889LCD/ATX

LGA775 Socket Mainboard

Flatpanel support

User's Manual



Document revision history.

Revision	Date	By	Comment
0	September 29th, 2004	JAL	Initial document. Product details, installation guide and connector descriptions.

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1. Introduction

Thanks for purchasing this 889LCD/ATX LGA775 socket mainboard.
This user's manual contains all the information that show you how to use the mainboard. Please take a moment to familiarize yourself with the design and organization of this manual.

1.1 Manual Features

This manual is divided into the following five sections:
Section 1: Product Information
A brief overview of what comes in the mainboard package and conditions to be noted.
Section 2: Specification
Specifies features and hardware wise use of the mainboard
Section 3: Connector layout
Specifies connector layout and mating connector types
Section 4: CMOS Setup Utility
A summary of the mainboard CMOS (BIOS) Setting.
Section 5: Software Utility
Introduction of some useful mainboard software utilities.

1.2 Package Check List

This mainboard package contains the following items. Please inspect the package contents and confirm that everything is there. If anything is missing or damaged, call your vendor for instructions before operating.

The package includes:

- One 889LCD/ATX Mainboard
- One Chassis Rear I/O Panel

1.3 Requirement according to IEC60950

1.3.1 Power connections to the motherboard

Users of 889LCD/ATX boards should take care when designing chassis interface connectors in order to fulfill the EN60950 standard:

When an interface/connector has a power pin (3.3V,5V,12V,….), that is directly connected to the motherboard power, please fulfill the following requirements:

To protect the external power lines of peripheral devices the customer has to take care about:

- That the wires have the right diameter to withstand the maximum available power.
- That the enclosure of the peripheral device fulfils the fire protecting requirements of IEC/EN 60950.

1.3.2 Lithium Battery Precautions

CAUTION! Danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by manufacturer. Dispose of used batteries according to the manufacturer's instructions.	**VORSICHT!** Explosionsgefahr bei unsachgemäßem Austausch der Batterie. Ersatz nur durch den selben oder einen vom Hersteller empfohlenen gleichwertigen Typ. Entsorgung gebrauchter Batterien nach angaben des Herstellers.
ADVARSEL! Lithiumbatteri – Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.	**ADVARSEL** Eksplosjonsfare ved feilaktig skifte av batteri. Benytt samme batteritype eller en tilsvarende type anbefalt av apparatfabrikanten. Brukte batterier kasseres i henhold til fabrikantens instruksjoner.
VARNING Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.	**VAROITUS** Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laltevalmistajan suosittelemaan tyyppiln. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

1.4 Environmental Conditions

State	Conditions
Operating Temperature	0°C – 60°C (forced cooling). It is the customer's responsibility to provide sufficient airflow to/from the board.
Operating Humidity	10% - 90% relative humidity (non-condensing)
Storage Temperature	-10°C – 85°C
Storage Humidity	5% - 95% relative humidity (non-condensing)

2. Specification

Form Factor	ATX, 305mm x 244mm (12" x 9.6")
CPU	• Intel® Pentium® 4 Processors, LGA775, 800/533 MHz FSB • Intel® Celeron® Processors, LGA775, 533 MHz FSB • Support for Hyper-Threading Technology • Compatible with Intel® 04B and 04A processors (please refer to processor support list available on our website)
Chipset	Intel® 915G + ICH6
Graphics	Intel® GMA900 Graphics Controller, 333 MHz core frequency, 256-bit 2-D and 32-bit 3-D engine, Motion video acceleration, up to 2048 x 1536 at 75 Hz refresh, Integrated 24-bit 400 MHz RAMDAC, Dynamic Video Memory Technology, upgradeable with PCI Express x16 Graphics Card or ADD2 Cards to support digital displays or TV Out, DDC 2B Support for Monitor Detection
Memory	4 x DIMM Sockets (1,8 V), 256 MB - 4 GB, Single or Dual Channel, DDR2 533/400 SDRAM, unbuffered, no ECC (For details on recommended RAM, please refer to our website)
LAN	Broadcom BCM5751 controller with 10/100/1000 Mbit/s, Alert Standard Format (ASF), Wake-on-LAN (WoL) by interesting Packets, Link Status Change and Magic Packet™, bootix® BootP or bootix® PXE Support
Drives	• 1 x ATA 100 Interface, up to 2 Drives, • 4 x Serial ATA 150 Interfaces, up to 4 Drives • 1 x Floppy
Audio	Analog Devices AD1986 Dual Mode Codec (AC97 / HD Audio), HW 3D Stereo Enhancement, SW Wavetable Synthesis Support • Line in • Line out • Microphone
USB	• 4 x USB2.0 at rear panel with fully compliant USB connectors and • 4 x USB2.0 internal via 2.5mm pin rows. • USB boot
Adapter interfaces	• 1 x PCI Express x 16 • 2 x PCI Express x 1 • 4 x PCI Slots (32Bit, 33 MHz, 5 V and 3.3 V) PCI Rev. 2.3
Miscelaneous interfaces	• PS2 Keyboard • PS2 Mouse • IEEE1284 parallel port (EPP/ECP) • RS232 Com port • CD Audio input • Intrusion detector input port • BTX power input
Feature connector	• Power On/Off button input • Reset button input • HDD activity LED output • Power on LED output • Message LED output • Speaker output • Password recovery input
Power	• BTX12V (24 Pin) or ATX12V (20 Pin) Power Supply required • Support for Soft-Off Power Supplies • 5 V and 3.3 V Supply Voltage on PCI Slots (PCI Rev. 2.3) • 3.3 V Auxiliary Supply Voltage on PCI Slots (Wake-Up Function) • On board CPU Voltage Regulator, 5 V / 2 A Auxiliary Power required for USB Wake-Up from Save-to-RAM, Save-to-Disk

BIOS	Phoenix cME FirstBIOS Desktop Pro Version V5.00 Recovery BIOS, SM-BIOS (DMI), BIOS and CPU Microcode Update via disk (stable user settings), Quick Boot, Logo Boot, Quiet Boot, Plug & Play, Automatic DRAM and PCI Configuration, BIOS Support for S.M.A.R.T, Advanced Power Management, ACPI S3 (Save-to-RAM), ACPI S4 (Save-to-Disk), Wake on time from S5

2.1 PCI Express

The PCI Express x16 slot is intended for graphics cards, and the PCI Express x1 slot for PCI Express x1 cards.

2.2 PCI standard

Technical data:
32 bit / 33 MHz PCI slots
5 V and 3.3 V supply voltage
3.3 V auxiliary voltage

2.2.1 PCI bus interrupts - Selecting correct PCI slot

IRQ Lines connect PCI/PCI Express slots and onboard components to the interrupt controller. IRQ Lines are permanently wired on the mainboard.
Which IRQs are assigned to the IRQ Lines is normally automatically specified by the BIOS (see description in "BIOS Setup").

i	To achieve optimum stability, performance and compatibility, avoid the multiple use of IRQ Lines (IRQ sharing). Should IRQ sharing be unavoidable, then all involved devices and their drivers must support IRQ sharing.

2.2.1.1 Monofunctional expansions cards:

PCI/PCI Express expansion cards require a maximum of one interrupt, which is called the PCI interrupt INT A (referring to interrupt line notation on expansion card). Expansion cards that do not require an interrupt can be installed in any desired slot.

2.2.1.2 Multifunctional expansion cards or expansion cards with integrated PCI-PCI bridge:

These expansion cards require up to four PCI interrupts: INT A, INT B, INT C, INT D. How many and which of these interrupts are used is specified in the documentation provided with the card.
The assignment of the PCI interrupts to the IRQ Lines is shown in the following table:

PCI INT LINE	Controller or slot INT																
	On board controller									Mechanical slot							
										1	2	3	4	5	6	7	
	USB 1,1				USB 2,0	SMBus	AC97 / HD Audio		LAN	PCIe x16	PCIe x1	PCIe x1	Slot PCI				
	1st	2nd	3rd	4th			Audio	HD Audio					1	2	3	4	
1 (A)	-	-	-	-	-	-	-	X	X	A	D	B	-	-	-	-	
2 (B)	-	-	-	-	-	-	X	-	-	B	A	C	-	-	-	-	
3 (C)	-	-	-	-	-	-	-	-	-	-	B	D	D	C	A	D	
4 (D)	-	-	-	-	-	X	-	-	-	-	C	A	C	D	B	A	
5 (E)	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	
6 (F)	-	-	X	-	-	-	-	-	-	-	-	-	B	A	C	B	
7 (G)	-	X	-	-	-	-	-	-	-	-	-	-	A	B	D	C	
8 (H)	X	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	

Use first PCI/PCI Express board that have a single IRQ Line (no IRQ sharing). If you must use another PCI/PCI Express board with IRQ sharing, check whether this card properly supports IRQ sharing with the other devices on this IRQ Line. The drivers of all cards and components on this IRQ Line must also support IRQ sharing.

2.3 Graphics

2.3.1 Technical data

Function: 2D/3D graphics controller, Dynamic Video memory Technology, 400 Mhz integrated 24-bit RAMDAC

Features: Display Data Channel (DDC), 2 SDVO channels (up to 200 megapixels per second/channel), dual-view support for ADD2 boards

2.3.2 Digital display

As the PCI Express x 16 port has 2 x SDVO ports multiplexed with the PCI Express interface, it is possible to select the SDVO interfaces and make easy connection to LCD panels. ADD2 boards defined by Intel will select the SDVO ports.

Kontron offers:

- ADD2-DVI card with a DVI-D interface
- ADD2-LVDS card with a LVDS transmitter interface
- ADD2-LVDS to TTL module for converting the ADD2-LVDS interface to TTL.

Dual independent interface performance is offered with this digital display interface and the on board VGA port.

Kontron offers adaptation services to an almost complete selection of Digital Displays. Call and ask for a list of currently supported displays.

2.3.3 Screen resolution

Depending on the operating system used, the screen resolutions in the following table refer to the mainboard screen controller.
If you are using an external screen controller, you will find details of supported screen resolutions in the operating manual or technical manual supplied with this controller.

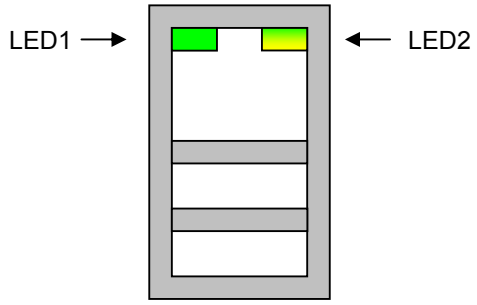
Screen resolution	Refresh rate (Hz)	Colour
640 x 480	120	32 bit
800 x 600	120	32 bit
1024 x 768	120	32 bit
1280 x 1024	120	32 bit
1600 x 1200	120	32 bit
1920 x 1440	85	32 bit
2048 x 1536	75	32 bit

2.4 LAN

The mainboard is equipped with the Broadcom BCM5751 LAN controller. This LAN controller supports the transfer rates 10 Mbit/s, 100 Mbit/s and 1000 Mbit/s.

Additional features supported are:
- WOL functionality through Magic Packet™
- ASF 2.0 format (Alert Standard Format
- LAN boot using bootix® BootP and Intel PXE

The LAN RJ45 connector has two status LED indicators.



LED 1 lights green - a connection exists (e.g. to a hub). LED is blinking green: activity

LED 2 lights up differently depending on the transfer rate:

10 Mbit/s	off
100 Mbit/s	green
1000 Mbit/s	yellow

2.5 Memory

2.5.1 Technical data

Technology: DDR2 400 / DDR2 533 unbuffered DIMM modules
184-Pin; 1.8 V; 64 Bit, no ECC

Size: 256 Mbytes to 4 Gbytes DDR2

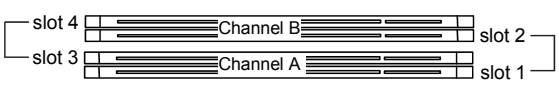
Granularity: 256, 512 or 1024 Mbyte for one socket

- A current list of the memory modules recommended for this mainboard is available on the Internet at: *www.kontron.com*

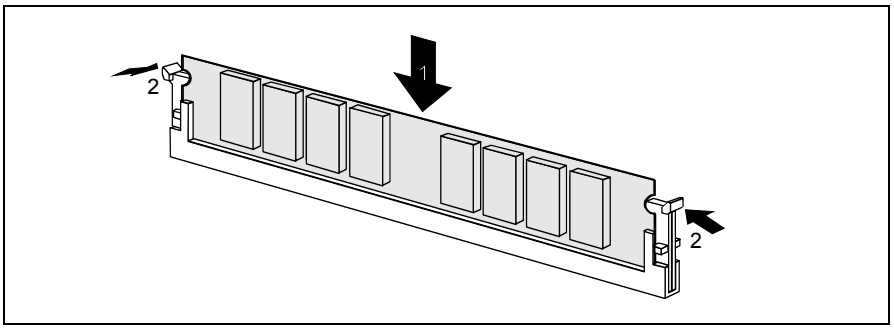
At least one memory module must be installed. Memory modules with different memory capacities can be combined.

⚠	You may only use unbuffered 1,8 V memory modules. Buffered memory modules are not supported. DDR2 memory modules must meet the PC3200 or PC4300 specification.

i	The mainboard has two memory channels (channel A and channel B) with two slots each (slot 1 and 3 or slot 2 and 4). If you use more than one memory module, then make sure to distribute the memory modules over both memory channels. By doing this you use the performance advantages of the dual-channel mode. The maximum system performance is given when the same memory size is used in Channel A and Channel B. To simplify equipping, the slots are colour coded. With a maximum memory configuration of 4 Gbytes, the visible and usable main memory is 3 to 3.5Gbytes only. This is because of the maximum addressable memory space of 4Gbytes, and memory allocation will deduct space from this for inserted PCI express and/or PCI cards.

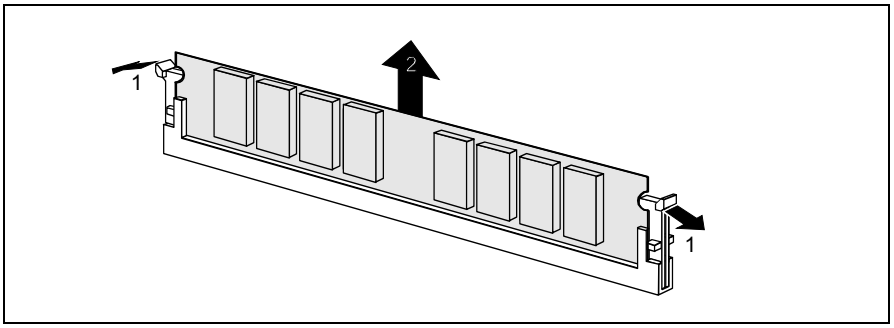


2.5.2 Installing a memory module



- ► Push the module ejector on each side of the memory slot outwards.
- ► Insert the memory module into the location (1).
- ► At the same time flip the ejectors upwards until the memory module snaps in place (2).

2.5.3 Removing a memory module



- ► Push the ejectors on the right and left of the memory slot outward (1).
- ► Pull the memory module out of the memory slot (2).

2.6 Processor

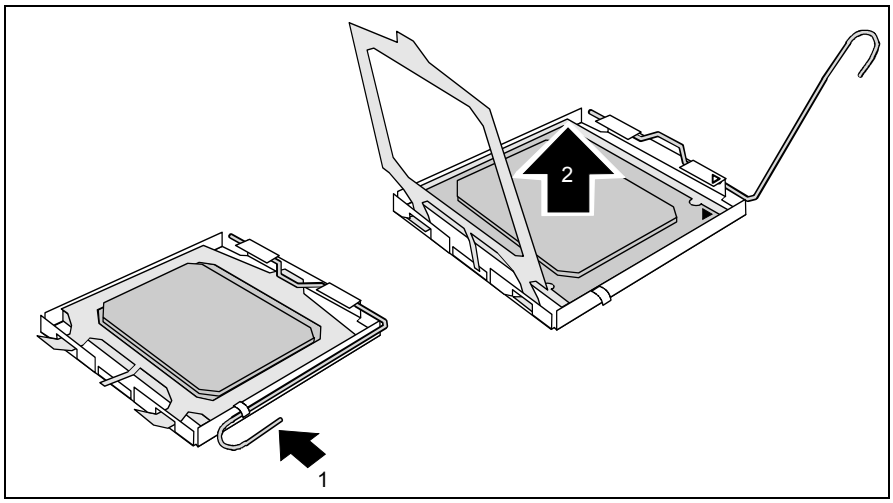
2.6.1 Technical data

- Intel Pentium 4 with 533 or 800 MHz front side bus in the LGA775 design.
- A current list of the processors supported by this mainboard is available on the Internet at: *www.Kontron.dk*

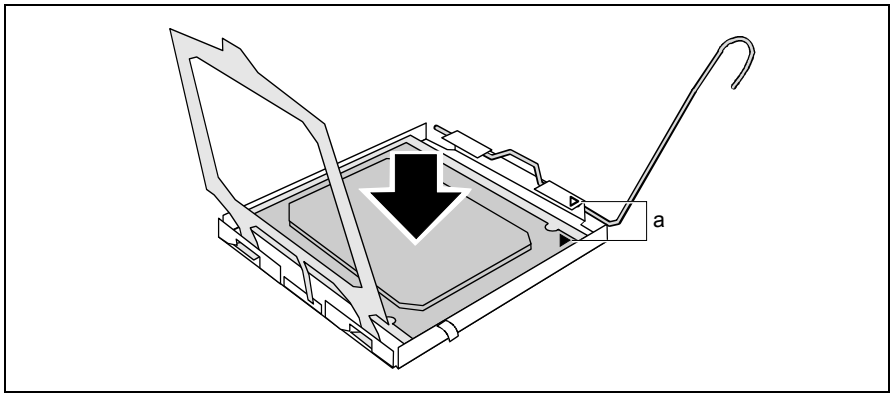
2.6.2 Installing processor with heat sink

Never touch the terminal side of the processor. Even a small amount of dirt, such as grease from the skin can impair the processor's operation or destroy the processor.
Place the processor in the socket with extreme care, as the spring contacts of the socket are very delicate and must not be bent.

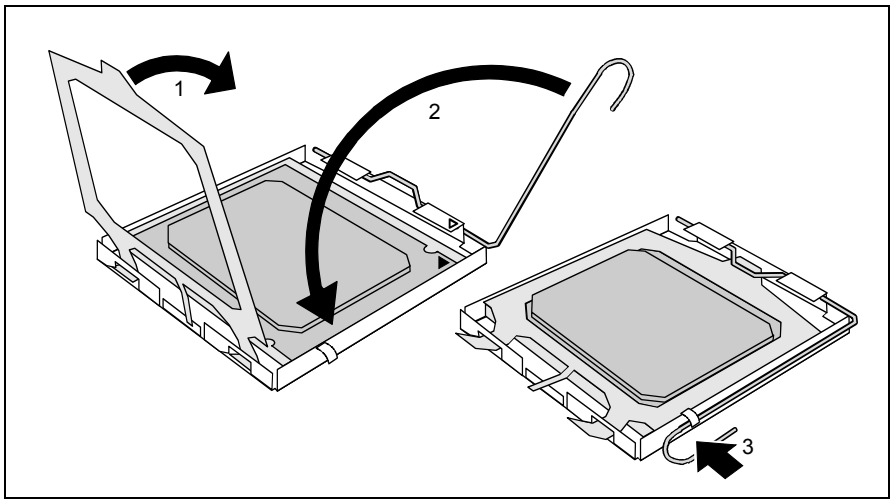
► Remove the heat sink.



► Press down the lever (1) and unhook it.
► Fold up the frame.
► Remove the old processor (2) from the socket.



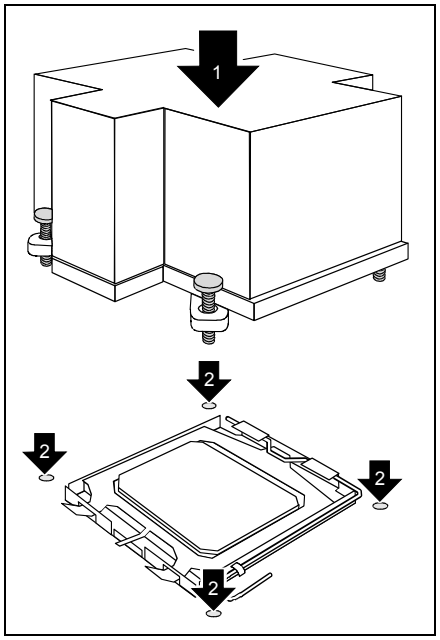
► Insert the new processor in the socket so that the marking of the processor is aligned with the marking on the socket (a).



- ► Fold down the frame (1).
- ► Press the lever downward (2) until it is hooked in again (3).

2.6.2.1 Mounting heat sink

Be sure to use heat conducting material between the processor and the heat sink. If a heat conducting pad (rubber-like foil) is already applied to the heat sink, then use it. Otherwise you must apply a very thin layer of heat conducting paste.
Please note that, depending on the heat sink used, different heat sink mounts are required on the mainboard.



- ► Depending on the configuration variant, you must pull a protective foil off the heat sink or coat the heat sink with heat conducting paste before fitting it.
- ► Secure the heat sink - depending on the model - with four screws or push it into the mounts (1+2).

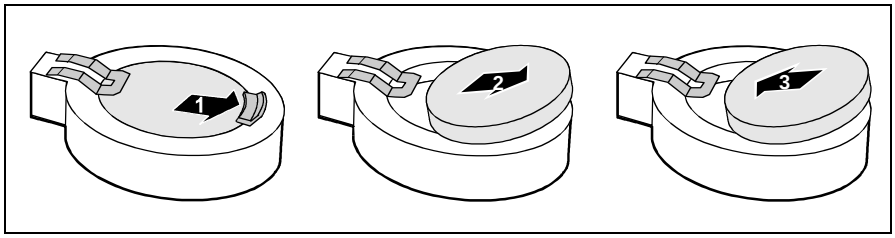
⚠	Heat conducting pads can only be used once. If you remove the heat sink, you must clean it and apply new heat conducting paste before you remount it.

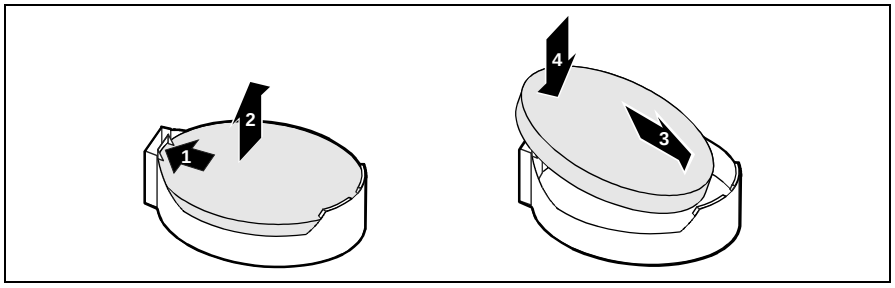
2.7 Battery

In order to permanently save the system information, a lithium battery is installed to provide the CMOS-memory with a current. A corresponding error message notifies the user when the charge is too low or the battery is empty. The lithium battery must then be replaced.

⚠	Incorrect replacement of the lithium battery may lead to a risk of explosion! The lithium battery may be replaced only with an identical battery or with a type recommended by the manufacturer. Do not throw lithium batteries into the household waste. They must be disposed of in accordance with local regulations concerning special waste. Make sure that you insert the battery the right way round. The plus pole must be on the top!

The lithium battery holder exists in different designs that function in the same way.





- ► Press the locking lug in the direction of the arrow(1); the battery ejects from the holder.
- ► Remove the battery (2).
- ► Push the new lithium battery of the identical type into the holder (3) and press it downward until it engages (4).

2.8 MTBF

The following calculations are based on specifications and figures by vendors for components.

Calculation base:

Standard	IEC 61709
Room temperature	26°C
Air speed	0,5 m/sec
Air volume	15m^3/h
Start temperature	0°C

According to IEC 61709 a switched off system has a failure rate 10% compared to a powered on system. On the assumption that the system is switched on 8h a day, the reliability was calculated using the following formula:

Formula for 8h per day operating: **µ[fit]=(8h / 24h x µ[fit]) + (16h / 24h x µ[fit] x 0,1)**
Conversation formula µ[fit] in MTBF[h]: **MTBF[h]=10^9/µ[fit]**

24h MTBF[h]	*24h µ[fit]*	*8h MTBF[h]*	*8h µ[fit]*
206058	4853	515145	1941

2.9 Power supply requirement

You require a Pentium4 power supply unit according to the BTX or ATX12V specification (BTX: 24-pin + 4-pin connection; ATX12V: 20-pin + 4-pin connection) for this mainboard.
If you use an ATX power supply, a graphics card in the PCI Express x16 slot will only be supplied with 25 W of power. For high-end graphics cards that require a power supply of up to 75 W, a BTX power supply unit is required.

Source	Voltage	Maximal variation	Mainboard current (Maximal)
Main Power Supply	+ 12 V	5 %	10.0 A
	- 12 V	10 %	0.05 A
	+ 5 V	5 %	6 A
	+ 3.3 V	5 %	4 A
Aux. Power Supply	+ 5 V	5 %	2 A

The specifications apply to the onboard components and represent the least favourable case. In addition, at least 350 mA is required for PCI on 3.3 V, and 500 mA per connected device for USB on 5 V.

2.10 APM and ACPI system status, energy-saving modes

System status	ACPI Status)1		APM Status	Power on LED/ Standby LED)2	Power on LED)3	Power consumption	Wakeup time
Normal operation	G0	S0	On	On/Off	On	Normal	
Simple energy-saving mode	G1	S1	Standby	Off/On	flashing	Almost like normal	Almost immediately
Maximum energy-saving mode)4 "Save to DRAM"		S3		Off/On	flashing	RAM, wakeup components	ca. 5s
Maximum energy-saving mode ** "Save To Disk"		S4		Off/Off	Off	RAM, wakeup components	ca. 20s
”Soft Off"	G2	S5	Soft Off	Off/Off	Off	Nearly zero	Full boot time
Mechanically Off	G3		Off	Off/Off	Off	Zero	Full boot time

)1 G = Global status; S = System status

)2 Two colours

)3 One colour

)4 The power supply unit must provide sufficiently loadable 5 V standby voltage.

To use the WOL functionality the power supply must provide a 5 V auxiliary voltage (5VSB) of at least 1 A.

2.11 Overload protection

For the USB, Keyboard, Mouse and VGA interfaces there are power sourcing capability. Below is a table of applicable load.

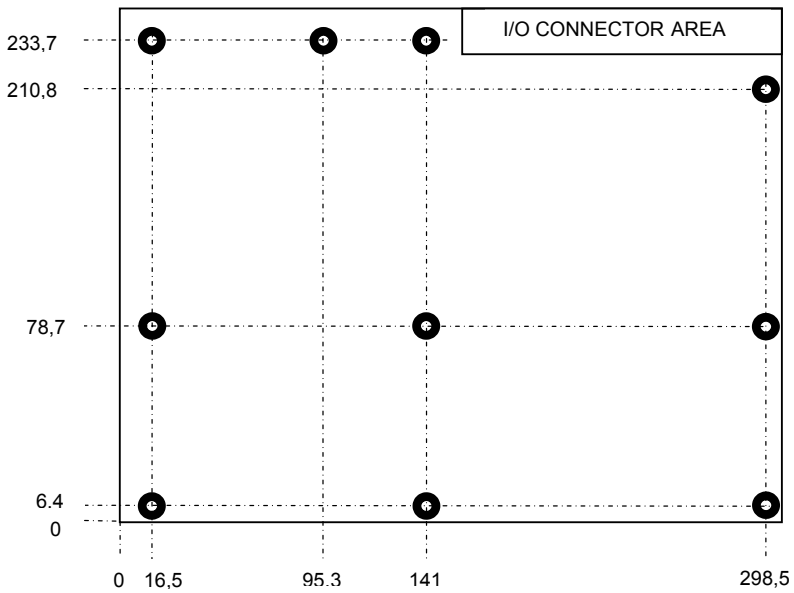
Fuse no.	Fuse	Connection	Maximum loadability
1	750 mA	Keyboard	Not specified
		Mouse	Not specified
		VGA port	Not specified
2	2000 mA	USB port 1	500 mA
		USB port 2	500 mA
		USB port 3	500 mA
		USB port 4	500 mA
3	2000 mA	USB port 5	500 mA
		USB port 6	500 mA
		USB port 7	500 mA
		USB port 8	500 mA

The fuses on this mainboard are polyfuses and will for this reason re-establish power connection after an error state when the violating load is removed.

2.12 Board layout

Board size and layout is compliant to ATX specification 2.3.
Mounting holes are located as below figure specifies

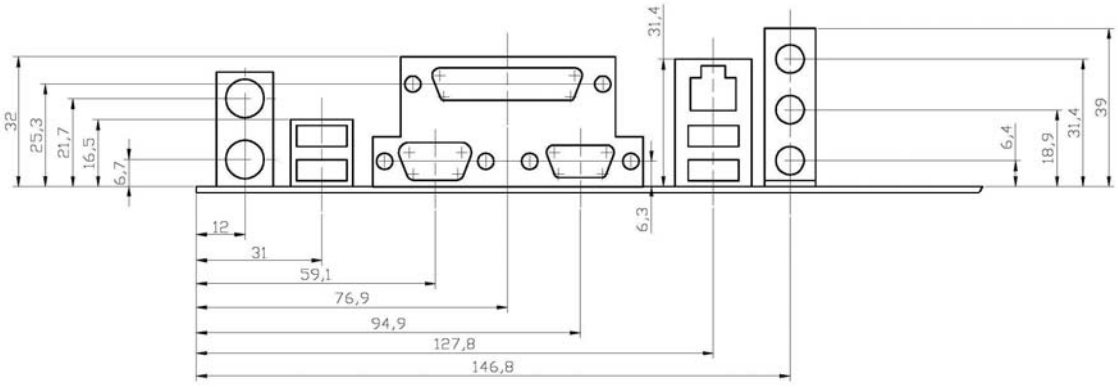
All dimentions in mm



2.13 Rear connector layout

Below drawing pictures typical values for rear connector placement. Kontron rear bracket will comply to this placement.

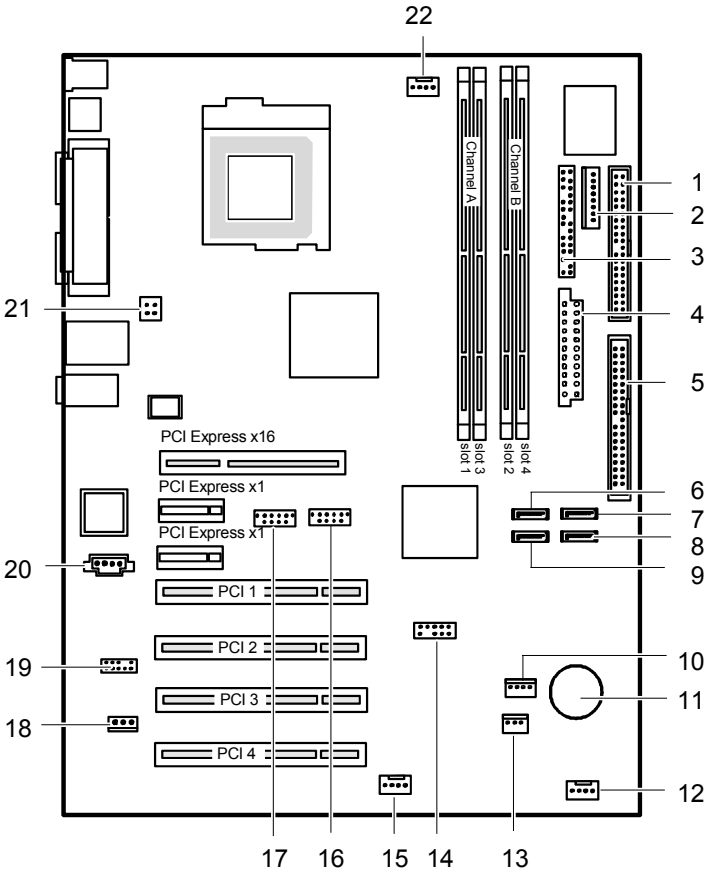
All dimentions in mm



3. Connectors

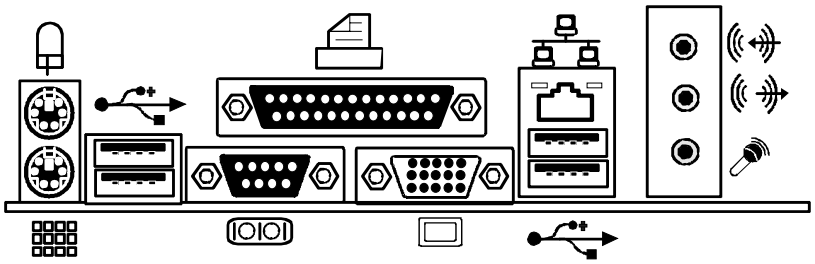
This section specifies all connector interfaces and their mating counterparts. Below picture gives an overview of the 889LCD/ATX mainboard.

Internal connectors and slots



1. Floppy disk drive
2. Power supply control
3. Front panel
4. Power supply
5. IDE-drives 1/2
6. Serial ATA3
7. Serial ATA4
8. Serial ATA2
9. Serial ATA1
10. SMB (not mounted)
11. Battery
12. Fan 2
13. Intrusion
14. Generic indicator interface
15. Fan 3 (not mounted)
16. USB (port 1/2)
17. USB (port 3/4)
18. S/PDIF connector
19. Audio front panel port
20. Audio in
21. CPU core power supply
22. Fan 1

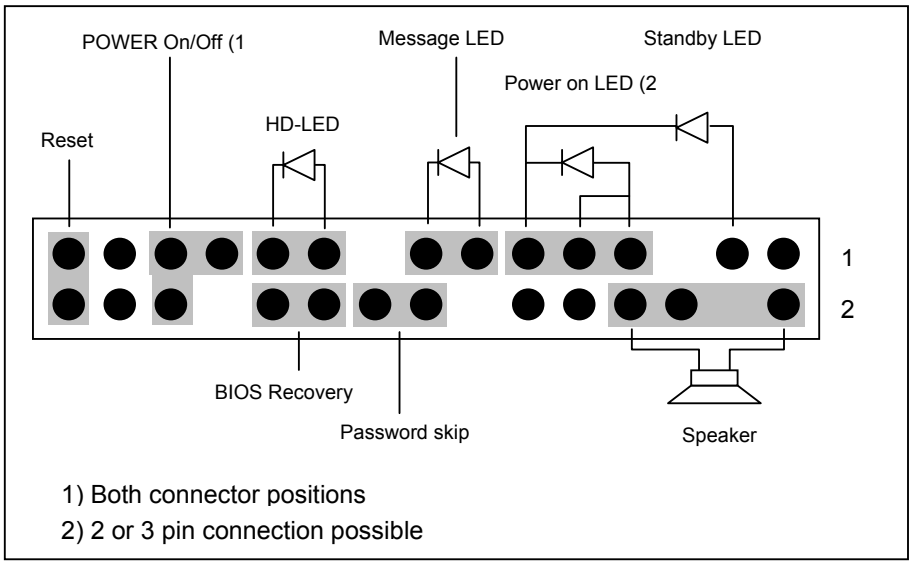
External connectors



3.1 Front Panel connector (FP)

Reference number 3 in overview picture.

Please note the polarity of the different connections. The positive terminal of the connection cables is often indicated with a coloured wire.

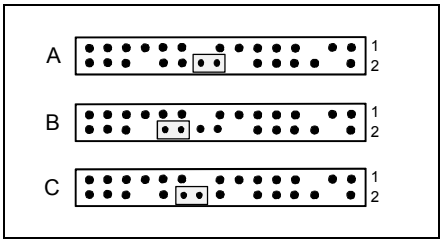


1) Both connector positions
2) 2 or 3 pin connection possible

Connection	Note
Reset	Connector for reset switch
Power On/Off	Connection for ATX On/Off switch
HD LED	Indicates HDD (hard disk) activity
Message LED	Indicates system management error
Power On LED	Indicates the system state APM or ACPI together with the Sleep LED (see chapter entitled "APM and ACPI system status, energy-saving modes").
BIOS Recovery	see "3.1.1" Chapter
Password skip	see "3.1.1" Chapter
Speaker	0,5 W at 8 Ohm

Pin	Signal	Pin	Signal
1	GND	2	Speaker -
3	"Standby" LED +	4	Key
5	Key	6	GND
7	"Power On" LED +	8	Speaker +
9	"Power On" LED +	10	Reserved
11	"Power On" LED - "Standby" LED - (GND)	12	Reserved
13	"Message" LED +	14	Key
15	"Message" LED -	16	Password Skip
17	Key	18	"Pseudo GND"
19	"HD" LED +	20	"Pseudo GND"
21	"HD" LED -	22	Recover BIOS
23	GND	24	Key
25	Power-Button (asserted low)	26	GND
27	reserved	28	GND
29	Reset-Button (asserted low)	30	GND

3.1.1 System Recovery



Pin pair A mounted =
Skipping system and BIOS Setup password

Pin pair B mounted =
System BIOS recovery

Pin pair C mounted =
factory setting (leave jumper here)

Pin pair A operation:
Inserted *System and BIOS Setup password are skipped when the board is powered up (password may then be modified)*
not inserted *System and BIOS Setup password must be entered when the device is switched on.*

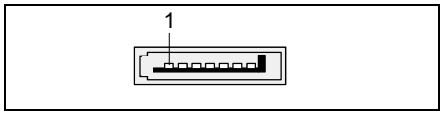
Pin pair B operation:
Inserted *The System BIOS executes from floppy drive A: and the inserted "Flash-BIOS-Diskette" restores the System BIOS on the mainboard.*
not inserted *Normal operation (default setting).*

Enables recovery of the old system BIOS after an attempt to update has failed. To restore the old BIOS you need a Flash BIOS Diskette (see chapter "4.2").

3.2 Seriel ATA

Reference number 6, 7, 8 and 9 in overview picture.

SATA port 1, 2, 3 & 4.



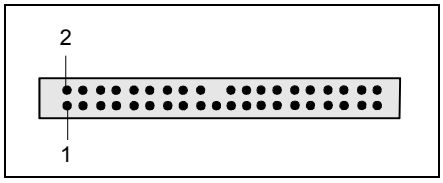
Mates with standard Seriel ATA cable.

Pin	Signal	Pin	Signal
1	GND	2	Transmit data positive
3	Transmit data negative	4	GND
5	Receive data negative	6	Receive data positive
7	GND	8	Key

3.3 IDE/ATA interface

Reference number 5 in overview picture.

IDE ATA port 1 and 2.
Mates with 40 pin HD cable or 80 pin UDMA cable. For UDMA cable please attach the blue coloured cable connector end to the motherboard connector.

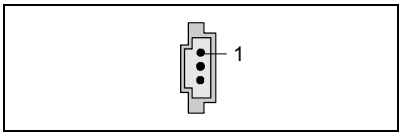


Pin	Signal	Pin	Signal
1	Reset drive (low asserted)	2	GND
3	Data 7 (high asserted)	4	Data 8 (high asserted)
5	Data 6 (high asserted)	6	Data 9 (high asserted)
7	Data 5 (high asserted)	8	Data 10 (high asserted)
9	Data 4 (high asserted)	10	Data 11 (high asserted)
11	Data 3 (high asserted)	12	Data 12 (high asserted)
13	Data 2 (high asserted)	14	Data 13 (high asserted)
15	Data 1 (high asserted)	16	Data 14 (high asserted)
17	Data 0 (high asserted)	18	Data 15 (high asserted)
19	GND	20	Key
21	DRQ (high asserted)	22	GND
23	I/O write (low asserted)	24	GND
25	I/O read (low asserted)	26	GND
27	I/O ready (low asserted)	28	Cable select
29	DAK (low asserted)	30	GND
31	IRQ (high asserted)	32	not connected
33	ADR 1 (high asserted)	34	ATA66 Detect (low asserted)
35	ADR 0 (high asserted)	36	ADR 2 (high asserted)
37	CS 1 (low asserted)	38	CS 3 (low asserted)
39	IDE-LED (low asserted)	40	GND

3.4 Audio S/PDIF

Reference number 18 in overview picture.

Mates with molex 70004 or equivalent connector type

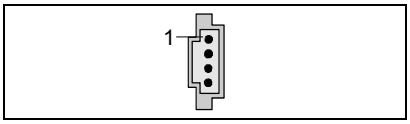


Pin	Signal
1	VCC
2	SPDIF out
3	GND

3.5 Analog audio input

Reference number 20 in overview picture.

Mates with molex 70004 or equivalent connector type

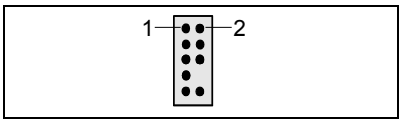


Pin	Signal
1	Left audio input
2	Audio GND
3	Audio GND
4	Right audio input

3.6 Audio Front Panel port

Reference number 19 in overview picture.

Mates with IDC cabling scheemes with ribbon cable or single wires terminated in IDC connectors

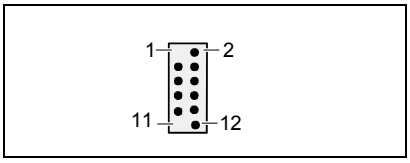


Pin	Signal	Pin	Signal
1	Microphone input	2	Analog GND
3	Microphone bias	4	Analog VCC
5	Right line output	6	Right line return
7	not connected	8	Key
9	Left line output	10	Left line return

If the audio front panel is not used, you must plug jumpers on pin pairs 5/6 and 9/10.

3.7 Internal USB

Reference number 16 and 17 in overview picture.
Mates with molex connector type 90142 or equivalent. Please use twisted pair cable as specified by USB2.0 standard for optimum performance.
Prepared for chipcard reader.

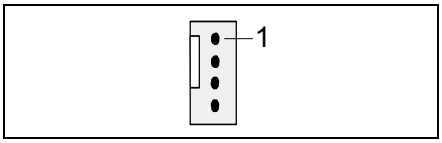


Pin	Signal	Pin	Signal
1	Key	2	Chipcard reader on or not connected
3	VCC 1 or 3	4	VCC 2 or 4
5	Data negative 1 or 3	6	Data negative 2 or 4
7	Data positive 1 or 3	8	Data positive 2 or 4
9	GND	10	GND
11	Key	12	not connected

3.8 Fan connectors

Reference number 12 and 22 in overview picture.

Mating in accordance to the Intel “Fan Specification for 4 wire PWM Controlled Fans”.

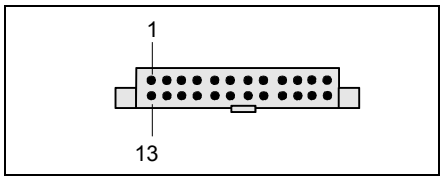


Pin	Signal
1	GND
2	+12 V
3	Fan sense
4	Fan Control

3.9 Main power connection

Reference number 4 in overview picture.

Comply to BTX Power connection requirements and compatible to ATX.

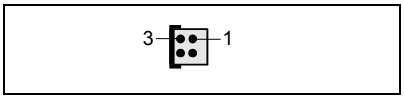


Pin	Signal	Pin	Signal
1	+3,3 V (P3V3P)	13	+3,3 V (P3V3P)
2	+3,3 V (P3V3P)	14	-12 V (P12VN)
3	GND	15	GND
4	+5V (VCC)	16	PS on (low asserted)
5	GND	17	GND
6	+5V (VCC)	18	GND
7	GND	19	GND
8	Powergood (high asserted)	20	-5 V (P5VN)
9	+5 V Auxiliary (VCC Aux)	21	+5 V (VCC)
10	+12 V (P12VP)	22	+5 V (VCC)
11	+12 V (P12VP)	23	+5 V (VCC)
12		24	GND

3.10 CPU core power

Reference number 21 in overview picture.

12 V cpu core supply. Complies to ATX and BTX PSU's



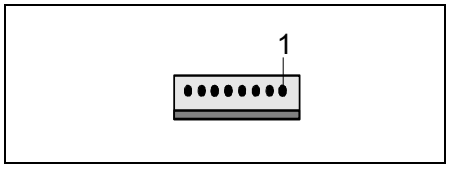
Pin	Signal	Pin	Signal
1	GND	2	GND
3	+12 V	4	+12 V

3.11 Power control

Reference number 2 in overview picture.

UNSUPPORTED - DO NOT USE

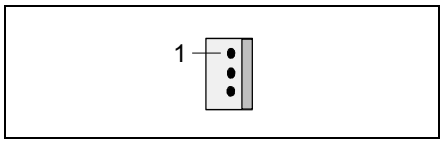
Additional FAN1 control/monitoring



Pin	Signal
1	
2	FAN1 Control
3	
4	FAN1 Sense
5	
6	
7	
8	

3.12 Intrusion sense

Reference number 13 in overview picture.



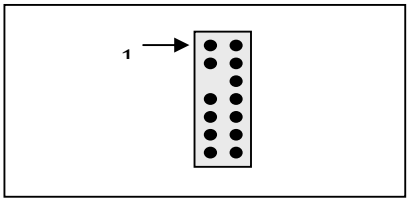
Intrusion detection interface.

1. Connect pin 3 to GND (pin 1) to indicate presense of intrusion switch.
2. Connect intrusion Switch between pin 1 and 2.

Pin	Signal
1	GND
2	Case open (asserted low)
3	Intrusion switch present (asserted low)

3.13 Generic indicator interface

Reference number 14 in overview picture.



ONLY USE ON KONTRON ADVICE

Led indicators and SMBus extension for potential case temperature sensor or likewise.

Pin	Signal	Pin	Signal
1	SMB CLK	8	LAN LINK LED(L)
2	GND	9	HD LED (L)
3	SMB DATA	10	MESSAGE LED(L)
4	GND	11	MESSAGE2 LED(L)
5	-	12	STANDBY LED(L)
6	P3V3P DUAL	13	POWER ON(L)
7	LAN ACTIVITY LED(L)	14	P3V3P DUAL(fused)

4. BIOS

4.1 BIOS Update

When should a BIOS update be carried out?
Kontron makes new BIOS versions available to ensure compatibility to new operating systems, new software or new hardware. In addition, new BIOS functions can also be integrated.
A BIOS update should always also be carried out when a problem exists that cannot be solved with new drivers or new software.

Where can I obtain BIOS updates?
The BIOS updates are available on the Internet at www.kontron.com.. If this is not applicable , then contact Kontron.

How does a BIOS update work?
You have two ways of doing this:

1. BIOS update under DOS with bootable BIOS update floppy disk - brief description

- *Download the update file from our website to your PC.*
- *Insert an empty floppy disk (1.44 MB).*
- *Run the update file (e.g.* 183703.EXE*).*
- *A bootable update floppy disk is created. Leave this floppy disk in the drive.*
- *Restart the PC.*
- *Follow the instructions on screen.*

2. BIOS update under Windows with DeskFlash utility

A BIOS update can also be carried out directly under Windows with the ***DeskFlash*** utility. *DeskFlash* can be downloaded from the Kontron website.

4.2 BIOS Recovery - Recovering System BIOS

All BIOS settings are reset to the default values.

- *On the mainboard set the jumper to the appropriate setting to restore the system BIOS (see chapter "3.1.1").*
- *Insert a BIOS update floppy disk and start the PC.*
- *Note the signals issued from the loudspeaker. You have successfully restored the BIOS if you hear the signal sequence "short-short- long- long- long" and the diskette access indicator is dark. This can take a few minutes.*
- *Restore the switch or jumper settings.*
- *Remove the floppy disk from the drive.*
- *Start the PC and invoke* BIOS Setup*.*
- *Select the menu item* Reset Configuration *in the menu* Advanced *and change the setting to* Yes*.*
- *Save the change and terminate* BIOS Setup*.*

The BIOS recovery has now been completed. The system restarts.

4.3 Microcode Update

What is a microcode update?

As there are no drivers for processors, Intel offers the possibility from the P6 family (Pentium Pro) on to update the command set (microcode) of the processor. This enables minor errors to be corrected and the performance to be increased.

To guarantee the best possible performance and error-free operation, Intel recommends updating the microcode for every new processor. Intel refers to the use of the processor without microcode updates as operation outside the specifications.

Safety for processor on Kontron Industrial mainboards

If the processor uses an old or incorrect microcode, error-free operation cannot be ensured. Kontron has therefore implemented a function on its industrial mainboards that interrupts the booting process if no suitable microcode is available for the installed processor. The output error message is
`Patch for installed CPU not loaded. Please run the bios flash update diskette.`

This message appears until the microcode update has been carried out. If the computer is nevertheless operated without a microcode update, error-free operation is not ensured.

When should a microcode update be carried out?

A microcode update should be carried out after the installation of a new processor.

In contrast to the BIOS update, only an updated version of the processor command set is stored. The system BIOS remains unaffected by this.

Microcode update under DOS with bootable microcode update floppy disk - brief description

- ► Download the update file from out website to your PC.
- ► Insert an empty floppy disk (1.44 MB).
- ► Run the update file under DOS (e.g. *1837101.EXE*).
- ► A bootable update floppy disk is created. Leave the floppy disk in the drive.
- ► Restart the PC.
- ► Follow the instructions on screen.

To determine whether the latest microcode update has been loaded, the so-called Patch-ID of the processor can be read out.

- ► Press the F1 key in the *BIOS Setup*.

The entry ***CPU / Patch ID*** is shown on the displayed information page.
A list with the current processors and the related Patch-IDs is available on the Internet.

If the processor is not recognised, you also require the microcode update tool for processors of the P6 family.

4.4 Error messages

This chapter contains error messages generated by the mainboard.

```
Available CPUs do not support the same bus frequency - System halted!
Memory type mixing detected
Non Kontron approved Memory Module detected - Warranty void
There are more than 32 32 RDRAM devices in the system
```

Check whether the system configuration has changed. If necessary, correct the settings.

`BIOS update for installed CPU failed`

This message appears if the microcode update required for the connected processor is not contained in the system BIOS.

- ► Boot the system with the inserted *Flash BIOS floppy disk*.
- ► Abort the normal Flash BIOS update by answering the question about whether you want to perform the update with
  `n` ↵
- ► To carry out the Flash BIOS update for the processor, enter:
  `flashbio␣/p6` ↵

`Check date and time settings`

The system date and time are invalid. Set the current date and time in the *Main* menu of the *BIOS Setup*.

`CPU ID 0x failed`

Switch the server off and on again. If the message is still displayed, go into the *BIOS setup* and set the corresponding processor to *Disabled* in the *Server - CPU Status* menu; please contact your sales outlet or customer service centre.

`CPU mismatch detected`

You have replaced the processor or changed the frequency setting. As a result, the characteristic data of the processor have changed. Confirm this change by running the *BIOS Setup* and exiting it again.

```
Diskette drive A error
Diskette drive B error
```

Check the entry for the diskette drive in the *Main* menu of the *BIOS Setup*. Check the connections to the diskette drive.

```
DMA test failed
EISA CMOS not writable
Extended RAM Failed at offset: nnnn
Extended RAM Failed at address line: nnnn
Failing Bits: nnnn
Fail-Safe Timer NMI failed
Multiple-bit ECC error occurred
Memory decreased in size
Memory size found by POST differed from EISA CMOS
Single-bit ECC error occurred
Software NMI failed
System memory exceeds the CPU's caching limit
System RAM Failed at offset: nnnn
Shadow RAM Failed at offset: nnnn
```

Switch the device off and on again. If the message is still displayed, please contact your sales outlet or customer service centre.

```
Failure Fixed Disk 0
Failure Fixed Disk 1
Fixed Disk Controller Failure
```

Check the entry for the hard disk drive in the *Main* menu and the entry for the IDE drive controller in the *Advanced - Peripheral Configuration* menu of the *BIOS Setup*. Check the hard disk drive's connections and jumpers.

```
Incorrect Drive A - run SETUP
Incorrect Drive B - run SETUP
```

Correct the entry for the diskette drive in the *Main* menu of the *BIOS Setup*.

```
Invalid NVRAM media type
```

Switch the device off and on again. If the message is still displayed, please contact your sales outlet or customer service centre.

```
Invalid System Configuration Data
```

In the *Advanced* menu of the *BIOS Setup* set the entry *Reset Configuration Data* to *Yes*.

```
Invalid System Configuration Data - run configuration utility
Press F1 to resume, F2 to Setup
```

This error message may be displayed if the machine was switched off during system start-up.

Call *BIOS Setup* and switch to the *Advanced* menu. Select the menu item *Reset Configuration Data* and change the setting to *Yes*. Save the change and terminate *BIOS Setup*. Reboot the device.

```
Keyboard controller error
```

Connect another keyboard or another mouse. If the message is still displayed, please contact your sales outlet or customer service centre.

```
Keyboard error
```

Check that the keyboard is connected properly.

```
Keyboard error nn
nn Stuck Key
```

Release the key on the keyboard (*nn* is the hexadecimal code for the key).

```
Missing or invalid NVRAM token
```

Switch the device off and on again. If the message is still displayed, please contact your sales outlet or customer service centre.

```
Monitor type does not match CMOS - RUN SETUP
```

Correct the entry for the monitor type in the *Main* menu of the *BIOS Setup*.

```
On Board PCI VGA not configured for Bus Master
```

In the *BIOS Setup*, in the *Advanced* menu, submenu *PCI Configuration*, set the *Shared PCI Master Assignment* entry to *VGA*.

```
One or more RDRAM devices are not used
One or more RDRAM devices have bad architecture/timing
One or more RDRAM devices are disabled
```

Contact your system administrator or contact our customer service centre.

```
Operating system not found
```

Check the entries for the hard disk drive and the floppy disk drive in the *Main* menu and the entries for *Boot Sequence* submenu of the *BIOS Setup*.

```
Parity Check 1
Parity Check 2
```

Switch the device off and on again. If the message is still displayed, please contact your sales outlet or customer service centre.

```
Previous boot incomplete - Default configuration used
```

By pressing function key **F2** you can check and correct the settings in *BIOS Setup*. By pressing function key **F1** the system starts with incomplete system configuration. If the message is still displayed, please contact your sales outlet or customer service centre.

```
Real time clock error
```

Call the *BIOS Setup* and enter the correct time in the *Main* menu. If the message is still displayed, please contact your sales outlet or customer service centre.

`System battery is dead - Replace and run SETUP`

Replace the lithium battery on the mainboard and redo the settings in the *BIOS Setup*.

`System Cache Error - Cache disabled`

Switch the device off and on again. If the message is still displayed, please contact your sales outlet or customer service centre.

`System CMOS checksum bad - - Default configuration used`

Call the *BIOS Setup* and correct the previously made entries or set the default entries.

`System Management Configuration changed or Problem occurred`

A system fan or system sensor has failed. Check the hardware operation.

`System timer error`

Switch the device off and on again. If the message is still displayed, please contact your sales outlet or customer service centre.

```
Uncorrectable ECC DRAM error
DRAM Parity error
Unknown PCI error
```

Switch the device off and on again. If the message is still displayed, please contact your sales outlet or customer service centre.

`Verify CPU frequency selection in Setup`

The frequency setting for the processor is invalid. Correct the *BIOS Setup* and the setting.

.