1MByte battery-buffered SRAM-Disc
- One AT-compatible serial interface with 16 Byte FIFO (hard-wired as RS232C interface)
- One USB-2.0 interface on the front panel
- Connection for keyboard and PS/2 mouse via Mini-DIN receptacle on the front panel (via Y cable)
- Watchdog, can be disabled, trigger period can be set between 0.25s and 32s
- connector for internal keyboard, mouse, USB, speaker on header row or Rear-I/O adapter
- LED displays on the front panel: "Run", "DD" and "GP", and 2 LEDs for Ethernet
- 3U board with front panel 4HP,
  Dimensions of the board 100mm x 160mm x 20.3mm
- Operating temperature 5-55℃, relative humidity 10- 90% non condensing
- Required supply voltages: +5V (typ. 1,0A)

Additional Features in the 8HP Version:

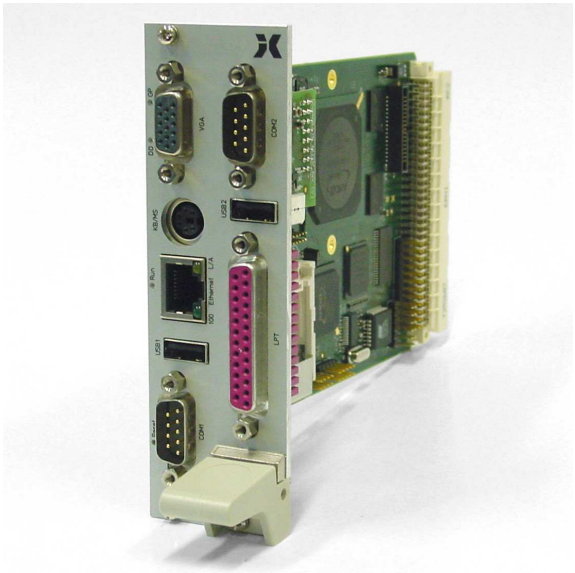
- parallel interface (ECP, EPP, PS/2, SPP) on the front panel
- Header for an additional serial- and USB-interface as exchangeable driver module on the front panel (RS232C+USB or RS485/422 Opto+USB or threefold USB-Hub)
- Optional On-Board 2.5" hard disk drive at the IDE interface
- 3U board with front panel 8HP,
  Dimensions of the board 100mm x 160mm x 40.6mm

2 Conception of the ISA96 V8/103

During development of the ISA96 V8/103, the following aspects were the focus:

- To reach the best possible downwards compatibility to the former P5- and V5-CPU cards.
- Improved performance and memory equipment.
- Simple passive cooling and expanded temperature range.
- Flexibility relating to the interface equipment.
- Cost-efficient design, high packing density, and industry-suited base equipment of the card.

The card mainly consists of a base board in single Eurocard format with firmly soldered processor and memory. In order to allow usage of the ISA96 V8/103 also in existing ISA96/AT96 systems, one common Mini-DIN-connector is foreseen for keyboard and mouse. Furthermore, there are connectors for one or two COM interfaces, for an analog monitor and (in the 8HP Version) for a parallel interface. Thanks to the extremely low power consumption, a relatively small heat sink is sufficient for cooling the processor. A fan is not required.



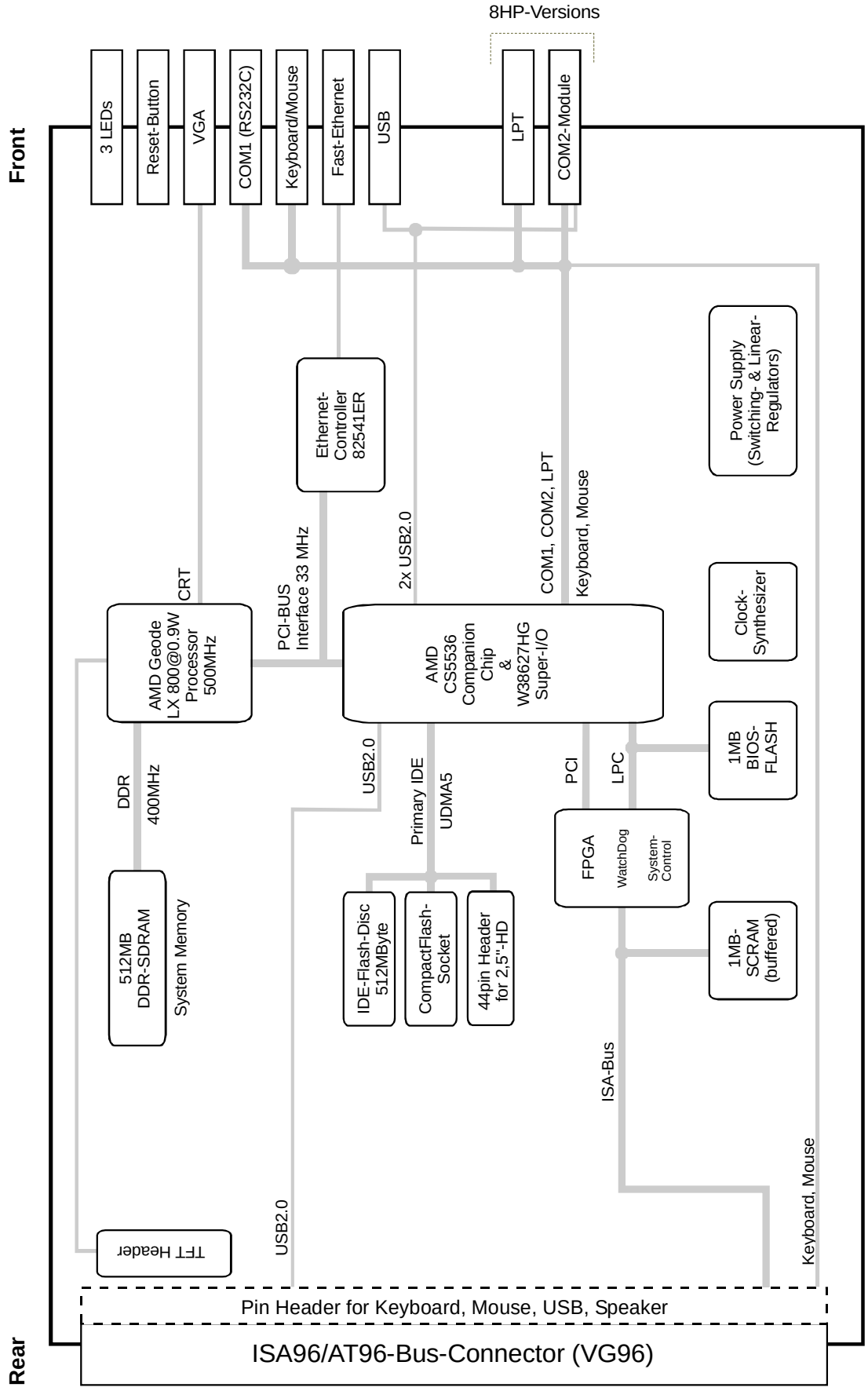
Version 8HP-Standard

Version 8HP with 2.5"-HD

The base equipment of the ISA96 V8/103 includes a Compact-Flash socket is firmly assembled as IDE-drive, for taking CompactFlash memory cards as IDE drive. The inserted CF cards are mechanically locked by the guiding rail of the card carrier. A 2.5" hard disk drive can be firmly mounted in the 8HP versions by means of the "V8/103 HD-Adapter". For non-volatile memorizing of process data or similar, there is a battery-buffered 1MByte SRAM-Disk.

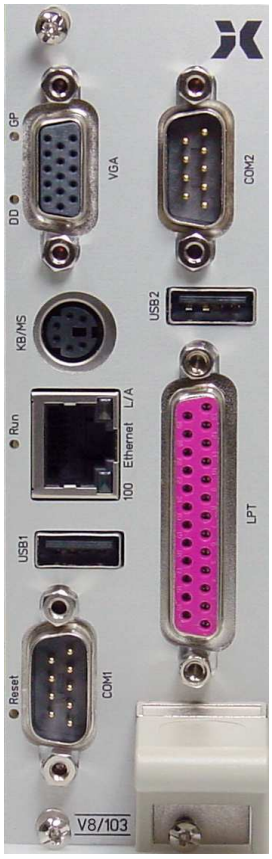
Even in the 4HP version, the front panel of the ISA96 V8/103 is optimally used by connectors for VGA, keyboard/mouse, Ethernet, USB, and COM1. Furthermore, three LEDs and a Reset-key exist. The 8HP-Standard version additionally offers space for an add-on serial module (COM2, USB) and for a parallel port (LPT).

3 Schematics of the ISA96 V8/103

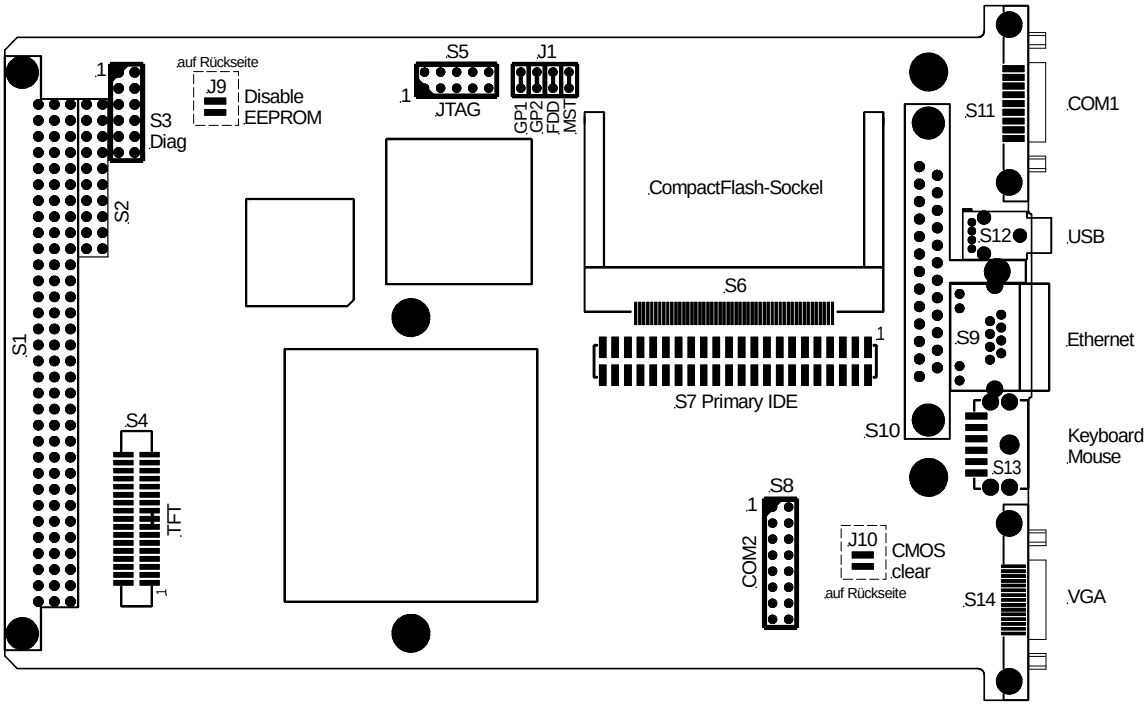


4 Front Panel

The below photo shows the fully elaborated front panel for the 8HP version.



5 Position print for Connector and Jumpers



6 Components of the ISA96 V8/103

6.1 Processor

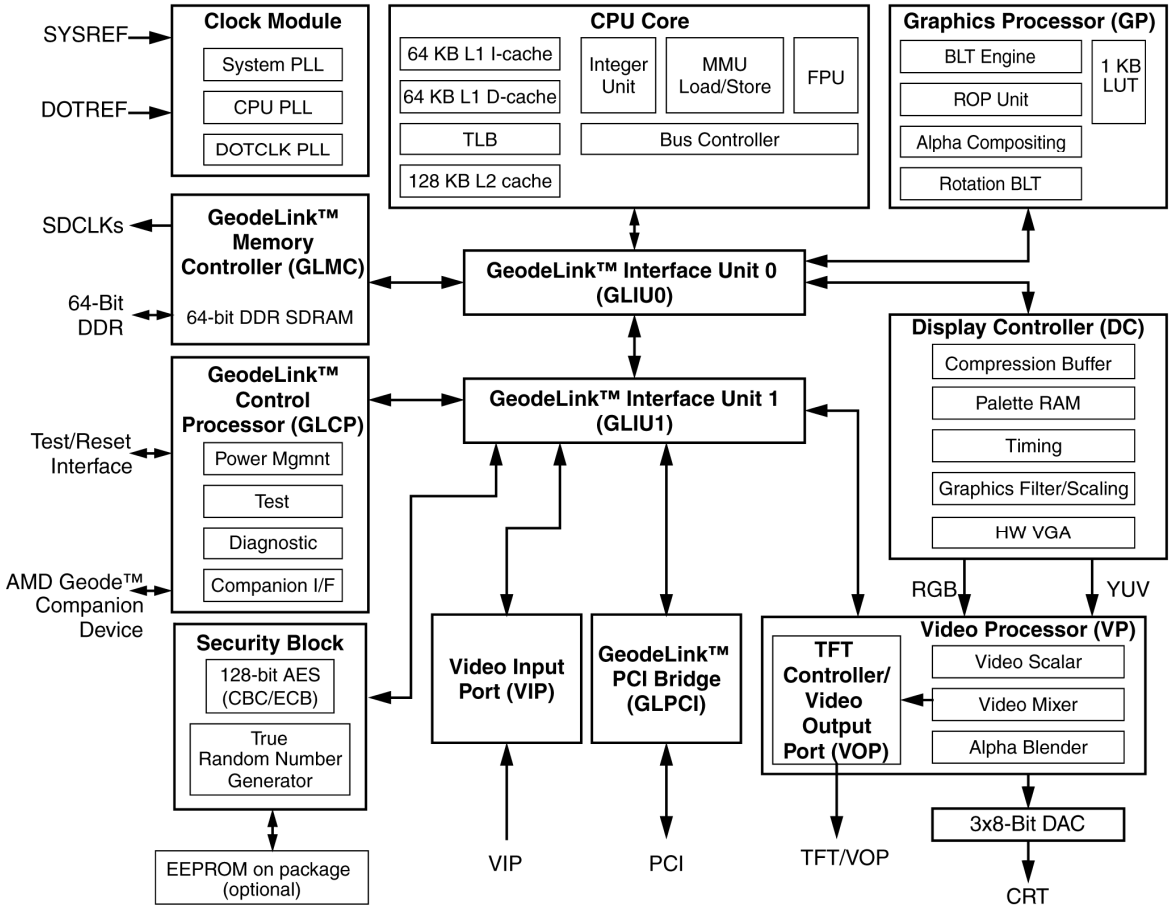
On the ISA96 V8/103, a Geode LX 800@0.9W from AMD is used. This energy-saving embedded-processor contains, further to the processor core, also a DDR memory controller and a graphics controller. Together with the Companion Chip CS5536 and a Fast-Ethernet controller, it makes an extremely compact x86-compatible system for demanding embedded application .

One of the most important properties of the firmly soldered 500MHz processor is its extremely low loss power, less than 2W. The entire system has a power consumption of about 5W. Therefore it is possible to compose fan-free or even hermetically enclosed systems with the ISA96 V8/103 without any problem.

Versions with higher system clock (600MHz) or with expanded temperature range are available on demand.

6.2 Schematics of the AMD Geode LX800

The following schematic view shows the components that are already integrated on the AMD Geode LX800. For composing an x86 compatible computer system, only a few additional components are required, in addition to the Companion-Chip and the Ethernet controller.



6.3 Main Memory

512MByte Mobile-DDR-SDRAM is already hard-wired on the ISA96 V8/103. It is not possible to expand the main memory by memory modules.

6.4 Fast-Ethernet controller

The ISA96 V8/103 includes an On-Board Gigabit-Ethernet controller 82541ER. It can, however, be driven only in Fast-Ethernet mode for 10Base-T and 100Base-TX networks. The RJ45 receptacle for connection of a Standard-Twisted-Pair network cable (Cat.5 or better) can be reached via the front panel.

General Features

- Integrated interface for 10Base-T and 100Base-TX
- Auto-Negotiation for speed, duplex and flow control
- Fulfills the demands as per IEEE 802.3u and IEEE 802.3x
- Full-Duplex operation at 10Mbps/100Mbps
- Internal FIFOs for Rx and Tx
- 2 LEDs at the RJ45 receptacle for checking network activities
- Ample driver software for diverse platforms

Status-LEDs

The Ethernet controller rules 2 LEDs "100" (green) and "L/A" (yellow). They are found on the front panel directly in the RJ45 receptacle "Ethernet". These LEDs give information about condition and activity of network and controller:

100 (green): "100Base-TX" - This LED shines when the controller works in 100MBaud mode. Otherwise, the controller is in 10Base-T mode. Recognition and switch-over to the actual type of network are done automatically.

L/A (yellow): "Link/Activity" - This LED shines as long as a trouble-free network link exists. During network activities, this LED goes out in the rhythmus of the sent or received data packages.

6.5 Super-I/O Controller

The Super-I/O controller W73627HG of the ISA96 V8/103 offers two serial interfaces, a parallel interface, a floppy controller, one controller for PS/2 keyboard and mouse, a hardware monitor, and several GPIO pins. On the ISA96 V8/103, however, the floppy controller is not utilized.

6.5.1 Hardware Monitor

For survey of supply voltages, temperatures and fans, a hardware monitor is integrated in the ISA96 V8/103. The measuring values as set in the BIOS-Setup in the "PC Health Status" sub-menu can be read via this component.

The following readings can be queried:

- supply voltages: CPU-Core voltage, 1.8V, 2.5V, 3.3V, 5V, 12V and V_{Bat}
- temperatures: environment temperature and CPU temperature
- fan: fan rotation speed system fan (connection via Rear-I/O adapter)

The hardware monitor can be addressed via specific I/O addresses (via LPC-Bus). The following table shows the possibilities how to access the hardware monitor:

Bus	Address	Description	Remarks
LPC	2Eh/2Fh	Super-I/O configuration register	Index/Data
LPC	295h/296h (1)	Hardware monitor configuration register	Index/Data

Remarks:

(1) The I/O address can be set via the Super-I/O configuration register CR60/CR61 of logic device B.

A detailed description of all registers of the hardware monitor is found in the W83627HG data sheet of the producer Nuvoton: http://www.nuvoton.com

6.6 CompactFlash

The ISA96 V8/103 has a slot for a CompactFlash memory card. The card is driven in True-IDE mode. it is a Master Device at the primary PATA interface. The inserted CompactFlash cards are mechanically locked by the guiding rail of the rack.

Attention: The IDE interface allows only the connection of two devices (Master and Slave). Therefore, when using a CompactFlash memory card, it is required to either switch off the On-Board Flash-Disk, or the IDE-connector S6 must remain free, see Chapter 8.7.

6.7 Flash-Disk

Already the base version of the ISA96 V8/103 is equipped with a 256MByte Flash-Disk. It can be utilized like a normal hard disk drive; you can even boot from it. On demand, also versions with bigger Flash-Disks can be realized.

Attention: The IDE interface allows only the connection of two devices (Master and Slave). Therefore, when using a CompactFlash memory card, it is required to either switch off the On-Board Flash-Disk, or the IDE-connector S6 must remain free, see Chapter 8.7.

6.8 SCRAM

In addition to the SDRAM main memory, the ISA96 V8/103 has 1MByte of CMOS-RAM (SCRAM). Its contents are buffered by the internal lithium battery. The SCRAM can be used in two different ways:

linear: The SCRAM is switched, completely or partly, directly into the memory address range between D0000h and EFFFFh. The required size and the start address can be determined in the BIOS-Setup on the "Special Features" page at the menu item "On-Board Static RAM". Certainly, the set address range may not be assigned by other cards.

switched: In this operating mode, the SCRAM is split in blocks of 16KByte each; only one such block is switched into the memory address range between CC000h and EFFFFh. The number of the block to be switched in can be entered via an I/O-Port. The start address of the 16KByte range must be set in the BIOS-Setup on the "Special Features" page at the menu item "On-Board Static RAM". This operating mode is compatible to the EPROM-Disk of the former ISA96 CPU cards.

6.9 EEPROM

The ISA96 V8/103 features an EEPROM with 512MByte. It usually contains a 1:1 image of the Setup parameters which are stored in the Standard-CMOS-RAM. Should the battery fail, the data in the Standard-CMOS-RAM become invalid. The BIOS of the ISA96 V5/103 will then read the parameters which were stored latest in the EEPROM, and will write them back into the Standard-CMOS-RAM. This way, the computer can still boot after a battery failure without user action. In such a case, however, date and time are wrong and must correspondingly be corrected.

In order to prevent that in case of invalid CMOS-RAM data automatically the contents of the EEPROM are copied into the CMOS-RAM, set Jumper **J9** (this will make sense only in the rare case that the EEPROM holds senseless data). Then, all adjustments in the Setup have to be repeated and must again be saved in the CMOS-RAM.

6.10 Watchdog

The ISA96 V8/103 contains a Watchdog that creates a hardware Reset if it is not triggered periodically by the running program within a certain time. This can considerably improve the reliability of the whole system.

In the BIOS-Setup, the page "Special Features Setup" allows to set different trigger periods between 250ms and 32s. The Watchdog can also be disabled completely. To allow the system to boot at all, the Watchdog becomes active only after it was triggered for the first time.

Triggering the Watchdog:

As mentioned before, the watchdog becomes active only after it was initially triggered

This is done as follows:

- Write the value 55h to I/O register 45h
- Write a value ≠55h to I/O register 46h (the value 55h generates the immediate Reset of the ISA96 V8/103).

Configuration of the Watchdog:

The Watchdog can be configured by software concerning their trigger times, and also be switched on and off (thus overwriting the settings made in the BIOS-Setup).

Configuration register **WDCONF** (Index 11):

D7	D6	D5	D4	D3	D2	D1	D0
-	-	-	-	WDT2	WDT1	WDT0	ENWD
-	-	-	-	r/w	r/w	r/w	r/w

WDT2...0: These Bits determine the time constant of the Watchdog.

0h:	0,25s	1h:	0,5s
2h:	1.0s	3h:	2.0s
4h:	4,0s	5h:	8,1s
6h:	16,1s	7h:	32.2s

ENWD: Setting this bit will enable the Watchdog. With the next write access to the Configuration Register WATCHDOG (refer below), the counter will start with the time constant set here.

This configuration register WDCONF must be written as follows:

- Write the value 11 (not 11h !) to I/O-Register 45h
- Write the desired value for WDCONF to I/O-Register 46h

7 Jumpers and LEDs

7.1 Jumpers

The ISA96 V8/103 has diverse soldered jumpers and plug-in jumpers that allow to adapt the component to different configuration. The following table gives an overview about the existing jumpers:

Jumper	Function	Description
J10	Clear CMOS	Shortly bridging this jumper (1...2s) deletes the CMOS-RAM
J1 GP1	GP-Jumper1	Universal jumper at GP_JMP1-Pin of the LCAs: removed: GP_JMP1 is high set: GP_JMP1 is low
J1 GP2	GP-Jumper2	Universal jumper at GP_JMP2-Pin of the LCAs: removed: GP_JMP2 is high set: GP_JMP2 is low
J9	Disable EEPROM	prevents reading the EEPROM, if set
J1 FDD	Disable FLASH-Disk	These two jumpers serve to configure the devices on the IDE interface, see Chapter 8.7
J1 MST	IDE-Master	

7.2 LEDs

Further to the LEDs on the network receptacle, the ISA96 V8/103 has three additional LEDs on the front panel:

RUN (blue): This LED signalizes booting of the system.

DD (green): This LED indicates accesses to the IDE interface.

GP (yellow): The denomination GP stands for "General Purpose". The function of this LED can be set in the BIOS setup (Special Features).

The following table shows the function of these three LEDs from switch on of the component until the start of the operating system:

Operating Condition	RUN	DD	GP
Powergood signal (PWROK) passive, 3.3V supply not OK. *Error reason: Step-down converter 3.3V or overload/short circuit*	OFF	OFF	OFF
Powergood-Signal (PWROK) passive normal period: about ½ s *Error reason, if static: Step-down converter overload/short circuit*	OFF	OFF	ON
Powergood-Signal ok, if /PCI-RESET signal active normal period: about 0,1s *Error reason, if static: Clocks or chipset*	ON	ON (*1) OFF (*2)	OFF
/PCI-RESET-Signal high, CPU starts POST. normal period: ca. 3-4s *Error reason, if static: CPU, FWH, Clocks, memory*	ON	ON	OFF
BIOS starts loading FPGA. normal period: about 2s *Error reason, if static: FPGA*	ON	ON (*1) OFF (*2)	OFF
FPGA is loaded, POST will be continued. normal period: about 3-4s *Error reason, if static: IDE*	flashes (1Hz)	ON (*1) OFF (*2)	OFF ON (*3)
IDE drives are initialized. normal period: about 1-2s *Error reason, if static: IDE, Interrupts*	flashes (1Hz)	flashes when accessed	OFF ON (*3)
BIOS POST completed, operating system is started.	ON	flashes when accessed	OFF ON (*3)

(*1): IDE Slave drive exists (normally Onboard-Flash)

(*2): IDE Slave drive not existing / disabled (Jumper at J1 FDD, for example)

(*3): Depending BIOS settings for "General Purpose LED"

8 Interfaces

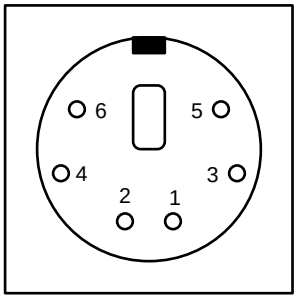
8.1 Keyboard- / Mouse Interface

A 6pole Mini-DIN counter-plug is integrated in the front panel of the ISA96 V8/103. Here you can connect a standard keyboard with PS/2-plug.

The signals of the PS/2 mouse are laid to two pins that the keyboard does not use, like this is common at laptops. So you may operate both units in parallel, by means of so-called usual „Y-cables“ which put available the signals from the mouse interface and from the keyboard interface on two separate Mini-DIN-counter-plugs.

Pin assignment of the Mini-DIN counter-plug (top view):

1 KB-Data
2 MS-Data
3 GND
4 +5V
5 KB-CLK
6 MS-CLK



8.2 USB Interfaces

Placed on the front panel of the ISA96 V8/103 is an USB 2.0 interface for connection of peripheral units. Another USB 2.0 interface can be utilized for COM2, with matching serial modules. A third interface is available via a Rear-I/O adapter. The USB interfaces fulfill USB specification 2.0 and therefore allow 480MBit/s as transfer rate. USB units are fit for "hot-plug", so they may be added to the ISA96 V8/103, or removed from it, during its operation. USB keyboards and mice are supported by BIOS (if activated so in the BIOS setup) and can therefore also be used, for example, under DOS.

For protection of the board, the power supply for the USB interface on the front panel is limited to about 1A by an electronic fuse.

8.3 Serial Interfaces

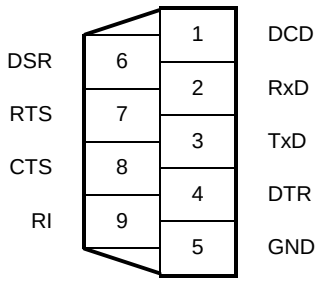
The ISA96 V8/103 has two serial interfaces, each with 16Byte FIFO (16550 compatible). The first interface (COM1) is hard-wired as RS232C. The second interface COM2 is reserved for a short serial driver module (only with 8HP variants).

Normally, these two serial interfaces are configured in the BIOS setup as COM1/COM2. Should however COM1/COM2 already exist on an external interface card, the two serial interfaces of the ISA96 V8/103 must be manually set to COM3/COM4 in the BIOS setup.

Details about the serial driver modules are found in their according Technical Descriptions. The actual Price List of Janich & Klass informs about which driver modules and adapters are actually available.

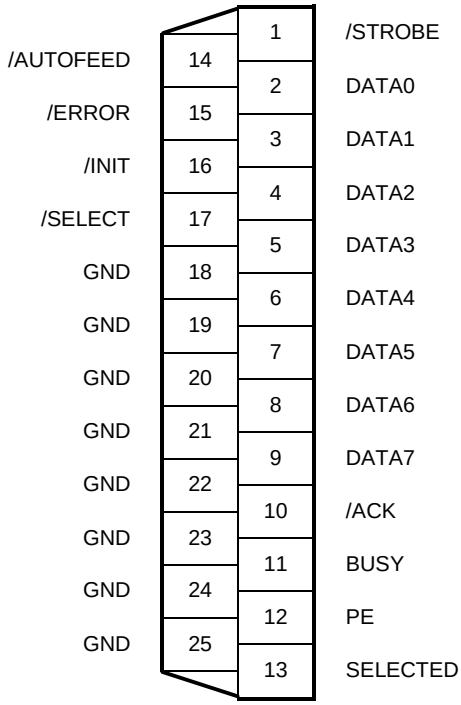
8.3.1 RS232 Interface COM1

9pin Sub-D Connector **COM1** (S11)



8.4 Parallel Interface

25pole Sub-D Receptacle **LPT** (S10)



The parallel interface is compatible to ECP, EPP, PS/2. SPP and IEEE1284.

8.5 Monitor

The ISA96 V8/103 allows to connect an analog monitor via the VGA-compatible 15pin HD-receptacle on the front panel. The following table shows the pin assignment:

15pin Sub-D Connector **VGA** (S14)

1	Red	75Ω 0,7V
2	Green	75Ω 0,7V
3	Blue	75Ω 0,7V
4	-	
5	Digital-GND	
6	Analog-GND	
7	Analog-GND	
8	Analog-GND	
9	-	
10	Digital-GND	
11	-	
12	DDC-Data	TTL
13	HSYNC	TTL
14	VSYNC	TTL
15	DDC-Clock	TTL

8.6 Flat Display Interface

34pin Header Row **S4**

	1	2	
GND	3	4	CLK
HSYNC	5	6	VSYNC
GND	7	8	R0
R1	9	10	R2
R3	11	12	R4
R5	13	14	GND
G0	15	16	G1
G2	17	18	G3
G4	19	20	G5
GND	21	22	B0
B1	23	24	B2
B3	25	26	B4
B5	27	28	GND
DE	29	30	+3.3V (max. 500mA)
+3.3V (max. 500mA)	31	32	R/L
U/D	33	34	

8.7 IDE Interface

The ISA96 V8/103 has a high performance IDE interface that allows 100MBytes/sec as transfer rate in "UDMA-5" mode.

Connected to this IDE interface are a CompactFlash socket, a Flash-Disk controller, and the 44pin header row **S7**. The latter allows to connect a 2.5" hard disk drive via a flat cable that will be firmly screwed on the ISA96 V8/103.

Attention: The IDE interface only allows to connect two devices (Master and Slave), the third device on the ISA96 V8/103 must therefore remain unused!

The following table shows the allowed combinations :

Master	**Slave**	**3rd Device**	**J1 FDD**	**J1 MST**
CompactFlash	2.5" Hard disk on S7	FlashDisk disabled	set	removed
2.5" Hard disk an S7	FlashDisk	CompactFlash removed	removed	removed
CompactFlash	FlashDisk	No hard disk at S4	removed	removed
FlashDisk	CompactFlash	No hard disk at S4	removed	set

8.7.1 Connector Assignment of the standard IDE Interface

44pin header row **S7**

/RESET	1	2	GND
SD7	3	4	SD8
SD6	5	6	SD9
SD5	7	8	SD10
SD4	9	10	SD11
SD3	11	12	SD12
SD2	13	14	SD13
SD1	15	16	SD14
SD0	17	18	SD15
GND	19	20	
DRQ	21	22	GND
/IOW	23	24	GND
/IOR	25	26	GND
IORDY	27	28	GND
/DACK	29	30	GND
IRQ	31	32	
SA1	33	34	/DIAG
SA0	35	36	SA2
/CS0	37	38	/CS1
/HDLED	39	40	GND
+5V (max. 1A)	41	42	+5V (max. 1A)
GND	43	44	

8.8 Rear I/O

The 24pin header row **S2** is foreseen for rear-side connection of unit-internal peripherals (Rear-I/O). Via a common flat cable, you can connect one each PS/2-keyboard, PS/2-mouse, USB unit, speaker, Reset-key, and the rpm signal of a fan.

24pol. header row **S2**

	1	2	RIO_VER2
RIO_VER1	3	4	RIO_VER0
Keyboard enable	5	6	GND
Keyb DATA R	7	8	Keyboard CLK R
+5V (max. 500mA)	9	10	Keyboard DATA FP
Keyb CLK FP	11	12	+3.3V (max. 100mA)
USB-	13	14	+5V (max. 500mA)
USB+	15	16	GND
Speaker	17	18	FAN ext. RPM
Reset#	19	20	
GND	21	22	mouse CLK
+5V (max. 500mA)	23	24	mouse DATA

9 Video Controller

The AMD Geode LX800 includes a highly integrated video controller with 2D accelerator. The controller utilizes the "Unified Memory Architecture" (UMA) where up to 8MByte of the fast DDR main memory are reserved for the video controller.

Generally, every ISA96 V8/103 offers the DSUB receptacle **VGA** on its front panel. Here, usual monitors, or analog flat displays can be connected. If in addition a digital (flat) display shall be connected, you require a matching adapter cable for the TFT connector **S4**.

In due case, please contact Janich & Klass for clearing further details.

9.1 Flat Display Type

When you want to connect a flat display to the ISA96 V8/103, it is necessary in advance to correctly set the type of display in the BIOS setup on the "Advanced Chipset Features" page.

Attention: This setting is critical! A false setting may lead to destruction of the connected flat display!

9.2 Video BIOS

The Video BIOS of the ISA96 V8/103 is fully compatible to Standard IBM VGA BIOS and to the interrupt 10h Video Service Function. It is specially optimized for the S3-Video controller of the ISA96 V8/103, offers diverse extended video- and graphics modes, and supports the VESA-Standards VBE 2.0, DPMS, DDC-2b and EDID 1 & 2.

In the standard version of the ISA96 V8/103, the Video BIOS has a size of 64Kbyte and assigns the memory range C0000h - CFFFFh (!). Therefore, the memory range von C8000h - CF000h that is free at many other systems, is not available here.

10 Resources Assignment

10.1 I/O- and Memory Address Assignment

In the **I/O address range** from 0000h to FFFFh ISA96 V8/103 assigns the following addresses:

Address	Function
0000h-000Fh	DMA controller
0020h-0021h	Master Interrupt controller
0022h-0023h	GPIO Index-/Data register
0040h-0043h	Timer component
0044h-0047h	V8/103 configuration port
0060h-0064h	keyboard controller
0065h-006Dh	Watchdog
0070h-0071h	Real-time clock & CMOS-RAM
0080h	Diagnosis display
0081h-008Fh	DMA controller
0092h	System status bits (Port A)
00A0h-00A1h	Slave Interrupt controller
00B2h	SMM register
00C0h-00DFh	DMA controller
00E0h-00EFh	DOS 4Gpage Register
01F0h-01F7h	Primary IDE
0278h-027Fh	LPT2 (if set so in the BIOS setup)
02E8h-02EFh	COM4 (if set so in the BIOS setup)
02F8h-02FFh	COM2 (if set so in the BIOS setup)
0378h-037Fh	LPT1 (if set so in the BIOS setup)
03E8h-03EFh	COM3 (if set so in the BIOS setup)
03F8h-03FFh	COM1 (if set so in the BIOS setup)
0480h-048Fh	DMA controller
0490h-0499h	Instruction Counter Register
04D0h-04D1h	Interrupt controller
0CF8h-0CFFh	PCI configuration port

The **MEMORY address range** is assigned as follows:

0h - 9FFFh	640KByte	DOS Application Area
A0000h - BFFFFh	128KByte	Video Buffer
C0000h - CFFFFh	64KByte	Video BIOS
D0000h - EFFFFh	128KByte	Adapter Area (*1)
F0000h - FFFFFh	64KByte	System BIOS
100000h - 3FFFFFFFh	1GByte	Main Memory
40000000h - FEBFFFFFh	~3GByte	PCI Memory
FEC00000h - FFFFFFFFh	20MByte	APIC & System BIOS

Furthermore, those memory- and I/O addresses are assigned that the PCI BIOS assigns to the PCI devices.

(*1): Initially after switch-on, the address range E8000h – EFFFFh is assigned by the BIOS. Only after booting of the systems, this area can be released for the ISA96-/AT96 Bus by modifying the chipset register.

10.2 Interrupts

Interrupt	In APIC mode arranged to
IRQ0	System timer
IRQ1	Keyboard
IRQ2	2nd interrupt controller
IRQ3	COM2
IRQ4	COM1
IRQ5	
IRQ6	Floppy-Disk Controller
IRQ7	LPT1
IRQ8	Real-time clock
IRQ9	Microsoft ACPI-conform system
IRQ10	
IRQ11	
IRQ12	
IRQ13	Coprocessor
IRQ14	Primary IDE
IRQ15	Secondary IDE

11 System Bus

11.1 Bus Assignment ISA96 Version

The following table shows the pin assignment of the Bus connector for the ISA96 version.

	a	b	c	
1	GND	n.c. (MASTER#)	IOCHCK#	**1**
2	RESET	SD15	SD7	**2**
3	+5V	SD14	SD6	**3**
4	IRQ9	SD13	SD5	**4**
5	MEMR#	SD12	SD4	**5**
6	DRQ2	SD11	SD3	**6**
7	n.c. (-12V)	SD10	SD2	**7**
8	0WS#	SD9	SD1	**8**
9	+12V	SD8	SD0	**9**
10	GND	SBHE#	IOREADY	**10**
11	SMEMW#	GND (LA23)	AEN	**11**
12	SMEMR#	LA22	SA19	**12**
13	IOW#	GND (LA21)	SA18	**13**
14	IOR#	LA20	SA17	**14**
15	+5V (DACK3#)	LA19	SA16	**15**
16	GND (DRQ3)	LA18	SA15	**16**
17	+5V (DACK1#)	LA17	SA14	**17**
18	GND (DRQ1)	GND (DACK7#)	SA13	**18**
19	REF#	n.c. (DRQ7)	SA12	**19**
20	CLOCK	+5V (DACK6#)	SA11	**20**
21	IRQ7	n.c. (DRQ6)	SA10	**21**
22	IRQ6	GND (DACK5#)	SA9	**22**
23	IRQ5	n.c. (DRQ5)	SA8	**23**
24	IRQ4	+5V (DACK0#)	SA7	**24**
25	IRQ3	n.c. (DRQ0)	SA6	**25**
26	DACK2#	MEMCS16#	SA5	**26**
27	TC	IOCS16#	SA4	**27**
28	BALE	IRQ15	SA3	**28**
29	+5V	IRQ14	SA2	**29**
30	OSC	IRQ12	SA1	**30**
31	MEMW#	IRQ11	SA0	**31**
32	GND	IRQ10	GND	**32**
	(Standard-ISA96-Bus assignment in brackets)			

11.2 Bus Assignment AT96 Version

The following table shows the pin assignment of the Bus connector for the AT96 version.

	a	b	c	
1	GND	SBHE#	IOCHCK#	1
2	RESET	MEMCS16#	SD7	2
3	+5V	SA23	SD6	3
4	IRQ9	IOCS16#	SD5	4
5	n.c.	SA22	SD4	5
6	DRQ2	IRQ10	SD3	6
7	n.c. (-12V)	SA21	SD2	7
8	0WS#	IRQ11	SD1	8
9	+12V	SA20	SD0	9
10	GND	IRQ12	IOREADY	10
11	SMEMW#	n.c. (UBatt)	AEN	11
12	SMEMR#	IRQ15	SA19	12
13	IOW#	GND (n.c.)	SA18	13
14	IOR#	IRQ14	SA17	14
15	+5V (DACK3#)	n.c.	SA16	15
16	GND (DRQ3)	+5V (DACK0#	SA15	16
17	+5V (DACK1#)	MEMR#	SA14	17
18	GND (DRQ1)	GND (DRQ0)	SA13	18
19	REF#	MEMW#	SA12	19
20	CLOCK	+5V (DACK5#)	SA11	20
21	IRQ7	SD8	SA10	21
22	IRQ6	GND (DRQ5)	SA9	22
23	IRQ5	SD9	SA8	23
24	IRQ4	+5V (DACK6#)	SA7	24
25	IRQ3	SD10	SA6	25
26	DACK2#	GND (DRQ6)	SA5	26
27	TC	SD11	SA4	27
28	BALE	SD12	SA3	28
29	+5V	SD13	SA2	29
30	OSC	SD14	SA1	30
31	GND	SD15	SA0	31
32	GND (DRQ7)	n.c. (MASHPR#)	GND (DACK7#)	32
	(Standard-AT96-Bus assignment in brackets)			

12 Power Supply of the ISA96 V8/103

The ISA96 V8/103 requires just one supply voltage:

- +5V ±5%, ca. 1.0A

The +12V supply voltage of the ISA96-Bus is not required for operating the ISA96 V8/103. Nevertheless, this voltage can be monitored by the hardware monitor, so that an eventual failure of this voltage is recognized, and appropriate counter-measures can be initiated.

13 BIOS

13.1 BIOS Update

You can re-program the BIOS-Flash-EPROM using the program "AWDFLASH.EXE" (please refer to the ISA96-CD). This enables you to make BIOS updates anytime without de-installing the card. On program start, user hints are displayed. You should by all means use the offered opportunity to save the old BIOS version to diskette! This will put you in a position to restore the old condition before the update, for the case that the new BIOS should not function as desired.

Hint: Before the start of AWDFLASH, the access to the BIOS-Flash must be released. This is done by once calling "FWH.EXE" with the parameter "ON".

13.2 Power-On self-Test (POST)

After the ISA96 V8/103 is switched on, the BIOS executes a self-test, the so-called "POST" = Power-On-Self-Test. Eventual errors during this self-test are indicated by beep codes or by visual messages. An error message can be followed by the query to press the <F1> key to continue, or <DEL> to enter the Setup.

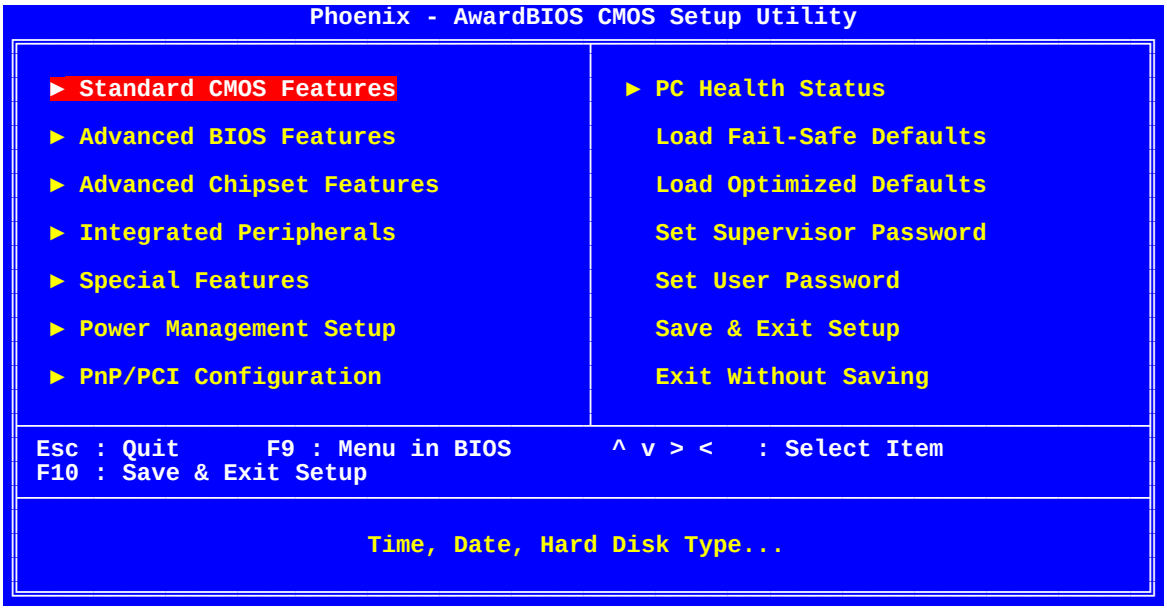
13.2.1 Beep Codes

The ISA96 V8/103 has a firmly mounted Piezo beeper which can be connected to the standard PC-speaker exit.

The BIOS puts out the following information, during the POST:

1 x short:	VGA-Controller was found and initialed error free.
long, repeated:	The BIOS has found no main memory, or a defective one.
1 x long, 2 x short:	The BIOS has found no VGA-Controller, or a defective one.
1 x short high, 1 x long deep:	The BIOS itself is damaged (wrong checksum).

13.3 BIOS Setup



This is the start page of the Setup as integrated in the BIOS. From here on, you can reach the different sub-pages of the Setup, or you can close the Setup. The following possibilities are at choice:

Standard CMOS Features
Use this sub-page to set date, time, and the type of connected drives.

Advanced BIOS Features
Different BIOS options can be set on this sub-page.

Advanced Chipset Features
The settings on this sub-page concern the chip set of the V8/103 and should normally not be altered.

Integrated Peripherals
Use this sub-page to alter the settings of the standard interfaces (IDE, FDC, USB, COM, LPT).

Special Features
The additional hardware components of the V8/103 (Silicon-Disk, SRAM, Board-Info) can be configured on this sub-page.

Power Management Setup
Use this sub-page to set different energy saving options.

PnP/PCI Configuration
This sub-page serves to influence the Plug&Play mechanisms of the BIOS.

PC Health Status
This sub-page displays the actual values of diverse supply voltages and temperatures.

Load Fail-Safe Defaults
With this menu item, you can return all Setup settings to a condition with which the V8/103 can securely boot in any case.

Load Optimized Defaults
Use this menu item to securely return all Setup settings to their factory settings.

Set Supervisor Password

In order to protect the BIOS-Setup and the entire system from unauthorized access, you can define a password with this menu item. A once activated password is deactivated again when you just press the <Return> key instead entering a new password.

Set User Password

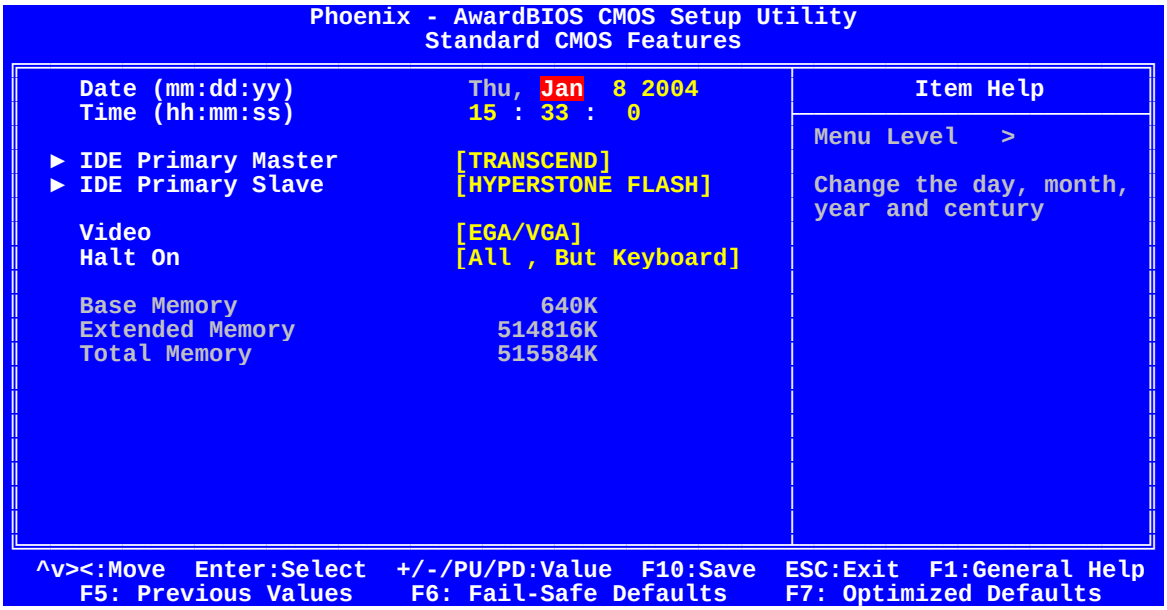
Similar to the Supervisor Password. Nevertheless, who logs in with this password cannot alter the BIOS-Setup, but just view it.

Save & Exit Setup

This menu item closes the Setup and saves all eventually made modifications.

Exit Without Saving

This menu item closes the Setup without saving eventually made modifications.



Date

Please set the actual date here. You may use the standard digit keys, but not the numeric keypad.

Time

Please set the actual time here. You may use the standard digit keys, but not the numeric keypad.

IDE Primary Master / Slave

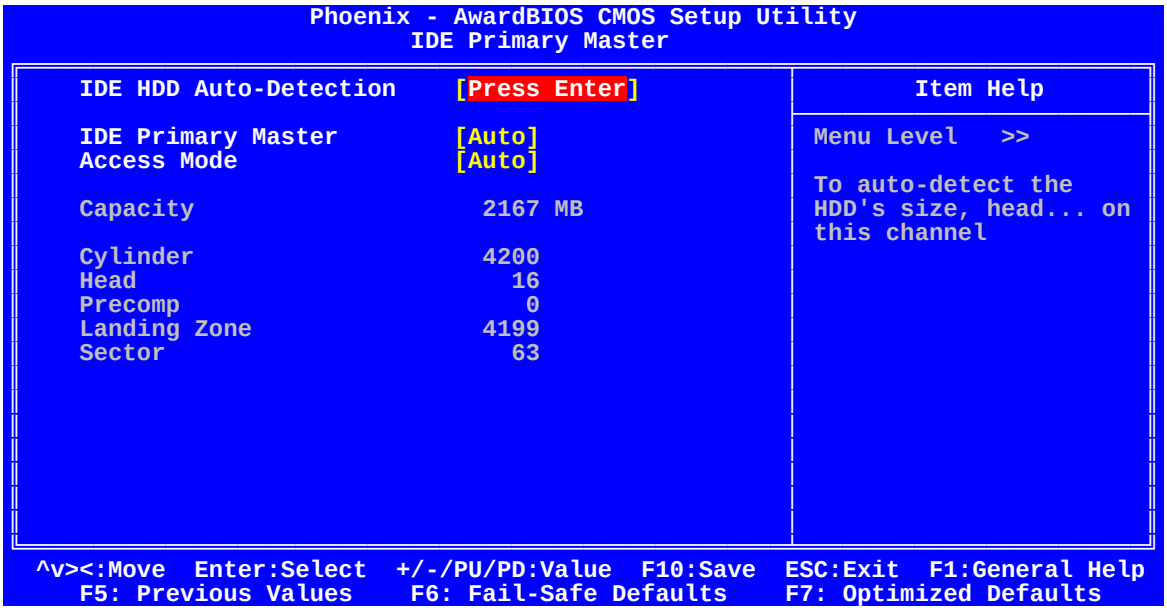
These menu items hide further sub-menus that serve for setting parameters for the connected hard disk drives (refer below).

Video

Please always set this item to "EGA/VGA".

Halt On

With this menu item, you can determine at which error kinds the BIOS shall halt the Power-On self test and shall give an error report. The error report is followed by the query to press the <F1> key for continuation, or <DEL> to enter the Setup.



IDE HDD Auto-Detection

With this function, the BIOS can read the parameters of the connected IDE drive. The values found there are displayed in the according lines.

IDE Primary Master

Under this option, you can determine the configuration mode for the selected hard disk drive:

"Auto" This is the recommended setting. The BIOS reads the parameters of the hard disk drive automatically and inserts them in the following lines.

"None" Please select this setting if no hard disk drive nor CD-ROM drive is connected to the corresponding IDE-Port.

"Manual" With this setting, you can enter the hard disk drive parameters by your own into the corresponding lines (only in connection Access Mode "CHS").

Access Mode

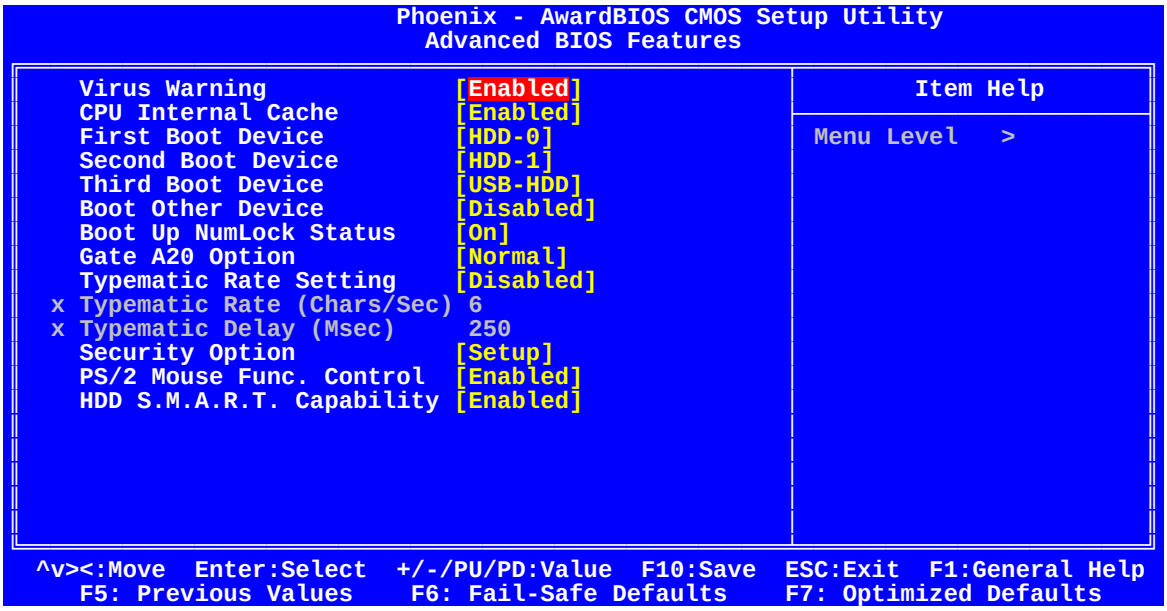
Under this option, you can determine the access mode for the selected hard disk drive.

"Auto": This is the recommended setting. The BIOS automatically reads the parameters of the hard disk and sets the correct mode.

"CHS": This setting should be used only if the hard disk was formatted with an older CPU board from Janich & Klass. The CHS mode indicates the actual number of cylinders, heads, and sectors for the drive, but caused by the limitation to 1024 cylinders, the operating system can recognize only 528MB of the drive size.

"LBA": LBA is a translation mode. You may wonder why the cylinders are divided by 2 or 4, and the heads are multiplied with 2 or 4. If the hard disk has 850MB, the cylinders are divided by 2, and the heads are multiplied with 2. At hard disks above 1,0GB, the cylinders are divided by 4 and the heads multiplied with 4. LBA modifies the number of cylinders and heads in a way that the sector limit of the BIOS are omitted - i.e. 63 sectors per track, 1024 tracks and 255 heads. LBA "fixes" the BIOS force to 1024 cylinders. The LBA mode keeps the number of cylinders below 1024. So, if a hard disk has 2484 cylinders and 16 heads, LBA makes it look for the BIOS as if the hard disk had only 621 cylinders and 64 heads.

"Large": The Large mode is not used very often. It works with a few systems, however not with most of them. It was a first trial at LBA. We recommend not to use Large at all.



Virus Warning

Virus Warning is not a virus protective program, but a write protection for boot sector and partition table. When you intend to write in this area, it will first check whether it is allowed. This option should, however, be "Disabled" so that no problems are generated during the installation of an operating system.

CPU Internal Cache

Cache memory is an additional memory which is substantially faster than the main memory. If the CPU queries data, the system delivers the queried date from the main memory into the Cache memory, for even faster access by the CPU.

First / Second / Third Boot Device

Here you can determine in which order the BIOS shall search the connected drives for a bootable operating system. The following possibilities are at choice:

"HDD-0"	Booting from the first hard disk that the BIOS finds[*1].
"CDROM"	Booting from a CDROM drive connected to S4.
"HDD-1"	Booting from the second hard disk that the BIOS finds[*1].
"USB-FDD"	Booting from an external USB floppy drive.
"USB-ZIP"	Booting from external USB ZIP drives and from USB memory sticks.
"USB-CDROM"	Booting from an external USB CDROM.
"USB-HDD"	Booting from an external USB Hard disk.
"Disabled"	The device is not utilized from booting of the operating system.

[*1] The BIOS searches for hard disks in the following sequence: Primary Master → Primary Slave. The first hard disk found in this search becomes "HDD-0", the second "HDD-1".

Boot Other Device

When this menu item is "Enabled", the BIOS boots from the first found bootable device, independent of the above described setup under First / Second / Third Boot Device.

Boot Up NumLock Status

This menu item checks the condition of the NumLock key on the keyboard after booting of the system. When set to "On", the numbers pad will create numbers instead of cursor commands.

Gate A20 Option

"Gate A20" relates to the way how the ISA96 P5/103 addresses memories above 1MB (extended memory). When set to "Fast", the chipset controls the "Gate A20". At "Normal", a pin in the keyboard controller controls the "Gate A20". Setting Gate A20 to "Fast" will raise the system speed, specially at OS/2 and Windows. "Fast" is default setting.

Typematic Rate Setting

When "Disabled", the two following items (Typematic Rate and Typematic Delay) are irrelevant. Key strokes repeat at a rate determined by the keyboard controller of the ISA96 V8/103.
When "Enabled", you can select between Typematic Rate and Typematic Delay.

Typematic Rate (Chars/Sec)

If "Enabled" was selected at menu item "Typematic Rate Setting", you can set a Typematic Rate (the rate at which characters repeat when a key is pressed down) of 6, 8, 10, 12, 15, 20, 24 or 30 characters per second.

Typematic Delay (msec)

If "Enabled" was selected at menu item "Typematic Rate Setting", you can set a Typematic Delay (the delay before key strokes begin to repeat) of 250, 500, 750 or 1000 milliseconds.

Security Option

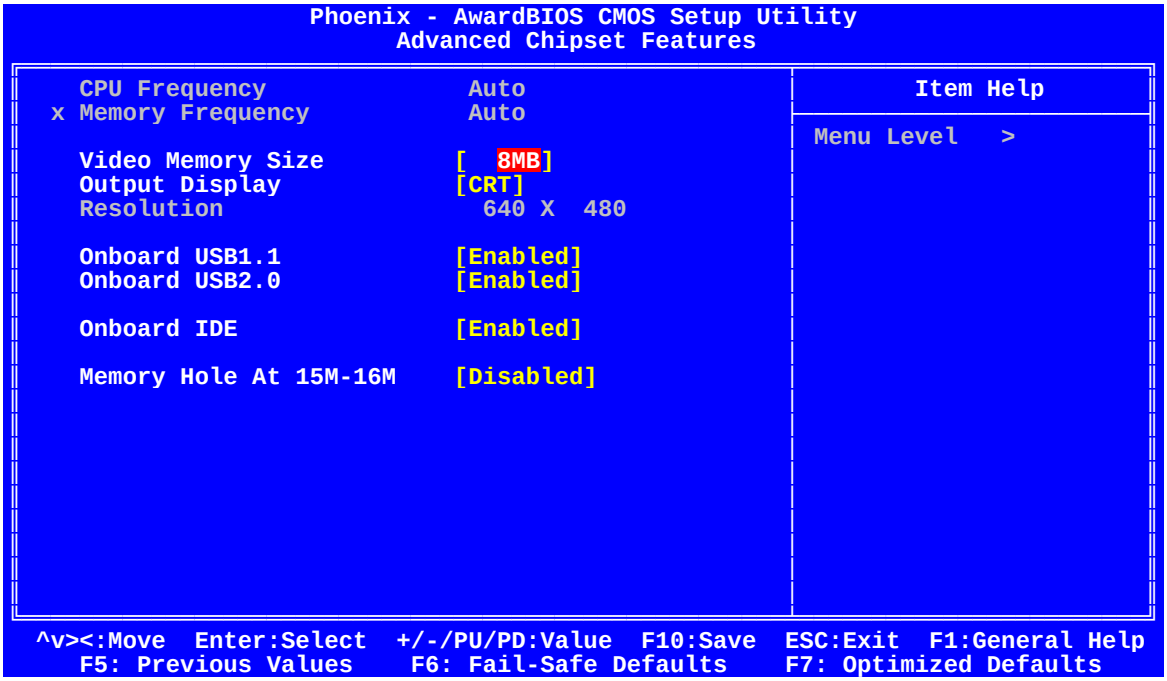
If you have a password, select whether the password is required every time the system boots ("System"), or only when you enter BIOS-Setup ("Setup").

PS/2 Mouse Func. Control

When "Disabled" is selected at this menu item, the BIOS does not search for a PS/2 mouse. This allows the free usage of IRQ12 on the ISA96-Bus. If you intend to utilize a PS/2 mouse, please set to "Enabled", the IRQ12 is then assigned by the mouse.

HDD S.M.A.R.T. Capability

The S.M.A.R.T. (Self Monitoring Analysis and Reporting Technology) is integrated in modern hard disks. With appropriate software, this technique can, among others, detect reading- and rpm-problems of the hard disk early in time.



The settings on this sub-page concern the chip set of the ISA96 V8/103 and should normally not be altered.

Video Memory Size

Use this option to determine how many MByte of the main memory are reserved for the video controller that is integrated in the chip set. If your application requires only little video memory, you may reduce this value in favor of main memory size.

Output Display

This menu item determines to which output unit the boot messages are delivered. The abbreviations stand for the following display units:

"CRT"	Analog monitor on VGA receptacle.
"Panel & CRT	Flat display on S4 and also analog monitor on VGA receptacle.

Resolution

When a flat display is connected to the ISA96 V8/103, it is necessary to set the adequate resolution for the display before its first usage.

Onboard USB1.1
Onboard USB2.0

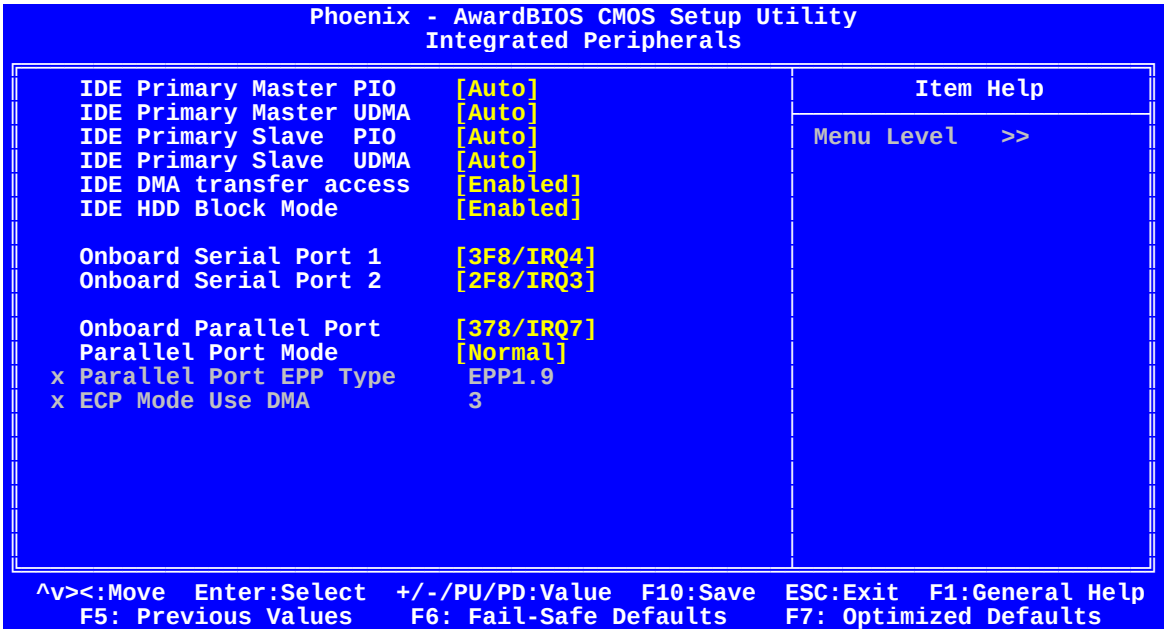
Placed on the ISA96 V8/103 is a chip set with support for USB 1.1 and USB2.0. You can toggle the according controller here.

Onboard IDE

"Enabled"	You can select this setting when you use the CompactFlash socket, the onboard Flash-Disk, or 2.5"-HD on S7.
"Disabled"	You can select this setting when you want to use neither the CompactFlash socket, nor a 2.5"-HD.

Memory Hole At 15M-16M

This option is responsible for the ISA96-Bus. When activated, it cuts a hole in the address range surpassing 15MB for a VGA Frame Buffer. When you have no ISA96 VGA in the system, you should set this option to "Disabled".



IDE Primary Master PIO
IDE Primary Master UDMA
IDE Primary Slave PIO
IDE Primary Slave UDMA

These menu items should all be "Auto".

IDE DMA transfer access

This option activates the DMA-access to the IDE drives. This may cause a speed advantage, under certain conditions.

IDE HDD Block Mode

Use this option to activate the Block-Mode of IDE hard disks. If your drive supports this mode and you activate this option, the number of blocks per query is read from the configuration sector of the hard disk drive. Recommended setup is "Enabled".

Onboard Serial Port 1/2

These menu items serve to determine addresses and interrupt lines for the two serial interfaces. Possible settings are as follows:

"Disabled"	The interface is disabled.
"3F8/IRQ4"	The interface becomes COM1.
"2F8/IRQ3"	The interface becomes COM2.
"3E8/IRQ4"	The interface becomes COM3.
"2E8/IRQ3"	The interface becomes COM4.
"Auto"	The BIOS decides by means of the other serial interfaces found in the system how the Onboard serial interfaces shall be configured.

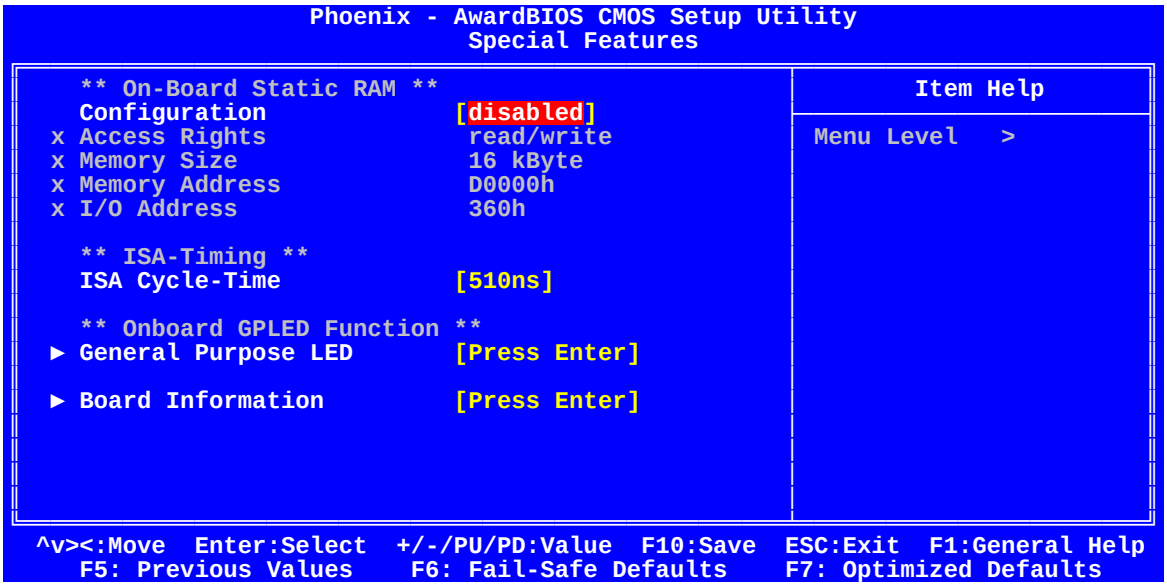
Onboard Parallel Port

This menu item serves to determine address and interrupt line for the parallel interface. Possible settings are as follows:

"Disabled"	The interface is disabled.
"378/IRQ7"	The interface becomes LPT1.
"278/IRQ5"	The interface becomes LPT2.
"3BC/IRQ7"	The interface becomes LPT3.

Parallel Port Mode

Please set the desired mode for the parallel interface here.



Use this Setup page to configure the additional functions of the ISA96 V8/103.

On-Board Static RAM

Configuration

"linear"	The additional SCRAM is used as individual coherent memory area in the address range CC000h ... EFFFFh. Start address and size: refer below.
"switched"	The additional SCRAM is split up to blocks of 16KByte each, of which always only one block can be switched on, in the address range CC000h ... EFFFFh.
"disabled"	The SCRAM is disabled.

Access Rights

"read/write"	The additional SCRAM can be read and written to.
"read/only"	The additional SCRAM is write-protected.

Memory Size

When the "Configuration" field states "linear", you can here set the size of the additional SCRAM between 16KByte and 128KByte.

Memory Address

Here you can set the memory start address of the additional SCRAM in steps of 16KByte each.

I/O Address

Here you can set the I/O start address of the additional SCRAM. The size of the I/O address range always is 2Byte.

ISA Cycle-Time

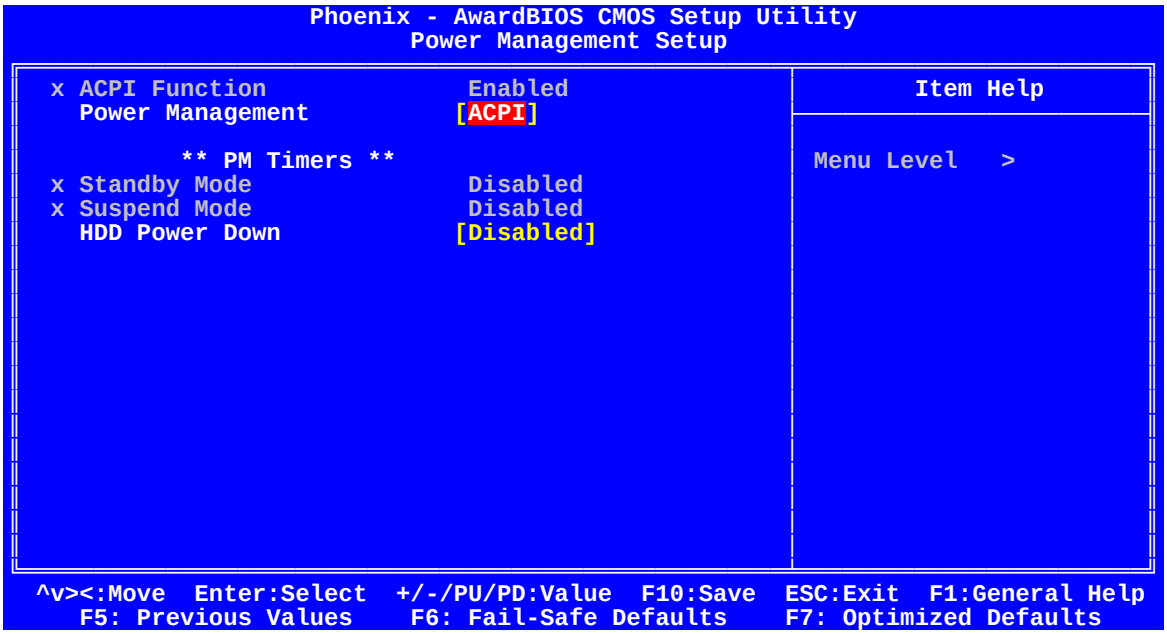
Here you can set the pulse width for write- and read control signals on the ISA-Bus.

On-Board GPLED Function

Here you can set the function of the GP-LED on the front panel. The LED then indicates the activity of the set sources. The signals are timely prolonged for better being seen.

Board Information

This menu item displays the actual hardware configuration.



In the settings for Power Management you adjust the way how the ISA96 V8/103 behaves at longer idle running.

Power Management

Here you can set when the ISA96 V8/103 shall enter the Suspend mode, or Standby mode, and when the hard disks shall be switched off. The following settings are possible:

"Disabled"	The Power Management is disabled.
"Legacy"	Here, the times are freely selectable: You can set, separately for "Suspend Mode" and for "Standby Mode", the period after that the BIOS shall set the computer to the adequate mode.
"ACPI"	Here, the operating system takes over the Power Management, via the ACPI function. In this case, the two following options "Standby Mode" and "Suspend Mode" can no longer be manually altered.

Standby Mode

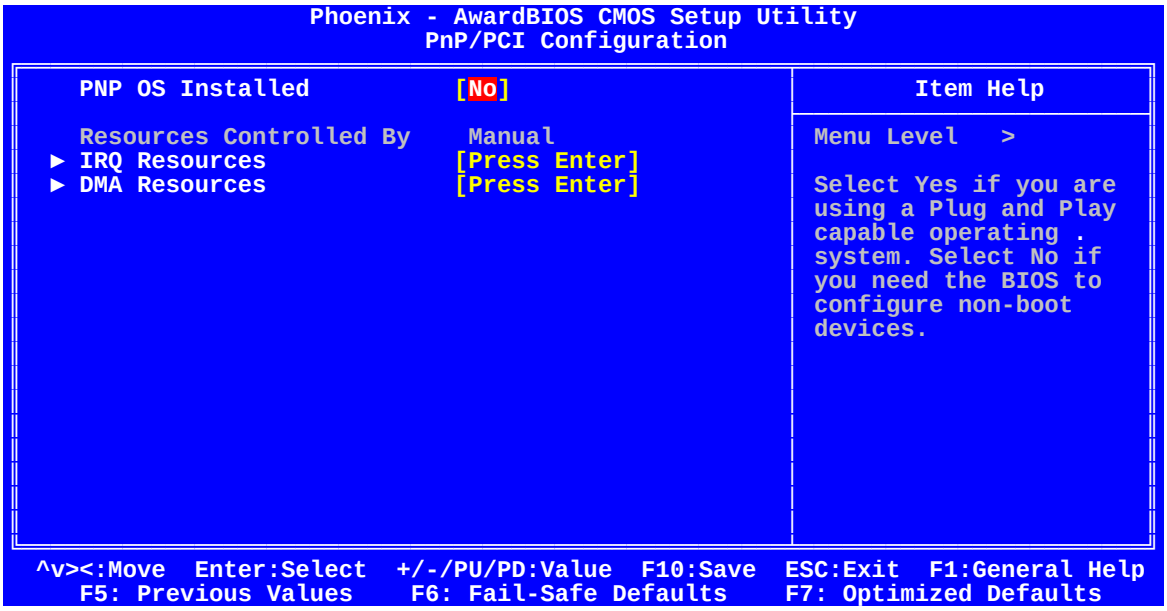
When the menu item "Power Management" is set to "Legacy", you can set here the period of inactivity after that the BIOS shall set the computer to Standby mode. The following settings are possible: "Disabled", "1 Sec" .... "120 Min".

Suspend Mode

When the menu item "Power Management" is set to "Legacy", you can set here the period of inactivity after that the BIOS shall set the computer to Suspend mode. The following settings are possible: "Disabled", "1 Sec" .... "120 Min".

HDD Power Down

Here you can set the period of inactivity after that the BIOS shall switch off the hard disk(s). The following settings are possible: "Disabled", "1 Sec" .... "120 Min".



This sub-page serves to influence the Plug&Play mechanisms of the BIOS'.

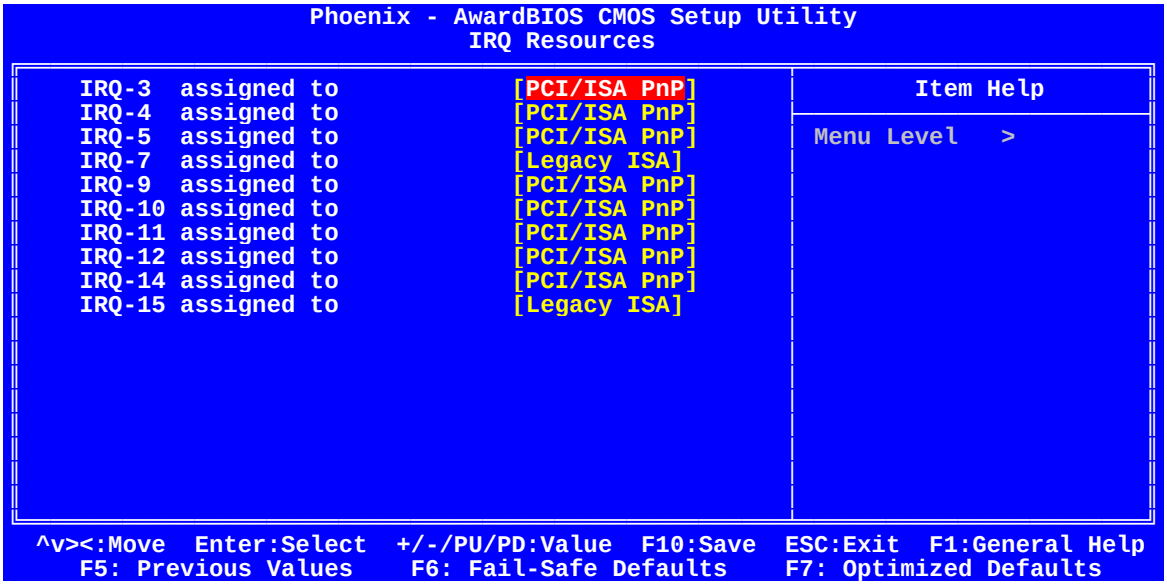
PNP OS Installed

When this option says "Yes", you inform the BIOS that your operating system allows for Plug & Play and that it controls the usage of the resources by itself. When the setup says "No", the BIOS controls the usage of the resources for all found devices on its own.

IRQ Resources

DMA Resources

These menu items hide further sub-menus. Those will help to reserve IRQs and DMSs for specific cards (refer further below).

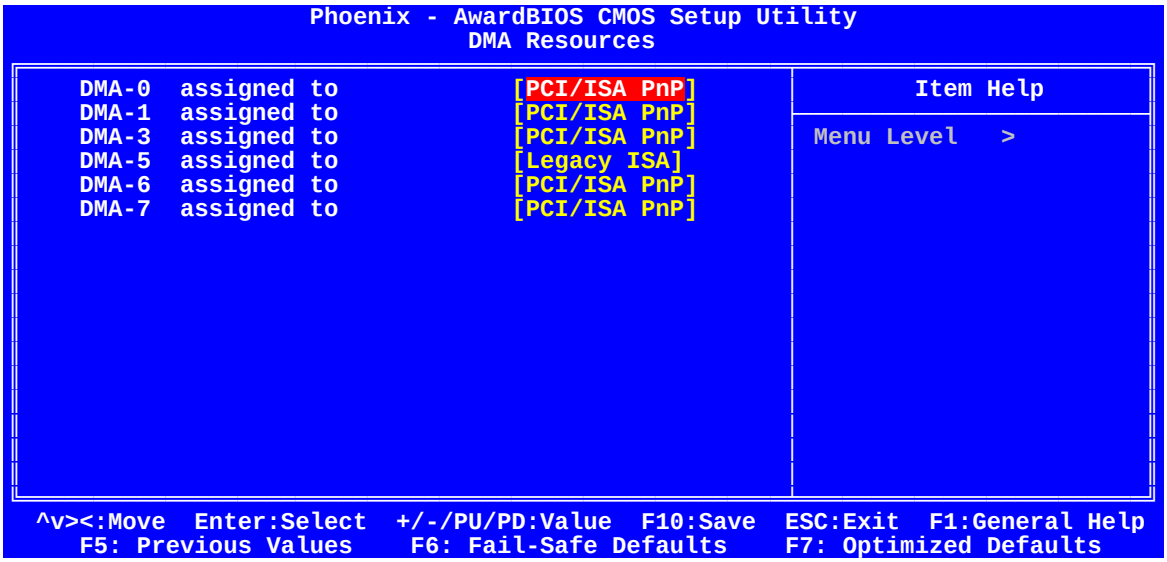


IRQ-*n* assigned to

Here you select, for each system interrupt, the following settings, depending on the type of card that uses the interrupt:

"Legacy ISA" Cards that fulfill the original PC-AT-Bus specification and that require a specific interrupt (usually all ISA96-I/O cards).

"PCI/ISA PnP" All IRQs that are not firmly assigned by specific cards should remain at this setting, in order to allow the BIOS to correctly configure Plug&Play devices.

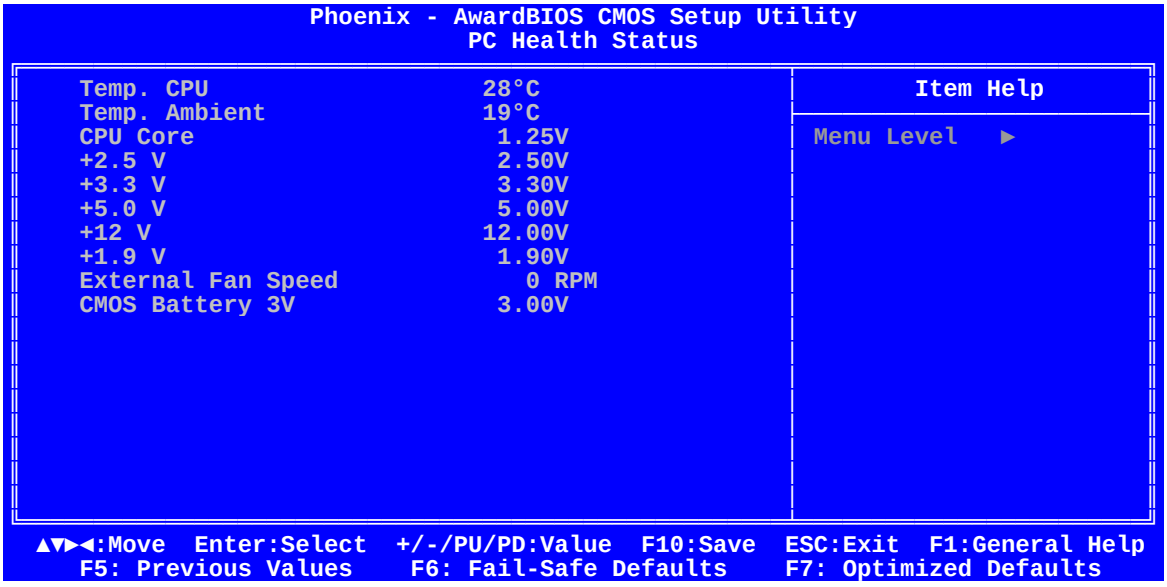


DMA-*n* assigned to

Here you select, separately for every System-DMA channel, the following settings, depending on the type of card that uses the DMA channel:

"Legacy ISA" Cards that fulfill the original PC-AT-Bus specification and that require a specific DMA channel (like the ISA96 FD-Card, for example).

"PCI/ISA PnP" All DMA channels that are not firmly assigned by specific cards should remain in this setting in order to allow the BIOS to correctly configure Plug&Play devices.



External Fan Speed

This line displays the actual fan speed of the housing fan, if existing.

Further indications

Here, the temperatures of CPU and base boards are displayed. Furthermore, you can check the individual voltages of the power supply.

14 Technical Data

Dimensions:	128mm * 173mm * 21mm (4HP variant) 128mm * 173mm * 41mm (8HP versions)
Design:	10 layer boards FR4 with solder mask and position print. All plugs are gold-covered.
Installation Position:	preferably upright.
Cooling:	at upright installation: convection cooling with at least 1m/min air speed.
Power Consumption:	typically 1.0A at +5V.

14.1 Environment Condition

Supply Voltages:	+4,85V ... +5,25V, max. 100mV Vss Ripple.
Operating Temperature:	-25 ... +70℃.
Storage Temperature:	-40 ... +85 ℃.
Relative Humidity:	10 - 90% non-condensing.
Storage Period:	unlimited.

15 Order Information

The Order Numbers of the ISA96 V8/103 (RoHS-conform) are composed as follows:

434.2684w x.0 y z

Version of Bus connector:
0 VG96 Bus connector and header rows for internal interfaces

CPU version:
0 AMD Geode LX800, 500MHz, 512MB DDR-SDRAM

Assembly Version of the Base Board:
0 4HP Version
1 8HP Version (LPT receptacle and header for COM2 serial module)
2 8HP Version (LPT receptacle and header for COM2 serial module) with firmly mounted 2.5" hard disk

Bus Configuration:
0 ISA96
1 AT96

Order Numbers for Accessories

434.268660.000 2	Serial Module M4 RS232C, 1xUSB, RoHS
404.268661.000 8	Serial Module M4 RS485/422 Opto, 1xUSB
404.268662.000 6	Serial Module M4 USB-Hub 3

16 Annex

16.1 Good to Know

16.1.1 USB BIOS Expansion

The chip set of the ISA96 V8/103 contains a USB-Controller with four equivalent USB interfaces. Two of these interfaces are available in form of two USB counter-plugs on the front panel of the ISA96 V8/103. Most USB units that can be connected here require an operating system that offers a corresponding USB support (Windows XP ...). For DOS or other older operating systems, usually no driver support is offered any more.

The ISA96 V5/103 however has the support for USB keyboards and USB mice implemented in its BIOS. It must first be activated in the BIOS setup, in due course. Enter the sub-menu "Integrated Peripherals/Onboard Device" and first set "USB Controller" to "enabled", only then enable the "USB Keyboard Support" or "USB Mouse Support".

16.2 Video Messages during POST

BIOS ROM checksum error - System halted	The checksum of the BIOS codes in the BIOS-Flash-EPROM is invalid. This means that the BIOS code may be defective. Please contact the Janich & Klass Service for replacing the BIOS chip.
CMOS Battery has failed	The CMOS battery functions no more. Please contact the Janich & Klass Service for replacing the battery.
CMOS checksum error	The checksum of the CMOS is wrong so that the system loads the default settings. A checksum error may mean that the contents of the CMOS memory were overwritten. The error might also have been caused by a weak battery. So please check the load condition of the battery and eventually let them replace.
"Press ESC to skip memory test"	The user may press the <Esc> key and can so skip the entire memory test.
"Floppy disk(s) fail"	The ISA96 V8/103 has no floppy connection. Please make sure that the floppy drive selection on the "Standard CMOS Features" page states "NONE".
"Hard Disk initializing, please wait a moment"	Some hard disks require some seconds for initializing.
"HARD DISK INSTALL FAILURE"	The BIOS cannot find or initiate the IDE controller or a drive connected to it. When you use a CompactFlash memory card, please check whether it correctly fits in the CompactFlash socket. Pins may not be bent.
"Hard disk(s) diagnosis fail"	The system may run specific drive diagnosis routines. This message appears when one, or several hard disk drives report an error while the diagnosis runs.
"Keyboard error or no keyboard present"	The BIOS cannot initiate the keyboard. Please make sure that the keyboard is correctly connected and that no keys are pressed during the POST. If you want to intentionally configure the system without any keyboard, please set the error-alt-condition in the Setup to "HALT ON ALL BUT KEYBOARD". The BIOS will then ignore the missing keyboard during the POST.
"Keyboard is locked out - Unlock the key"	This message usually means that one or several keys were pressed during the keyboard test. Please make sure that nothing lies on the keyboard.
"Memory Test"	This message appears during a full test of the memory. The tested memory ranges are counted downwards.
"Memory Test fail"	If the POST finds an error during the memory test, additional information will appear with details about kind and place of the memory error.

"Override enabled - Defaults loaded"	If the system can not boot with the actual CMOS configuration, the BIOS can overwrite the actual configuration with BIOS default values, which are suited for the most stable basic system operations.
"Press TAB to show POST screen"	If your ISA96 V8/103 displays a logo during booting, instead of the usual BIOS POST displays, you can toggle between the logo and the standard POST displays with the <TAB> key.
"Primary master hard disk fail"	The BIOS detects an error on the hard disk, which is connected to the stated IDE interface.
"Primary slave hard disk fail"	