Perfection in Automation

PROVIT 5000
User's Manual

Provit 5000

USER'S MANUAL

Version: **4.5 (February 2002)**

Mod. No.: **MAPRV5000-E**

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Chapter 1: General Information

Chapter 2: Controllers

Chapter 3: Display Units

Chapter 4: Display Kits

Chapter 5: Keypad Modules

Chapter 6: Software

Chapter 7: Accessories

Chapter 8: Technical Appendix

Chapter 1 • General Information

1. Manual History

Version	Date	Comments	Barcode ID
4.5	December 2001	Changes/New features - Provit 5600 cable set 5A5601.01 added - Section Revision: Provit 5600 IPC Configuration Options - Graphics Revision: MTC Function Libraries - Expansion of BIOS settings for Celeron system units due to BIOS Upgrade Version 1.06 and 1.07 - Description Revision: BIOS Updates - Description Revision: Provit 5000 Utilities (MTC Diagnose Tool) - Table Revision: Current Requirements / Power Consumption of the Components - Table Revision: Power Supply Currents - Mains Failure Bridging table for Provit bus units added - Changeover to a new PCMCIA controller for interface boards (5A5000.01, 5A5000.05 and 5A5000.06) - Provit 5600 Configuration Options (CD-ROM, LS-120,...) revised - Model numbers for Mkey documentation MAMKEY-F added - Model numbers for Provit 5000 User Documentation MAPRV500-F added - Dimension diagrams for IPC5000/5000C 5 slot and IPC5600/5600C added - Dimension diagrams for the external 19" keyboard 5E9600.01-010 and 5E9600.01-020 added - 320 MB Compact Flash 9A0015.09 added - 8 MB Compact Flash card 9A0015.07 changed to status release/series - Arcnet Cards 5A1105.00-090, 5A1107.00-090, 5A1109.00-090 and 0TP360.04 added - Technical description of the CMOS battery 0AC201.9 (lithium battery added) - Remote CD ROM / LS-120 drive combination 5A5003.02 added - 2 slot bus units 5C5000.21, 5C5000.22 added - 5 slot bus units 5C5000.31, 5C5000.32, 5C5600.03 and 5C5600.04 added - System unit 5C5001.21 for remote CD ROM drive added - Model numbers for USV documentation MAUSV1-0, MAUSV1-E, MAUSV1-F added - Add-on CD ROM drive 5A5009.01 added - Glossary added - Power consumption data for individual components added - Controller FDD / DVD-ROM 5A5600.05 - Controller ZIP250 / CD-ROM 5A5600.06 added - Controller FDD / CD-RW 5A5600.07 added - Combination options for Provit 5600 drives added - Description of the maintenance which can be carried out has been added - Changeover to a new layout - Expansion of BIOS settings for Celeron system units because of BIOS Upgrade Version 1.04 and V1.05 - Celeron 433 5C5002.13 cancelled - PC card 220 MB 9A0009.07 cancelled - replacement type Compact Flash 192 MB 9A0015.08 - OEM MS-WinNT-E Class2 DEV IPC5000/5600 9S0001.04-020 added - OEM MS-WinNT-E Class2 DEV IPC5000C/5600C 9S0001.05-020 added - Pentium III / 850 MHz 5C5002.16 added - 256 MB SDRAM 9A0004.14 added - Hard disk sales text has been changed (notes added) - Infrared touch screen 5D5211.06 added	0112

Table 1: Manual History

Version	Date	Comments	Barcode ID
		Changes/New features - Processor dependent temperature alarm and fan control description added - BIOS settings for booting different peripheral devices for IPC5600/IPC5600C added - Storage temperature for IPCs and display units added - Background lighting 9A0110.10 added (replacement part for 5D5212.02 and 5D5212.04) - Functional ground description added - Award BIOS error messages (alarm signal) added - Amendment of the IP 20 specification for controllers and displays added - Display design/color definitions for the display units added - Footnote changes for all tables - Display unit 5D5100.04 added - Display unit 5D5212.04 added - Panel Flange Adapter 5A5007.01 added - Provit Drivers & Utilities CD-ROM 5S0000.01-090 added and the replaceable software cancelled - Table format adjusted - Operating temperature table added for the IPC5000, IPC5600, IPC5000C and IPC5600C - Footnote changes for all tables - Display unit 5D5100.04 added - Display unit 5D5212.04 added - Panel Flange Adapter 5A5007.01 added - Provit Drivers & Utilities CD-ROM 5S0000.01-090 added and replaceable software cancelled - Table format adjusted - Operating temperature table added to the IPC5000, IPC5600, IPC5000C and IPC5600C - Model numbers added - Pentium III / 600 MHz and associated system units added	
4.2	December 2000	Changes/New features - Model numbers added - Pentium III / 600 MHz and associated system units added - Changeover to a new layout	0012

Table 1: Manual History (cont.)

2. Information for Using the Manual

2.1 Legend

Special attention must be given to instructions accompanied by an exclamation mark. Bernecker + Rainer shall not be liable for product damages resulting from failure to comply with instructions and regulations.

European dimension standards are valid for all dimension diagrams (e.g. display dimensions, etc.).

3. Chapter Overview

Chapter	Contents
Chapter 1: General Information	Overview of Provit industrial PCs, terminology and order/delivery information
Chapter 2: Controllers	Descriptions of the different controllers and their components and of all other IPC components.
Chapter 3: Display Units	Technical data, dimensions and installation guidelines for Provit 5000 display units.
Chapter 4: Display Kits	Description and data for all display kits (displays for self installation).
Chapter 5: Keypad Modules	Explanation of Panelware keypad modules and description of all modules
Chapter 6: Software	Description of BIOS, BIOS Upgrade, Provit 5000 Utilities and the allocation of system resources (interrupts, I/O addresses, etc.).
Chapter 7: Accessories	Overview of all accessories and devices available from B&R
Chapter 8: Technical Appendix	Technical information for Touch Screen, etc.

Table 2: Chapter Overview

4. Terminology

Abbreviation	Explanation
BIOS	Basic Input and Output System
VGA	Video Graphics Array
MTC	Maintenance Controller
FPC	Flat Panel Controller
FPD	Flat Panel Display
CRT	Cathode Ray Tube (Monitor)
FDD	Floppy Disk Drive

Table 3: Terminology

Abbreviation	Explanation
HDD	Hard Disk Drive
IPC	Industrial PC
PnP	Plug & Play
Provit	PROcess VIsualization Terminal

Table 3: Terminology

5. Provit 5000 Industrial PCs

Provit Industrial PCs offer the distinct advantage of a modular design for your computer controlled industrial workplace. You can select from a large range of controllers, displays and options which guarantees flexibility for your industrial PC. This includes modular and flexible installation options and fieldbus interfaces constructed for use in industrial environments.

Open Architecture

B&R Provit industrial PCs offer you all the advantages of open architecture including performance. This guarantees that your individual requirements are met.

Operating Systems

100% compatibility with the IBM AT standard makes it possible to run various operating systems.

Types

Essentially, you have a choice of two types of controller systems:

- IPC5000: The compact all round model
- IPC5600: Offering even more flexibility

Within the IPC5000 and IPC5600 product ranges, you can also select between the different mainboards available.

- IPC5000**C** and IPC5600**C**: Intel 440BX chipset, Socket370

Detailed information regarding the system's configurations is available in the respective chapters.

IPCs from the IPC5000 and IPC5600 series represent the high performance end of the Provit IPC line and are divided into the following components:

- System Unit
- Bus Unit
- Processor
- Mass Memory
- Main Memory

Note: For various reasons, diagrams in this manual may have slight differences from their actual appearance. Unless otherwise stated, these differences refer exclusively to design and not to their functionality.

6. Contents of Delivery

All devices and accessories (processors, RAM, software, documentation etc.) must be ordered separately from B&R. This means for example, that a user manual is not delivered with the IPC unless it is ordered separately. This measure is taken to prevent bulk purchasers from automatically receiving a large amount of unwanted manuals. In this way, extra financial and logistical expenses can be avoided. A full listing of all IPC products available from B&R can be found in Chapter 7: Accessories.

7. Model Numbers

7.1 Bus Units

Model Number	Description	Remark
5C5000.01	**Bus unit with 100 – 240 VAC supply voltage, 2 slots (1 PCI, 2 ISA)** Provit 5000 Controller Bus Unit with 2 slots in total; 1 BR ISA and 1 half size ISA / PCI. Supply voltage 100 – 240 VAC. For system units 5C5001.xx	
5C5000.02	**Bus unit with 24 VDC power supply, 2 slots (1 PCI, 2 ISA)** Provit 5000 Controller Bus Unit with 2 slots in total; 1 BR ISA and 1 half size ISA / PCI. Supply voltage 24 VDC. For system units 5C5001.xx	
5C5000.11	**Bus unit with 100 – 240 VAC supply voltage, 4 slots (3 PCI, 4 ISA)** Provit 5000 Controller Bus Unit with 4 slots in total; 1 BR ISA and 3 half size ISA / PCI. Supply voltage 100 – 240 VAC. For system units 5C5001.xx	
5C5000.12	**Bus unit with 24 VDC power supply, 4 slots (3 PCI, 4 ISA)** Provit 5000 Controller Bus Unit with 4 slots in total; 1 BR ISA and 3 half size ISA / PCI. Supply voltage 24 VDC. For system units 5C5001.xx	
5C5000.21	**Bus unit with power supply 100-240 VAC, 2 slots (2 PCI, 1 ISA) with the connection options of the add-on CD-ROM drive 5A5009.01** Provit 5000 Controller Bus Unit with 2 slots in total; 1 BR ISA and 1 half size ISA / PCI. Prepared for add-on CD-ROM drive. Supply voltage 100-240 V AC. For system units 5C5601.xx	*In preparation*

Table 4: Model numbers for bus units

Model Number	Description	Remark
5C5000.22	**Bus unit with power supply 24 VDC, 2 slots (2 PCI, 1 ISA) with the connection options of the add-on CD-ROM drive 5A5009.01** Provit 5000 Controller Bus Unit with 2 slots in total; 1 BR ISA and 1 half size ISA / PCI. Prepared for add-on CD-ROM drive 5A5009.01. Supply voltage 24 VDC. For system units 5C5001.xx	*In preparation*
5C5000.31	**Bus unit with power supply 100-240 VAC, 5 slots (3 PCI, 3 ISA) with the connection options of the add-on CD-ROM drive 5A5009.01** Provit 5000 Controller Bus Unit with 5 slots in total; 1 BR ISA and 1 half size ISA. ISA, 1 half size ISA/PCI and 2 half size PCI. Prepared for add-on CD-ROM drive 5A5009.01. Supply voltage 100-240 V AC. For system units 5C5001.xx	*In preparation*
5C5000.32	**Bus unit with power supply 24 VDC, 5 slots (3 PCI, 3 ISA) with the option to connect the add-on CD-ROM drive 5A5009.01.** Provit 5000 Controller Bus Unit with 5 slots in total; 1 BR ISA and 1 half size ISA. ISA, 1 half size ISA/PCI and 2 half size PCI. Prepared for add-on CD-ROM drive 5A5009.01. Supply voltage 24 V DC. For system units 5C5001.xx	*In preparation*
5C5600.01	**Bus unit with 115/230 VAC power supply, 4 slots (3 PCI, 4 ISA)** Provit 5600 Controller Bus Unit with 4 slots in total; 1 half size ISA and 3 full size ISA/PCI. Supply voltage 100/240 VAC with Autoselect . For system units 5C5601.xx	
5C5600.02	**Bus unit with 24 VDC power supply, 4 slots (3 PCI, 4 ISA)** Provit 5600 Controller Bus Unit with 4 slots in total; 1 half size ISA and 3 full size ISA/PCI. Supply voltage 24 VDC. For system units 5C5601.xx	
5C5600.03	**Bus unit with 115/230 VAC power supply, 5 slots (3 PCI, 3 ISA)** Provit 5600 Controller Bus Unit with 5 slots in total; 1 half size ISA, 1 full size ISA, 1 full size ISA/PCI, 2 full size ISA. Supply voltage 100/240 VAC. For system units 5C5601.xx	
5C5600.04	**Bus unit with 24 VDC power supply, 5 slots (3PCI, 3 ISA)** Provit 5600 Controller Bus Unit with 5 slots in total; 1 half size ISA, 1 full size ISA, 1 full size ISA/PCI, 2 full size ISA. Supply voltage 24 V DC. For system units 5C5601.xx	
5C5600.11	**Bus unit with 115/230 VAC power supply, 6 slots (3 PCI, 6 ISA)** Provit 5600 Controller Bus Unit with 6 slots in total; 1 half size ISA, 2 full size ISA and 3 full size ISA/PCI. Supply voltage 100/240 VAC with Autoselect . For system units 5C5601.xx	
5C5600.12	**Bus unit with 24 VDC power supply, 6 slots (3 PCI, 6 ISA)** Provit 5600 Controller Bus Unit with 6 slots in total; 1 half size ISA, 2 full size ISA and 3 full size ISA/PCI. Supply voltage 24 VDC. For system units 5C5601.xx	

Table 4: Model numbers for bus units (cont.)

7.2 System Units

Model Number	Description	Remark
5C5001.01	**System unit with an Intel 82430HX chipset, VGA, MTC, 2 SIMM slots** Provit 5000 Controller System Unit without processor. Intel 82430HX chipset, 512 kB PB cache, 2 PS/2 SIMM slots, 1 MB video memory, Award Elite BIOS, 2 serial interfaces and 1 parallel interface. Connections for FPD, monitor, PS/2 AT keyboard, PS/2 mouse, USB, Panelware keypad modules and external FDD.	
5C5001.03	**System unit with an Intel 82430HX chipset, VGA, MTC, 2 SIMM slots** Provit 5000 Controller System Unit without processor. Intel 82430HX chipset, 512 kB PB cache, 2 PS/2 SIMM slots, 2 MB video memory, Award Elite BIOS, 2 serial interfaces and 1 parallel interface. Connections for the FPD, monitor, PS/2 AT keyboard, PS/2 mouse, USB, Panelware keypad modules and external FDD.	
5C5001.11	**System unit with an Intel 82440BX chipset, VGA, MTC, 3 DIMM slots** Provit 5000 Controller System Unit for Intel Celeron and Pentium III processors, 2 MB video memory, Intel 82440 BX chipset, 3 DIMM slots, 2 serial interfaces, 1 parallel interface. Connections for FPD, monitor, PS/2 AT keyboard, PS/2 mouse, USB, external FDD and Ethernet 10/100 (Twisted Pair), without processor.	
5C5001.12	**System unit with an Intel 82440BX chipset, VGA, MTC, 3 DIMM slots** Provit 5000 Controller System Unit, for Intel Celeron and Pentium III processors, 4 MB video memory, Intel 82440 BX chipset, 3 DIMM slots, 2 serial interfaces, 1 parallel interface. Connections for the FPD, monitor, PS/2 AT keyboard, PS/2 mouse, USB, external FDD and Ethernet 10/100 (twisted pair), without processor	
5C5001.21	**System unit with an Intel 82440BX chipset, VGA, MTC, 3 DIMM slots** Provit 5000 Controller System Unit, for Intel Celeron and Pentium III processors, 2 MB video memory, Intel 82440 BX chipset, 3 DIMM slots, 2 serial interfaces, 1 parallel interface. Connections for FPD, monitor, PS/2 AT keyboard, PS/2 mouse, USB, remote IDE drive and Ethernet 10/100 (Twisted Pair), without processor	*In preparation*
5C5601.01	**System unit with an Intel 82430HX chipset, VGA, MTC, 2 SIMM slots** Provit 5600 controller system unit, for Intel Pentium processors, 2 MB video memory, Intel 82430HX chipset, 512 kB PB cache, 2 PS/2 SIMM slots, Award Elite BIOS, 2 serial interfaces and 1 parallel interface. Connections for FPD, monitor, PS/2 AT keyboard, PS/2 mouse, USB, Panelware keypad and external FDD.	
5C5601.11	**System unit with an Intel 82440BX chipset, VGA, MTC, 3 DIMM slots** Provit 5600 Controller System Unit, for Intel Celeron and Pentium III processors, 2 MB video memory, Intel 82440 BX chipset, 3 DIMM slots, 2 serial interfaces, 1 parallel interface. Connections for FPD, monitor, PS/2 AT keyboard, PS/2 mouse, USB, external FDD and Ethernet 10/100 (twisted pair), without processor	
5C5601.12	**System unit with an Intel 82440BX chipset, VGA, MTC, 3 DIMM slots** Provit 5600 Controller System Unit for Intel Celeron and Pentium III processors, 4 MB video memory, Intel 82440 BX chipset, 3 DIMM slots, 2 serial interfaces, 1 parallel interface. Connections for FPD, monitor, PS/2 AT keyboard, PS/2 mouse, USB, external FDD and Ethernet 10/100 (twisted pair), without processor	

Table 5: Model numbers for system units

7.3 Processors

Model Number	Description	Remark
5C5002.01	**Processor iP 100** Intel Pentium ® processor 100 MHz. Only available together with a system unit.	
5C5002.02	**Processor iP 120** Intel Pentium ® processor 120 MHz. Only available together with a system unit	*Cancelled since 06/1999*
5C5002.03	**Processor iP 133** Intel Pentium® Processor 133 MHz. Available in combination with a system unit only	*Cancelled since 04/1999*
5C5002.04	**Processor iP 150** Intel Pentium® Processor 150 MHz. Available in combination with a system unit only	*Cancelled since 05/1999*
5C5002.05	**Processor iP 166** Intel Pentium ® processor 166 MHz. Only available together with a system unit	
5C5002.06	**Processor iP 200** Intel Pentium ® processor 200 MHz. Only available together with a system unit.	*Cancelled since 05/1999*
5C5002.07	**Processor AMD K6 166** AMD K6 166 MHz processor with MMX technology. Only available together with a system unit.	*Cancelled since 05/1999*
5C5002.08	**Processor iP 200 MMX** Intel Pentium® processor 200 MHz with MMX technology. Only available together with a system unit.	
5C5002.09	**Processor AMD K6 266** AMD K6 266 MHz processor. Only available together with a system unit.	*Cancelled since 12/1999*
5C5002.11	**Processor Celeron 300** Intel Celeron ® processor 300/66, 32 kB L1 cache, 128 kB L2 cache. Only available together with system units 5C5001.1x and 5C5601.1x.	
5C5002.12	**Processor Celeron 366** Intel Celeron ® processor 366/66, 32 kB L1 cache, 128 kB L2 cache. Only available together with system units 5C5001.1x and 5C5601.1x.	
5C5002.13	**Processor Celeron 433** Intel Celeron ® processor 433/66, 32 kB L1 cache, 128 kB L2 cache. Only available together with system units 5C5001.1x and 5C5601.1x.	*Cancelled since 11/2000*
5C5002.14	**Processor Celeron 566** Intel Celeron ® processor 566/66, 32 kB L1 cache, 128 kB L2 cache. Only available together with system units 5C5001.1x and 5C5601.1x.	
5C5002.15	**Processor iP III 600** Intel Pentium ® processor III 600MHz, 32 kB L1 cache, 256 kB L2 cache. Only available together with system units 5C5001.1x and 5C5601.1x.	
5C5002.16	**Processor iP III 850** Intel Pentium ® processor III 850 MHz, 32 kB L1 cache, 256 kB L2 cache. Only available together with system units 5C5001.1x and 5C5601.1x.	

Table 6: Processor model numbers

7.4 Mass Memory

Model Number	Description	Remark
5A5001.01	**Hard Disk 420 MB** [1)] Hard Disk 420 MB 2.5" (63.5 mm) removable hard disk with a storage capacity of 420 MB and rubber suspension.	*Cancelled since 01/1997*
5A5001.02	**Hard Disk 1.44 GB** [1)] Hard Disk 1.44 GB 2.5" (63.5 mm) removable hard disk with a storage capacity of 1.44 GB and rubber suspension.	*Cancelled since 02/1999*
5A5001.03	**Hard Disk 2.1 GB** [1)] Hard Disk 2.1 GB 2.5" (63.5 mm) removable hard disk with a storage capacity of 2.1 GB and rubber suspension.	*Cancelled since 02/2000*
5A5001.04	**Hard Disk 4.3 GB** [1)] Hard Disk 4.3 GB 2.5" (63.5 mm) removable hard disk with a storage capacity of 4.3 GB and rubber suspension.	*Cancelled since 02/2000*
5A5001.05	**Hard Disk 6 GB** [1)] Hard Disk 6 GB 2.5" (63.5 mm) removable hard disk with a storage capacity of 6 GB and rubber suspension.	*Cancelled since 11/2000*
5A5001.08	**Hard Disk 6 GB** [1)] Hard Disk 6 GB 2.5" (63.5 mm) removable hard disk with a storage capacity of 6 GB and fixed mounting.	
9A0009.01	**PC Card Flash 6 MB ATA/True IDE** PC card ATA Flash 6 MB Type II PCMCIA card with 6 MB Flash PROM and true IDE/ATA mode	*Cancelled since 05/1999*
9A0009.02	**PC Card Flash 40 MB ATA/True IDE** PC card ATA Flash 40 MB Type II PCMCIA card with 40 MB Flash PROM and true IDE/ATA mode	*Cancelled since 04/2000*
9A0009.03	**PC Card Flash 20 MB ATA/True IDE** PC card ATA Flash 20 MB Type II PCMCIA card with 20 MB Flash PROM and true IDE/ATA mode	*Cancelled since 04/2000*
9A0009.04	**PC Card Flash 110 MB ATA/True IDE** PC card ATA Flash 110 MB Type II PCMCIA card with 110 MB Flash PROM and true IDE/ ATA mode	*Cancelled since 04/2000*
9A0009.05	**PC Card Flash 60 MB ATA/True IDE** PC card ATA Flash 60 MB Type II PCMCIA card with 60 MB Flash PROM and true IDE/ATA mode	*Cancelled since 04/2000*
9A0009.06	**PC Card Flash 220 MB ATA/True IDE FMC** PC card ATA Flash 220 MB Type II PCMCIA card with 220 MB Flash PROM and true IDE/ ATA mode	*Cancelled since 11/2000*
9A0009.07	**PC Card Flash 220 MB ATA/True IDE** PC card ATA Flash 220 MB Type II PCMCIA card with 220 MB Flash PROM and true IDE/ ATA mode	*Cancelled since 11/2000*
9A0009.08	**PC Card Flash 48 MB ATA/True IDE** PC card ATA Flash 48 MB Type II PCMCIA card with 48 MB Flash PROM and true IDE/ATA mode	*Cancelled since 04/2000*
9A0009.09	**PC Card Flash 440 MB ATA/True IDE** PC card ATA Flash 440 MB Type II PCMCIA card with 440 MB Flash PROM and true IDE/ ATA mode	
9A0015.01	**Compact Flash 20 MB ATA/True IDE** Compact Flash card with 20 MB Flash PROM. Supports the true IDE/ATA mode.	*Cancelled since 05/2000*

Table 7: Mass memory model numbers

Model Number	Description	Remark
9A0015.02	**Compact Flash 64 MB ATA/True IDE** Compact Flash card with 64 MB Flash PROM. Supports the true IDE/ATA mode.	
9A0015.03	**Compact Flash 10 MB ATA/True IDE** Compact Flash card with 10 MB Flash PROM. Supports the true IDE/ATA mode.	*Cancelled since 09/1999*
9A0015.04	**Compact Flash 48 MB ATA/True IDE** Compact Flash card with 48 MB Flash PROM. Supports the true IDE/ATA mode.	*Cancelled since 04/1999*
9A0015.05	**Compact Flash 128 MB ATA/True IDE** Compact Flash card with 128 MB Flash PROM. Supports the true IDE/ATA mode.	
9A0015.06	**Compact Flash 32 MB ATA/True IDE** Compact Flash card with 32 MB Flash PROM. Supports the true IDE/ATA mode.	
9A0015.07	**Compact Flash 8 MB ATA/True IDE** Compact Flash card with 8 MB Flash PROM. Supports the true IDE/ATA mode.	
9A0015.08	**Compact Flash 192 MB ATA/True IDE** Compact Flash card with 192 MB Flash PROM. Supports the true IDE/ATA mode.	
9A0015.09	**Compact Flash 320 MB ATA/True IDE** Compact Flash card with 320 MB Flash PROM. Supports the true IDE/ATA mode.	

Table 7: Mass memory model numbers (cont.)

1) **Note:**The use of a silicon disk is required in vibration and shock environments.

7.5 Main Memory

Model Number	Description	Remark
9A0004.01	**SIM 1 MB (30pin)** 1 MB x 9 (30pin)	*Cancelled since 02/1999*
9A0004.02	**SIMM 4 MB (30 pin)** 4 MB x 9 (30pin)	*Cancelled since 02/1999*
9A0004.03	**PS/2 SIMM 4 MB 1 MB x 32 (72 pin)** PS/2 SIMM 4 MB, for 5C5001.01, 5C5001.03 and 5C5601.01system units	
9A0004.04	**PS/2 SIMM 16 MB 4 MB x 32 (72 pin)** PS/2 SIMM 16 MB, for 5C5001.01, 5C5001.03 and 5C5601.01system units	
9A0004.05	**PS/2 SIMM 8 MB 2 MB x 32 (72 pin)** PS/2 SIMM 8 MB, for 5C5001.01, 5C5001.03 and 5C5601.01system units	
9A0004.06	**PS/2 SIMM 32 MB 8 MB x 32 (72 pin)** PS/2 SIMM 32 MB, for 5C5001.01, 5C5001.03 and 5C5601.01system units	
9A0004.07	**PS/2 SIMM 64 MB 16 MB x 32 (72 pin)** PS/2 SIMM 64 MB, for 5C5001.01, 5C5001.03 and 5C5601.01system units	*Cancelled since 11/2000*
9A0004.11	**DIMM SDRAM PC100 64 MB 8 MB x 64 (168 pin)** DIMM module 64 MB, for 5C5001.1x and 5C5601.1x system units	
9A0004.12	**DIMM SDRAM PC100 128 MB 16 MB x 64 (168 pin)** DIMM module 128 MB, for 5C5001.1x and 5C5601.1x system units	
9A0004.14	**DIMM SDRAM PC100 256 MB 32 MB x 64** DIMM module 256 MB, for 5C5001.1x and 5C5601.1x system units	

Table 8: Main memory model numbers

7.6 Interface Boards

Model Number	Description	Remark
5A5000.01	**Interface board, 2 x COM, CAN, PC card slot** ISA 16 bit interface board, with 2 serial interfaces, Dallas Hardware Security Key, CAN bus interface, 1 PC Card slot (Type I, II and III), 256 kB SRAM (battery packed).	
5A5000.02	**Interface board, 2x COM, CAN, PC card slot, Ethernet connection (BNC)** ISA 16 bit interface board, with 2 serial interfaces, Dallas Hardware Security Key, CAN bus 1 PC Card slot (Type I, II and III), 256 kB SRAM (battery packed), Ethernet connection (BNC, NE2000 compatible).	*Cancelled since 03/2000*
5A5000.05	**Interface board, 2x COM, CAN, PC card slot, Ethernet connection (twisted pair)** ISA 16 bit interface board, with 2 serial interfaces, Dallas Hardware Security Key, CAN bus interface, 1 PC Card slot (Type I, II and III), 256 kB SRAM (battery packed), Ethernet connection (twisted pair).	
5A5000.06	**Interface board, 2x COM, CAN, PC card slot, Ethernet connection (BNC)** ISA 16 bit interface board, with 2 serial interfaces, Dallas Hardware Security Key, CAN bus interface, 1 PC Card slot (Type I, II and III), 256 kB SRAM (battery packed), Ethernet connection (BNC).	
5A1105.00-090	**ARCNET PC130E ISA Card** 8 Bit ISA card for operating an Arcnet network. BNC connector. Needs a half size slot.	*Cancelled since 04/1999*
5A1107.00-090	**ARCNET PCX20-CXB**	*Customer specific*
5A1109.00-090	**ARCNET PCX-CXB ISA Card**	
0TP360.04	**ARCNET AN-520BT ISA card**	

Table 9: Model numbers for interface boards

7.7 Display Units

Model Number	Description	Remark
5D5100.01	**Display unit 10.4" LCD color display** Provit 5000 display unit with LCD color display, 10.4" diagonal, protection IP65 (from front). Comes complete with accessories (cable). Outline dimensions 310 x 236 mm (WxH).	*Cancelled since 05/1999*
5D5100.04	**Display unit 10.4" VGA display (color TFT)** Provit 5000 display unit with VGA color TFT display, 10.4" diagonal, protection IP65 (from front). Comes complete with accessories (cable). Outline dimensions 310 x 236 mm (WxH).	
5D5200.01	**Display unit 10.4" VGA display (color TFT) with touch screen** Provit 5000 display unit with VGA color TFT display, 10.4" diagonal and integrated touch screen (resistive). Protection IP65 (from front). Comes complete with accessories (cable). Outline dimensions 310 x 236 mm (WxH).	*Cancelled since 03/1999*
5D5200.04	**Display unit 13.8" VGA display (color TFT) with touch screen** Provit 5000 display unit with VGA color TFT display, 13.8" diagonal and integrated touch screen (resistive). Protection IP65 (from front). Comes complete with accessories (cable). Outline dimensions 392 x 296 mm (WxH).	*Cancelled since 01/1999*
5D5201.02	**Display unit 10.4" SVGA display (color TFT) with touch screen** Provit 5000 display unit with SVGA color TFT display, 10.4" diagonal and integrated Touch Screen (resistive). Protection IP65 (from front). Comes complete with accessories (cable). Outline dimensions 310 x 236 mm (WxH).	*Cancelled since 03/1999*
5D5201.03	**Display unit 12.1" SVGA display (color TFT) with touch screen** Provit 5000 display unit with SVGA color TFT display, 12.1" diagonal and integrated touch screen (resistive). Protection IP65 (from front). Comes complete with accessories (cable). Outline dimensions 379 x 300 mm (WxH).	*Cancelled since 03/1999*

Table 10: Display units model numbers

Model Number	Description	Remark
5D5202.01	**Display unit 13.8" XGA display (color TFT) with touch screen** Provit 5000 display unit with XGA color TFT display, 13.8" diagonal and integrated touch screen (resistive). Protection IP65 (from front). Comes complete with accessories (cable). Outline dimensions 392 x 296 mm (WxH).	*Cancelled since 03/1999*
5D5202.03	**Display unit 13.8" XGA display (color TFT) with touch screen** Provit 5000 display unit with XGA color TFT display, 13.8" diagonal and integrated touch screen (resistive). Protection IP65 (from front). Comes complete with accessories (cable). Outline dimensions 392 x 296 mm (WxH).	*Cancelled since 02/1999 Replacement type is 5D5212.02*
5D5210.01	**Display unit 10.4" VGA display (color TFT) with touch screen** Provit 5000 display unit with VGA color TFT display, 10.4" diagonal and integrated touch screen (resistive). Protection IP65 (from front). Comes complete with accessories (cable). Outline dimensions 310 x 236 mm (WxH).	
5D5211.02	**Display unit 10.4" SVGA display (color TFT) with touch screen** Provit 5000 display unit with SVGA color TFT display, 10.4" (264 mm) diagonal and integrated touch screen (resistive) Protection IP65 (from front). Comes complete with accessories (cable). Outline dimensions 310 x 236 mm (WxH).	
5D5211.03	**Display unit 12.1" SVGA display (color TFT) with touch screen** Provit 5000 display unit with SVGA color TFT display kit, 12.1" diagonal and integrated touch screen (resistive) Outline dimensions 379 x 300 mm (WxH).	
5D5211.06	**Display unit 12.1" SVGA display (color TFT) with touch screen (infrared)** Provit 5000 display unit 12.1" SVGA color TFT display with touch screen (infrared). Protection IP65 (from front). Outline dimensions 379 x 300 mm (WxH).	
5D5212.01	**Display unit 13.8" XGA display (color TFT) with touch screen** Provit 5000 display unit with XGA color TFT display, 13.8" diagonal and integrated touch screen (resistive). Protection IP65 (from front). Comes complete with accessories (cable). Outline dimensions 392 x 296 mm (WxH).	*Cancelled since 12/1999*
5D5212.02	**Display unit 15" XGA display (color TFT) with touch screen** Provit 5000 display unit with 15" XGA color TFT display, and integrated touch screen (resistive). Protection IP65 (from front). Outline dimensions 435 x 330 mm (WxH).	
5D5212.04	**Display unit 15" XGA display (color TFT) with touch screen** Provit 5000 display unit with 15" XGA color TFT display with touch screen (resistive). Protection IP65 (from front). Outline dimensions 420 x 330 mm (WxH).	
5D5213.01	**Display unit 18.1" SXGA display (color TFT) with touch screen** Provit 5000 display unit with 18.1" SXGA color TFT display, and integrated touch screen (resistive). Protection IP65 (from front). Supply voltage 24 VDC. Outline dimensions 482 x 399 mm (WxH).	
5D5500.10	**Display unit 10.4" VGA display (color TFT) with keys** Provit 5000 display unit with VGA color TFT display, 10.4" diagonal, 10 softkeys, 13 function keys and 20 system keys. Protection IP65 (from front) Outline dimensions 310 x 387 mm (WxH).	
5D5500.32	**Display unit 10.4" VGA display (color TFT) with keys** Provit 5000 display unit with VGA color TFT display, 10.4" diagonal, 10 softkeys, 13 function keys and 20 system keys. Protection IP65 (from front) Outline dimensions 310 x 387 mm (WxH).	*Cancelled since 02/1999 Replacement type is 5D5510.10*
5D5501.01	**Display unit 10.4" SVGA display (color TFT) with keys** Provit 5000 display unit with SVGA color TFT display, 10.4" diagonal, 10 softkeys, 13 function keys and 20 system keys. Protection IP65 (from front) Outline dimensions 310 x 387 mm (WxH).	
5D5510.10	**Display unit 10.4" VGA display (color TFT) with keys** Provit 5000 display unit with VGA color TFT display, 10.4" diagonal, 10 softkeys, 13 function keys and 20 system keys. Outline dimensions 310 x 387 mm (WxH).	*Replacement type for 5D5500.32*

Table 10: Display units model numbers (cont.)

Model Number	Description	Remark
5D5600.01	**Display unit 10.4" VGA display (color TFT) with keys** Provit 5600 display unit with VGA color TFT, 10.4" diagonal, 20 softkeys, 26 function keys and 26 system keys, DIN AT keyboard socket and status LEDs. Outline dimensions 19" x 7 HE (WxH).	
5D5600.02	**Display unit 10.4" VGA display (color TFT) with keys and touch pad** Provit 5600 display unit with VGA color TFT display, 10.4" diagonal, resistive touch pad, 20 softkeys, 26 function keys and 26 system keys, DIN AT keyboard socket and status LEDs. Comes complete with accessories (cable). Outline dimensions 19" x 7 HE (WxH).	
5D5600.03	**Display unit 10.4" VGA display (color TFT) with keys and touch screen.** Provit 5600 display unit with VGA color TFT display, 10.4" diagonal, resistive touch screen, 20 softkeys, 26 function keys and 26 system keys, DIN AT keyboard socket and status LEDs. Outline dimensions 19" x 7 HE (WxH).	
5D5601.01	**Display unit 12.1" VGA display (color TFT) with keys.** Provit 5600 display unit with VGA color TFT, 12.1" diagonal, 20 softkeys, 26 function keys and 26 system keys, DIN AT keyboard socket and status LEDs. Outline dimensions 19" x 7 HE (WxH).	
5D5601.02	**Display unit 12.1" VGA display (color TFT) with keys and touch pad.** Provit 5600 display unit with VGA color TFT display, 12.1" diagonal, resistive touch pad, 20 softkeys, 26 function keys and 26 system keys, DIN AT keyboard socket and status LEDs. Comes complete with accessories (cable). Outline dimensions 19" x 7 HE (WxH).	
5D5601.03	**Display unit 12.1" VGA display (color TFT) with keys and touch screen** Provit 5600 display unit with VGA color TFT display, 12.1" diagonal, resistive touch screen, 20 softkeys, 26 function keys and 26 system keys, DIN AT keyboard socket and status LEDs. Outline dimensions 19" x 7 HE (WxH).	
5D9200.01	**Display unit 20.1" display (color TFT) with Touch Screen** Provit display unit with color TFT display, 1280 x 1024 pixel resolution, 20.1" (510 mm) diagonal and integrated touch screen (resistive). The display unit is equipped with a standard RGB connector and can be operated on each PC with a VGA connector. Additionally, this display unit supports the emulation of VGA, SVGA and XGA resolution. Protection IP65 (from front). Comes complete with accessories (cable, driver software and manual). Outline dimensions 566 x 466 mm (WxH).	*Cancelled since 03/2000*

Table 10: Display units model numbers (cont.)

7.8 Display Kits

Model Number	Description	Remark
5D5000.03	**Display kit with 10.4" VGA display (color TFT)** Provit 5000 display kit, with VGA color TFT display, 10.4" diagonal. Without housing.	
5D5000.10	**Display kit with 10.4" VGA display (color LCD)** Provit 5000 display kit, with VGA color LC display kit, 10.4" diagonal. Comes complete with accessories (approx. 250 mm cable) but without housing.	
5D5000.14	**Display kit with 13.8" VGA display (color TFT)** Provit 5000 display kit, with VGA color TFT display, 13.8" diagonal. Comes complete with accessories (approx. 250 mm cable) but without housing.	*Cancelled*
5D5000.18	**Display kit with 13.8" XGA display (color TFT)** Provit 5000 display kit, with XGA color TFT display, 13.8" diagonal. Comes complete with accessories (approx. 250 mm cable) but without housing.	*Cancelled*

Table 11: Display kits model numbers

7.9 Accessories

Model Number	Description	Remark
0AC201.9	**Lithium Batteries (5 pcs.)** Lithium batteries, 5 pcs., 3 V / 950 mAh	
5A1102.00-090	**RS232 ISA interface board** 16 bit ISA card with two electrically isolated interfaces RS232 connectors.	
5A1104.00-090	**Profibus ISA card** 16 bit ISA card with two Profibus network connectors. Needs a full size ISA slot.	
5A1105.00-090	**Arcnet PC130E ISA card** ARCNET PC130E ISA card 8 bit ISA Arcnet network card with a BNC connector. Needs a half size slot.	
5A1106.00-090	**4x RS232 ISA card C104P 4x9pin** 4x RS232 ISA card, C104P, 16 bit ISA card with 4 serial interfaces (RS232).	
5A2001.01	**External floppy drive, 3.5" 1.44 MB, beige** External 3.5" floppy disk drive, beige front	
5A2001.02	**Floppy disk drive transparent door, lockable, IP55** Transparent door for external FDD, sealed with a gasket. IP65 protection (from front). For external floppy disk drives 5A2001.01 and 5A2001.05	
5A2001.05	**External floppy drive, 3.5" 1.44 MB, black** External 3.5" floppy disk drive, black front	
5A2500.01	**FDD Extension** Front plate for installing an external floppy disk drive and two optional push buttons.	
5A5002.01	**Silicon Disk Adapter PC card** ATA/IDE adapter for operating a PC card ATA Flash disk as a Silicon disk	
5A5002.02	**Dual Silicon Disk Adapter Compact Flash** Dual Silicon Disk Adapter Compact Flash, with 2 slots for operating Compact Flash cards 9A0015.xx in IPC5000, IPC5600, IPC5000C, IPC5600C	
5A5003.02	**Remote CD ROM / LS 120 drive** incl. mounting bracket. Without front cover, for connection to a 5C5001.21 system unit. Dimensions 156 x 52 x 164 mm (WxHxD)	
5A5003.03	**Front Cover** For remote CD ROM / LS 120 drive 5A5003.02	
5A5004.01	**Remote Display Cable 0.6 m** Remote display cable 0.6 m for Provit 5000/5600	
5A5004.02	**Remote Display Cable 1.8 m** Remote display cable 1.8 m for Provit 5000/5600	
5A5004.05	**Remote Display Cable 5 m** Remote display cable 5 m for Provit 5000/5600	
5A5004.06	**Remote Display Cable 5 m with angled plug.** Remote display cable 5 m, with angled plug (70°) for Provit 5000/5600.	
5A5004.10	**Remote Display Cable 10 m** Remote display cable 10 m for Provit 5000/5600	
5A5004.11	**Remote Display Cable 10 m with angled plug** Remote display cable 10 m, with angled plug (70°) for Provit 5000/5600.	
5A5007.01	**Panel Flange Adapter Type A** Panel flange adapter type A for display unit 5D5212.04	

Table 12: Model numbers for accessories

Model Number	Description	Remark
5A5008.01	**Slot Cover** Slot cover for system units 5C5000.01/02	
5A5008.02	**Slot Cover** Slot cover for system units 5C5000.11/12	
5A5009.01	**Provit 5000 Controller CD-ROM** For bus units 5C5000.2x and 5C5000.3x	
5A5600.01	**Controller FDD** Controller FDD, for system units 5C5601.xx	
5A5600.02	**Controller FDD / CD-ROM** Controller FDD and CD-ROM, for system units 5C5601.xx	
5A5600.03	**Panel FDD** Panel FDD, for Provit 5600 display units.	
5A5600.04	**Controller LS120 CD-ROM** Controller LS 120 and CD-ROM drive, for system units 5C5601.xx	
5A5600.05	**Controller FDD DVD-ROM** Controller FDD and DVD-ROM drive, for system units 5C5601.xx	*In preparation*
5A5600.06	**Controller ZIP250 CD-ROM** Controller ZIP250 and CD-ROM drive for system units 5C5601.xx	*On request*
5A5600.07	**Controller FDD CD-RW**	*In preparation*
5A5601.01	**IPC5000 Cables** IPC5000 cables for connecting display, touch screen and Panel FDD to the IPC 5000 (when installing the IPC5000 on display units 5D560x.xx)	
5A5601.02	**IPC5600 Cables** IPC5600 cables for connecting display and touch screen to an IPC5600 (when installing IPC5600/ 5600C on display units 5D5212.02 und 5D5213.01)	
5A5608.02	**Slot Cover** Slot cover for system units 5C5600.11/12	
5A9000.01	**Provit Fitting Template** Fitting template for all standard display units of the Provit 2000 and Provit 5000 product line.	
5E9600.01-010	**AT keyboard 19" IP65 German** AT keyboard for front mount installation in the 19" format (482.6 mm). German keyboard layout.	
5E9600.01-020	**AT keyboard 19" IP65 English (US)** AT keyboard for front mount installation in the 19" format (482.6 mm). US keyboard layout.	
9A0001.03	**AC power cable with plug IPC 5000/5000C/5600/5600C 2 m** Power cable with a suitable plug for the IPC 5000 (can be bolted together) and standard German wall socket at the other end. Length 2m.	
9A0002.02	**PS/2 Adapter AT female to the PS/2 male** PS/2 keyboard adapter, adapter for connecting an AT keyboard with DIN connector to an IPC2000/ IPC5000 PS/2 socket	
9A0003.01	**Dallas Keyring Adapter** Dallas Key Ring adapter for operating the Dallas dongle on a parallel PC interface	
9A0005.01	**Centronics Cable (1.8 m)** Centronics cable 1.8 m, cable for connecting a printer or external floppy disk drive to an IPC.	
9A0007.01	**Provit IPC Keypad Module Cable 90 cm** Keypad module cable 90 cm for connecting PANELWARE keypad modules to a Provit IPC	

Table 12: Model numbers for accessories (cont.)

Model Number	Description	Remark
9A0008.01	**PC Card PCM20-CXB Arcnet** PC Card PCM20-CXB, type II PCMCIA card COM20020, ARCNET controller and BNC connection, without PCMCIA software	
9A0010.02	**PCI Ultra SCSI Adapter AHA 2940AU** PCI Ultra SCSI adapter; AHA 2940AU PCI card for operating SCSI devices to a PC including documentation and software without cable DB50mini connector.	
9A0011.02	**External SCSI CDROM 100 – 240 VAC supply voltage DB 50m** External SCSI CD-ROM, external 12 x CD-ROM drive in desktop housing. 100 – 240 VAC. supply voltage, with documentation and software. DB50mini connector.	
9A0012.01	**SCSI Cable DB50mini, length 1.8 m** SCSI cable DB50mini 1.8 m cable for operating the external SCSI CD-ROM drive to the PCI Ultra SCSI adapter	
9A0013.01	**Pen for resistive touch screen**	
9A0014.02	**RS232 Extension Cable 1.8 m** RS232 extension cable e.g. for operating a discharged Provit 5000/5600 display unit with touch screen. Length 1.8 m.	
9A0014.05	**RS232 Extension Cable 5 m** RS232 extension cable e.g. for operating a discharged Provit 5000/5600 display unit with touch screen. Length 5 m.	
9A0014.10	**RS232 Extension Cable 10 m** RS232 extension cable e.g. for operating a discharged Provit 5000/5600 display unit with touch screen. Length 10 m.	
9A0015.99	**Compact Flash Adapter**	
9A0016.01	**PS/2 Extension Cable, length 2.0 m**	
9A0017.01	**RS232 Null Modem Cable 0.6 m** To connect UPS and IPC (9 pin DSUB socket - 9 pin DSUB socket)	
9A0017.02	**RS232 Null Modem Cable 1.8 m** To connect UPS and IPC (9 pin DSUB socket - 9 pin DSUB socket)	
9A0100.11	**UPS 24 VDC** 24 VDC input, 24 VDC input; serial interface.	
9A0100.12	**UPS Battery Unit Type A** 24 V; 7 Ah; including battery cage.	
9A0100.13	**UPS Battery Unit Type A (replacement part)** 2 x 12 V; 7 Ah; for battery unit 9A0100.12.	
9A0100.14	**UPS Battery Unit Type B** 24 V; 2.2 Ah; including battery cage.	
9A0100.15	**UPS Battery Unit Type B (replacement part)** 2 x 12 V; 2.2 Ah; for battery unit 9A0100.14.	

Table 12: Model numbers for accessories (cont.)

7.10 Software

Model Number	Description	Remark
5S0000.01-090	**Provit Drivers & Utilities CD** Provit Drivers & Utilities CD ROM, contains driver (touch screen, graphics, etc.) and the latest BIOS upgrades for all Provit product lines	

Table 13: Model numbers for software

Model Number	Description	Remark
5S5000.01-090	**Provit 5000 Utilities** Includes libraries, DLL´s, for operating systems MS DOS®, MS Windows® 3.x , Windows 95, Windows NT for usage of the maintenance functions.	*Cancelled since 11/2000*
5S5000.02-090	**Provit 5000 Upgrade Disk** Provit 5000 Upgrade Disk contains the latest versions of BIOS (Elite BIOS, VGA BIOS, MTC BIOS) for the IPC 5000.	*Cancelled since 11/2000*
5S5000.03-090	**Provit 5000 Graphics** Includes the current versions of graphics drivers for operating systems like MS-DOS® (VESA), MS-Windows ® 3.x, Windows 95, Windows NT and OS/2.	*Cancelled since 11/2000*
5S5000.04-090	**Provit 5000 Upgrade Service Disk** Provit 5000 Upgrade Service Disk	*Cancelled since 11/2000*
5S5001.01-090	**Provit Mkey Utilities** For configuring modular keypads to Provit IPCs, manual included.	*Cancelled since 11/2000*
5S5001.02-090	**Provit Mkey Utilities Development Kit** Implementation instructions for operating the modular keypad to an IPC. Example programs and description included.	*Cancelled since 11/2000*
5S0002.01-020	**Phoenix PC Card Manager** Provit PC Card Utilities software for operating PC card compatible cards, including card and socket services for PCMCIA cards.	
5S0003.02-020	**Elo Touch Screen Utilities** Elo Touch Screen Utilities driver for display units 5D2210.xx, 5D520x.xx, 5D521x.xx,5D560x.03. For MS-DOS, Windows 3.x, Windows 95, Windows NT and OS/2	*Cancelled since 11/2000*
5S0003.04-020	**Interlink Touch Pad Utilities** Interlink Touch Pad Utilities for display units 5D560x.02	*Cancelled since 11/2000*
5S0010.01-020	**Intel EtherExpress Utilities** Driver for the Ethernet interface of the ISA card 5A5000.05 and 5A5000.06, for MS-DOS Windows 3.x, Windows 95, Windows NT and OS/2	*Cancelled since 11/2000*
9S0000.01-010	**OEM MS-DOS 6.22 German (Disk)** OEM MS-DOS, German, diskettes, including manual Only available with a new IPC.	
9S0000.01-020	**OEM MS-DOS 6.22 English (Disk)** OEM MS-DOS, English, diskettes, including manual Only available with a new IPC.	
9S0000.02-010	**OEM MS-Win95 German (CD)** OEM MS-Windows 95, CD, German, including manual Only available with a new IPC.	
9S0000.02-020	**OEM MS-Win95 English (CD)** OEM MS-Windows 95, CD, English, manual included. Only available with a new IPC.	
9S0000.03-010	**OEM MS-DOS 6.22 / MS Win3.11 German (Disk)** OEM MS-DOS and MS-Windows 3.11, German, manuals and diskettes included. Only available with a new IPC.	
9S0000.03-020	**OEM MS-DOS 6.22 / MS-Win3.11 English (Disk)** OEM MS-DOS and MS-Windows 3.11, English, manuals and diskettes included. Only available with a new IPC.	
9S0000.04-010	**OEM MS-WinNT4.0 WS German (CD)** OEM MS-Windows NT4.0 WS, CD, German, manual included Only available with a new IPC.	

Table 13: Model numbers for software (cont.)

Model Number	Description	Remark
9S0000.04-020	**OEM MS-WinNT4.0 WS English (CD)** OEM MS-Windows NT4.0 WS, CD, English, manual included Only available with a new IPC.	
9S0000.05-010	**OEM MS-Win98 German (CD)** OEM MS-Windows98, CD, German, manual included Only available with a new IPC.	
9S0000.05-020	**OEM MS-Win98 English (CD)** OEM MS-Windows98, CD, English, manual included Only available with a new IPC.	
9S0000.06-010	**OEM MS-Win2000 Professional German (CD)** OEM MS-Windows2000, CD, German, manual included Only available with a new IPC.	
9S0000.06-020	**OEM MS-Win2000 Professional English (CD)** OEM MS-Windows2000, CD, English, manual included Only available with a new IPC.	
9S0001.04-020	**OEM MS-WinNT Embedded Runtime IPC5000/IPC5600** Class 2 Image (English) preinstalled on Compact Flash 192 MB. For IPC5000 (5C5001.0x) and IPC5600 (5C5601.0x)	
9S0001.05-020	**OEM MS-WinNT Embedded Runtime IPC5000C/IPC5600C** Class 2 Image (English) preinstalled on Compact Flash 192 MB. For IPC5000C (5C5001.1x) and IPC5600C (5C5601.1x)	

Table 13: Model numbers for software (cont.)

7.11 Documentation

Model Number	Description	Remark
MAPRV5000-0	Provit 5000 User Manual, German	
MAPRV5000-E	Provit 5000 User Manual, English	
MAPRV5000-F	Provit 5000 User Manual, French	
MAMKEY-0	Provit Mkey User Manual, German	
MAMKEY-E	Provit Mkey User Manual, English	
MAMKEY-F	Provit Mkey User Manual, French	
MAUSV1-0	UPS Short Description, German	
MAUSV1-E	UPS Short Description, English	
MAUSV1-F	UPS Short Description, French	

Table 14: Model numbers for documentation

Chapter 2 • Controllers

1. Technical Data

IPCs should never be used in very dusty environments, as the fans can get blocked up (bus unit and processor), therefore no longer guaranteeing sufficient cooling.

1.1 Controllers

Controller	IPC5000	IPC5600	IPC5000C	IPC5600C
Compatibility	100% IBM AT compatible			
Certification	Meets ISO 9001 production standards			
Standards Temperature Shock / Tests Carried Out Vibration / Tests Carried Out Emission / Tests Carried Out Immunity / Tests Carried Out	 IEC61131-2 / IEC60068-2-x IEC61131-2 / IEC60068-2-27 (except hard disk) 1) IEC61131-2 / IEC60068-2-6 (except hard disk) 1) IEC61000-6-4 / CISPR22 IEC61131-2 / IEC61000-4-x			
Protection	IP20 2)			
Installation	Vertical, ±45°	Vertical, ±45° with FDD or CD ROM ±25°	Vertical, ±45°	Vertical, ±45° with FDD or CD ROM ±25°
Operating Temperature 3) 4) 5) With Intel Processors With AMD Processors Relative Humidity3)	 Without HDD: 0-55°C; with HDD see "Mass memory" Without HDD: 0-50°C; with HDD see "Mass memory" 5 to 95% (non condensing)		 Without HDD: 0-50°C; with HDD see "Mass memory" - 5 to 95% (non condensing)	
Storage Temperature Relative Humidity	 -20 to +60°C 5 to 95% (non condensing)			
Weight 2 Slot Design 4 Slot Design 6 Slot Design	 Approx. 3.9 kg Approx. 4.9 kg -	 - Approx. 7.8 kg Approx. 8.4 kg	 Approx. 3.9 kg Approx. 4.9 kg -	 - Approx. 7.8 kg Approx. 8.4 kg
Measurements (W x H x D in mm) 2 Slot Design 4 Slot Design 5 Slot Design 6 Slot Design	 270 x 92.4 x 196 270 x 157.4 x 196 270 x 157.4 x 196 -	 - 276.9 x 164.9 x 399.2 276.9 x 164.9 x 399.2 276.9 x 203.2 x 399.2	 270 x 92.4 x 196 270 x 157.4 x 196 270 x 157.4 x 196 -	 - 276.9 x 164.9 x 399.2 276.9 x 164.9 x 399.2 276.9 x 203.2 x 399.2
Altitude	Max. 3,000 m			

Table 15: Technical data for controllers

1) Values for the respective hard disks are included in the "Hard Disks" section.
2) Conforms to the IP20 standard with inserted interface boards 5A5000.02, 5A500.05 or 5A5000.06 and a PCMCIA card plugged into the slot provided on the interface board.
3) Only applies to remote operation i.e. a display not mounted on the controller - remote mounting. For more details, see the "Mounting Instructions" section in the "Display Units" chapter.
4) The maximum operating temperature of the IPC is 45°C, when using 5C5002.13 processors (Celeron 433) with the system unit 5C5001.1x

5) When using the processors 5C5002.14 (Celeron 566) with the system unit 5C5001.1x , the maximum operating temperature is revision number ≤D0 45°C.

1.2 Bus Units

1.2.1 IPC5000 and IPC5000C

Bus Units	5C5000.01 1) 2) 3)	5C5000.02 2) 3) 4)	5C5000.11 1)	5C5000.12 4)
Slots5)				
Total	2		4	
B&R ISA 16 Bit 6)	1		1	
Half Size ISA 16 Bit	-		-	
Half Size ISA 16 Bit/PCI 32 Bit	1		3	
Half Size PCI 32 Bit	-		-	
Full Size ISA 16 Bit	-		-	
Full Size ISA 16 Bit/PCI 32 Bit	-		-	
Full Size PCI 32 Bit	-		-	
Supply Voltage	100 - 240 VAC 50 - 60 Hz	24 VDC	100 - 240 VAC 50 - 60 Hz	24 VDC
Fan Type / Design	Ball bearings, analog control			
Number of Fans				
∅40 mm	2		3	2

Table 16: Technical data for IPC5000 bus units

1) A 3 pin cable with grounding contact plug is required for operation (order no. 9A0001.03)
2) The maximum operating temperature of the IPC is 45°C, when using the processor 5C5002.13 (Celeron 433) with the system unit 5C5001.1x.
3) When using the processors 5C5002.14 (Celeron 566) with the system unit 5C5001.1x , the maximum operating temperature is with revision ≤D0 45°C.
4) A plug (with terminal blocks) for connecting to the supply is contained in the delivery. The cable must be provided by customers.
5) All PCI slots have an operating voltage of 5V and a clock frequency of 33MHz.
6) Standard 16 bit ISA interface, with specific mechanical requirements.

Bus Units	5C5000.21 1) 2) 3)	5C5000.22 2) 3) 4)	5C5000.31 1)	5C5000.32
Slots5)				
Total	2		5	
B&R ISA 16 Bit 6)	-		1	
Half Size ISA 16 Bit	-		1	
Half Size ISA 16 Bit/PCI 32 Bit	1		1	
Half Size PCI 32 Bit	1		2	
Full Size ISA 16 Bit	-		-	
Full Size ISA 16 Bit / PCI 32 Bit	-		-	
Full Size PCI 32 Bit	-		-	
Supply Voltage	100 - 240 VAC 50 - 60 Hz	24 VDC	100 - 240 VAC 50 - 60 Hz	24 VDC
Fan Type / Design	Ball bearings, analog control			
Number of Fans				
∅40 mm	2		1	1
∅50 mm	-		2	1

Table 17: Technical data for IPC5000 bus units

1) A 3 pin cable with grounding contact plug is required for operation (order no. 9A0001.03)
2) The maximum operating temperature of the IPC is 45°C, when using the processor 5C5002.13 (Celeron 433) with the system unit 5C5001.1x.
3) When using the processors 5C5002.14 (Celeron 566) with the system unit 5C5001.1x , the maximum operating temperature is with revision ≤D0 45°C.
4) A plug (with terminal blocks) for connecting to the supply is contained in the delivery. The cable must be provided by customers.
5) All PCI slots have an operating voltage of 5V and a clock frequency of 33MHz.
6) Standard 16 bit ISA interface, with specific mechanical requirements.

1.2.2 IPC5600 and IPC5600C

Bus Units	5C5600.01 1)	5C5600.02 2)	5C5600.03 1)	5C5600.04 2)	5C5600.11 1)	5C5600.12 4)
Slots3)						
Total	4		5		6	
B&R ISA 16 Bit 4)	-		-		-	
Half Size ISA 16 Bit	1		1		1	
Half Size ISA 16 Bit/PCI 32 Bit	-		-		-	
Half Size PCI 32 Bit	-		-		-	
Full Size ISA 16 Bit	-		1		2	
Full Size ISA 16 Bit / PCI 32 Bit	3		1		3	
Full Size PCI 32 Bit	-		2		-	
Supply Voltage	115 / 230 VAC 50 - 60 Hz	24 VDC	115 / 230 VAC 50 - 60 Hz	24 VDC	115 / 230 VAC 50 - 60 Hz	24 VDC
Fan Type / Design	Ball bearings, analog control					
Number of Fans						
∅ 80 mm	1		1		-	
∅ 92 mm	-		-		1	

Table 18: Technical data for IPC5600 bus units

1) A 3 pin cable with grounding contact plug is required for operation (order no. 9A0001.03)
2) A plug (with terminal blocks) for connecting to the supply is contained in the delivery. The cable must be provided by customers.
3) All PCI slots have an operating voltage of 5V and a clock frequency of 33MHz
4) Standard 16 bit ISA interface, with specific mechanical requirements.

1.3 System Units

1.3.1 IPC5000 and IPC5600

System Units	5C5001.01	5C5001.03	5C5601.01
Mainboard General Information	Real-time clock 1) CMOS backup in the FlashPROM Temperature monitoring (CPU, I/O, display unit)		
Math Processor	Integrated in the processor, no socket		
BIOS	AWARD Elite BIOS, Plug and Play compatible		
Chipset	Intel 430HX		
Processor Socket	ZIF socket 7		
DRAM	2 x PS/2 SIMM, EDO or FPM 2) Max. 128 MB		
2nd Level Cache	512 KB pipeline burst 3)		

Table 19: Technical data for IPC5000 and IPC5600 system units

System Units	5C5001.01	5C5001.03	5C5601.01
Interfaces COM1 COM2 LPT1 USB Panelware Keyboard Mouse External Disk Drive	 RS232, 16 Byte FIFO RS232, 16 Byte FIFO SPP, EPP and ECP modes 2 USB ports[4)] Up to 8 Panelware keypad modules (daisy chained) Enhanced AT PS/2 PS/2 Yes		
VGA Controller	Chips & Technologies C&T65550 [5)]		
Graphic Memory	1 MB	2 MB	2 MB
Interfaces	FPD (Panellink) + CRT (15 pin VGA DSUB connector)		
Hard Disk / Silicon Disk Slots	1		2

Table 19: Technical data for IPC5000 and IPC5600 system units

1) The quartz used with the IPC has an accuracy of 10 ppm. This means after influences such as operating temperature and wiring of the quartz have been taken into account, the inaccuracy is typically 2 seconds per day.
2) When using SIMM modules with an operating voltage of 3.3 V and 5 V respectively.
3) For IPCs with a revision number ≤34.03, only the 256 KB L2 cache is available.
4) Only for system units with revision ≤34.03; otherwise not available
5) The VGA controller C&T65548 with 1 MB graphic memory is used for system unit 5C5001.01 with a revision number ≤21.01.

1.3.2 IPC5000C and IPC5600C

System Units	5C5001.11	5C5001.12	5C5001.21	5C5601.11	5C5601.12
Mainboard General Information	Real-time clock [1)] CMOS backup in the FlashPROM Temperature monitoring (CPU, I/O, display unit)				
Math Processor	Integrated in the processor, no socket				
BIOS	AWARD Elite BIOS, Plug and Play compatible				
Chipset	Intel 440BX				
Processor Socket	Socket 370				

Table 20: Technical data for IPC5000C and IPC5600C system units

System Units	5C5001.11	5C5001.12	5C5001.21	5C5601.11	5C5601.12
DRAM	2 x DIMM PC100 max. 512 MB				
2nd Level Cache	Integrated into the processor				
Interfaces COM1 COM2 LPT1 USB Keyboard Mouse	 RS232, 16 Byte FIFO RS232, 16 Byte FIFO SPP, EPP and ECP modes 2 USB ports Enhanced AT PS/2 PS/2				
External Disk Drive	Yes		No	Yes	
VGA Controller Chips & Technologies	69000	69030	69000	69000	69030
Graphic Memory	2 MB	4 MB	2 MB	2 MB	4 MB
Interfaces	FPD (Panellink) + CRT (15 pin VGA DSUB connector)				
Remote IDE Interface	No		Yes	No	
Ethernet Controller (on board) Connection Compatibility Cabling	Intel 82559 10/100 Mbit/s RJ45 Twisted Pair (10BaseT/100BaseT) Not NE2000 compatible S/STP (category 5)				
E-IDE slots	1			2	

Table 20: Technical data for IPC5000C and IPC5600C system units

1) The quartz used with the IPC has an accuracy of 20 ppm. This means after influences such as operating temperature and wiring of the quartz have been taken into account, the inaccuracy is typically 5 seconds per day.

1.4 Processors

1.4.1 IPC5000 and IPC5600

Processor	5C5002.01	5C5002.02	5C5002.03	5C5002.04	5C5002.05	5C5002.06
Manufacturer / Type	Intel Pentium	Intel Pentium	Intel Pentium	Intel Pentium	Intel Pentium	Intel Pentium
Clock Frequency [MHz]	100	120	133	150	166	200
L1 Cache	2 x 8 KB	2 x 8 KB	2 x 8 KB	2 x 8 KB	2 x 8 KB	2 x 8 KB
MMX Technology	No	No	No	No	No	No
Fan	∅ 40 mm, ball bearings					
Processor	**5C5002.07**	**5C5002.08**	**5C5002.09**			
Manufacturer / Type	AMD K6	Intel Pentium	AMD K6			
Clock Frequency [MHz]	166	200	266 [1)]			
L1 Cache	2 x 32 KB	2 x 16 KB	2 x 32 KB			
MMX Technology	Yes	Yes	Yes			
Fan	∅ 40 mm, ball bearings					

Table 21: Technical data for IPC5000 and IPC5600 processors

1) An AMD K6-266 processor can only be operated in system units with a revision number greater than or equal to 44.04.

1.4.2 IPC5000C and IPC5600C

Processor	5C5002.11	5C5002.12	5C5002.13 [1)]	5C5002.14 [2)]	5C5002.15	5C5002.16
Manufacturer / Type	Intel Celeron				Intel Pentium III	
Clock Frequency CPU [MHz]	300	366	433	566	600	850
Clock Frequency Bus [MHz]	66				100	
L1 Cache	2 x 16 KB					
L2 Cache	128 KB				256 KB	
MMX Technology	Yes					
Fan	∅ 40 mm, ball bearings				∅ 50 mm, ball bearings	

Table 22: Technical data for IPC5000C and IPC5600C processors

1) When using the processor 5C5002.13 (Celeron 433) together with system unit 5C5001.1x , the maximum operating temperature of the IPC is 45°C.
2) When using the processor 5C5002.14 (Celeron 566) together with system unit 5C5001.1x , the maximum operating temperature is at revision ≤D0 45°C.

1.5 Hard Disks

Hard Disk	5A5001.02	5A5001.03	5A5001.04	5A5001.05 [1]	5A5001.08 [1]
Capacity	1.44 GB	2.1 GB	4.3 GB	6 GB	
Standards Shock Vibration	150 G, 2 ms 0.5 G, 5 to 500 Hz			150 G, 2 ms 1.0 G, 5 to 400 Hz	

Table 23: Technical data for hard disks

1) More detailed information about 6 GB hard disks can be found in Chapter 8 "Technical Appendix".

1.6 Silicon Disks

Silicon Disk (PC Card) [1]	Capacity	Silicon Disk (Compact Flash) [1]	Capacity
9A0009.01	6 MB	9A0015.07	8 MB
9A0009.02	40 MB	9A0015.03	10 MB
9A0009.03	20 MB	9A0015.01	20 MB
9A0009.04	110 MB	9A0015.06	32 MB
9A0009.05	60 MB	9A0015.04	48 MB
9A0009.06 [2]	220 MB	9A0015.02	64 MB
9A0009.07	220 MB	9A0015.05	128 MB
9A0009.08	48 MB	9A0015.08	196 MB
9A0009.09	440 MB	9A0015.09	320 MB

Table 24: Technical data for silicon disks

1) A special adapter is required to operate the silicon disks (see section "Silicon Disks").
2) Full Metal Card, i.e. the housing of the PC Card is completely made of metal.

1.7 Main Memory

1.7.1 IPC5000 and IPC5600

Main Memory	9A0004.03	9A0004.05	9A0004.04	9A0004.06	9A0004.07
Slot	PS/2 SIMM (72pin)				
Size	4 MB	8 MB	16 MB	32 MB	64 MB

Table 25: Technical data for IPC5000 and IPC5600 main memory

1.7.2 IPC5000C and IPC5600C

Main Memory	9A0004.11	9A0004.12	9A0004.14
Slot	DIMM (168pin)		
Size	64 MB	128 MB	256 MB

Table 26: Technical data for IPC5000C and IPC5600C main memory

1.8 Interface Boards

Interface board	5A5000.01	5A5000.02	5A5000.05	5A5000.06
Slot	B&R 16 bit ISA [1)]			
COM3	Combined RS232 / RS422 interface, tri-state, electrically isolated , 16 Byte FIFO			
COM4	Combined RS232 / RS422 interface, tri-state, electrically isolated , 16 Byte FIFO			
CAN Bus	CAN 2.0b specification, Intel 82527 controller			
PC Card	1 PCMCIA slot, Type I, II or III			
SRAM	256 kB; addressable with PCMCIA socket 2, own lithium backup battery			
LPT2	Internal, for Hardware Security Key (Dongle)			
Ethernet Connection Controller Compatibility Cabling	-	10 Mbit/s BNC (10Base2) UMC 9008F NE2000 compatible RG58	10 Mbit/s RJ45 Tw. Pair (10BaseT) Intel 82595 Not NE2000 compatible S/STP (category 5)	10 Mbit/s BNC (10Base2) Intel 82595 Not NE2000 compatible RG58

Table 27: Technical data for interface boards

1) Cannot be operated in a standard ISA socket of a standard PC.

1.9 Arcnet Interface Boards

Arcnet Board	5A51105.00-090	5A1107.00-090	5A1109.00-090	0TP360.04
Slot	ISA			
Arcnet Connection Controller Cabling	ISA 8 Bit BNC SMC 0022063 RG62	ISA 8 Bit BNC SMC COM20020 RG62	ISA 8 Bit BNC SMC COM90C65 RG62	ISA 16 Bit BNC, Twisted Pair SMC 90C66 RG62, UTP wire RJ-11

Table 28: Technical data for Arcnet interface boards

2. Dimensions

2.1 IPC5000 and IPC5000C (2 slot design)

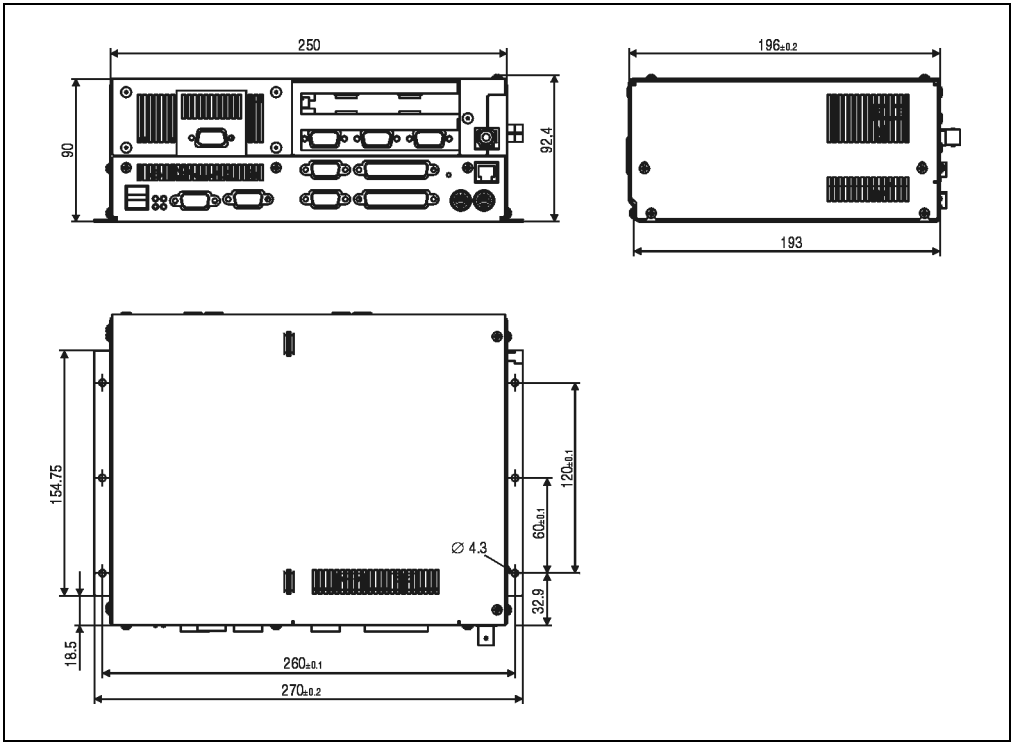


Figure 1: IPC5000 and IPC5000C dimensions (2 slot design)

2.2 IPC5000 and IPC5000C (4 slot design)

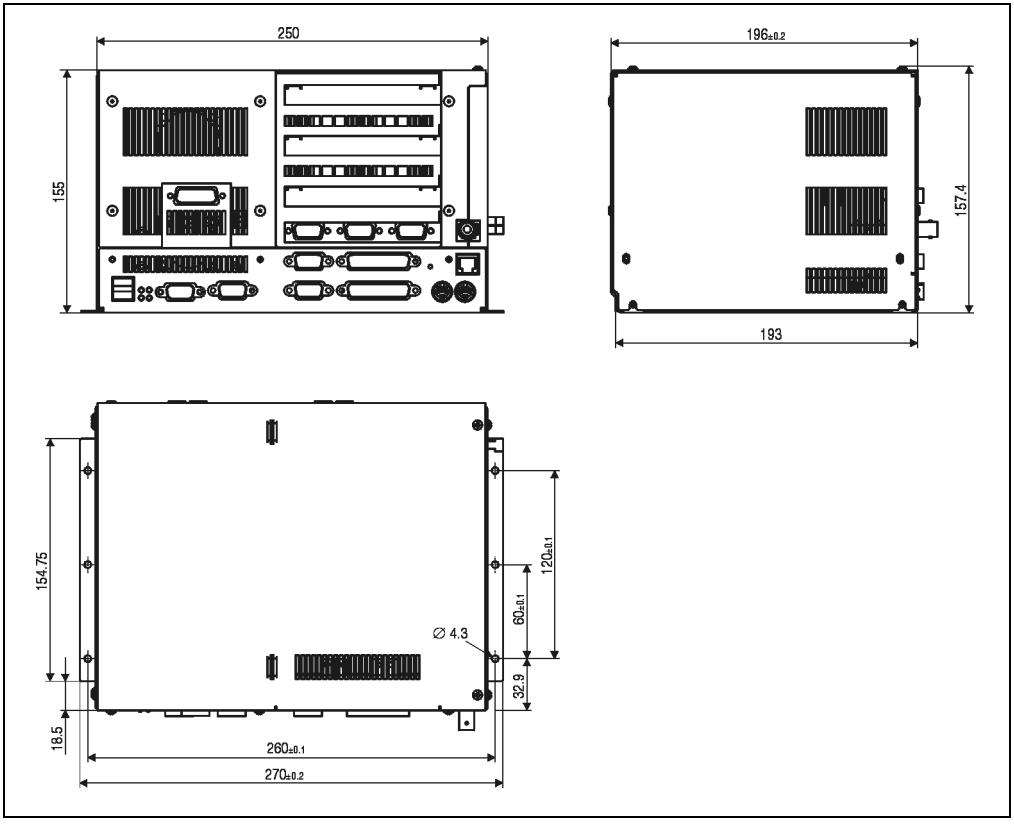


Figure 2: IPC5000 and IPC5000C dimensions (4 slot design)

2.3 IPC5000 and IPC5000C (5 slot design)

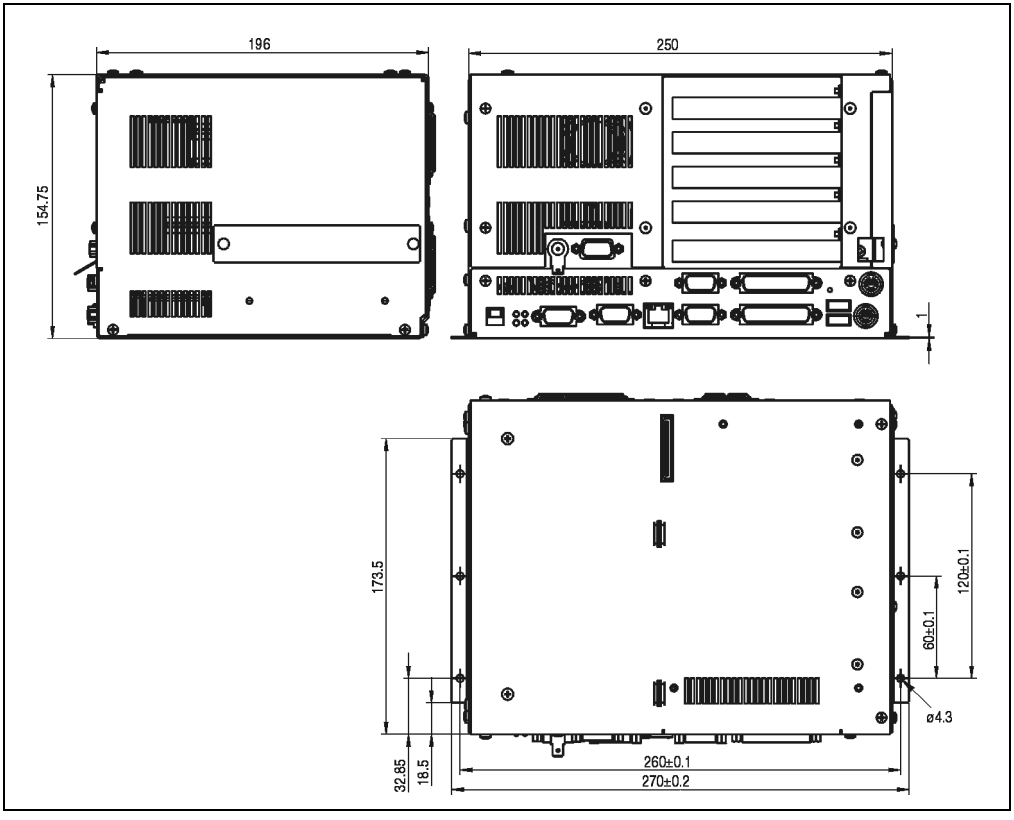


Figure 3: IPC5000 and IPC5000C dimensions (5 slot design)

2.4 IPC5000 and IPC5600C (4 slot design)

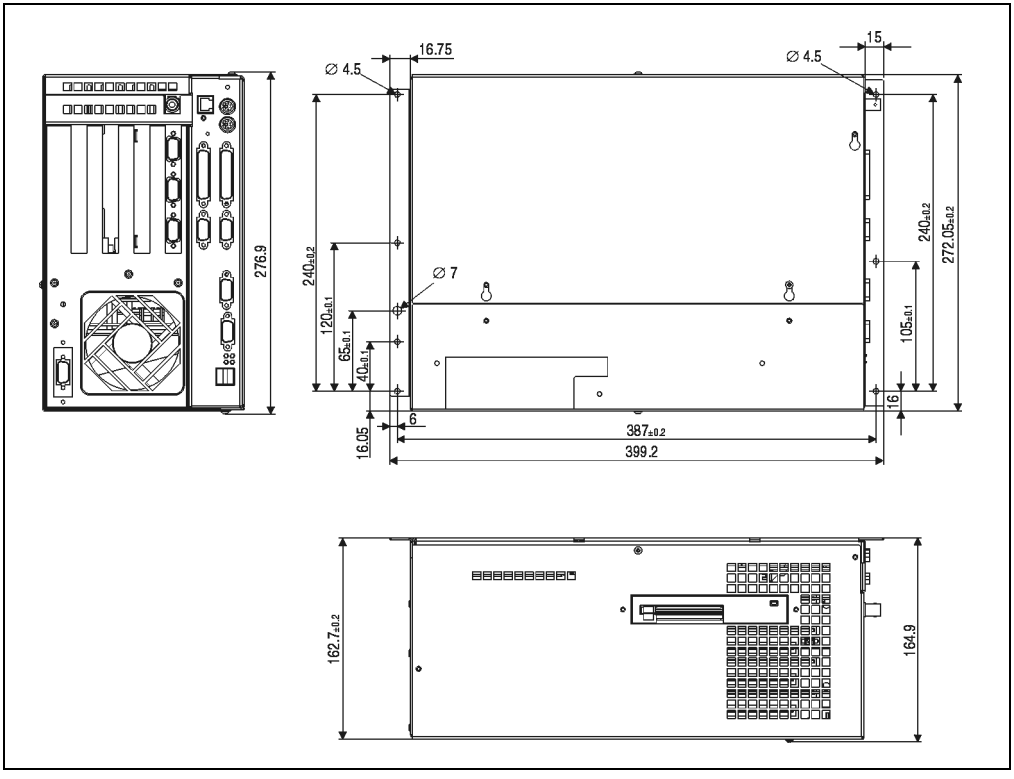


Figure 4: IPC5600 and IPC5600C dimensions (4 slot design)

2.5 IPC5000 and IPC5600C (5 slot design)

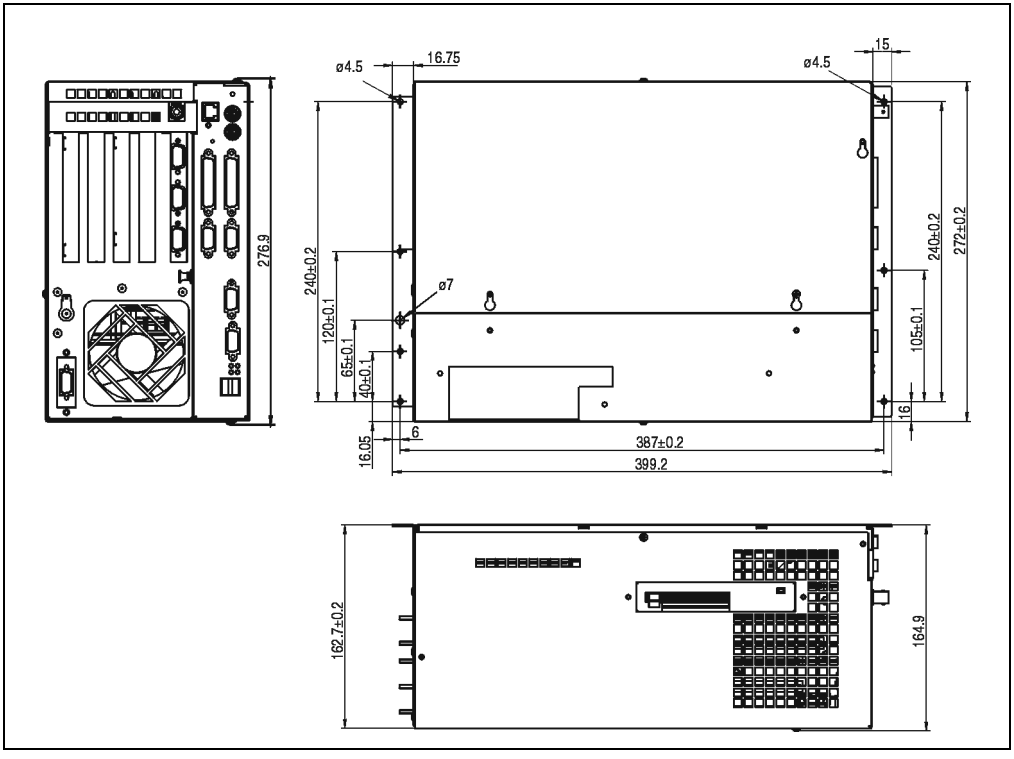


Figure 5: IPC5600 and IPC5600C dimensions (5 slot design)

2.6 IPC5000 and IPC5600C (6 slot design)

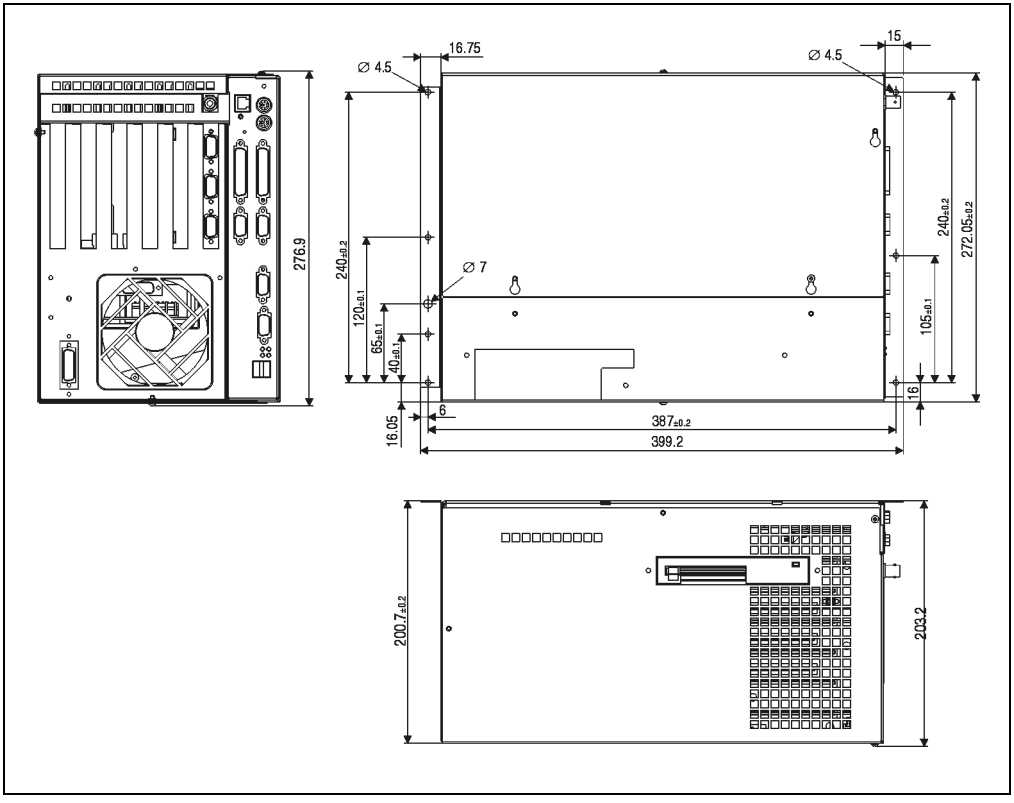


Figure 6: IPC5600 and IPC5600C dimensions (6 slot design)

3. Mounting Instructions

- As standard, the controller is mounted on the back of the display unit (standard mounting). The option of remote operation is also available (remote mounting), where a display can be operated by the controller, up to a maximum distance of 10 m.
- Screws are contained in the delivery for both standard and remote mounting.
- All connectors must be pointing downwards when mounting the IPC5000/ IPC5000C.
- The IPC5600/IPC5600C is mounted horizontally, i.e. all connectors must point to the right (when viewed from behind).
- In order to guarantee sufficient air circulation, allow a distance of at least 10 cm between the fans and all other objects.
- IPC5000/IPC5000C and IPC5600/IPC5600C controllers can be mounted at an angle of max. ±45°:

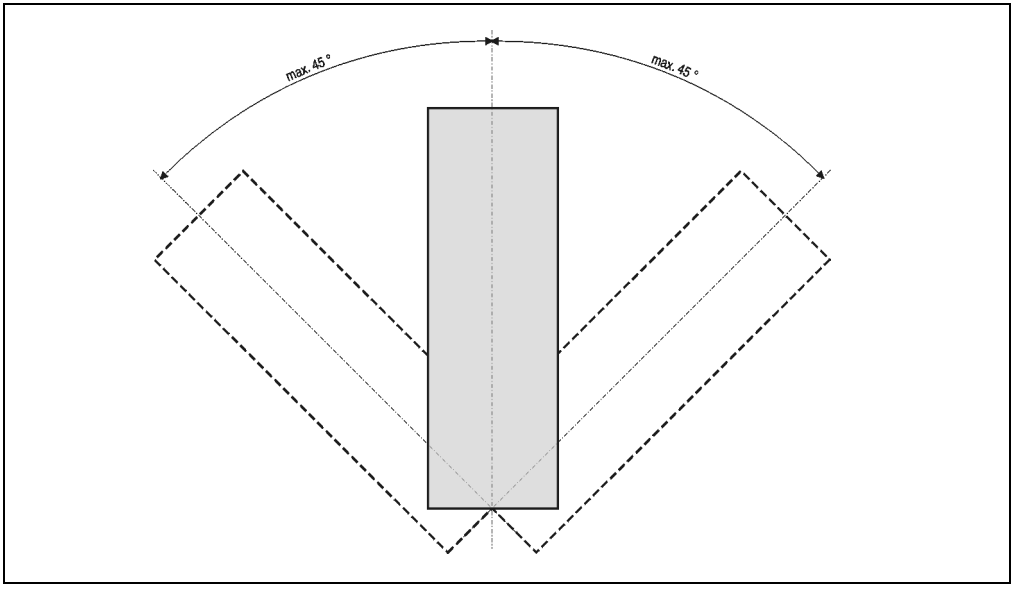


Figure 7: Mounting Instructions

If a disk drive or a CD-ROM drive is being operated on a IPC5600/IPC5600C controller, only an angle of ±25° max. is valid.

4. Operating Temperature

The maximum operating temperatures specified for the IPC5000, IPC5600, IPC5000C and IPC5600C are given in the following tables.

4.1 IPC5000 and IPC5600

IPC5000/IPC5600	Intel Pentium	AMD K6
Without HDD	0 - 55 °C	0 - 50 °C
With HDD	5 - 47 °C	5 - 47 °C
With 24 hr HDD Operation	5 - 40 °C	5 - 40 °C

Table 29: Operating temperature for the IPC5000 and IPC5600

4.2 IPC5000C

IPC5000C	Intel Celeron 300 / 366 MHz	Intel Celeron 433 MHz	Intel Celeron 566 MHz	Intel Pentium III 600 MHz	Intel Pentium III 850 MHz
Without HDD	0 - 50 °C	0 - 45 °C 1)	0 - 45 °C 2) 0 - 55 °C 3)	0 - 50 °C	0 - 40 °C
With HDD	5 - 47 °C	5 - 45 °C	5 - 47 °C	5 - 47 °C	5 - 40 °C
With 24 hr HDD Operation	5 - 40 °C	5 - 40 °C	5 - 40 °C	5 - 40 °C	5 - 40 °C

Table 30: Operating temperature for the IPC5000C

1) Only in connection with 5C5001.1x system units
2) Only with 5C5002.14 with a revision number < D0
3) Only with 5C5002.14 starting with revision number D0

4.3 IPC5600C

IPC5600C	Intel Celeron 300 / 366 MHz	Intel Celeron 433 MHz	Intel Celeron 566 MHz	Intel Pentium III 600 MHz	Intel Pentium III 850 MHz
Without HDD	0 - 55 °C	0 - 50 °C 1)	0 - 50 °C 2) 0 - 55 °C 3)	0 - 55 °C	0 - 50 °C
With HDD	5 - 47 °C	5 - 47 °C	5 - 47 °C	5 - 47 °C	5 - 47 °C
With 24 hr HDD operation	5 - 40 °C	5 - 40 °C	5 - 40 °C	5 - 40 °C	5 - 40 °C

Table 31: Operating temperature for the IPC5600C

1) Only available with 5C5001.1x system units
2) Only with 5C5002.14 with a revision number < D0
3) Only with 5C5002.14 starting with revision number D0

5. Components Overview

5.1 IPC5000 (2 slot design)

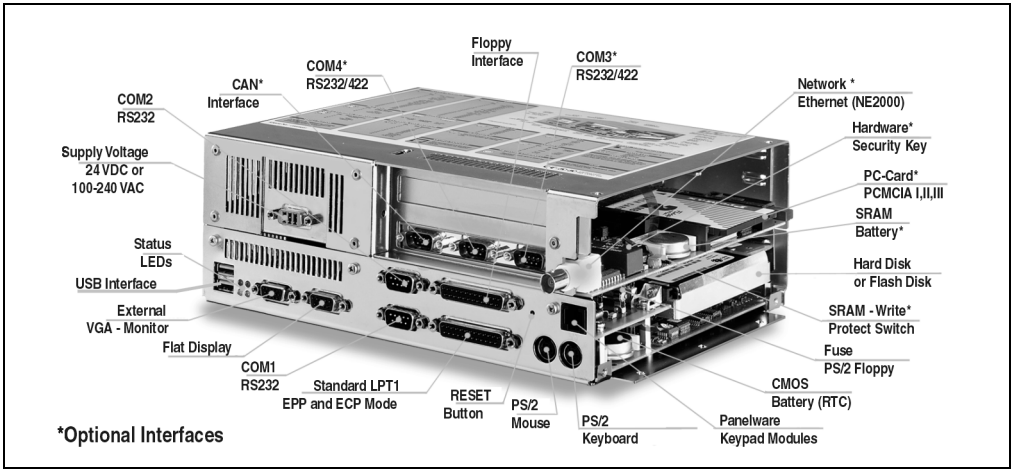


Figure 8: IPC5000 components (bus unit with 2 slots)

5.2 IPC5000 (4 slot design)

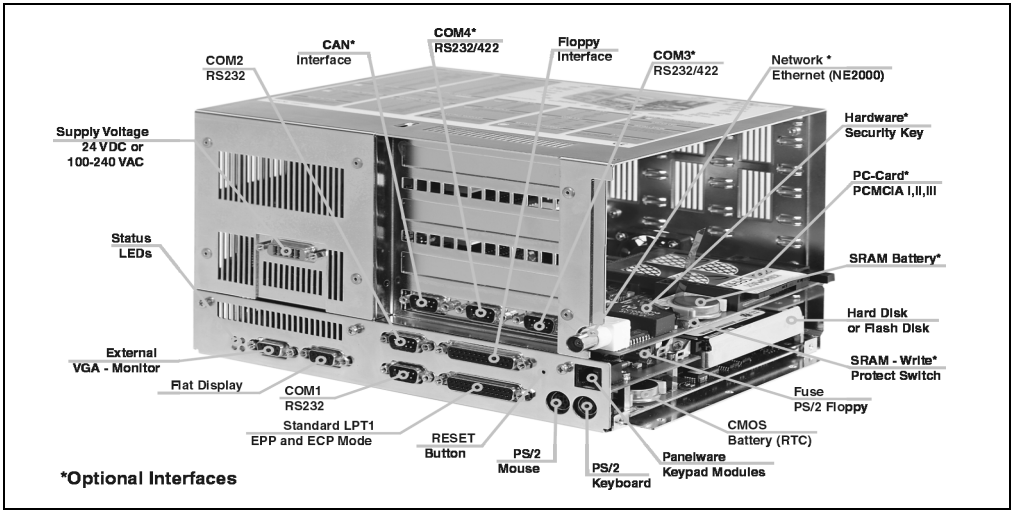


Figure 9: IPC5000 components (bus unit with 4 slots)

5.3 IPC5600 (4 slot design)

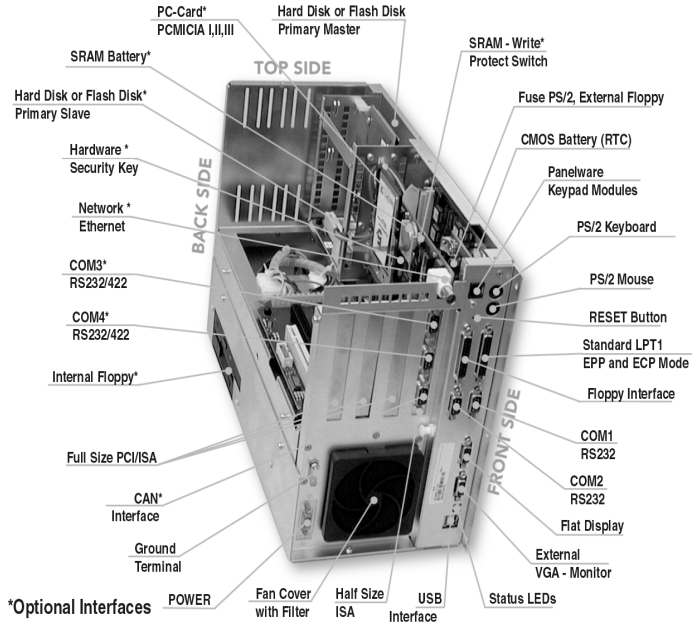


Figure 10: IPC5600 components (bus unit with 4 slots)

5.4 IPC5600 (6 slot design)

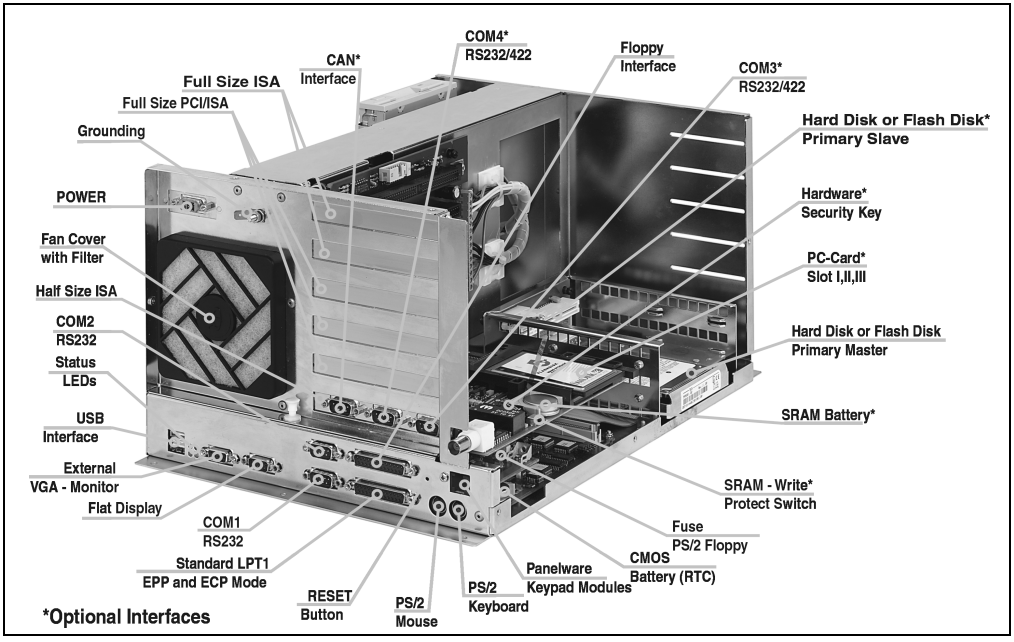


Figure 11: IPC5600 components (bus unit with 6 slots)

5.5 IPC5000C (2 slot design)

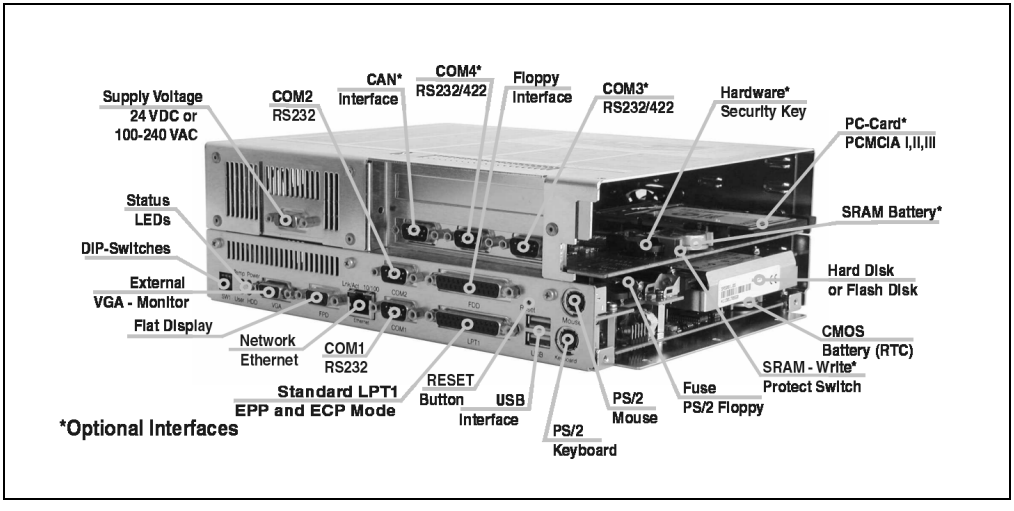


Figure 12: IPC5000C components (bus unit with 2 slots)

5.6 IPC5000C (4 slot design)

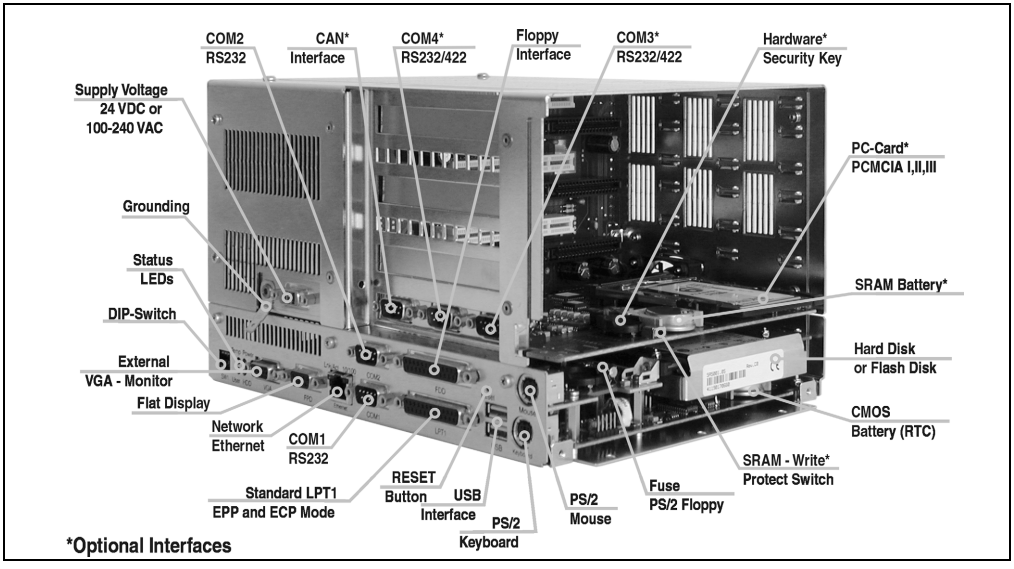


Figure 13: IPC5000C components (bus unit with 4 slots)

5.7 IPC5600C (4 slot design)

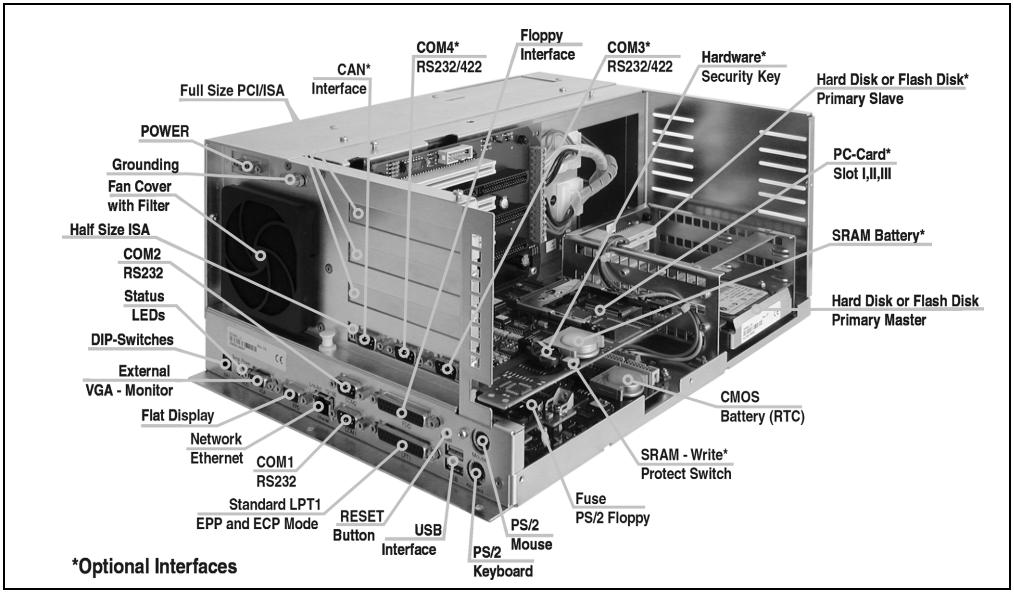


Figure 14: IPC5600C components (bus unit with 4 slots)

5.8 IPC5600C (6 slot design)

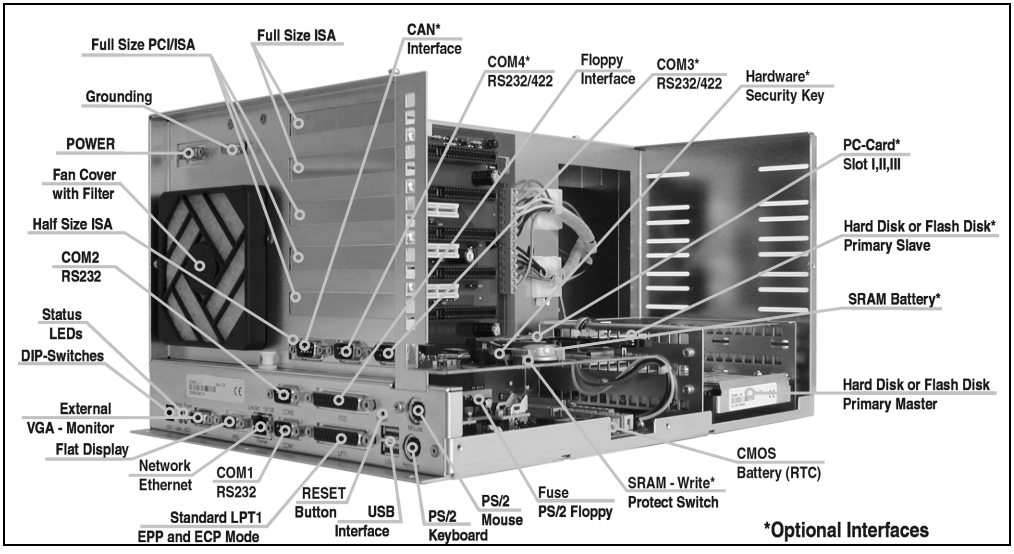


Figure 15: IPC5600C components (bus unit with 6 slots)

6. Provit 5600 IPC Configuration Options

It is possible to use different drives (floppy disk, CD-ROM, DVD ROM) with a 5C5601.* system unit. These drives can be installed in various ways in the system unit, subject to the specific mounting guidelines for each individual drive (see the following pages).See "Installation Guidelines" on page 73.

Several types of drives can be selected:

Model Number	Description	Remark
5A5600.01	Controller FDD, for system units 5C5601.xx	
5A5600.02	Controller FDD and CD-ROM, for system units 5C5601.xx	
5A5600.03	Panel FDD, for Provit 5600 display units.	
5A5600.04	Controller LS 120 and CD-ROM drive, for system units 5C5601.xx	
5A5600.05	Controller FDD and DVD-ROM drive, for system units 5C5601.xx	
5A5600.06	Controller ZIP250 and CD-ROM drive for system units 5C5601.xx	on request
5A5600.07	Controller FDD CD-RW	

Table 32: Controller accessories model numbers

6.1 5A5600.01

Figure 16: 5A5600.01 level with a display unit 5D560x.0x

The figure shows the 5A5600.01 controller in a level type of installation with a 5D560x.0x display unit.

6.1.1 Mounting Guidelines for the Controller 5A5600.01

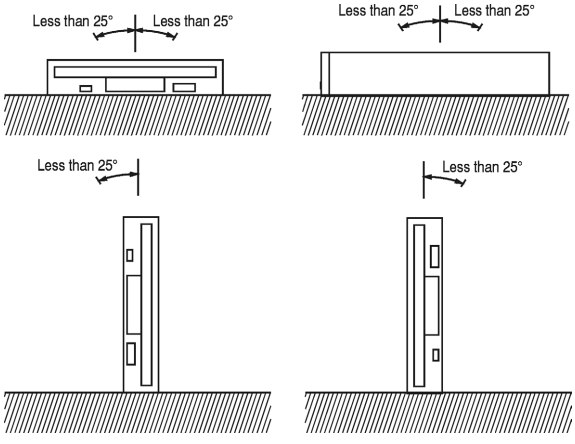


Figure 17: Mounting guidelines for the 5A5600.01 controller

6.1.2 Technical Data 5A5600.01

5A5600.01	
Disk Drive	3.5" drive 1.44 MB
Color	Black
Driver	Not required

Table 33: Technical data for the 5A5600.01 controller

5A5600.01	
Operating Temperature Relative Humidity	 4 - 51.7 °C 20 - 80%, (non-condensing)
Storage Temperature Relative Humidity	 -22 to +60 °C 5 - 90 %, (non-condensing)
Vibration Operating Storage	 Max. 1.5 G at 10 - 100 Hz, 1 octave/min Max. 1 G at 100 -200 Hz, 1 octave/min Max. 0.5 G at 200 -600 Hz, 1 octave/min No information available
Shock Operating Storage	 Read/write max. 5 G for 11 ms (half sine wave) (Written) max. 10 G for 11 ms (half sine wave) No information available

Table 33: Technical data for the 5A5600.01 controller

6.2 5A5600.02

Figure 18: 5A5600.02 level with a display unit 5D560x.0x

The figure shows the 5A5600.02 controller in a level type of installation with a 5D560x.0x display unit.

6.2.1 Mounting Guidelines for the 5A5600.02 Controller

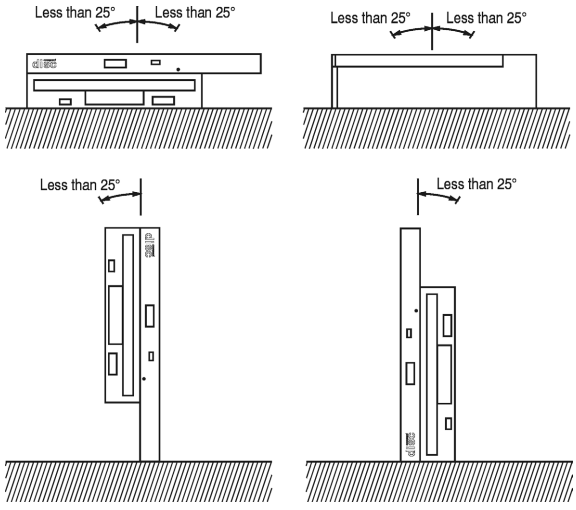


Figure 19: Mounting guidelines for the 5A5600.02 controller

6.2.2 Technical Data for the 5A5600.02 Controller

5A5600.02	
Disk Drive	3.5" drive 1.44 MB data carrier
CD-ROM drive	24x
Color	Black
Driver	Found on the Provit Drivers & Utilities CD-ROM 5S0000.01-090 or can be downloaded directly from B&R's homepage (www.br-automation.com)
Operating Temperature Relative Humidity	 5 - 51.7 °C 20 - 80%, (non-condensing)
Storage Temperature Relative Humidity	 -22 to +60 °C 5 - 90 %, (non-condensing)
Vibration Operating CD-ROM Storage	 Max. 0.3 G at 5 - 500 Hz, 1 octave/min Max. 2 G at 5 - 500 Hz, 1 octave/min
Shock Operating CD-ROM Storage	 Max. 5 G for 11 ms (half sine wave) Max. 60 G for 11 ms (half sine wave)

Table 34: Technical data for the 5A5600.02 controller

6.3 5A5600.03

This type of controller can be mounted on the back of display units 5D5600.0x and 5D5601.0x with the installation slot provided on the display unit.

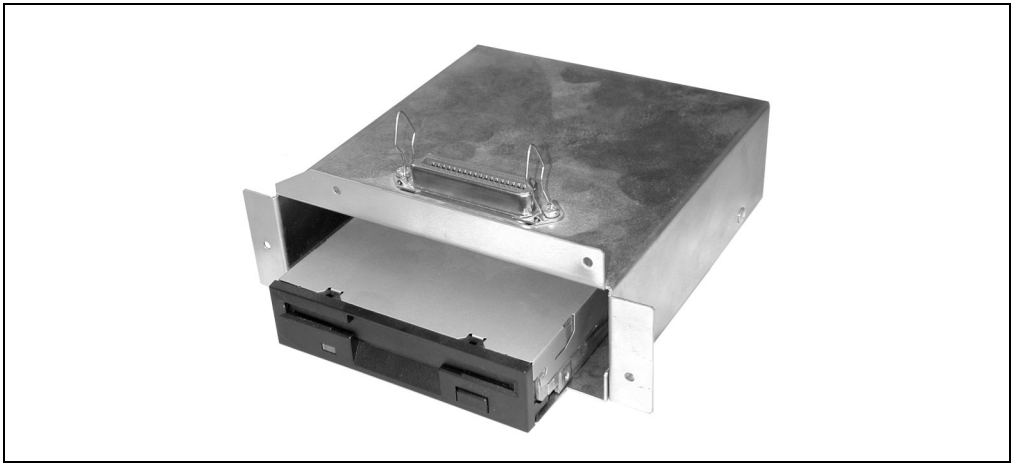


Figure 20: Figure 5A5600.03

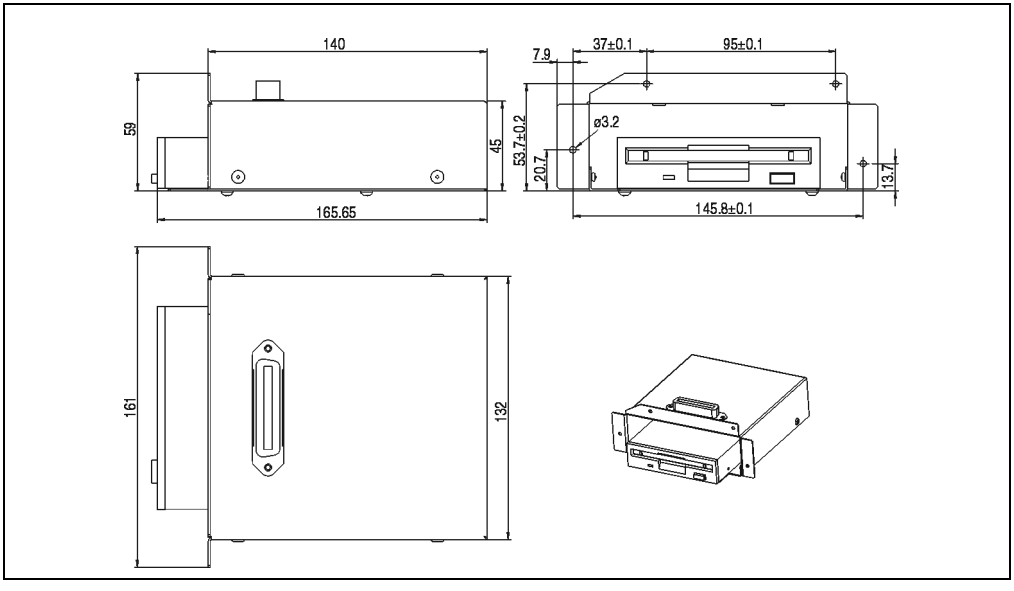


Figure 21: FDD Dimensions, 5A5600.03

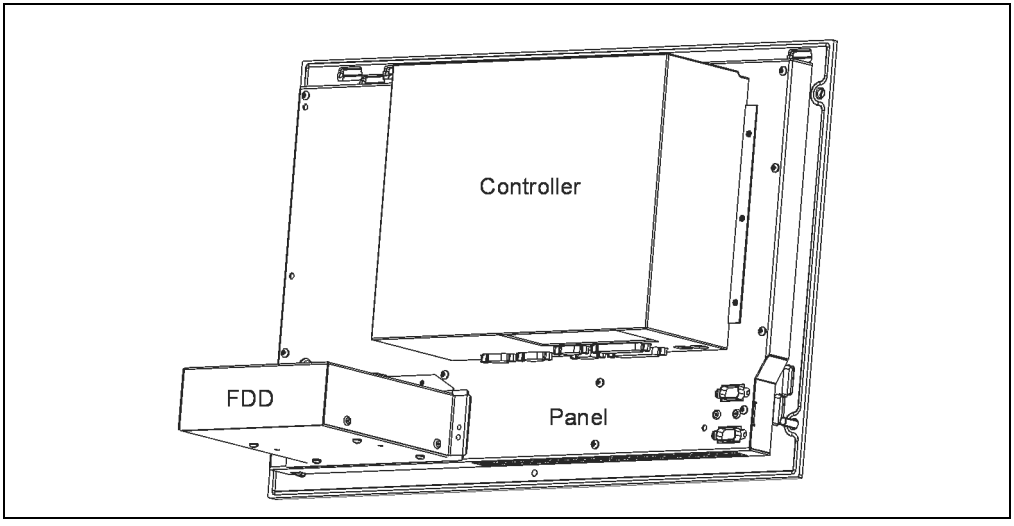


Figure 22: Mounting example of an FDD 5A5600.03 with controller on a panel

The connection is made using a standard Centronics cable via a 25 pin DSUB socket. B&R offers a separate 50 cm long connection cable (order no. 5A5601.01) for mounting the FDD (as shown in Figure 22). A longer 1.8 m cable is also available (model no: 9A9005.01).

6.3.1 Mounting Guidelines for the 5A5600.03 Controller

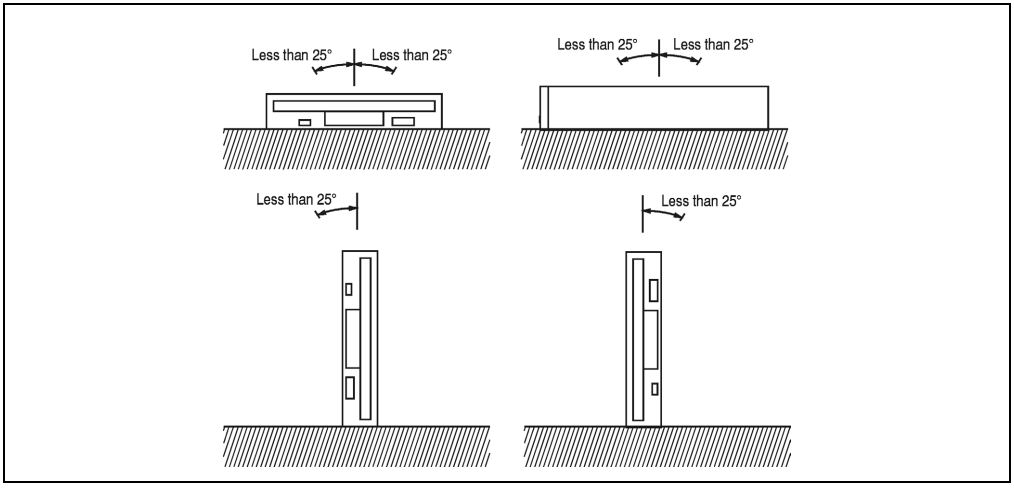


Figure 23: Mounting guidelines for the 5A5600.03 controller

6.3.2 Technical Data for the 5A5600.03 Controller

5A5600.03	
Disk Drive	3.5" drive 1.44 MB data carrier
Color	Black
Driver	Not required
Operating Temperature Relative Humidity	 4 - 51.7 °C 20 - 80%, (non-condensing)
Storage Temperature Relative Humidity	 -22 to +60 °C 5 - 90 %, (non-condensing)
Vibration Operating Storage	 Max. 1.5 G at 10 - 100 Hz, 1 octave/min Max. 1 G at 100 - 200 Hz, 1 octave/min Max. 0.5 G at 200 - 600 Hz, 1 octave/min No information available
Shock Operating Storage	 Read/write max. 5 G for 11 ms (half sine wave) (written) max. 10 G for 11 ms (half sine wave) No information available

Table 35: Technical data for the 5A5600.03 controller

6.4 5A5600.04

Figure 24: 5A5600.04 level with a display unit 5D560x.0x

The figure shows the 5A5600.04 controller in a level type of installation with a 5D560x.0x display unit.

6.4.1 Mounting Guidelines for the 5A5600.04 Controller

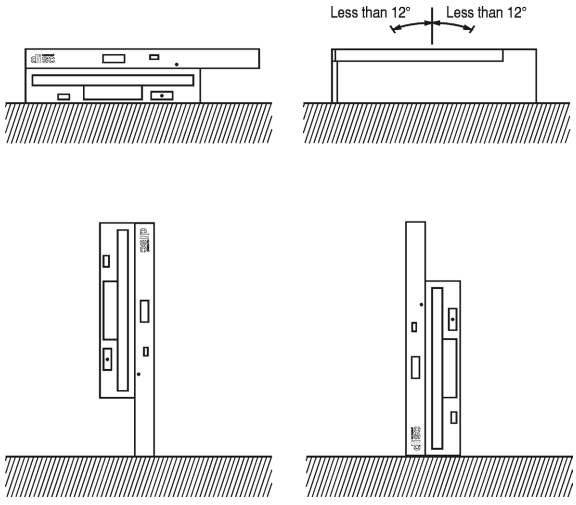


Figure 25: Mounting guidelines for the 5A5600.04 controller

6.4.2 Technical Data for the 5A5600.04 Controller

5A5600.04	
LS -120	3.5" drive 1.44 MB / 120 MB disks
CD-ROM drive	24x
Color	Beige
Driver	Found on the Provit Drivers & Utilities CD-ROM 5S0000.01-090 or can be downloaded directly from B&R's homepage (www.br-automation.com)
Operating Temperature Relative Humidity	 5 - 45 °C 20 - 80%, (non-condensing)
Storage Temperature Relative Humidity	 -20 to +60 °C 8 - 90 %, (non-condensing)
Vibration Operating Storage	 Max. 0.25 G at 10 -500 Hz, 1 octave/min Max. 2 G at 10 -500 Hz, 1 octave/min
Shock Operating Storage	 5 G for 11 ms (half sine wave) 60 G for 11 ms (half sine wave)

Table 36: Technical data for the 5A5600.04 controller

6.5 5A5600.05

Figure 26: 5A5600.05 level with a display unit 5D560x.0x

The figure shows the 5A5600.05 controller in a level type of installation with a 5D560x.0x display unit.

6.5.1 Mounting Methods for the 5A5600.05 Controller

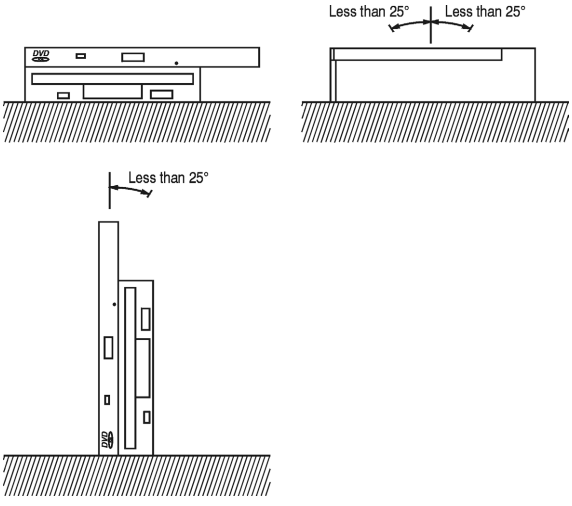


Figure 27: Mounting guidelines for the 5A5600.05 controller

6.5.2 Technical Data for the 5A5600.05 Controller

5A5600.05	
Floppy Drive	3.5" drive 1.44 MB data carrier
DVD Drive	8x DVD read, 24x CD read

Table 37: Technical data for the 5A5600.05 controller

5A5600.05	
Color	Black
Driver	Found on the Provit Drivers & Utilities CD-ROM 5S0000.01-090 or can be downloaded directly from B&R's homepage (www.br-automation.com).
Operating Temperature Relative Humidity	 5 - 51.7 °C 20 - 80%, (non-condensing)
Storage Temperature Relative Humidity	 -22 to +60 °C 5 - 90 %, (non-condensing)
Vibration Operating DVD Drive Storage	 Max. 0.2 G at 5 - 500 Hz, 1 octave/min Max. 2 G at 5 - 500 Hz, 1 octave/min
Shock Operating DVD Drive Storage	 Max. 5 G for 11 ms (half sine wave) Max. 60 G for 11 ms (half sine wave)

Table 37: Technical data for the 5A5600.05 controller

6.6 5A5600.07

Figure 28: 5A5600.07 level with a display unit 5D560x.0x

The figure shows the 5A5600.07 controller in a level type of installation with a 5D560x.0x display unit.

6.6.1 Mounting Methods for the 5A5600.07 Controller

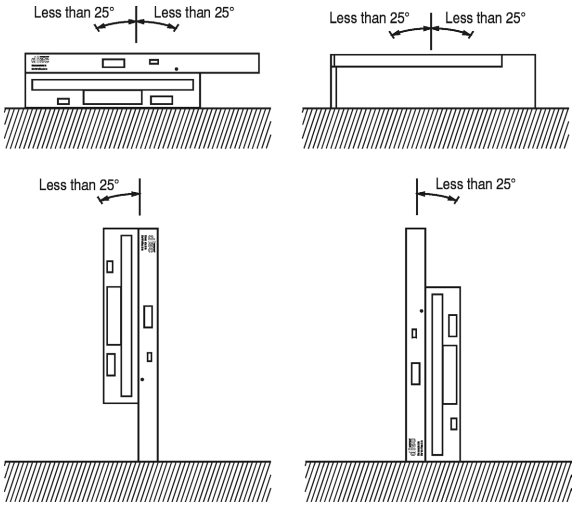


Figure 29: Mounting guidelines for the 5A5600.07 controller

6.6.2 Technical Data for the 5A5600.07 Controller

5A5600.07	
Disk Drive	3.5" drive 1.44 MB data carrier
CD-RW drive	See technical data for the CD - RW drive (Table 39 on page 68)
Color	Black
Driver	Found on the Provit Drivers & Utilities CD-ROM 5S0000.01-090 or can be downloaded directly from B&R's homepage (www.br-automation.com)
Operating Temperature Relative Humidity	 5 - 45 °C 20 - 80%, (non-condensing)
Storage Temperature Relative Humidity	 -22 to +60 °C 5 -90 %, (non-condensing)
Vibration Operating CD RW Drive Storage	 Max. 0.2 G at 5 - 500 Hz, 1 octave/min Max. 2 G at 5 - 500 Hz, 1 octave/min
Shock Operating CD RW Drive Storage	 Max. 5 G for 11 ms (half sine wave) Max. 60 G for 11 ms (half sine wave)

Table 38: Technical data for the 5A5600.05 controller

Technical Data for the CD-RW Drive	
Recording Rate	Recordable: 4x and 2x Rewriteable: 4x and 2x
Reading Rate	24x
CDs to be used	CD-DA, CD-ROM (Mode 1), CD-ROM XA Mode 2 (Form 1, Form 2), Photo CD (Multisession) CD-I, Video CD, CD Extra (CD Plus)
Recording Technique	Disc at once, session at once, track at once, packet write
CD Diameter	12 cm, 8 cm
Rotation Rate (24 x CAV)	5.090 min^{-1} (rpm)
Interface	IDE / ATAPI
Data Transfer Rate (asynchronous transfer)	Continual Access: 3.6 MB/s max. (tracks limit) 3.7 MB/s (average rate)
Access Time	Typically 110 ms
Data Buffer Capacity	2 MB
Charge Mechanism	Drawer Procedure
Power Consumption	Standby: 0.35 Watt Write 4x: 3.5 Watt
MTBF	60,000 POH

Table 39: Technical data for the CD-RW drive

6.7 Drive Combinations

The following statements refer to B&R's product range at the time this manual went to print. Naturally it is also possible to use further drives in other combinations resulting from changes to the product range or modification of hardware components. Information regarding this can be received directly from B&R.

Since the IPC5600/5600C driver can also be operated remotely by the controller (e.g. in the display unit), the following configuration options arise:

Combinations	Location
Floppy Disk Drive 5A5600.01	In the IPC5600/5600C
Floppy Disk Drive 5A5600.03	External (e.g. in a display unit)
FDD / CD-ROM Unit 5A5600.02	In the IPC5600/5600C
LS120 / CD-ROM Unit 5A5600.04	In the IPC5600/5600C
FDD / DVD Unit 5A5600.05	In the IPC5600/5600C
ZIP 250 / CD-ROM Unit 5A5600.06	In the IPC5600/5600C
FDD / CD-RW Unit 5A5600.07	In the IPC5600/5600C
Floppy Disk Drive 5A5600.03 FDD / CD-ROM Unit 5A5600.02	External (e.g. in a display unit) In the IPC5600/5600C
Floppy Disk Drive 5A5600.03 LS120 / CD-ROM Unit 5A5600.04	External (e.g. in a display unit) In the IPC5600/5600C
Floppy Disk Drive 5A5600.01 Floppy Disk Drive 5A5600.03	In the IPC5600/5600C External (e.g. in a display unit)
Floppy Disk Drive 5A5600.03 FDD / DVD Unit 5A5600.05	External (e.g. in a display unit) In the IPC5600/5600C
Floppy Disk Drive 5A5600.03 ZIP 250 / CD-ROM Unit 5A5600.06	External (e.g. in a display unit) In the IPC5600/5600C
Floppy Disk Drive 5A5600.03 FDD / CD-RW Unit 5A5600.07	External (e.g. in a display unit) In the IPC5600/5600C

Table 40: Combination options for Provit 5600 IPC drives

Connection to the controller is made via the external floppy disk drive interface for those versions whose floppy disk drives are operated remotely by the controller (e.g. in the display unit).

The maximum distance allowed between controller and display is 1.8 m with FDD remote operation (e.g. as a Panel FDD)

6.8 Operation of 3.5" Floppy Disk Drive

Combinations	Location
Floppy Disk Drive 5A5600.01	In the IPC5600
Floppy Disk Drive 5A5600.03	External (e.g. in a display unit)
FDD / CD-ROM Unit 5A5600.02	FDD and CD-ROM in the IPC5600
Floppy Disk Drive 5A5600.03 FDD / CD-ROM Unit 5A5600.02	External (e.g. in a display unit) In the IPC5600
Floppy Disk Drive 5A5600.01 Floppy Disk Drive 5A5600.03	In the IPC5600 External (e.g. in a display unit)
Floppy Disk Drive 5A5600.03 FDD / DVD Unit 5A5600.05	External (e.g. in a display unit) In the IPC5600/5600C
Floppy Disk Drive 5A5600.03 ZIP 250 / CD-ROM Unit 5A5600.06	External (e.g. in a display unit) In the IPC5600/5600C
Floppy Disk Drive 5A5600.03 FDD / CD-RW Unit 5A5600.07	External (e.g. in a display unit) In the IPC5600/5600C

Table 41: Operation of floppy disk drive

When using FDD's, please note that the drive on the external FDD is designated as drive A - as only drive A is bootable.

However if only one floppy disk drive is available (installed in the IPC), then it is not possible to boot from this one, because it is operating as drive B. Therefore a second, physically non-existent drive must be registered in BIOS (see section "Standard CMOS Setup") so that "Swap Floppy Drive" (see "BIOS Features Setup"), can be used to designate the internal drive as drive A, allowing it to be used for booting.

Parallel Operation from Two 3.5" Floppy Disk Drives

As shown in the above table, it is possible to operate two floppy disk drives simultaneously with the IPC5600/IPC5600C:

- One drive in the controller
- One drive on the interface for the external floppy disk drive

Normally drive designation A is assigned to the external floppy disk drive. In order to boot the floppy disk drive in the controller (e.g. during service work), the parameter "Swap Floppy Drive" must be switched to 'Enabled' (found under the menu item "BIOS Features Setup" in BIOS).

6.9 Operation of LS120 Drives

Combinations	Location
LS120 / CD-ROM unit 5A5600.04	LS120 and CD-ROM in the IPC5600
Floppy disk drive 5A5600.03 LS120 / CD-ROM unit 5A5600.04	External (e.g. in a display unit) In the IPC5600

Table 42: LS120 drive combination options

Note: In the IPC5600/IPC5600C, BIOS enables the LS120 drives (which are actually IDE devices e.g. CD-ROM drives) to operate like a floppy disk drive (drive letter A or B). However, it is only possible to use standard diskettes (360 KB, 720 KB, 1.44 MB) with the LS120 drive. The option to work with special 120 MB diskettes is not a built-in feature of BIOS and must be supported by the operating system.

If a LS120 drive is operated without a second floppy disk drive (in BIOS "Floppy A = None" and "Floppy B = None"), see section "Standard CMOS Setup", then it can be accessed as the A drive and therefore can also be booted.

If another additional floppy disk drive is being used (parallel to the LS120 drive) to the external floppy disk drive interface, then the floppy disk drive is operated as drive A and the LS120 drive is operated as drive B. In this case, the expression "LS/Zip" (found in BIOS under the menu item "BIOS Features Setup") must be first in the "Boot Sequence" parameter so that the LS120 drive can be used for booting .

6.10 BIOS Settings for Booting an IPC5600/5600C with Different Peripheral Devices

From the internal floppy disk drive	
Drive A	1.4 M, 3.5"
Drive B	1.4 M, 3.5"
Boot Sequence	A, C, SCSI
Swap Floppy Drive	Enabled
On-Chip Secondary IDE	*Settings are irrelevant for this configuration..*
From the internal CD-ROM drive	
Drive A	*Settings are irrelevant for this configuration..*
Drive B	*Settings are irrelevant for this configuration..*
Boot Sequence	CD-ROM, C, A
Swap Floppy Drive	*Settings are irrelevant for this configuration..*
On-Chip Secondary IDE	Enabled
From the internal LS-120 drive	
Drive A	*Settings are irrelevant for this configuration..*
Drive B	None
Boot Sequence	LS/ZIP, C
Swap Floppy Drive	*Settings are irrelevant for this configuration..*
On-Chip Secondary IDE	Enabled
From the external floppy disk drive	
Drive A	1.4 M, 3.5"
Drive B	None
Boot Sequence	A, C, SCSI
Swap Floppy Drive	Enabled
On-Chip Secondary IDE	*Settings are irrelevant for this configuration..*
From the internal floppy disk drive (=Drive A) with external floppy disk drive (= Drive B)	
Drive A	1.4 M, 3.5"
Drive B	1.4 M, 3.5"
Boot Sequence	A, C, SCSI
Swap Floppy Drive	Enabled
On-Chip Secondary IDE	*Settings are irrelevant for this configuration..*
From the external floppy disk drive (=Drive A) with internal floppy disk drive (=Drive B)	
Drive A	1.4 M, 3.5"
Drive B	1.4 M, 3.5"
Boot Sequence	A, C, SCSI
Swap Floppy Drive	Disabled
On-Chip Secondary IDE	*Settings are irrelevant for this configuration..*

Table 43: BIOS settings for booting an IPC5600/5600C with different peripheral devices

6.11 Installation Guidelines

There are three options available for installing drives, with the IPC5600/IPC5600C (local operation requires the display and controller to be connected):

- Drives accessible from the back of the controller, level with the back

Figure 30: Drives accessible from the back of the controller

When installing an LS120 / CD-ROM unit 5A5600.04 and ZIP 250 / CD-ROM unit 5A5600.06, it is not possible to install this level with the back of a 4 slot Provit 5600 bus unit (5C5600.01 and 5C5600.02) and 5 slot bus unit (5C5600.03 and 5C5600.04). It is only possible to install level with the back when using a 6 slot Provit 5600 bus unit (5C5600.11 and 5C5600.12).

- Drives accessible from the front, level with the front of the controller

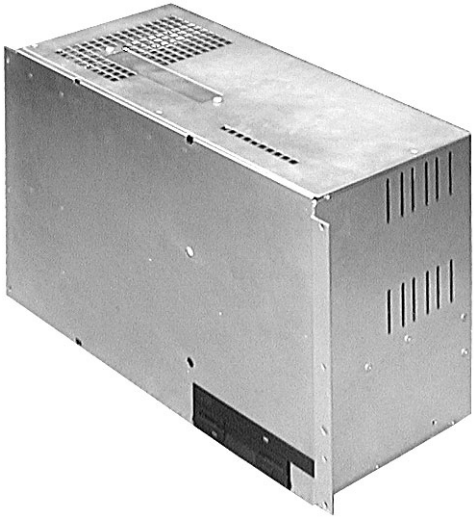


Figure 31: Drives accessible from the front of the IPC, level with the front of the controller

When installing an LS120 / CD-ROM unit 5A5600.04 and ZIP 250 / CD-ROM unit 5A5600.06, it is not possible to install this level with the back of a 4 slot Provit 5600 bus unit (5C5600.01 and 5C5600.02) and 5 slot bus unit (5C5600.03 and 5C5600.04). It is only possible to install level with the back when using a 6 slot Provit 5600 bus unit (5C5600.11 and 5C5600.12).

- Drives accessible from the front, level with the front of the display (with standard installation)

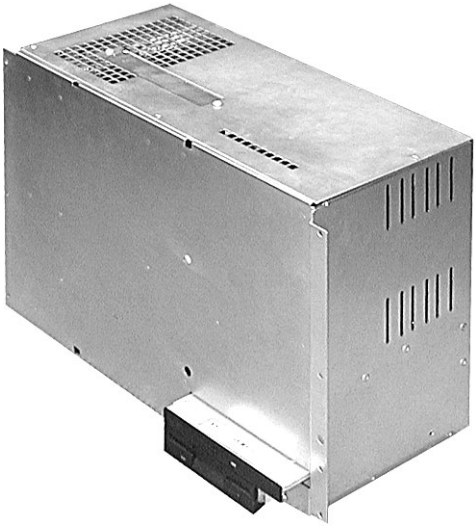


Figure 32: Drives accessible from the front of the IPC, level with the front of the display unit

6.12 Modification Instructions

Drives are installed before delivery according to the customer's wishes. However if it should be necessary to make modifications, an easy step by step instruction follows:

a) Opening the housing

Remove the marked screws and detach the cover

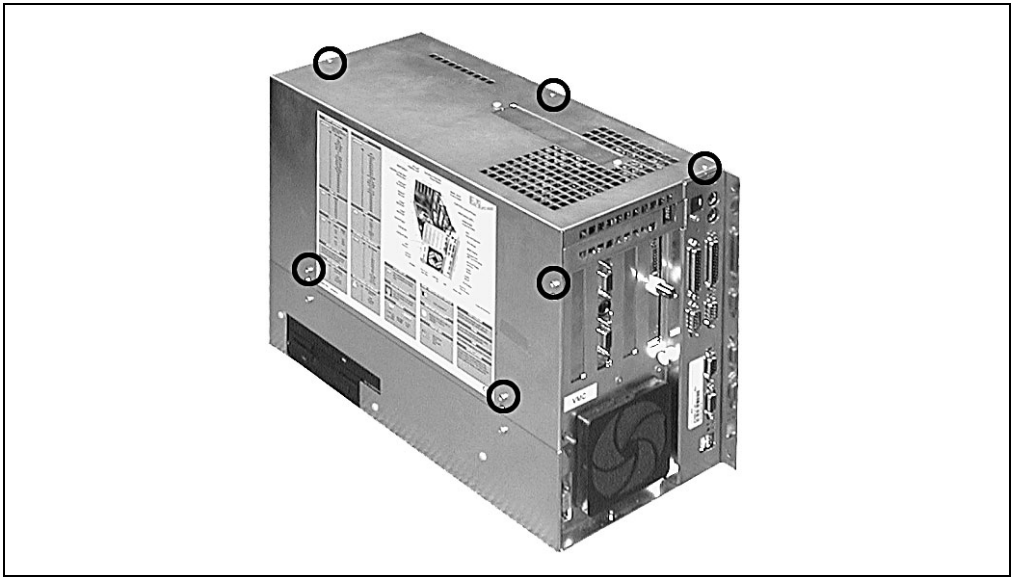


Figure 33: Opening the housing

b) Removing the bus unit

Remove the marked screws. The bus unit is now only connected to the system unit by the connector and the safety pins (white) marked.

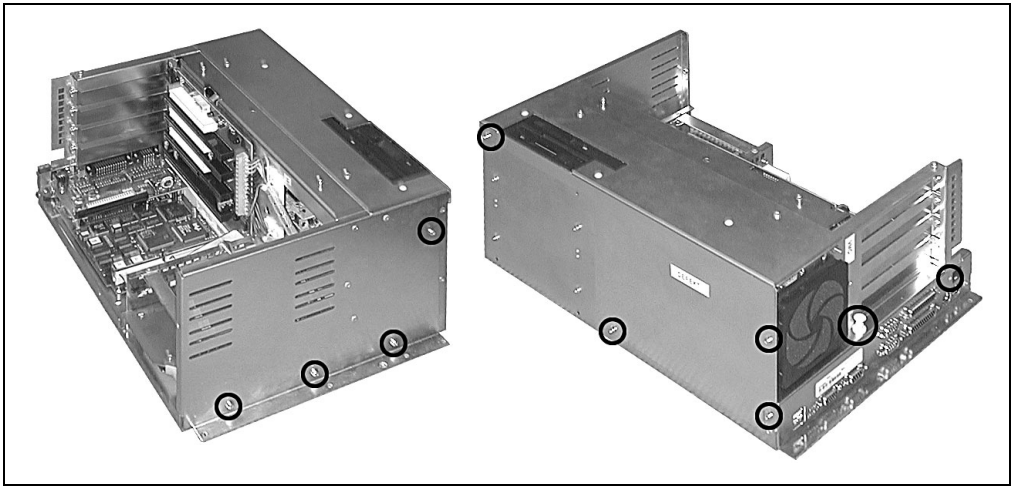


Figure 34: Removing the screws

The bus unit can now be detached.

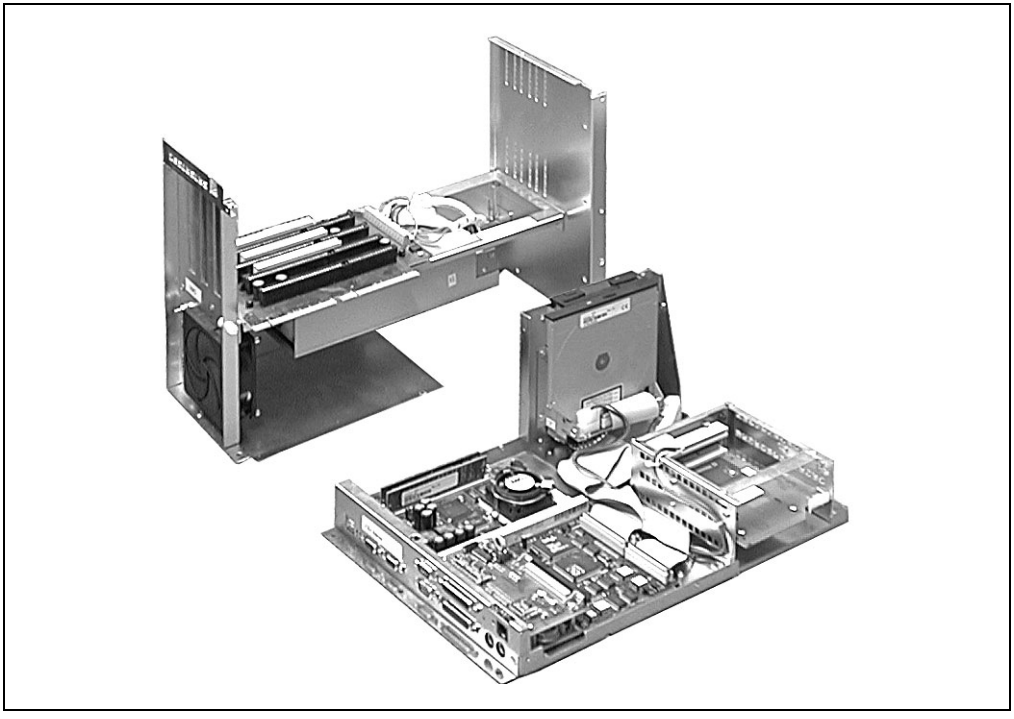


Figure 35: Detaching the bus unit

The bus unit (in the background) is not required for the remainder of the process.

c) Detaching the drive

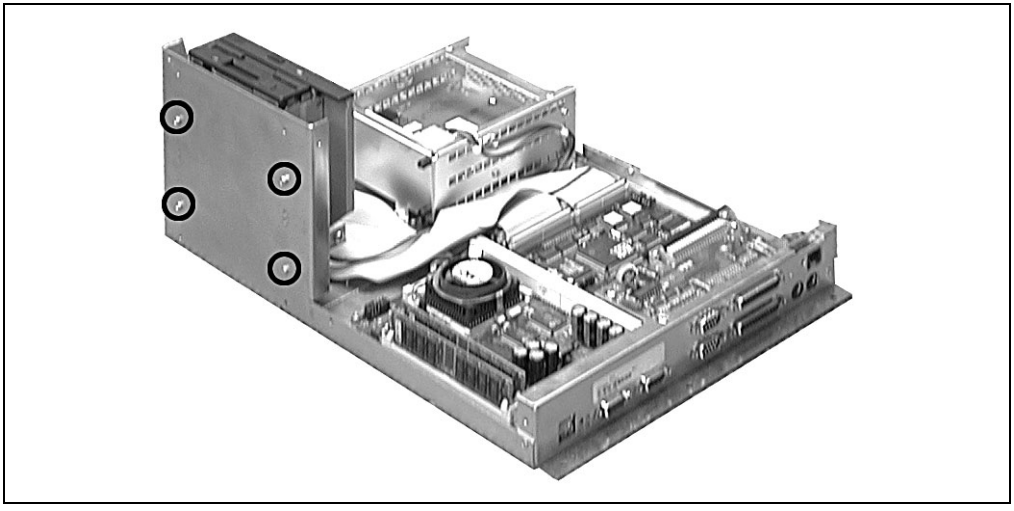


Figure 36: Detaching the drive

The drive can be detached from the mounting frame by removing the marked screws.

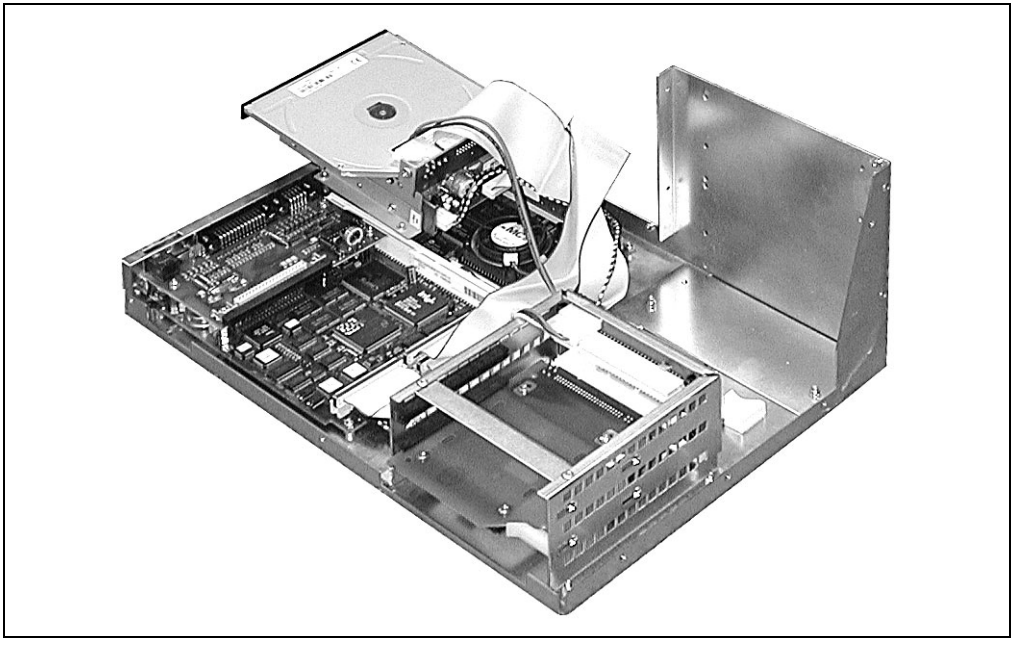


Figure 37: Detaching the drive

d) Reinstalling the drive

Depending on whether the drive with your IPC is accessible from the front or the back, you must now remove or install a cover plate on the "opposite side", so that the unnecessary opening of the housing is now closed. The drive can then be reinstalled on the mounting frame in the desired alignment.

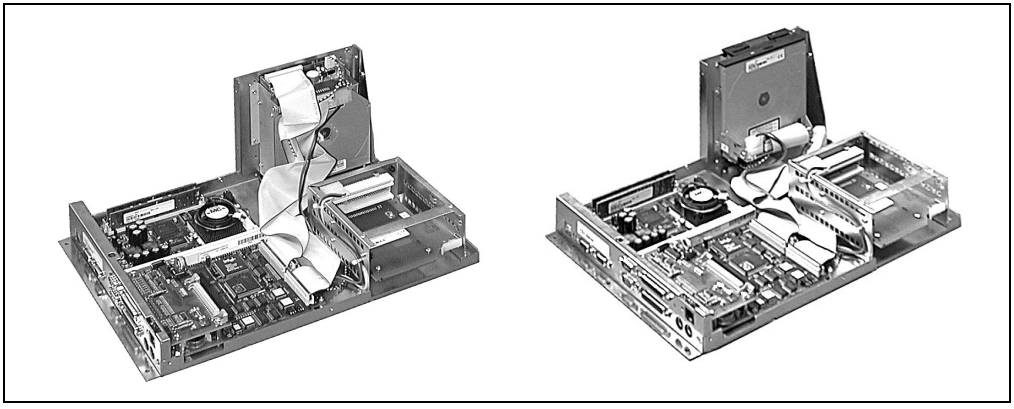


Figure 38: Aligning the drive to the front or the back

If the drives are accessible from the front of the IPC, they can be installed either level with the front of the controller or level with the front of a mounted display.

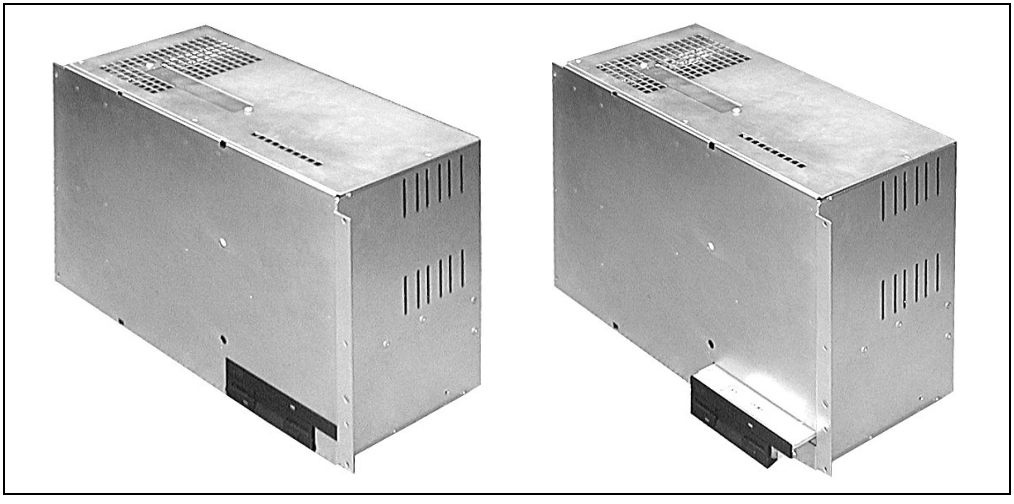


Figure 39: Mounting options

To reassemble your IPC, carry out the above steps in reverse.

7. System Unit with Socket 7 (ZIF)

7.1 General Information

This section refers to the following system units:

Controller	System Units
IPC5000	5C5001.01, 5C5001.03
IPC5600	5C5601.01

Table 44: System unit with socket 7 (ZIF)

The system unit is integrated into the lower housing with the mainboard and all peripheral interfaces:

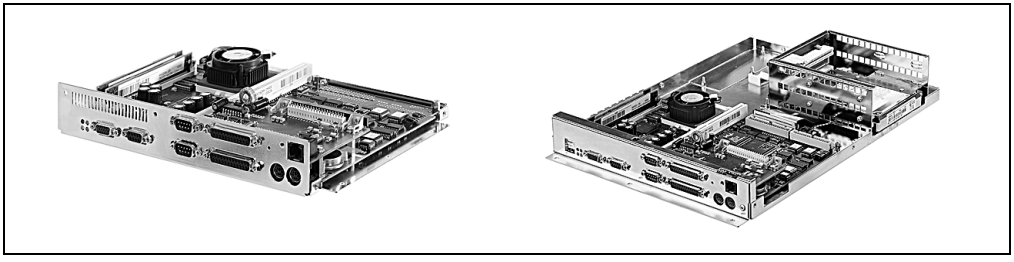


Figure 40: System units 5C5001.01 / 5C5001.03 (left) and 5C5601.01 (right)

7.2 Technical Data

Controller	IPC5000		IPC5600
System Units	5C5001.01	5C5001.03	5C5601.01
Mainboard General Information	Real-time clock [1)] CMOS backup in the FlashPROM Temperature monitoring (CPU, I/O, display unit)		
Math Processor	Integrated in the processor, no socket		
BIOS	AWARD Elite BIOS, Plug and Play compatible		
Chipset	Intel 430HX		
Processor Socket	ZIF socket 7		
DRAM	2 x PS/2 SIMM, EDO or FPM [2)] Max. 128 MB		
2nd Level Cache	512 KB pipeline burst [3)]		

Table 45: Technical data for system units with socket 7 (ZIF)

Controller	IPC5000		IPC5600
Interfaces COM1 COM2 LPT1 USB Panelware Keyboard Mouse External Disk Drive	 RS232, 16 Byte FIFO RS232, 16 Byte FIFO SPP, EPP and ECP modes 2 USB ports[4)] Up to 8 Panelware keypad modules (daisy chained) Enhanced AT PS/2 PS/2 Yes		
VGA Controller	Chips & Technologies C&T65550 [5)]		
Graphic Memory	1 MB	2 MB	2 MB
Interfaces	FPD (Panellink) + CRT (15 pin VGA DSUB connector)		
Hard Disk / Silicon Disk Slots	1		2

Table 45: Technical data for system units (cont.)with socket 7 (ZIF)

1) The quartz used with the IPC has an accuracy of 10 ppm. This means after influences such as operating temperature and wiring of the quartz have been taken into account, the inaccuracy is typically 2 seconds per day.
2) When using SIMM modules with an operating voltage of 3.3 V and 5 V respectively.
3) Only the 256 KB L2 cache is available for IPCs with a revision number ≤34.03.
4) Only for system units with revision ≤34.03; otherwise not available
5) The VGA controller C&T65548 with 1 MB graphic memory is used for system unit 5C5001.01 with a revision number ≤21.01.

7.3 Mainboard

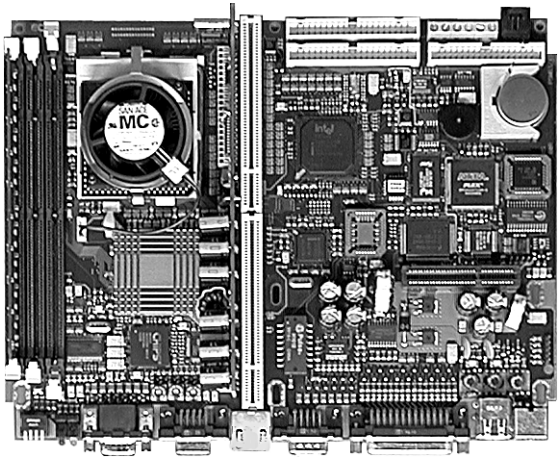


Figure 41: Mainboard of system units 5C5001.01, 5C5001.03 and 5C5601.01

All of the IPC's basic functions are implemented on the mainboard. Basically, these are:

- Processor socket
- Chipset
- 2nd level cache
- DRAM socket
- Plug for the bus unit (power supply, ISA, PCI und IDE buses)
- Super I/O controller (COM1, COM2, LPT1, external FDD interface, PS/2 mouse, keyboard controller, USB interfaces, system clock)
- VGA controller (with CRT and FPD connection)
- Status LEDs
- Battery
- Reset button
- Recovery mode jumper
- MTC maintenance controller (Panelware module operation, keyboard operation, Panellink FPD interface, temperature monitoring with fan control)

Components listed out here are described in detail in the following sections.

7.4 Processor Socket

The following processors can be used in the system units listed:

Processor Type	Intel Pentium	Intel Pentium MMX	AMD K6
System Units	5C5001.01, 5C5001.03, 5C5601.01		
Clock Frequency [MHz]	100 / 120 / 133 / 150 / 166 / 200	200	166 / 266
1st Level Cache	2 x 8 KB	2 x 16 KB	2 x 32 KB
Socket	Socket 7 (ZIF socket)		

Table 46: Processors to be used

Processors can only be ordered from B&R together with a corresponding system unit and vice versa. All system units supplied by B&R are therefore equipped with a processor. All installation and setting work takes place at B&R. If processors are used which have not been supplied by B&R, the warranty claim is then void.

7.5 Jumper Settings

Jumper settings for system units 5C5002.02, 5C5001.03 and 5C5601.01 can be made in the following places on the mainboard:

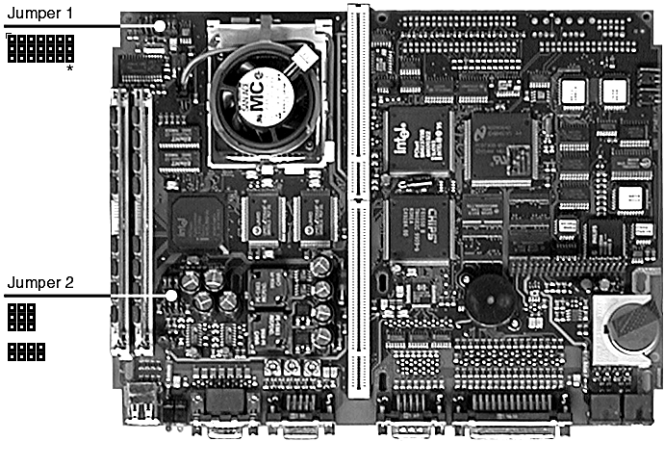


Figure 42: Jumper settings on mainboards with Socket 7 (ZIF)

Jumper 1: Processor clock frequency

Jumper 2: Processor supply voltage

The pins marked with * on the IPC5000 jumpers below (jumper 1) are only available with system units with a revision number starting from 44.04. They are only relevant when using an AMD K6 266 processor.

The correct jumper settings for the processor used are made by B&R. If the jumper settings are changed, the warranty claim is then void.

Setting the Processor Clock Frequency (jumper 1):

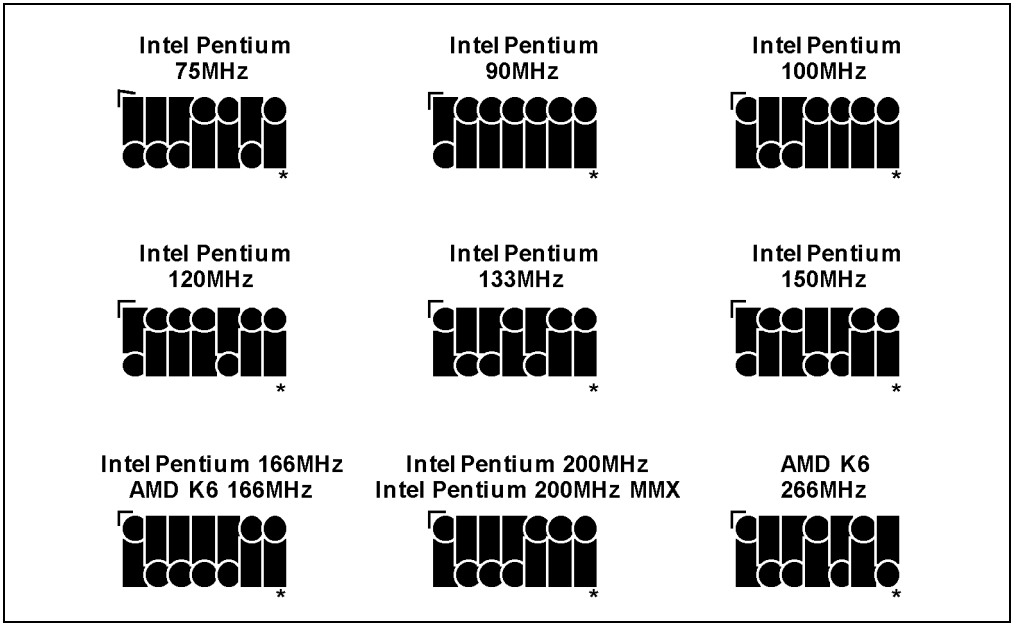


Figure 43: Setting the processor clock frequency (jumper 1):

* With the IPC5000, only in system units with revision numbers starting from 44.04, otherwise not available.

The defined clock frequency is not permitted to exceed the actual frequency specified for the processor.

Setting the Processor Power Supply Voltage (Jumper 2):

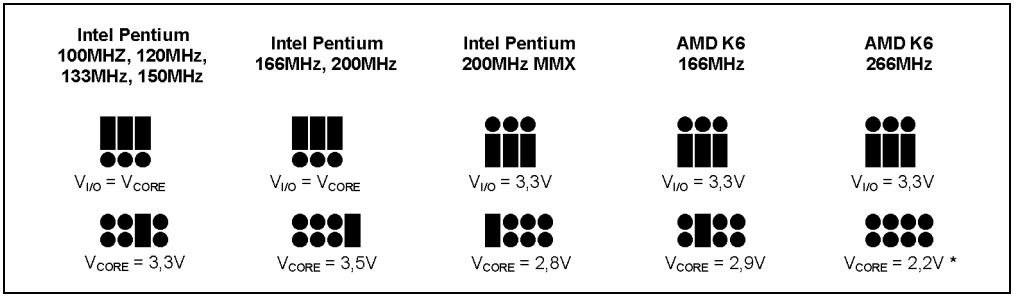


Figure 44: Setting the processor power supply voltage (jumper 2)

* With the IPC5000, only for system units with revision numbers starting from 44.04, otherwise 2.5 V.

7.6 DRAM Socket

System Units	Chipset	Socket	Installation	Remark
5C5001.01 5C5001.03 5C5601.01	Intel 430HX	2x PS/2 SIMM FPM or EDO	Max. 128 MB	When using the IPC5000, the SIMM modules are only allowed to be a maximum 29.5 mm high.

Table 47: DRAM socket

For detailed information about memory modules, see "Main Memory".

It is possible to alter the operating voltage of SIMM modules using a jumper, for the following system units:

System Unit	Starting with revision number
5C5001.01	44.04
5C5001.03	44.04
5C5601.01	20.00

Table 48: Altering the operating voltage for SIMM modules

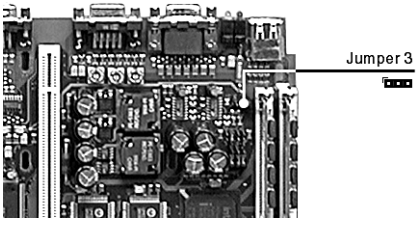


Figure 45: Location of the jumpers for DRAM operating voltage

Settings:

	Jumper	Connection	DRAM Operating Voltage
Jumper 3 	1	1 - 2	3.3 V
		2 - 3	5 V (default setting)

Table 49: Jumper settings for DRAM operating voltage

7.7 Serial Interfaces COM1and COM2

There are two PC compatible serial interfaces with a 16 byte FIFO on the mainboard. They are UART16550 and Plug & Play compatible.

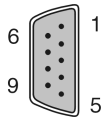
Serial interfaces COM1, COM2		
RS232 interface Not electrically isolated Up to 115 kBaud		9 pin DSUB connector 
Pin	**Assignment**	
1	DCD	
2	RXD	
3	TXD	
4	DTR	
5	GND	
6	DSR	
7	RTS	
8	CTS	
9	RI	

Table 50: Pin assignment COM1 and COM2

Default Settings	COM1	COM2
Interrupt	4	3
I/O Address	3F8h - 3FFh	2F8h - 2FFh

Table 51: Standard settings for COM1 and COM1

To change these settings, see the "BIOS Settings" section in Chapter 6 "Software".

7.8 Parallel Interface LPT1

The parallel interface LPT1 is a 25 pin DSUB socket. It supports EPP and ECP operating modes (Plug & Play compatible) as well as the standard SPP mode.

Parallel Interface LPT1			
Pin	**Assignment**	**Pin**	**Assignment**
1	Data Strobe	14	Autofeed
2	Data 0	15	Error
3	Data 1	16	Printer Init
4	Data 2	17	Printer Select Input
5	Data 3	18	GND
6	Data 4	19	GND
7	Data 5	20	GND
8	Data 6	21	GND
9	Data 7	22	GND
10	Acknowledge	23	GND
11	Busy	24	GND
12	Paper End	25	GND
13	Printer Select Status		

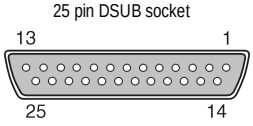


Table 52: Pin assignments LPT1

Default Settings	LPT1
Interrupt	7
I/O Address	378h - 37Fh

Table 53: Standard settings for LPT1

To change these settings, see the "BIOS settings" section in Chapter 6 "Software".

Note: Provit IPC parallel interfaces are equipped with a protective circuit in order to conform with requirements for operating in industrial environments. This can possibly lead to limitations in regard to the maximum transfer rate.

7.9 Interface for External Floppy Disk Drive

An external floppy disk drive can be connected to the 25 pin DSUB socket.

It is not possible to operate a second parallel device on this interface (LPT)

Interface for External Disk Drive			
Pin	**Assignment**	**Pin**	**Assignment**
1	n.c.	14	Density
2	Index	15	Side Select
3	Track 0	16	Direction
4	Write Protect	17	Step
5	Read Data	18	GND
6	Disk. Chan.	19	GND
7	n.c.	20	GND
8	n.c.	21	GND
9	+5 V	22	GND
10	Drive Select	23	GND
11	Motor on	24	GND
12	Write Data	25	GND
13	Write Gate		

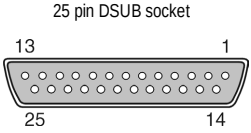


Table 54: Pin assignment interface for external floppy disk drive

Setting	LPT1
Interrupt	6
I/O Address	3F0h - 3F7h

Table 55: Standard settings for the external floppy disk drive interface

These settings cannot be changed.

Because of general PC specifications, this interface should be handled with extreme care with regard to EMC, location of cables etc. It should therefore only be used for service.

7.10 USB Interface

All Provit 5000 system units (for IPC5000 only with a revision number starting from 34.03) have a USB (Universal Serial Bus) host controller with USB ports:

Figure 46: USB ports (5C5001.01, 5C5001.03 and 5C5601.01)

Because of general PC specifications this interface should be handled with extreme care with regard to EMC, location of cables etc.

7.11 AT Keyboard Connection (PS/2)

A PS/2 socket is used to connect an external AT keyboard. The external AT keyboard works parallel with connected Panelware keypad modules. The keyboard interface is operated by the MTC.

An external AT keyboard is available from B&R (see Chapter 7 "Accessories").

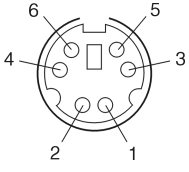
External AT Keyboard Connection (PS/2)		
Pin	Assignment	PS/2 socket
1	KBDATA	
2		
3	GND	
4	+5 V	
5	KBCLK	
6		

Table 56: External AT keyboard connection (PS/2)

Setting	PS/2 Keyboard
Interrupt	1
I/O Address	060h - 06Fh

Table 57: Standard settings for the AT keyboard interface

These settings cannot be changed.

Because of general PC specifications, this interface should be handled with extreme care with regard to EMC, location of cables etc. Therefore, it should be only used for service.

Make sure the connections for the PS/2 keyboard and PS/2 mouse are not swapped.

No device is allowed to be connected, which uses the PS/2 keyboard supply as a power source.

7.12 Mouse Connection (PS/2)

On the mainboard, an interface for connecting a standard PS/2 mouse is provided. This can be activated in BIOS in the BIOS Features Setup menu (see the "BIOS Features Setup" section).

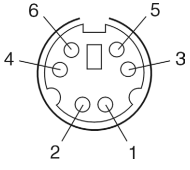
Mouse Connection (PS/2)		
Pin	Assignment	PS/2 socket 
1	Mouse Data	
2		
3	GND	
4	+5 V	
5	Mouse CLK	
6		

Table 58: Mouse connection (PS/2)

Setting	PS/2 Keyboard
Interrupt	12
I/O Address	-

Table 59: Standard settings for mouse interface (PS/2)

These settings cannot be changed.

Because of general PC specifications, this interface should be handled with extreme care with regard to EMC, location of cables etc. Therefore, it should be only used for service.

Make sure the connections for the PS/2 keyboard and PS/2 mouse are not swapped.

No device is allowed to be connected that uses the PS/2 keyboard supply as a power source.

7.13 VGA Controller

Controller	Provit 5000		Provit 5600
System Unit	5C5001.01	5C5001.03	5C5601.01
Manufacturer	Chips & Technologies		
Model	C&T 65550 1)		C&T 65550
Graphic Memory	1MB	2MB	2MB
Interfaces	FPD (Panellink) + CRT (15 pin VGA DSUB)		FPD (Panellink) + CRT (15 pin VGA DSUB connector)

Table 60: VGA Controller

1) The VGA controller C&T65548 with 1 MB graphic memory is used for a 5C5001.01 system unit with a revision number ≤1.01.

The VGA controller is integrated onto the mainboard and offers high graphic performance through the connection with the PCI bus.

Outputs are available for two display devices:

7.13.1 FPD Connection:

A Provit 5000 flat display can be connected on this Panellink interface (see Chapter 3 "Display Units").

Data (e.g. the operating hours of the display) is also transmitted simultaneously via the Panellink cable.

FPD Interface		
Panellink		9 pin DSUB socket 9 5 6 1
Pin	**Assignment**	
1	GND	
2	TXC+ / RS485A	
3	TX0+ / VCC	
4	TX1+ / +12V	
5	TX2+ / GND	
6	TXC- / RS485B	
7	TX0- / VCC	
8	TX1- / +12V	
9	TX2- / GND	

Table 61: FPD interface pin assignments

7.13.2 CRT Connection:

An external monitor can be connected to this interface.

CRT Connection:				
Pin	**Assignment**	**Pin**	**Assignment**	15 pin DSUB socket 5 1 10 6 15 11
1	R	9	+5V	
2	G	10	GND	
3	B	11	n.c.	
4	n.c.	12	DDC Data	
5	GND	13	HSYNC	
6	GND	14	VSYNC	
7	GND	15	DDC CLK	
8	GND			

Table 62: Pin assignment connection for CRT:

The built-in graphic controller allows a flat display and an external monitor to be operated simultaneously. Settings in this regard can either be changed in BIOS under the menu item "Additional Peripherals" or with software, using a graphic driver (online help for the driver).

Simultaneous operation of a monitor is not possible with SXGA TFT displays and LCD displays.

Note: The corresponding C&T graphic driver for Windows 3.11/95/98/NT is available from B&R.

Display units developed for Provit 2000 series IPCs cannot be used together with a Provit 5000 series IPC.

7.13.3 Use of an External Graphic Card

It is possible to operate an external graphic card in a PCI slot on the mainboard. If such a card has been inserted, it is automatically recognized during the start-up procedure and the onboard VGA controller automatically switches itself off. It is not possible to manually switch the VGA controller on and off.

An external graphic card cannot be operated in an ISA slot.

By deactivating the onboard VGA controller, it is not possible to operate a display or monitor to the IPC's FPD and CRT interfaces using an external graphic card, as these are switched off.

7.13.4 Relationship between Resolution, Graphic Memory and Colors

The following table applies to all graphic controllers and display units. It should be noted that with high resolutions (XGA, SXGA), the number of colors is very limited.

Video Memory	Resolution	Pixels	Number of Colors
1MB	VGA	640 x 480	16 million (true color)
	SVGA	800 x 600	65535 (high color)
	XGA	1024 x 768	256
2MB	VGA	640 x 480	16 million (true color)
	SVGA	800 x 600	16 million (true color)
	XGA	1024 x 768	65535 (high color)
	SXGA	1280 x 1024	256

Table 63: Resolution, graphic memory and colors

7.14 Fuse

There is a fuse provided on the mainboard for the supply voltage to the PS/2 keyboard, PS/2 mouse and external floppy disk drive. It is accessible after opening the housing:

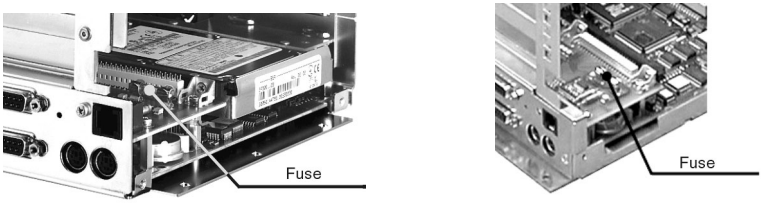


Figure 47: Fuse for IPC5000 (left) and IPC5600 (right)

Fuse	
Nominal Voltage	250V
Nominal Current	1A
Type	Time lag

Table 64: Fuse

7.15 Status LEDs

The IPCs 5000 and 5600 are equipped with four LEDs which are visible on the outside of the controller:

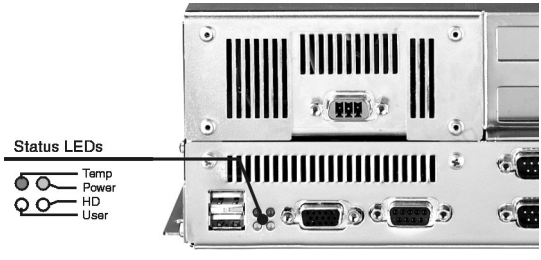


Figure 48: Status LEDs

LED	Function
Power	Supply voltage on the power supply is OK
User	Can be programmed by the user (see the section "MTC Function Libraries")
HDD	Signalized activity of the memory medium in the IDE slot.
Temp	Indicates over-temperature (see the "Temperature Monitoring with Fan Regulation" section)

Table 65: Status LEDs

There are four status LEDs built into the front of the Provit display unit 5D560x.0x. They have the same functions as those in the controller.

7.16 Battery

The battery compartment is accessible after opening the housing:

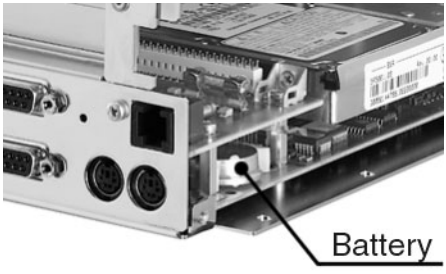


Figure 49: Battery compartment

The lithium battery (3 V, 950 mAh) keeps the CMOS memory and real-time clock running when the supply voltage for the IPC has been switched off. The buffer duration of the battery is at least 4 years (at 50 °C, 8.5 mA current requirements of the supplied components and a self discharge of 40%).

The battery status can be monitored by the maintenance controller using software.

7.17 Reset Button

The reset button is accessible through a small hole near the external floppy disk drive interface. In order to avoid accidental activation, a reset can only be triggered with a pointed object.

Figure 50: Reset Button

7.18 Recovery Jumper / User Jumper

The Recovery Jumper / User Jumper is easily accessible after opening the housing:

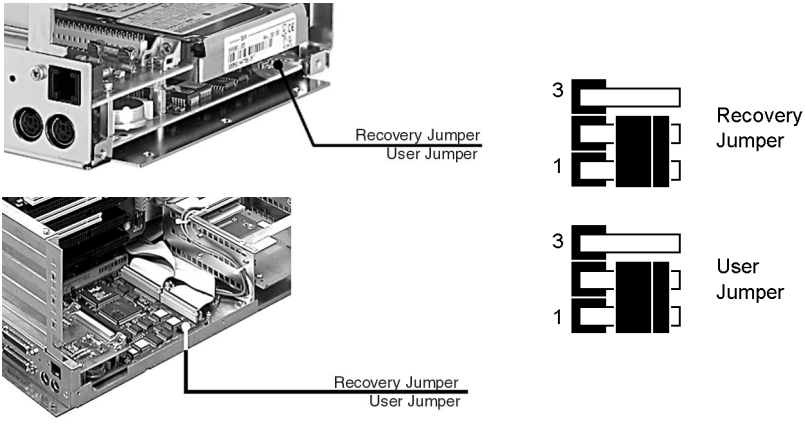


Figure 51: Recovery Jumper / User Jumper IPC5000 (above) and IPC5600 (below)

7.18.1 Recovery Jumper

Recovery mode is available to the user when the IPC can no longer be booted; due to either an error in BIOS or a damaged BIOS (e.g. power failure during the BIOS upgrade).

This BIOS mode can be activated by making the following jumper settings:

Connection	Function
1 - 2	Standard Mode
2 - 3	Recovery Mode

Table 66: Recovery Jumper

If the IPC has been switched to recovery mode, a special BIOS in the CMOS memory boot block is then used. This BIOS is permanently written by the manufacturer (Award) to the CMOS memory (cannot be modified) and initializes only those system components which are absolutely necessary for the execution of the upgrade.

When starting up in recovery mode, the operating system must be started from a bootable diskette, because no mass memory devices are initialized by BIOS.

After the IPC has been started in recovery mode, another fully functioning BIOS must be written using BIOS Upgrade Utilities (see the "BIOS Upgrade" section). After a successful upgrade, the IPC must be switched off and the recovery jumper returned to the standard setting. BIOS then boots again properly.

7.18.2 User Jumper

The user jumper is not required for setting system functions. It can be utilized by the user and evaluated using Provit 5000 Utilities (see section "Provit 5000 Utilities").

Connection	Function
1 - 2	Off (high)
2 - 3	On (low)

Table 67: User Jumper

7.19 Maintenance Controller (MTC)

The MTC is a standalone processor system, which provides additional functions that are not available with a "normal" PC. The MTC communicates with the PC via the ISA bus (using a couple register). The address can be stored under the menu item "Additional Peripherals" (see the "Additional Peripherals" section).

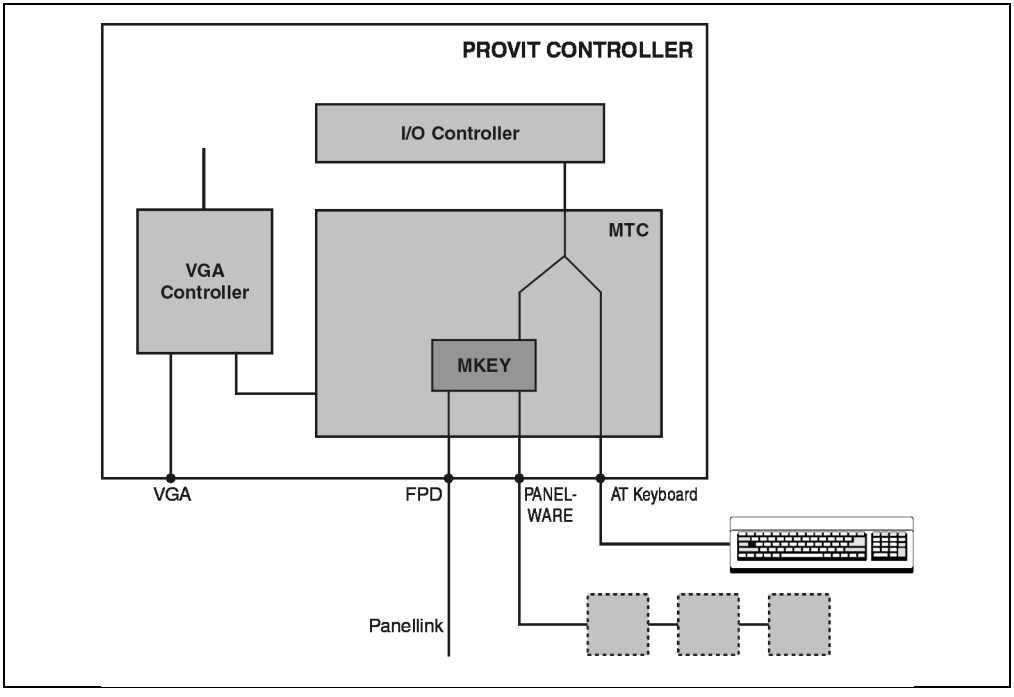


Figure 52: Maintenance Controller (MTC) block diagram

The MTC is responsible for the following tasks and components:

- AT PS/2 keyboard
- Panelware keypad modules
- Operating data coverage (controller and display unit)
- Temperature monitoring with fan regulation
- Qualitative evaluation of the condition of the battery (good/bad)

7.19.1 AT PS/2 Keyboard

As shown in the block diagram, the keyboard is not operated directly by the keyboard controller in the I/O controller, but rather by the MTC. It is therefore possible to plug an AT keyboard in and out while the IPC is switched on (Hot Plug). Furthermore, the AT keyboard can be operated parallel to connected Panelware keypad modules or to a keyboard on a display unit (also see the "Using Panelware Modules" section).

7.19.2 Panelware Keypad Modules

Communication with connected Panelware keypad modules is handled completely by the MTC. Panelware keypad modules work parallel to a connected AT keyboard or function keys on the display unit (keys on the display should be treated like Panelware modules, also see the section "Using Panelware Modules").

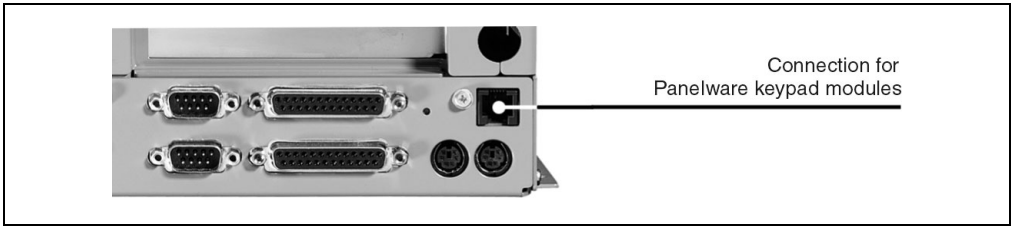


Figure 53: Connection of Panelware keypad modules

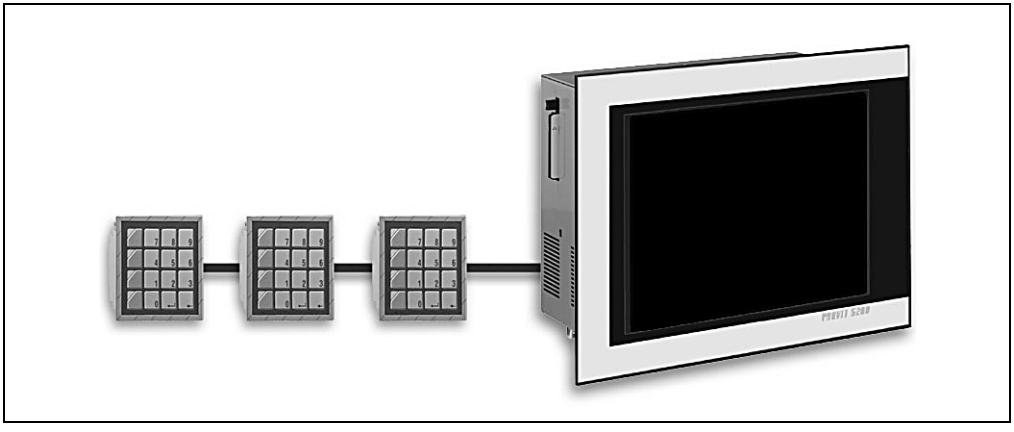


Figure 54: Daisy chaining of Panelware keypad modules

Daisy chaining makes it possible to operate up to 8 Panelware modules in series. The following limitations apply to the current requirements for Panelware modules:

	Keys	LEDs
Maximum number in the entire system (controller unit and display unit)	128	128 (max. 48 lit simultaneously)

Table 68: Connection of Panelware keypad modules

Make sure that inputs and outputs are properly connected to Panelware modules (labeled on the module) because connecting them incorrectly could damage Panelware modules.

If a Provit 5600 series display unit is used, it is not possible to connect external keypad modules because the corresponding number of keys has already been integrated into these displays.

Configuration of the keys and evaluation of key strokes is made using Mkey utilities and the Mkey driver (see the "Provit Mkey Utilities User Manual").

7.19.3 Operating Data Coverage

It is possible to read certain controller and display unit statistical operating data using the MTC:

- Power-on cycles
- Operating hours
- Over-temperature hours
- Fan cooler hours; (optional with display unit both fans with controller units)

This data is stored in the controller and display in an EPROM memory. The data is stored independently from each other and therefore can be read separately.

The operating hours are only updated every full hour, i.e. if for example after 55 minutes a power failure occurs, the counter values are not raised to one hour. The transfer of operating data from the display to the MTC is made using the FPD interface (Panellink), as shown in the "Maintenance Controller Block Diagram".

Operating data is read either in BIOS under the menu item "Additional Peripherals" or using software, Provit 5000 Utilities (see the section "Provit 5000 Utilities").

7.19.4 Temperature Monitoring with Fan Regulation

The MTC constantly monitors the temperature using temperature sensors in the following areas:

- CPU socket
- I/O area
- Display unit

Temperature Sensor	Alarm [1]		Fan		LED
	On	Off	On	Off	
CPU Socket	55 °C	53 °C	40 °C	37 °C	Yes
I/O Area	60 °C	58 °C	40 °C	37 °C	Yes
Display Unit	[2]				Yes

Table 69: MTC temperature monitoring

1) The temperature LED on the controller and on the display (if available) is lit and an alarm bit is set in the MTC, which can be reacted to using software.
2) Temperature alarms depend on the display unit used

7.19.5 Battery Monitoring

The CMOS battery can be evaluated (good or bad) using the MTC. Information is displayed either in BIOS under the menu item "Additional Peripherals" or using software, Provit 5000 Utilities (see the section "Provit 5000 Utilities").

8. System Units with Socket 370

8.1 General Information

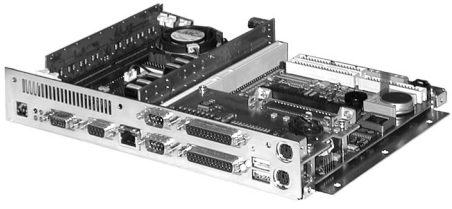
This section refers to the following system units:

Controller	System Units
IPC5000C	5C5001.11, 5C5001.12, 5C5001.21
IPC5600C	5C5601.11, 5C5601.12

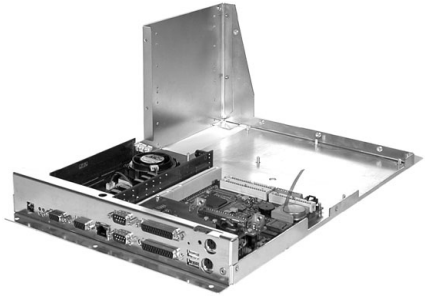
Table 70: System units with socket 370

More detailed information can be found in the next chapter.

The system unit is integrated into the lower housing with the mainboard and all peripheral interfaces:



System units 5C5001.11 and 5C5001.12



System units 5C5601.11 and 5C5001.12

Figure 55: System units 5C5x01.11 and 5C5x01.12

8.2 Technical Data

System Unit	5C5001.11	5C5001.12	5C5001.21	5C5601.11	5C5601.12
Mainboard General Information	Real-time Clock CMOS backup in the FlashPROM Temperature monitoring (CPU, I/O, display unit)				
Math Processor	Integrated in the processor, no socket				
BIOS	AWARD Elite BIOS, Plug and Play compatible				
Chipset	Intel 440BX				
Processor Socket	Socket 370				
DRAM	3 x DIMM PC100 max. 512 MB				
2nd Level Cache	Integrated into the processor				

Table 71: Technical data for system units with socket 370

Interfaces COM1 COM2 LPT1 USB Keyboard Mouse	RS232, 16 Byte FIFO RS232, 16 Byte FIFO SPP, EPP and ECP modes 2 USB ports Enhanced AT PS/2 PS/2				
Ext. Floppy Drive	Yes		No	Yes	
VGA Controller Chips & Technologies	69000	69030	69000	69000	69030
Graphic Memory	2 MB	4 MB	2 MB	2 MB	4 MB
Interfaces	FPD (Panellink) + CRT (15 pin VGA DSUB connector)				
Remote IDE Interface	No		Yes	No	
Ethernet Controller (on board) Connection Compatibility Cabling	Intel 82559 10/100 Mbit/s RJ45 Twisted Pair (10BaseT/100BaseT) Not NE2000 compatible S/STP (category 5)				
E-IDE slots	1			2	

Table 71: Technical data for system units with socket 370 (cont.)

8.3 Mainboard

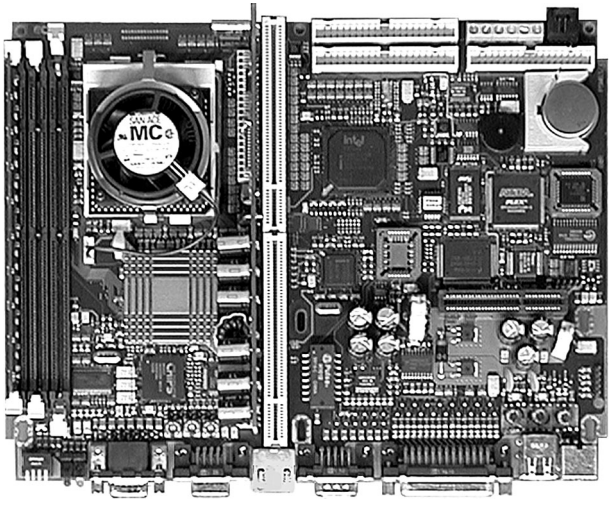


Figure 56: Mainboard system units with socket 370

All of the IPC's basic functions are implemented on the mainboard. Basically, these are:

- Processor socket
- Chipset
- DRAM socket

- Plug for the bus unit (ISA, PCI and IDE bus + power supply)
- Super I/O controller (COM1, COM2, LPT1, external FDD interface, PS/2 mouse, keyboard controller, USB interfaces, system clock)
- VGA controller (with CRT and FPD connection)
- Status LEDs
- Battery
- Reset button
- Recovery mode switch
- MTC Maintenance Controller (keyboard operation, Panellink FPD interface, temperature monitoring with fan regulation)
- Ethernet controller
- Hardware security key

All components listed above are described in detail in the following sections.

8.4 Processor Socket

The following processors can be used in the system units listed:

Processor Type	Intel Celeron	Intel Pentium III
Compatible System Units	5C5001.11 5C5001.12 5C5001.21 5C5601.11 5C5601.12	
Clock Frequency [MHz]	300 (5C5002.11) 366 (5C5002.12) 433 (5C5002.13) 566 (5C5002.14)	600 (5C5002.15) 850 (5C5002.16)
1st Level Cache	2x 16 KB	
2nd Level Cache (integrated in the processor)	128 KB	256 KB
Socket	Socket 370	

Table 72: Processors to be used

Processors can only be ordered from B&R together with a corresponding system unit and vice versa. All system units supplied by B&R are therefore equipped with a processor. All installation and setting work takes place at B&R. If processors are used which have not been supplied by B&R, the warranty claim is then void.

8.5 Jumper Settings

No jumper settings are required (or possible) for system units with socket 370 (5C5001.11, 5C5001.12, 5C5001.21, 5C5601.11 and 5C5601.12). The multiplier for the processor clock (bus clock 66 MHz or 100 MHz for Pentium III/600 or 850) and the core voltage for the processor are permanently set.

8.6 DRAM Socket

System Units	5C5001.11	5C5001.12	5C5001.21	5C5601.11	5C5601.12
Chipset	Intel 440BX				
Socket	3x DIMM PC100				
Installation	Max. 256 MB per module Max. 512 MB in total				
Remark	When using the IPC5000C, the DIMM module is only allowed to be a maximum 29.5 mm high.				

Table 73: DRAM socket

For more detailed information about the main memory see the "Main Memory" section.

8.7 Serial Interfaces COM1 and COM2

There are two PC compatible serial interfaces with a 16 byte FIFO on the mainboard. They are UART16550 and Plug & Play compatible.

Serial interfaces COM1, COM2	
RS232 interface Not electrically isolated up to 115 kBaud	
Pin	**Assignment**
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

9 pin DSUB connector

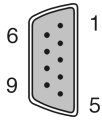


Table 74: Pin assignment COM1 and COM2

Default Settings	COM1	COM2
Interrupt	4	3
I/O Address	3F8h - 3FFh	2F8h - 2FFh

Table 75: Default settings COM1 and COM2

To change these settings see the section "Integrated Peripherals".

8.8 Parallel Interface LPT1

The parallel interface LPT1 is a 25 pin DSUB socket. It supports EPP and ECP operating modes (Plug & Play compatible) and the standard SPP mode.

Parallel Interface LPT1			
Pin	**Assignment**	**Pin**	**Assignment**
1	Data Strobe	14	Autofeed
2	Data 0	15	Error
3	Data 1	16	Printer Init
4	Data 2	17	Printer Select Input
5	Data 3	18	GND
6	Data 4	19	GND
7	Data 5	20	GND
8	Data 6	21	GND
9	Data 7	22	GND
10	Acknowledge	23	GND
11	Busy	24	GND
12	Paper End	25	GND
13	Printer Select Status		

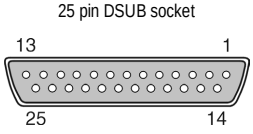


Table 76: Pin assignment LPT1 interface

Default Settings	LPT1
Interrupt	7
I/O Address	378h - 37Fh

Table 77: Default settings LPT1

To change these settings see the section "Integrated Peripherals".

Note: Provit IPC parallel interfaces are equipped with a protective circuit in order to conform with requirements for operating in industrial environments. This can possibly lead to limitations in regard to the maximum transfer rate.

Because of general PC specifications, this interface should be handled with extreme care with regard to EMC, location of cables etc.

8.9 Interface for External Floppy Disk Drive

An external floppy disk drive can be connected to the 25 pin DSUB socket (see Chapter 7 "Accessories").

It is not possible to operate a second parallel device on this interface.

Interface for External Disk Drive			
Pin	**Assignment**	**Pin**	**Assignment**
1	n.c.	14	Density
2	Index	15	Side Select
3	Track 0	16	Direction
4	Write Protect	17	Step
5	Read Data	18	GND
6	Disk. Chan.	19	GND
7	n.c.	20	GND
8	n.c.	21	GND
9	+5 V	22	GND
10	Drive Select	23	GND
11	Motor on	24	GND
12	Write Data	25	GND
13	Write Gate		

25 pin DSUB socket

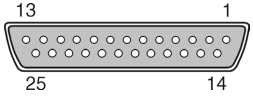


Table 78: Pin assignment interface for external floppy disk drive

Setting	LPT1
Interrupt	6
I/O Address	3F0h - 3F7h

Table 79: Interface settings for external floppy disk drive

These settings cannot be changed.

Because of general PC specifications, this interface should be handled with extreme care with regard to EMC, location of cables etc. It should therefore only be used for service.

8.10 USB Interface

All Provit 5000 system units are equipped with a USB Host controller with two USB ports:

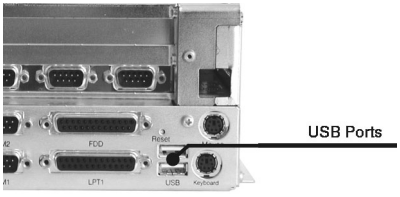


Figure 57: USB Ports

Because of general PC specifications this interface should be handled with extreme care with regard to EMC, location of cables etc.

8.11 AT Keyboard Connection (PS/2)

A PS/2 socket is used to connect an external AT enhanced keyboard. The external AT keyboard works parallel to connected Panelware keyboards. The keyboard interface is operated by the MTC (see the section "AT PS/2 Keyboard"). An external PS/2 AT keyboard is available from B&R (see Chapter 7 "Accessories").

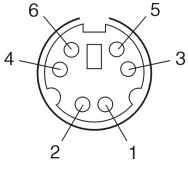
AT Keyboard Connection (PS/2)		
Pin	**Assignment**	PS/2 socket 
1	KBDATA	
2		
3	GND	
4	+5 V	
5	KBCLK	
6		

Table 80: Pin assignments for AT keyboard (PS/2)

Setting	PS/2 Keyboard
Interrupt	1
I/O Address	060h - 06Fh

Table 81: AT keyboard (PS/2) settings

These settings cannot be changed.

Because of general PC specifications, this interface should be handled with extreme care with regard to EMC, location of cables etc. Therefore, it should be only used for service.

Make sure the connections for the PS/2 keyboard and PS/2 mouse are not swapped.

No device is allowed to be connected, which uses the PS/2 keyboard supply as a power source.

8.12 Mouse Connection (PS/2)

An interface for the connecting a standard PS/2 mouse is provided on the mainboard. This can be activated in BIOS in the "BIOS Features Setup" menu (see the section "BIOS Features Setup").

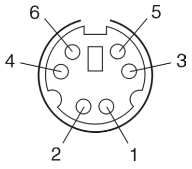
Mouse Connection (PS/2)		
Pin	**Assignment**	PS/2 socket 
1	Mouse DATA	
2		
3	GND	
4	+5 V	
5	Mouse CLK	
6		

Table 82: Mouse interface connection (PS/2)

Setting	PS/2 Keyboard
Interrupt	12
I/O Address	-

Table 83: Standard settings for mouse interface (PS/2)

Because of general PC specifications, this interface should be handled with extreme care with regard to EMC, location of cables etc. Therefore, it should be only used for service.

Make sure the connections for the PS/2 keyboard and PS/2 mouse are not swapped.

No devices are allowed to be connected that use the PS/2 mouse supply as a power source.

8.13 VGA Controller

Controller	IPC5000C			IPC5600C	
System Unit	5C5001.11	5C5001.12	5C5001.21	5C5601.11	5C5601.12
Manufacturer	Chips & Technologies				
Model	C&T 69000 or 69030 AGP				
Interfaces	FPD (Panellink) + CRT (15 pin VGA DSUB connector)				
VGA Controller Chips & Technologies	69000	69030	69000	69000	69030
Graphic Memory	2MB	4MB	2MB	2MB	4MB

Table 84: VGA Controller

The VGA controller is integrated into the mainboard and offers high graphic performance through the connection with the AGP bus. Outputs are available for two display devices:

8.13.1 FPD Connection:

A Provit 5000 flat display can be connected to this Panellink interface (see Chapter 3 "Display Units").

Data (e.g. the operating hours of the display) is also transmitted simultaneously via the Panellink cable. For more details see the section "Operating Data Coverage"

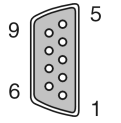
FPD Interface		
Panellink		9 pin DSUB socket 
Pin	**Assignment**	
1	GND	
2	TXC+ / RS485A	
3	TX0+ / VCC	
4	TX1+ / +12V	
5	TX2+ / GND	
6	TXC- / RS485B	
7	TX0- / VCC	
8	TX1- / +12V	
9	TX2- / GND	

Table 85: FPD Interface pin assignment

8.13.2 CRT Connection:

An external monitor can be connected to this interface.

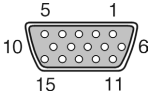
CRT interface				
Pin	**Assignment**	**Pin**	**Assignment**	15 pin DSUB socket 
1	R	9	+5V	
2	G	10	GND	
3	B	11	n.c.	
4	n.c.	12	DDC Data	
5	GND	13	HSYNC	
6	GND	14	VSYNC	
7	GND	15	DDC CLK	
8	GND			

Table 86: CRT Interface pin assignment

The built-in graphic controller allows a flat display and an external monitor to be operated simultaneously. Settings in this regard can either be changed in BIOS under the menu item "Additional Peripherals" or by software using a graphic driver (online help for the driver).

Simultaneous operation of a monitor is not possible with SXGA TFT displays and LCD displays.

Note: The corresponding C&T graphic driver for Windows 3.11/95/98/NT is available from B&R.

Display units developed for Provit 2000 series IPCs cannot be used together with a Provit 5000 series IPC.

8.13.3 Use of an External Graphic Card

It is possible to operate an external graphic card in a PCI slot on the mainboard. If such a card is inserted, it is automatically recognized during the start-up procedure and the onboard VGA controller automatically switches itself off. It is not possible to manually switch the VGA controller on and off.

An external graphic card cannot be operated in an ISA slot.

By deactivating the onboard VGA controller, it is not possible to operate a display or monitor to the IPC's FPD and CRT interfaces using an external graphic card, as these are switched off.

8.13.4 Relationship between Resolution, Graphic memory and Colors

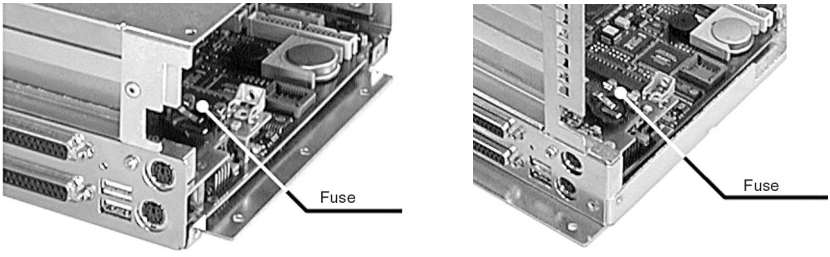
The following table applies to all graphic controllers and display units. It should be noted that with high resolutions (XGA, SXGA) the number of colors is very limited.

Video Memory	Resolution	Pixels	Number of Colors
2 MB	VGA	640 x 480	16 million (true color)
	SVGA	800 x 600	16 million (true color)
	XGA	1024 x 768	65535 (high color)
	SXGA	1280 x 1024	256
4 MB	VGA	640 x 480	16 million (true color)
	SVGA	800 x 600	16 million (true color)
	XGA	1024 x 768	16 million (true color)
	SXGA	1280 x 1024	65535 (high color)
		1600 x 1200	65535 (high color)

Table 87: Relationship between resolution, graphic memory and color depth

8.14 Fuse

A fuse is provided on the mainboard for the supply voltage to the keyboard, mouse and the external floppy disk drive. It is accessible after opening the housing:



IPC5000C fuse IPC5600C fuse

Figure 58: Fuse for IPC5000C and IPC5600C

8.15 LPT2 (Hardware Security Key)

A Dallas Hardware Security key can be found on the mainboard, which is required for software protection ("Dongle"). The slot is found near the fuse and can be addressed as LPT2.

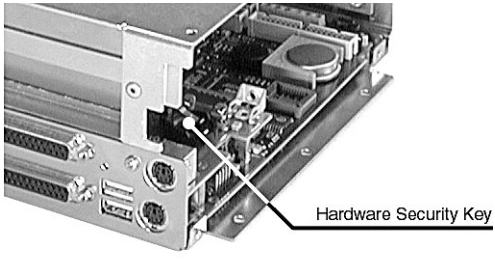


Figure 59: Hardware Security Key

Default Settings	LPT2
Interrupt	-
I/O Address	278h - 27Fh

Table 88: Hardware Security Key default settings

To change these settings see the section "Additional Peripherals".

8.16 Status LEDs

The IPC 5000C and 5600C are equipped with four LEDs, visible on the outside of the controller:

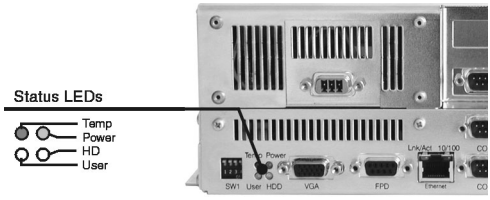


Figure 60: Status LEDs IPC5000C and IPC5600C

LED	Function
Power	Supply voltage to the power supply is OK
User	Can be programmed by the user
HDD	Signalized activity of the memory medium in the IDE slot.
Temp	Indicates over-temperature (see the section "Temperature Monitoring with Fan Regulation"

Table 89: Status LEDs functions for the IPC5000C and IPC5600C

There are four status LEDs built into the front of the Provit display unit 5D560x.0x. They have the same functions as those in the controller.

8.17 Battery

The battery compartment is accessible after opening the housing:

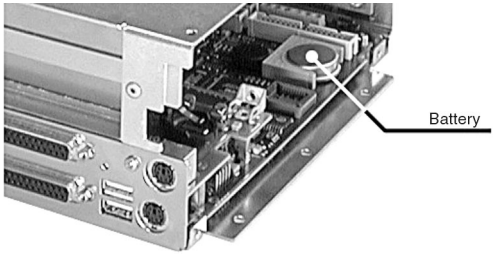


Figure 61: Battery holder for IPC5000C and IPC5600C

The lithium battery (3 V, 950 mAh) keeps the CMOS memory and real-time clock running when the supply voltage for the IPC has been switched off. The buffer duration of the battery is at least 4 years (at 50°C, 8.5 mA current requirements of the supplied components and a self discharge of 40%) The battery voltage can be monitored by the maintenance controller using software (see the section "Maintenance Controller MTC").

8.18 Reset Button

The reset button is accessible through a small hole near the external floppy disk drive interface. In order to avoid accidental activation, a reset can only be triggered with a pointed object.

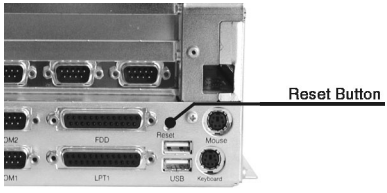


Figure 62: Reset button for the IPC5000C and IPC5600C

8.19 DIP Switch

The DIP switch is found on the front of the IPC5000C/5600C:

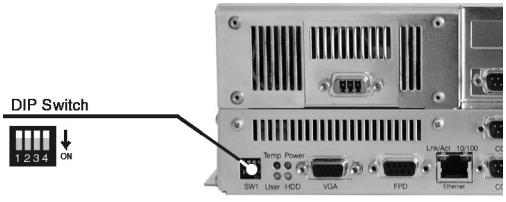


Figure 63: DIP switch for the IPC5000C and IPC5600C

Switch	Position	Function
1	Off On	Boot Block is write protected Boot Block is not write protected
2	Off On	Normal Mode Recovery Mode
3	Off On	User Jumper = Low User Jumper = High
4		Reserved

Table 90: Function DIP switch for the IPC5000C and IPC5600C

8.19.1 Boot Block Switch

The Boot Block write protect is turned on or off using the DIP switch 1. The Boot Block is a 16 KB large memory area in BIOS, which normally is not write protected. In some cases (e.g. upgrading the boot block for recovery mode), it is necessary to rewrite the Boot Block. This is possible after turning switch 1 on using BIOS Upgrade Utilities (see the section "BIOS Upgrade").

Be very careful when changing the Boot Block. The system is no longer operational with damaged boot blocks and BIOS hardware must then be exchanged.

8.19.2 User Switch

The user jumper is not required for setting system functions. It can be utilized by the user and evaluated using Provit 5000 Utilities (see the section "Provit 5000 Utilities").

8.20 Maintenance Controller (MTC)

The MTC is a standalone processor system, which provides additional functions that are not available with a "normal" PC. The MTC communicates with the PC via an ISA bus (using a couple register; FIFO and Direct Access Mode additional with the IPC5000C and IPC5600C).

The address can be stored under the menu item "Additional Peripherals".

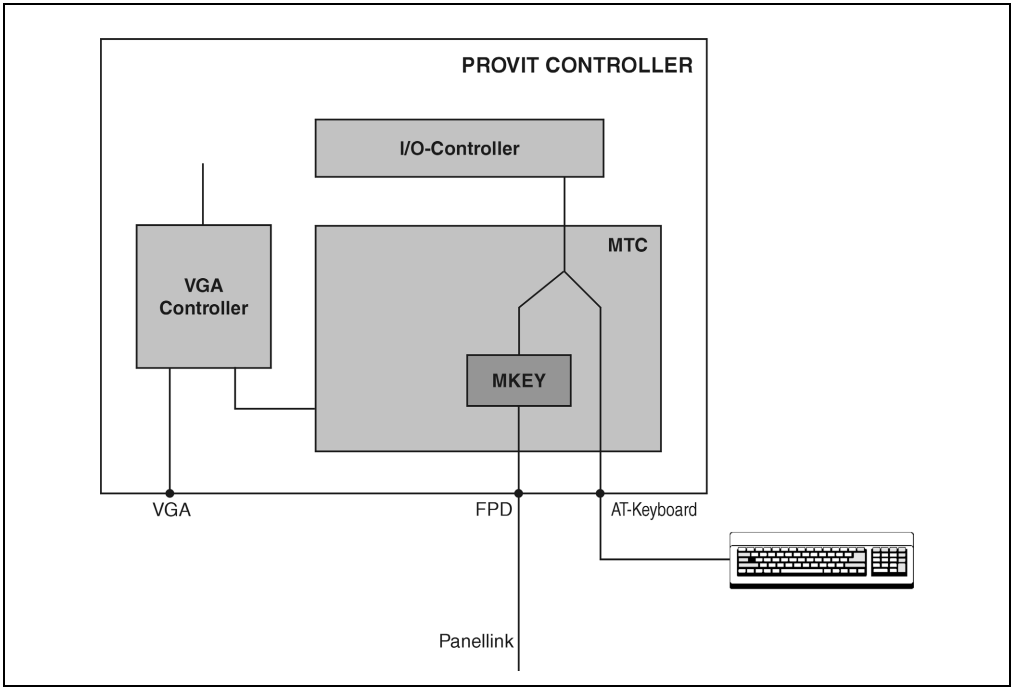


Figure 64: MTC block diagram

The MTC is responsible for the following tasks and components:

- AT keyboard (PS/2)
- Panelware keypad modules
- Operating data coverage (controller and display unit)
- Temperature monitoring with fan regulation
- Qualitative evaluation of the condition of the battery (good/bad)

8.20.1 AT Keyboard (PS/2)

As shown in the block diagram, the keyboard is not directly operated by the keyboard controller in the I/O controller, but rather by the MTC. It is therefore possible to plug an AT keyboard in and out while the IPC is switched on (Hot Plug). Furthermore, the AT keyboard can be operated parallel to connected keypad modules or to a keyboard on a display unit (see the next section).

8.20.2 Panelware Keypad Modules

Communication with inserted Panelware keypad modules is handled completely by the MTC. Panelware keypad modules work parallel to an AT keyboard connected to the controller or to a keyboard on the Provit 5000 series display unit.

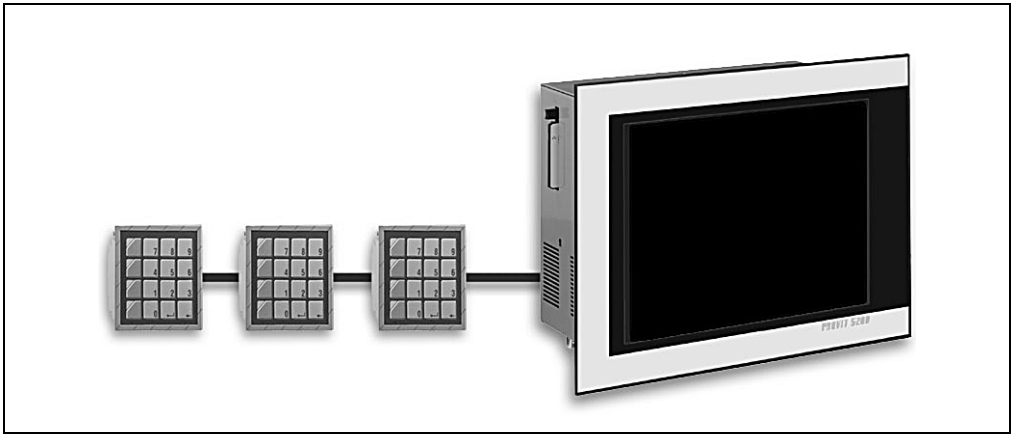


Figure 65: Connection of Panelware keypad modules

There is no connection available on the controller for Panelware modules with system units 5C5001.11, 5C5001.12, 5C5601.11 and 5C5601.12 . Keyboard modules can be exclusively inserted to the Provit 5000 series display for these units.

Daisy chaining makes it possible to operate up to 8 Panelware modules in series. The following limitations apply to current requirements for Panelware modules:

	Keys	LEDs
Maximum Amount in Entire System (Display Unit)	128	128 (Max. 32 lit simultaneously)

Table 91: Connections of Panelware keypad module key and LEDs.

Make sure that inputs and outputs are connected properly to Panelware modules (labeled on the module) because connecting them incorrectly could damage the Panelware modules.

If a Provit 5600 series display unit is used, it is not possible to connect external keypad modules because the corresponding number of keys has already been integrated into these displays.

Configuration of the keys and evaluation of key strokes is made using Mkey utilities and the Mkey driver (see the "Provit Mkey Utilities User Manual").

8.20.3 Operating Data Coverage

It is possible to read certain controller and display unit statistical operating data using the MTC:

- Power-on cycles
- Operating hours
- Over-temperature hours
- Fan cooler hours; (optional with display unit both fans with controller units)

This data is stored in the controller and display in an EPROM memory. The data is stored independently from each other and therefore can be read separately.

The operating hours are only updated every full hour, i.e. if for example after 55 minutes a power failure occurs, the counter values are not raised to one hour. The transfer of the operation data from the display to the MTC is made with the FPD interface (Panellink).

Operating data is read either in BIOS in the menu point "Additional Peripherals" or using software (Provit 5000 Utilities).

8.20.4 Temperature Monitoring with Fan Regulation

The MTC constantly monitors the temperature using temperature sensors in the following areas:

- CPU internal
- CPU socket
- I/O area
- Display unit

Fan RPM is constantly monitored and regulated separately by the MTC. The RPM depends on the temperature measured.

				Alarm		Fan		LED	Alarm Signal	
Short Description	Processor Type	Min[1)]	Max	On	Off	On	Max		Sample	kHz
Internal Processor Temperature	Default Values	0°	127°	85°	83°	60°	76°	✓	0AAH	2
	Celeron 300[2)]			85°	83°	60°	76°			
	Celeron 366[2)]			85°	83°	60°	76°			
	Celeron 433[2)]			85°	83°	60°	76°			
	Celeron 566[2)]			87°	85°	62°	78°			
	Pentium III 600[2)]			80°	78°	55°	61°			
	Pentium III 850[2)]			78°	76°	53°	69°			
Processor Socket Temperature	Default Values	0°	127°	80°	78°	55°	71°	✓	050H	1
	Celeron 300[2)]			80°	78°	55°	71°			
	Celeron 366[2)]			80°	78°	55°	71°			
	Celeron 433[2)]			80°	78°	55°	71°			
	Celeron 566[2)]			85°	83°	59°	75°			
	Pentium III 600[2)]			78°	76°	52°	68°			
	Pentium III 850[2)]			76°	74°	50°	66°			
I/O Slot Temperature		0°	127°	68°	66°	40°	56°	✓	050H	1
Processor Fan (nominal 5400 RPM)		0 RPM	6100 RPM	~70%	~71%			✓	0AEH	2
Display Temperatures		0°	127°	[3)]				✓	051H	1
RS485 Isolation Interrupted									033H	1

Table 92: MTC temperature monitoring IPC5000C and IPC5600C

1) Negative temperatures are set to 0°
2) Starting with the new BIOS Version 1.05 for the IPC5000C and IPC5600C, both temperature alarm and fan control depends on the processor.
3) Temperature alarms depend on the display unit used

The following figure indicates the different alarm signals. If 2 different alarms are triggered simultaneously, then the higher priority alarm is emitted first.

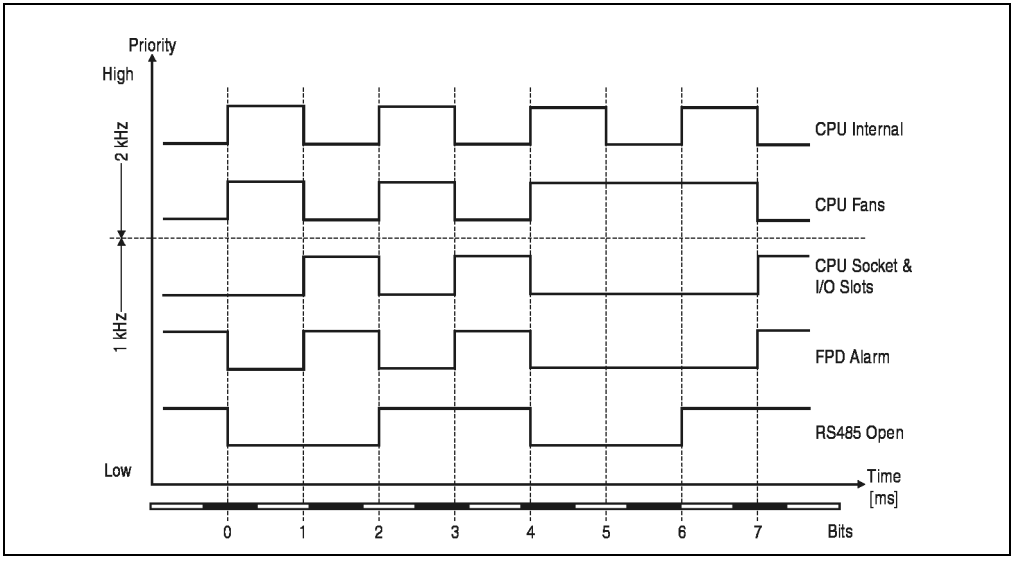


Figure 66: MTC alarms

8.21 Ethernet Controller

Ethernet	10/100 Mbit/s [1]
Connection	RJ45 Twisted Pair (10BaseT/100BaseT)
Controller	Intel 82559
Compatibility	Not NE2000 compatible
Cabling	S/STP (category 5)

Table 93: Ethernet Controller

1) Both operating modes are possible, as switching takes place automatically.

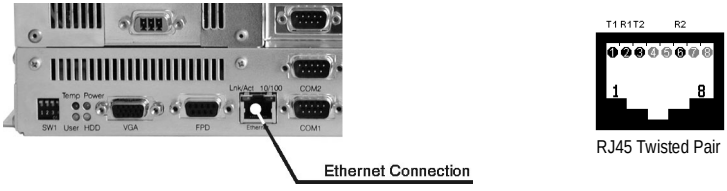


Figure 67: Ethernet connection

The onboard Ethernet controller on system units 5C5001.11, 5C5001.12, 5C5001.21, 5C5601.11 and 5C5601.12 provides an RJ45 Twisted Pair connection, the 2 LEDs are attached to the status control:

LED	On	Off
Green	100 Mbit/s	10 Mbit/s
Orange	Link	Activity (blinking)

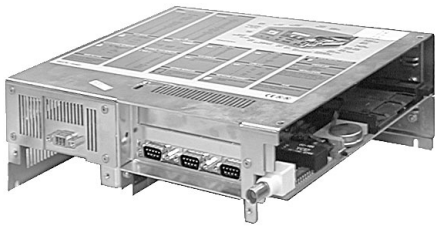
Table 94: Status LEDs Ethernet controller

Special drivers are necessary for operating the Ethernet controller. They are found on the Provit Drivers & Utilities CD ROM (model number 5S0000.01-090) or can be downloaded from B&R's homepage (www.br-automation.com).

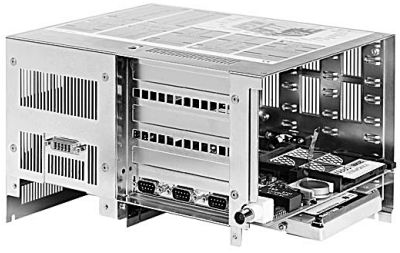
9. Bus Unit

9.1 General Information

The bus unit contains the power supply (24 VDC, 100-240 VAC or 115/230 VAC), the system bus (ISA or PCI), IDE slots and one or two fans.

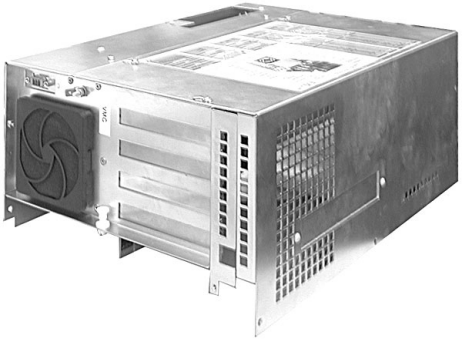


5C5000.01 and 5C5000.02

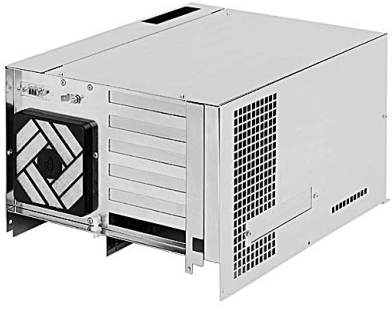


5C5000.11 and 5C5000.12

Figure 68: Bus units IPC5000 and IPC5000C



5C5600.01 and 5C5600.02



5C5600.11 and 5C5600.12

Figure 69: Bus units IPC5000C and IPC5600C

5C5000.21 and 5C5000.22

5C5000.31 and 5C5000.32

Figure 70: Bus unit IPC5000 and IPC5000C for add-on for CD ROM drive

9.2 Technical Data

Controller	IPC5000/5000C							
Bus Unit	5C5000.01	5C5000.02	5C5000.11	5C5000.12	5C5000.21	5C5000.22	5C5000.31	5C5000.32
Slots[1)] Total B&R ISA 16 Bit [2)] Half Size ISA 16 Bit Half S. ISA 16 Bit / PCI 32 Bit Half Size PCI 32 Bit Full Size ISA 16 Bit Full S. ISA 16 Bit / PCI 32 Bit Full Size PCI 32 Bit	 2 1 - 1 - - - -		 4 1 - 3 - - - -		 2 - - 1 1 - - -		 5 1 1 1 2 - - -	
Supply Voltage [3)] Nominal	100 - 240 VAC	24 VDC	100 - 240 VAC	24 VDC	100 - 240 VAC	24 VDC	100 - 240 VAC	24 VDC
Supply Voltage Tolerance Range	85 - 264 VAC	18 - 30 VDC	85 - 264 VAC	18 - 30 VDC	85 - 264 VAC	18 - 30 VDC	85 - 264 VAC	18 - 30 VDC
Supply Voltage Frequency	50 - 60 Hz	-	50 - 60 Hz	-	50 - 60 Hz	-	50 - 60 Hz	-
Fan Type / Design	Ball bearings, analog control							
Number of Fans ∅ 40 mm ∅ 50 mm	 2 -		3 -	2 -	 2 -		1 2	1 1

Table 95: Technical data for IPC5000/5000C bus units

1) All PCI slots have an operating voltage of 5V and a clock frequency of 33MHz.
2) Standard 16 bit ISA interface; operation of standard ISA boards is not possible due to mechanical requirements.
3) AC power supply: A 3 pin cable with grounding contact plug is required for operation (model no. 9A0001.03). 24 VDC power supply: a plug (with terminal blocks) for connecting to the supply, is contained in the delivery. The cable must be provided by customers.

Controller	IPC5600/5600C					
Bus Unit	5C5600.01	5C5600.02	5C5600.03	5C5600.04	5C5600.11	5C5600.12
Slots[1)] Total B&R ISA 16 Bit [2)] Half Size ISA 16 Bit Half S. ISA 16 Bit / PCI 32 Bit Half Size PCI 32 Bit Full Size ISA 16 Bit Full S. ISA 16 Bit / PCI 32 Bit Full Size PCI 32 Bit	 4 - 1 - - - 3 -		 5 - 1 - - 1 1 2		 6 - 1 - - 2 3 -	
Nominal Supply Voltage	115 / 230 VAC	24 VDC	115 / 230 VAC	24 VDC	115 / 230 VAC	24 VDC
Supply Voltage Tolerance	85 - 132 VAC 170 - 264 VAC	18 - 30 VDC	85 - 132 VAC 170 - 264 VAC	18 - 30 VDC	85 - 132 VAC 170 - 264 VAC	18 - 30 VDC
Supply Voltage Frequency	50 - 60 Hz	-	50 - 60 Hz	-	50 - 60 Hz	-
Fan Type / Design	Ball bearings, analog control					

Table 96: Technical data for IPC5000/5600C bus units

Controller	IPC5600/5600C		
Number of Fans ∅ 80 mm ∅ 92 mm	 1 -	 1 -	 - 1

Table 96: Technical data for IPC5000/5600C bus units

1) All PCI slots have an operating voltage of 5V and a clock frequency of 33MHz.
2) Standard 16 bit ISA interface; operation of standard ISA cards is not possible due to mechanical requirements.

A maximum of 3 ISA cards can be used simultaneously because of specifications for the Intel 440BX chipset.

9.3 ISA/PCI - Slots

Provit 5000: All standard width 16 bit ISA and 32 bit PCI cards, in the half size format, can be installed. It is not possible to use the cards in the full size format.

Provit 5600: All standard 16 bit ISA and 32 bit PCI cards in the half size and also the full size format can be installed.

9.3.1 Maximum Measurements for Insert Cards

The following displayed measurements refer to maximum measurements for insert cards, which can be used in Provit Industrial PCs (as described above). These measurements have no connection with existing standards or specifications for ISA and PCI cards.

a) Half Size Cards

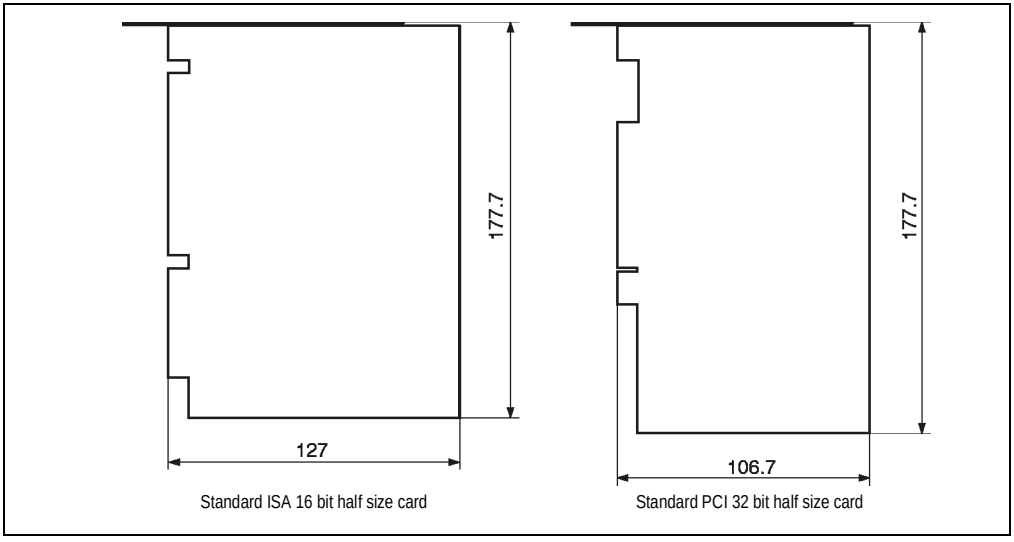


Figure 71: Standard half size cards

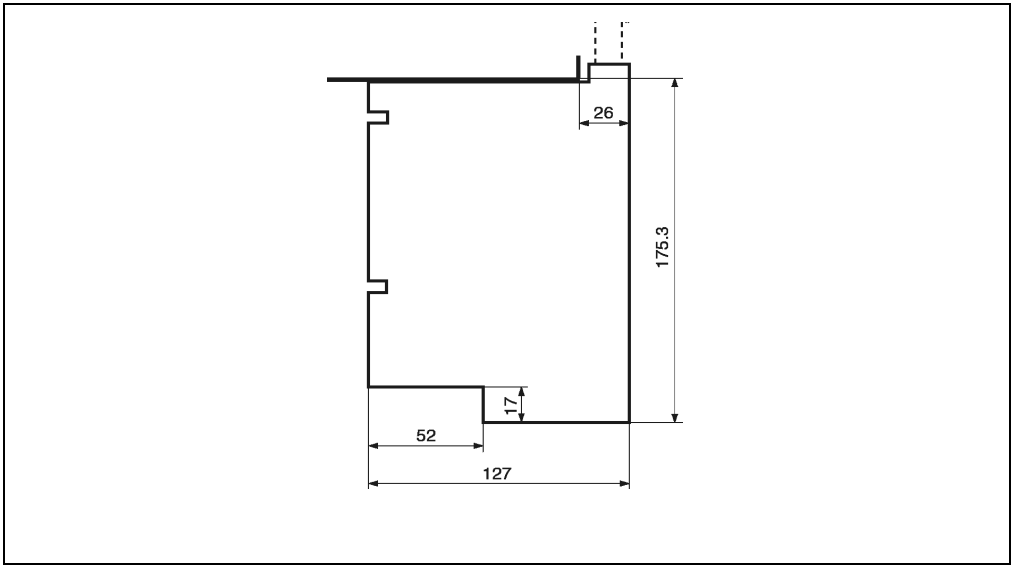


Figure 72: B&R half size cards

* Only for B&R interface boards with BNC Ethernet connection.

B&R ISA cards are not standard width 16 bit ISA cards. Therefore they can only be used in B&R IPCs from the Provit 5000 and Provit 5600 series. An example of such a card is the B&R interface board. Because of mechanical requirements it is also not possible to operate a standard half size ISA card in the B&R ISA slot.

b) Full Size Insert Cards

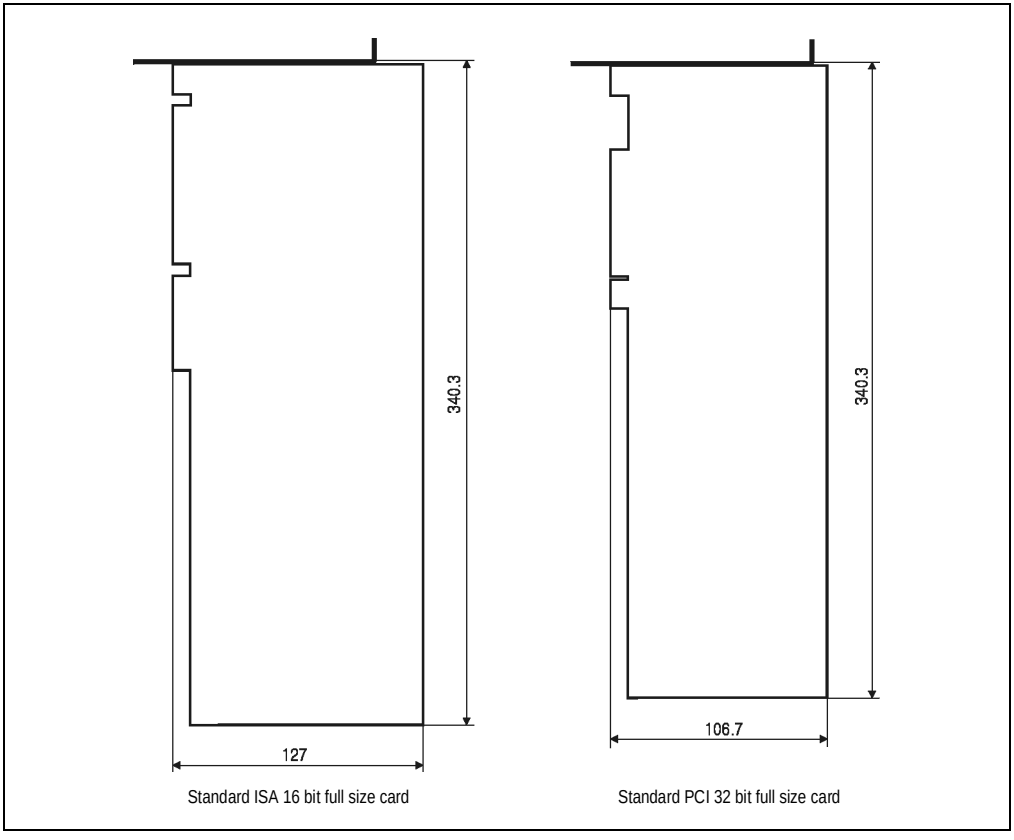


Figure 73: Standard full size cards

9.3.2 Fasteners for Full Size Cards

Fasteners for full size cards are contained in the delivery of Provit 5600 bus units (model no: 5C56xx.xx). The fasteners consist of a guide rail and a mounting screw. They are connected by attaching screws to openings in the housing, above and below the card, thus providing increased stability to the card.

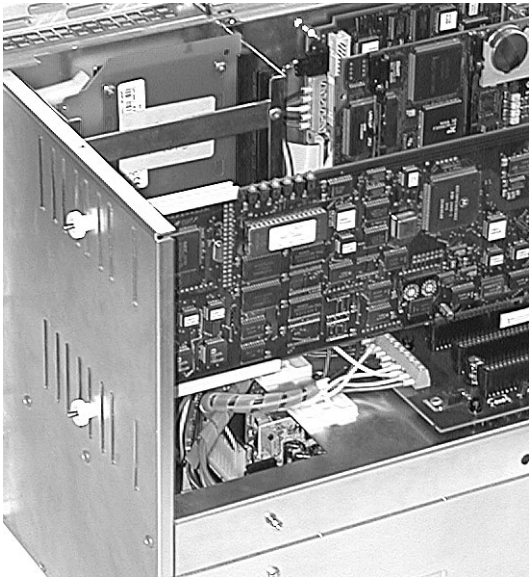


Figure 74: Fasteners for full size cards

If components are positioned on the edge of the full size card, it is possible that the card does not fit in the guide rail correctly. In this case, the guide rail must be sawed off where required.

9.4 Hard Disk / Silicon Disk Slots

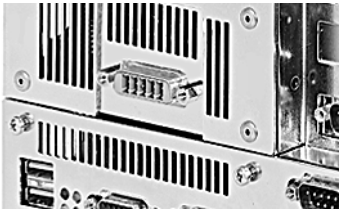
There is a slot available in the Provit 5000 controller to connect mass memory media using an IDE interface. Two IDE devices can be installed in the Provit 5600 controller.

A PCI plug is used to connect (mechanically or electrically) the hard drive to the IPC. However, the mass memory media does not possess a PCI interface and cannot operate on the PCI bus (see also the section "Mass Memory").

9.5 Power Supply

The power supply is installed in the housing cover as a part of the bus unit. It has been designed so that it is shielded from the other part of the bus circuit board and the system unit.

3 pin connection (AC)



5 pin connection (DC)

Figure 75: Connection for supply voltage

All bus units are available either with a 240 VAC or 24 VDC power supply:

Controller	IPC5000				IPC5600			
Bus Unit	**5C5000.01**	**5C5000.02**	**5C5000.11**	**5C5000.12**	**5C5600.01**	**5C5600.02**	**5C5600.03**	**5C5600.04**
Supply Voltage	100 - 240 VAC	24 VDC	100 - 240 VAC	24 VDC	115 / 230 VAC	24 VDC	115 / 230 VAC	24 VDC
Bus Unit	**5C5000.21**	**5C5000.22**	**5C5000.31**	**5C5000.32**	**5C5600.11**	**5C5600.12**		
Supply Voltage	100 - 240 VAC	24 VDC	100 - 240 VAC	24 VDC	115 / 230 VAC	24 VDC		

Table 97: Supply voltage of the bus units

Note: 24 V power supplies have safeguards which mean if the plug is wired incorrectly, a diode prevents possible damage.

A 3 pin (AC power supply) or 5 pin (DC power supply) DSUB plug is used for the supply voltage (with stress relief and screws for fastening to the controller):

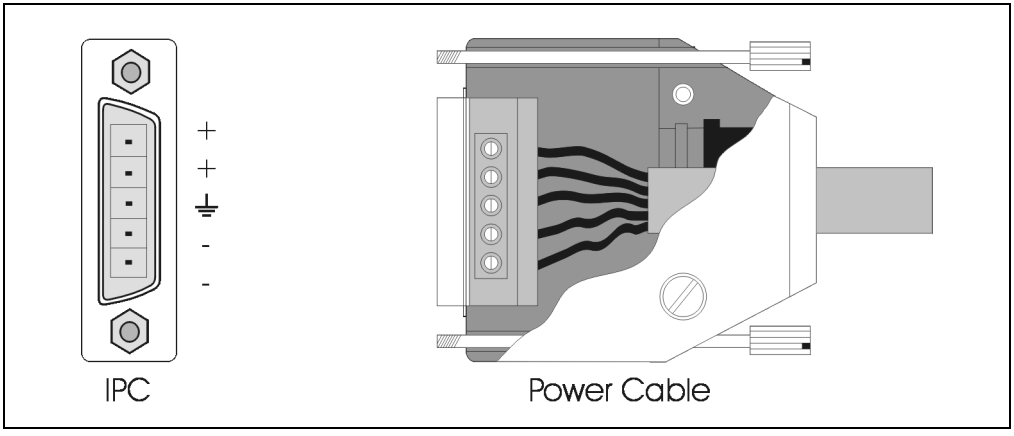


Figure 76: Plug and socket (5 pin) for DC supply

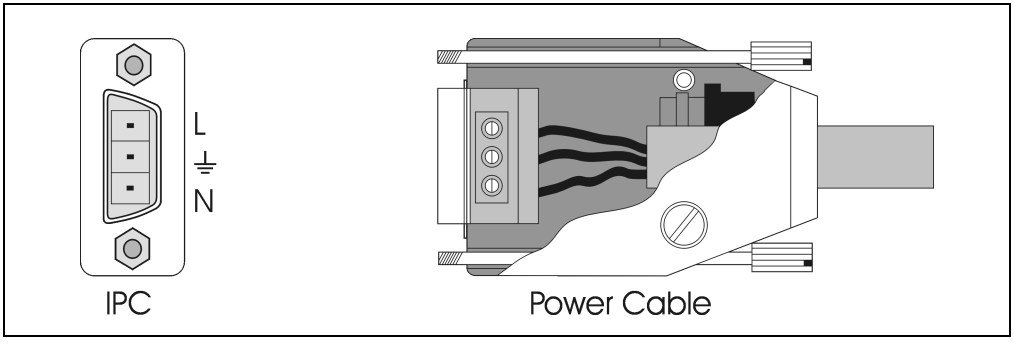


Figure 77: Plug and socket (3 pin) for AC supply

Criteria	Data
Standards	UL, CSA
Cable Cross Section	0.14 – 1.5 mm^2
AWG	28 - 16

Table 98: Power supply connection and cable specifications

9.6 IPC5000 and IPC5600 Current Requirements / Power Consumption

To calculate the power consumption of Provit IPCs, tables are created with recommended values for power consumption for the individual components. The current requirements of the individual components are arranged according to the necessary supply voltages, showing the respective current requirements for each supply voltage (+5 V, -5 V, +12 V and -12 V).

The values specified are typical values and show a certain tolerance. This depends on configuration details and cannot be determined exactly.

Components	Current Requirements for Supply Voltage			
	+5 V	-5 V	+12 V	-12 V
Mainboard with 8 MB DRAM (SIMM)	2 A	-	0.1 A	0.1 A
Mainboard with 64 MB DRAM (SIMM)	2.2 A	-	0.1 A	0.1 A
Intel Pentium 100 MHz At 24 VDC supply At 240 VAC supply	 2 A -	 - -	 - Up to 0.9 A	 - -
Intel Pentium 166 MHz At 24 VDC supply At 240 VAC supply	 2.8 A -	 - -	 - 1.2 A	 - -
Intel Pentium 200 MHz With 24 VDC supply With 240 VAC supply	 3.1 A -	 - -	 - 1.3 A	 - -
Interface Board	0.5 A	-	0.1 A	-
Hard Disk	0.5 A	-	-	-
Disk Drive	0.1 A	-	-	-
PC Card	1)	-	-	-
Cards in the ISA or PCI Slot	Max. 2 A 1)	Max. 0.3 A 1)	Max. 1 A 1)	Max. 0.4 A 1)
Panelware Keypad Modules	-	-	0.2 A	-
Display Units 5D5500 series	0.5 A	-	0.9 A	-
Display Units 5D5200 Series 10.4" TFT	0.5 A	-	0.5 A	-
Display Units 5D5200 Series 13.8" TFT	0.7 A	-	0.9 A	-
Display Units 5D5200 Series 15" TFT	0.8 A	-	0.9 A	-
Display Unit 18.1" TFT	2.6 W IPC side 2)			
24 VDC Supply Max. Current Requirements (total)	10 A	0.3 A	4 A	1 A
Max. Power Consumption (total)	60 W			
240 VAC Supply Max. Current Requirements (total)	15 A (6 A 3))	0.3 A	6 A (3 A 3))	1 A (0.7 A 3))
Max. Power Consumption (total)	100 W (60 W 3))			

Table 99: Current requirements / power consumption of the components

1) The data sheet for the respective manufacturer is available
2) 25.5 W on the side of the external supply voltage
3) For bus unit 5C5000.01

To calculate the IPC's current requirements and power consumption, select all installed components from this table and list them e.g. as shown below (a power supply with a 24 VDC supply voltage is required):

Components	Current Requirements for Supply Voltage			
	+5 V	-5 V	+12 V	-12 V
Mainboard with 8 MB DRAM (SIMM)	2 A	-	0.1 A	0.1 A
Intel Pentium 100 MHz with 24 VDC Supply	2 A	-	-	-
Interface Board	0.5 A	-	0.1 A	-
Hard Disk	0.5 A	-	-	-
Disk Drive	0.1 A	-	-	-
Display Units 5D5200 Series 10.4" TFT	0.5 A	-	0.5 A	-
Current Requirements	5.6 A	-	0.7 A	0.1 A
Power Consumption (P = U * I)	28 W	-	8.4 W	1.2 W
Total Power Consumption	**37.6 W**			

Table 100: Example for current requirements and power consumption

With this structure, you have four current values (one for each voltage supply), which are multiplied with the associated voltages to determine the power consumption (P = U * I).

You then add the power ratings for the respective supply voltages, which results in the total power consumption for the IPC.

Please note, that maximum values for current requirements and power consumption, listed in the "Current Requirements of the Components" table must not be exceeded!

9.7 IPC5000C and IPC5600C Current requirements / Power consumption

Current requirements are arranged according to the bus units used for Provit IPCs with system units for socket 370 CPUs.

If you use bus units

- 5C5000.11 (IPC5000, 4 slots, 240 VAC)
- 5C5000.31 (IPC5000, 5 slots, 240 VAC) or
- 5C5600.* (IPC5600, starting from revision number x.x),

the values for power consumption are found in the following table:

IPCs Configuration	Current Requirements	
	For 5 V[1)]	For 12 V[1)]
Celeron 300, 64 MB DRAM Celeron 300, 640 MB DRAM	4.2 A 5.2 A	0.2 A 0.2 A
Celeron 366, 64 MB DRAM Celeron 366, 640 MB DRAM	4.8 A 5.8 A	0.2 A 0.2 A
Celeron 433, 64 MB DRAM Celeron 433, 640 MB DRAM	5.4 A 5.4 A	0.2 A 0.2 A
Celeron 566, 64 MB DRAM Celeron 566, 640 MB DRAM	4.2 A 5.2 A	0.2 A 0.2 A
Pentium III 600, 64 MB DRAM [2)] Pentium III 600, 640 MB DRAM [2)]	4.8 A 5.8 A	0.2 A 0.2 A
Pentium III 850, 64 MB DRAM Pentium III 850, 640 MB DRAM	5.4 A 5.4 A	0.2 A 0.2 A

Table 101: Current requirements IPC5000C and IPC5600C

1) Current consumption on the corresponding voltage of the power supply (5 V or 12 V)
2) Only for IPC5600C

If you use bus units

- 5C5000.11 (IPC5000, 2 Slots, 240 VAC)
- 5C5000.02 (IPC5000, 2 Slots, 24 VDC)
- 5C5000.12 (IPC5000, 4 Slots, 24 VDC)
- 5C5000.11 (IPC5000, 2 Slots, 240 VAC)
- 5C5000.22 (IPC5000, 2 Slots, 24 VDC) or
- 5C5000.12 (IPC5000, 5 Slots, 24 VDC),

the values for power consumption can be found in the table on the next page.

IPC5000C and IPC5600C current requirements:

IPCs Configuration	Current Requirements	
	for 5 V	for 12 V
Celeron 300, 64 MB DRAM Celeron 300, 640 MB DRAM	3 A 3 A	0.7 A 1.0 A
Celeron 366, 64 MB DRAM Celeron 366, 640 MB DRAM	3.5 A 3.5 A	0.7 A 1.0 A
Celeron 433, 64 MB DRAM Celeron 433, 640 MB DRAM	4.2 A 4.2 A	0.7 A 1.0 A
Celeron 566, 64 MB DRAM Celeron 566, 640 MB DRAM	3 A 3 A	0.7 A 1.0 A

Table 102: Current requirements IPC5000C and IPC5600C

The values given are typical values and have a certain tolerance. This depends on configuration details and cannot be determined exactly.

The values given are measured on IPCs with only an external floppy disk drive connected as a peripheral device (no hard disk, no cards etc.).

Power supplies can deliver the following currents:

Bus Unit	Current for Supply Voltage				Max. Power
	+5 V	-5 V	+12 V	+12 V	
5C5000.01	6	0.3 A	3 A	0.7 A	60 W
5C5000.02 5C5000.12 5C5000.22 5C5000.32 5C5600.02 5C5600.04 5C5600.12	10 A	0.3 A	4 A	1 A	60 W
5C5600.11 5C5000.21 5C5000.31 5C5600.01 5C5600.03 5C5600.11	15 A	0.3 A	6 A	1 A	100 W

Table 103: Power supply currents

9.8 Power Failure Bypass Function of the Bus Units

Bus Unit	Supply Voltage	Power	Power Failure Bypass
5C5000.01	100 - 240 VAC	60 W	20 ms for 60 W load
5C5000.02	24 VDC	60 W	1.5 ms for + 5 V and 1 ms for + 12 V with 150 W load
5C5000.11	100 - 240 VAC	100 W	20 ms for 80 W load
5C5000.12	24 VDC	60 W	1.5 ms for + 5 V and 1 ms for + 12 V with 150 W load
5C5000.21	100 - 240 VAC	100 W	20 ms for 80 W load
5C5000.22	24 VDC	60 W	1.5 ms for + 5 V and 1 ms for + 12 V with 150 W load
5C5000.31	100 -240 VAC	100 W	20 ms for 80 W load
5C5000.32	24 VDC	60 W	1.5 ms for + 5 V and 1 ms for + 12 V with 150 W load
5C5600.01	115 / 230 VAC	100 W	20 ms for 100 W load
5C5600.02	24 VDC	60 W	1.5 ms for + 5 V and 1 ms for + 12 V with 150 W load
5C5600.03	115 / 230 VAC	100 W	20 ms for 100 W load
5C5600.04	24 VDC	60 W	1.5 ms for + 5 V and 1 ms for + 12 V with 150 W load
5C5600.11	115 / 230 VAC	100 W	20 ms for 100 W load
5C5600.12	24 VDC	60 W	1.5 ms for + 5 V and 1 ms for + 12 V with 150 W load

Table 104: Power failure bypass function for Provit bus units

9.9 Functional Ground Connection

It is possible to connect the bus unit with functional ground, which supports the device's function and noise suppression. The connection is made with a cable on a part of the housing which is grounded (e.g. switching cabinet, etc.). A suitable cable with a plug must be supplied by the customer.

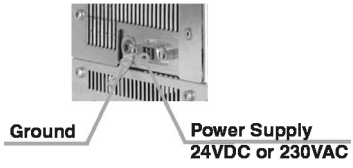


Figure 78: Functional ground connection for IPC5000 and IPC5000C (4 slot design)

Figure 79: Functional ground connection IPC5600/IPC5600C (4 slot and 6 slot design)

The possibility exists to connect functional ground for the following bus units (with the following revision numbers):

Model No.	Module ID	Starting with Rev. no.
5C5000.11	Bus unit 4 slot 100 - 240 VAC	D0
5C5000.21	Bus unit 2 slot 100 - 240 VAC	A0
5C5000.22	Bus unit 2 slot 24 VDC	A0
5C5000.31	Bus unit 5 slot 100 - 240 VAC	A0
5C5000.32	Bus unit 5 slot 24 VDC	A0
5C5600.01	Bus unit 4 slot 115 / 230 VAC	C0
5C5600.02	Bus unit 4 slot 24 VDC	C0
5C5600.03	Bus unit 5 slot 115 / 230 VAC	A0
5C5600.04	Bus unit 5 slot 24 VDC	A0
5C5600.11	Bus unit 6 slot 115 / 230 VAC	00
5C5600.12	Bus unit 6 slot 24 VDC	C0

10. Processors

See sections "Processor Socket for System Units with socket 7 (ZIF) " or "Processor Socket for System Units with Socket 370".

11. Mass Memory

A silicon disk (PC card, Compact flash) is required in environments with vibration and shock.

Hard disk drives are normally not designed for use in industrial environments. If excessive vibrations or shock occur during use, B&R is not liable for damage to a properly functioning hard disk. The limits specified by the respective manufacturers are displayed in the following tables.

Hard Disk	5A5001.02	5A5001.03	5A5001.04	5A5001.05 1)	5A5001.08 1)
Capacity	1.44 GB	2.1 GB	4.3 GB	6 GB	
Operating Temperature2)	5 - 47 °C			5 - 47 °C 5 - 40 °C at 24 h operation	
Standards Shock Vibration	150 G, 2 ms 0.5 G, 5 to 500 Hz			150 G, 2 ms 1.0 G, 5 to 400 Hz	

Table 105: Technical data hard disks

1) More detailed information about 6 GB hard disks can be found in Chapter 8 "Technical Appendix".
2) Operating temperature of the controller

Silicon Disk (PC Card)	Capacity	Silicon Disk (Compact Flash)	Capacity
9A0009.01	6 MB	9A0015.07	8 MB
9A0009.02	40 MB	9A0015.03	10 MB
9A0009.03	20 MB	9A0015.01	20 MB
9A0009.04	110 MB	9A0015.06	32 MB
9A0009.05	60 MB	9A0015.04	48 MB
9A0009.06 1)	220 MB	9A0015.02	64 MB
9A0009.07	220 MB	9A0015.05	128 MB
9A0009.08	48 MB	9A0015.08	196 MB
9A0009.09	440 MB	9A0015.09	320 MB

Table 106: Technical data for silicon disks

1) Full Metal Card, i.e. the housing of the PC Card is completely made of metal.

Mass memory media are inserted in the bus unit in a hard disk / silicon disk slot (enhanced IDE interface), which is accessible after opening the housing (see also section "Hard Disk / Silicon Disk Slots").

Mass memory media are installed on a special insert card. A PCI plug is used for connecting (mechanically and electrically) the hard drive to the IPC. Please note however, that mass memory media does not possess a PCI interface nor can it operate on the PCI bus.

11.1 Types of Mass memory Media

There are two different mass memory media to choose from with the IPC5000 and IPC5600 series:

- Hard Disks
- Silicon Disks

In contrast to conventional hard disks, silicon disks have no mechanical parts. Storage takes place in a FlashPROM on a pure semi conductor basis. This means they are free from nearly all mechanical influences such as shock or vibration.

Selecting which mass memory to use depends on the different viewpoints and properties of the respective media.

Hard disks, for example, can only be used limitedly in environments with heavy vibrations or mechanical shock (see table below). Another characteristic is that hard disks have limited operating times, real 24 hour continuous operation is only possible under certain conditions.

Silicon disks however are almost immune to all mechanical and environmental influences. Nevertheless, the number of write/erase cycles is limited and the price is higher than conventional hard drives.

11.1.1 Hard Disks

A silicon disk (PC card, Compact flash) is required in environments with vibration and shock. Hard disk drives are normally not designed for use in industrial environments. If there is excessive vibration or shock present during the applications, B&R shall not be liable for damage to a properly functioning hard disk. The specified limit values can be read from the corresponding tables.

Hard Disk	5A5001.02	5A5001.03	5A5001.04	5A5001.05 1)	5A5001.08 1)
Capacity	1.44 GB	2.1 GB	4.3 GB	6 GB	
Operating Temperature 2)	5 - 47 °C			5 - 47 °C 5 - 40 °C at 24 h operation	
Standards Shock Vibration	150 G, 2 ms 0.5 G, 5 to 500 Hz			150 G, 2 ms 1.0 G, 5 to 400 Hz	

Table 107: Technical data hard disks

1) More detailed information about 6 GB hard disks can be found in Chapter 8 "Technical Appendix".
2) Operating temperature of the controller

Hard drives in the 2.5" format are used exclusively.

See the section "Assignment of Resources" for I/O addresses and interrupt settings.

The top side of the hard drives should never be touched. Magnet heads can be damaged by even light pressure because the housing plate is very thin.

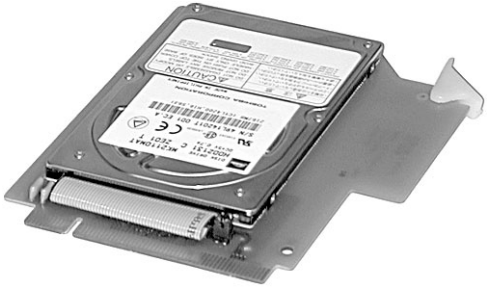


Figure 80: Hard disk mounted directly on the adapter card (Model 5A5001.03)

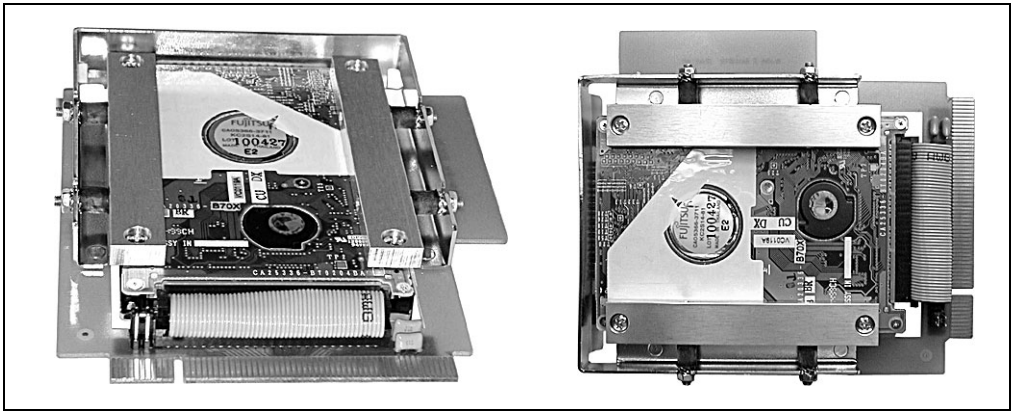


Figure 81: Hard disk mounted on adapter card with rubber suspension (5A5001.05)

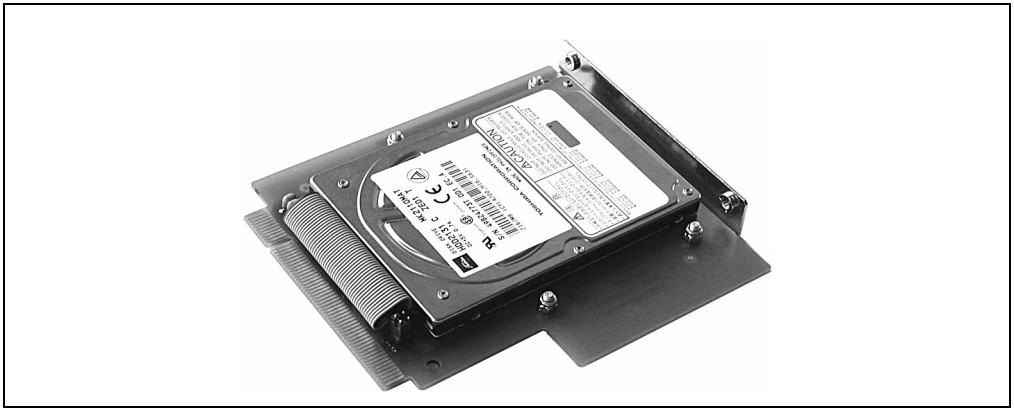


Figure 82: Hard disk mounted directly on adapter card (5A5001.08)

11.1.2 Silicon Disks

Silicon disks (memory media on a pure semi conductor basis) are available from B&R in two variations:

- PC cards
- Compact Flash cards

Silicon Disk (PC Card)	Capacity	Silicon Disk (Compact Flash)	Capacity
9A0009.01	6 MB	9A0015.07	8 MB
9A0009.02	40 MB	9A0015.03	10 MB
9A0009.03	20 MB	9A0015.01	20 MB
9A0009.04	110 MB	9A0015.06	32 MB
9A0009.05	60 MB	9A0015.04	48 MB
9A0009.06 1)	220 MB	9A0015.02	64 MB
9A0009.07	220 MB	9A0015.05	128 MB
9A0009.08	48 MB	9A0015.08	196 MB
9A0009.09	440 MB	9A0015.09	320 MB

Table 108: Technical data for silicon disks

1) Full Metal Card, i.e. the housing of the PC Card is completely made of metal.

Silicon disks are installed on special adapter cards, which enable operation in a hard disk / silicon disk slot on a Provit Industrial PC.

PC cards and Compact Flash cards can be used here as a real alternative to a hard disk, i.e. there is the option to boot from the silicon disk using a True-IDE/ATA interface.

Use without the adapter card is also possible. This is done by operating the PC card / Compact Flash Card as normal, in a corresponding slot, as pure data memory.

a) PC Cards

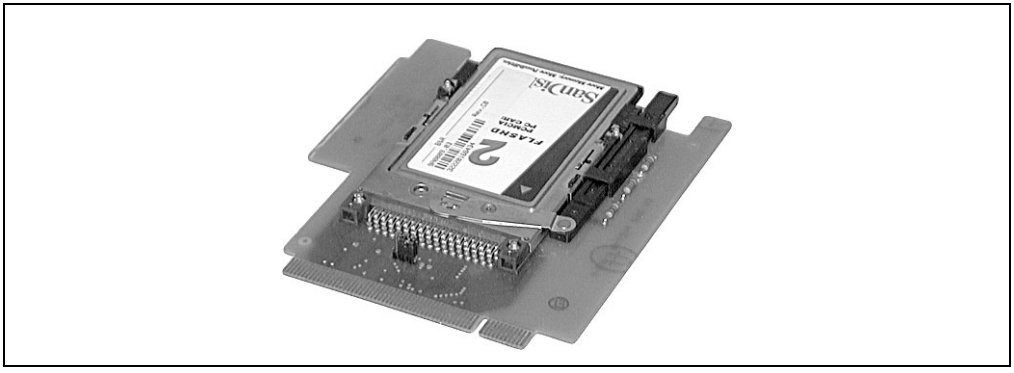


Figure 83: Silicon disk (PC card) on the adapter card

These memory media consist of PC cards in type II format with FlashPROM memory. The adapter card for using PC cards as "hard disk replacement" in the hard disk / silicon disk slot on the IPC is available under model no. 5A5002.01.

b) Compact Flash Cards

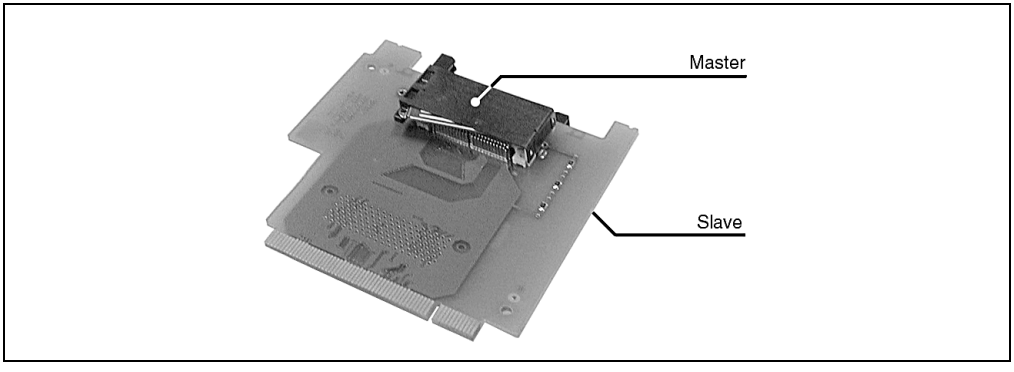


Figure 84: Silicon disk (PC card) on the adapter card

Differences between PC cards and Compact Flash cards are only noticeable in regards to mechanical measurements and the number of pins. Compact Flash cards also contain a FlashPROM memory.

The adapter card for using PC cards as "hard disk replacement" in the hard disk / silicon disk slot on the IPC is available under model no. 5A5002.02. On this adapter card, there are 2 Compact Flash slots (top or bottom of the circuit board).

12. Lifespan of Silicon Disks (Compact Flash, PC Card)

12.1 General Information

The silicon disks used in the IPCs are from SanDisk. They are 100% compatible with all operating systems because of their ATA industry standard design.

12.2 Construction

A silicon disk is divided internally into individual sectors, whereby one sector corresponds to 512 bytes. (Example: 48 MByte = 48 * 1,024,000 Byte [1] = 49,152,000 Byte / 512 Byte = 96,000 sectors) These e.g. 96,000 sectors, are named "user sectors" and can be freely chosen by the user.

Compact Flash and PC cards possess over 1% of spare sectors. Additionally they possess user sectors, which are also based on their memory capacity. In the example, this corresponds to 960 spare sectors.

This additional memory is run automatically and therefore cannot be accessed by the user. The necessity for these sectors is due to the limited number of write/erase cycles per sector, currently estimated to be at least 300,000 accesses (typically 1,000,000 accesses). If a user sector can no longer be successfully written to and checked, it is automatically replaced with a spare sector.

12.3 Organization of Data in an Application

a) Ring buffer storage

With ring buffer storage, data is always saved on the same sectors, e.g. from an application that always writes the same amount of data (file size does not change). The date and time information is also updated for the designated sectors.

b) Continuous storage

With continuous storage, the data is continually saved at the end of the last defined sector (continuous writing e.g. trending). Date, time and file size information (changed with every write cycle) is thereby updated for the designated sectors.

1) SanDisk use the following conversion formulas: 1 sector = 512 bytes, 1 MByte = 1,024,000 bytes

12.4 Calculation of the Lifespan

12.4.1 Example 1: Ring Buffer Data Storage

An application records the data every minute for the previous 5 hours. The data is saved on the same sectors (ring buffer).

Specifications: 64 MByte silicon disk, 10 kByte per minute i.e. 10 *1,024 Byte / 512 Byte = 20 sectors per minute

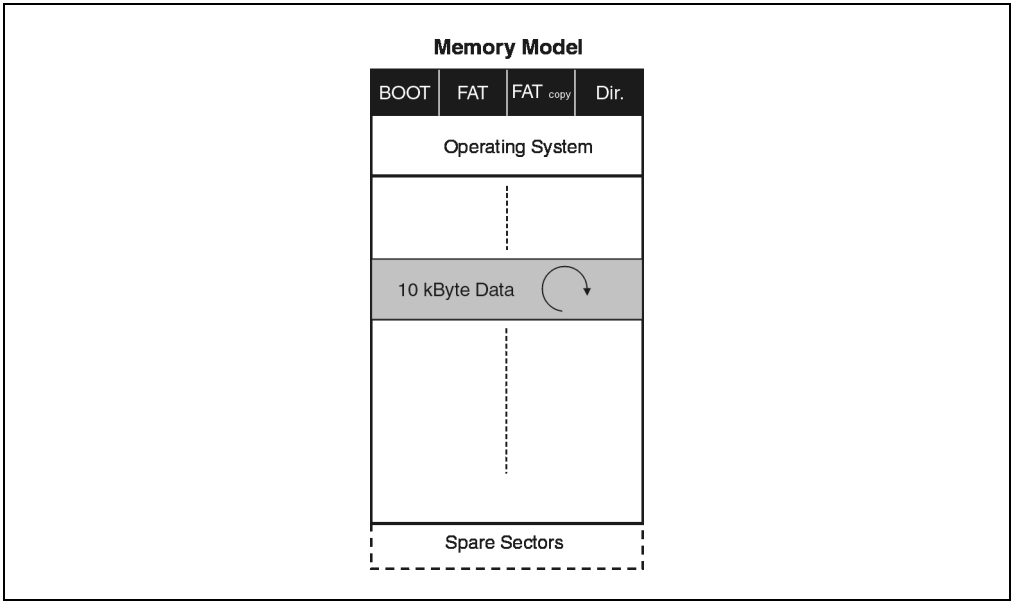


Figure 85: Ring Buffer example

1. Calculations of the sectors

User sectors: 64 * 1,024,000 byte / 512 byte = 128,000 sectors

Spare sectors: 1% of user sectors = 1,280 sectors

2. Write cycles per year

23 sectors per minute (20 data + 2 FAT + 1 directory)

(20 + 2 + 1) sectors * 60 minutes * 24 hours * 365 days = 12,088,800 write cycles per year.

3. Possible number of write/erase cycles per year

(1,280 spare sectors + 23 sectors) * 300,000 accesses = 390,900,000 write/erase cycles per year

4. Lifespan

390,900,000 write erase cycles per year / 12,088,800 write cycles per year = a guaranteed lifespan of 32 years

Typical lifespan: 32 years * 3.3 = 105.6 years

12.4.2 Example 2: Continuous Data Storage

An application writes consecutively a data amount on a PC card (e.g. trending).

Specifications: 40 MByte PC card, with 20 MByte system data (operating system, application,…) and 20 MByte data (application memory), 20 KByte per minute i.e. 20 * 1,024 byte / 512 byte = 40 sectors per minute

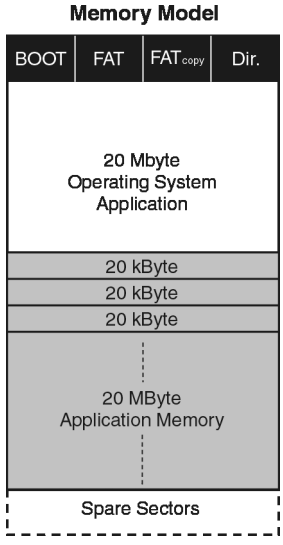


Figure 86: Continuous Data Storage

1. Calculations of the sectors

User sectors (system data): 20 * 1,024,000 byte / 512 byte = 40,000 sectors (are not changed)

User sectors: 20 * 1,024,000 byte / 512 byte = 40,000 sectors

Spare sectors:1% of user sectors = 800 Sectors

2. Write cycles per year

3 sectors per minute (2 FAT + 1 directory) are always upgraded.

(2 + 1) sectors * 60 minutes * 24 hours * 365 days = 1,576,800 write cycles per year.

3. Possible number of write/erase cycles per year

3 user sectors + 800 spare sectors = 803 sectors

803 sectors * 300,000 accesses = 240,900,000 write/erase cycles per year

4. Lifespan

The lifespan is then determined by 2 factors:

a) Memory capacity depleted (20 kByte are continually written)

20 MByte application memory / 20 kByte per minute = 16.67 hours

b) Spare sectors depleted (3 sectors are continually specified)

240,900,000 write erase cycles per year / 1,576,800 write cycles per year = a guaranteed lifespan of 152.8 years

Typical lifespan: 152.8 years * 3.3 = 504.24 years

Because of the amount of data written every minute, the memory capacity is depleted before the lifespan is reached, and no further data can be saved.

13. Main Memory

The type of DRAM modules which can be used, depends on the system unit or controller:

Controller	IPC5000/IPC5600				
System Units	5C5001.01 5C5001.03 5C5601.01				
Slots	2 x PS/2 SIMM (72 pin) FPM or EDO				
Size	9A0004.03 4 MB	9A0004.05 8 MB	9A0004.04 16 MB	9A0004.06 32 MB	9A0004.07 64 MB

Table 109: Main memory IPC5000 and IPC5600

Controller	IPC5000C / IPC5600C		
System Units	5C5001.11 5C5001.12 5C5601.11 5C5601.12		
Slots	3 x DIMM (168 pin) PC100 SDRAM		
Size	9A0004.11 64 MB	9A0004.12 128 MB	9A0004.14 256 MB

Table 110: Main memory IPC5000C and IPC5600C

Slots for DRAM modules are accessible after opening the housing.

DRAM modules are allowed to be a maximum of 29.5 mm high if used in IPC5000/ IPC5000C.

13.1 System Units with SIMM Slots

The mainboards of system units 5C5001.01, 5C5001.03 and 5C5601.01 are equipped with two 72 pin standard PS/2 SIMM slots (also see section "DRAM socket").

Because of the chipset used (Intel 430HX), two identical SIMM module (size and organization) must always be used.

The total size of the SIMM module used can be a maximum of 128 MB (also see section "DRAM socket"). Therefore the following memory configurations are possible :

SIMM Modules (two at a time)		Memory Size (total)
Size	Organization	
4 MB	1 MB x 32/36	8 MB
8 MB	2 MB x 32/36	16 MB
16 MB	4 MB x 32/36	32 MB
32 MB	8 MB x 32/36	64 MB
64 MB	16 MB x 32/36	128 MB

Table 111: Possible memory configurations with SIMM modules

SIMM modules with the correct operating voltage must be used (see section "DRAM socket").

13.2 System Units with DIMM Slots

Three 168 pin standard DIMM slots for PC100 SDRAM memory modules are found on the mainboards of system units 5C5001.11 and 5C5601.11 (also see the section "DRAM Socket").

The size and number of memory modules used in the different DIMM slots are limited by the following conditions:

- Max. 256 MB per module
- Max. of 512 MB in total

14. Interface Board

Interface board	5A5000.01	5A5000.02	5A5000.05	5A5000.06
Slot	B&R 16 Bit ISA			
COM3	Combined RS232 / RS422 interface, tri-state, electrically isolated , 16 byte FIFO			
COM4	Combined RS232 / RS422 interface, tri-state, electrically isolated , 16 byte FIFO			
CAN Bus	CAN 2.0b specification, Intel 82527 controller			
PC Card	1 PCMCIA slot, Type I, II or III			
SRAM	256 KB; can be addressed via PCMCIA socket 2 Own lithium backup battery			
LPT2	Internal, for Hardware Security Key (Dongle)			
Ethernet Connection Controller Manufacturer Compatibility Cabling	-	BNC (10Base2) UMC 9008F NE2000 compatible RG58	RJ45 Tw. Pair (10BaseT) Intel 82595 Not NE2000 compatible S/STP (category 5)	BNC (10Base2) Intel 82595 Not NE2000 compatible RG58

Table 112: Technical data for the interface board

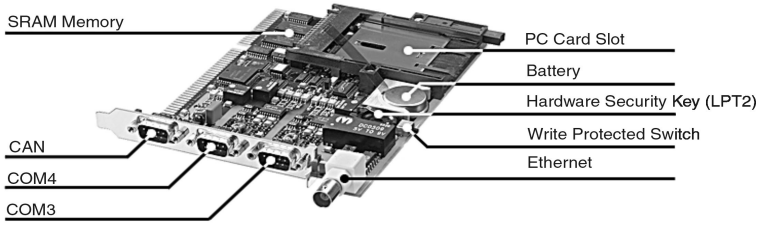


Figure 87: Interface Board

The B&R interface board is not a standard width ISA card. They can therefore only be used in Provit 5000 and 5600 series IPCs.

The following interface boards with the following revisions are equipped with a new PCMCIA controller (VG469): 5A5000.01 starting from revision E0, 5A5000.05 starting from revision G0 and 5A5000.06 starting from revision E0. To guarantee that the controller operates properly, the following BIOS versions must be used: IPC5000/5600 starting from BIOS version V1.57 or higher
IPC5000C/5600C starting from BIOS version V1.06 or higher.

All current deliveries are equipped with the aforementioned BIOS Versions or higher. Systems with an older BIOS version must be updated.

14.1 Dimensions

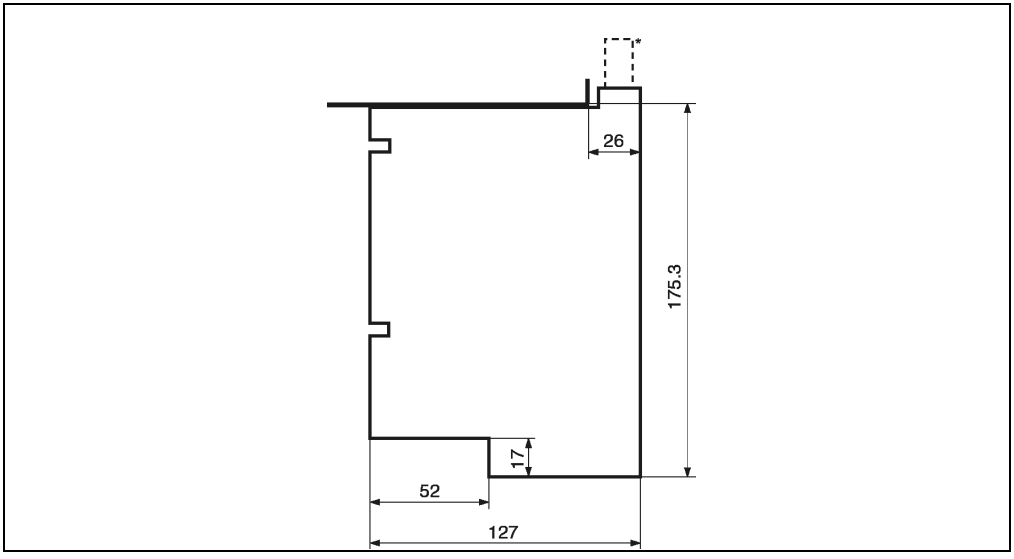


Figure 88: Interface board measurements

* Only for B&R interface boards with a BNC Ethernet connection.

14.2 Serial Interfaces COM3 and COM4

Two combined RS232/RS422 interfaces are available on the interface board. The operating mode (RS232/RS422) is selected automatically, depending on the electrical connection. Both interfaces are equipped with a 16 Byte FIFO memory and are Plug & Play and UART16550 compatible.

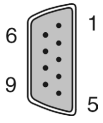
COM3, COM4			
RS232/RS422 interface electrically isolated RS232 to 115 kBaud, RS422 to 19200 Baud			9 pin DSUB plug 
Pin	**Assignment RS232**	**Assignment RS232**	
1		$\overline{\text{TXD}}$	
2	RXD		
3	TXD		
4		TXD	
5	GND	GND	
6		$\overline{\text{RXD}}$	
7	RTS		
8	CTS		
9		RXD	

Table 113: Pin assignment COM3 and COM4

Resource settings (I/O address, interrupt) are made during the system start by the Plug & Play BIOS and cannot be manually changed by the user (only with an ISA configuration utility or Windows 95/98). If a resource is already assigned, BIOS attempts to assign configurations to the interfaces COM3 and COM4 in the following order:

Setting	COM3		COM4	
	Interrupt	I/O Address	Interrupt	I/O Address
Basic configuration 1 (Default)	11	3E8h	12	2E8h
Basic configuration 2	3, 4, 7, 9, 10, 11, 12, 14, 15	3E8h	3, 4, 7, 9, 10, 11, 12, 14, 15	2E8h
Basic configuration 3	3, 4, 7, 9, 10, 11, 12, 14, 15	200h - 3F8h	3, 4, 7, 9, 10, 11, 12, 14, 15	200h - 3F8h
Basic configuration 4	3, 4, 5, 7, 9, 10, 11, 12, 14, 15	200h - 3F8h	3, 4, 5, 7, 9, 10, 11, 12, 14, 15	200h - 3F8h

Table 114: Configurations COM3 and COM4

14.2.1 RS485 Interface Operation

COM3 and COM4 interfaces can also be operated in RS422 mode as RS485 interfaces. This is possible by a TriState switching, which is made using RTS.

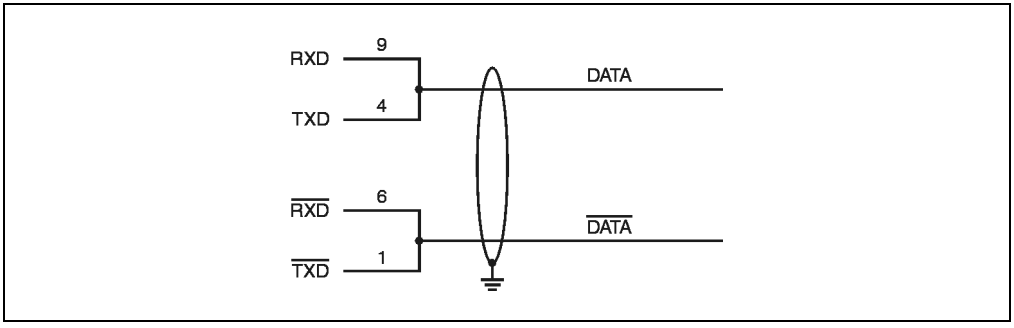


Figure 89: Operation of COM3 or COM4 interface in the RS485 mode

14.3 CAN Interface

The B&R interface board is equipped with an Intel 82527 CAN controller, which conforms to CAN specifications 2.0b. It is thereby possible to use standard protocols CAN and extended CAN. B&R software supports the standard CAN identifier (11 bit).

The CAN controller can trigger an NMI (non-maskable interrupt).

CAN	
Electrically Isolated from the System Ground Assignment According to CiA DS 102-1	
Pin	**Assignment**
1	
2	CAN Low
3	GND
4	
5	
6	Reserved
7	CAN High
8	
9	

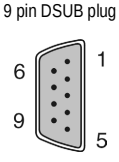


Table 115: CAN pin assignment

Default Settings	CAN
Interrupt	None [1)]
I/O Address	384h = Address register 385h = Data register

Table 116: Default settings CAN

1) Either IRQ10, NMI or no interrupt (see the "Additional Peripherals" section)

Settings for the I/O addresses cannot be changed.

14.4 PC Card Slot / SRAM

A PC card slot which can be accessed with the housing closed is available on the interface board. Type I, II or III cards can be used in this slot. The slot is compatible with PCMCIA Release 2.0 and JEIDA V4.1 standards and is operated as PC card socket 1. We recommend use of memory cards with Tuple (also known as CIS).

Default Settings	PC Card Slot
Interrupt	Depends on card
I/O Address	3E0h - 3E1h

Table 117: PC Card slot resources

The I/O address is permanently set. The assignment of an interrupt is made - if necessary (depending on card) - using Plug & Play (see section "Interrupt Assignments").

A 256 KB SRAM integrated in the interface board can be accessed via PC card slot 2. To the user, this memory looks like an inserted PC Card.

Buffering takes place with a lithium battery on the interface board (3 V, 950 m Ah). The lifespan of this battery is at least 1.5 years, but typically 4 years (at 50°C and 256 KB SRAM).

It is possible to protect the internal SRAM from being written to unintentionally by using a write protect switch. This switch is accessible from the outside through a small opening. If the switch is pointing in the direction of the PC card slot, then write protection is activated.

Operating a compatible PC card is not possible without a corresponding driver. These are available from B&R (model number 5S0002.01-020).

14.5 LPT2 (Hardware Security Key)

A Dallas Hardware Security key, required for software protection ("Dongle"), is found on the mainboard.The slot is found near the SRAM backup battery and is addressable as LPT2.

Default Settings	LPT2
Interrupt	-
I/O Address	278h - 27Fh

Table 118: Default settings LPT2

To change these settings see the section "Additional Peripherals".

14.6 Ethernet Controller

Interface Board	5A5000.01	5A5000.02	5A5000.05	5A5000.06
Ethernet	-	10 Mbit/s	10 Mbit/s	10 Mbit/s
Connection	-	BNC (10Base2)	RJ45 Twisted Pair (10BaseT)	BNC (10Base2)
Controller	-	UMC 9008F	Intel 82595	Intel 82595
Compatibility	-	NE2000 compatible	Not NE2000 compatible	Not NE2000 compatible
Cabling	-	RG58	S/STP (category 5)	RG58

Table 119: Ethernet Controller interface board

Interface board 5A5000.02 guarantees that all software and protocols on the market can be used, because of its compatibility with the NE2000 standard.

An Intel manufactured Ethernet Controller is used for interface boards 5A5000.05 and 5A5000.06, which requires a special software driver. This is found on the Provit Drivers & Utilities CD ROM (model number 5S0000.01-090) or can be downloaded directly from B&R's homepage (www.br-automation.com).

Resource settings (I/O address, interrupt) are made during the system start by the Plug & Play BIOS and cannot be manually changed by the user (only with an ISA configuration utility or Windows 95/98).

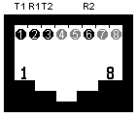
If a resource is already assigned, the BIOS attempts to assign other configurations to the Ethernet controller in the following order:

Setting	5A5000.02 (UMC Ethernet NE2000)		5A5000.05 and .06 (Intel Ethernet, not NE2000)	
	Interrupt	I/O Address	Interrupt	I/O Address
Basic Configuration 1 (Default)	5	300h	3, 4, 5, 7, 9, 10, 11, 12	200h - 390h
Basic Configuration 2	3, 4, 5, 10, 11, 12, 15	300h	-	-
Basic Configuration 3	3, 4, 5, 10, 11, 12, 15	200h - 3E0h	-	-

Table 120: Ethernet Controller configurations

Connections

BNC socket (IEEE 802.3)



RJ45 Twisted Pair socket (EN 50173)

Figure 90: Ethernet connections

Chapter 3 • Display Units

1. Overview

Model No.	Description	Remark
5D5100.01	Display unit 10.4" VGA color display (color LCD)	*Cancelled since 05/1999*
5D5100.04	Display unit 10.4" TFT display (color TFT) with touch screen	
5D5200.01	Display unit 10.4" TFT display (color TFT) with touch screen	*Cancelled since 03/1999*
5D5200.04	Display unit 13.8" TFT display (color VGA) with touch screen	*Cancelled since 01/1999*
5D5201.02	Display unit 10.4" TFT display (color TFT) with touch screen	Cancelled *since 03/1999*
5D5201.03	Display unit 12.1" TFT display (color TFT) with touch screen	Cancelled *since 03/1999*
5D5202.01	Display unit 13.8" TFT display (color XGA) with touch screen	Cancelled *since 03/1999*
5D5202.03	Display unit 13.8" TFT display (color XGA) with touch screen in bright grey design.	*Cancelled since 02/1999 Replacement type is 5D5212.02*
5D5210.01	Display unit 10.4" TFT display (color VGA) with touch screen in bright grey design.	
5D5211.02	Display unit 10.4" TFT display (color SVGA) with touch screen in bright grey design.	
5D5211.03	Display unit 12.1" TFT display (color SVGA) with touch screen in bright grey design.	
5D5211.06	Display unit 12.1" TFT display (color SVGA) with touch screen (infrared) in bright grey design.	
5D5212.01	Display unit 13.8" TFT display (color XGA) with touch screen in bright grey design.	*Cancelled since 12/1999*
5D5212.02	Display unit 15" TFT display (color XGA) with touch screen in bright grey design.	
5D5212.04	Display unit 15" TFT display (color XGA) with touch screen in bright grey design.	
5D5213.01	Display unit 18.1" TFT display (color SXGA) with touch screen in bright grey design.	
5D5500.10	Display unit 10.4" TFT display (color TFT) with keys	
5D5500.32	Display unit 10.4" TFT display (color VGA) with keys in bright grey design.	*Cancelled since 02/1999 Replacement type is 5D5510.10*
5D5501.01	Display unit 10.4" TFT display (color SVGA) with keys	
5D5510.10	Display unit 10.4" TFT display (color TFT) with keys	Replacement type for 5D5500.32
5D5600.01	Display unit 10.4" TFT display (color TFT) with keys	
5D5600.02	Display unit 10.4" TFT display (color VGA) with keys and touch pad	
5D5600.03	Display unit 10.4" TFT display (color TFT) with keys around the touch screen	
5D5601.01	Display unit 12.1" TFT display (color SVGA) with keys	
5D5601.02	Display unit 12.1" TFT display (color SVGA) with keys and touch pad	
5D5601.03	Display unit 12.1" TFT display (color SVGA) with keys and touch screen	
5D9200.01	Display unit 20.1" TFT display (color SXGA) SXGA 20.1" with touch screen	*Cancelled since 03/2000*

Table 121: Display Unit Overview

Display units developed for Provit 2000 series IPCs cannot be used together with a Provit 5000 series IPC.

2. Mounting Guidelines

The display unit can either be fastened directly to the controller unit (standard mounting) or operated remotely (remote mounting):

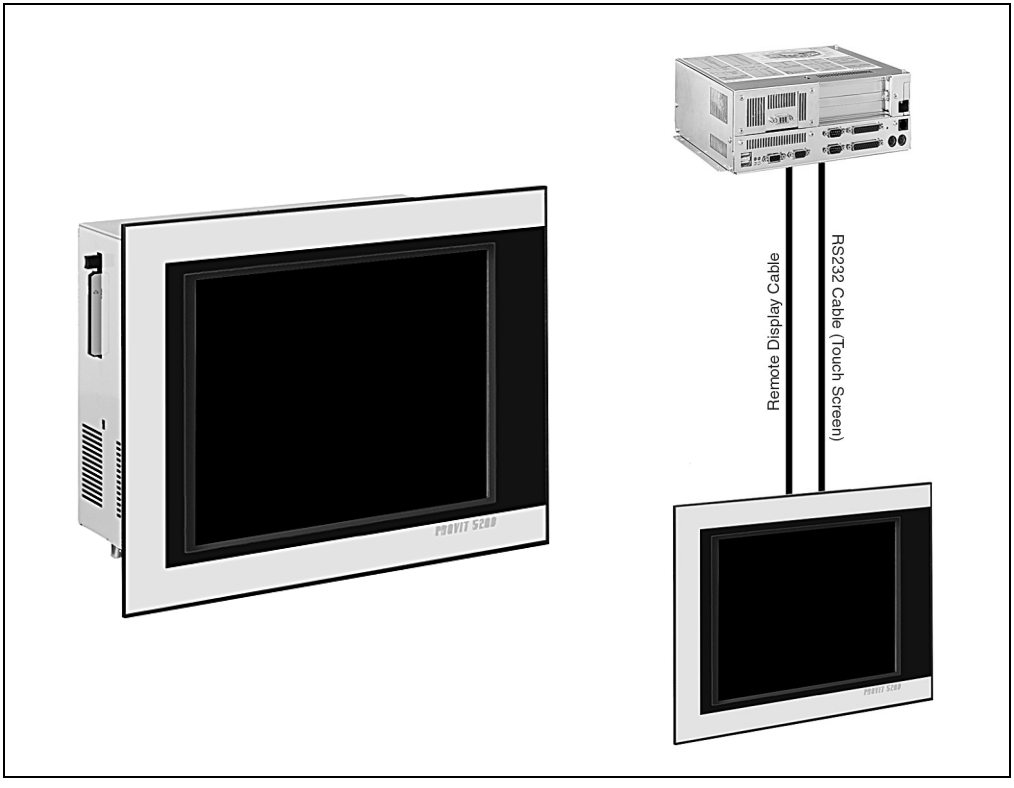


Figure 91: Standard mounting (left) and remote mounting (right)

If the controller unit is fastened on the back of the display, care must be taken that all connections are pointing downwards.

With remote mounting, the maximum permitted distance of the display unit from the controller unit depends on the respective display unit. Information regarding this is given in the respective sections by technical data tables for the display.

Remote display and RS232 cable (touch screen) must be ordered separately.

Model Number	Short Text
5A5004.01	Remote Panel Cable 0.6 m
5A5004.02	Remote Panel Cable 1.8 m
5A5004.05	Remote Panel Cable 5 m
5A5004.06	Remote Panel Cable 5 m 1 x 70°
5A5004.10	Remote Panel Cable 10 m
5A5004.11	Remote Panel Cable 10 m 1 x 70°
9A0014.02	RS232 Extension Cable 1.8 m
9A0014.05	RS232 Extension Cable 5 m
9A0014.10	RS232 Extension Cable 10 m

Table 122: Remote cable and RS232 cable overview

2.1 Distance for Remote Operation

A maximum distance of 5 m is standard for remote operation of the display by the controller. A distance of up to 10 m depends on the revision numbers for the system and the display units:

System Units		
Model No.:	**Short Text**	**10 m Distance starting from Rev.**
5C5001.01	System 82430HX VGA MTC 2SIMM	E0
5C5001.03	System 82430HX VGA MTC 2SIMM	E0
5C5601.01	System 82430HX VGA MTC 2SIMM	F0
Display Units		
Model No.:	**Short Text**	**10 m Distance starting from Rev.**
5D5000.03	Panel Kit TFT C VGA 10.4"	D0
5D5000.10	Panel Kit LCD C VGA 10.4"	D0
5D5000.14	Panel Kit TFT C VGA 13.8"	D0
5D5000.18	Panel kit TFT color XGA 13.8"	D0
5D5210.01	iPanel TFT C VGA 10.4" T	D0
5D5211.02	iPanel TFT C SVGA 10.4" T	D0
5D5211.03	iPanel TFT C SVGA 12.1" T	E0
5D5212.02	iPanel TFT C XGA 15" T	D0
5D5212.04	iPanel TFT C XGA 15" T	C0
5D5510.10	iPanel TFT C VGA 10.4" F	D0
5D5600.01	Panel TFT C VGA 10.4" F	D0

Table 123: Distance with remote operation

System Units		
5D5600.02	Panel TFT C VGA 10.4" FM	D0
5D5600.03	Panel TFT C VGA 10.4" FT	D0
5D5601.01	Panel TFT C VGA 12.1" F	D0
5D5601.02	Panel TFT C VGA 12.1" FM	D0
5D5601.03	Panel TFT C VGA 12.1" FT	D0

Table 123: Distance with remote operation (cont.)

3. Using Panelware Modules

Optional Panelware keypad modules can be connected to Provit 5000 controllers (with the exception of 5C5001.11, 5C5001.12, 5C5601.11 and 5C5601.12), and all Provit 5000 displays:

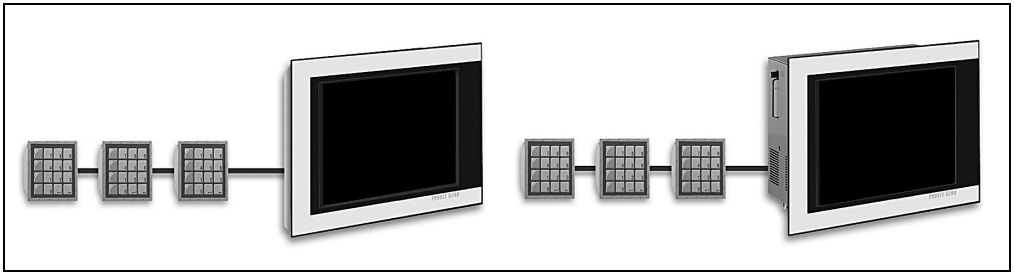


Figure 92: Connection of Panelware modules

The following limitations apply to current requirements for Panelware modules:

	Keys	LEDs
Maximum Number in the Entire System (controller unit and display unit)	128	128 (max. 48 lit simultaneously)
Maximum Amount on the Display Unit	128	128 (max. 32 lit simultaneously)

Table 124: Current requirements limitations

When connecting Panelware modules to a display unit, it is not possible to operate 128 keys or 128 LEDs on all display units. For the following modules, this depends on the revision number (on models with a lower revision than the ones shown, only 64 keys or 64 LEDs can be operated):

Display Unit	128 Keys / 128 LEDs starting with Rev.	Remark
5D5100.01	11.20	
5D5200.01	34.20	
5D5200.04	23.20	
5D5201.02	22.20	
5D5201.03	20.20	
5D5202.01	11.20	
5D5202.03		Cancelled; replacement type 5D5212.01
5D5500.10	34.20	
5D5501.01	31.20	

Table 125: Number of keys and LEDs on the display unit

This also applies for all display kits (see Chapter 4 "Display Kits"):

Display Unit	128 Keys / 128 LEDs starting with revision	Remark
5D5000.03	21.20	
5D5000.10	10.20	
5D5000.14	22.20	
5D5000.18	10.20	

Table 126: Number of keys and LEDs on the display unit

With 5600 series display units, it is not possible to connect external keypad modules because the respective number of keys is already integrated into these displays.

Function keys and keypad modules work parallel to a connected AT keyboard. Up to 8 Panelware modules can be daisy chained in series (taking the maximum amounts of keys and LEDs into account).

Make sure that inputs and outputs are properly connected to Panelware modules (labeled on the module) because connecting them incorrectly could damage the Panelware modules.

The specific connection options to the displays are found in the respective chapters.

Configuration of the keys and evaluation of key strokes is made using Mkey utilities and the Mkey driver (see the "Provit Mkey Utilities User Manual").

4. Brightness/Contrast

The brightness (background lighting) and the contrast of Provit display units can be set in the following ways:

- In BIOS in the menu item "Additional Peripherals"
- Using Mkey utilities (see "Provit Mkey Utilities User Manual")
- Using Provit 5000 Utilities (see section "Provit 5000 Utilities")

It is not possible to set the contrast for TFT displays

5. Relationship between Resolution, Graphic Memory and Colors

The following table is valid for all display units. Please note that the number of colors are limited with high resolutions (XGA,SXGA).

Video Memory	Resolution	Pixels	Number of Colors
1MB	VGA	640 x 480	16 million (true color)
	SVGA	800 x 600	65535 (high color)
	XGA	1024 x 768	256
2MB	VGA	640 x 480	16 million (true color)
	SVGA	800 x 600	16 million (true color)
	XGA	1024 x 768	65535 (high color)
	SXGA	1280 x 1024	256
4 MB	VGA	640 x 480	16 million (true color)
	SVGA	800 x 600	16 million (true color)
	XGA	1024 x 768	16 million (true color)
	SXGA	1280 x 1024	65535 (high color)
		1600 x 1200	65535 (high color)

Table 127: Relationship between graphic memory, resolution and color depth

6. Block Diagram for Controller, Display and Peripherals

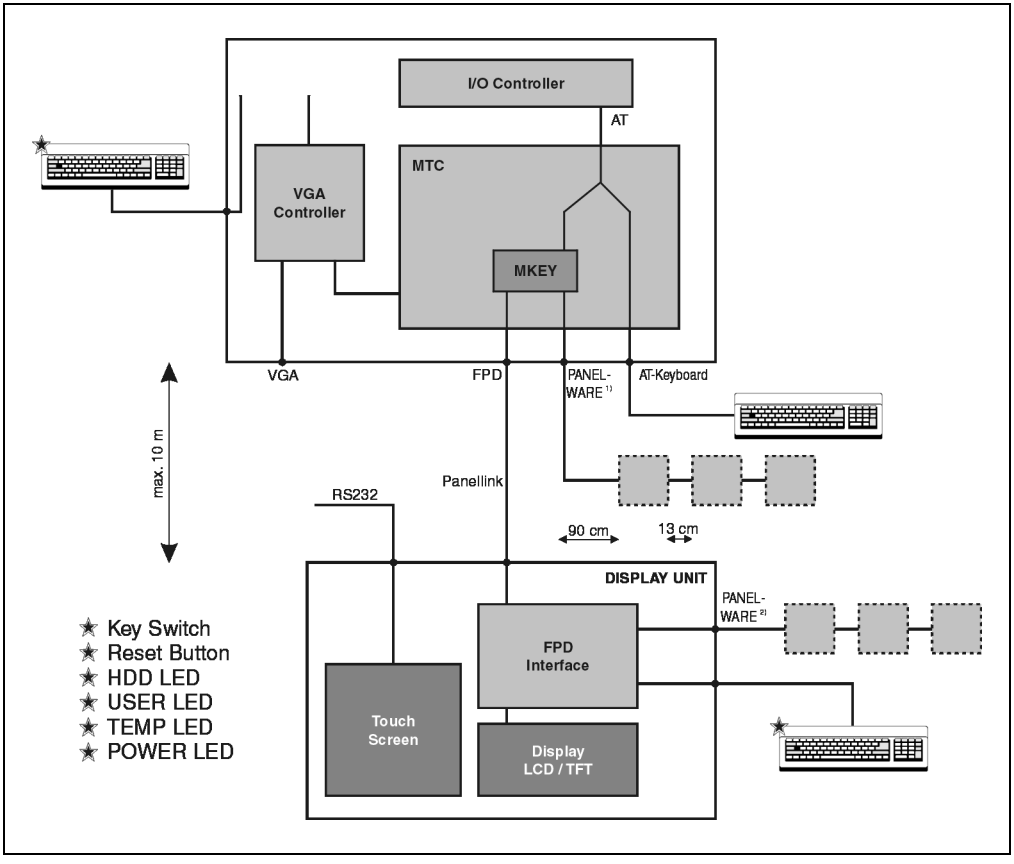


Figure 93: Block diagram for controller, display and peripherals

1) Panelware modules can only be connected directly to bus units 5C5001.01, 5C5001.03 and 5C5601.01.
2) Panelware modules can only be directly connected to Provit 5000 displays.

7. Display Unit 5D5100.01 and 5D5100.04

7.1 Photo

Figure 94: Display unit 5D5100.01 and 5D5100.04

7.2 Dimensions

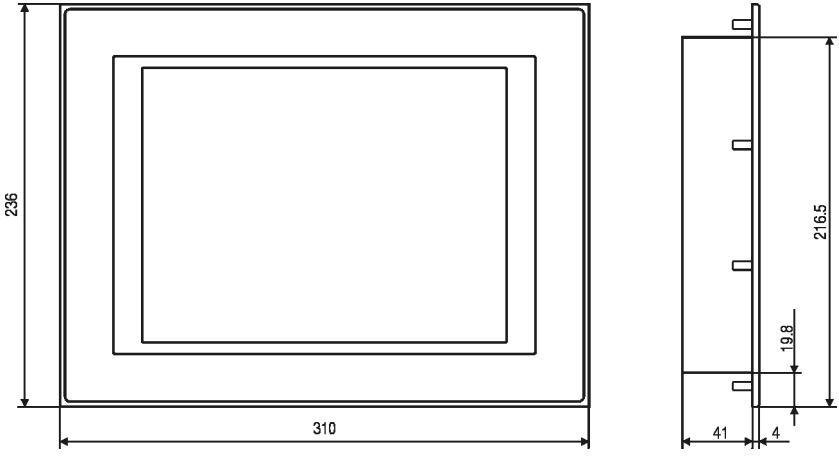


Figure 95: Measurements for 5D5100.01 and 5D5100.04

7.3 Technical Data

Model Number	5D5100.01	5D5100.04
Short Text	Panel LCD C VGA 10.4"	Panel LCD C VGA 10.4"
Controller Remote Operation	IPC5000, IPC5600 [1] Max. 10 m [2]	
Display Type Colors [3]	LCD color, CFL background lighting 262,144 colors	TFT color, background lighting 262,144 colors
Resolution	VGA (640 x 480 pixels)	
Protection	IP 20 rear sided	
Display Diagonal	10.4" (264 mm)	
Front Filter Glass Frame Décor Foil [4] Gasket	IP 65, dust and sprayed water protection (from front) Non reflective Aluminum anodized Polyester Flat gasket around display front	
Design	Black	
Background Lighting (type) Brightness Lifespan [5] [6]	70 cd/m^2 10,000 h	200 cd/m^2 20,000 h
Temperature Operating Storage	0 -40 °C, depending on installation -20 to +60 °C	0 - 50 °C, depending on installation -20 to +60 °C
Relative Humidity Operating Storage	5 - 85 %, non-condensing T ≤40 °C: 5% to 90 % (non-condensing) T > 40 °C: < 90 % non-condensing	
Weight	Approx. 1.7 kg	
Outer Dimensions (W x H x D) [7]	310 x 270 x 45 mm	
Display Design/Colors	Black	
Accessories Remote Panel Cable 0.6 m Remote Panel Cable 1.8 m Remote Panel Cable 5 m Remote Panel Cable 5 m 1 x 70° Remote Panel Cable 10 m Remote Panel Cable 10 m 1 x 70° RS232 Extension 1.8 m RS232 Extension 5 m RS232 Extension 10 m Background Lighting	 5A5004.01 5A5004.02 5A5004.05 5A5004.06 5A5004.10 5A5004.11 9A0014.02 9A0014.05 9A0014.10 Available	

Table 128: Technical data 5D5100.01 and 5D5100.04

1) Only remote operation is possible with the IPC 5600 because of mechanical dimensions.
2) Distance depends on the revision number; see the section "Distance for Remote Operation"
3) The actual number of colors depends on the graphic memory, the graphics mode set and the graphic driver used.
4) Resistant according to DIN 42 115 part 2, see "Technical Appendix"
5) Decrease in brightness of 50 %.
6) At 25°C operating temperature.
7) Without controller.

7.4 Door Mount Installation

The cutout and drill holes are to be made according to the following measurements for door installation. The installation template is not included with delivery and is available under the model number 5A9000.01.

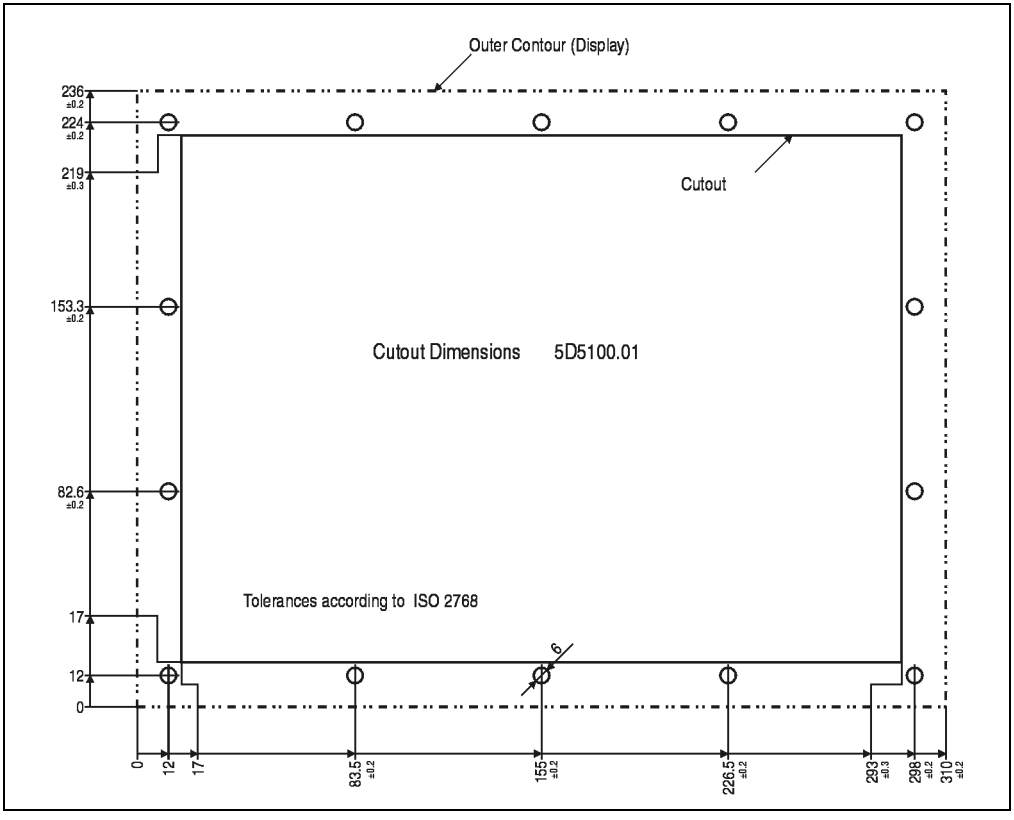


Figure 96: Door mount installation 5D5100.01 and 5D5100.04

7.5 Mounting Guidelines

When mounting the display unit on the controller unit (standard mounting) the display is fastened on the controller with the six screws included in the delivery. The FPD connection cable for standard mounting is also included in the delivery.

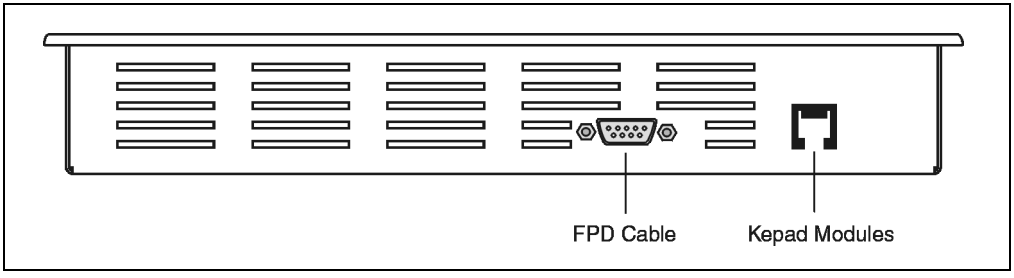


Figure 97: Connections 5D5100.01 and 5D5100.04

8. Display Units 5D5200.01 and 5D5210.01

These display units are equipped with a touch screen (see section "Technical Data").

8.1 Photo

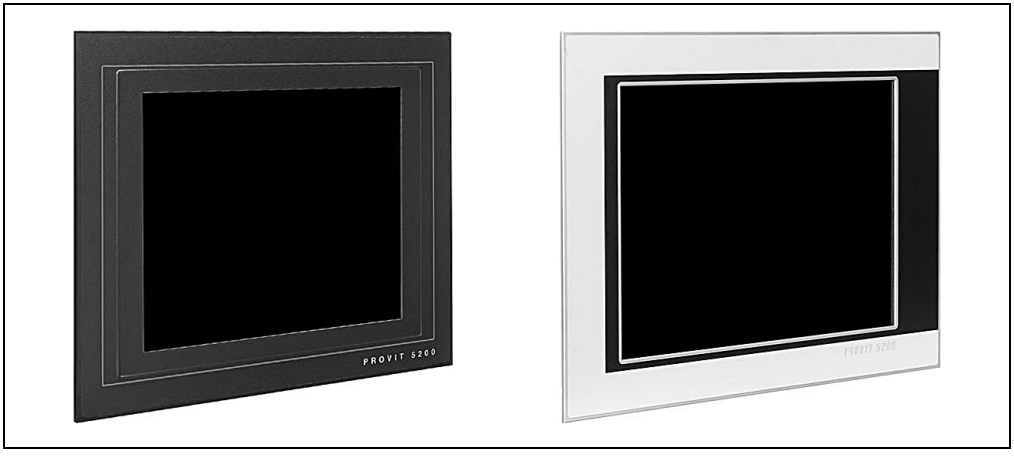


Figure 98: Display units 5D5200.01 (left) and 5D5210.01 (right)

8.2 Dimensions

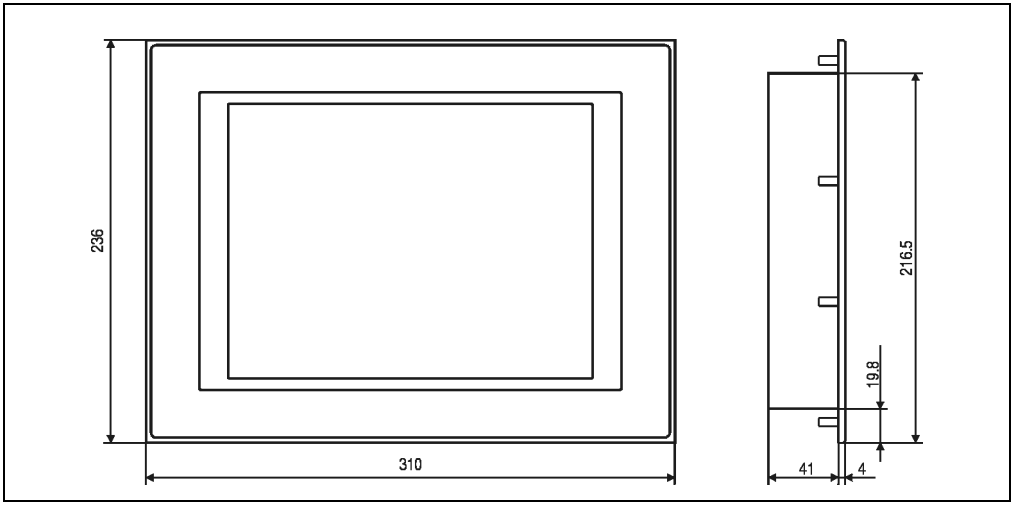


Figure 99: Measurements 5D5200.01 and 5D5210.01

8.3 Technical Data

Model Number	5D5200.01	5D5210.01
Short Text	Panel TFT C VGA 10.4" T	iPanel TFT C VGA 10.4" T
Controller Remote Operation	IPC5000, IPC5600 1) Max. 10 m 2)	
Display Type Colors 3)	TFT color, CFL background lighting 262,144	
Resolution	VGA (640 x 480 pixels)	
Display Diagonal	10.4" (264 mm)	
Protection	IP 20 rear sided	
Front Frame Décor Foil 4) Gasket	IP65, dust and sprayed water protection (from front) Aluminum anodized Polyester Flat gasket around display front	
Design	Black	Light Gray
Touch Screen 5) Technology	Accu Touch Analog, resistive	
Background Lighting (type) Brightness Lifespan 6) 7)	 200 cd/m^2 50,000 h	
Temperature Operating Storage	 0 - 50 °C, depending on installation -20 to +60 °C	
Relative Humidity Operating Storage	 5 - 85 %, non-condensing T ≤40 °C: 5% to 90 % (non-condensing) T > 40 °C: < 90 % non-condensing	
Weight	Approx. 2 kg	
Outer Dimensions (W x H x D) 8)	310 x 236 x 45 mm	
Display Design/Colors Dark Gray border around the Display Background	Black	 Pantone 432c Pantone 427c
Accessories Remote Panel Cable 0.6 m Remote Panel Cable 1.8 m Remote Panel Cable 5 m Remote Panel Cable 5 m 1 x 70° Remote Panel Cable 10 m Remote Panel Cable 10 m 1 x 70° RS232 Extension 1.8 m (Touch) RS232 Extension 5 m (Touch) RS232 Extension 10 m (Touch) Background Lighting Touch Screen Driver	 5A5004.01 5A5004.02 5A5004.05 5A5004.06 5A5004.10 5A5004.11 9A0014.02 9A0014.05 9A0014.10 Available 5S0000.01-090	

Table 129: Technical data 5D5200.01 and 5D5210.01

1) Only remote operation is possible with the IPC 5600 because of mechanical dimensions.
2) Distance depends on the revision number; see the section "Distance for Remote Operation"
3) The actual number of colors depends on the graphic memory, the graphics mode set and the graphic driver used.
4) Resistant according to DIN 42 115 part 2, see also "Technical Appendix"
5) See Chapter 8 "Technical Appendix"

6) Decrease in brightness of 50 %.
7) At 25 °C operating temperature.
8) Without controller.

8.4 Door Mount Installation

The cutout and drill holes are to be made according to the following measurements for door installation. The installation template is not included with delivery and is available under the model number 5A9000.01.

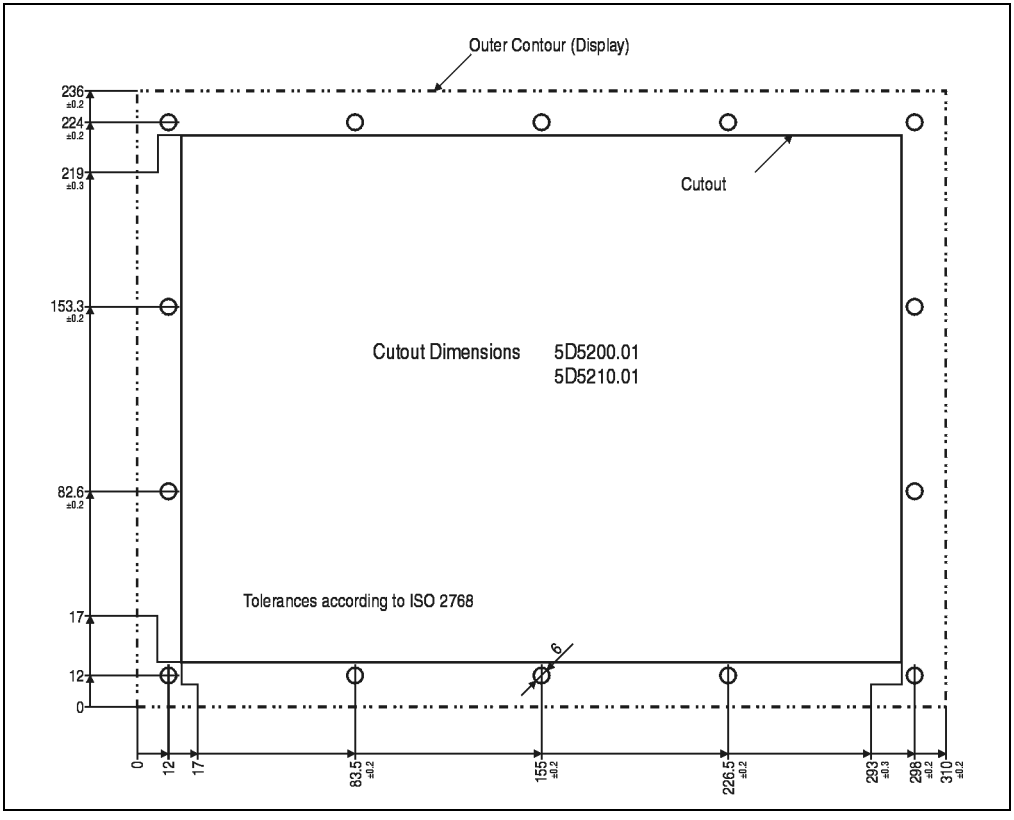


Figure 100: Door mount installation 5D5200.01 and 5D5210.01

8.5 Mounting Guidelines

When mounting the display unit on the controller unit (standard mounting) the display is fastened on the controller with the six screws included in the delivery. The FPD and touch screen connection cables for standard mounting are also included in the delivery. The touch screen cable is connected to a controller's RS232 interface.

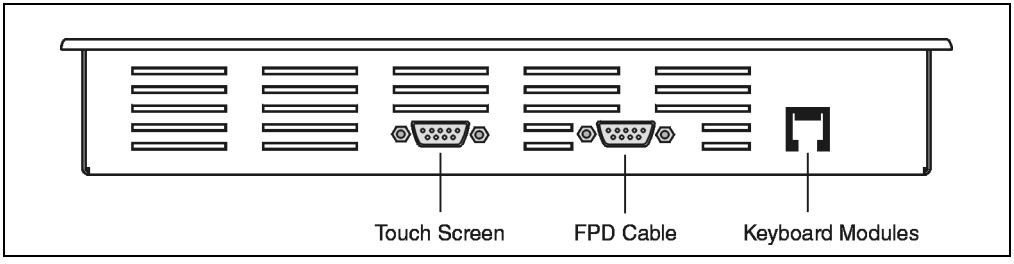


Figure 101: Connections 5D5200.01 and 5D5210.01

9. Display Unit 5D5200.04

These display units are equipped with a touch screen (see the "Technical Data" section).

9.1 Photo

Figure 102: Display unit 5D5200.04

9.2 Dimensions

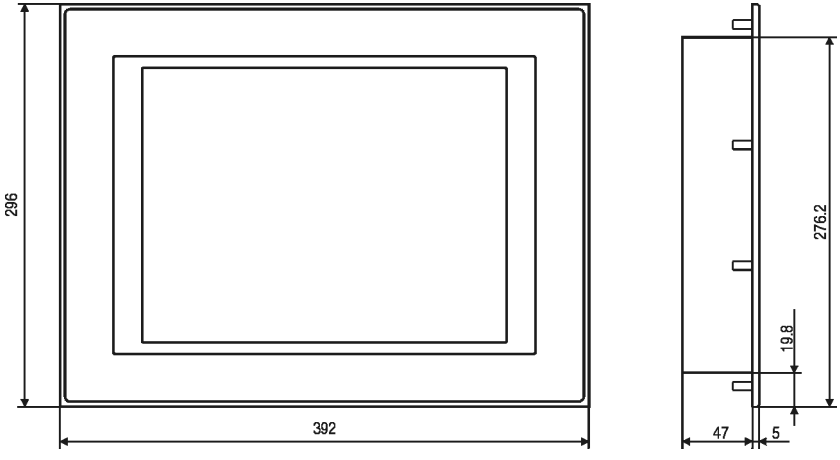


Figure 103: Measurements 5D5200.04

9.3 Technical Data

Model Number	5D5200.04
Short Text	Panel TFT C VGA 13.8in T
Controller Remote Operation	IPC5000, IPC5600 [1)] Max. 10 m [2)]
Display Type Colors [3)]	TFT color, CFL background lighting 16 million
Resolution	VGA (640 x 480 pixels)
Display Diagonal	13.8" (350 mm)
Protection	IP 20 rear sided
Front Frame Décor Foil [4)] Gasket	IP 65, dust and sprayed water protection (from front) Aluminum anodized Polyester Flat gasket around display front
Design	Black
Touch Screen [5)] Technology	Accu Touch Analog, resistive
Background Lighting (type) Brightness Lifespan [6) 7)]	 180 cd/m^2 10,000 h
Temperature Operating Storage	 0 - 50 °C, depending on installation -20 to +60 °C
Relative Humidity Operating Storage	 5 - 85 %, non-condensing T ≤40 °C: 5% to 90 % (non-condensing) T > 40 °C: < 90 % non-condensing
Weight	Approx. 4.2 kg
Outer Dimensions (W x H x D) [8)]	392 x 296 x 52 mm
Accessories Remote Panel Cable 0.6 m Remote Panel Cable 1.8 m Remote Panel Cable 5 m Remote Panel Cable 5 m 1 x 70° Remote Panel Cable 10 m Remote Panel Cable 10 m 1 x 70° RS232 Extension 1.8 m (Touch) RS232 Extension 5 m (Touch) RS232 Extension 10 m (Touch) Background Lighting Touch Screen Driver	 5A5004.01 5A5004.02 5A5004.05 5A5004.06 5A5004.10 5A5004.11 9A0014.02 9A0014.05 9A0014.10 Available 5S0000.01-090

Table 130: Technical Data 5D5200.04

1) Only remote operation is possible with the IPC 5600 because of mechanical dimensions.
2) Distance depends on the revision number; see the section "Distance for Remote Operation"
3) The actual number of colors depends on the graphic memory, the graphics mode set and the graphic driver used.
4) Resistant according to DIN 42 115 part 2, see also "Technical Appendix"
5) See Chapter 8 "Technical Appendix"
6) Decrease in brightness of 50 %.
7) At 25°C operating temperature.
8) Without controller.

9.4 Door Mount Installation

The cutout and drill holes are to be made according to the following measurements for door installation. The installation template is not included with delivery and is available under the model number 5A9000.01.

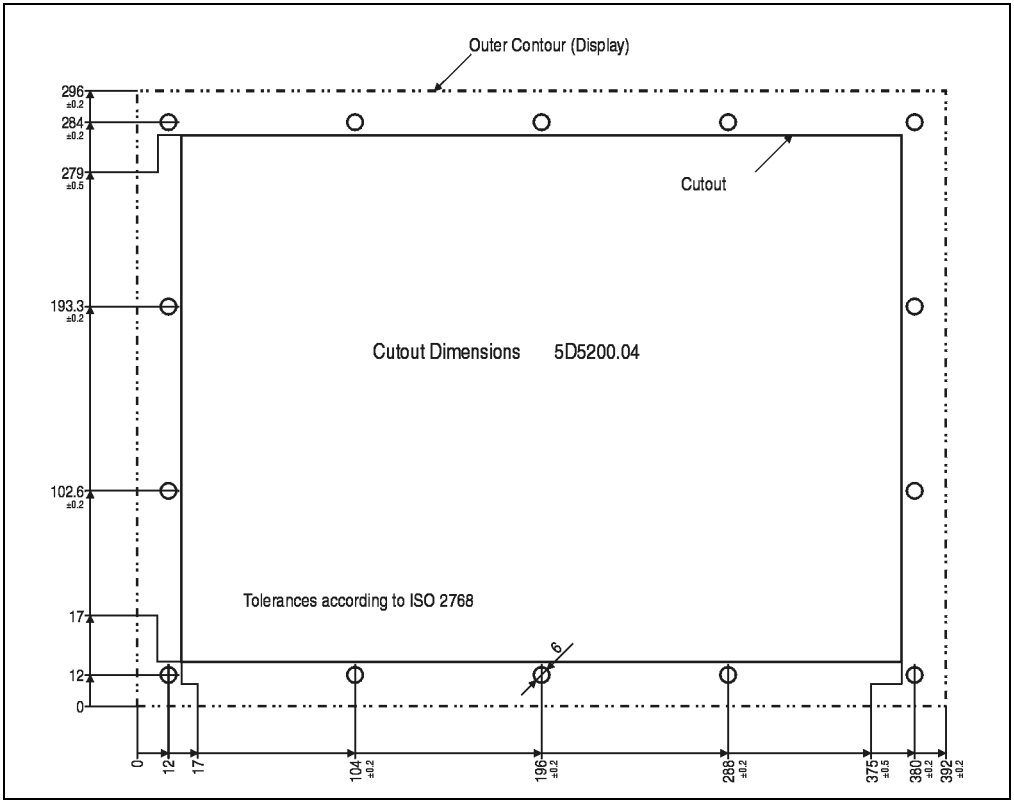


Figure 104: Door mount installation 5D5200.04

9.5 Mounting Guidelines

When mounting the display unit on the controller unit (standard mounting) the display is fastened to the controller with the six screws included in the delivery. The FPD and touch screen connection cables for standard mounting are also included in the delivery. The touch screen cable is connected to a controller's RS232 interface.

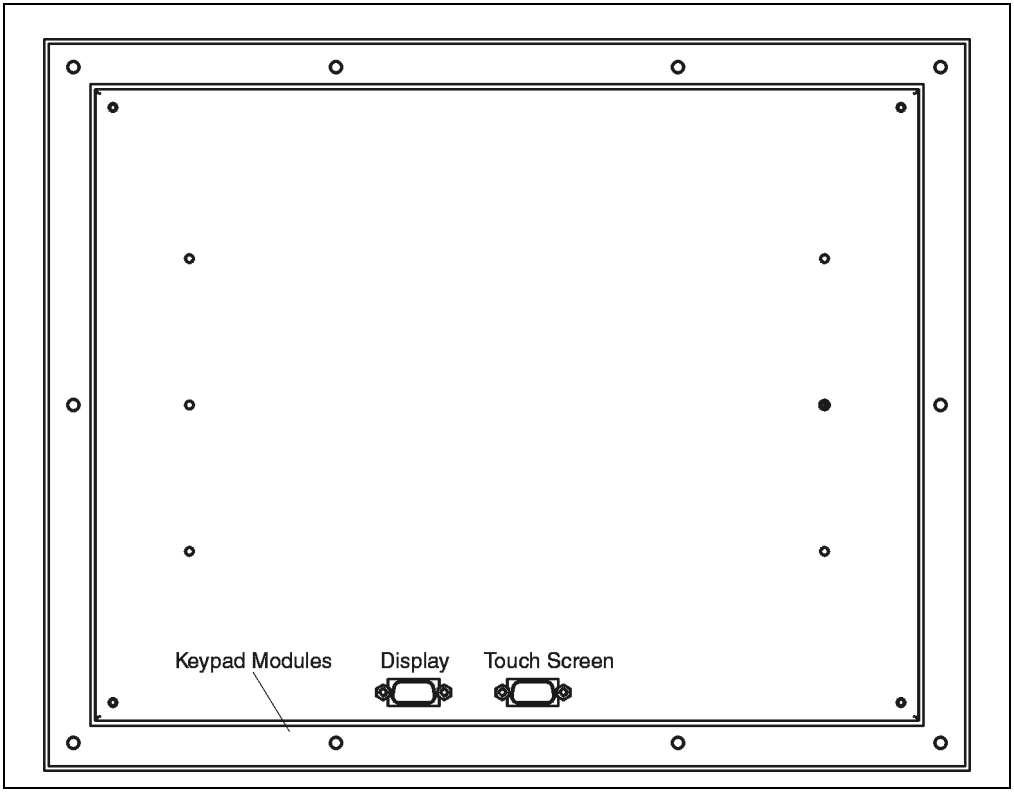


Figure 105: Connections 5D5200.04

10. Display Units 5D5201.02 and 5D5211.02

These display units are equipped with a touch screen (see the "Technical Data" section).

10.1 Photo

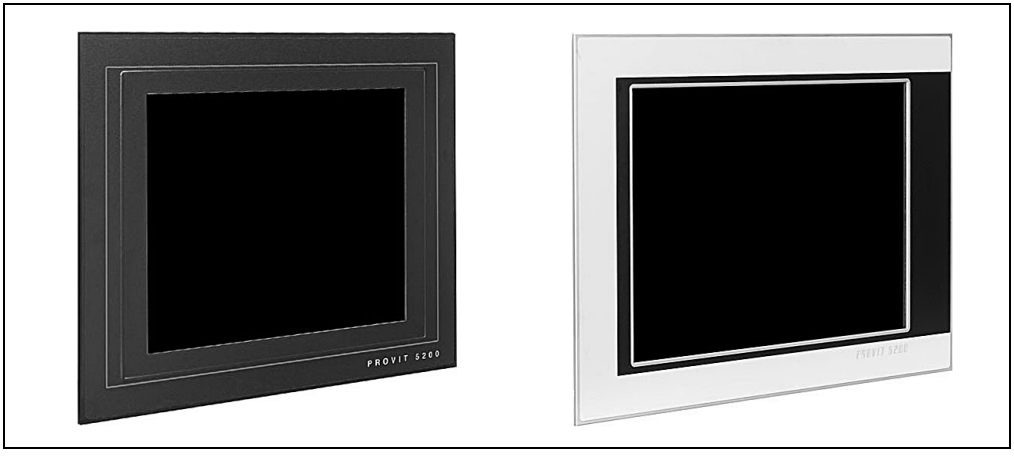


Figure 106: Display units 5D5201.02 (left) and 5D5211.02 (right)

10.2 Dimensions

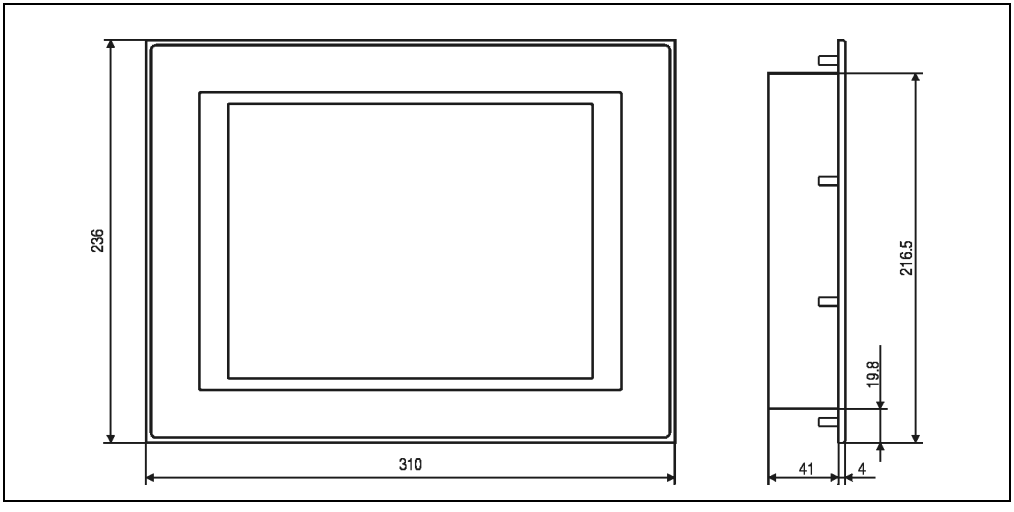


Figure 107: Measurements 5D5201.02 and 5D5211.02

10.3 Technical Data

Model Number	5D5201.02	5D5211.02
Short Text	Panel TFT C SVGA 26.42" T	iPanel TFT C SVGA 10.4" T
Controller Remote Operation	IPC5000, IPC5600 1) Max. 10 m 2)	
Display Type Colors 3)	TFT color, CFL background lighting 262,144	
Resolution	SVGA (800 x 600 pixels)	
Display Diagonal	10.4" (264 mm)	
Protection	IP 20 rear sided	
Front Frame Décor Foil 4) Gasket	IP65, dust and sprayed water protection (from front) Aluminum anodized Polyester Flat gasket around display front	
Design	Black	Light Gray
Touch Screen 5) Technology	Accu Touch Analog, resistive	
Background Lighting (type) Brightness Lifespan 6) 7)	 180 cd/m^2 10,000 h	
Temperature Operating Storage	 0 - 50 °C, depending on installation -20 to +60 °C	
Relative Humidity Operating Storage	 5 - 85 %, non-condensing T ≤40 °C: 5% to 90 % (non-condensing) T > 40 °C: < 90 % non-condensing	
Weight	Approx. 2.4 kg	
Outer Dimensions (W x H x D) 8)	310 x 236 x 45 mm	
Display Design/Colors Dark Gray border around the Display Background	Black	 Pantone 432c Pantone 427c
Accessories Remote Panel Cable 0.6 m Remote Panel Cable 1.8 m Remote Panel Cable 5 m Remote Panel Cable 5 m 1 x 70° Remote Panel Cable 10 m Remote Panel Cable 10 m 1 x 70° RS232 Extension 1.8 m (Touch) RS232 Extension 5 m (Touch) RS232 Extension 10 m (Touch) Background Lighting Touch Screen Driver	 5A5004.01 5A5004.02 5A5004.05 5A5004.06 5A5004.10 5A5004.11 9A0014.02 9A0014.05 9A0014.10 Available 5S0000.01-090	

Table 131: Technical Data 5D5201.02 and 5D5211.02

1) Only remote operation is possible with the IPC 5600 because of mechanical dimensions.
2) Distance depends on the revision number; see the section "Distance for Remote Operation"
3) The actual number of colors depends on the graphic memory, the graphics mode set and the graphic driver used.
4) Resistant according to DIN 42 115 part 2, see also "Technical Appendix"
5) See Chapter 8 "Technical Appendix"

6) Decrease in brightness of 50 %.
7) At 25°C operating temperature.
8) Without controller.

10.4 Door Mount Installation

The cutout and drill holes are to be made according to the following measurements for door installation. The installation template is not included with delivery and is available under the model number 5A9000.01.

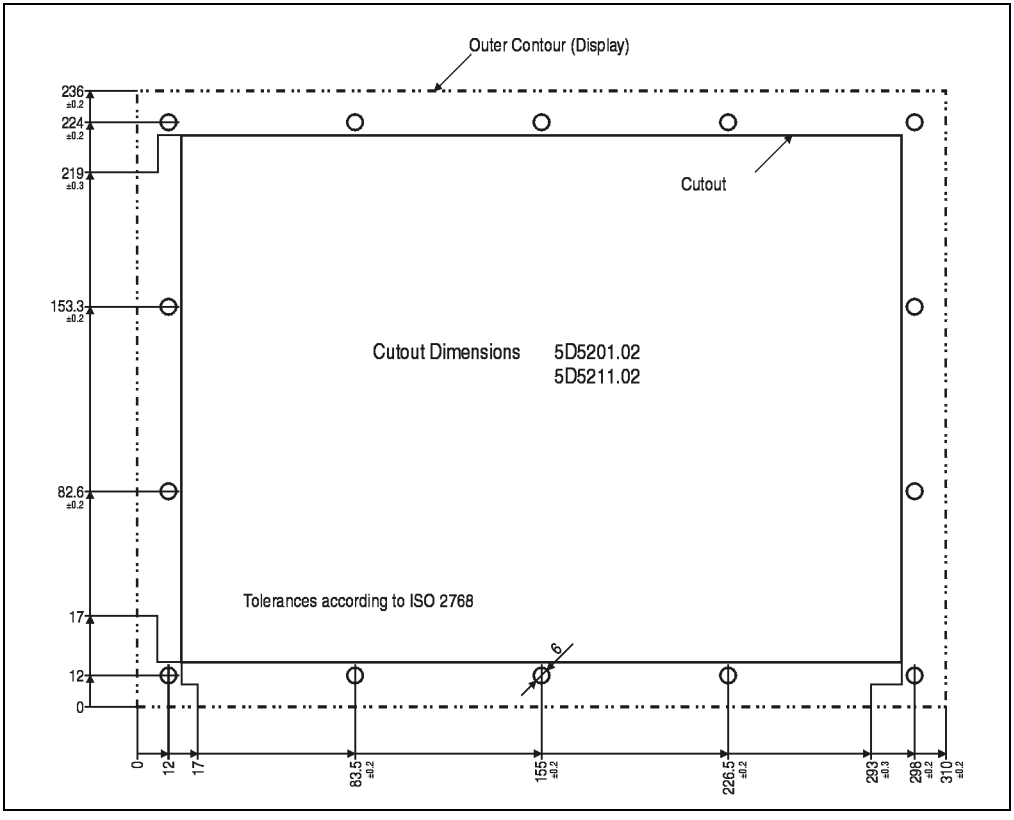


Figure 108: Door mount installation 5D5201.02 and 5D5211.02

10.5 Mounting Guidelines

When mounting the display unit on the controller unit (standard mounting) the display is fastened to the controller with the six screws included in the delivery. The FPD and touch screen connection cables for standard mounting are also included in the delivery. The touch screen cable is connected to a controller's RS232 interface.

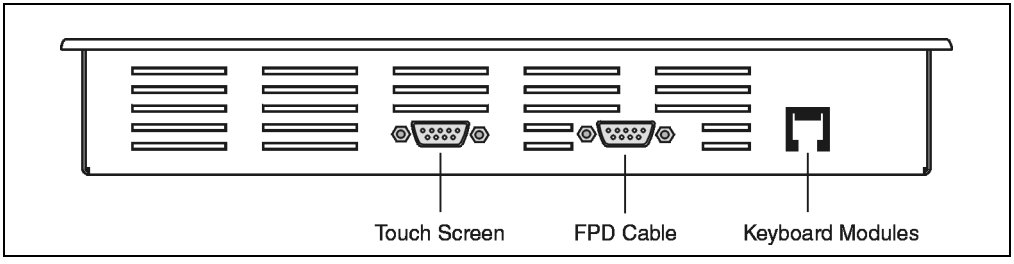


Figure 109: Connections 5D5201.02 and 5D5211.02

11. Display Units 5D5201.03 and 5D5211.03

These display units are equipped with a touch screen (see section "Technical Data").

11.1 Photo

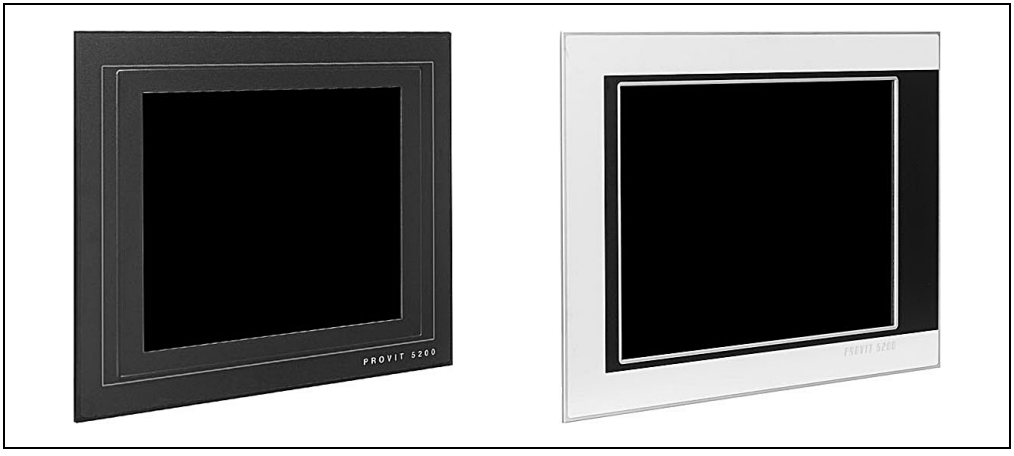


Figure 110: Display units 5D5201.03 (left) and 5D5211.03 (right)

11.2 Dimensions

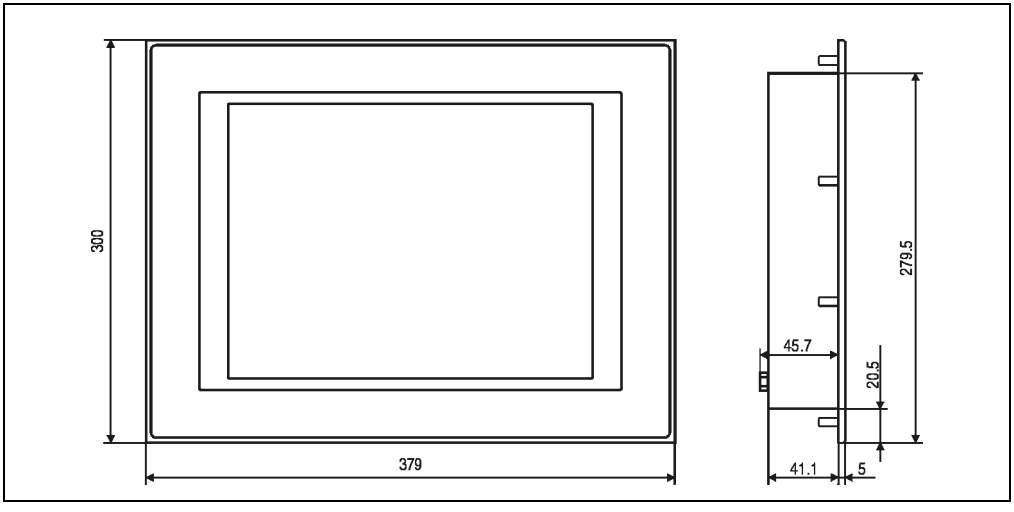


Figure 111: Measurements 5D5201.03 and 5D5211.03

11.3 Technical Data

Model Number	5D5201.03	5D5211.03
Short Text	Panel TFT C SVGA 12,1in T	iPanel TFT C SVGA 12.1" T
Controller Remote Operation	IPC5000, IPC5600 1) Max. 10 m 2)	
Display Type Colors 3)	TFT color, CFL background lighting 262,144	
Resolution	SVGA (800 x 600 pixels)	
Display Diagonal	12.1" (307 mm)	
Protection	IP 20 rear sided	
Front Frame Décor Foil 4) Gasket	IP65, dust and sprayed water protection (from front) Aluminum anodized Polyester Flat gasket around display front	
Design	Black	Light Gray
Touch Screen 5) Technology	Accu Touch Analog, resistive	
Background Lighting (type) Brightness Lifespan 6) 7)	 300 cd/m^2 8) 50,000 h 8)	
Temperature Operating Storage	 0 - 50 °C, depending on installation -20 to +60 °C	
Relative Humidity Operating Storage	 5 - 85 %, non-condensing T ≤40 °C: 5% to 90 % (non-condensing) T > 40 °C: < 90 % non-condensing	
Weight	Approx. 4.1 kg	
Outer Dimensions (W x H x D) 9)	379 x 300 x 50 mm	
Display Design/Colors Dark Grey Border around the Display Background	Black	 Pantone 432c Pantone 427c
Accessories Remote Panel Cable 0.6 m Remote Panel Cable 1.8 m Remote Panel Cable 5 m Remote Panel Cable 5 m 1 x 70° Remote Panel Cable 10 m Remote Panel Cable 10 m 1 x 70° RS232 Extension 1.8 m (Touch) RS232 Extension 5 m (Touch) RS232 Extension 10 m (Touch) Background Lighting Touch Screen Driver	 5A5004.01 5A5004.02 5A5004.05 5A5004.06 5A5004.10 5A5004.11 9A0014.02 9A0014.05 9A0014.10 Available 5S0000.01-090	

Table 132: Technical Data 5D5201.03 and 5D5211.03

1) Only remote operation is possible with the IPC 5600 because of mechanical dimensions.
2) Distance depends on the revision number; see the section "Distance for Remote Operation"
3) The actual number of colors depends on the graphic memory, the graphics mode set and the graphic driver used.
4) Resistant according to DIN 42 115 part 2, see also "Technical Appendix"
5) See Chapter 8 "Technical Appendix"

6) Decrease in brightness of 50 %.
7) At 25°C operating temperature.
8) starting with rev. no. = G0: Brightness= 140 cd/m², Lifespan= 10,000 h
9) Without controller.

11.4 Door Mount Installation

The cutout and drill holes are to be made according to the following measurements for door installation. The installation template is not included with delivery and is available under the model number 5A9000.01.

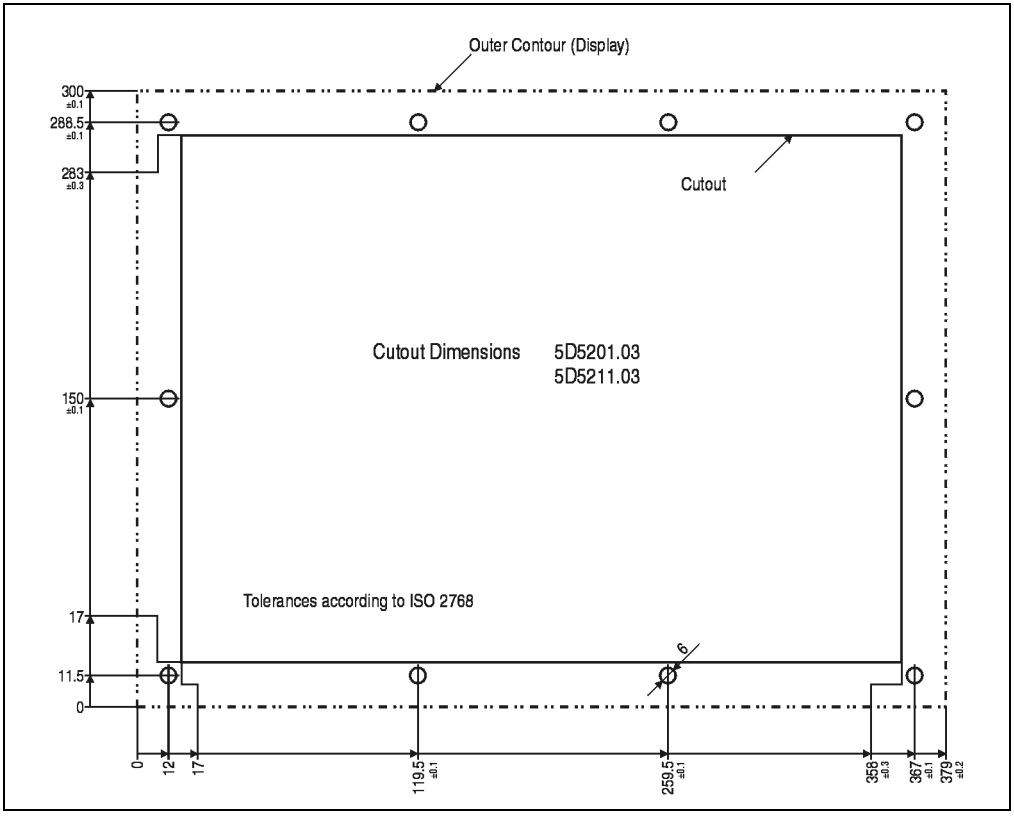


Figure 112: Front door installation 5D5201.03 and 5D5211.03

11.5 Mounting Guidelines

When mounting the display unit on the controller unit (standard mounting) the display is fastened to the controller with the six screws included in the delivery. The FPD and touch screen connection cables for standard mounting are also included in the delivery. The touch screen cable is connected to a controller's RS232 interface.

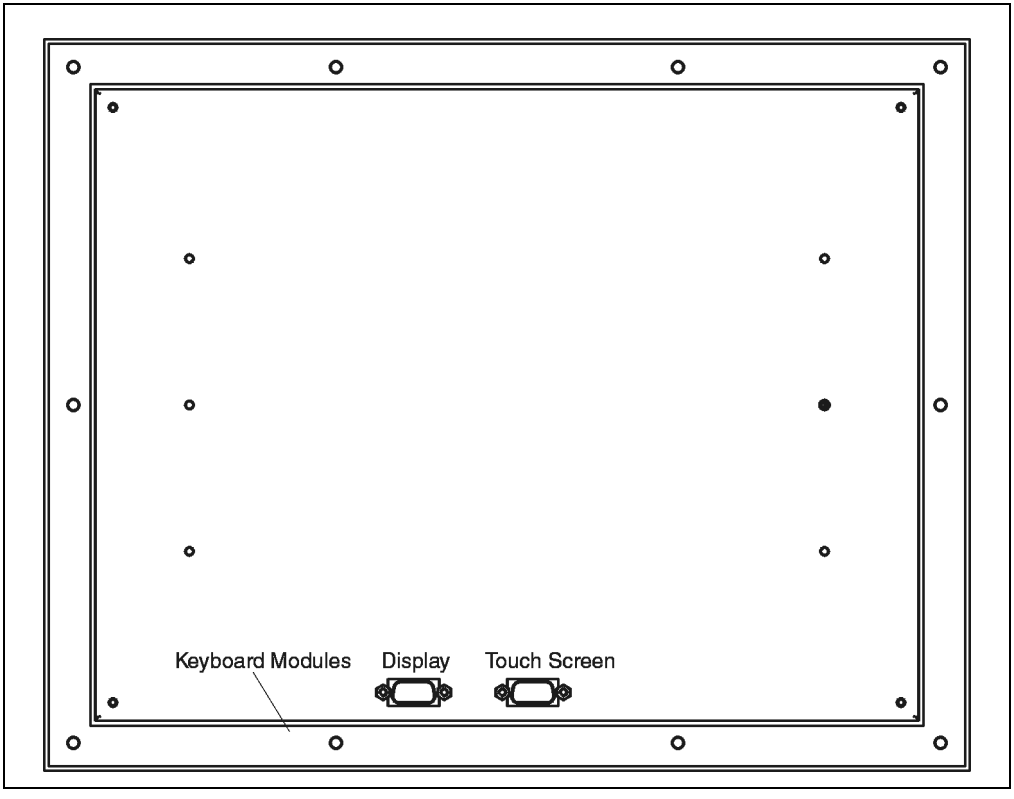


Figure 113: Dimensions 5D5201.03 and 5D5211.03

12. Display Unit 5D5211.06

This display unit is equipped with a touch screen with infrared technology
See “Technical Data”

12.1 Photo

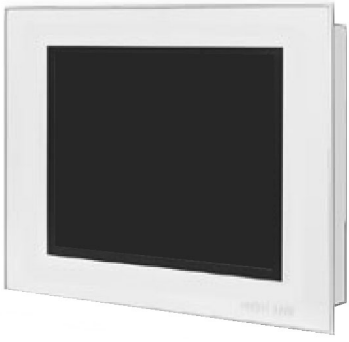


Figure 114: Display unit 5D5211.06

12.2 Dimensions

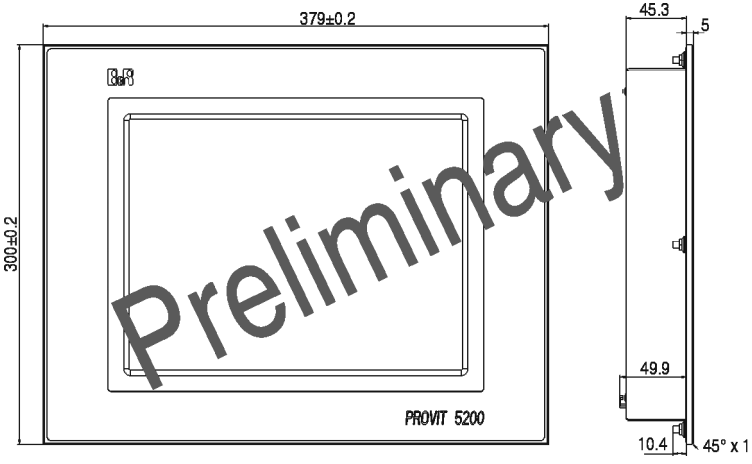


Figure 115: Measurement 5D5211.06

12.3 Technical Data

Model Number	5D5211.06
Short Text	iPanel TFT C SVGA 12.1" T
Controller Remote Operation	IPC5000, IPC5600 [1)] Max. 10 m [2)]
Display Type Colors [3)]	TFT Color, C 262,144
Resolution	SVGA (800 x 600 pixels)
Display Diagonal	12.1" (307 mm)
Protection	IP 20 rear sided
Front Frame Décor Foil [4)] Gasket	IP65 (from front) Aluminum anodized Polyester Flat gasket around display front
Design	Light Gray
Touch Screen [5)] Technology	Citron Infrared
Background Lighting (type) Brightness Lifespan [6) 7)]	 300 cd/m^2 50,000 h
Temperature Operating Storage	 0 - 50 °C, depending on installation -20 to +60 °C
Relative Humidity Operating Storage	 5 - 85 %, non-condensing T ≤40 °C: 5% to 90 % (non-condensing) T > 40 °C: < 90 % non-condensing
Weight	Approx. 4.1 kg
Outer Dimensions (W x H x D) [8)]	379 x 300 x 50 mm
Display Design/Colors Background	 Pantone 427c
Accessories Remote Panel Cable 0.6 m Remote Panel Cable 1.8 m Remote Panel Cable 5 m Remote Panel Cable 5 m 1 x 70° Remote Panel Cable 10 m Remote Panel Cable 10 m 1 x 70° RS232 Extension 1.8 m (Touch) RS232 Extension 5 m (Touch) RS232 Extension 10 m (Touch) Background Lighting Touch Screen Driver	 5A5004.01 5A5004.02 5A5004.05 5A5004.06 5A5004.10 5A5004.11 9A0014.02 9A0014.05 9A0014.10 Available 5S0000.01-090

Table 133: Technical Data 5D5211.06

1) Only remote operation is possible with the IPC 5600 because of mechanical dimensions.
2) Distance depends on the revision number; see the section "Distance for Remote Operation"
3) The actual number of colors depends on the graphic memory, the graphics mode set and the graphic driver used.
4) Resistant according to DIN 42 115 part 2, see also "Technical Appendix"
5) See Chapter 8 "Technical Appendix"
6) Decrease in brightness of 50 %.

7) At 25°C operating temperature.
8) Without controller.

12.4 Door mount installation

When installing the display unit to the controller unit (standard installation) the display is fastened to the controller with the six screws that were included in the delivery. The FPD and touch screen connection cables for standard installation are included in the delivery. The touch screen cable is connected to a controller's RS232 interface.

The cutout and drill holes are to be made according to the following measurements for door installation. The installation template is not included with delivery and is available under the model number 5A9000.01.

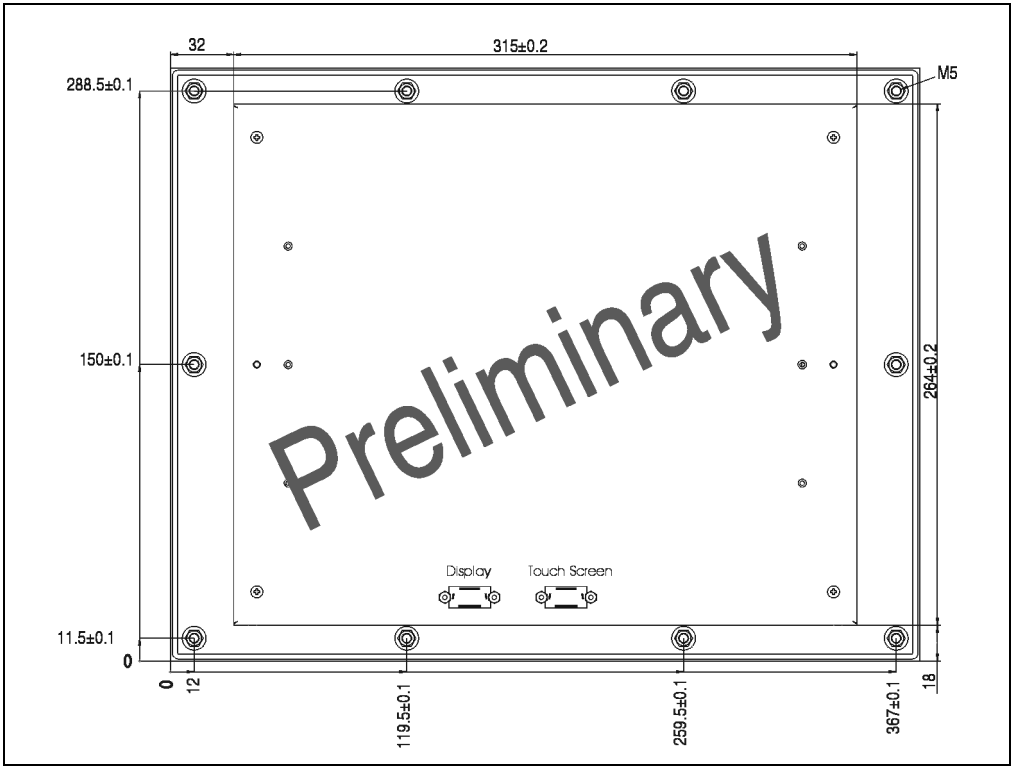


Figure 116: Door mount installation 5D5211.06

13. Display Units 5D5202.01, 5D5202.03 and 5D5212.01

These display units are equipped with a touch screen (see the "Technical Data" section).

13.1 Photo

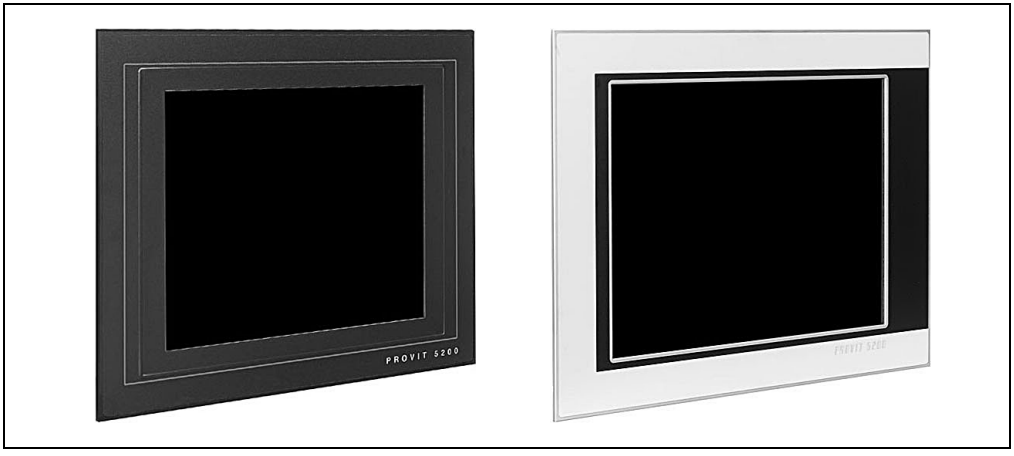


Figure 117: Display units 5D5202.01, 5D5202.03 (left) and 5D5212.01 (right)

13.2 Dimensions

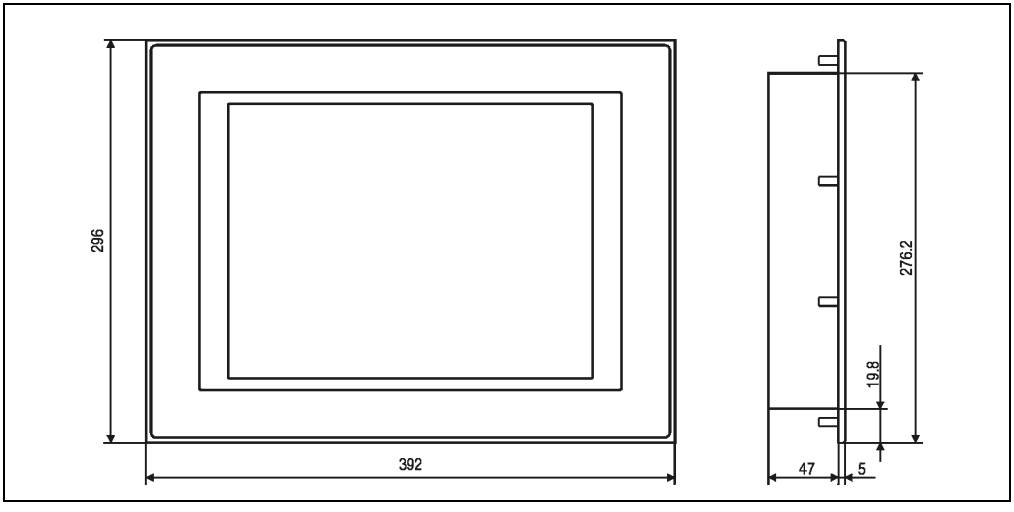


Figure 118: Measurements 5D5202.01, 5D5202.03 and 5D5212.01

13.3 Technical Data

Model Number	5D5202.01	5D5202.03	5D5212.01
Short Text	Panel TFT C XGA 13.8" T	iPanel TFT C XGA 13.8" T	iPanel TFT C XGA 13.8" T
Controller Remote Operation	IPC5000, IPC5600 1) Max. 10 m 2)		
Display Type Colors 3)	TFT color, CFL background lighting 262,144		
Resolution	XGA (1024 x 768 pixels)		
Display Diagonal	13.8" (351 mm)		
Protection	IP 20 rear sided		
Front Frame Décor Foil 4) Gasket	IP65, dust and sprayed water protection (from front) Aluminum anodized Polyester Flat gasket around display front		
Design	Black	Light Gray	Light Gray
Touch Screen 5) Technology	Accu Touch Analog, resistive		
Background Lighting (type) Brightness Lifespan 6) 7)	180 cd/m^2 10,000 h		
Temperature Operating Storage	0 - 50 °C, depending on installation -20 to +60 °C		
Relative Humidity Operating Storage	5 - 85 %, non-condensing T ≤40 °C: 5% to 90 % (non-condensing) T > 40 °C: < 90 % non-condensing		
Weight	Approx. 4.2 kg		
Outer Dimensions (W x H x D) 8)	392 x 296 x 52 mm		
Display Design/Colors Dark gray border around the display Background	Black	Pantone 432c Pantone 427c	
Accessories Remote Panel Cable 0.6 m Remote Panel Cable 1.8 m Remote Panel Cable 5 m Remote Panel Cable 5 m 1 x 70° Remote Panel Cable 10 m Remote Panel Cable 10 m 1 x 70° RS232 Extension 1.8 m (Touch) RS232 Extension 5 m (Touch) RS232 Extension 10 m (Touch) Background Lighting Touch Screen Driver	5A5004.01 5A5004.02 5A5004.05 5A5004.06 5A5004.10 5A5004.11 9A0014.02 9A0014.05 9A0014.10 Available 5S0000.01-090		

Table 134: Technical data 5D5202.01, 5D5202.03 and 5D5212.01

1) Only remote operation is possible with the IPC 5600 because of mechanical dimensions.
2) Distance depends on the revision number; see section "Distance for remote operation"
3) The actual number of colors depends on the graphic memory, the graphics mode set and the graphic driver used.
4) Resistant according to DIN 42 115 part 2, see also "Technical Appendix"
5) See Chapter 8 "Technical Appendix"

6) Decrease in brightness of 50 %.
7) At 25°C operating temperature.
8) Without controller.

13.4 Door Mount Installation

The cutout and drill holes are to be made according to the following measurements for door installation. The installation template is not included with delivery and is available under the model number 5A9000.01.

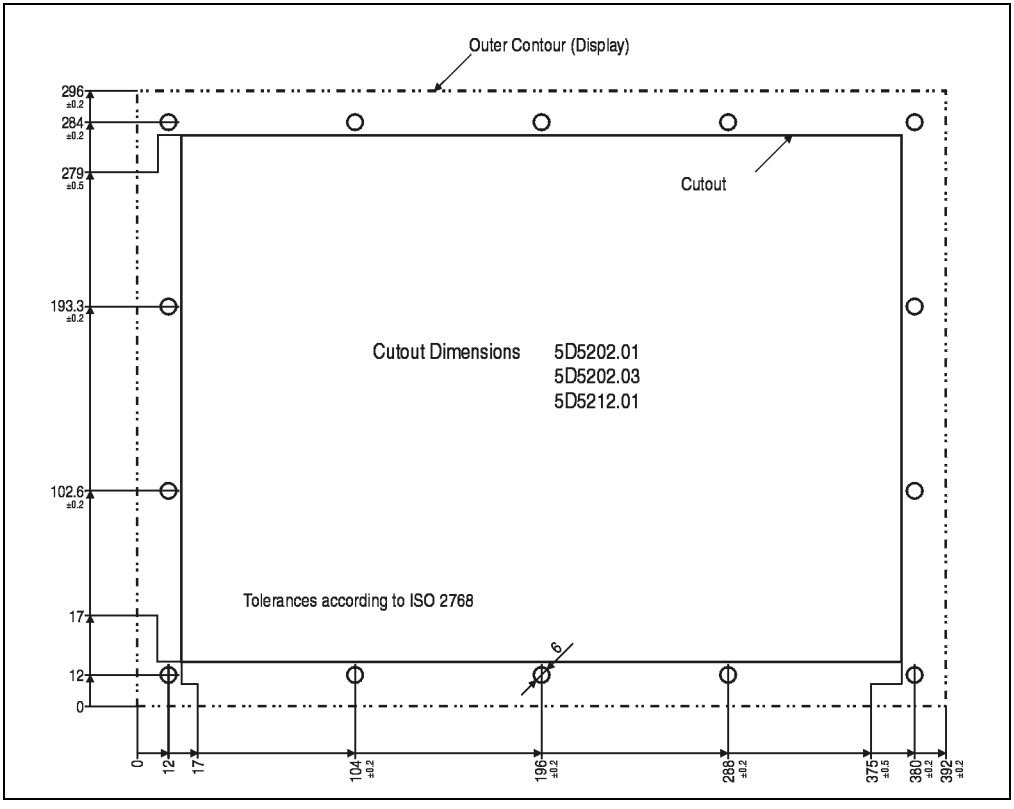


Figure 119: Front door installation 5D5202.01, 5D5202.03 and 5D5212.01

13.5 Mounting Guidelines

When mounting the display unit on the controller unit (standard mounting) the display is fastened to the controller with the six screws included in the delivery. The FPD and touch screen connection cables for standard mounting are also included in the delivery. The touch screen cable is connected to a controller's RS232 interface.

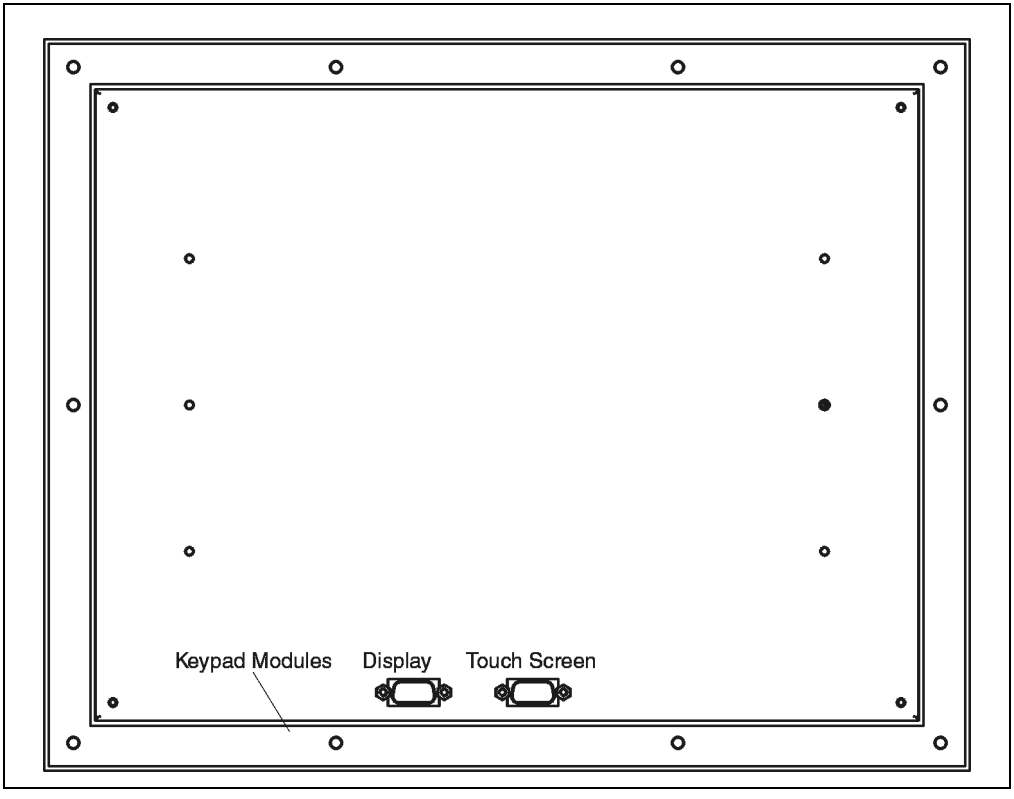


Figure 120: Connections 5D5202.01, 5D5202.03 and 5D5212.01

14. Display Unit 5D5212.02

These display units are equipped with a touch screen (see section "Technical Data").

14.1 Photo

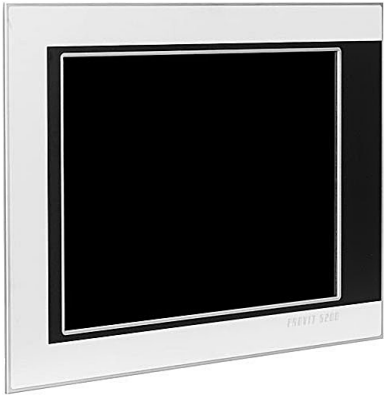


Figure 121: Display unit 5D5212.02

14.2 Dimensions

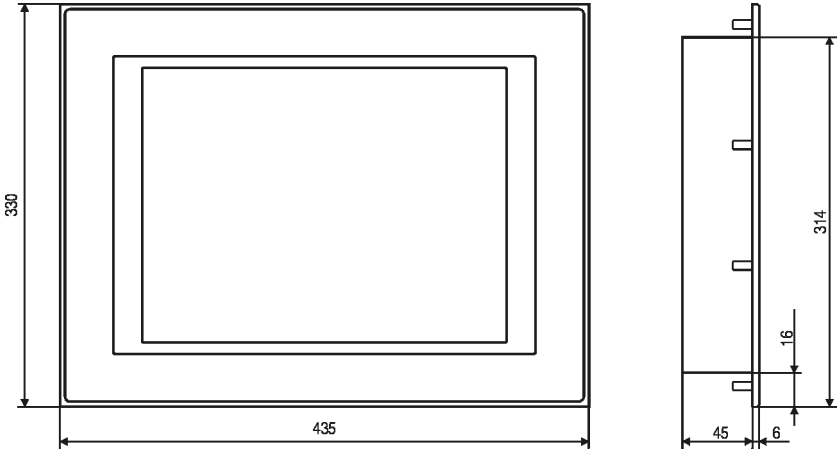


Figure 122: Measurements 5D5212.02

14.3 Technical Data

Model Number	5D5212.02
Short Text	iPanel TFT C XGA 15in T
Controller Remote Operation	IPC5000, IPC5600 [1)] Max. 10 m [2)]
Display Type Colors [3)]	TFT color, CFL background lighting 262,144
Resolution	VGA (1024 x 768 pixels)
Display Diagonal	15" (381 mm)
Protection	IP 20 rear sided
Front Frame Décor Foil [4)] Gasket	IP 65, dust and sprayed water protection (from front) Aluminum anodized Polyester Flat gasket around display front
Design	Light Gray
Touch Screen [5)] Technology	Accu Touch Analog, resistive
Background Lighting (type) Brightness Lifespan [6) 7)]	 200 cd/m^2 50,000 h
Temperature Operating Storage	 0 - 50 °C, depending on installation -20 to +60 °C
Relative Humidity Operating Storage	 5 - 85 %, non-condensing T ≤40 °C: 5% to 90 % (non-condensing) T > 40 °C: < 90 % non-condensing
Weight	Approx. 5.4 kg
Outer Dimensions (W x H x D) [8)]	435 x 330 x 51 mm
Display Design/Colors Dark gray border around the display Background	 Pantone 432c Pantone 427c
Accessories Remote Panel Cable 0.6 m Remote Panel Cable 1.8 m Remote Panel Cable 5 m Remote Panel Cable 5 m 1 x 70° Remote Panel Cable 10 m Remote Panel Cable 10 m 1 x 70° RS232 Extension 1.8 m (Touch) RS232 Extension 5 m (Touch) RS232 Extension 10 m (Touch) Background Lighting Touch Screen Driver	 5A5004.01 5A5004.02 5A5004.05 5A5004.06 5A5004.10 5A5004.11 9A0014.02 9A0014.05 9A0014.10 Available 5S0000.01-090

Table 135: Technical Data 5D5212.02

1) Installation on IPC5600 only possible using a separate cable set (model no. 5A5601.02)
2) Distance depends on the revision number; see the section "Distance for Remote Operation"
3) The actual number of colors depends on the graphic memory, the graphics mode set and the graphic driver used.
4) Resistant according to DIN 42 115 part 2, see also "Technical Appendix"
5) See Chapter 8 "Technical Appendix"

6) Decrease in brightness of 50 %.
7) At 25°C operating temperature.
8) Without controller.

14.4 Door Mount Installation

The cutout and drill holes are to be made according to the following measurements for door installation. The installation template is not included with delivery and is available under the model number 5A9000.01.

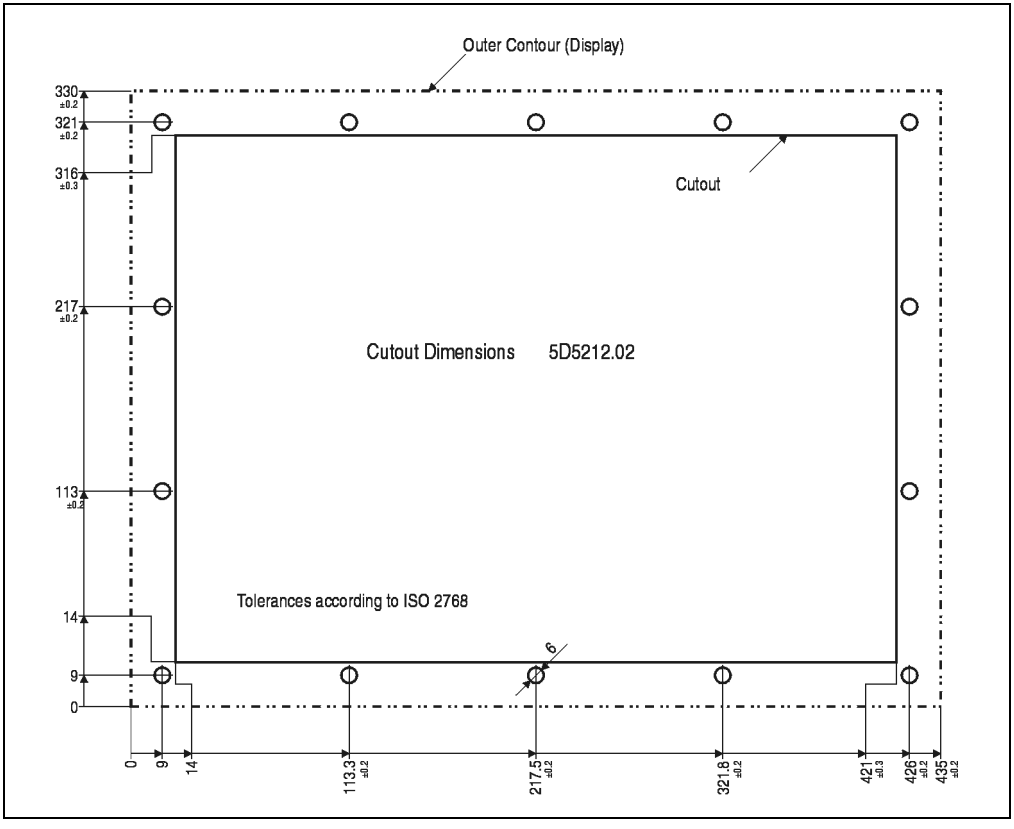


Figure 123: Door mount installation 5D5212.02

14.5 Mounting Guidelines

When mounting the display unit on the controller unit (standard mounting) the display is fastened to the controller with the six screws included in the delivery. The FPD and touch screen connection cables for standard mounting are also included in the delivery. The touch screen cable is connected to a controller's RS232 interface.

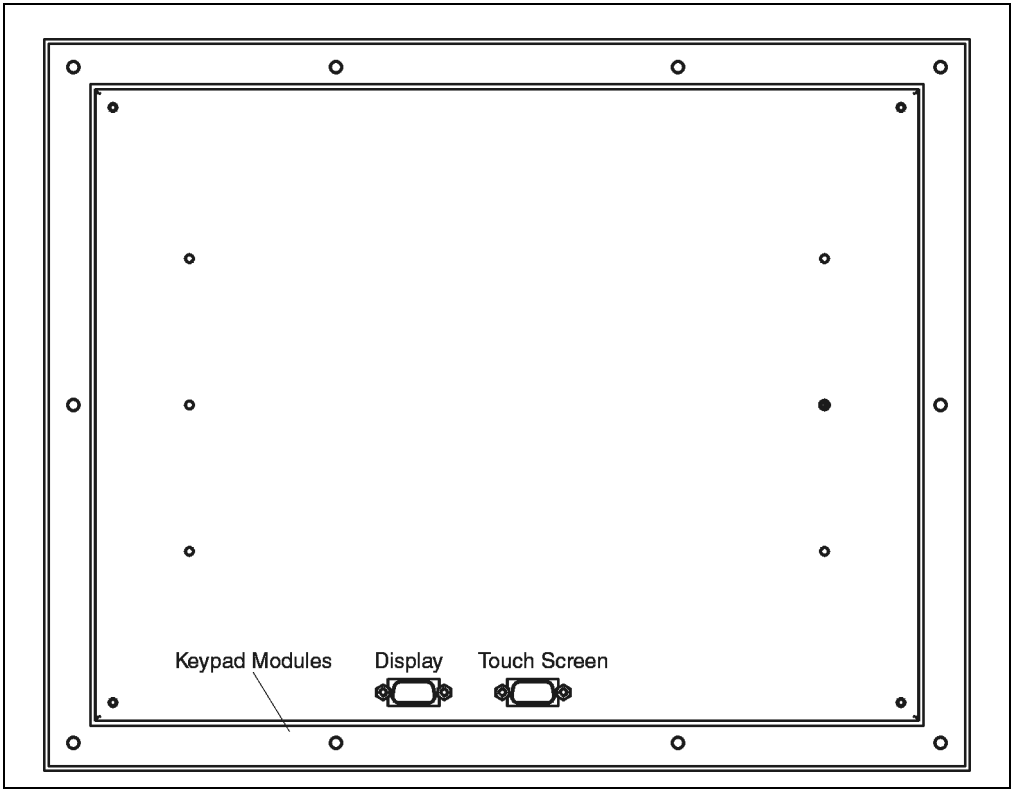


Figure 124: Connections 5D5212.02

15. Display Unit 5D5212.04

These display units are equipped with a touch screen (see section "Technical Data").

15.1 Photo

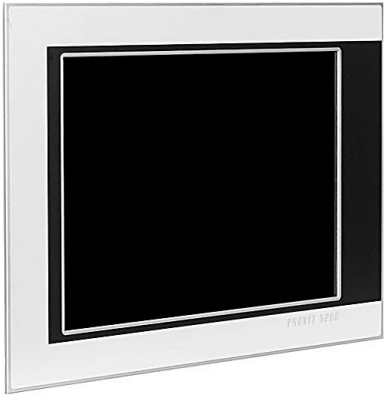


Figure 125: Display unit 5D5212.04

15.2 Dimensions

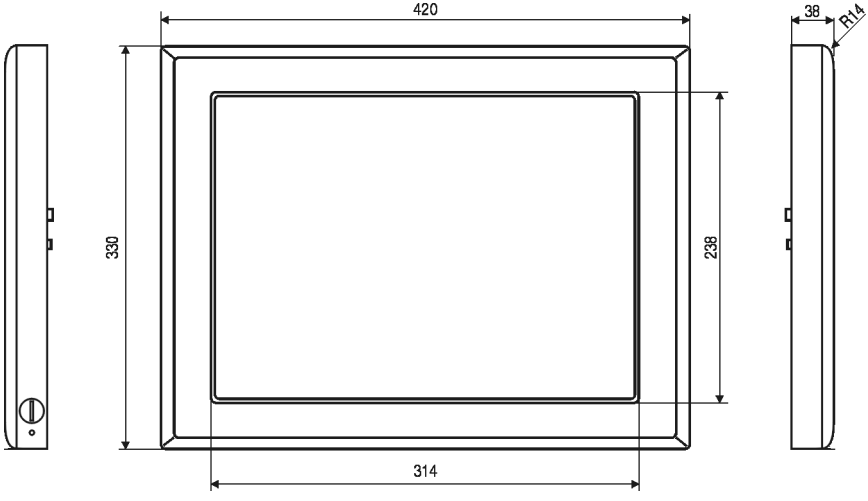


Figure 126: Measurements 5D5212.04

15.3 Technical Data

Model Number	5D5212.04
Short Text	iPanel TFT XGA 15in T
Controller Remote Operation	IPC5000 or IPC5600 Max. 10 m [1]
Display Type Colors [2]	TFT color, CFL background lighting 262,144
Resolution	XGA (1024 x 768 pixels)
Display Diagonal	15" (381 mm)
Protection	IP 20 rear sided
Front Frame Décor Foil [3] Gasket	IP 65, dust and sprayed water protection (from front) Aluminum anodized Polyester Flat gasket around display front
Design	Light Gray
Touch Screen Technology	Accu Touch Analog, resistive
Background Lighting (type) Brightness Lifespan [4] [5]	 200 cd/m^2 50,000 h
Temperature Operating Storage	 0 - 50 °C, depending on installation -20 to +60 °C
Relative Humidity Operating Storage	 5 - 85 %, non-condensing T ≤40 °C: 5% to 90 % (non-condensing) T > 40 °C: < 90 % non-condensing
Weight	Approx. 5.5 kg
Outer Dimensions (W x H x D) [6]	420 x 330 x 38 mm
Display Design/Colors Dark gray border around the display Background	 Pantone 432c Pantone 427c
Accessories Remote Panel Cable 0.6m Remote Panel Cable 1.8m Remote Panel Cable 5m Remote Panel Cable 5m 1x70° Remote Panel Cable 10m Remote Panel Cable 10m 1x70° RS232 Extension 1.8m (Touch) RS232 Extension 5m (Touch) RS232 Extension 10m (Touch) Background Lighting Touch Screen Driver Panel Flange Adapter	 5A5004.01 5A5004.02 5A5004.05 5A5004.06 5A5004.10 5A5004.11 9A0014.02 9A0014.05 9A0014.10 Available 5S0000.01-090 5A5007.01

Table 136: Technical Data 5D5212.04

1) Distance depends on the revision number; see the section "Distance for Remote Operation"
2) The actual number of colors depends on the graphic memory, the graphics mode set and the graphic driver used.
3) Resistant according to DIN 42 115 part 2, see also "Technical Appendix"
4) Decrease in brightness of 50%.

5) At 25°C operating temperature.
6) Without controller.

15.4 Mounting Guidelines

It is possible to install this display unit on a swing arm system. This is done using the Panel Flange Panel adapter type A (model no. 5A5007.01) for this display unit.

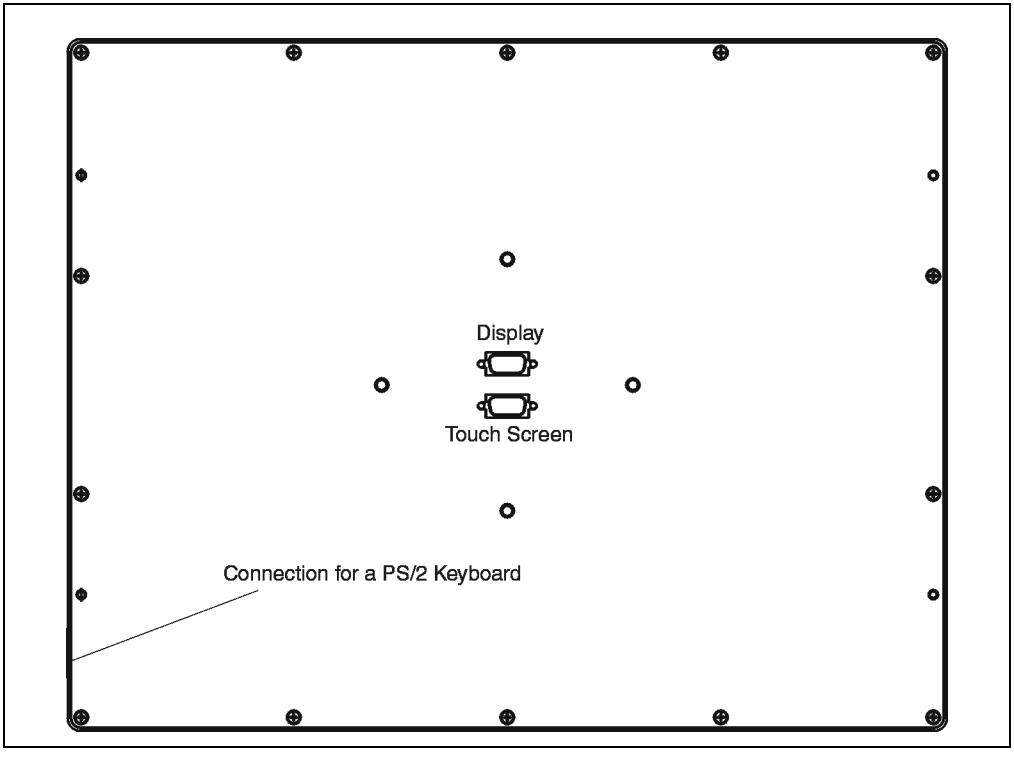


Figure 127: Connections 5D5212.04

For suspension, B&R offers a suitable Panel Flange adapter for this display unit. See section "Panel Flange Adapter for Display Unit 5D5212.04".

Model Number	Description
5A5007.01	Panel flange adapter for display unit 5D5212.04, including screws to fasten the display unit.

Table 137: Panel Flange adapter order data

16. Display Unit 5D5213.01

These display units are equipped with a touch screen (see section "Technical Data").

16.1 Photo

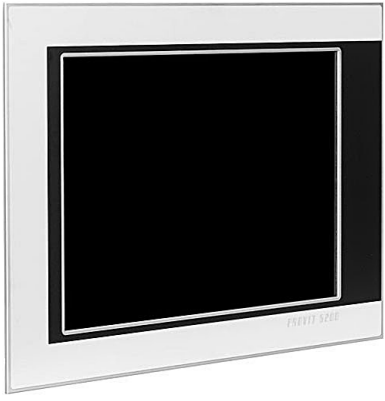


Figure 128: Display unit 5D5213.01

16.2 Dimensions

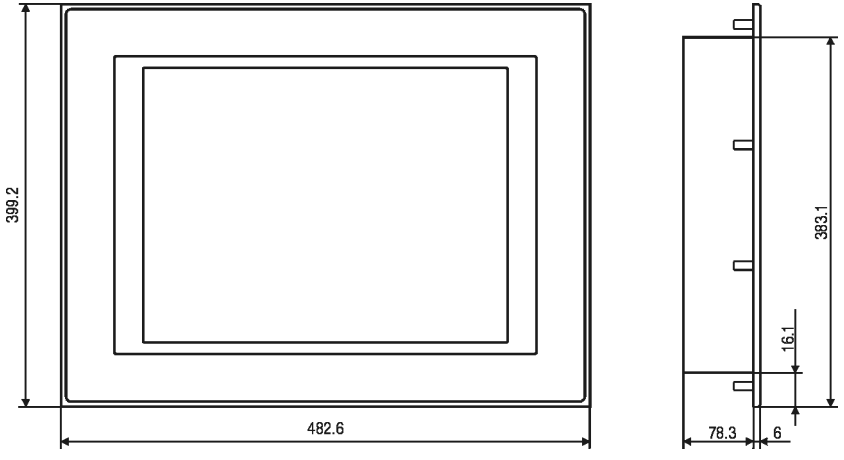


Figure 129: Measurements 5D5213.01

16.3 Technical Data

Model Number	5D5213.01
Short Text	iPanel TFT C SXGA 18in T
Controller Remote Operation	IPC5000, IPC5600 1) Max. 10 m 2)
Display Type Colors 3)	TFT color, CFL background lighting 16 million
Resolution	SXGA (1280 x 1024 pixels)
Display Diagonal	18.1" (460 mm)
Protection	IP 20 rear sided
Front Frame Décor Foil 4) Gasket	IP 65, dust and sprayed water protection (from front) Aluminum anodized Polyester Flat gasket around display front
Design	Light Gray
Touch Screen 5) Technology	Accu Touch Analog, resistive
Background Lighting (type) Brightness Lifespan 6) 7)	 200 cd/m^2 50,000 h
Temperature Operating Storage	 0 - 45 °C, depending on installation -20 to +60 °C
Relative Humidity Operating Storage	 5 - 85 %, non-condensing T ≤40 °C: 5% to 90 % (non-condensing) T > 40 °C: < 90 % non-condensing
Weight	Approx. 10.2 kg
Outer Dimensions (W x H x D) 8)	482.6 x 399.2 x 89 mm
Display Design/Colors Dark gray border around the display Background	 Pantone 432c Pantone 427c
Accessories Remote Panel Cable 0.6 m Remote Panel Cable 1.8 m Remote Panel Cable 5 m Remote Panel Cable 5 m 1 x 70° Remote Panel Cable 10 m Remote Panel Cable 10 m 1 x 70° RS232 Extension 1.8 m (Touch) RS232 Extension 5 m (Touch) RS232 Extension 10 m (Touch) Background Lighting Touch Screen Driver	 5A5004.01 5A5004.02 5A5004.05 5A5004.06 5A5004.10 5A5004.11 9A0014.02 9A0014.05 9A0014.10 Available 5S0000.01-090

Table 138: Technical Data 5D5213.01

1) Installation on IPC5600 only possible using a separate cable set (model no. 5A5601.02)
2) Distance depends on the revision number; see the section "Distance for Remote Operation"
3) The actual number of colors depends on the graphic memory, the graphics mode set and the graphic driver used.
4) Resistant according to DIN 42 115 part 2, see also "Technical Appendix"
5) See Chapter 8 "Technical Appendix"

6) Decrease in brightness of 50 %.
7) At 25°C operating temperature.
8) Without controller.

This display unit requires an external 24 VDC supply voltage (plug is included in the delivery, see figure "Plug and Socket (5 pin) for DC Supply"). Power consumption for the 24 VDC is approximately 25 W at 100% brightness.

16.4 Door Mount Installation

The cutout and drill holes are to be made according to the following measurements for door installation. The installation template is not included with delivery and is available under the model number 5A9000.01.

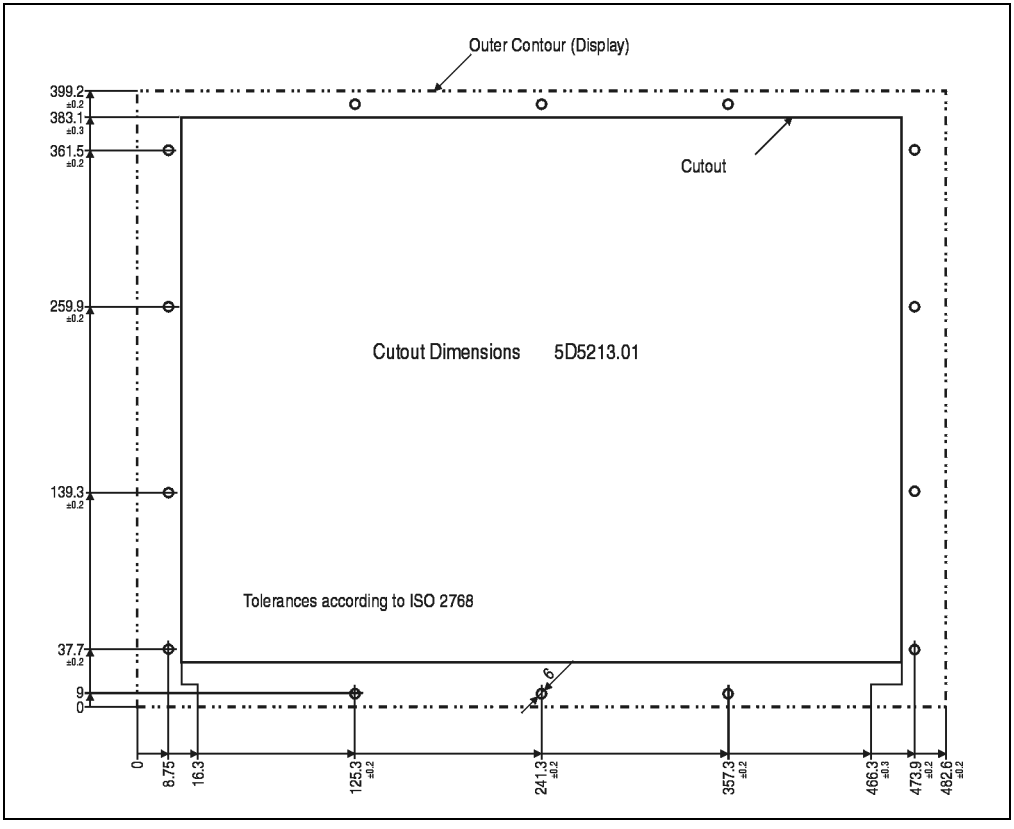


Figure 130: Door mount installation 5D5213.01

16.5 Mounting Guidelines

When mounting the display unit on the controller unit (standard mounting) the display is fastened to the controller with the six screws included in the delivery. The FPD and touch screen connection cables for standard mounting are also included in the delivery. The touch screen cable is connected to a controller's RS232 interface.

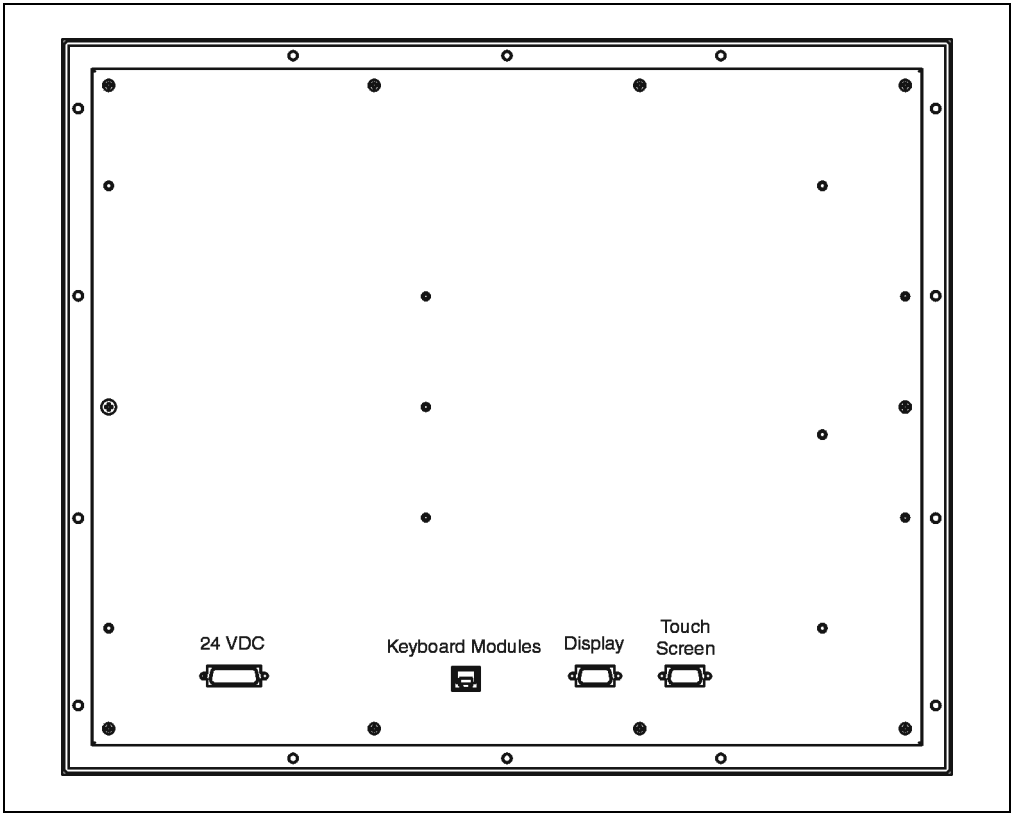


Figure 131: Connections 5D5213.01

17. Display Unit 5D9200.01

These display units are equipped with a touch screen (see section "Technical Data").

17.1 Photo

Figure 132: Display unit 5D9200.01

17.2 Dimensions

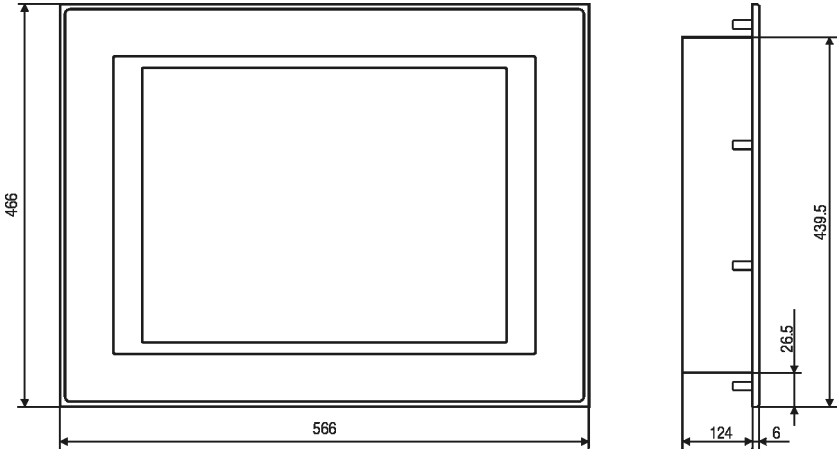


Figure 133: Measurements 5D9200.01

17.3 Technical Data

Model Number	5D9200.01
Short Text	Panel TFT C SXGA 20.1in T RGB
Controller	IPC5000
Display Type Colors [1]	TFT color, CFL background lighting 16.7 million
Connections VGA Touch Supply	 Analog RGB connection, 15 pin DSUB standard VGA plug, suitable for operation to every PC with VGA connection 9 pin DSUB, RS232 +24 VDC, 5 pin DSUB
Resolution Emulations	SXGA (1280 x 1024 pixels) VGA (640 * 480), SVGA (800 * 600) and XGA (1024 * 768)
Display Diagonal	18.1" (460 mm)
Protection	IP 20 rear sided
Front Frame Décor Foil [2] Gasket	IP 65, dust and sprayed water protection (from front) Aluminum anodized Polyester Flat gasket around display front
Design	Black
Touch Screen [3] Technology	Accu Touch Analog, resistive
Background Lighting (type) Brightness Lifespan [4] [5]	 150 cd/m^2 50,000 h
Temperature Operating Storage	 0 - 50 °C, depending on installation -20 to +60 °C
Relative Humidity Operating Storage	 5 - 85 %, non-condensing T ≤40 °C: 5% to 90 % (non-condensing) T > 40 °C: < 90 % non-condensing
Weight	Approx. 10.2 kg
Outer Dimensions (W x H x D) [6]	566 x 466 x 130 mm
Display Design 7 Colors Background	 Black
Accessories Remote Panel Cable 0.6 m Remote Panel Cable 1.8 m Remote Panel Cable 5 m Remote Panel Cable 5 m 1 x 70° Remote Panel Cable 10 m Remote Panel Cable 10 m 1 x 70° RS232 Extension 1.8 m (Touch) RS232 Extension 5 m (Touch) RS232 Extension 10 m (Touch) Background Lighting Touch Screen Driver	 5A5004.01 5A5004.02 5A5004.05 5A5004.06 5A5004.10 5A5004.11 9A0014.02 9A0014.05 9A0014.10 Available 5S0000.01-090

Table 139: Technical Data 5D9200.01

1) The actual number of colors depends on the graphic memory, the graphics mode set and the graphic driver used.
2) Resistant according to DIN 42 115 part 2, see also "Technical Appendix"
3) See Chapter 8 "Technical Appendix"
4) Decrease in brightness of 50 %.
5) At 25°C operating temperature.
6) Without controller.

This display unit requires an external 24 VDC supply voltage (plug is included in the delivery, see figure "Plug and Socket (5 pin) for DC Supply"). The 24 VDC power consumption is typically 37 W.

17.4 Door Mount Installation

The cutout and drill holes are to be made according to the following measurements for door installation:

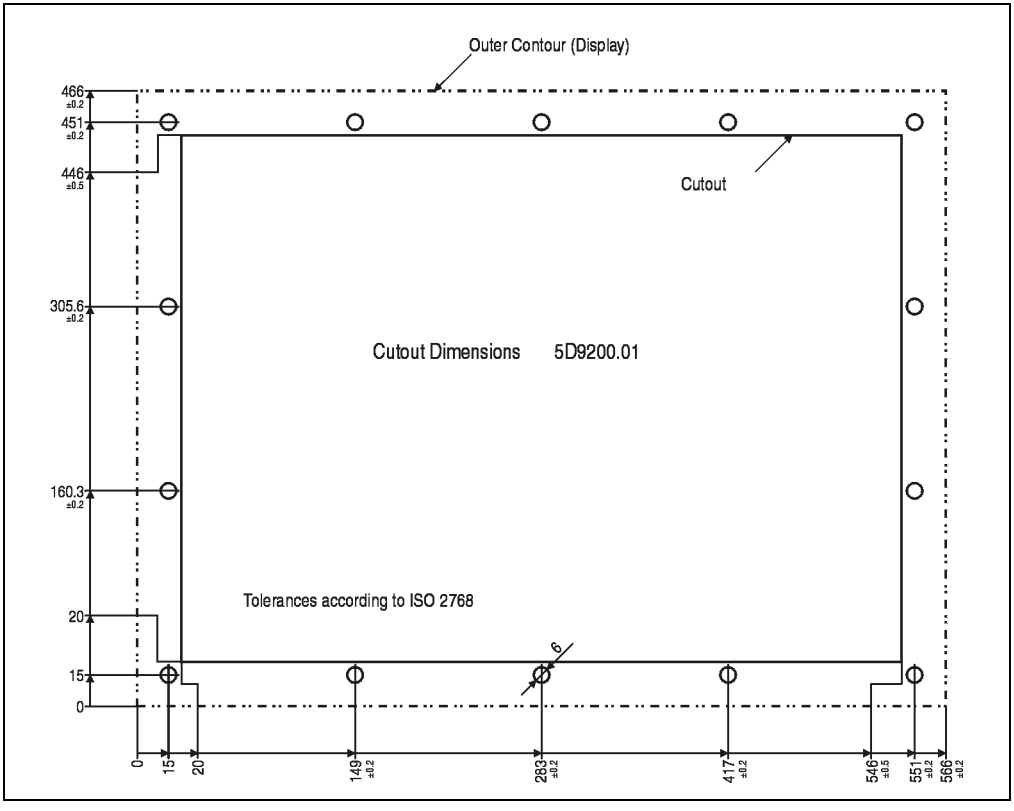


Figure 134: Door mount installation 5D9200.01

17.5 Mounting Guidelines

When mounting the display unit on the controller unit (standard mounting) the display is fastened to the controller with the six screws included in the delivery. VGA, touch screen and service connection cables for standard mounting are included in delivery.

The touch screen and the service cable are both connected to RS232 interfaces (COM1 and COM2) of the controller. For standard mounting, the VGA connection is made using the cable delivered. A standard VGA cable is used for remote installation.

Display connections are accessible at the back in a cover and arranged as follows:

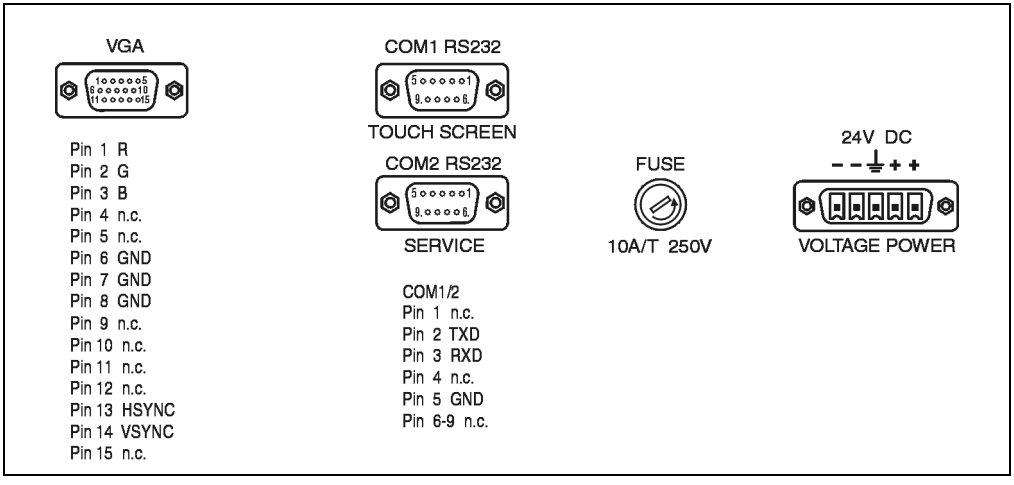


Figure 135: Connections 5D9200.01

18. Displays 5D5500.10, 5D5500.32, 5D5501.01 and 5D5510.10

18.1 Photo

5D5500.10 and 5D5500.325D5501.01 and 5D5510.10

Figure 136: Display units 5D55xx.xx

18.2 Dimensions

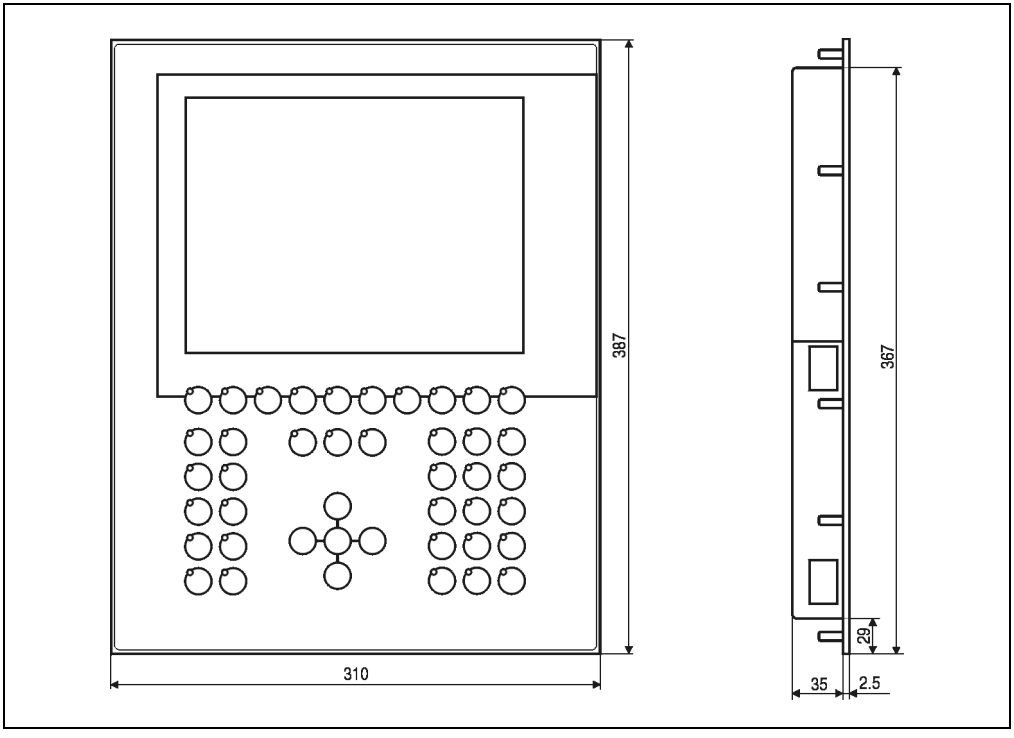


Figure 137: Measurements 5D55xx.xx

18.3 Technical Data

Model Number	5D5500.10	5D5500.32	5D5501.01	5D5510.10
Short Text	Panel TFT C VGA 10.4" F	iPanel TFT C VGA 10.4" F	Panel TFT C SVGA 10.4" F	iPanel TFT C VGA 10.4" F
Controller[1)] Remote Operation	IPC5000, IPC5600 Max. 10 m [2)]			
Display Type Colors [3)]	TFT color, CFL background lighting 262,144			
Resolution	VGA (640 x 480 pixels)	VGA (640 x 480 pixels)	SVGA (800 x 600 pixels)	VGA (640 x 480 pixels)
Display Diagonal	10.4" (264 mm)			
Front Frame Décor Foil [4)] Gasket	IP 65, dust and sprayed water protection (from front) Aluminum anodized Polyester Flat gasket around display front			
Design	Black	Light Gray	Black	Light Gray
Background Lighting (type) Brightness Lifespan [5) 6)]	200 cd/m^2 50,000 h	200 cd/m^2 50,000 h	180 cd/m^2 10,000 h	200 cd/m^2 50,000 h
Temperature Operating Storage	0 - 50 °C, depending on installation -20 to +60 °C			
Relative Humidity Operating Storage	5 - 85 %, non-condensing T ≤40 °C: 5% to 90 % (non-condensing), T > 40 °C: < 90 % non-condensing			
Weight	Approx. 3.7 kg			
Outer Dimensions (W x H x D) [7)]	310 x 387 x 38 mm			
Display Design/Colors Dark Grey Border around the Display Bright Background Orange Keys Dark Grey keys Legend strips (grey)	Black Black	Pantone 432c Pantone 427c Pantone 151c Pantone 431c	Black Black	Pantone 432c Pantone 427c Pantone 151c Pantone 431c Pantone 429c
Accessories Remote Panel Cable 0.6 m Remote Panel Cable 1.8 m Remote Panel Cable 5 m Remote Panel Cable 5 m 1 x 70° Remote Panel Cable 10 m Remote Panel Cable 10 m 1 x 70° Background Lighting Slide in Legends Provit Mkey Utilities	5A5004.01 5A5004.02 5A5004.05 5A5004.06 5A5004.10 5A5004.11 Available 5A2500.06 (black) and 5A2500.09 (grey) 5S0000.01-090			

Table 140: Technical Data 5D55xx.xx

1) Only remote operation is possible with the IPC 5600 because of mechanical dimensions.
2) Distance depends on the revision number; see the section "Distance for Remote Operation"
3) The actual number of colors depends on the graphic memory, the graphics mode set and the graphic driver used.
4) Resistant according to DIN 42 115 part 2, see also "Technical Appendix"
5) Decrease in brightness of 50 %.
6) At 25°C operating temperature.
7) Without controller.

18.4 Door Mount Installation

The cutout and drill holes are to be made according to the following measurements for door installation. The installation template is not included with delivery and is available under the model number 5A9000.01.

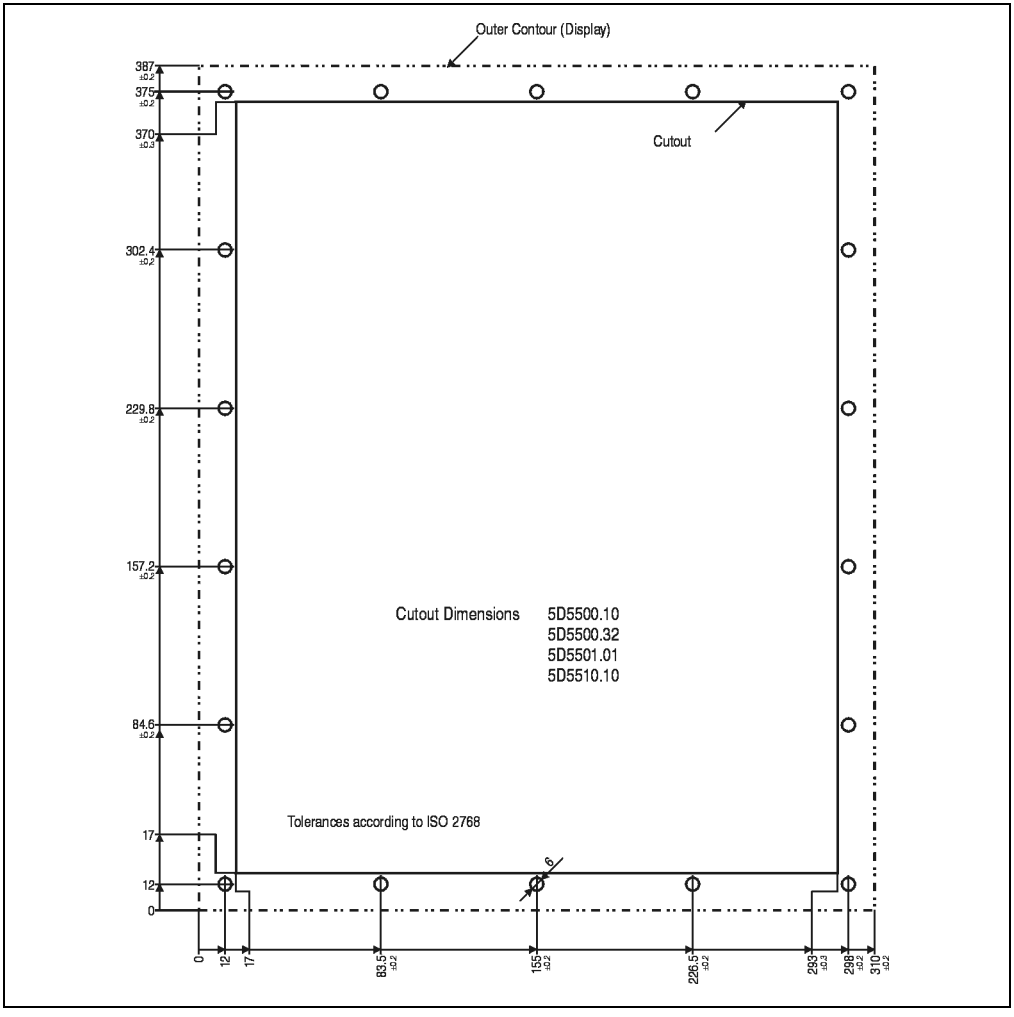


Figure 138: Door mount installation 5D55xx.xx

18.5 Mounting Guidelines

When mounting the display unit on the controller unit (standard mounting) the display is fastened to the controller with the six screws included in the delivery. The FPD connection cable and a cable for connecting further Panelware modules are included in delivery.

The function keys are treated like Panelware modules. As a result, the same regulations apply to the connection, particularly in regard to the maximum number of keys (see the section "Using Panelware Modules").

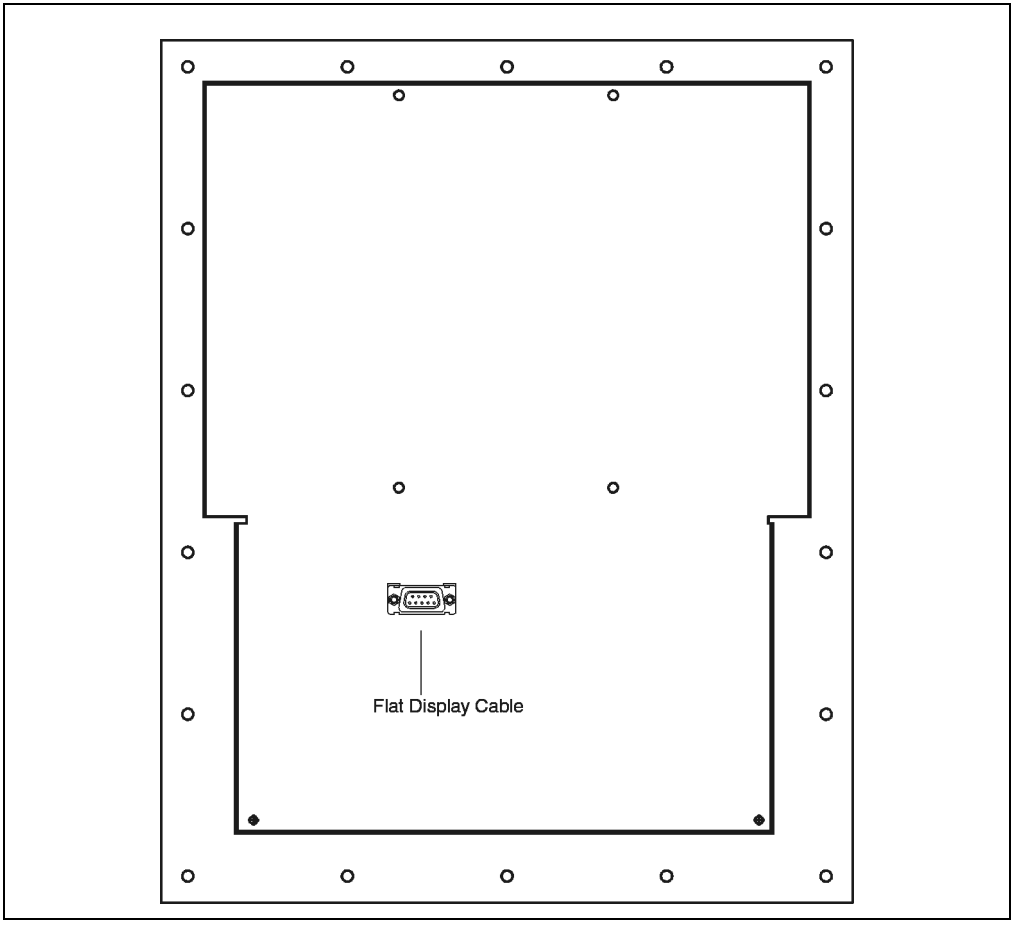


Figure 139: Connections 5D55xx.xx

Transfer of the key codes from display to controller is made using the FPD cable and not with a separate cable. The existing Panelware cable on the display is used as output (for further Panelware modules) and not as input.

Note: The function keys in the display represent the connected Panelware module. Further modules can then be connected to the display.

Configuration of the keys and evaluation of key strokes is made using Mkey utilities and the Mkey driver (see the "Provit Mkey Utilities User Manual").

18.6 Key Labels

The keys of display units 5D5500.10, 5D5500.32, 5D5501.01 and 5D5510.10 can be labeled with the help of legend strips. The key legend strip slots can be accessed from the back of the display.

Two legend strips are required for the function keys ([F1] - [F5] and [F6] - [F0]). The legend strips for the small key block (3 keys) are inserted from the side, while the ones for the larger key block (10 keys) are inserted from below.

18.6.1 5D5500.10 and 5D5500.32

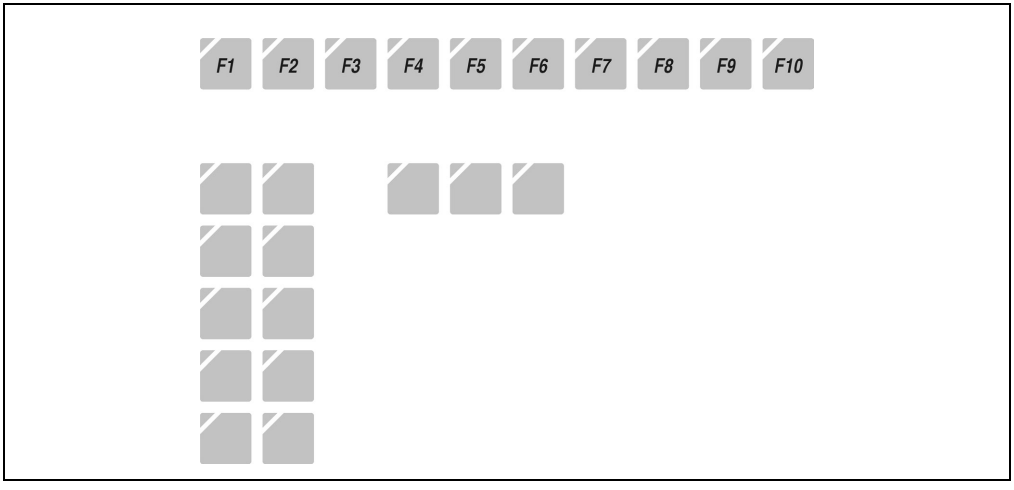


Figure 140: Key labels 5D5500.10 and 5D5500.32

18.6.2 5D5501.01 and 5D5510.10

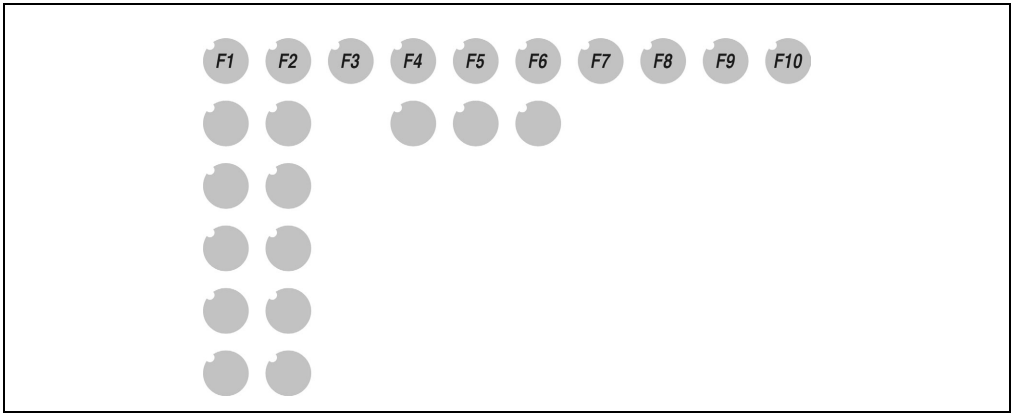


Figure 141: Key labels 5D5501.01 and 5D5510.10

Displays are delivered with partially pre-labeled key legend strips.

Printable legend strips can be ordered from B&R (model numbers see Chapter 7 "Accessories"). They can be printed using a standard laser printer.

19. Display Units 5D5600.0x and 5D5601.0x

19.1 Photo

Figure 142: Display units 5D5600.0x and 5D5601.0x

19.2 Dimensions

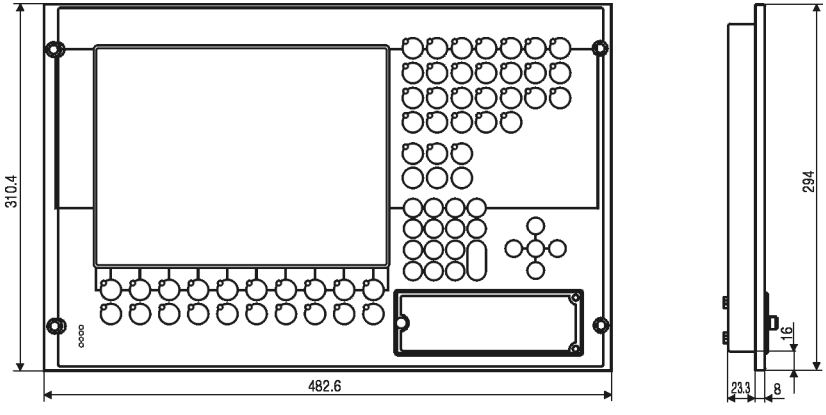


Figure 143: Measurements 5D566.0x and 5D5601.0x

19.3 Technical Data

Model Number	5D5600.01	5D5600.02	5D5600.03	5D5601.01	5D5601.02	5D5601.03
Short Text	Panel TFT C VGA 10.4" F	Panel TFT C VGA 10.4" FM	Panel TFT C VGA 10.4" FT	Panel TFT C SVGA 12.1" F	Panel TFT C SVGA 12.1" FM	Panel TFT C SVGA 12.1" FT
Controller Remote Operation	IPC5000 [1], IPC5600 Max. 10 m [2]					
Display Type Colors [3]	TFT color, CFL background lighting 262,144					
Resolution	VGA (640 x 480 pixels)			SVGA (800 x 600 pixels)		
Display Diagonal	10.4" (264 mm)			12.1" (307 mm)		
Protection	IP 20 rear sided					
Front Frame Décor Foil [4] Gasket Accessible from the front Remote Operation	IP65, dust and sprayed water protection (from front) Aluminum anodized Polyester Flat gasket around display front AT keyboard socket (PS/2), FDD (Controller), CD-ROM AT keyboard socket (PS/2), FDD (Panel)					
Touch Screen [5] Technology Touch Pad	- - 	- Touch Pad	Accu Touch an./res. -	- -	- Touch Pad	Accu Touch an./res.
Other Information Reset Button AT keyboard (PS/2) Standard Mounting FDD or LS120 CD-ROM Remote Mounting 3.5" FDD	Accessible behind front cover Socket accessible behind front cover Accessible behind front cover Accessible behind front cover Accessible behind front cover, max. 1.8 m distance					
Design	Light Gray					
Background Lighting (type) Brightness Lifespan [6] [7]	 200 cd/m^2 50,000 h			 300 cd/m^2 50,000 h		
Temperature Operating Storage	0 - 50 °C, depending on installation -20 to +60 °C					
Relative Humidity Operating Storage	5 - 85 %, non-condensing T ≤40 °C: 5% to 90 % (non-condensing) T > 40 °C: < 90 % non-condensing					
Weight	Approx. 4.5 kg					
Outer Dimensions (W x H x D) [8]	482 x 310 x 31 mm (19 inch x 7 HU)					
Display Design/Colors dark grey Bright background orange keys dark grey keys Legend strips (grey)	 Pantone 432c Pantone 427c Pantone 151c Pantone 431c Pantone 429c					

Table 141: Technical Data 5D5600.0x and 5D5601.0x

1) Installation only possible with separate cable set (model no. 5A5601.01)

2) Distance depends on the revision number; see the section "Distance for Remote Operation"
3) The actual number of colors depends on the graphic memory, the graphics mode set and the graphic driver used.
4) Resistant according to DIN 42 115 part 2, see also "Technical Appendix"
5) See Chapter 8 "Technical Appendix"
6) Decrease in brightness of 50 %.
7) At 25°C operating temperature.
8) Without controller

19.4 Door Mount Installation

The cutout and drill holes are to be made according to the following measurements for door installation. The installation template is not included with delivery and is available under the model number 5A9000.01.

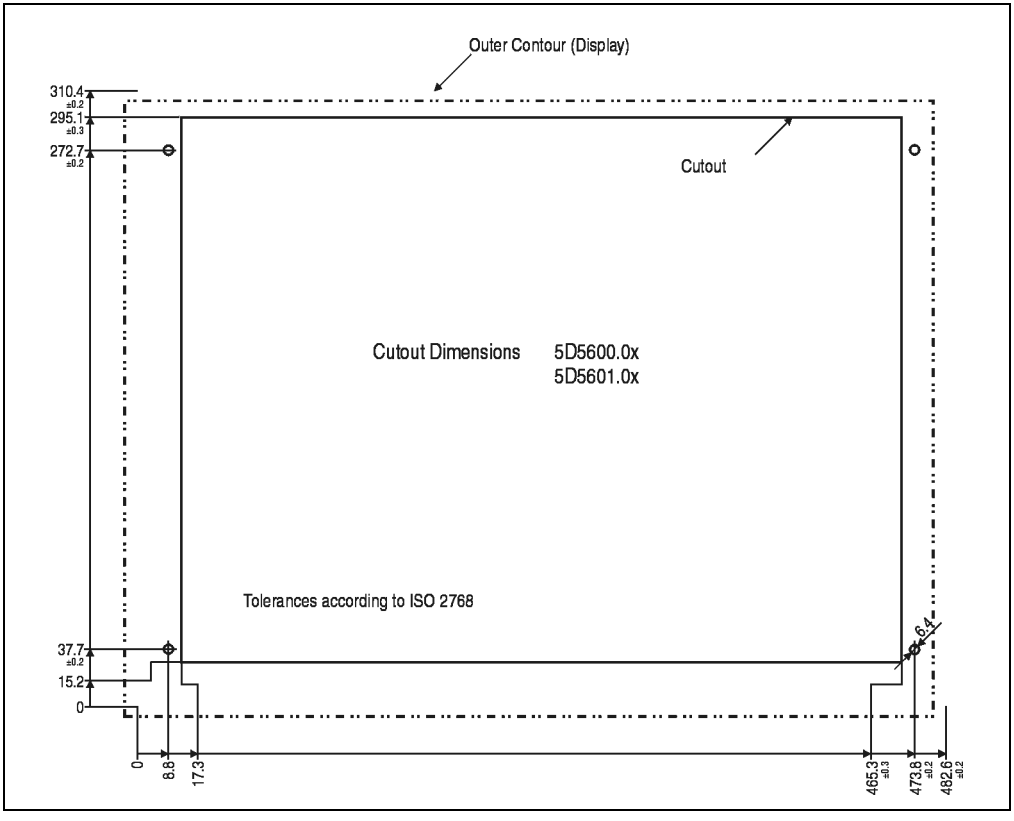


Figure 144: Door mount installation 5D5600.0x and 5D5601.0x

19.5 Mounting Guidelines

When mounting the display unit on the controller unit (standard mounting) the display is fastened to the controller with the six screws included in the delivery. The FPD and touch screen connection cables for standard mounting are also included in the delivery.

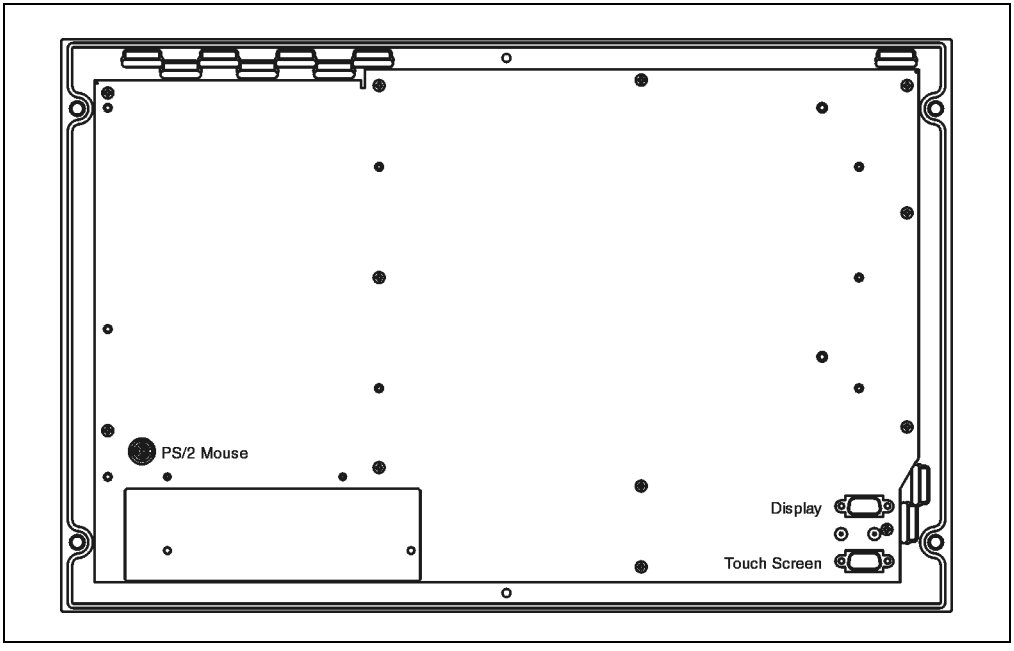


Figure 145: Connections 5D5600.0x and 5D5601.0x

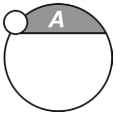
It is not possible to use Panelware modules with display units 5D5600.0x and 5D5601.0x, because the integrated keys in the display have already reached the maximum number of keys (see the "Using Panelware Modules" section).

The dimensions of display units 5D5600.0x and 5D5601.0x allow for installation in standard 19" plug-in frames.

19.6 Integrated Keys

Configuration of all keys and evaluation of key strokes is made using Mkey utilities and Mkey driver (see the Provit Mkey Utilities User Manual).

- Function Keys

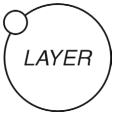


The 26 function keys can be programmed by the user. Likewise, the integrated LEDs are available in every key . On the function keys the letters (A to Z) are printed. The area underneath can be labeled using legend strips (see the "Key Labels" section).

- Softkey Buttons

The 20 Softkey buttons are arranged below the display and likewise can be programmed by the user. This also applies for integrated LEDs in each key. Softkey buttons can be labeled using legend strips without constraint (see section "Key Labels").

- System Keys



Functions for the 26 system keys (numerical Block, Ctrl, Alt, Del, Tab, Windows) are the same as with conventional PCs. An exception however is the [Layer] key, which allows multiple assignment for all existing keys (similar to the shift key). The display units 5D5600.0x and 5D5601.0x allow up to 4 levels to be used (multiple assignments). In this case, keys are defined as a level selector switch (see the Provit Mkey Utilities User Manual). The system keys are printed at B&R and are unable to be labeled.

It is important to note that a maximum of 2 special keys can be pressed simultaneously, otherwise the key code can no longer be recognized correctly (with the exception of [Ctrl]+[Alt]+[Del]).

19.7 Reset Button

A reset button is accessible through a small gap behind the front cover of the display unit.

Triggering of a reset after pressing the button is delayed by approximately 2 to 3 seconds. Do not attempt to initiate a reset by repeated or forced pressing!

19.8 LED Displays

There are four status LEDs in the bottom left corner of the display unit:

- POWER (green): The controller's supply voltage is present
- USER (yellow): Can be programmed by the user
- HDD (yellow): Signalizes hard disk activity
- TEMP(red): Indicates excessive temperature (see the section "Temperature Monitoring with Ventilation")

19.9 Key Labels

The display unit keys 5D5600.0x and 5D5601.0x can be labeled using legend strips. The designated strip slots can be accessed at the back of the display (from the side and from above).

Figure 146: Legend strips 5D5600.0x and 5D5601.0x

Displays are delivered with partially pre-labeled key legend strips. Printable legend strips can be ordered from B&R (model numbers see Chapter 7 "Accessories"). They can be printed using a standard laser printer.

The following keys are labeled:

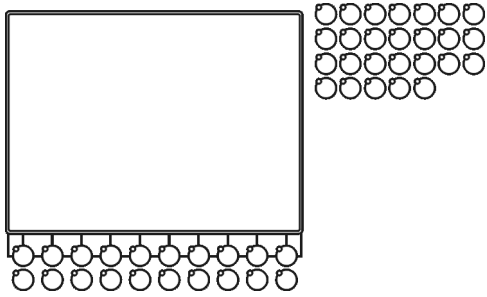


Figure 147: Labeled keys 5D5600.0x and 5D5601.0x

19.10 Accessories

Model Number	Accessories
5A5004.01	Remote Panel Cable 0.6 m
5A5004.02	Remote Panel Cable 1.8 m
5A5004.05	Remote Panel Cable 5 m
5A5004.06	Remote Panel Cable 5 m 1 x 70°
5A5004.10	Remote Panel Cable 10 m
5A5004.11	Remote Panel Cable 10 m 1 x 70°
9A0014.02	RS232 Extension 1.8 m (Touch)
9A0014.05	RS232 Extension 5 m (Touch)
9A0014.10	RS232 Extension 10 m (Touch)
5S0000.01-090	Provit Drivers & Utilities CD-ROM contains the necessary driver for Touch Screen, Interlink Touch Pad, Provit Mkey Utilities
5A5602.01	Slide in Legend 10.4"
5A5602.02	Slide in Legend 12.1"
Available	Background Lighting

Table 142: Order data accessories 5D5600.0x and 5D5601.0x

Chapter 4 • Display Kits

1. General Information

Display kits are designed to be installed by the customer (integration in a machine). Display kits consist of the display and the corresponding cable (without housing).

1.1 Overview

Type	Description	Remark
5D5000.03	Panel Kit TFT Color VGA 10.4"	
5D5000.10	Panel Kit LCD Color VGA 10.4"	
5D5000.14	Panel Kit TFT Color VGA 13.8"	
5D5000.18	Panel Kit TFT Color XGA 13.8"	

Table 143: Display kits overview

1.2 Mounting Guidelines

Display kits are supplied with a 10 cm (approx) long Panellink cable (9 pin DSUB), which makes the connection to the controller.

Display kits cannot be fastened to the controller during delivery. Therefore customers must ensure they have the appropriate installation and/or fastening tools.

If the display is to be remotely operated by the controller (remote mounting), then a separately ordered remote display cable is required (model no. 5A5004.05, also see the "Mounting Guidelines" section).

With remote mounting, the maximum permitted distance between the display unit and the controller unit depends on the respective display unit. Information is found in the technical data for the display kits tables in the respective chapters.

1.3 Using Panelware Modules

See Chapter 3 “Display Units“, section 3. “Using Panelware Modules”.

1.4 Brightness/Contrast

See Chapter 3 “Display Units“, section 4. “Brightness/Contrast”.

2. Display Kit 5D5000.03

2.1 Photo

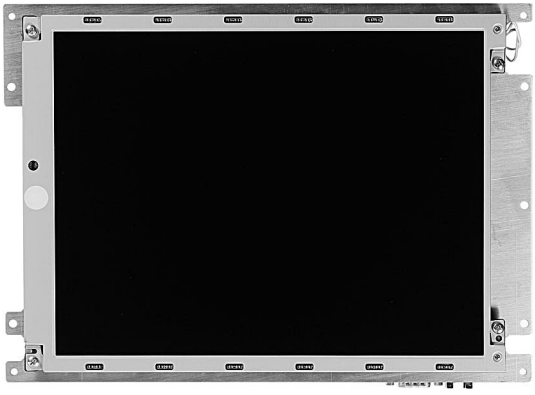


Figure 148: Display kit 5D5000.03

2.2 Dimensions

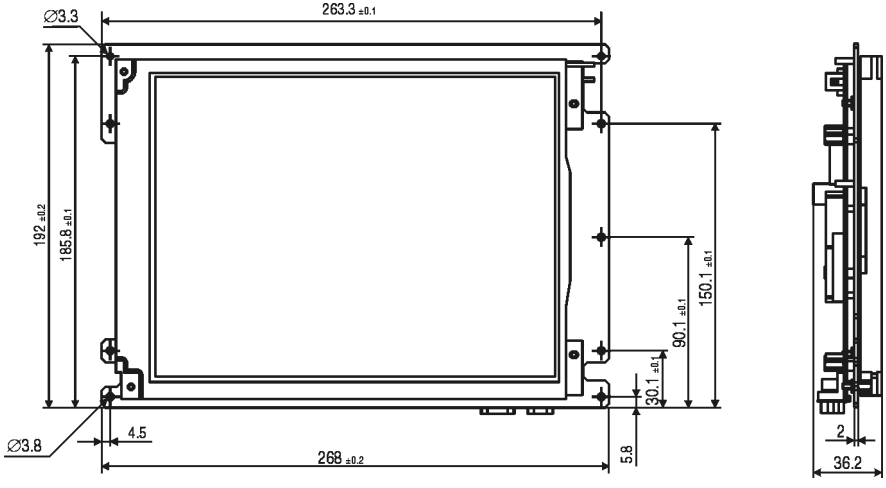


Figure 149: Measurements 5D5000.03

2.3 Technical Data

Model Number	5D5000.03
Short Text	Panel Kit TFT C VGA 10.4"
Controller	IPC5000, IPC5600 Max distance 10 m [1]
Display Type Colors [2]	TFT color, CFL background lighting 262,144
Resolution	VGA (640 x 480 pixels)
Display Diagonal	10.4" (264 mm)
Background Lighting (type) Brightness Lifespan [3] [4]	 200 cd/m^2 50,000 h
Temperature Operating Storage	 0 - 50 °C, depending on installation -20 to +60 °C
Relative Humidity Operating Storage	 5 - 85 %, non-condensing T ≤40 °C: 5% to 90 % (non-condensing) T > 40 °C: < 90 % non-condensing
Weight	Approx. 0.43 kg
Outer Dimensions (W x H x D)	268 x 192 x 36.2 mm

Table 144: Technical Data 5D5000.03

1) Distance depends on the revision number; see the section "Distance for Remote Operation"
2) The actual number of colors depends on the graphic memory, the graphics mode set and the graphic driver used.
3) Decrease in brightness of 50 %.
4) At 25°C operating temperature.

3. Display Kit 5D5000.10

3.1 Photo

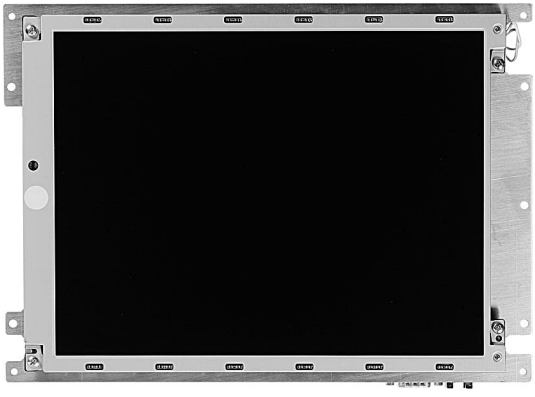


Figure 150: Display Kit 5D5000.10

3.2 Dimensions

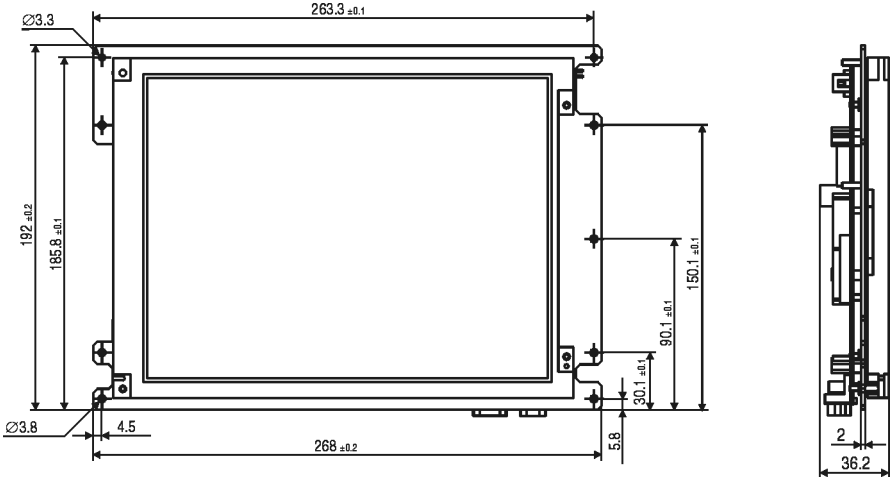


Figure 151: Measurements 5D5000.10

3.3 Technical Data

Model Number	5D5000.10
Short Text	Panel Kit LCD C VGA 10.4"
Controller	IPC5000, IPC5600 Max distance 10 m [1]
Display Type Colors [2]	LCD color, CFL background lighting 262,144
Resolution	VGA (640 x 480 pixels)
Display Diagonal	10.4" (264 mm)
Background Lighting (type) Brightness Lifespan [3] [4]	 70 cd/m^2 10,000 h
Temperature Operating Storage	 5 - 40 °C, depending on installation -20 to +60 °C
Relative Humidity Operating Storage	 5 - 85 %, non-condensing T ≤40 °C: 5% to 90 % (non-condensing) T > 40 °C: < 90 % non-condensing
Weight	Approx. 0.75 kg
Outer Dimensions (W x H x D)	268 x 192 x 36.2 mm

Table 145: Technical Data 5D5000.10

1) Distance depends on the revision number; see the section "Distance for Remote Operation"
2) The actual number of colors depends on the graphic memory, the graphics mode set and the graphic driver used.
3) Decrease in brightness of 50 %.
4) At 25°C operating temperature.

4. Display Kit 5D5000.14

4.1 Photo

Figure 152: Display kit 5D5000.14

4.2 Dimensions

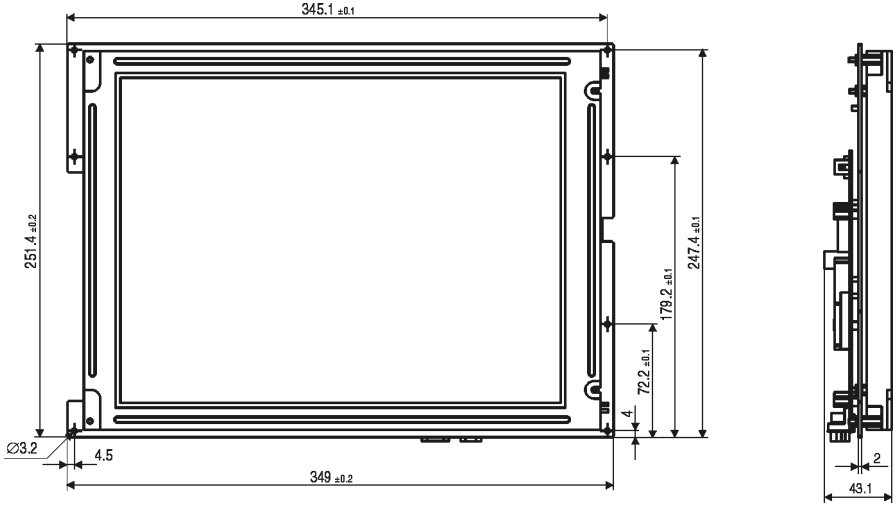


Figure 153: Measurements 5D5000.14

4.3 Technical Data

Model Number	5D5000.14
Short Text	Panel Kit TFT C VGA 13.8"
Controller	IPC5000, IPC5600 Max distance 10 m [1]
Display Type Colors [2]	TFT color, CFL background lighting 16 million
Resolution	VGA (640 x 480 pixels)
Display Diagonal	13.8" (351 mm)
Background Lighting (type) Brightness Lifespan [3] [4]	 180 cd/m^2 10,000 h
Temperature Operating Storage	 0 - 50 °C, depending on installation -20 to +60 °C
Relative Humidity Operating Storage	 5 - 85 %, non-condensing T ≤40 °C: 5% to 90 % (non-condensing) T > 40 °C: < 90 % non-condensing
Weight	Approx. 0.75 kg
Outer Dimensions (W x H x D)	349 x 251.4 x 43.1 mm
Relative Humidity	5 - 85 %, non-condensing

Table 146: Technical Data 5D5000.14

1) Distance depends on the revision number; see the section "Distance for Remote Operation"
2) The actual number of colors depends on the graphic memory, the graphics mode set and the graphic driver used.
3) Decrease in brightness of 50 %.
4) At 25°C operating temperature.

5. Display Kit 5D5000.18

5.1 Photo

Figure 154: Display kit 5D5000.18

5.2 Dimensions

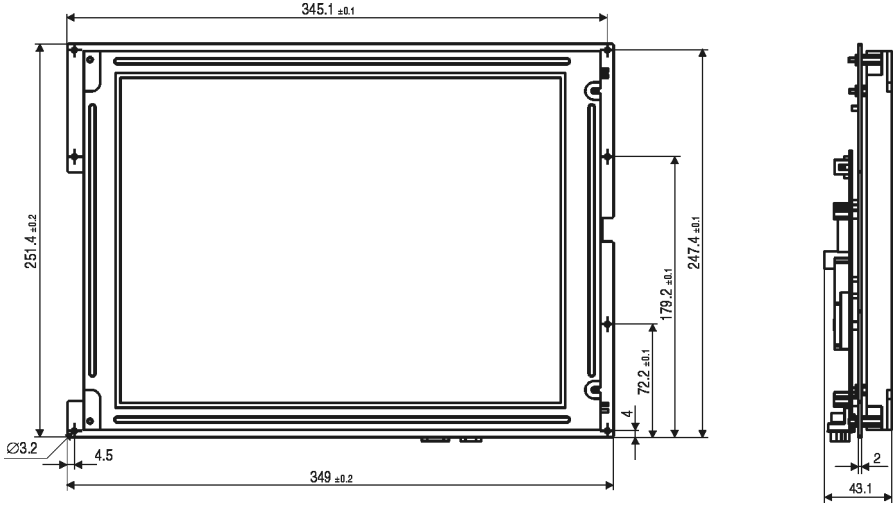


Figure 155: Measurements 5D5000.18

5.3 Technical Data

Model Number	5D5000.18
Short Text	Panel Kit TFT C XGA 13.8"
Controller	IPC5000, IPC5600 Max distance 10 m [1]
Display Type Colors [2]	TFT color, CFL background lighting 16 million
Resolution	XGA (1024 x 768 pixels)
Display Diagonal	13.8" (351 mm)
Background Lighting (type) Brightness Lifespan [3] [4]	 180 cd/m^2 10,000 h
Temperature Operating Storage	 0 - 50 °C, depending on installation -20 to +60 °C
Relative Humidity Operating Storage	 5 - 85 %, non-condensing T ≤40 °C: 5% to 90 % (non-condensing) T > 40 °C: < 90 % non-condensing
Weight	Approx. 0.75 kg
Outer Dimensions (W x H x D)	349 x 251.4 x 43.1 mm

Table 147: Technical Data 5D5000.18

1) Distance depends on the revision number; see the section "Distance for Remote Operation"
2) The actual number of colors depends on the graphic memory, the graphics mode set and the graphic driver used.
3) Decrease in brightness of 50 %.
4) At 25°C operating temperature.

Chapter 5 • Keypad Modules

1. Overview

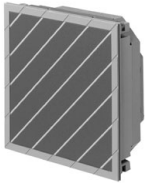
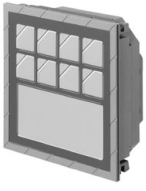
16 keys, 16 LEDs 	Dummy module, no keys 
12 keys, 4 LEDs 	E-Stop button 
8 keys, 4 LEDs, 1 label field 	Key Switch with ON/OFF switch 
4 keys, 4 LEDs, 4 label fields 	Start/Stop button with label field 

Table 148: Overview of the keypad modules

2. General Information

2.1 Dimensions

All standard keypad modules have the same dimensions, special keypad modules can be up to 60 mm deep.

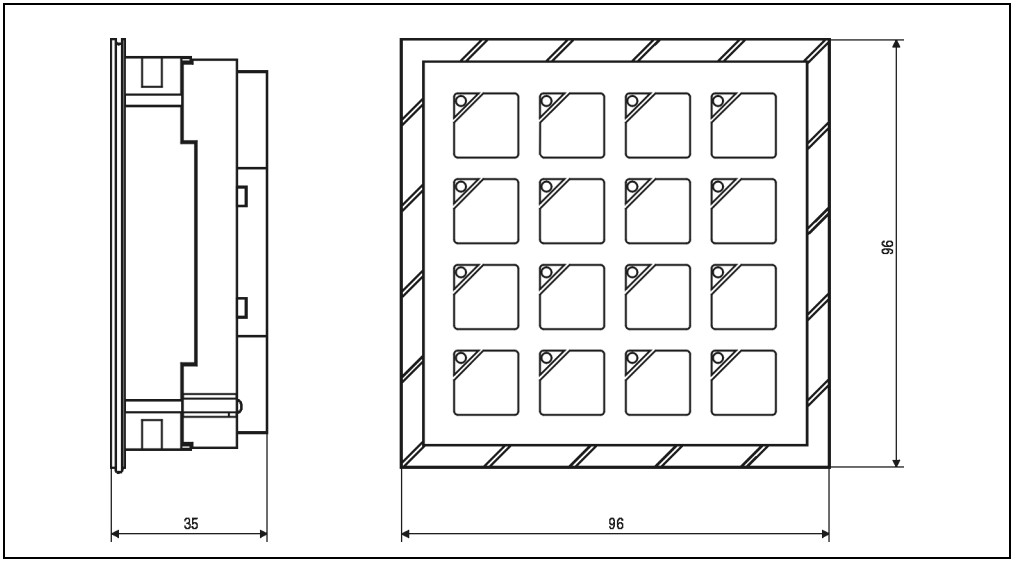


Figure 156: Dimensions for standard keypad modules

2.2 Standard and Special Keypad Modules

Keypad modules are divided into two groups:

- Up to eight standard keypad modules can be daisy chained and connected to a controller.
- Special keypad modules are identical to the rest of the keypad modules regarding their design. An electrical connection with a controller or standard keypad module is not possible.They are to be wired by an electrician according to their function (e.g. connecting an E-STOP button to an emergency stop circuit).

3. Standard Keypad Modules

3.1 Connecting to a Controller or Other Keypad Modules.

All standard keypad modules can be connected to a controller or an another keypad module with a short cable. There are two sockets provided on the module for this purpose. The sockets are labeled as input or output with triangle arrows. An output is provided on the controller and on the display which can be connected to a keypad module input.

Make sure that an input is never connected to an input, or an output is never connected to an output, as this will damage the modules.

For more detailed information about connecting to a controller, see the section "Panelware Keypad Modules" or the section "Connecting to Displays".

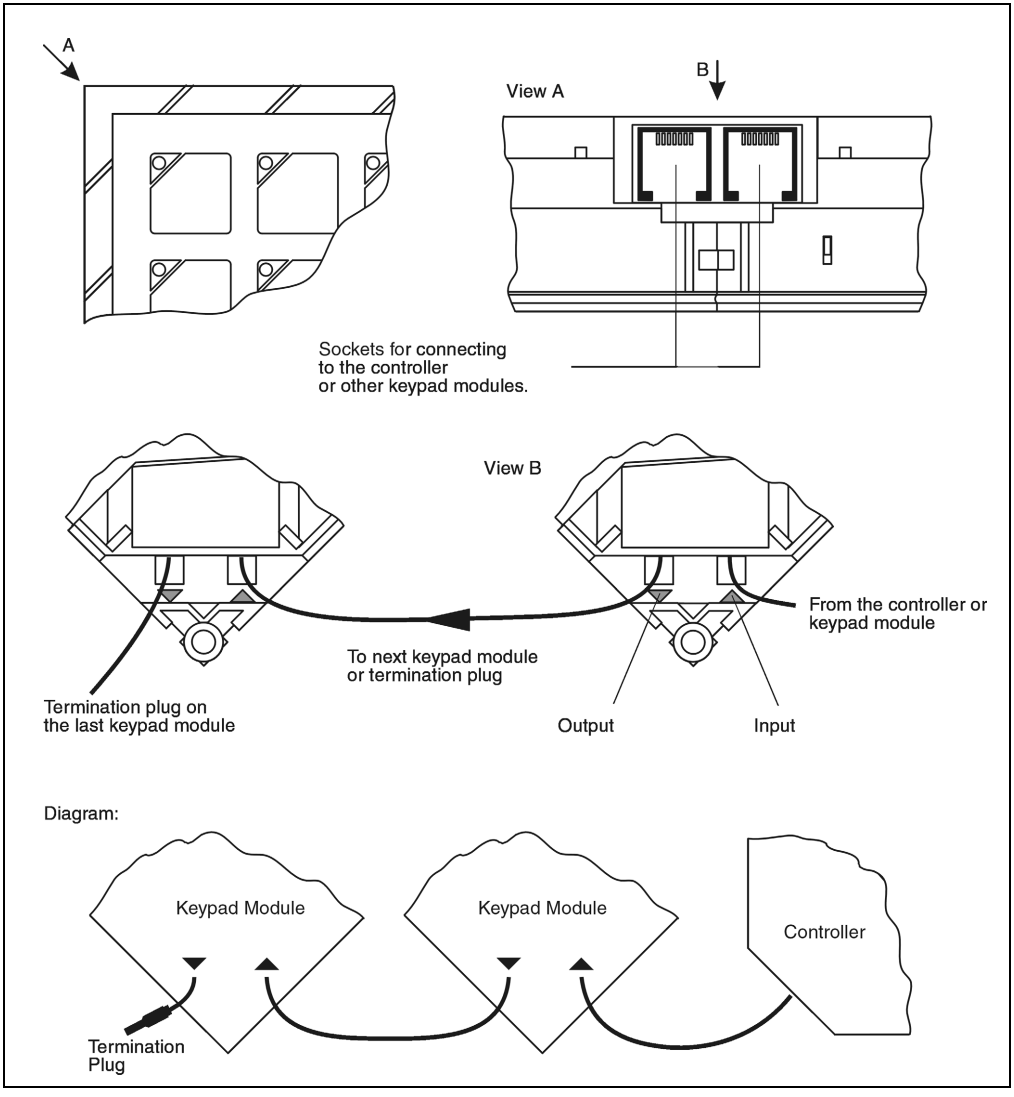


Figure 157: Connection to the controller or other keypad modules.

A 90 cm long keypad module cable can be ordered as an accessory.

Model Number	Description
9A0007.01	Keypad module cable (90 cm)

Table 149: Order data for the keypad module cable (90 cm)

It can only be connected between the Provit 5000 Controller and the first keypad module. The standard keypad module cable is to be used for all other keypad modules (13 cm long).

Only keypad modules with the following model numbers can be used:

Model Number	Keypad Module
4E0011.01-090	16 keys
4E0021.01-090	12 + 4 keys
4E0031.01-090	8 keys
4E0041.01-090	4 keys

Table 150: Keypad modules to be used

3.2 Keypad Module 16 Keys

3.2.1 Dimensions

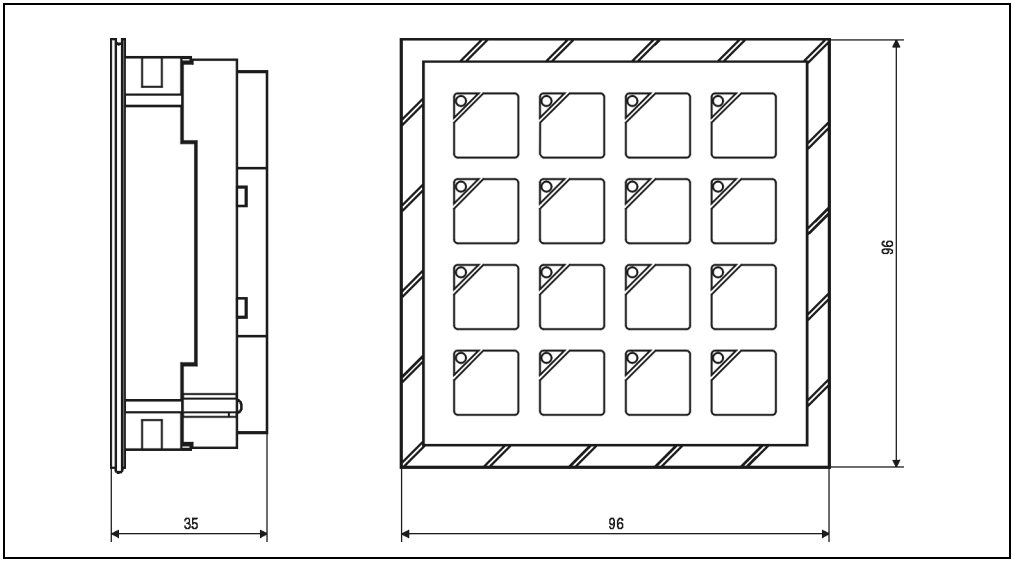


Figure 158: Dimensions for keypad module 16 keys

3.2.2 Technical Data

Model Number	4E0011.01-090
Number of Keys	16 short stroke keys
Number of LEDs	16 (yellow)
Labeling	Can be labeled by the user
Temperature Range Operating Storage	 0 to 50 °C -20 to 60 °C
Relative Humidity Operating Storage	 5 to 95 % (non condensing) 5 to 95 % (non condensing)
Shock	Conforms to IEC 68-2-27
Vibration	Conforms to IEC 68-2-6

Table 151: Technical data for keypad modules 16 keys

3.3 Keypad Module 12+4 Keys

3.3.1 Dimensions

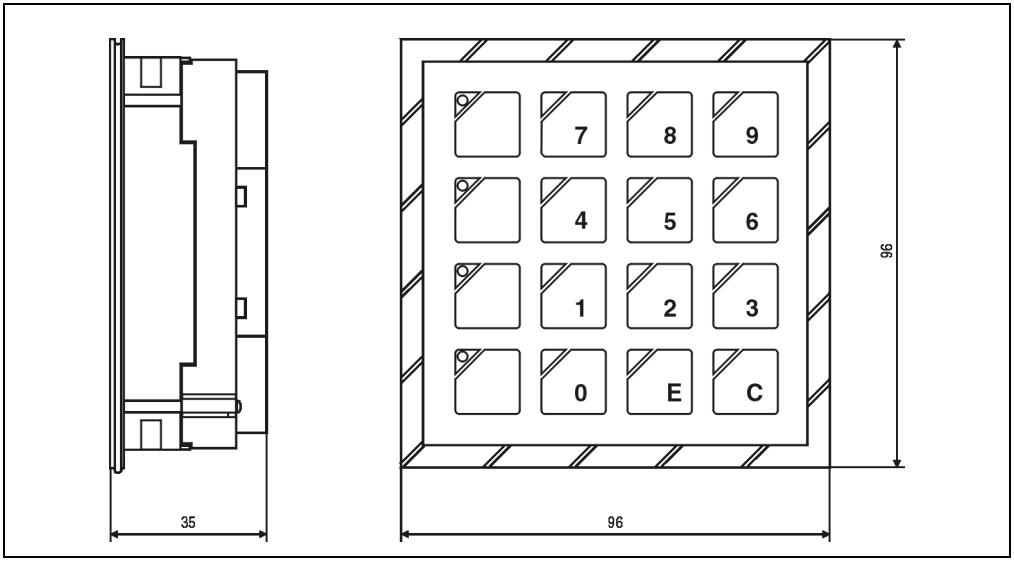


Figure 159: Dimensions for keypad module 12+4 Keys

3.3.2 Technical Data

Model Number	4E0021.01-090
Number of Keys	16 short stroke keys
Number of LEDs	4 (yellow)
Labeling	12 keys are labeled as number block 4 keys can be labeled by the user
Temperature Range Operating Storage	 0 to 50 °C (32 to 122 °F) -20 to 60 °C (-4 to 140 °F)
Relative Humidity Operating Storage	 5 to 95 % (non condensing) 5 to 95 % (non condensing)
Shock	Conforms to IEC 68-2-27
Vibration	Conforms to IEC 68-2-6

Table 152: Technical data for keypad modules 12+4 keys

3.4 Keypad Module 8 Keys

3.4.1 Dimensions

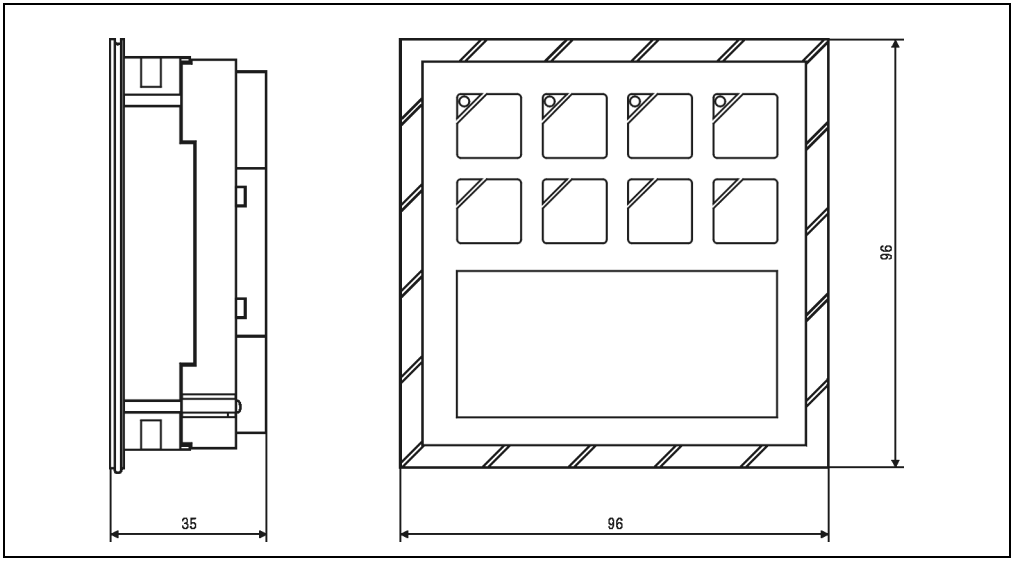


Figure 160: Dimensions for keypad module 8 keys

3.4.2 Technical Data

Model Number	4E0031.01-090
Number of Keys	8 short stroke keys
Number of LEDs	4 (yellow)
Labeling	Can be labeled by the user
Label Fields	A field for additional information
Temperature Range Operating Storage	 0 to 50 °C (32 to 122 °F) -20 to 60 °C (-4 to 140 °F)
Relative Humidity Operating Storage	 5 to 95 % (non condensing) 5 to 95 % (non condensing)
Shock	Conforms to IEC 68-2-27
Vibration	Conforms to IEC 68-2-6

Table 153: Technical data for keypad modules 8 keys

3.5 Keypad Module 4 Keys

3.5.1 Dimensions

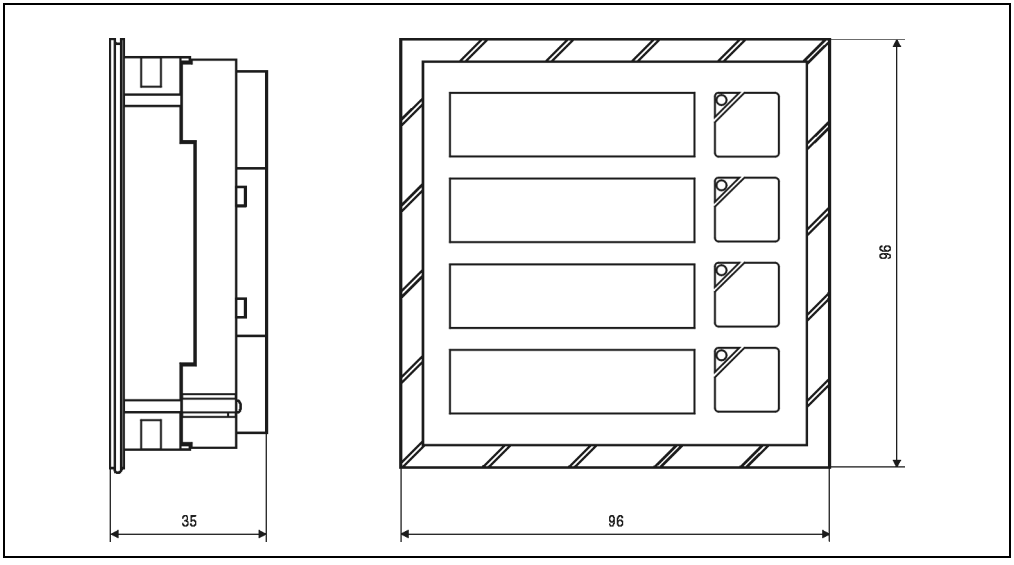


Figure 161: Dimensions for keypad module 4 keys

3.5.2 Technical Data

Model Number	4E0041.01-090
Number of Keys	4 short stroke keys
Number of LEDs	4 (yellow)
Labeling	Can be labeled by the user
Label Fields	Four fields for additional information
Temperature Range Operating Storage	 0 to 50 °C (32 to 122 °F) -20 to 60 °C (-4 to 140 °F)
Relative Humidity Operating Storage	 5 to 95 % (non condensing) 5 to 95 % (non condensing)
Shock	Conforms to IEC 68-2-27
Vibration	Conforms to IEC 68-2-6

Table 154: Technical data for keypad modules 4 keys

4. Special Keypad Modules

4.1 Dummy Module

4.1.1 Dimensions

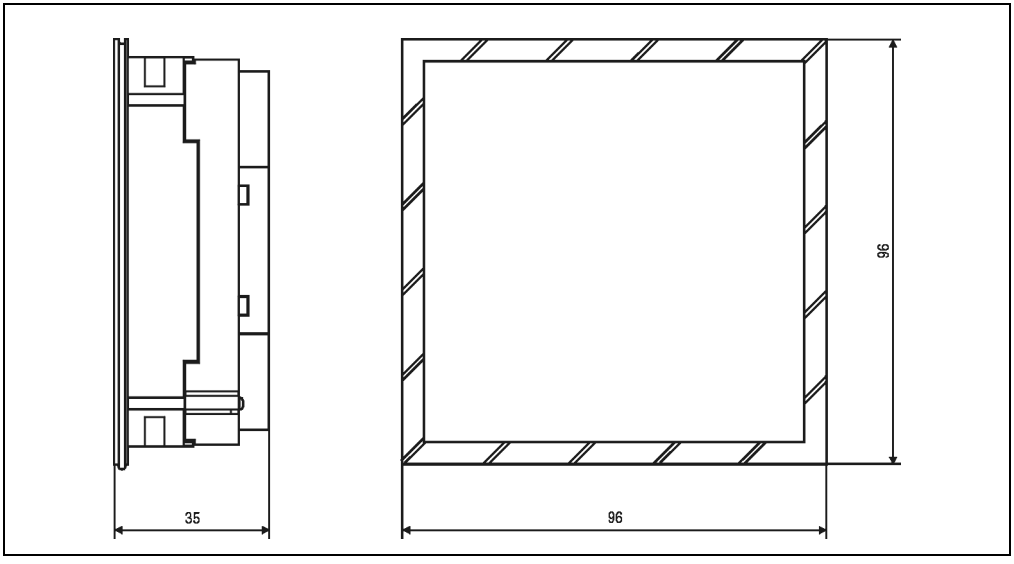


Figure 162: Dimensions for the dummy module

4.1.2 Technical Data

Model Number	4E0050.01-090
Number of Keys	None
Number of LEDs	None
Temperature Range Operating Storage	 0 to 50 °C (32 to 122 °F) -20 to 60 °C (-4 to 140 °F)
Relative Humidity Operating Storage	 5 to 95 % (non condensing) 5 to 95 % (non condensing)
Shock	Conforms to IEC 68-2-27
Vibration	Conforms to IEC 68-2-6

Table 155: Technical data for dummy module

4.2 E-Stop Button

4.2.1 Dimensions

Note: No controller can be placed behind this module because of the depth of the module.

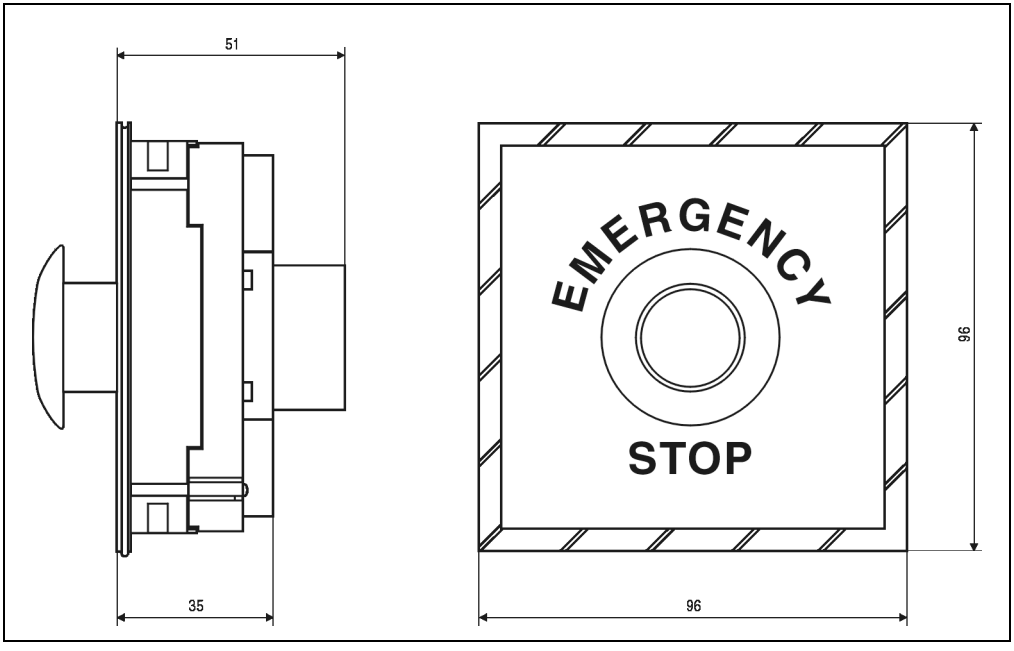


Figure 163: Dimensions for keypad module with E-stop button

4.2.2 Technical Data

Model Number	4E0060.01-090
Number of Switches	1 E-stop button
Temperature Range Operating Storage	 0 to 50 °C (32 to 122 °F) -20 to 60 °C (-4 to 140 °F)
Relative Humidity Operating Storage	 5 to 95 % (non condensing) 5 to 95 % (non condensing)
Shock	Conforms to IEC 68-2-27
Vibration	Conforms to IEC 68-2-6

Table 156: Technical data for keypad module with E-stop button

4.3 Key Switch

Note: No controller can be placed behind this module because of the depth of the module.

4.3.1 Dimensions

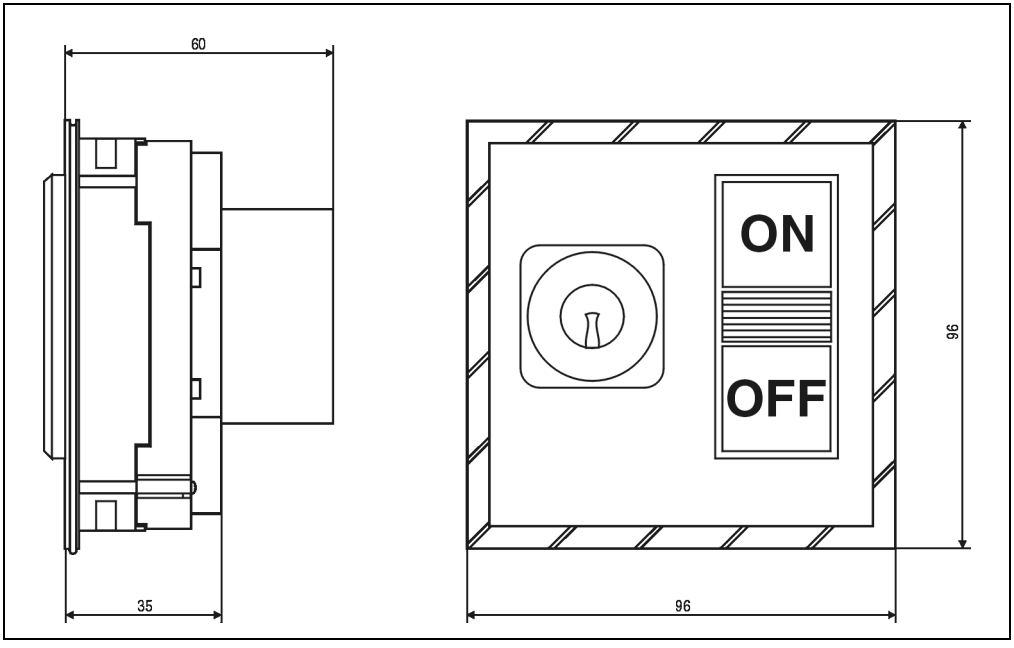


Figure 164: Dimensions for keypad module with key switch

4.3.2 Technical Data

Model Number	4E0070.01-090
Number of Switches	1 key switch 1 ON/OFF switch
Temperature Range Operating Storage	 0 to 50 °C (32 to 122 °F) -20 to 60 °C (-4 to 140 °F)
Relative Humidity Operating Storage	 5 to 95 % (non condensing) 5 to 95 % (non condensing)
Shock	Conforms to IEC 68-2-27
Vibration	Conforms to IEC 68-2-6

Table 157: Technical data for keypad module with key switch

4.4 START/STOP Switch

Note: No controller can be placed behind this module because of the depth of the module.

4.4.1 Dimensions

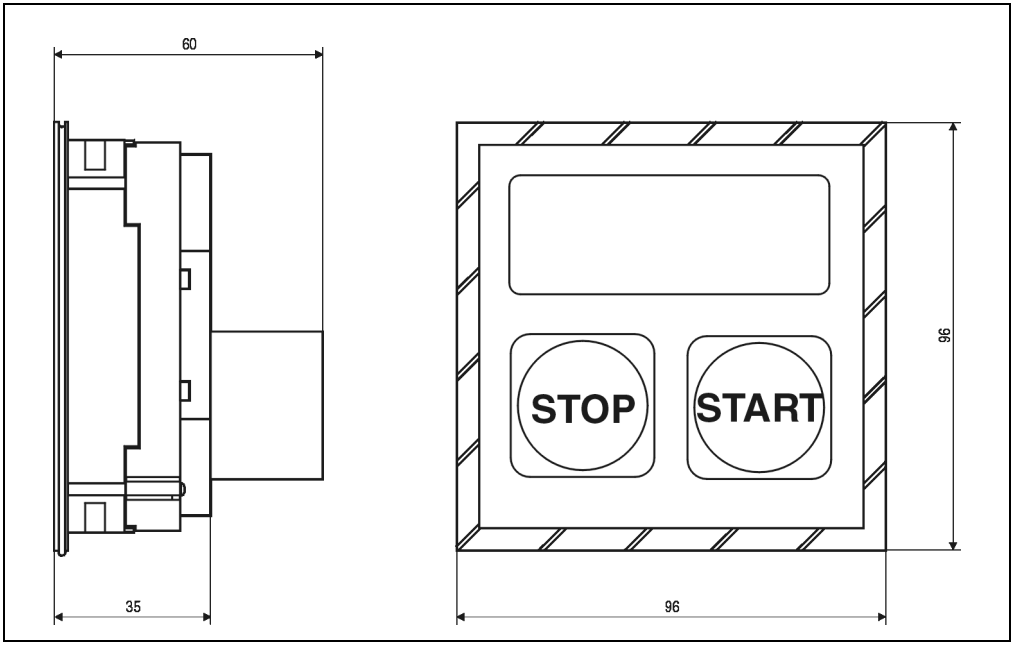


Figure 165: Dimensions for keypad module with Start/Stop switch

4.4.2 Technical Data

Model Number	4E0080.01-090
Number of Keys	2 keys (labeled with START or STOP)
Temperature Range Operating Storage	 0 to 50 °C (32 to 122 °F) -20 to 60 °C (-4 to 140 °F)
Relative Humidity Operating Storage	 5 to 95 % (non condensing) 5 to 95 % (non condensing)
Shock	Conforms to IEC 68-2-27
Vibration	Conforms to IEC 68-2-6

Table 158: Technical data for keypad module with Start/Stop switch

5. Key Legend Sheets for Keypad Modules

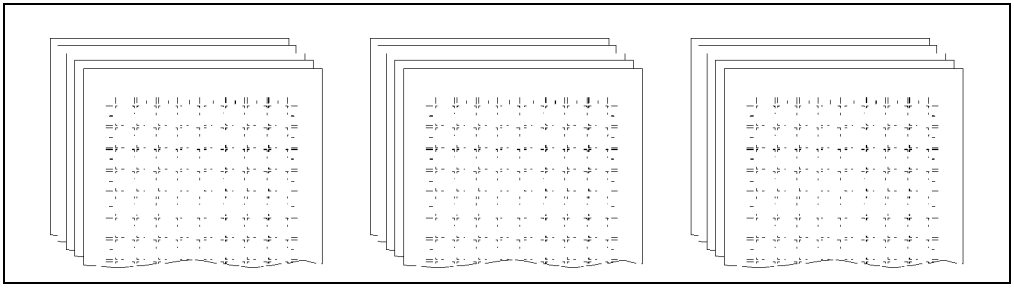


Figure 166: Key legend sheets for keypad modules

Key Legend Sheets for Keypad Modules	Blue Black	4A0005.00-000 4A0005.00-500
Five label sheets each for keypad modules with 4, 8, and 16 LEDs in A4 and US Letter format. Each label sheet has six keypad labels. The keypad labels are perforated so they can be removed from the label sheet easily.		

Table 159: Key legend sheets for keypad modules order data

6. Accessories

Accessories are delivered with each keypad module. They are packed together with the module.

Accessories	Amount	
	Standard Keypad Module	Special Keypad Module
Connection Elements	2	2
Cable Covers	2	2
Keypad Module Cable (connection to a controller or a keypad module)	1	--
Clamps	2	2
Mounting Bolt Pins	1	1

Table 160: Accessories

Chapter 6 • Software

1. BIOS General Information

BIOS is an abbreviation for "**B**asic **I**nput and **O**utput **S**ystem". It is the most basic standardized connection between the user and the system (hardware). EliteBIOS from Award Software is used on Provit 5000 and Provit 5600 IPC's.

The BIOS Setup Utility lets you modify basic system configuration settings. These settings are stored in CMOS RAM and in FPROM (as a backup).

The CMOS RAM is a nonvolatile battery backed memory which retains information when the power is turned off on the IPC.

The EliteBIOS used is a customized version of an industry-standard BIOS for IBM PC AT-compatible personal computers. It supports Intel x86 and compatible processors. The BIOS provides critical low-level support for the central processing unit, memory and I/O subsystems.

It has been customized by B&R through the addition of important, but non standard, features such as virus and password protection, power management, and detailed fine-tuning of the chipset controlling the system.

1.1 BIOS Setup

The EliteBIOS is immediately activated when you switch on the power supply of the IPC.

The BIOS reads system configuration information in CMOS RAM, compares it with the CMOS backup in FPROM and begins the process of checking the system and configuring it through the power-on self test (POST).

When these "preliminaries" are finished, the BIOS seeks an operating system in the data storage devices available (hard drive, floppy drive, etc.). The BIOS launches the operating system and hands over control of system operations to it.

To enter Setup, press the DEL key when this message appears briefly at the bottom of the screen (during POST):

```
Press DEL to enter SETUP
```

If the message disappears before you press DEL and you still wish to enter Setup, you must reboot the system.

General rules: The best advice is to alter only those settings that you thoroughly understand. Settings should not be changed in the chipset screen without a good reason. Chipset defaults have been carefully chosen by Award or from B&R to guarantee ideal performance and reliability. Even a seemingly minor change to the chipset setup may cause the system to become unstable.

1.2 Setup Keys

The following keys help you navigate in Setup:

Key	Function
Cursor ↑	Move to previous item
Cursor ↓	Move to next item
Cursor ←	Move to the item in the left hand direction
Cursor →	Move to the item in the right hand direction
ESC	Main Menu: Quit without saving changes into CMOS RAM. Exit current page and return to Main Menu
PgUp↑	Increase the numeric value or make changes
PgDn ↓	Decrease the numeric value or make changes
+	Increase the numeric value or make changes
-	Decrease the numeric value or make changes
F1	A help window pops up that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help window press ESC or the F1 key again.
F2	The color scheme can be chosen from a selection of 16 different colors. Shift-F2 to revert back to the previous color
F3	Not used
F4	Not used
F5	Old values: Restore the previous CMOS value from CMOS. This key is not available in the Main Menu and CMOS setup settings.
F6	Load BIOS Defaults: Default parameters are loaded, ensuring a stable system. This key is not available in the Main Menu and CMOS setup settings.
F7	Load Setup Defaults: Factory settings are loaded into the system for optimal configuration. This key is not available in the Main Menu and CMOS setup settings.
F8	Not used
F9	Not used
F10	Save all the CMOS changes (only possible in Main Menu)

Table 161: Keys used in the BIOS

1.3 Booting Procedure Problems

If, after making and saving system changes in BIOS Setup, you discover that the IPC is no longer able to boot properly, the EliteBIOS supports an override to the CMOS settings that resets your system to its default configuration. You can invoke this override by immediately pressing INSERT when you restart your computer.

Note: You can restart by either using the ON/OFF switch, the RESET button or by pressing CTRL-ALT-DEL.

2. BIOS System for System Units with Socket 7 (ZIF)

The SETUP defaults are the settings recommended by B&R.

2.1 BIOS Setup Main Menu

The BIOS Setup main menu appears immediately by pressing the DEL button:

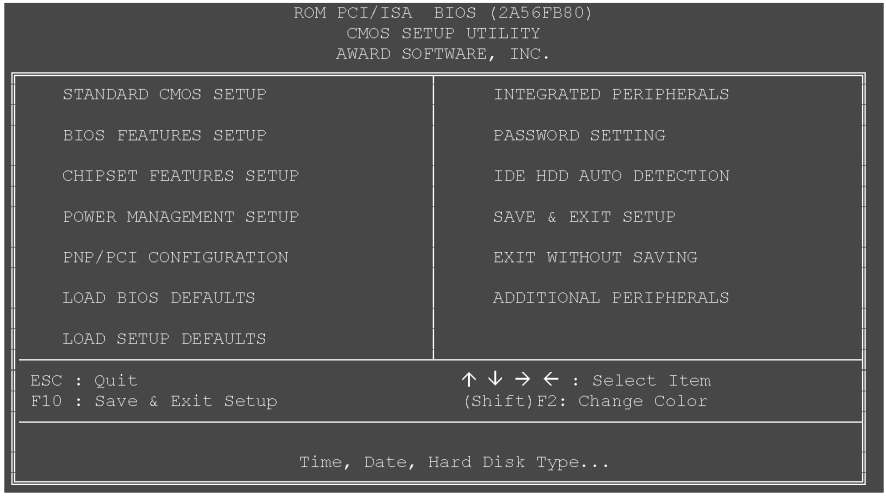


Figure 167: BIOS Setup Main Menu

The individual menu points are explained in the following sections.

Standard CMOS Setup

Options in the original PC AT-compatible BIOS.

BIOS Features Setup

Award enhanced BIOS options.

Chipset Features Setup

Specific options for the chipset system

Power Management Setup

Advanced Power Management (APM) options.

PnP/PCI Configuration

Options for Plug & Play and PCI cards

Load BIOS Defaults

Loads factory settings for the most stable minimal performance system operations.

Load Setup Defaults

Loads factory settings for optimal system performance

Integrated Peripherals

Peripheral subsystems for different I/O operations of the system

Password Setting

Change, set or disable password.

IDE HDD Auto Detection

Automatic detection and configuration of IDE devices

Save & Exit Setup

Save settings in CMOS-RAM and exit BIOS Setup

Exit Without Saving

Abandon all changes and exit BIOS Setup.

Additional Peripherals

B&R specific settings for integrated peripheral devices

2.2 Standard CMOS Setup

```
                    ROM PCI/ISA BIOS (2A56FB80)
                       STANDARD CMOS SETUP
                      AWARD SOFTWARE, INC.

   Date (mm:dd:yy) : Mon, Apr 26 1999
   Time (hh:mm:ss) :  2 : 19 : 21

   HARD DISKS          TYPE  SIZE  CYLS HEADS PRECOMP LANDZONE SECTORS  MODE
   Primary Master    : Auto     0     0     0       0        0       0  AUTO
   Primary Slave     : None     0     0     0       0        0       0  ----
   Secondary Master  : None     0     0     0       0        0       0  ----
   Primary Slave     : None     0     0     0       0        0       0  ----

   Drive A : 1.44M, 3.5 in.
   Drive B : None

   Video   : EGA/VGA                          Base Memory:    640K
                                            Extended Memory:  31744K
   Halt On : All,But Keyboard                  Other Memory:    384K
                                              Total Memory:  32768K

ESC : Quit              ↑ ↓ → ← : Select Item        PU/PD/+/- : Modify
F1  : Help              (Shift)F2: Change Color
```

Figure 168: Standard CMOS Setup

Date and Time

The real-time clock (RTC) can be set here. These settings are not saved in FPROM (backup for CMOS RAM).

Hard Disks

Parameters for existing hard disks in the IPC are set here.

We recommend that you select AUTO. BIOS automatically detects the specifications and the optimal operating mode of almost all IDE hard drives. When you select AUTO for a hard drive, those specifications are detected during POST, every time the system boots.

If you do not want to select the AUTO drive, there are some other options for selecting the drive type below:

- Match the specifications of your installed IDE hard disk or silicon disk with the predefined values for drive types 1 through 45. If one of the predefined drive types is the same as your hard disk or silicon disk then you can select this type.
- Select USER and enter the corresponding values into each drive parameter field.
- Use the IDE HDD Auto Detection function in the Setup Main Menu (see section "IDE HDD Auto Detection");

Here is a brief explanation of drive specifications:

Type

BIOS contains a table of predefined drive types with certain specifications. Drives whose specifications do not accommodate any pre-defined type are classified as USER.

Size

Disk drive capacity (approximate). Note that this size is usually slightly greater than the size of a formatted disk given by a disk-checking program.

Cyls	Number of cylinders	
Head	Number of heads	
Precomp	Write Precompensation Cylinder	
Landzone	Landing zone	
Sector	Number of sectors	
Mode	AUTO	BIOS automatically determines the optimal mode.
	Normal	The following maximum values are supported: Number of cylinders= 1024 Number of heads = 16 Number of sectors = 64
	Large	For drives that do not support LBA and have more than 1024 cylinders.
	LBA	Logical Block Addressing: For drives with more than 1024 cylinders. During drive accesses, the IDE controller transforms the data address described by sector, head, and cylinder number into a physical block address. This results in a significantly improved data transfer rate.

Drive A: and Drive B:

Select the correct specifications for the diskette drive(s) installed in the computer:

None	No diskette drive installed
360k, 5.25"	5¼ inch diskette; 360 kByte capacity
1.2M, 5.25"	5¼ inch diskette; 1.2 MByte capacity
720k , 3.5"	3½ inch diskette; 720 kByte capacity
1.44M, 3.5"	3½ inch diskette; 1.44 MByte capacity
2.88M, 3.5"	3½ inch diskette; 2.88 MByte capacity

Video

Select the type of primary video subsystem in your computer. BIOS usually detects the correct video type automatically. BIOS supports a secondary video subsystem, but you do not select it in Setup.

EGA/VGA	Enhanced Graphics Adapter / Video Graphics Array. For EGA, VGA, SEGA, SVGA or PGA monitor adapters.
CGA 40	Color Graphics Adapter, power up in 40 column mode
CGA 80	Color Graphics Adapter, power up in 80 column mode
MONO	Monochrome Adapter includes high resolution monochrome adapters

Halt On

During the POST, the computer stops if BIOS detects a hardware error (waits for the <F1>key to be pressed).

You can tell BIOS to ignore certain errors during POST and continue the boot-up process.

No errors	POST does not stop for any errors.
All errors	If BIOS detects any non-fatal errors POST stops and prompts you to take corrective action.
All, but keyboard	POST does not stop for a keyboard error, but stops for all other errors.
All, but diskette	POST does not stop for diskette drive errors, but stops for all other errors.
All, but disk/key	POST does not stop for a keyboard or disk error, but stops for all other errors.

2.3 BIOS Features Setup

```
                    ROM PCI/ISA BIOS (2A56FB80)
                        BIOS FEATURES SETUP
                       AWARD SOFTWARE, INC.

Virus Warning                Disabled   Video  BIOS Shadow  : Enabled
CPU Internal Cache         : Enabled    C8000-CBFFF Shadow  : Disabled
External Cache               Enabled    CC000-CFFFF Shadow  : Disabled
Quick Power On Self Test   : Disabled   D0000-D3FFF Shadow  : Disabled
Boot Sequence              : A,C,SCSI   D4000-D7FFF Shadow  : Disabled
Swap Floppy Drive          : Disabled   D8000-DBFFF Shadow  : Disabled
Boot Up Floppy Seek        : Enabled    DC000-DFFFF Shadow  : Disabled
Boot Up NumLock Status     : On
Boot Up System Speed         High
Gate A20 Option            : Fast
Typematic Rate Setting     : Disabled
Typematic Rate (Chars/Sec) : 6
Typematic Delay (Msec)     : 250
Security Option            : Setup
PS/2 mouse function control  Enabled    ESC : Quit        ↑↓→←: Select Item
PCI/VGA Palette Snoop        Disabled   F1  : Help         PU/PD/+/- : Modify
OS Select For DRAM > 64MB  : Non-OS2    F5  : Old Values  (Shift)F2 : Color
                                        F6  : Load BIOS  Defaults
                                        F7  : Load Setup Defaults
```

Figure 169: BIOS Features Setup

Virus Warning

When Enabled, you receive a warning message when a program (especially a virus) attempts to alter the boot sector or partition table of the boot drive (not the rest of the hard drive). If this happens, you should run an anti-virus program and check the data carriers.

Some disk diagnostic programs (e.g. data carrier maintenance or partitioning) alter the boot sector. If you plan to run such a program, we recommend that you first disable the virus warning.

CPU Internal Cache

Switches the processor's L1 cache, on or off. Switching off the internal cache slows the system down considerably, and therefore is not advisable.

External Cache

Makes it possible to prevent the use of the integrated L2 cache on the mainboard. Switching off the internal cache slows down the system considerably, and is therefore not advisable.

Quick Power On Self Test

When set to Enabled, POST speeds up (no detailed memory test).

Boot Sequence

Determines the order for booting the devices. A range of different combinations are available.

At the beginning of the sequence, an operating system is sought on the first device. If there is none found, the BIOS searches for the next device etc. If an operating system is found on a device, then this drive is booted. However if the BIOS does not find an operating system, an error message appears on the screen.

If there is no hard disk on the drive which was finally booted, then it is automatically assigned drive designation A. If an additional disk drive is available, then it is automatically assigned the drive designation B.

Swap Floppy Drive

This field is effective only in systems with two diskette drives (IPC5600, see the section "Operating 3.5" Diskette Drives").

Selecting Enabled assigns the drive designation B to drive A and the drive designation A to drive B .

Boot Up Floppy Seek

When Enabled, BIOS tests (searches for) floppy drives during the POST to determine whether they have 40 or 80 tracks.

Note: Only 360 KByte diskettes have 40 tracks. All diskettes with 720 KByte, 1.2 MByte and 1.44 MByte have 80 tracks. Since very few modern PCs have 40-track floppy drives, we recommend that you disable this field to save time.

Boot Up NumLock Status

With this field you can define the status of the NumLock button, when booting. When toggled "On", the numeric keypad generates numbers instead of controlling cursor operations. When toggled "Off", the control fields are used for the keys (Cursor Keys, Pos1, End, etc.).

Boot Up System Speed

Select HIGH to boot the default CPU speed.

Select LOW to boot at the speed of the AT bus. Some older software requires this mode.

Gate A20 Option

This setting has no function for systems with the Intel 430HX chipset.

Typematic Rate Setting

Keystrokes repeat at a rate determined by the keyboard controller in your system.

When disabled, the typematic rate and typematic delay (see below) are irrelevant. The typematic rate and typematic delay can only be defined when Enabled has been selected.

Typematic Rate (chars/sec)

When the typematic rate setting is enabled, you can select a typematic rate (the rate at which the character repeats when you hold down a key) of 6, 8, 10, 12, 15, 20, 24 or 30 characters per second. The repeat rate determines the speed that characters are repeated when a key is pressed and held down.

Note: The accuracy of this setting is ±20%.

Typematic Delay (ms)

When the typematic rate setting is enabled, you can select a typematic delay (the delay before key strokes begin to repeat) of 250, 500, 750 or 1000 milliseconds. The typematic delay is the period of time which passes between pressing the key and the appearance of the next characters (when a key is pressed and held down).

Note: The accuracy of this setting is ±20%.

Security Option

Here you can select between Setup and System. This option appears after a password is requested. If you have a password, select whether the password is required every time the system boots or only when you enter Setup.

PS/2 Mouse Function Control

If you are using a PS/2 pointing device, select Enabled. When using a serial pointing device, please deactivate this option.

PCI/VGA Palette Snoop

This option is set as default to Disabled and should not be changed.

OS Select For DRAM > 64MB

If more than 64 MB DRAM is installed on your IPC, then you must select between the operating system "OS2" and "Non-OS2".

Shadowing

Shadow settings are only valid for ISA cards. Shadowing means that software which is found on a ROM chip of an ISA card (Firmware) in RAM, can be copied. The data can be read from there with the faster system bus.

This results in improved performance of Firmware programs (e.g. BIOS, Video BIOS etc.). However the size of high memory in RAM (640kB - 1MB) is reduced (e.g. reduction in the high memory range available for loading device drivers).

Video BIOS Shadow and C8000-CBFFF Shadow

These settings have no function, as the 42 KB size VGA BIOS is copied (shadowed) in every section of RAM .

Note: The last 8 KB of the memory area C8000 to CBFFF are available.

Memory Area D0000 - DFFFF

This area can be occupied by Firmware or other expansion cards. If an expansion peripheral in your system contains ROM based firmware, you need to know the address range the ROM occupies to shadow it into the correct area of RAM.

2.4 Chipset Features Setup

```
                    ROM PCI/ISA BIOS (2A56FB80)
                      CHIPSET FEATURES SETUP
                       AWARD SOFTWARE, INC.

Auto Configuration       : Enabled        Memory Parity/ECC Check  : Auto
DRAM Timing              : 70ns           Single Bit Error Report  : Enabled
DRAM RAS# Precharge Time: 4               L2 Cache Cacheable Size  : 64MB
DRAM R/W Leadoff Timing : 7/6             Chipset NA# Asserted     : Enabled
Fast RAS# to RAS# Delay : 3               Pipeline Cache Timing    : Faster
DRAM Read Burst EDO/FPM : x333/x444       Passive Release          : Enabled
DRAM Write Burst Timing : x333            Delayed Transaction      : Disabled
Turbo Read Leadoff       : Disabled
DRAM Speculative Leadoff: Disabled
Turn-Around Insertion    : Disabled
ISA Clock                : PCICLK/4

System BIOS Cacheable    : Disabled
Video BIOS Cacheable     : Disabled
8 Bit I/O Recovery Time : 1
16 Bit I/O Recovery Time: 1               ESC : Quit        ↑↓→←: Select Item
Memory Hole At 15M-16M   : Disabled       F1  : Help         PU/PD/+/- : Modify
Peer Concurrency         : Enabled        F5  : Old Values   (Shift)F2 : Color
Chipset Special Features: Enabled         F6  : Load BIOS  Defaults
DRAM ECC/PARITY Select   : Parity         F7  : Load Setup Defaults
```

Figure 170: Chipset Features Setup

The parameters in this screen are for system designers, service personnel, and technically competent users only. The best advice is to alter only those settings that you thoroughly understand.

Auto Configuration

The Auto Configuration option selects predetermined optimal values for the chipset parameters. When Disabled, chipset parameters revert to setup information stored in CMOS RAM.

When the option Auto Configuration is switched on, the white displayed settings in the diagram cannot be changed.

DRAM Timing

The value in this field depends on performance parameters of the installed memory chips (DRAM). Do not change the value from the factory setting unless you install new memory that has a different performance rating than the original DRAM.

DRAM RAS# Precharge Time

The precharge time is the number of cycles it takes for the RAS to accumulate its charge before DRAM refresh. If insufficient time is allowed, refresh may be incomplete and the DRAM may fail to retain data.

DRAM R/W Leadoff Timing

The number of CPU tacts are defined here, which are required for every read or write access from DRAM. Changing the value from the setting determined by the board designer for the installed DRAM may cause memory errors.

Fast RAS# to CAS# Delay

When DRAM is refreshed, both rows and columns are addressed separately. This setup item allows you to determine the timing of the transition from RAS to Column Address Strobe (CAS).

DRAM Read Burst (EDO / FPM)

Sets the timing for reads from EDO (Extended Data Output) or FPM (Fast Page Module) memory. The lower the timing value, the faster the access is in RAM. Selecting timing values lower than the installed DRAM is able to support, can result in memory errors.

DRAM Write Burst Timing

Sets the timing for writes to memory. The lower the timing value, the faster the access is in RAM. Selecting timing numbers lower than the installed DRAM is able to support can result in memory errors.

Turbo Read Leadoff

Select Enabled to shorten the leadoff cycles and optimize performance in cacheless, 50-60 MHz, or one-bank EDO DRAM systems.

DRAM Speculative Leadoff

A read request from the CPU to the DRAM controller includes the memory address of the desired data. When Enabled, Speculative Leadoff lets the DRAM controller pass the read command to memory slightly before it has fully decoded the address, thus speeding up the read process.

Turn-Around Insertion

When Enabled, the chipset inserts one extra clock to the turn-around of back-to-back DRAM cycles.

ISA Clock

You can set the speed of the AT bus to one-third or one-fourth of the CPU clock speed.

System BIOS Cacheable

Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Video BIOS Cacheable

Selecting Enabled allows caching of the Video BIOS ROM at C0000h-CBFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

8/16 Bit I/O Recovery Time

The I/O recovery mechanism delays PCI I/O cycles (created by PCI hardware), so that it can guarantee compatibility with the ISA bus. A delay of one or more bus clock cycles can be set. These two fields let you define recovery time (in bus clock cycles) for 16-bit and 8-bit I/O.

Memory Hole at 15M-16M

You can reserve this area of system memory for ROM memory on ISA cards. When this area is reserved, it cannot be cached. The user information for peripherals that need to use this area of system memory usually describes their memory requirements.

If this option is activated, then the memory area of over 16MB cannot be used anymore.

Peer Concurrency

"Enabled" means that more than one PCI device can be active at a time.

Chipset Special Features

When disabled, the Chipset behaves (for compatibility reasons) like an Intel 82430FX Chipset. The Intel 82430FX Chipset is the predecessor of the Intel 82430HX Chipset.

DRAM ECC/PARITY Select

This option must be set according to the type of DRAM installed in your system: error-correcting code (ECC) or parity (default).

Memory Parity/ECC Check

Select Enabled, Disabled, or AUTO. In AUTO mode, the BIOS enables memory checking automatically when it detects the presence of ECC or parity DRAM.

Single Bit Error Report

If this option or the Memory Parity/ECC check option is enabled, selecting Enabled here tells the system to report an error when a correctable single-bit error occurs.

L2 Cache Cacheable Size

This option defines those sizes of RAM, which can be read by the L2 cache. Should always be set to 512 MB.

Chipset NA# Asserted

Selecting Enabled permits pipelining, in which the chipset signals the CPU for a new memory address before all data transfers for the current cycle are complete, resulting in faster performance.

Pipeline Cache Timing

For secondary cache of one bank, select Faster. For a secondary cache of two banks, select Fastest.

Passive Release

When Enabled, CPU to PCI bus accesses are allowed during passive release. Otherwise, the arbiter only accepts another PCI master access to local DRAM.

Delayed Transaction

The chipset has an embedded 32 bit posted write buffer to support delay transactions cycles. Select Enabled to support compliance with PCI specification version 2.1.

2.5 Power Management Setup

```
                    ROM PCI/ISA BIOS (2A56FB80)
                      POWER MANAGEMENT SETUP
                      AWARD SOFTWARE, INC.

Power Management      : Disable          ** Power Down & Resume Events **
PM Control by APM     : Yes              IRQ3  (COM 2)         : ON
Video Off Method      : DPMS             IRQ4  (COM 1)         : ON
MODEM Use IRQ         : 3                IRQ5  (Reserved)      : ON
                                         IRQ6  (Floppy Disk)   : OFF
Doze Mode             : Disable          IRQ7  (LPT 1)         : ON
Standby Mode          : Disable          IRQ8  (RTC Alarm)     : OFF
Suspend Mode          : Disable          IRQ9  (IRQ2 Redir)    : ON
HDD Power Down        : Disable          IRQ10 (Reserved)      : ON
                                         IRQ11 (Reserved)      : ON
** Wake Up Events in Doze & Standby **   IRQ12 (PS/2 Mouse)    : ON
IRQ3  (Wake-Up Event): ON                IRQ13 (Coprocessor)   : ON
IRQ4  (Wake-Up Event): ON                IRQ14 (Hard Disk)     : ON
IRQ8  (Wake-Up Event): ON                IRQ15 (Reserved)      : ON
IRQ12 (Wake-Up Event): ON
                                         ESC : Quit        ↑↓→←: Select Item
                                         F1  : Help         PU/PD/+/- : Modify
                                         F5  : Old Values   (Shift)F2 : Color
                                         F6  : Load BIOS  Defaults
                                         F7  : Load Setup Defaults
```

Figure 171: Power Management Setup

Power Management

This option allows you to define the type (or degree) of power saving, meaning that after a certain period of inactivity certain components of the system are switched off. There are different selection options containing the presettings for Doze, Standby, Suspend and HDD Power Down Mode values (see below):

Disable	All power saving methods are deactivated
Min Saving	Minimum power savings. After an inactivity period of one hour, all disengageable system components switch into energy saving mode.
Max Saving	Maximum power savings: Switch off after one minute
User Define	The values for Doze, Standby, Suspend and HDD Power Down Mode can be set individually.

If you want to operate a real-time clock on your IPC, then we recommend that Power Management is deactivated. This leads to improved system performance (no SMI Generation).

PM Control by APM

If Advanced Power Management (APM) is installed on your system, selecting Yes gives better power savings.

Video Off Method

Determines the condition of the monitor when it is in Standby mode.

MODEM User IRQ

If a modem is installed on your IPC, then you enter the interrupt used in this field. If the system is in Powersave mode it is awoken again by a signal of this interrupt.

Doze Mode

With this option you can determine after which period of time without user activity, the processor should be operated with reduced speed. Value range: 1 Minute to 1hour.

Standby Mode

With this option you can determine after which time of user inactivity, the built in disk drive and graphic controller should be switched off. Value range: 1 Minute to 1hour.

Suspend Mode

With this option you can determine after which time of user inactivity, all the system components (apart from the processor) should be switched off. Value range: 1 Minute to 1hour.

HDD Power Down

With this option you can determine after which time of user inactivity the hard disk should be switched off (if there are a number of hard disks in the IPC, then all are switched off). Value range: 1 Minute to 1hour.

Note: B&R built-in hard disks switch themselves off independently after 45 minutes inactivity.

Wake Up Events In Doze & Standby

ON determines the signal that can awake the listed IRQs from the IPC in Doze or Standby modes. OFF can prevent a given IRQ from being deleted in Doze or Standby modes. This is also possible for the following IRQs 3, 4, 8 and 12.

Power Down and Resume Events

Determine whether a signal can be awoken from one of the listed IRQs of the system from the Suspend Mode.

2.6 PNP/PCI Configuration

```
                    ROM PCI/ISA BIOS (2A56FB80)
                         PNP CONFIGURATION
                       AWARD SOFTWARE, INC.

Resources Controlled By  : Manual          PCI IRQ Activated By : Level
                                           PCI IDE  IRQ Map To  : PCI-AUTO
                                            Streaming           : Disabled
IRQ-3  assigned to : Legacy ISA             Primary   IDE INT#  : A
IRQ-4  assigned to : Legacy ISA             Secondary IDE INT#  : B
IRQ-5  assigned to : PCI/ISA PnP
IRQ-7  assigned to : Legacy ISA            Used MEM base addr   : N/A
IRQ-9  assigned to : PCI/ISA PnP
IRQ-10 assigned to : PCI/ISA PnP
IRQ-11 assigned to : PCI/ISA PnP
IRQ-12 assigned to : PCI/ISA PnP
IRQ-14 assigned to : PCI/ISA PnP
IRQ-15 assigned to : PCI/ISA PnP
DMA-0  assigned to : PCI/ISA PnP
DMA-1  assigned to : PCI/ISA PnP
DMA-3  assigned to : PCI/ISA PnP           ESC : Quit        ↑↓→←: Select Item
DMA-5  assigned to : PCI/ISA PnP           F1  : Help         PU/PD/+/- : Modify
DMA-6  assigned to : PCI/ISA PnP           F5  : Old Values  (Shift)F2 : Color
DMA-7  assigned to : PCI/ISA PnP           F6  : Load BIOS  Defaults
                                           F7  : Load Setup Defaults
```

Figure 172: PnP/PCI Configuration

Resources Controlled By

When set to AUTO, BIOS can automatically configure all Plug and Play compatible and bootable devices. When set to Manual, all IRQ and DMA settings can be made by the user.

By default (AUTO) during the BIOS system start, all ISA cards resources (I/O address, IRQ, DMA port, memory) are assigned first and afterwards all Plug & Play devices are then configured. No manual assignments can be made in the BIOS Setup for resources from Plug & Play devices. This is only possible with ICU (ISA Configuration Utility, available directly from Intel) or Windows 95/98/2000 as well as Linux.

IRQ-n Assigned to / DMA-n Assigned to

The settings "Legacy ISA" and PCI/ISA PnP are possible.

Legacy ISA is used, if ISA devices require a special interrupt or a special DMA channel. Plug & Play compatible devices work with the setting PCI/ISA PnP.

PCI IRQ Activated by

Leave the IRQ trigger set at Level unless the PCI card assigned to the interrupt specifies Edge-triggered interrupts (see documentation for the respective device).

PCI IDE IRQ Map to

This field lets you select PCI IDE IRQ mapping or PC AT (ISA) interrupts.

If your system does not have one or two PCI IDE connectors on the system board, select values according to the type of IDE interface(s) installed in your system (PCI or ISA).

Standard settings for ISA interrupts on IDE channels: IRQ14 for the primary channel and IRQ15 for the secondary channel.

Primary/Secondary IDE INT#

Each PCI peripheral connection is capable of activating up to four interrupts: INT# A, INT# B, INT# C and INT# D. By default, a PCI connection is assigned INT# A.

Assigning INT# B has no meaning unless the peripheral device requires two interrupt services rather than just one. If the PCI IDE interface in the chipset has for example two channels, it then requires two interrupt services. The primary and secondary IDE INT# fields default to values appropriate for two PCI IDE channels, with the primary PCI IDE channel having a lower interrupt than the secondary.

Used MEM Base Addr

This option makes it possible to reserve a main memory window in the upper memory area, e.g. for some older ISA network cards. If a starting address is specified instead of N/A (not available), the option Used MEM Length can be used to set the size of the memory area required.

Used MEM Length

Sets the size of the memory area to be reserved, starting at the address defined in Used MEM Base Addr.

2.7 Load BIOS Defaults

Loads BIOS defaults. These are factory settings with standard values, which are defined by the BIOS manufacturer for the most stable minimal performance system operations.

2.8 Load Setup Defaults

Loads the Setup defaults. These are factory settings which are defined by B&R for optimal performance of your IPC.

2.9 Integrated Peripherals

```
                    ROM PCI/ISA BIOS (2A56FB80)
                       INTEGRATED PERIPHERALS
                        AWARD SOFTWARE, INC.

IDE HDD Block Mode        : Enabled      Onboard Serial Port 1    : Auto
PCI Slot IDE 2nd Channel  : Enabled
On-Chip Primary   PCI IDE: Enabled
On-Chip Secondary PCI IDE: Disabled      Onboard Serial Port 2    : Auto
IDE Primary Master PIO    : Auto
IDE Primary Slave PIO     : Auto

                                         Onboard Parallel Port    : 378/IRQ7

USB Controller            : Disabled
                                         Parallel Port Mode       : SPP
KBC input clock           : 8MHz
Onboard FDC Controller    : Enabled

                                         ESC : Quit        ↑↓→←: Select Item
                                         F1  : Help         PU/PD/+/- : Modify
                                         F5  : Old Values   (Shift)F2 : Color
                                         F6  : Load BIOS  Defaults
                                         F7  : Load Setup Defaults
```

Figure 173: Integrated Peripherals

IDE HDD Block Mode

Switches the block mode on/off for the hard disk. If the block mode is enabled, then more sectors are simultaneously transferred at data transfer resulting from the increase in speed.

PCI Slot IDE 2nd Channel

The second IDE channel can be manually deactivated here.

On-Chip Primary/Secondary IDE

The integrated IDE interface is equipped with two IDE channels, which can be switched on and off separately here.

IDE Primary Master/Slave PIO

The PIO (Programmed I/O) fields let you select a PIO mode (0 to 4), as well as the AUTO mode for all of the connected IDE devices (theoretically four: two channels per interface). The PIO mode specifies the maximum speed of transfer to the IDE bus. Modes 0 through 4 provide successively increased performance. The AUTO setting automatically selects the best mode for each device.

With older hard drives and ATA Flash disks, setting the PIO mode too high can cause read and write errors. Therefore we recommend that you select the AUTO setting.

USB Controller

Switches the On Board USB controller on or off. If the Enabled option is selected, then a further option appears:

USB Keyboard Support

Enables the use of a USB keypad to the USB port.

If you want to avail of a USB keypad and you are using an operating system other than Windows 98/2000, then the Power Management must be switched on for the USB keypad to function properly (see section "Power Management setup").

KBC input clock

Clock frequency of the keypad controller.

Onboard FDC Controller

Switch the integrated floppy disk controller on or off. If it is disabled, the floppy disk drive does not function any longer.

Onboard Serial Port 1 and 2

Here you can set the I/O addresses and interrupts of COM1 or COM2 interfaces. The options to choose from are AUTO, Disabled, Manual and some settings with predefined parameters. Normally the AUTO setting is recommended.

Default assignment for AUTO:

COM1I/O address 3F8h - 3FFh, IRQ4
COM2I/O address 2F8h - 3FFh, IRQ3

Onboard Parallel Port

The settings for the parallel interface LPT1cannot be automatically detected. They should be selected from a row of predefined values or arbitrarily set with Manual.

Parallel Port Mode

Here you can set the operating mode of the parallel interface. The following items can be selected:

SPP	Standard Parallel Port (max. 64 kByte/s unidirectional)
EPP 1.7	Enhanced Parallel Port v1.7 (max. 2 Mbyte/s bidirectional)
EPP 1.9	Enhanced Parallel Port v1.9 (max. 2 Mbyte/s bidirectional)
ECP	Enhanced Capability Port (max. 2 Mbyte/s bidirectional)
EPP+ECP	Combined EPP/ECP transfer

Please take note that the EPP and ECP modes must be supported by connected devices.

ECP Mode Use DMA

A DMA channel is used from the parallel interface in the ECP mode.

2.10 Password Setting

The system password can be set here (min. 4, max. 8 characters). If, when requested to enter password, you exit without pressing Enter, the password function is deactivated (see also section "BIOS Features Setup, Security Option").

The password entered is also saved in the CMOS Backup, which makes it impossible to delete the password. If the password is forgotten, then the Flash ROM component must be exchanged at B&R.

2.11 IDE HDD Auto Detection

All connected IDE devices are automatically recognized in this menu.

When using larger hard disks, you must select between the different data transfer methods (normal, LBA or large) according to each HDD type and size. The LBA Mode is preferred when using Windows systems (see also the section "Standard CMOS Setup, Hard Disks").

2.12 Save & Exit Setup

The BIOS Setup Utility is closed with this item. Changes made are saved in CMOS after confirmation.

Note: In order to confirm, the Z key must be pressed when using a German keyboard (US keyboard layout).

2.13 Exit Without Saving

With this item you can close the BIOS Setup Utility without saving the changes made in the CMOS.

Note: In order to confirm, the Z key must be pressed when using a German keyboard (US keyboard layout).

2.14 Additional Peripherals

```
                    ROM PCI/ISA BIOS (2A56FB80)
                      ADDITIONAL PERIPHERALS
                       AWARD SOFTWARE, INC.

Controller Hardware ID:                  Controller Software ID:
                    0101.2001.0001         BIOS:00.31 VGA:10.03 MTC:00.14

Display Type ID     : 0042               Statistics              IPC   FPD
   Name             : FPC00.21             Power On Cycles     : 22590 00176
   Mode             : Auto                 Operating Hours     : 20823 00254
   FPD Contrast     : Auto                 Overtemp. Hours     : 00001 00019
   FPD Brighness    : Auto                 Fan Cooler Hours    : 00339

CAN detected I/O Port     : 384-385h     CMOS Battery Status   : OK
         assigned IRQ     : NONE
                                         User Serial ID        : 0000 0000
PCMCIA detected I/O Port  : 3E0-3E1h           Show            : No

Hardware Security Key
       detected I/O Port  : 278-27Fh     ESC : Quit        ↑↓→←: Select Item
                                         F1  : Help         PU/PD/+/- : Modify
MTC Communication                        F5  : Old Values   (Shift)F2 : Color
       detected I/O port  : 110-11Ah     F6  : Load BIOS  Defaults
                                         F7  : Load Setup Defaults
```

Figure 174: Additional Peripherals

Controller Hardware ID

This twelve digit number is a code number for the system components included:

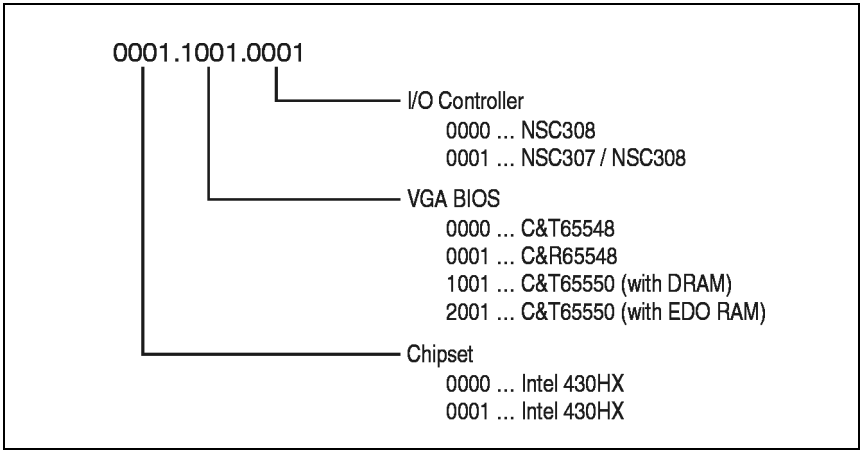


Figure 175: Controller Hardware ID

Display Type ID

The type of B&R display used is shown:

Type ID	Display
0010	TFT VGA 10.4"
0011	TFT VGA 13.8"
0013	TFT VGA 10.4"
0014	TFT VGA 10.4"
0030	LCD VGA 10.4"
0040	TFT SVGA 10.4"
0041	TFT SVGA 12.1"
0042	TFT SVGA 12.1"

Type ID	Display
0050	TFT XGA 13.8"
0051	TFT XGA 14.5"
0070	TFT XGA 13.8"
0071	TFT XGA 14.5"
0072	TFT XGA 15"
0073	TFT XGA 15"
0080	TFT SXGA 18"

Table 162: Display Type ID

Note: Using the Provit 5000 Service Upgrade model number 5S5000.04-090, newly developed displays are added to this list.

Name Description of the display for software use.

Mode With this item you can select which display device (Display = FPD, Monitor = CRT) should be active when the system is started:

	AUTO	All connected display devices are automatically activated. If no display device is connected then the monitor is activated
	CRT	Only the monitor is activated
	FPD	Only the display is activated
	CRT+FPD	The monitor and display are activated (simultaneous mode)
FPD contrast	The contrast of the connected display can be set. **Attention:** This is only possible for LCD displays.	
FPD brightness	The brightness of the connected display can be set (possible for both LCD and TFT displays). If a value (e.g. 80%) is saved in the BIOS Setup then the BIOS uses these each time the system is started, also when another display is connected.	

CAN Detected I/O Port

If a B&R interface board is installed in your IPC, then the I/O range is shown here. See also the section "CAN Interface".

CAN Assigned IRQ

Here, an IRQ can be assigned to the CAN port of the interface board (disconnecting the interrupt line). You can choose between the options NONE, IRQ10 and NMI (Non Maskable Interrupt). See also the section "CAN Interface".

PCMCIA Detected I/O Port

The I/O address range of the PCMCIA port (Socket 1) is displayed on the interface board. See also the section "PC Card Slot/ SRAM".

Hardware Security Key Detected I/O Port

The I/O address range of the Hardware Security Key is displayed on the interface board. See also the section "LPT2 (Hardware Security Key)".

MTC Communication Assigned I/O Port

Here the I/O address can be set for communication of the MTC.

Attention: Some ISA cards (e.g. network cards) always use the address range that the MTC normally uses for communication. In this case another MTC I/O address must be selected (see also the section "Maintenance Controller MTC").

Controller Software ID

The version numbers of BIOS, VGA BIOS and MTC are given.

Statistics

Displays the operating data which is collected using the MTC:

- Power-on cycles
- Operating hours
- Over-temperature hours
- Operating hours of the fans (Fan Cooler Hours; for display units optional, both fans for controller unit)

See also the section "Operating Data Coverage".

CMOS Battery Status

It is displayed using the MTC, if the backup battery for the CMOS RAM is in order. If this option has the value "Bad" then the battery should be exchanged as soon as possible.

User Serial ID

A user serial number (32 bit, in hex format) can be entered here. This is saved in the CMOS.

Show

When set to "Yes" the user serial number (see above, User Serial ID) is displayed in the device window upon the system being started.

2.15 Comparison of BIOS Settings (BIOS Defaults / Setup Defaults)

2.15.1 BIOS Features Setup

Elite BIOS Version Description	00.17		00.19	
	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults
Virus Warning	Enabled	Disabled	Enabled	Disabled
CPU Internal Cache	Enabled	Enabled	Enabled	Enabled
External Cache	Enabled	Enabled	Enabled	Enabled
Quick Power On Self Test	Disabled	Disabled	Disabled	Disabled
Boot Sequence	A,C,SCSI	A,C,SCSI	A,C,SCSI	A,C,SCSI
Swap Floppy Drive	Disabled	Disabled	Disabled	Disabled
Boot Up Floppy Seek	Enabled	Enabled	Enabled	Enabled
Boot Up NumLock Status	On	On	On	On
Boot Up System Speed	High	High	High	High
Gate A20 Option	Normal	Fast	Normal	Fast
Typematic Rate Setting	Disabled	Disabled	Disabled	Disabled
Typematic Rate (chars/sec)	6	6	6	6
Typematic Delay (ms)	250	250	250	250
Security Option	Setup	Setup	Setup	Setup
PS/2 Mouse Function Control	Enabled	Enabled	Enabled	Enabled
PCI/VGA Palette Snoop	Disabled	Disabled	Disabled	Disabled
OS Select for DRAM > 64MB	Non-OS2	Non-OS2	Non-OS2	Non-OS2
Video BIOS Shadow	Enabled	Enabled	Enabled	Enabled
C8000-CBFFF	Disabled	Disabled	Disabled	Disabled
CC000-CFFFF	Disabled	Disabled	Disabled	Disabled
D0000-D3FFF	Disabled	Disabled	Disabled	Disabled
D4000-D7FFF	Disabled	Disabled	Disabled	Disabled
D8000-DBFFF	Disabled	Disabled	Disabled	Disabled
DC000-DFFFF	Disabled	Disabled	Disabled	Disabled

Table 163: BIOS Features Setup

2.15.2 Chipset Features Setup

Elite BIOS Version Description	00.17		00.19	
	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults
Auto Configuration	Enabled	Enabled	Enabled	Enabled
DRAM Timing	70ns	70ns	70ns	70ns
DRAM RAS# Precharge Time	4	4	4	4
DRAM R/W Leadoff Timing	7/6	7/6	7/6	7/6
Fast RAS# to CAS# Delay	3	3	3	3
DRAM Read Burst (EDO / FPM)	X333/x444	X333/x444	X333/x444	X333/x444
DRAM Write Burst Timing	X333	X333	X333	X333
Turbo Read Leadoff	Disabled	Disabled	Disabled	Disabled
DRAM Speculative Leadoff	Disabled	Disabled	Disabled	Disabled
Turn-Around Insertion	Disabled	Disabled	Disabled	Disabled
ISA Clock	PCICLK/4	PCICLK/4	PCICLK/4	PCICLK/4
System BIOS Cacheable	Disabled	Disabled	Disabled	Disabled
Video BIOS Cacheable	Disabled	Disabled	Disabled	Disabled
8 Bit I/O Recovery Time	3	1	3	1
16 Bit I/O Recovery Time	2	1	2	1
Memory Hole at 15M-16M	Disabled	Disabled	Disabled	Disabled
Peer Concurrency	Enabled	Enabled	Enabled	Enabled
Chipset Special Features	Disabled	Enabled	Disabled	Enabled
DRAM ECC/PARITY Select	ECC	Parity	ECC	Parity
Memory Parity/ECC Check	AUTO	AUTO	AUTO	AUTO
Single Bit Error Report	Enabled	Enabled	Enabled	Enabled
L2 Cache Cacheable Size	512MB	512MB	512MB	512MB
Chipset NA# Asserted	Enabled	Enabled	Enabled	Enabled
Pipeline Cache Timing	Faster	Faster	Faster	Faster
Passive Release	Enabled	Enabled	Enabled	Enabled
Delayed Transaction	Disabled	Disabled	Disabled	Disabled

Table 164: Chipset Features Setup

2.15.3 Power Management Setup

Elite BIOS Version	00.17		00.19	
Description	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults
Power Management	Disable	Disable	Disable	Disable
PM Control by APM	Yes	Yes	Yes	Yes
Video Off Method	DPMS	DPMS	DPMS	DPMS
Modem Use IRQ	3	3	3	3
Doze Mode	Disable	Disable	Disable	Disable
Standby Mode	Disable	Disable	Disable	Disable
Suspend Mode	Disable	Disable	Disable	Disable
HDD Power Down	Disable	Disable	Disable	Disable
IRQ3 (Wake-Up Event)	OFF	ON	OFF	ON
IRQ4 (Wake-Up Event)	OFF	ON	OFF	ON
IRQ8 (Wake-Up Event)	OFF	ON	OFF	ON
IRQ12 (Wake-Up Event)	OFF	ON	OFF	ON
IRQ3 (COM 2)	OFF	ON	OFF	ON
IRQ4 (COM 1)	OFF	ON	OFF	ON
IRQ5 (Reserved)	OFF	ON	OFF	ON
IRQ6 (Floppy Disk)	OFF	OFF	OFF	OFF
IRQ7 (LPT 1)	OFF	ON	OFF	ON
IRQ8 (RTC Alarm)	OFF	OFF	OFF	OFF
IRQ9 (IRQ2 Redir)	OFF	ON	OFF	ON
IRQ10 (Reserved)	OFF	ON	OFF	ON
IRQ11 (Reserved)	OFF	ON	OFF	ON
IRQ12 (PS/2 Mouse)	OFF	ON	OFF	ON
IRQ13 (Coprocessor)	OFF	ON	OFF	ON
IRQ14 (Hard Disk)	OFF	ON	OFF	ON
IRQ15 (Reserved)	OFF	ON	OFF	ON

Table 165: Power Management Setup

2.15.4 PNP/PCI Configuration

Elite BIOS Version	00.17		00.19	
Description	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults
Resources Controlled by	AUTO	Manual	AUTO	Manual
IRQ-3 Assigned to		Legacy ISA		Legacy ISA
IRQ-4 Assigned to		Legacy ISA		Legacy ISA
IRQ-5 Assigned to		PCI/ISA PnP		PCI/ISA PnP
IRQ-7 Assigned to		Legacy ISA		Legacy ISA
IRQ-9 Assigned to		PCI/ISA PnP		PCI/ISA PnP
IRQ-10 Assigned to		PCI/ISA PnP		PCI/ISA PnP
IRQ-11 Assigned to		PCI/ISA PnP		PCI/ISA PnP
IRQ-12 Assigned to		PCI/ISA PnP		PCI/ISA PnP
IRQ-14 Assigned to		PCI/ISA PnP		PCI/ISA PnP
IRQ-15 Assigned to		PCI/ISA PnP		PCI/ISA PnP
DMA-0 Assigned to		PCI/ISA PnP		PCI/ISA PnP
DMA-1 Assigned to		PCI/ISA PnP		PCI/ISA PnP
DMA-3 Assigned to		PCI/ISA PnP		PCI/ISA PnP
DMA-5 Assigned to		PCI/ISA PnP		PCI/ISA PnP
DMA-6 Assigned to		PCI/ISA PnP		PCI/ISA PnP
DMA-7 Assigned to		PCI/ISA PnP		PCI/ISA PnP
PCI IRQ Activated by	Level	Level	Level	Level
PCI IDE IRQ Map to	PCI-AUTO	PCI-AUTO	PCI-AUTO	PCI-AUTO
Streaming	Disabled	Disabled	Disabled	Disabled
Primary IDE INT#:	A	A	A	A
Secondary IDE INT#	B	B	B	B
Used MEM Base Addr		N/A		N/A

Table 166: PnP/PCI Configuration

2.15.5 Integrated Peripherals

Elite BIOS Version	00.17		00.19	
Description	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults
IDE HDD Block Mode	Disabled	Enabled	Disabled	Enabled
PCI Slot IDE 2nd Channel	Enabled	Enabled	Enabled	Enabled
On-Chip Primary PCI IDE	Enabled	Enabled	Enabled	Enabled
On-Chip Secondary PCI IDE	Disabled	Disabled	Disabled	Disabled
IDE Primary Master PIO	AUTO	AUTO	AUTO	AUTO
IDE Primary Slave PIO	AUTO	AUTO	AUTO	AUTO
USB Controller	Disabled	Disabled	Disabled	Disabled
KBC Input Clock	8 MHz	8 MHz	8 MHz	8 MHz
Onboard FDC Controller	Enabled	Enabled	Enabled	Enabled
Onboard Serial Port 1	AUTO	AUTO	AUTO	AUTO
Onboard Serial Port 2	AUTO	AUTO	AUTO	AUTO
Onboard Parallel Port	378/IRQ7	378/IRQ7	378/IRQ7	378/IRQ7
Parallel Port Mode	SPP	SPP	SPP	SPP

Table 167: Integrated Peripherals

2.15.6 Additional Peripherals

Elite BIOS Version	00.17		00.19	
Description	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults
Mode	AUTO	AUTO	AUTO	AUTO
FPD Contrast	AUTO	AUTO	AUTO	AUTO
FPD Brightness	AUTO	AUTO	AUTO	AUTO
CAN Detected I/O Port				
Assigned IRQ	NONE	NONE	NONE	NONE
MTC Communication Assigned I/O Port	110 -11A	110 -11A	110 -11A	110 -11A
User Serial ID	0000 0000	0000 0000	0000 0000	0000 0000
Show	No	No	No	No

Table 168: Additional Peripherals

3. BIOS for System Unit with Socket 370

The SETUP defaults are the settings recommended by B&R.

3.1 BIOS Setup Main Menu

The BIOS Setup main menu appears immediately by pressing the DEL button:

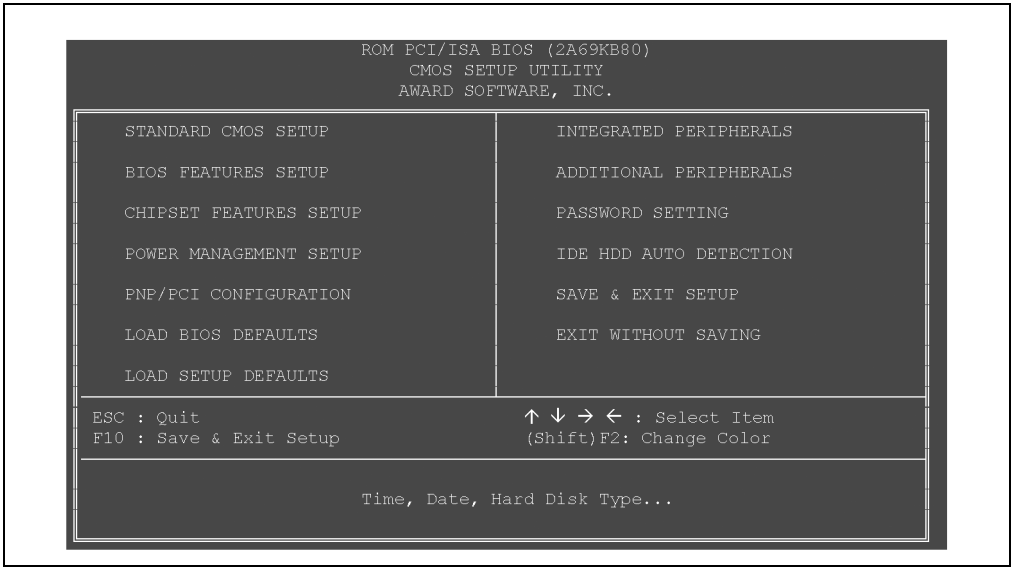


Figure 176: BIOS Setup Main Menu

The individual menu points are explained in the following sections.

Standard CMOS Setup

Options in the original PC AT-compatible BIOS.

BIOS Features Setup

Enhanced BIOS options.

Chipset Features Setup

Specific options for the chipset system

Power Management Setup

Advanced Power Management (APM) options.

PnP/PCI Configuration

Options for Plug & Play and PCI cards

Load BIOS Defaults

Loads factory settings for the most stable minimal performance system operations.

Load Setup Defaults

Loads factory settings for optimal system performance

Integrated Peripherals

Peripheral subsystems for different I/O operations of the system

Additional Peripherals

B&R specific settings for integrated peripheral devices

Password Setting

Change, set or disable password.

IDE HDD Auto Detection

Automatic detection and configuration of IDE devices

Save & Exit Setup

Save settings in CMOS-RAM and exit BIOS Setup

Exit Without Saving

Abandon all changes and exit BIOS Setup.

3.2 Standard CMOS Setup

```
                    ROM PCI/ISA BIOS (2A69KB80)
                        STANDARD CMOS SETUP
                       AWARD SOFTWARE, INC.

   Date (mm:dd:yy) : Mon, Apr 26 1999
   Time (hh:mm:ss) :  2 : 19 : 21

   HARD DISKS          TYPE  SIZE  CYLS HEADS PRECOMP LANDZONE SECTORS  MODE
   Primary Master    : Auto     0     0     0       0        0       0  AUTO
   Primary Slave     : None     0     0     0       0        0       0  ----
   Secondary Master  : None     0     0     0       0        0       0  ----
   Primary Slave     : None     0     0     0       0        0       0  ----

   Drive A : 1.44M, 3.5 in.
   Drive B : None

   Video   : EGA/VGA                          Base Memory:    640K
                                            Extended Memory:  31744K
   Halt On : All,But Keyboard                  Other Memory:    384K
                                              ------------------------
                                               Total Memory:  32768K

ESC : Quit              ↑ ↓ → ← : Select Item        PU/PD/+/- : Modify
F1  : Help              (Shift)F2: Change Color
```

Figure 177: Standard CMOS Setup

Date and Time

The real-time clock (RTC) can be set here. These settings are not saved in FPROM (backup for CMOS RAM).

Hard Disks

Parameters for existing hard disks in the IPC are set here.

We recommend that you select AUTO. BIOS automatically detects the specifications and the optimal operating mode of almost all IDE hard drives. When you select AUTO for a hard drive, those specifications are detected during POST, every time the system boots.

If you do not want to select the AUTO drive, there are some other options below:

- Match the specifications of your installed IDE hard disk or silicon disk with the predefined values for drive types 1 through 45. If one of the predefined drive types corresponds to your hard disk or silicon disk then you can select this type.
- Select USER and enter the corresponding values into each drive parameter field.

- Use the IDE HDD auto detection function in the Setup Main Menu (see section "IDE HDD Auto Detection");

Here is a brief explanation of drive specifications:

Type

BIOS contains a table of predefined drive types with certain specifications. Drives whose specifications do not accommodate any pre-defined type are classified as type USER.

Size

Disk drive capacity (approximate). Note that this size is usually slightly greater than the size of a formatted disk given by a disk-checking program.

Cyls Number of cylinders

Head Number of heads

Precomp Write Precompensation Cylinder

Landzone Landing Zone

Sector Number of Sectors

Mode

AUTO BIOS automatically determines the optimal mode.

Normal The following maximum values are supported:
Number of cylinders= 1024
Number of heads = 16
Number of sectors = 64

Large For drives that do not support LBA and have more than 1024 cylinders.

LBA Logical Block Addressing: For drives with more than 1024 cylinders. During drive accesses, the IDE controller transforms the data address described by sector, head, and cylinder number into a physical block address. This results in a significantly improved data transfer rate.

Drive A: and Drive B:

Select the correct specifications for the diskette drive(s) installed in the computer:

None	No diskette drive installed
360k, 5.25"	5¼ inch diskette; 360 kByte capacity
1.2M, 5.25"	5¼ inch diskette; 1.2 MByte capacity
720k , 3.5"	3½ inch diskette; 720 kByte capacity
1.44M, 3.5"	3½ inch diskette; 1.44 MByte capacity
2.88M, 3.5"	3½ inch diskette; 2.88 MByte capacity

Video

Select the type of primary video subsystem in your computer. BIOS usually detects the correct video type automatically. BIOS supports a secondary video subsystem, but you do not select it in Setup.

EGA/VGA	Enhanced Graphics Adapter / Video Graphics Array. For EGA, VGA, SEGA, SVGA or PGA monitor adapters.
CGA 40	Color Graphics Adapter, power up in 40 column mode
CGA 80	Color Graphics Adapter, power up in 80 column mode
MONO	Monochrome Adapter includes high resolution monochrome adapters

Halt On

During the POST, the computer stops if BIOS detects a hardware error (waits for the <F1>key to be pressed).

You can tell BIOS to ignore certain errors during POST and continue the boot-up process.

No errors	POST does not stop for any errors.
All errors	If BIOS detects any non-fatal errors POST stops and prompts you to take corrective action.
All, but keyboard	POST does not stop for a keyboard error, but stops for all other errors.

All, but diskette	POST does not stop for diskette drive errors, but stops for all other errors.
All, but disk/key	POST does not stop for a keyboard or disk error, but stops for all other errors.

3.3 BIOS Features Setup

```
                    ROM PCI/ISA BIOS (2A69KB80)
                        BIOS FEATURES SETUP
                       AWARD SOFTWARE, INC.

Virus Warning                Disabled   Video  BIOS Shadow  : Enabled
CPU Internal Cache         : Enabled    C8000-CBFFF Shadow  : Disabled
External Cache               Enabled    CC000-CFFFF Shadow  : Disabled
CPU L2 Cache ECC Checking  : Enabled    D0000-D3FFF Shadow  : Disabled
Processor Number Feature1) : Enabled    D4000-D7FFF Shadow  : Disabled
Quick Power On Self Test   : Disabled   D8000-DBFFF Shadow  : Disabled
Boot From LAN First        : Enabled    DC000-DFFFF Shadow  : Disabled
Boot Sequence              : A,C,SCSI
Swap Floppy Drive          : Disabled
Boot Up Floppy Seek        : Enabled
Boot Up NumLock Status     : On
Gate A20 Option            : Normal
Typematic Rate Setting     : Disabled

Security Option            : Setup      ESC : Quit        ↑↓→←: Select Item
PCI/VGA Palette Snoop      : Disabled   F1  : Help         PU/PD/+/- : Modify
Assign IRQ For VGA         : Disabled   F5  : Old Values   (Shift)F2 : Color
OS Select For DRAM > 64MB  : Non-OS2    F6  : Load BIOS  Defaults
Report No FDD For WIN 95   : Yes        F7  : Load Setup Defaults
```

Figure 178: BIOS Features Setup

1) This function is available with a Coppermine Technology based processor (e.g. Celeron 566/66 or Pentium III 600/100 and Pentium III 850/100).

Virus Warning

When enabled, you receive a warning message if a program (especially a virus) attempts to alter the boot sector or the partition table of the boot drive (not the rest of the hard drive). If this happens, you should run an anti-virus program and check the data carriers.

Some disk diagnostic programs (e.g. data carrier maintenance or partitioning) alter the boot sector. If you plan to run such a program, we recommend that you first disable the virus warning.

Some disk diagnostic programs (e.g. data carrier maintenance or partitioning) alter the boot sector. If you plan to run such a program, we recommend that you first disable the virus warning.

CPU Internal Cache

Switching the L1 cache of the processor, on or off. Switching off the internal cache slows down the system considerably, and therefore is not advisable.

External Cache

Makes possible to prevent the use of the integrated L2 cache on the mainboard. Switching off the internal cache slows down the system considerably, and is therefore not advisable.

CPU L2 Cache ECC Checking

With the Error Correction Code individual faulty Bits are automatically corrected when reading/writing the L2 cache memory.

Processor Number Feature

This option, which checks the access to the serial number of the processor, is available with processors based on the Coppermine core (e.g. Celeron 566/66, Pentium III 600/100). If the parameter is set to Enabled, other programs (e.g. Microsoft Internet Explorer 4.0) can be accessed and forwarded.

Quick Power On Self Test

When Enabled POST speeds up (no detailed memory test).

Boot From LAN First

Before a specified device of an operating system is searched for using a "Boot Sequence", BIOS attempts to boot from a device connected to the network.

Boot Sequence

Determines the order in which to boot the respective devices, offering different combination options.

At the beginning of the sequence, an operating system is sought on the first device. If there is none found, BIOS searches for the next device etc. If an operating system is found on a device then this drive is booted. However, if BIOS does not find an operating system an error message then appears on the screen.

If there is no hard disk on the drive which was finally booted, then it is automatically assigned drive designation A. If an additional disk drive is available, then it is automatically assigned the drive designation B.

Swap Floppy Drive

This field is effective only in systems with two disk drives (IPC5600, see section "Operating 3.5" Disk Drives").

Selecting Enabled, assigns the drive designation B to drive A and the drive designation A to drive B .

Boot Up Floppy Seek

When Enabled, BIOS tests (searches for) floppy drives during the POST to determine whether they have 40 or 80 tracks.

Note Only 360 KByte diskettes have 40 tracks. All diskettes with 720 KByte, 1.2 MByte and 1.44 MByte have 80 tracks. Since very few modern PCs have 40-track floppy drives, we recommend that you disable this field to save time.

Boot Up NumLock Status

With this field you can define the state of the NumLock button when booting. When toggled "On", the numeric keypad generates numbers instead of controlling cursor operations. When toggled OFF, the control fields are used for the keys (Cursor Keys, Pos1, End, etc.).

Gate A20 Option

Gate A20 refers to the manner in which the system addresses memory above 1 MB (extended memory). When set to Fast, the system chipset controls Gate A20. When set to Normal, a pin in the keyboard controller controls Gate A20.

Setting Gate A20 to Fast improves system speed, particularly with OS/2 and Windows.

Typematic Rate Setting

Keystrokes repeat at a rate determined by the keyboard controller in your system. Typematic rate and typematic delay options are irrelevant if disabled. However when Enabled, the typematic Rate and a typematic delay can be selected.

Typematic Rate (chars/sec)

When the typematic rate setting is enabled, you can select a typematic rate (the rate at which the character repeats when you hold down a key) of 6, 8, 10, 12, 15, 20, 24 or 30 characters per second. The repeat rate determines the speed that characters are repeated when a key is pressed and held down.

Note: The accuracy of this setting is ±20%.

Typematic Delay (ms)

When the typematic rate setting is enabled, you can select a typematic delay (the delay before key strokes begin to repeat) of 250, 500, 750 or 1000 milliseconds. The typematic delay is the period of time which passes between pressing the key and the appearance of the next characters (when a key is pressed and held down).

Note: The accuracy of this setting is ±20%.

Security Option

Here you can select between Setup and System. This option appears after a password is requested. If you have a password, select whether the password is required every time the system boots, or only when you enter Setup.

PS/2 Mouse Function Control

Switches the PS/2 connection on or off when using a PS/2 pointing device.

PCI/VGA Palette Snoop

This option is set as a default to Disabled and should not be changed.

OS Select For DRAM > 64MB

If more than 64 MB DRAM is installed on your IPC, then you must select between the operating system "OS2" and "Non-OS2".

Shadowing

Shadow settings are only valid for ISA cards. Shadowing means that software which is found on a ROM chip of an ISA card (Firmware) in RAM, can be copied. The data can be read from there with the faster system bus.

This results in improved performance of Firmware programs (e.g. BIOS, Video BIOS etc.). However the size of high memory in RAM (640kB - 1MB) is reduced (e.g. reduction in the high memory range available for loading device drivers).

Video BIOS Shadow and C8000-CBFFF Shadow

These options have no function, as the 42 KB size VGA BIOS is copied (shadowed) into every section of RAM .

Note: The last 8 KB of the memory area C8000 to CBFFF are available.

Memory Area D0000 - DFFFF

These areas can be occupied by Firmware on other expansion cards. If an expansion peripheral in your system contains ROM based firmware, you need to know the address range the ROM occupies to shadow it into the correct area of RAM.

3.4 Chipset Features Setup

```
                    ROM PCI/ISA BIOS (2A69KB80)
                       CHIPSET FEATURES SETUP
                        AWARD SOFTWARE, INC.

SDRAM Control by          : SPD          Auto Detect DIMM/PCI Clk : Enabled
SDRAM RAS-to-CAS Delay    : 3            CPU Clock(MHz)/Spread(%) : Default
SDRAM RAS Precharge Time  : 3
SDRAM CAS latency Time    : 3
SDRAM Precharge Control   : Disabled
DRAM Data Integrity Mode  : Non-ECC
System BIOS Cacheable     : Disabled
Video BIOS Cacheable      : Disabled
Video RAM Cacheable       : Disabled
8 Bit I/O Recovery Time   : 1
16 Bit I/O Recovery Time  : 1
Memory Hole At 15M-16M    : Disabled
Passive Release           : Enabled      ESC : Quit        ↑↓→←: Select Item
Delayed Transaction       : Disabled     F1  : Help         PU/PD/+/- : Modify
AGP Aperture Size         : 64           F5  : Old Values  (Shift)F2 : Color
                                         F6  : Load BIOS  Defaults
                                         F7  : Load Setup Defaults
```

Figure 179: Chipset Features Setup

The parameters in this screen are for system designers, service personnel, and technically competent users only. The best advice is to alter only those settings that you thoroughly understand.

SDRAM Control by

SPD: The values SDRAM RAS-to-CAS delay, SDRAM RAS Precharge Time and SDRAM CAS Latency Time are automatically set (BIOS reads out the SDRAM parameter).

Manual: These values can be manually changes

SDRAM RAS-to-CAS Delay

When DRAM is refreshed, both rows and columns are addressed separately. This setup item allows you to determine the timing of the transition from RAS to Column Address Strobe (CAS).

SDRAM RAS Precharge Time

The precharge time is the number of cycles it takes for the RAS to accumulate its charge before DRAM refresh. If insufficient time is allowed, refresh may be incomplete and the DRAM may fail to retain data.

SDRAM CAS Latency Time

This value should not be changed as it can cause instability in the system.

SDRAM Precharge Control

This value should not be changed as it can cause instability in the system.

BIOS Cacheable

Selecting Enabled allows caching of the BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Video BIOS Cacheable

Selecting Enabled allows caching of the Video BIOS ROM at C0000h-CBFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Video RAM Cacheable

Selecting Enabled allows caching of the Video BIOS ROM at C0000h-CBFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

8/ 16 Bit I/O Recovery Time

The I/O recovery mechanism delays PCI I/O (created by PCI hardware), so that it can guarantee compatibility with the ISA bus. A delay of one or more bus clock cycles can be set. These two fields let you define recovery time (in bus clock cycles) for 16-bit and 8-bit I/O.

Memory Hole at 15M-16M

You can reserve this area of system memory for ROM memory on ISA cards. When this area is reserved, it cannot be cached. The user information for peripherals that need to use this area of system memory usually describes their memory requirements.

If this option is activated, then the memory area of over 16MB cannot be used anymore.

Passive Release

When Enabled, CPU to PCI bus accesses are permitted during the Passive Release procedure. Otherwise, the arbiter only accepts another PCI master access to local DRAM.

Delayed Transaction

The chipset has an embedded 32 bit posted write buffer to support delay transactions cycles. Select Enabled to support compliance with PCI specification version 2.1.

AGP Aperture Size (MB)

Identifies those memory areas which can be used as graphic memory. Write procedures on this memory area are relayed without delay to the AGP bus.

Auto Detect DIMM/PCI Clk

The clock line is activated only with existing DIMMs.

CPU Clock (MHz) / Spread(%)

Settings of the system clock control. These values depend on the processor type.

For Celeron processors:

Default	66 MHz, -0.5% control
66(+/-.5)	66 MHz, ±0.5% control
66(-.5)	66 MHz, -0.5% control

For Pentium III 600/100:

Default	100 MHz, -0.5% control
100(+/-.5)	100 MHz, ±0.5% control
100(-.5)	100 MHz, -0.5% control
103(-.5)	103 MHz, -0.5% control
124(-.5)	124 MHz, -0.5% control
133(-.5)	133 MHz, -0.5% control

3.5 Power Management Setup

```
                    ROM PCI/ISA BIOS (2A69KB80)
                      POWER MANAGEMENT SETUP
                       AWARD SOFTWARE, INC.

Power Management      : User Define      ** Reload Global Timer Events **
PM Control by APM     : Yes              IRQ[3-7,9-15],NMI     : Disabled
Video Off Method      : DPMS             Primary IDE 0         : Disabled
Video Off After       : Standby          Primary IDE 1         : Disabled
MODEM Use IRQ         : 3                Secondary IDE 0       : Disabled
Doze Mode             : Disable          Secondary IDE 1       : Disabled
Standby Mode          : Disable          Floppy Disk           : Disabled
Suspend Mode          : Disable          Serial Port           : Enabled
HDD Power Down        : Disable          Parallel Port         : Disabled
Throttle Duty Cycle   : 62.5%
PCI/VGA Act-Monitor   : Disabled
PowerOn by Ring       : Disabled
Resume by Alarm       : Enabled
 Date(of Month) Alarm : 0
 Time(hh:mm:ss) Alarm : 7: 0:17

IRQ8 Break Suspend    : Disabled
                                         ESC : Quit        ↑↓→←: Select Item
                                         F1  : Help         PU/PD/+/- : Modify
                                         F5  : Old Values   (Shift)F2 : Color
                                         F6  : Load BIOS  Defaults
                                         F7  : Load Setup Defaults
```

Figure 180: Power Management Setup

Power Management

This option allows you to define the type (or degree) of power saving. That means that after a certain period of inactivity certain components of the system are switched off.

There are different selection options containing the presettings for Doze, Standby, Suspend and HDD Power Down Mode values (see below):

Disable	All power saving methods are deactivated
Min Saving	Minimum power savings. After an inactivity period of one hour, all disengageable system components switch into energy saving mode.
Max Saving	Maximum power savings: Switch off after one minute
User Define	The values for Doze, Standby, Suspend and HDD Power Down Mode can be set individually.

If you want to operate a real-time clock on your IPC, then we generally recommend that Power Management is deactivated. This leads to improved system performance (no SMI Generation).

PM Control by APM

If Advanced Power Management (APM) is installed on your system, selecting Yes gives better power savings.

Video Off Method

Determines the condition of the monitor when it is in Standby mode.

Video Off after

Determines the degree of power saving for Doze, Standby and Suspend modes when the monitor goes into power saving mode.

MODEM User IRQ

If a modem is installed on your IPC, then you enter the interrupt used in this field. If the system is in Powersave mode it is awoken again by a signal of this interrupt.

Doze Mode

With this option you can determine after which period of time without user activity, the processor should be operated with reduced speed. Value range: 1 Minute to 1hour.

Standby Mode

With this option you can determine after which time of user inactivity, the built in disk drive and graphic controller should be switched off. Value range: 1 Minute to 1hour.

Suspend Mode

With this option you can determine after which time of user inactivity, all the system components (apart from the processor) should be switched off. Value range: 1 Minute to 1hour.

HDD Power Down

With this option you can determine after which time of user inactivity the hard disk should be switched off (if there are a number of hard disks in the IPC, then all are switched off). Value range: 1 Minute to 1hour.

Note: B&R built-in hard disks switch themselves off independently after 45 minutes inactivity.

Throttle Duty Cycle

When the system enters Doze mode the CPU clock runs only part of the time. You may select the percentage of time that the clock runs. This setting defines this frequency in relation to the original system clock.

PCI/VGA Act Monitor

When Enabled, each activity in connection to the VGA controller or monitor results in the resetting of timers for the standby modes (also see Reload Global Timer Events).

PowerOn by Ring

When Enabled a signal to the ring indicator (e.g. a incoming call to the modem) overrides the Powersave modes.

Resume by Alarm

When Enabled you can set the date and time at which the real-time clock awakens the system out of the Powersave mode.

IRQ 8 Break Suspend

You can switch on or off monitoring of the IRQ8 (the real-time clock) in the Powersave mode.

Reload Global Timer Events

It is determined here whether activity to the listed components is reset by the timer when switching on the Powersave mode.

When Enabled, a movement of the device (e.g. mouse movement with a serial mouse) is regarded as an activity and the switch-off times (for Doze, Standby and Suspend modes) restart afresh.

3.6 PNP/PCI Configuration

```
                    ROM PCI/ISA BIOS (2A69KB80)
                         PNP CONFIGURATION
                       AWARD SOFTWARE, INC.

PnP OS Installed          : No          PCI IDE IRQ Map To    : ISA
Resources Controlled By   : Manual
Reset Configuration Data  : Disabled

IRQ-3  assigned to : PCI/ISA PnP        Used MEM base addr    : N/A
IRQ-4  assigned to : PCI/ISA PnP
IRQ-5  assigned to : PCI/ISA PnP        Assign IRQ for USB    : Disabled
IRQ-7  assigned to : PCI/ISA PnP
IRQ-9  assigned to : PCI/ISA PnP
IRQ-10 assigned to : PCI/ISA PnP
IRQ-11 assigned to : PCI/ISA PnP
IRQ-12 assigned to : PCI/ISA PnP
IRQ-14 assigned to : PCI/ISA PnP
IRQ-15 assigned to : PCI/ISA PnP
DMA-0  assigned to : PCI/ISA PnP
DMA-1  assigned to : PCI/ISA PnP        ESC : Quit        ↑↓→←: Select Item
DMA-3  assigned to : PCI/ISA PnP        F1  : Help         PU/PD/+/- : Modify
DMA-5  assigned to : PCI/ISA PnP        F5  : Old Values   (Shift)F2 : Color
DMA-6  assigned to : PCI/ISA PnP        F6  : Load BIOS  Defaults
DMA-7  assigned to : PCI/ISA PnP        F7  : Load Setup Defaults
```

Figure 181: PnP/PCI Configuration

PnP OS Installed

When set to AUTO, all Plug & Play compatible and bootable devices are possible (automatically Windows 95/98/2000 and Linux).

Resources Controlled By

When set to AUTO, all Plug & Play compatible and bootable devices are automatically configured by the BIOS. When set to Manual, all IRQ and DMA settings can be made by the user.

Normally (AUTO) during the BIOS system start, all ISA cards resources (I/O address, IRQ, DMA port, memory) are assigned first and then afterwards all Plug & Play devices are configured. No manual assignments can be made in the BIOS Setup for resources from Plug & Play devices. This is only possible with ICU (ISA Configuration Utility, available directly from Intel) or Windows 95/98/2000 as well as Linux.

Reset Configuration Data

Normally you leave this setting disabled. When Enabled, an update of the Extended System Configuration Data (ESCD) is carried out after exiting the BIOS Setup. This may be necessary for booting problems resulting from installation of new hardware components.

IRQ-n Assigned to / DMA-n Assigned to

The settings "Legacy ISA" and PCI/ISA PnP are possible.

Legacy ISA is used, if ISA devices require a special interrupt or a special DMA channel. Plug & Play compatible devices work with the PCI/ISA PnP setting.

PCI IDE IRQ Map to

This field lets you select PCI IDE IRQ mapping or PC AT (ISA) interrupts.

If your system does not have one or two PCI IDE connectors on the system board, select values according to the type of IDE interface(s) installed in your system (PCI or ISA).

Standard settings for ISA interrupts on IDE channels: IRQ14 for the primary channel and IRQ15 for the secondary channel.

Primary/Secondary IDE INT#

Only appears if the value ISA is not entered in the field PCI IDE IRQ Map to.

Each PCI peripheral connection is capable of activating up to four interrupts: INT# A, INT# B, INT# C and INT# D. By default, a PCI connection is assigned INT# A.

Assigning INT# B has no meaning unless the peripheral device requires two interrupt services instead of just one. For example, if the PCI IDE interface in the chipset has two channels, it then requires two interrupt services. The primary and secondary IDE INT# fields default to values appropriate for two PCI IDE channels, with the primary PCI IDE channel having a lower interrupt than the secondary.

Used MEM Base Addr

This option makes it possible to reserve a main memory window in the upper memory area, e.g. for some older ISA network cards. If a starting address is specified instead of N/A (not available), the option Used MEM Length can be used to set the size of the memory area required.

Used MEM Length

Sets the size of the memory area to be reserved, starting at the address defined in Used MEM Base Addr.

3.7 Load BIOS Defaults

Loads the BIOS defaults. They are factory settings with standard values, which are defined by the BIOS manufacturer for the most stable minimal performance system operations.

3.8 Load Setup Defaults

Loads the Setup defaults. These are factory settings which are defined by B&R for optimal performance of your IPC.

3.9 Integrated Peripherals

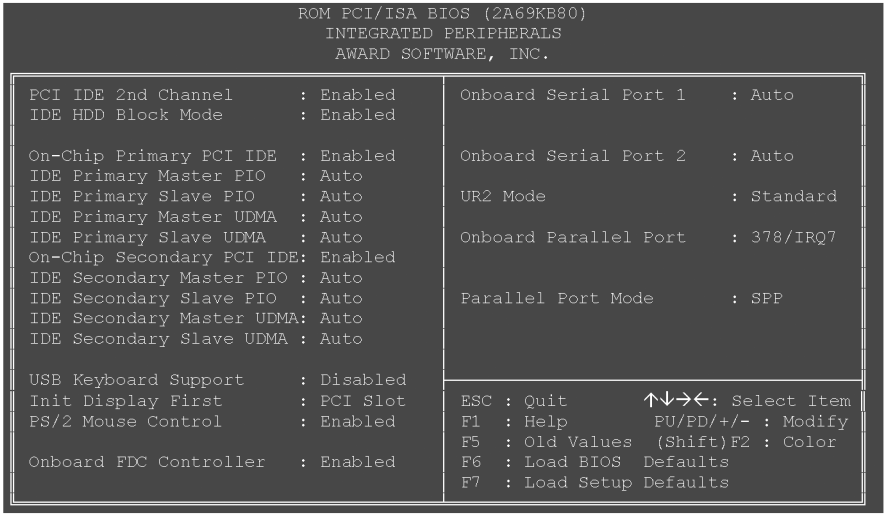


Figure 182: Integrated Peripherals

PCI Slot IDE 2nd Channel

The second IDE channel can be manually deactivated here.

IDE HDD Block Mode

Switches the block mode on/off for the hard disk. If the block mode is Enabled, then more sectors are simultaneously transferred at data transfer resulting from the increase in speed.

On-Chip Primary/Secondary PCI IDE

The integrated IDE interface is equipped with two IDE channels, which can be switched on and off separately here.

IDE Primary/Secondary Master/Slave PIO

The PIO (Programmed I/O) fields let you select a PIO mode (0 to 4), and the AUTO mode for all connected IDE devices (theoretically four: two channels per interface). The PIO mode specifies the maximum transfer speed on the IDE bus. Modes 0 through 4 provide successively increased performance. The AUTO setting automatically selects the best mode for each device.

With older hard drives and ATA Flash disks, setting the PIO mode too high can cause read and write errors. Therefore we recommend that you select the AUTO setting.

IDE Primary/Secondary Master/Slave UDMA

If a connected IDE device supports an Ultra DMA mode, then this is detected by the AUTO setting and the respective mode is set.

USB Keyboard Support

Enables the use of a USB keypad to the USB port.

If you want to avail of a USB keypad and you are using an operating system other than Windows 98/2000, then Power Management must be switched on for the USB keypad to function properly (see section "Power Management setup").

Init Display First

Determine the display device that will be initialized first.

Onboard FDC Controller

Switch the integrated floppy disk controller on or off. If it is disabled, the floppy disk drive does not function any longer.

PS/2 Mouse Control

Switches the PS/2 connection on or off when using a PS/2 pointing device.

Onboard Serial Port 1 and 2

Here you can set the I/O addresses and interrupts of COM1 or COM2 interfaces. The options to choose from are AUTO, Disabled, Manual and some settings with predefined parameters. Normally the AUTO setting is recommended.

Default assignment for the AUTO setting:

COM1	I/O address 3F8h - 3FFh, IRQ4
COM2	I/O address 2F8h - 3FFh, IRQ3

UR2 Mode

The type of operation of the COM2 interface can be selected here:

Standard	RS232 interface
Sharp IR	IrDA compatible serial infrared interface
IrDA SIR	IrDA-1.0 compatible serial infrared interface

Onboard Parallel Port

The settings for the parallel interface LPT1cannot be automatically detected. They are either to be selected from a row of predefined values or arbitrarily set with Manual.

Parallel Port Mode

Here you can set the operating mode of the parallel interface. The following items can be selected:

SPP	Standard Parallel Port (max. 64 kByte/s unidirectional)
EPP 1.7	Enhanced Parallel Port v1.7 (max. 2 MByte/s bidirectional)
EPP 1.9	Enhanced Parallel Port v1.9 (max. 2 MByte/s bidirectional)
ECP	Enhanced Capability Port (max. 2 MByte/s bidirectional)
EPP+ECP	Combined EPP/ECP transfer

Please take note that the EPP and ECP modes must be supported by connected devices.

ECP Mode Use DMA

A DMA channel is used from the parallel interface in the ECP mode.

3.10 Additional Peripherals

```
                    ROM PCI/ISA BIOS (2A69KB80)
                       ADDITIONAL PERIPHERALS
                        AWARD SOFTWARE, INC.

Display Type ID          : 0042        Controller HW ID:         000000
   Name                  : FPC00.21    Controller SW ID:     BIOS:Be.00
   Mode                  : AUTO          FPGA:00.01 VGA:00.01 MTC:00.13
   FPD Contrast          : AUTO
   FPD Brightness        : AUTO        Show               : Statistics 1)

CAN detected I/O Port    :  384          Statistics            IPC    FPD
   assigned IRQ          : NONE          Power On Cycles  :   22599    176
                                         Operating Hours  :   20823    254
PCMCIA detected I/O Port :  3E0          Overtemp. Hours  :       1     19
                                         Fan Cooler Hours :     339
Hardware Security Key
   assigned Onboard [I/O]: NONE
   detected Extern. [I/O]:  278          Skip ext.Alarm 2):  No

MTC Communication                        ESC : Quit        ↑↓→←: Select Item
   assigned I/O Port     : 110h          F1  : Help         PU/PD/+/- : Modify
                                         F5  : Old Values  (Shift)F2 : Color
   User Serial ID        : 0000 0000     F6  : Load BIOS  Defaults
   Show                  : No            F7  : Load Setup Defaults
```

Figure 183: Additional Peripherals

1) In addition to the Statistics settings there is also Voltage, Temperature and Alarms settings (see 'Statistics' for explanation)
2) Skip ext. Alarm is available starting from Elite BIOS version 1.09.

Display Type ID

The type of B&R display used is shown:

Type ID	Display
0010	TFT VGA 10.4"
0011	TFT VGA 13.8"
0013	TFT VGA 10.4"
0014	TFT VGA 10.4"
0030	LCD VGA 10.4"
0040	TFT SVGA 10.4"
0041	TFT SVGA 12.1"
0042	TFT SVGA 12.1"

Type ID	Display
0050	TFT XGA 13.8"
0051	TFT XGA 14.5"
0070	TFT XGA 13.8"
0071	TFT XGA 14.5"
0072	TFT XGA 15"
0073	TFT XGA 15"
0080	TFT SXGA 18"

Table 169: Display Type ID

Note: Using the Provit 5000 Service Upgrade model number 5S5000.04-090, newly developed displays are added to this list.

Name	Description of the display for software use.	
Mode	With this item you can select which display device should be active when the system is started:	
	AUTO	All connected display devices are automatically activated. If no display device is connected then the monitor is activated
	CRT	Only the monitor is activated
	FPD	Only the display is activated
	CRT+FPD	The monitor and display are activated (simultaneous mode)
FPD contrast	The contrast of the connect display can be set.	
	Attention: This is only possible for LCD displays.	
FPD brightness	The brightness of the connect display can be set. Possible for both LCD as well as for TFT displays.	
	If a value (e.g. 80%) is stored in the BIOS Setup then the BIOS uses these each time the system is started, also when another display is connected.	

CAN Detected I/O Port

If a B&R interface board is installed in your IPC, then the I/O range is shown here. See also the section "CAN Interface".

CAN Assigned IRQ

Here, an IRQ can be assigned to the CAN port of the interface board (disconnecting the interrupt line). You can choose between the options NONE, IRQ10 and NMI (Non Maskable Interrupt). See also the section "CAN Interface".

PCMCIA Detected I/O Port

The I/O address range of the PCMCIA port (Socket 1) is displayed on the interface board. See also the section "PC Card Slot/ SRAM".

Hardware Security Key Detected I/O Port

The I/O address range of the Hardware Security Key is displayed. The Hardware Security Key is available on both the mainboard (see section "LPT2 / Hardware Security Key") and the B&R interface board (see section "LPT2 / Hardware Security Key").

If a B&R interface board is installed in your IPC, then the I/O address range of this Hardware Security Keys is displayed, otherwise those on the mainboard.

MTC Communication Assigned I/O Port

The I/O address can be set here for MTC communication.

Some ISA cards (e.g. network cards) use fixed address space, via which the MTC normally also communicates. In such cases, another MTC I/O address must be selected. Also see the section "Maintenance Controller MTC".

User Serial ID

A user serial number (32 bit, in hex format) can be entered here. It is stored in CMOS.

Show

When set to "Yes" the user serial number (see "User Serial ID" above) is displayed in the device window when the system is started.

Controller HW ID

Hardware Identification number.

Controller SW ID

The version numbers of BIOS, FPGA, VGA-BIOS and MTC are given.

Show

Here you can toggle between different operating data, which is collected using the MTC. This data is shown below.

Statistics

```
Show                : Statistics

  Statistics          IPC    FPD
  Power ON Cycles   : 22599  176
  Operating Hours   : 20823  254
  Overtemp. Hours   :     1   19
  Fan Cooler Hours  :   339
```

Figure 184: Statistics

- Power-on cycles
- Operating Hours
- Over-temperature Hours
- Fan cooler hours (operating hours for the fans; optional display units, both fans for controller unit)

See also the section "Operating Data Coverage".

Voltage

```
Show                : Voltage

  2.5 Volt          :   2.515 Volt
  3.3 Volt          :   3.390 Volt
  5.0 Volt          :   5.141 Volt
 12.0 Volt          :  11.994 Volt
 Core               :   1.988 Volt
 Battery            :   3.059 Volt
```

Figure 185: Voltage

The actual values of the IPC's power supply for 2.5 V, 3.3 V, 5.0 V, 12.0 V, processor core and the CMOS battery are shown.

Temperature

```
Show                : Temperature

  CPU Processor     :      52°
  CPU Socket        :      45°
  I/O               :      37°
  FPD               :      31°
  FAN               :    5357RPM
```

Figure 186: Temperature

- CPU processor (internal processor temperature)
- CPU socket
- I/O
- FPD (display unit)
- FAN (rpm of the processor fan)

Alarms

```
Show                :    Alarms

   CPU Temperature  :      OK
   I/O Temperature  :      OK
   FPD Temperature  :      OK
   Battery Status   :      OK
   FAN RPM          :      OK
```

Figure 187: Alarms

A display shows you whether an alarm (over-temperature) for the CPU components, I/O module and display (FPD) is available. Likewise, the status of CMOS battery (ok / bad) and the fan rpm (ok/fail) are displayed.

Skip Ext. Alarm

This setup setting is available starting from Elite BIOS Version 1.09 .

No	Fan alarm evaluation and the communication evaluation between the controller and FPD are activated.
P6 Fan	Fan alarm evaluation is deactivated. No alarm goes off when the fan fails. The communication evaluation between the controller and FPD remains activated and is signaled acoustically.
RS485	Fan alarm evaluation is activated and signaled acoustically. The communication evaluation between the controller and FPD remains activated and is signaled acoustically.
P6Fan+RS485	Fan alarm evaluation and communication evaluation between the controller and FPD are both activated.

3.11 Password Setting

The system password can be set here (min. 4, max. 8 characters). If, when requested to enter password, you exit without pressing Enter, the password function is deactivated (see also the section "BIOS Features Setup, Security Option").

The password entered is also saved in the CMOS Backup, which makes it impossible to delete the password. If the password is forgotten, then the Flash ROM component must be exchanged at B&R.

3.12 IDE HDD Auto Detection

All connected IDE devices are automatically detected when you choose this menu item. When using larger hard disks, you must select between the different data transfer methods (normal, LBA or large) according to each HDD type and size. The LBA Mode is preferred when using Windows systems (see also the section "Standard CMOS Setup, Hard Disks").

3.13 Save & Exit Setup

BIOS Setup Utility is closed with this item. Changes made are saved in CMOS after confirmation.

Note: In order to confirm the execution, the Z key must be pressed when using a German keyboard (US keyboard layout).

3.14 Exit Without Saving

With this item you can close BIOS Setup Utility without saving the changes made in the CMOS.

Note: In order to confirm the execution, the Z key must be pressed when using a German keyboard (US keyboard layout).

3.15 Comparison of BIOS Settings (BIOS Defaults / Setup Defaults)

3.15.1 BIOS Features Setup

Elite BIOS Version	V01.08		V01.09		V01.10		V01.11	
Description	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults
Virus Warning	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
CPU Internal Cache	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
External Cache	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
CPU L2 Cache ECC Checking	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
Processor Number Feature 1)	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
Quick Power On Self Test	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Boot From LAN First	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Boot Sequence	A,C,SCSI	A,C,SCSI	A,C,SCSI	A,C,SCSI	A,C,SCSI	A,C,SCSI	A,C,SCSI	A,C,SCSI
Swap Floppy Drive	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Boot Up Floppy Seek	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
Boot Up NumLock Status	On	On	On	On	On	On	On	On
Gate A20 Option	Normal	Fast	Normal	Fast	Normal	Fast	Normal	Fast
Typematic Rate Setting	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Security Option	Setup	Setup	Setup	Setup	Setup	Setup	Setup	Setup
PCI/VGA Palette Snoop	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Assign IRQ for VGA	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
OS Select for DRAM > 64 MB	Non-OS2	Non-OS2	Non-OS2	Non-OS2	Non-OS2	Non-OS2	Non-OS2	Non-OS2
Report No FDD for WIN 95	No	Yes	No	Yes	No	Yes	No	Yes
Video BIOS Shadow	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
C8000-CBFFF	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
CC000-CFFFF	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
D0000-D3FFF	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
D4000-D7FFF	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
D8000-DBFFF	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
DC000-DFFFF	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled

Table 170: BIOS Features Setup V01.08 to V01.11

1) This function is available with a Coppermine Technology based processor (e.g. Celeron 566/66 or Pentium III 600/100 and Pentium III 850/100).

Elite BIOS Version	V01.13		V01.14		V01.15	
Description	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults
Virus Warning	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
CPU Internal Cache	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
External Cache	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
CPU L2 Cache ECC Checking	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
Processor Number Feature [1)]	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
Quick Power On Self Test	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Boot From LAN First	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Boot Sequence	A,C,SCSI	A,C,SCSI	A,C,SCSI	A,C,SCSI	A,C,SCSI	A,C,SCSI
Swap Floppy Drive	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Boot Up Floppy Seek	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
Boot Up NumLock Status	On	On	On	On	On	On
Gate A20 Option	Normal	Fast	Normal	Fast	Normal	Fast
Typematic Rate Setting	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Security Option	Setup	Setup	Setup	Setup	Setup	Setup
PCI/VGA Palette Snoop	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Assign IRQ for VGA	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
OS Select for DRAM > 64MB	Non-OS2	Non-OS2	Non-OS2	Non-OS2	Non-OS2	Non-OS2
Report No FDD for WIN 95	No	Yes	No	Yes	No	Yes
Video BIOS Shadow	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
C8000-CBFFF	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
CC000-CFFFF	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
D0000-D3FFF	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
D4000-D7FFF	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
D8000-DBFFF	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
DC000-DFFFF	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled

Table 171: BIOS Features Setup V01.13, V01.14 and V01.15

1) This function is available with a Coppermine Technology based processor (e.g. Celeron 566/66 or Pentium III 600/100 and Pentium III 850/100).

3.15.2 Chipset Features Setup

Elite BIOS Version	V01.08		V01.09		V01.10		V01.11	
Description	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults
SDRAM Control by	Manual	SPD	Manual	SPD	Manual	SPD	Manual	SPD
SDRAM RAS-to-CAS Delay	3	2	3	2	3	2	3	2
SDRAM RAS Precharge Time	3	2	3	2	3	2	3	2
SDRAM CAS latency Time	3	2	3	2	3	2	3	2
SDRAM Precharge Control	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
DRAM Data Integrity Mode	Non-ECC	Non-ECC	Non-ECC	Non-ECC	Non-ECC	Non-ECC	Non-ECC	Non-ECC
System BIOS Cacheable	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Video BIOS Cacheable	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Video RAM Cacheable	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
8 Bit I/O Recovery Time	3	1	3	1	3	1	3	1
16 Bit I/O Recovery Time	2	1	2	1	2	1	2	1
Memory Hole At 15M - 16M	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Passive Release	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
Delayed Transaction	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
AGP Aperture Size (MB)	64	64	64	64	64	64	64	64
Auto Detect DIMM/PCI Clk	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
CPU Clock (MHz) / Spread(%)	Default	Default	Default	Default	Default	Default	Default	Default

Table 172: Chipset Features Setup V01.08 to V01.11

Elite BIOS Version	V01.13		V01.14		V01.15	
Description	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults
SDRAM Control by	Manual	SPD	Manual	SPD	Manual	SPD
SDRAM RAS-to-CAS Delay	3	2	3	2	3	2
SDRAM RAS Precharge Time	3	2	3	2	3	2
SDRAM CAS Latency Time	3	2	3	2	3	2
SDRAM Precharge Control	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
DRAM Data Integrity Mode	Non-ECC	Non-ECC	Non-ECC	Non-ECC	Non-ECC	Non-ECC
System BIOS Cacheable	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Video BIOS Cacheable	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Video RAM Cacheable	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
8 Bit I/O Recovery Time	3	1	3	1	3	1
16 Bit I/O Recovery Time	2	1	2	1	2	1
Memory Hole at 15M-16M	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Passive Release	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
Delayed Transaction	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
AGP Aperture Size (MB)	64	64	64	64	64	64
Auto Detect DIMM/PCI Clk	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
CPU Clock (MHz) / Spread(%)	Default	Default	Default	Default	Default	Default

Table 173: Chipset Features Setup V01.13, V01.14 and V01.15

3.15.3 Power Management Setup

Elite BIOS Version	V01.08		V01.09		V01.10		V01.11	
Description	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults
Power Management	User Define	User Define	User Define	User Define	User Define	User Define	User Define	User Define
PM Control by APM	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Video Off Method	DPMS	DPMS	DPMS	DPMS	DPMS	DPMS	DPMS	DPMS
Video Off After	Standby	Standby	Standby	Standby	Standby	Standby	Standby	Standby
Modem Use IRQ	3	3	3	3	3	3	3	3
Doze Mode	Disable	Disable	Disable	Disable	Disable	Disable	Disable	Disable
Standby Mode	Disable	Disable	Disable	Disable	Disable	Disable	Disable	Disable
Suspend Mode	Disable	Disable	Disable	Disable	Disable	Disable	Disable	Disable
HDD Power Down	Disable	Disable	Disable	Disable	Disable	Disable	Disable	Disable
Throttle Duty Cycle	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%
PCI/VGA Act-Monitor	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
PowerOn by Ring	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Resume by Alarm	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
IRQ 8 Break Suspend	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
IRQ[3-7,9-15],NMI	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Primary IDE 0	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Primary IDE 1	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Secondary IDE 0	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Secondary IDE 1	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Floppy Disk	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Serial Port	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
Parallel Port	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled

Table 174: Power Management Setup V01.08 to V01.11

Elite BIOS Version	V01.13		V01.14		V01.15	
Description	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults
Power Management	Disable	Disable	Disable	Disable	Disable	Disable
PM Control by APM	Yes	Yes	Yes	Yes	Yes	Yes
Video Off Method	DPMS	DPMS	DPMS	DPMS	DPMS	DPMS
Video Off After	Standby	Standby	Standby	Standby	Standby	Standby
Modem Use IRQ	3	3	3	3	3	3
Doze Mode	Disable	Disable	Disable	Disable	Disable	Disable
Standby Mode	Disable	Disable	Disable	Disable	Disable	Disable
Suspend Mode	Disable	Disable	Disable	Disable	Disable	Disable
HDD Power Down	Disable	Disable	Disable	Disable	Disable	Disable
Throttle Duty Cycle	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%
PCI/VGA Act-Monitor	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
PowerOn by Ring	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Resume by Alarm	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
IRQ 8 Break Suspend	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
IRQ[3-7,9-15],NMI	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Primary IDE 0	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Primary IDE 1	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Secondary IDE 0	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Secondary IDE 1	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Floppy Disk	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Serial Port	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
Parallel Port	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled

Table 175: Power Management Setup V01.13, V01.14 and V01.15

3.15.4 PNP/PCI Configuration

Elite BIOS Version	V01.08		V01.09		V01.10		V01.11	
Description	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults
PNP OS Installed	No	No	No	No	No	No	No	No
Resources Controlled by	AUTO	Manual	AUTO	Manual	AUTO	Manual	AUTO	Manual
Reset Configuration Data	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
IRQ-3 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
IRQ-4 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP

Table 176: PnP/PCI Configuration V01.08 to V01.11

Elite BIOS Version	V01.08		V01.09		V01.10		V01.11	
Description	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults
IRQ-5 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
IRQ-7 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
IRQ-9 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
IRQ-10 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
IRQ-11 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
IRQ-12 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
IRQ-14 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
IRQ-15 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
DMA-0 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
DMA-1 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
DMA-3 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
DMA-5 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
DMA-6 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
DMA-7 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
PCI IDE IRQ Map to	PCI-AUTO	ISA	PCI-AUTO	ISA	PCI-AUTO	ISA	PCI-AUTO	ISA
Primary IDE INT#:	A		A		A		A	
Secondary IDE INT#	B		B		B		B	
Used MEM Base Addr		N/A		N/A		N/A		N/A
Assign IRQ for USB	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled

Table 176: PnP/PCI Configuration V01.08 to V01.11 (cont.)

Elite BIOS Version	V01.13		V01.14		V01.15	
Description	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults
PNP OS Installed	No	No	No	No	No	No
Resources Controlled by	AUTO	Manual	AUTO	Manual	AUTO	Manual
Reset Configuration Data	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
IRQ-3 Assigned to		Legacy ISA		Legacy ISA		Legacy ISA
IRQ-4 Assigned to		Legacy ISA		Legacy ISA		Legacy ISA
IRQ-5 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
IRQ-7 Assigned to		Legacy ISA		Legacy ISA		Legacy ISA
IRQ-9 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
IRQ-10 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
IRQ-11 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
IRQ-12 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
IRQ-14 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
IRQ-15 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
DMA-0 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
DMA-1 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
DMA-3 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
DMA-5 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
DMA-6 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
DMA-7 Assigned to		PCI/ISA PnP		PCI/ISA PnP		PCI/ISA PnP
PCI IDE IRQ Map to	PCI-AUTO	ISA	PCI-AUTO	ISA	PCI-AUTO	ISA
Primary IDE INT#:	A		A		A	
Secondary IDE INT#	B		B		B	
Used MEM Base Addr		N/A		N/A		N/A
Assign IRQ for USB	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled

Table 177: PnP/PCI Configuration V01.13, V01.14 and V01.15

3.15.5 Integrated Peripherals

Elite BIOS Version	V01.08		V01.09		V01.10		V01.11	
Description	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults
PCI IDE 2nd Channel	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
IDE HDD Block Mode	Disabled	Enabled	Disabled	Enabled	Disabled	Enabled	Disabled	Enabled
On-Chip Primary PCI IDE	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
IDE Primary Master PIO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO
IDE Primary Slave PIO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO
IDE Primary Master UDMA	Disabled	AUTO	Disabled	AUTO	Disabled	AUTO	Disabled	AUTO
IDE Primary Slave UDMA	Disabled	AUTO	Disabled	AUTO	Disabled	AUTO	Disabled	AUTO
On-Chip Secondary PCI IDE	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
IDE Secondary Master PIO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO
IDE Secondary Slave PIO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO
IDE Secondary Master UDMA	Disabled	AUTO	Disabled	AUTO	Disabled	AUTO	Disabled	AUTO
IDE Secondary Slave UDMA	Disabled	AUTO	Disabled	AUTO	Disabled	AUTO	Disabled	AUTO
USB Keyboard Support	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Init Display First	PCI Slot	PCI Slot	PCI Slot	PCI Slot	PCI Slot	PCI Slot	PCI Slot	PCI Slot
PS/2 Mouse Control	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
Onboard FDC Controller	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
Onboard Serial Port 1	3F8/IRQ4	3F8/IRQ4	3F8/IRQ4	3F8/IRQ4	3F8/IRQ4	3F8/IRQ4	3F8/IRQ4	3F8/IRQ4
Onboard Serial Port 2	2F8/IRQ3	2F8/IRQ3	2F8/IRQ3	2F8/IRQ3	2F8/IRQ3	2F8/IRQ3	2F8/IRQ3	2F8/IRQ3
UR2 Mode	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
Onboard Parallel Port	378/IRQ7	378/IRQ7	378/IRQ7	378/IRQ7	378/IRQ7	378/IRQ7	378/IRQ7	378/IRQ7
Parallel Port Mode	SPP	SPP	SPP	SPP	SPP	SPP	SPP	SPP

Table 178: Integrated Peripherals V01.08 to V01.11

Elite BIOS Version	V01.13		V01.14		V01.15	
Description	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults
PCI IDE 2nd Channel	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
IDE HDD Block Mode	Disabled	Enabled	Disabled	Enabled	Disabled	Enabled
On-Chip Primary PCI IDE	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
IDE Primary Master PIO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO
IDE Primary Slave PIO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO
IDE Primary Master UDMA	Disabled	AUTO	Disabled	AUTO	Disabled	AUTO
IDE Primary Slave UDMA	Disabled	AUTO	Disabled	AUTO	Disabled	AUTO
On-Chip Secondary PCI IDE	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
IDE Secondary Master PIO						
IDE Secondary Slave PIO						
IDE Secondary Master UDMA						
IDE Secondary Slave UDMA						
USB Keyboard Support	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Init Display First	PCI Slot	PCI Slot	PCI Slot	PCI Slot	PCI Slot	PCI Slot
PS/2 Mouse Control	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
Onboard FDC Controller	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
Onboard Serial Port 1	3F8/IRQ4	3F8/IRQ4	3F8/IRQ4	3F8/IRQ4	3F8/IRQ4	3F8/IRQ4
Onboard Serial Port 2	2F8/IRQ3	2F8/IRQ3	2F8/IRQ3	2F8/IRQ3	2F8/IRQ3	2F8/IRQ3
UR2 Mode	Standard	Standard	Standard	Standard	Standard	Standard
Onboard Parallel Port	378/IRQ7	378/IRQ7	378/IRQ7	378/IRQ7	378/IRQ7	378/IRQ7
Parallel Port Mode	SPP	SPP	SPP	SPP	SPP	SPP

Table 179: Integrated Peripherals V01.13, V01.14 and V01.15

3.15.6 Additional Peripherals

Elite BIOS Version	V01.08		V01.09		V01.10		V01.11	
Description	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults
Display Type	1)							
Name								
Mode	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO
FPD Contrast	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO
FPD Brightness	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO
CAN Detected I/O Port Assigned IRQ								
PCMCIA Detected I/O Port								
Hardware Security Key assigned Onboard [I/O]	Disable	Disable	Disable	Disable	Disable	Disable	Disable	Disable
Detected IFBoard [I/O]								
MTC Communication Assigned I/O Port	110h	110h	110h	110h	110h	110h	110h	110h
User Serial ID	No	No	No	No	No	No	No	No
Show	0000 0000	0000 0000	0000 0000	0000 0000	0000 0000	0000 0000	0000 0000	0000 0000
Show	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
Skip Ext. Alarm	(not supported)	(not supported)	No	No	No	No	No	No

Table 180: Additional Peripherals V01.08 to V01.11

1) Depends on the connected display type

Elite BIOS Version	V01.13		V01.14		V01.15	
Description	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults
Display Type	1)					
Name						
Mode	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO
FPD Contrast	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO
FPD Brightness	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO
CAN Detected I/O Port						
Assigned IRQ						
PCMCIA Detected I/O Port						
Hardware Security Key assigned Onboard [I/O]	Disable	Disable	Disable	Disable	Disable	Disable
Detected IFBoard [I/O]						

Table 181: Additional Peripherals V01.13, V01.14 and V01.15

Elite BIOS Version	V01.13		V01.14		V01.15	
Description	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults	BIOS Defaults	Setup Defaults
MTC Communication Assigned I/O Port	110h	110h	110h	110h	110h	110h
User Serial ID	No	No	No	No	No	No
Show	0000 0000	0000 0000	0000 0000	0000 0000	0000 0000	0000 0000
Show	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
Skip Ext. Alarm	No	No	No	No	No	No

Table 181: Additional Peripherals V01.13, V01.14 and V01.15 (cont.)

1) Depends on the connected display type

4. BIOS Upgrade

To upgrade your BIOS to a newer version, you will need the Provit 5000 Upgrade diskette, which is found on the Provit Drivers & Utilities CD-ROM (model number 5S0000.01-090) or downloaded directly from the support area of the B&R homepage (www.br-automation.com).

An upgrade might be necessary for several reasons:

- BIOS was destroyed or damaged and the IPC can no longer be booted.
  (for booting in the Recovery Mode and subsequent BIOS upgrade, see the section "Recovery-Jumper / User-Jumper").
- To upgrade functions implemented in BIOS Setup or to add new functions or components.
- To guarantee MTC function libraries on Provit 5000 IPCs
  (see also section "MTC function libraries").

To carry out a BIOS Upgrade, the following steps should be taken:

First, the diskette must be made bootable (commando line "sys a:" or "format a: /s")

Insert diskette in the disk drive or LS-120 drive and boot from this. The settings which have to be made in the BIOS are included in the Table 43, "BIOS settings for booting an IPC5600/5600C with different peripheral devices", on page 72.
This appears after booting from the diskette in the following start menu:

```
Start Menu for MS-DOS 6.22
==========================

1. Upgrade complete System (BIOS, VGA, MTC)
2. Upgrade VGA only
3. Upgrade ELITE BIOS only
4. Upgrade MTC only
5. Upgrade FPC only
6. Start Upgrde Utility
7. Exit to MS-DOS

Select the option you require.
```

Figure 188: Start menu BIOS Update IPC5000/5600 (V1.56 or higher)

```
Start Menu for MS-DOS 6.22
==========================

1. Upgrade complete System (BIOS, VGA, MTC, FPGA)
2. Upgrade VGA only
3. Upgrade Elite BIOS only
4. Upgrade MTC only
5. Upgrade FPC only
6. Upgrade FPGA only
7. Start Upgrade Utiltity
8. Exit to MS-DOS

Select the option you require:
```

Figure 189: Start menu BIOS Update IPC5000C/5600C (V1.05 or higher)

If you do not press a button within 5 seconds, then step 1 (Upgrade Complete System) is automatically carried out and the system independently updated.

If you want to individually upgrade BIOS, VGA-BIOS or MTC, then you can either select option 2, 3 or 4 in the start menu or menu item 5 (Start Upgrade Utility). With this utility, you can both manually carry out BIOS upgrades and also protect existing Firmware on the diskette.

A more detailed description can be found in the readme files on the diskette.

4.1 Upgrade Utility

If the Start Upgrade Utility option (described in the above MS-DOS Start Menu) is selected, then the following screen content appears after a short while:

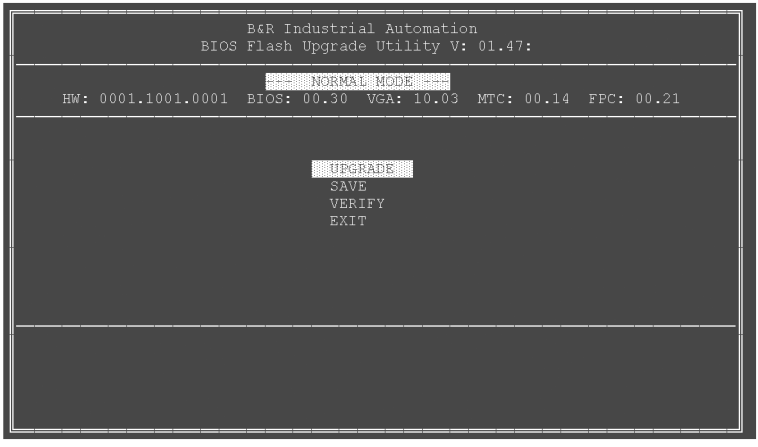


Figure 190: BIOS Upgrade Utility Main Menu

After selecting one of the functions, a further menu shows the components in which the selected function can be used (in the example: Upgrade). The following figure corresponds to the upgrade utility for IPC5000/5600 system units:

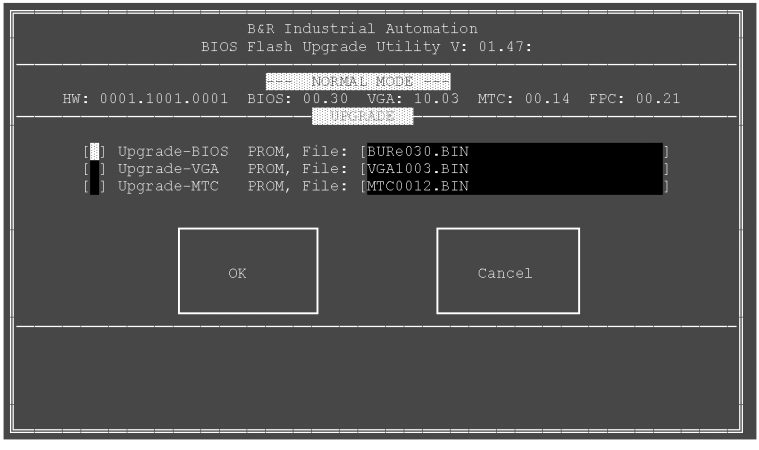


Figure 191: BIOS Upgrade Utility - Upgrade

The components must be selected with the spacebar. This selection is confirmed with OK and then the procedure is started.

4.2 Upgrade without Monitor/Display

A BIOS upgrade can also be carried out, if there is no visualization device (display or monitor) available. The messages are emitted acoustically by the PC speaker. The following coding is used:

4.2.1 Status Messages During Upgrades

All status messages consist of a long tone followed by one or more short tones.

Status Messages	
Short Tones	Meaning
1	Beginning of a file load
2	Beginning the algorithm upgrade
3	Beginning deletion of the FlashPROM
4	Beginning of writing the data in FlashPROM
5	Programming is ended

Table 182: Acoustic status messages

4.2.2 General Messages

General Messages			
Long Tone	Short Tones	Message	Necessary User Action
3	0	/h option specified for the non existent VGA	
4	4	The boot block write protect switch has not been set to Write Enable [1)]	Set the switch to Write Enable and press Enter to continue (see the section "Boot Block Switch")
1 [2)]	-	Leave the diskette in the drive and press Reset. The system is completely updated after the reset	Press the Reset button and let the system upgrade completely

Table 183: General acoustic messages

1) After approx. 20 seconds the upgrade tool tries to write again on the boot block. If this is unsuccessful, its repeats this procedure.
2) This continuous tone is emitted until a reset is triggered.

4.2.3 Error Messages

All status messages consist of a long tone followed by one or more short tones.

Error Messages		
Short Tones	**Message**	**Necessary User Action or Cause**
1	Wrong memory model	Start "Flat DOS" 1)
2	Upgrade file not found	Error with opening a necessary file
3	Wrong or no answer from the Flash identifier	Wrong Flash – wrong upgrade program for this computer system
4	Error in the upgrade file (required code is missing or checksum is wrong)	Wrong file or a upgrade file from another computer system given
5	Error reserving memory	Too little base memory – start Flat DOS" 1)
6	Error reading the upgrade files	File is too short – wrong or defective
7	Error deleting Flash	Flash defect, programming voltage not available
8	Error deleting Flash	Flash defect, programming voltage not available
9	IPCXXUPG.CFG not found or error in opening	File not available or defective
10	Error in initializing the MTC communication	Wrong computer system or MTC defect
11	Error reading out the versions (MTC, FPGA)	Wrong computer system, MTC defect, MTC in recovery mode
12	Error writing to the MTC (wrong checksum)	Data is wrong
13	-	
14	Error removing an MTC command	Wrong computer system, MTC defect
15	Wrong or missing answer from the MTC	Wrong computer system, MTC defect

Table 184: Acoustic error messages

1) "Flat DOS" = no driver device or program in "autoexec.bat" and "config.sys", i.e. only loaded in "command.com".

4.2.4 Award BIOS Alarm Signals

While the Provit 5000 IPC is booting, errors can occur with Award BIOS (see table below). These errors are signaled by different alarm signal codes.

Long Tones	Short Tones	Meaning	Necessary User Action
	1	Everything OK	
1		Memory problem, RAM components are not set correctly or are defective.	Check RAM components, replace if necessary
1	2	Video problem, graphic card or graphic chip defect or not sitting properly.	Check graphic card, replace if necessary

Table 185: Award BIOS error signals

5. Provit 5000 Utilities

Provit 5000 Utilities contain the following components which can be found on the Provit Drivers & Utilities CD-ROM or can be downloaded directly from B&R's homepage (www.br-automation.com).

- MTC Function Libraries

Only MTC function libraries are covered in this manual. Additional information on other topics is available in the Provit 5000 Utilities Software Packet.

5.1 MTC Function Libraries

The necessary libraries for all MTC service and safety functions are available in Provit 5000 Utilities (see the section "Maintenance Controller MTC"). Examples of these functions are:

- Operating Data Coverage
- Collection of the temperature values in the IPC
- Display of the battery status
- Read out brightness and contrast values of the display and change etc.

The MTC libraries are available both in 16 bit and 32 bit technology. This means they can be used with 16 bit and 32 bit operating systems (MS DOS, MS Windows 3.x and MS Windows 95/98/ME/2000).

5.1.1 Function Diagram

Firstly, a start address is determined (according to the 16 bit or 32 bit operating system) in BIOS. If this is successful, then all necessary variables are stored internally, which makes communication possible between the MTC or BIOS.

The following block diagram shows the MTC function libraries design:

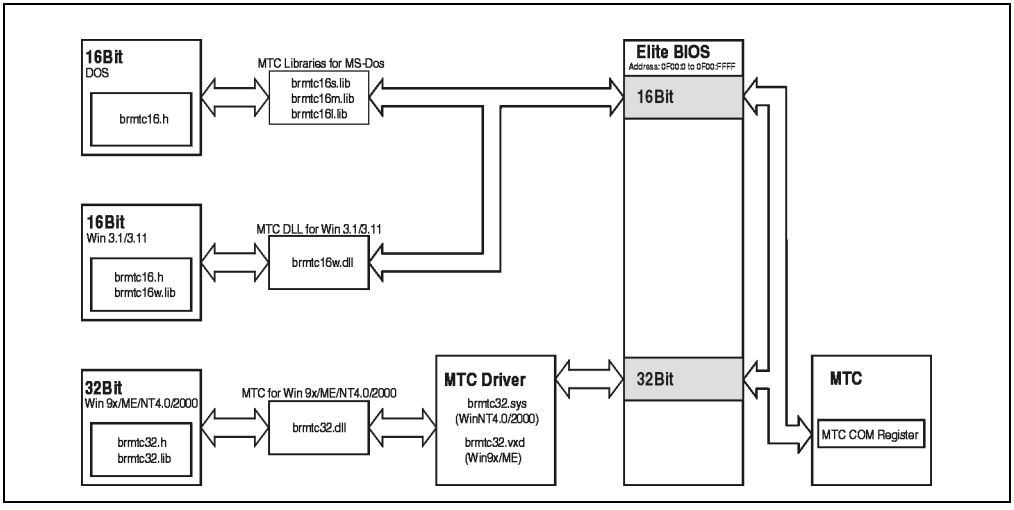


Figure 192: MTC function libraries

Further information and instructions about the specific application of these functions are included as documentation in the Provit 5000 Utilities Software Packet.

5.1.2 MTC Diagnose Tool

A program for demonstrating all the functions contained in the 32 bit DLL library is available in Provit 5000 Utilities. If you have correctly installed Provit 5000 Utilities (MTC Driver and MTC Diagnose are mandatory), then you receive a window (see screenshot) which is inserted into the setup program in the Windows start menu after the MTC Diagnose program starts:

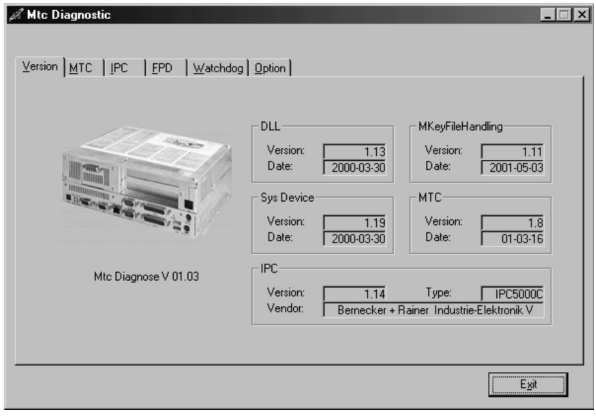


Figure 193: MTC Diagnose Screenshot

The following data is available on the register cards listed below:

Register Card	Function
Version	Version numbers of the different software components
MTC	Reads and configures key assignments and LED status
IPC	IPC Statistic values
FPD	FPD Statistic values
Watchdog	A watchdog timer is included in the MTC
Option	Set cyclic query times for the operating data

Table 186: MTC Diagnose

A more detailed description of the MTC Diagnose tool is given after the standard installation of the program (starting from V1.09) in the software documentation. This is then stored in the installation path ...\BrAutomation\Drivers\MTC\Doc\.

In order to guarantee that MTC function libraries run on Provit 5000 IPCs, the latest BIOS Upgrade must be always be used.

6. Assignment of Resources

6.1 RAM Address Assignments

RAM Address	Resource
000000h - 0003FFh	Interrupt Vectors
000400h - 09FFFFh	MS-DOS Programs
0A0000h - 0AFFFFh	VGA Graphics
0B8000h - 0BBFFFh	VGA Text Mode
0C0000h - 0C9FFFh	VGA BIOS
0CA000h - 0CBFFFh	Reserved
0D0000h - 0DFFFFh	According to PnP standard, the expansion is placed at the first free position.
0E0000h - 0EFFFFh	Free
0F0000h - 0FFFFFh	Award Elite BIOS
100000h -	DRAM

Table 187: RAM address assignments

6.2 DMA Channel Assignments

DMA Channel	Resource
0	Free
1	Free
2	Disk Drive
3	LPT1 (ECP) [1)]
4	Reserved
5	Free
6	Free
7	Free

Table 188: DMA channel assignments

1) Default setting: Only valid when the setting ECP is selected in the BIOS Setup for LPT1 (see the section "Integrated Peripherals"). Otherwise, freely available.

6.3 UMA Memory Assignments

The upper memory area (UMA) is the memory area in RAM from 640 KB to 1024 KB.

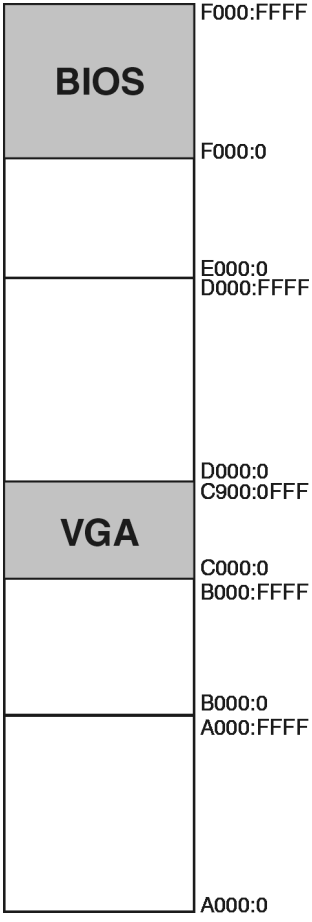


Figure 194: UMA memory assignments

6.4 I/O Address Assignments

I/O Address	Resource
000h - 01Fh	DMA Controller 1
020h - 03Fh	Interrupt Controller 1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 071h	Real-time Clock, NMI Mask, CMOS
080h	Debug Port (POST Code)
081h - 09Fh	Page Register DMA Controller
0A0h - 0BFh	Interrupt Controller 2
0C0h - 0DFh	DMA Controller 2
0F0h - 0FFh	FPU
170h - 177h	Res. Sec. Hard Disk
1F0h - 1F8h	Prim. Hard Disk
278h - 27Fh	Hardware Security Key
2F8h - 2FFh	COM2 1)
376h - 377h	Res. Sec. Hard Disk
378h - 37Fh	LPT1
384h - 385h	CAN Controller
3B0h - 3BFh	Monochrome Display
3C0h - 3DFh	VGA Display
3E0h - 3E1h	PC Card Controller 2)
3F0h - 3F7h	Floppy Controller
3F8h - 3FFh	COM1 1)
LPT1 + 400h	ECP Port, LPT+400h 1)
CF8h - CFBh	PCI Config Address Register
CFCh - CFFh	PCI Config Data Register
FF00h - FF07h	IDE Bus Master Register

Table 189: I/O address assignments

1) Default setting
2) Only if a B&R interface board is present in the IPC (see the section "Interface Board")

6.5 Interrupt Assignments

IRQ		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	NMI	NONE
System Timer		●																	
Keyboard			●																
IRQ Cascade				●															
COM1					❍	●	❍	❍	❍		❍	❍	❍	❍		❍			❍
COM2					●	❍	❍	❍	❍		❍	❍	❍	❍		❍			❍
LPT1					❍	❍	❍	❍	●		❍	❍	❍	❍		❍			❍
PS/2 Mouse														●					
FDD								●											❍
Real-time Clock										●									
Coprocessor															●				
Hard Disk Prim.																●			
Hard Disk Sec.																	❍		●
B&R	COM3 1)				❍	❍	❍		❍		❍	❍	●	❍		❍	❍		❍
	COM4 1)				❍	❍	❍		❍		❍	❍	❍	●		❍	❍		❍
	Ethernet 2)				❍	❍	●					❍	❍	❍			❍		❍
	PC Card				❍	❍	❍		❍		❍	❍	❍	❍		❍	❍		●
	CAN											❍						❍	●

Table 190: Interrupt assignments

1) When assigning resources to PnP devices COM3 and COM4, see section "Serial Interfaces COM3 and COM4"
2) For the assignment of resources for the Plug&Play-Ethernet-Controller see section "Ethernet Controller"

● ... Default Setting
❍ ... Optional Setting

Chapter 7 • Accessories

1. RS232 Interface Board 5A1102.00-090

1.1 General Information

The RS232 interface board can be used in all AT compatible PCs. This interface board requires a small slot. It is equipped with two electrically isolated serial RS232 interfaces, which can be configured alternatively as COM1/COM2 or COM3/COM4. With jumpers on the board, both RS232 interfaces can be assigned interrupt numbers (IRQ 3, 4, 5, 7, 10 or 11) .

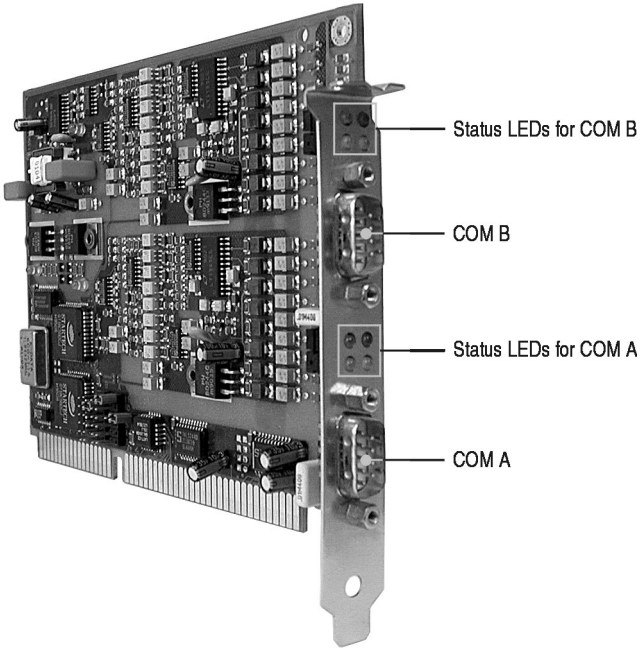


Figure 195: RS232 interface board

1.2 Pin Assignment

RS232 Interface			
Pin	Product ID	Function	
1	DCD	Input	
2	RXD	Input	
3	TXD	Output	
4	DTR	Output	
5	GND	Electrically isolated from Chassis GND	
6	DSR	Input	
7	RTS	Output	
8	CTS	Input	
9	RI	Input	

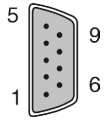


Table 191: Pin Assignment RS232 Interface

1.3 Status LEDs

Both RS232 interfaces are each equipped with four status LEDs for transmit, receive and handshake lines.

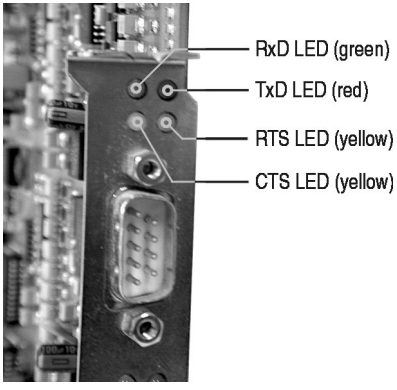


Figure 196: RS232 interface board LEDs

1.4 Jumper Settings

With jumpers on the board, the following settings can be made:

- Interface description (COM1/COM2 or COM3/COM4)
- IRQ Allocation (IRQ 3, 4, 5, 7, 10, or 11)

Jumper Position:

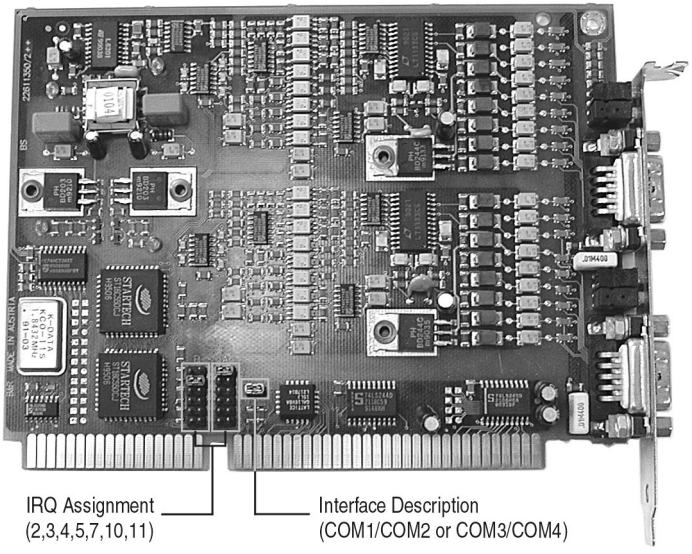


Figure 197: Jumper Position

1.4.1 Interface Description (COM1/COM2 or COM3/COM4)

If the jumper is inserted (default setting when the board is delivered), both RS232 interfaces are used as COM3 and COM4. The lower DSUB plug is COM3, the upper one is COM4. If the jumper is not inserted, both interfaces are used as COM1 and COM2 (COM1 below).

1.4.2 IRQ Setting

Both interfaces are assigned IRQ numbers with both jumper rows (see picture on the previous page).

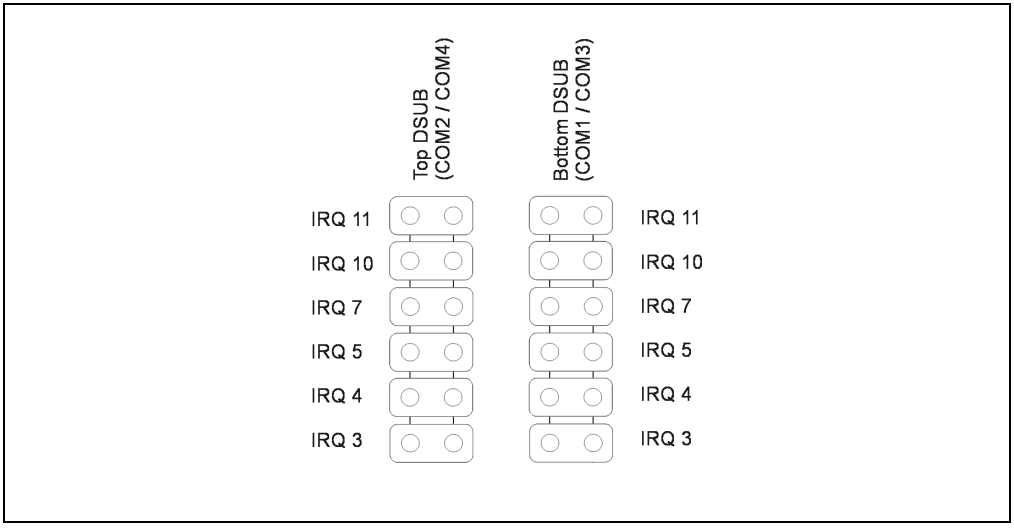


Figure 198: IRQ jumper

Only one jumper can be inserted in each jumper row. The IRQ numbers for both interfaces must be different. The IRQs used are not allowed to be engaged with other boards in the system.

1.4.3 Configuration Examples

Example 1: The B&R RS232 board is the only interface board in a PC. Interface boards should be used as COM1 and COM2 (COM1 = IRQ 4 and COM2 = IRQ 3):

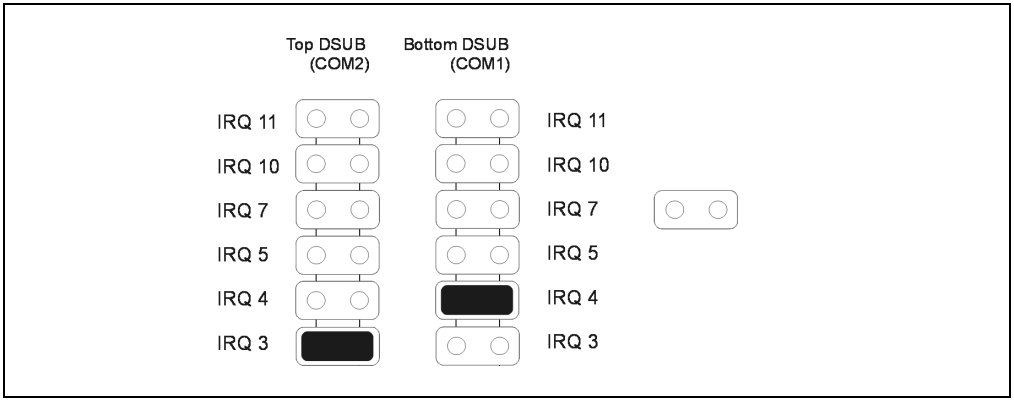


Figure 199: IRQ Setting Example 1

Example 2: A PC is already equipped with two serial RS232 interfaces, which are used as COM1 and COM2 (IRQ 4 and IRQ 3). B&R RS232 board interfaces are to be set as COM3 and COM4. The interrupt numbers 5 and 7 are already used for one network card and a parallel interface board. IRQ numbers 11 and 10 must be configured for COM3 and COM4.

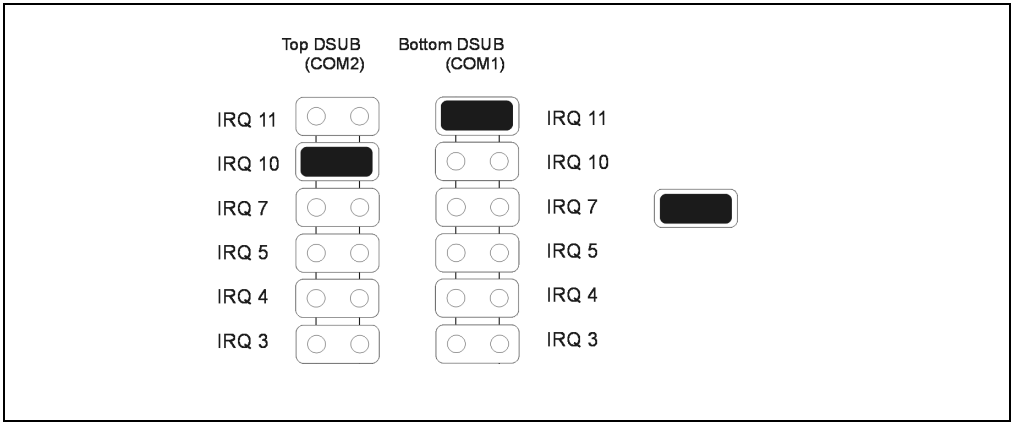


Figure 200: IRQ Setting Example 2

2. External Disk Drive 5A2001.01

2.1 General Information

An external FDD can be connected to a Provit 5000/5600 series IPC interface (see also the section "Interface for External Floppy Disk Drive").

2.2 Photo

Figure 201: External floppy disk drive (beige front plate)

2.3 Connection

The connection is made using a standard Centronics cable via a 25 pin DSUB socket.

The length of the Centronics cable (the distance between controller and floppy disk drive) is allowed to be a maximum of 1.8 m.

2.4 Technical Data

External Disk Drive	
Diskette Format	3.5" (to 1.44 MB)
Dimensions (W x H x D)	72 x 144 x 163 mm
Cutout Size	138+1 x 68 + 0.7 mm
Operating Temperature	0 - 55 °C
Relative Humidity	5 - 95%, (non-condensing)
Power Consumption	2.9 W

Table 192: Technical data for external disk drive

Because of general PC specifications, this interface should be handled with extreme care with regard to EMC, location of cables etc. It should therefore only be used for service.

An optional cover, which can be locked (IP55 protection) is also available.

2.5 Installation

The disk drive is integrated into a housing, suitable for installation on a control panel. It can also be installed using an installation plate, which also provides space for two optional entry devices (e.g. switch):

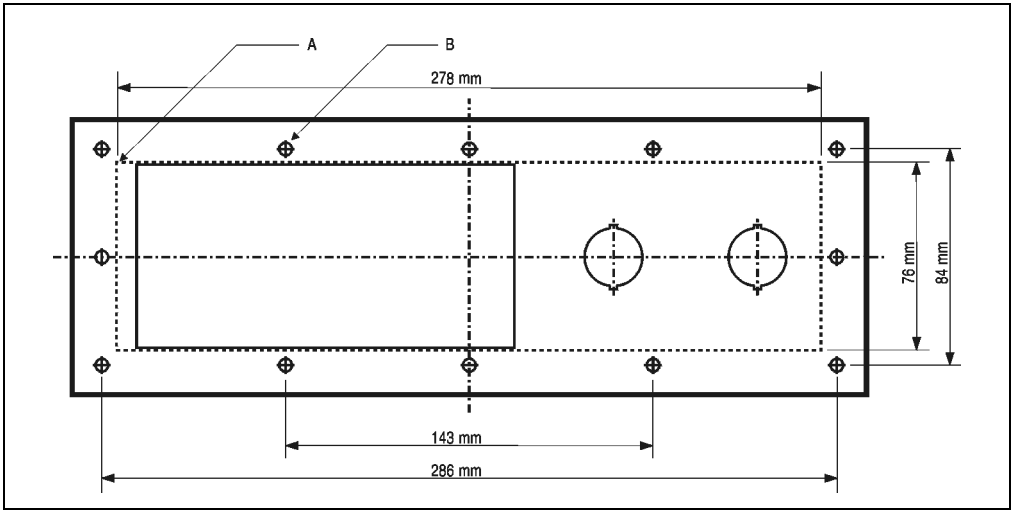


Figure 202: Front plate for external floppy disk drive

2.6 Order Data

Model Number	Description
5A2001.01	External 3.5 inch (88.9 mm) 1.44 MB floppy disk drive (beige front) in a housing that is designed to be installed in a control panel. There is no cable included in the delivery (Standard Centronics Cable 9A0005.01). Color: PS/2 beige.
5A2001.05	External 3.5 inch (88.9 mm) 1.44 MB floppy disk drive (black front) in a housing that is designed to be installed in a control panel. There is no cable included in the delivery (Standard Centronics Cable 9A0005.01). Color: black
5A2001.02	Transparent door with sealed lock suitable for external disk drive . IP55 protection (from front). Suitable for the external floppy disk drive 5A2001.01 and 5A2001.05
5A2500.01	Front plate for installing an external floppy disk drive and two optional push buttons.
9A0005.01	Centronics Cable (1.8 m) for connecting to a printer or an external disk drive.

Table 193: Order data for external FDD

3. External CD-ROM Drive 9A0011.02

3.1 General Information

If an SCSI adapter with an external DB50mini-connector (order no. 9A0010.02) is present in the IPC, it can be used to operate the external CD-ROM drive.

3.2 Photo

Figure 203: External CD-ROM drive

3.3 Power Supply

The 40 slot CD-ROM drive is installed in a desktop housing and requires an external power supply (100 to 240 VAC).

3.4 Order Data

Model Number	Description
9A0011.02	External SCSI CD-ROM; PS100-240 VAC External 40 slot CD-ROM drive in desktop housing. Power supply 100 – 240 VAC. Documentation and software included. DB50mini connector.
9A0010.02	PCI Ultra SCSI Adapter AHA 2940AU. PCI card for operating SCSI devices to a PC. Documentation and software (without cable) included. DB50mini connector.
9A0012.01	SCSI cable DB50mini (1.8 m). Cable for operating an external SCSI CD-ROM drive to a PCI Ultra SCSI adapter

Table 194: External CD-ROM drive order data

4. Remote CD ROM / LS -120 Drive 5A5003.02

Figure 204: Symbol photo 5A5003.02 with 5A5003.03

For the 5C5001.21 system unit on the IPC5000C, it is possible to connect an external CD ROM / LS-120 drive combination (5A5003.02) with a mega line cable (model no. 5A5004.05 5 m and 5A5004.10 10 m) to the special 9 pin DSUB socket present on the IPC. An external supply voltage is not necessary because the drive is supplied by the system unit. It is also possible to boot from this drive.

4.1 Dimensions

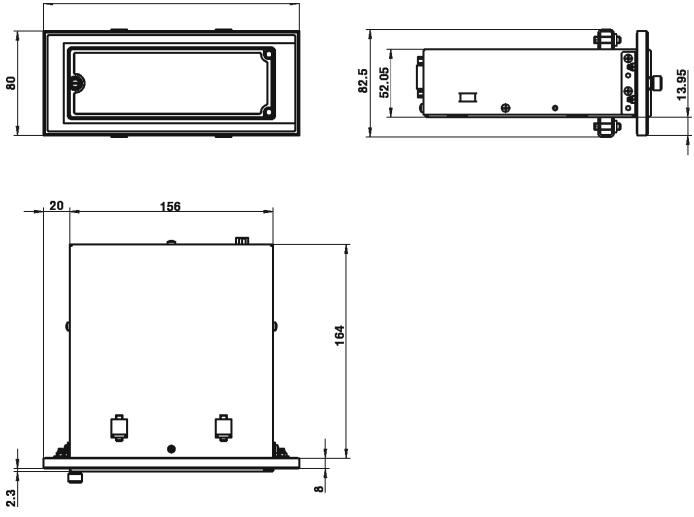


Figure 205: Dimensions 5A5003.02 with 5A5003.03

4.2 Mounting Instructions

The remote CD ROM / LS-120 drive can be mounted both vertically and horizontally (tolerance 12°; see figure "Mounting Vertical / Horizontal Remote CD ROM / LS-120 Drive").

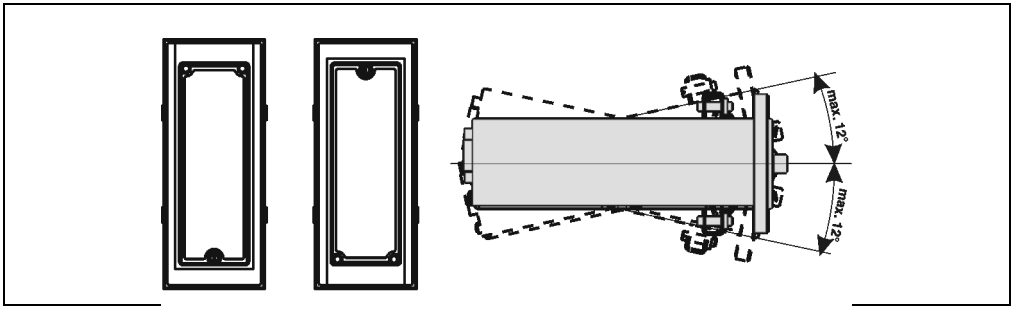


Figure 206: Mounting instructions for remote CD ROM / LS-120 drive (vertical/horizontal)

4.3 Mounting Methods

It is possible to mount the remote CD-ROM LS-120 drive in two different ways.

4.3.1 Table Mounting

Four rubber feet are included in the delivery to facilitate this mounting option for standard devices (5A5003.02).

4.3.2 Mounting with Front Cover

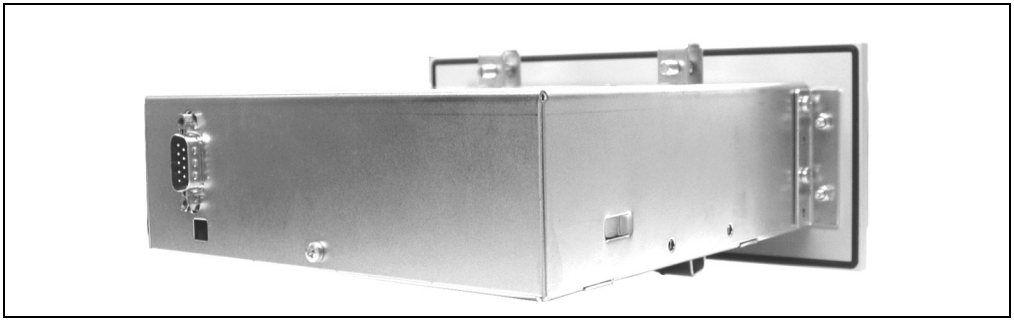


Figure 207: Mounting method with front cover

The front cover must be ordered separately (5A5003.03). The material for mounting is enclosed.

4.4 Technical Data

External Remote CD ROM / LS -120 Drive	
LS-120	3.5" drive 1.44 MB / 120 MB disks
CD-ROM	24x
Measurements in mm (W x H x D) Remote IDE CD ROM LS-120	156 x 52 x 164
Measurements in mm (W x H x D) Remote IDE CD ROM LS-120 with front cover	196 x 80 x 172
Operating Temperature Relative Humidity	 5 - 45 °C 20 to 80 % (non condensing)
Storage Temperature Relative Humidity	 -20 to 60 °C 8 - 90 %, (non-condensing)
Power Consumption	Approx. 8.4 Watt (both drives in Read Mode)

Table 195: Technical data for the remote CD ROM / LS -120 drive

4.5 Accessories

The remote CD ROM / LS-120 drive can be also mounted using a front cover, which can be ordered from B&R (model no. 5A5003.03).

Figure 208: Remote IDE front cover , 5A5003.03

5A5003.03	Remote IDE Front Cover
Front cover design / colors Dark grey border around the cover Light grey background	 Pantone 432c Pantone 427c

Table 196: Color remote IDE front cover

4.6 Model Numbers

Model Number	Description
5A5003.02	**Remote CD ROM / LS -120 drive** incl. Mounting bracket and rubber feet, without front cover, for connection with a 5C5001.21 system unit, dimensions 156 x 52 x 164 mm (W x H x D)
5A5003.03	**Remote IDE Front Cover** For remote CD ROM / LS -120 drive 5A5003.02
5A5004.05	Remote cable 5 m
5A5004.10	Remote cable 10 m

Table 197: Model numbers for external Remote CD ROM / LS -120 drive

5. Provit 5000 Controller Add-On CD ROM 5A5009.01

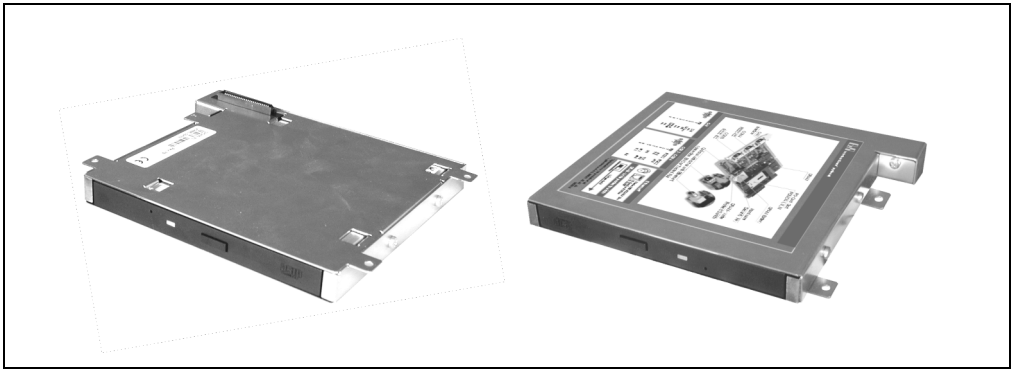


Figure 209: Provit 5000 Controller Add-On CD-ROM 5A5009.01

This drive can be operated together with the bus units (5C5000.2x and 5C5000.3x), which are prepared on the back (see Figure 210: "Bus Unit Connector").

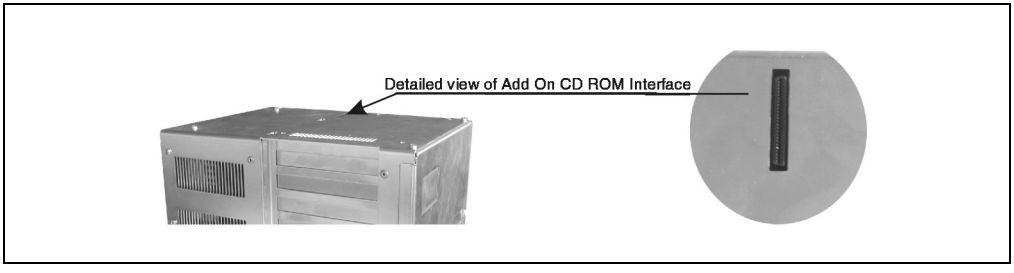


Figure 210: Bus unit connector

The add-on CD ROM drive is mounted on the bus unit with the 4 screws included in the delivery.

Figure 211: Provit 5000 controller add-on CD ROM 5A5009.01 (mounted)

By using a slimline drive, installation depth is only marginally increased by 16 mm.

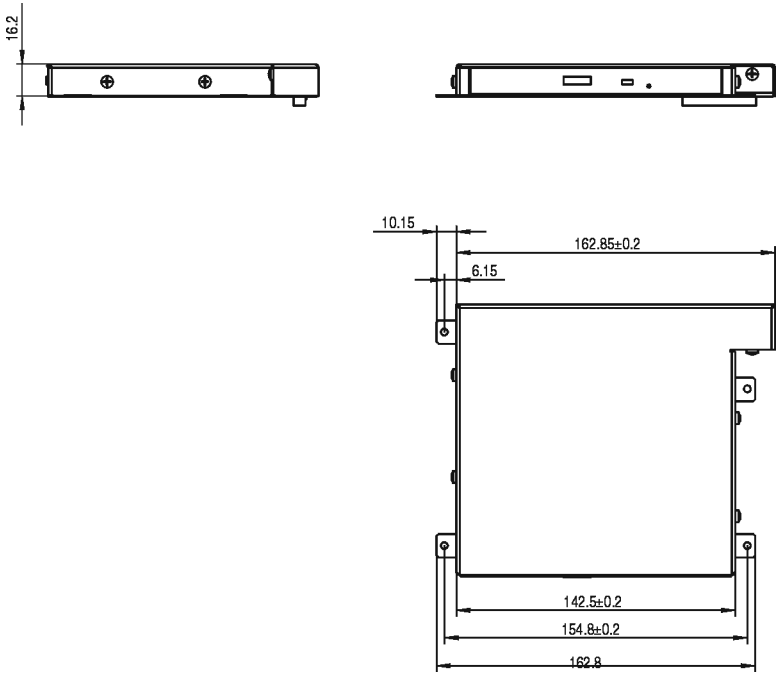


Figure 212: Dimensions for the add-on CD ROM 5A5009.01

5.1 Mounting Instructions for the Add-On CD ROM with Controller

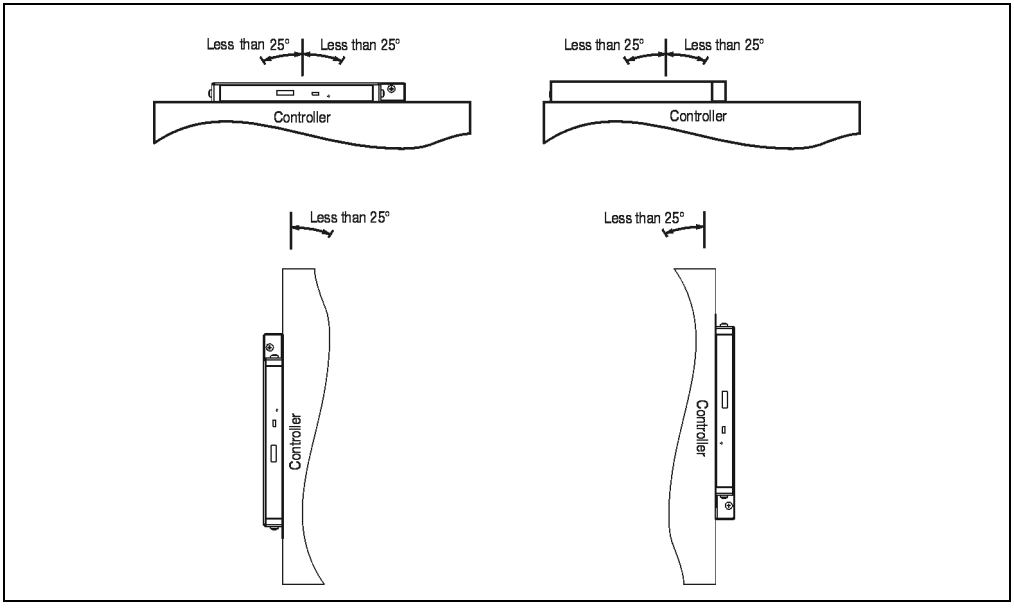


Figure 213: Mounting guidelines for add-on CD ROM with controller

5.2 Technical Data

Provit 5000 Controller Add-On CD ROM 5A5009.01 Drive	
CD-ROM	24x
Dimensions	See Figure 212: “Dimensions for the add-on CD ROM 5A5009.01”.
Operating Temperature Relative Humidity	 5 - 55 °C 8 to 80 % (non condensing)
Storage Temperature Relative Humidity	 -20 to 60 °C 5 - 90 %, (non-condensing)
Power Consumption	Stand By: 0.1 W Average: 4 W (Read) Peak: 7 W (ejection of CD)

Table 198: Technical data for the add-on CD ROM 5A5009.01

6. Hardware Security Key Parallel Adapter 9A0003.01

This adapter also allows the Hardware Security Key (Dongle) to be externally operated on the parallel port.

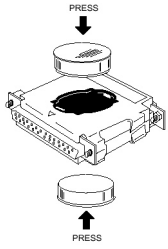


Figure 214: Hardware Security Key parallel adapter

Features:

- A parallel interface for Dallas Hardware Security Keys is available
- Requires no external energy source
- Functions concurrently with other parallel devices
- Supports the following operating system: MS DOS, OS/2, Windows, Windows NT, QNX, PC UNIX based
- Is used to protect installed applications in a system

Model Number	Description
9A0003.01	Dallas Key Ring adapter for operating the Dallas dongle on a parallel PC interface

Table 199: Hardware Security Key Parallel Adapter order data

7. Provit 5600 Keyboard 5E9600.01-010 and 5E9600.01-020

The Provit 5600 keyboard is an IBM compatible AT enhanced keyboard for front mount installation in 19" format. The connection is made using the AT PS/2 socket of the Provit IPC (see the section "Connection for AT Keypad"). The keyboard is available in German and US English layouts.

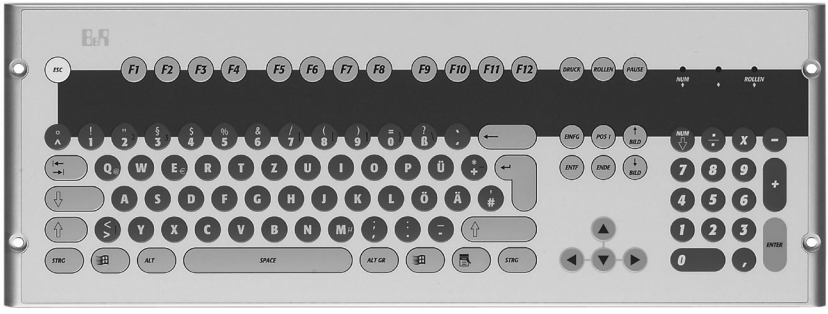


Figure 215: AT keyboard (US keyboard layout)

Model Number	5E9600.01-010 (German Keyboard Layout) 5E9600.01-010 (US Keyboard Layout)
Short Text	IBM compatible AT enhanced keyboard for front mount installation in 19 inch (482.6 mm) format
Front	IP65, dust and sprayed water protection (from front)
Frame	Aluminum anodized
Gasket	Flat gasket around display front
Weight	Approx. 2.1 kg
Operating Temperature	0 - 55°C
Relative Humidity	5 - 95%, (non-condensing)
Outer Dimensions (W x H x D)	482.6 x 177 x 35 (19 inch x 4 HE)

Table 200: Technical data for AT keyboard

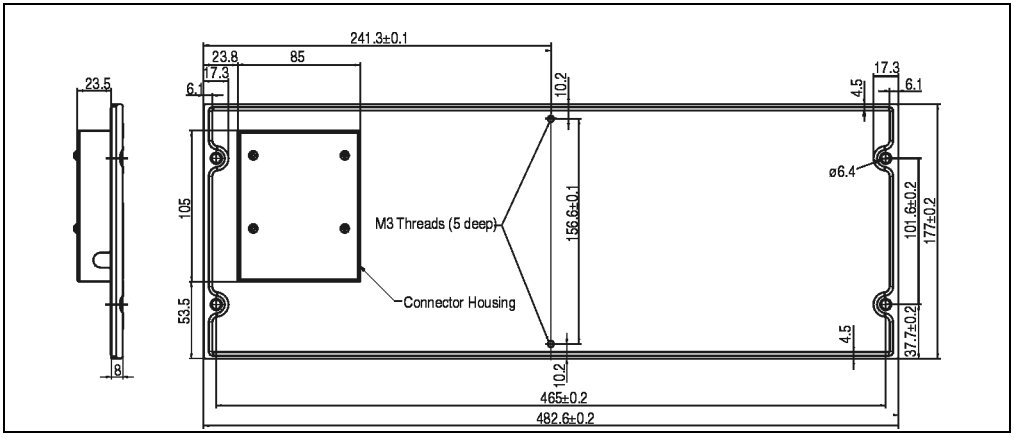


Figure 216: Installation dimensions 19" AT keyboard (figure overleaf)

8. Remote Display Cable 5A5004.xl

Model Number	5A5004.01	5A5004.02	5A5004.05	5A5004.06	5A5004.10	5A5004.11
Length	0.6 m	1.8 m	5 m	5 m 1 x 70°	10 m	10 m 1 x 70°
Manufacturer's Product ID	Kerpen Megaline 8					
Outer Diameter	Max. 9.5 mm					
Cable Category	S/STP					
Shielding	Each individual cable pair and entire cable					
Number of Cable Pairs	4					
Wave Impedance	100 Ω					
Wire Cross Section	AWG 22					

Table 201: Technical data remote display cable

The cable is equipped with 9 pin DSUB plugs (one plug, one socket) in a metal plated housing. The DSUB connector housing can be a maximum of 32 mm wide (straight connector housing).

	DSUB socket	DSUB plug
1. Cable Pair	2 6	2 6
2. Cable Pair	3 7	3 7
3. Cable Pair	4 8	4 8
4. Cable Pair	5 9	5 9
Mass [1)]	1	1
Shield [1)]	Housing	Housing

Table 202: Pin Assignments for Remote Display cable

1) Shield and mass (pin 1) can be electrically connected

9. Panel Flange Adapter for the Display Unit 5D5212.04

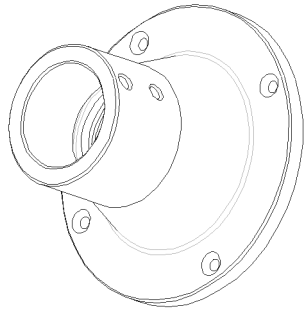


Figure 217: Panel Flange Adapter

Model Number	5A5007.01
Weight	2.4 kg

Table 203: Technical data for Panel Flange adapter

The Panel Flange adapter is delivered with the screws needed for fastening it to the display unit 5D5212.04.

Chapter 8 • Technical Appendix

1. Hardware Security Key

The Hardware Security Key (Dongle) protects the software. B&R recommends the DS1425 security key from Dallas Semiconductors.

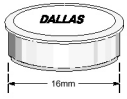


Figure 218: Dallas Security Key

Features:

- Requires no external energy supply
- Universally applicable with different platforms
- Contains an intelligent reaction generator
- Has a unique 64 bit serial number and three 384 bit fields from a password protected RAM.

2. Lithium Battery

Lifespan:	TBL
Capacity:	950 mAh
Voltage:	3 V
Current Consumption:	8.5 µA at 60 °C
Storage Time:	Max. 3 years at 30 °C
Humidity:	0 to 95 %, non-condensing

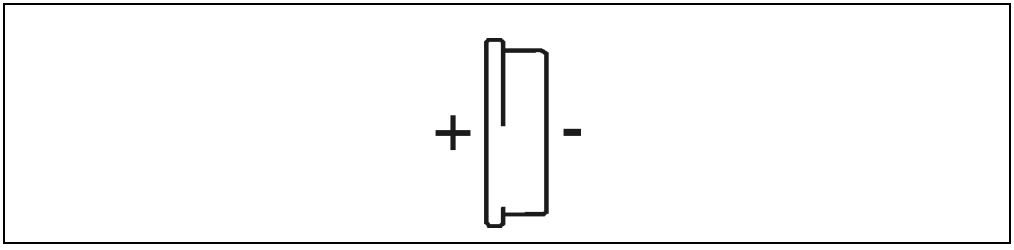


Figure 219: Lithium Battery

The buffer duration of the battery is at least 4 years (at 50°C, 8,5 µA of the supplied components and a self discharge of 40%)

3. CAN Bus

3.1 General Information

CAN stands for Controller Area Network protocol. CAN Bus features:

- Fieldbus
- Low costs
- High noise immunity
- Bus structure
- Open system
- Fast data transfer for small data packages (up to 8 bytes)
- Error detection by means of CRC (Cyclic Redundancy Check) and frame testing - Hamming distance 6
- Predictable transmission time for high priority messages (real time behavior)
- Easy use

B&R and CAN

The controller used by B&R (Intel 82527) meets CAN Bus specification 2.0B. Protocols Standard CAN and Extended CAN can be used on a bus.

B&R software currently supports the standard CAN identifier (29 bit).

3.2 Bus Length

The type of cable used depends on the required bus length and the number of nodes. Bus length is mainly determined by the bit rate.

The following table includes values for the maximum bus length, depending on the transfer speed and the Synchronization Jump Width (SJW). Permitted oscillator tolerances are given in the fourth column.

The synchronization jump width (SJW) is the factor that determines the range over which the CPU can be synchronized. The bigger the SJW, the shorter the maximum bus length.

Bit Rate [kBit/s]	Synchronization Jump Width (SJW)	Bus Length [m]	Permitted Oscillator Tolerance [%] [%]
500	0 1 2 3	67 56 33 10	0.121 0.242 0.363 0.485
250	0 1 2 3	215 192 147 101	0.121 0.242 0.363 0.485
125	0 1 2 3	510 465 374 283	0.121 0.242 0.363 0.485
100	0 1 2 3	658 601 488 374	0.121 0.242 0.363 0.485
50	0 1 2 3	1397 1) 1284 1) 1056 1) 829	0.121 0.242 0.363 0.485
20	0 1 2 3	3613 1) 3329 1) 2761 1) 2193 1)	0.121 0.242 0.363 0.485
10	0 1 2 3	7306 1) 6738 1) 5602 1) 4456 1)	0.121 0.242 0.363 0.485

Table 204: CAN Bus length

1) Conforming to CiA (CAN in Automation), the maximum bus length should be 1000 m

Relationship Between the Number of Nodes and the Bus Length for Each Cable Type:

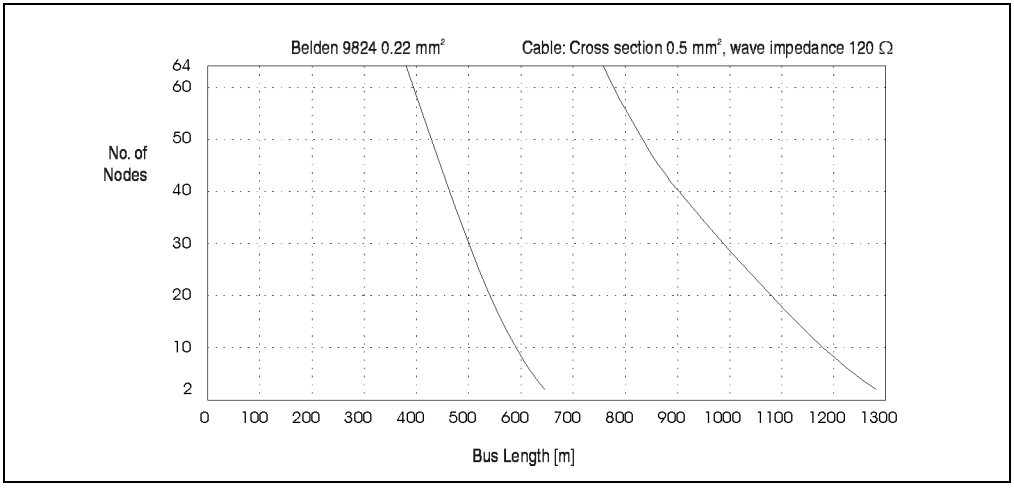


Figure 220: CAN – Number of nodes / Bus Length

3.3 Operation Information

CAN interface

Chip used: Intel 82527

Interrupt: IRQ10

I/O Address: 384h - 385h

Access to the CAN Data Area

I/O Address	Register	Function
384h	Address Register	Defines the register number to access.
385h	Data Register	Access of the register defined in the address register.

Table 205: Access to the CAN Data Area

Clock Out Data Register (Bit Timing Registers)

To set the baud rate, the bit timing registers 0 and 1 must be set to the values below. The PC and PLC columns show which B&R products the baud rate can be set for.

Bit Timing Register 1	Bit Timing Register 0	Baud Rate	PC	PLC
80h	23h	1000 kBit/s	●	❍
80h	25h	800 kBit/s	●	❍
80h	2Bh	500 kBit/s	●	●
81h	2Bh	250 kBit/s	●	●
83h	2Bh	125 kBit/s	●	●
84h	2Bh	100 kBit/s	●	❍
89h	2Bh	50 kBit/s	●	❍
98h	2Bh	20 kBit/s	●	●
B1h	2Bh	10 kBit/s	●	❍

Table 206: CAN Clock Out Data Register

4. Touch Screen Elo Accu Touch

Elo Accu Touch Screen	Specifications
Precision	± 2.03 mm
Light Permeability	75% for HL panels
Resistance	35 million contacts on the same point
Chemical Resistance	Acetone, Methyl, Isophyl alcohol, Ammonia
Release pressure	< 100 g
Input	Finger, pencil
Accu Touch Controller	
Reaction time	21 ms at 9600 Baud / 7 ms at 19.200 Baud
Resolution	4096 x 4096 pixels

Table 207: Technical data for Elo Accu touch screen

Pin Assignment for Elo Touch Screen	
9 pin DSUB Socket	9 pin DSUB Plug
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9

Table 208: Pin assignment for Elo Touch Screen

Further information is available at www.elotouch.com

5. Décor Foil (polyester foil)

5.1 Chemical Resistance

The décor foil used by B&R conforms to DIN 42 115 (section 2). This means it is resistant to exposure to the following chemicals for a 24 hour period with no visible signs of damage:

<table>
<tr><td>Ethanol
Cyclohexanol
Diacetone alcohol
Glycol
Isopropanol
Glycerin
Methanol
Triacetin
Dowandol DRM/PM</td><td colspan="2">Formaldehyde 37% - 42%
Acetaldehyde
Aliphatic hydrocarbons
Toluene
Xylene
White spirits</td><td rowspan="2">Trichloroethane
Ethyl acetate
Diethyl ether
N-Butyl acetate
Amyl acetate
Butylcellosolve
Ether</td></tr>
<tr><td>Acetone
Methyl ethyl ketone
Dioxan
Cyclohexanone
MIBK
Isophorone</td><td colspan="2">Formic acid<50%
Acetic acid<50%
Phosphoric acid<30%
Hydrochloric acid<36%
Nitric acid<10%
Trichloracetic acid <50%
Sulphuric acid<10%</td></tr>
<tr><td>Ammonia <40%
Caustic soda<40%
Potassium hydroxide
Alkali carbonate
Bichromate
Potassium
Ferro cyanide/ Ferro cyanide
Acetonitrile
Sodium bisulphate</td><td>Cutting oil
Diesel oil
Linseed oil
Paraffin oil
Blown castor oil
Silicon oil
Turpentine oil substitute
Universal brake fluid
Decon</td><td>Aviation fuel
Petrol
Water
Sea water</td><td>Sodium hypochlorite<20%
Hydrogen peroxide <25%
Potassium carbonate
Washing powders
Fabric conditioner
Ferric chloride
Ferrous chloride (FeCl2)
Ferrous chloride (FeCl3)
Dibutyl
Phthalate
Dioctyl
Phthalate
Sodium carbonate</td></tr>
</table>

Table 209: Resistance to chemicals

The décor foil conforms to DIN 42 115 (section 2) for exposure to glacial acetic acid< 1 hour without any sign of visible damage.

6. Technical Data for Hard Disks

A silicon disk (PC card, Compact flash) is required in environments with vibration and shock. Hard disk drives are normally not designed for use in industrial environments. If excessive vibrations or shock occur during use, B&R is not liable for damage to a properly functioning hard disk. The specified limit values can be read from the corresponding tables.

6.1 Technical Data for the 2.1 GB 5A5001.03 and 4.3 5A5001.04 GB Hard Disk

Model Number	5A5001.03	5A5001.04
Manufacturer's Product ID	Toshiba MK2110MAT	Toshiba MK4309MAT
Capacity	2.16 GB	4.32 GB
Number of Heads	2	4
Number of Cylinders (User)	8910	8880
Bytes Per Sector	512	
Speed of Revolution	4,200 rpm	
Access Time	7.14 ms	
Positioning Time (Seek, Typical Values) Minimum (Track to Track) Average Maximum	 3 ms 13 ms 25 ms	
Starting Time (0 rpm to Read Access)	4 seconds (typically)	
Switch Off Time	3 seconds (typically)	
Mounting Methods on the Adapter Card	Fixed	
Powersave	The hard disk is shut down regardless of the IPC's Power Management settings, If no access is made after 45 minutes	
Interface	AT (ATA-2/ATA-3/ATA-4)	
Data Transfer Rate To the medium To / From Host	 12.5 to 22.3 MB/s Max. 33.3 MB/s (Ultra-DMA Mode 2)	
Cache	512 KB	
Noise level (Idle Mode)	Approx. 36 dBA	
Vibration Operating Storage	 No non-recovered errors at max. 5 -500 Hz and 0.5 G (4.9 m/s^2 0-peak) No damage at max. 10 -500 Hz and 5 G (49 m/s^2 0-peak)	
Shock (pulse with a Sinus Half-wave) Operating Storage	No non-recovered errors at max. 150 G (1.470 m/s^2 0-peak) and 2 ms duration No damage at max. 500 G (4.900 m/s^2 0-peak) and 2 ms duration No damage at max. 150 G (1.470 m/s^2 0-peak) and 11 ms duration	
MTBF (hours)	300,000	
Lifespan	5 years or 20,000 POH	
Temperature (operating / storage)	5 - 55 °C / -20 to 60 °C	

Table 210: Technical data for the 2.1 and 4.3 B hard disks

6.2 Technical Data for the 6 GB Hard Disk 5A5001.05 and 5A5001.08

Model Number	5A5001.05	5A5001.08
Manufacturer's Product ID	Fujitsu MHK2060AT (customized)	
Capacity	6.0 GB	
Number of Heads	2	
Number of Cylinders (User)	14.784	
Number of Sectors (User)	11,733,120	
Bytes Per Sector	512	
Memory Methods	16/17 MTR	
Track Density	24,300 TPI	
Bit Density	383 kbpi	
Revolution Speed	4,200 rpm ±1%	
Access Time (Average)	7.14 ms	
Positioning Time (Seek, Typical Values) Minimum (Track to Track) Average Maximum	 1.5 ms 13 ms 23 ms	
Starting Time (0 rpm to Read Access)	5 seconds (typically)	
Switch Off Time	5 seconds (typically)	
Mounting Methods on the Adapter Card	Rubber cushioned	Fixed
Powersave	The hard disk is shut down regardless of the IPC's power management settings, if no access is made after 30 minutes.	
Interface	ATA-5	
Data Transfer Rate To the medium To / from Host	 12.5 to 22.3 MB/s Max. 66.6 MB/s (Ultra-DMA Mode 4)	
Cache	512 KB	
Noise Level (Idle Mode)	Approx. 30 dBA in a distance of 1 m	
Vibration Operating Storage	 No non-recovered errors at max. 5 - 400 Hz and 1.0 G (9.8 m/s^2 0-peak) No damage at max. 5 - 400 Hz and 5 G (49 m/s^2 0-peak)	
Shock (pulse with a Sinus Half-wave) Operating Storage	No non-recovered errors at max. 150 G (1.470 m/s^2 0-peak) and 2 ms duration No damage at max. 700 G (6.860 m/s^2 0-peak) and 2 ms duration No damag at max. 120 G (1.176 m/s^2 0-peak) and 11 ms duration	

Table 211: Technical data for the 6 GB Hard Disk

6.2.1 Reliability

Mean Time Between Failure (MTBF)

300,000 hours under the following conditions:

Operating time: max. 250 hours per month or 3000 hours per year

Working time (read or write accesses): max. 20% of operating time

CSS-hits (parking of the heads): max. 50 per day; a max. 50,000 in total

Data Protection

In the event of power loss, all data stored on the hard disk is safe. This does not apply to a block which is just being written to during formatting and reorganization of data blocks, at the time of a power loss.

Error Rate

With repeated read attempts and ECC corrections, non-recoverable read errors occur not more than 10 times when reading 1014 bits. Positioning errors which can be corrected within a new attempt, are triggered max. 10 times for every 107 accesses.

24 Hour Operation

When setting environmental conditions for operating the hard disk, a differentiation is made in regard to continuous 24 hour operation. A 24 hour operation of the hard disk is possible by observing the following conditions:

- The operating temperature of the controller is allowed only to be 5 - 40 °C
- 3 year lifespan or max. 15,000 operating hours
- MTBF is 200,000 hours

The 24 hour operation facility is a special feature for both the 5A5001.05 and 5A5001.08 hard disk. The hard disk is equipped with a special microcode to fulfill this purpose, which automatically carries out a spin-down/spin-up cycle every 24 hours (motor switched off and switched back on; duration is approx. 7 seconds). During this period of time, the magnet data carrier cannot be written on (write accesses are cached).

7. Maintenance Work

The following section describes service/maintenance work which can be carried out by the user.

Maintenance Work for	Maintenance Work	Change Interval [1)]
Mainboard	Battery	Every 4 years
	Fuse	---
Interface Board	Battery	Every 4 years

Table 212: Maintenance Work

1) The change interval refers to the average life span and operating conditions and are recommended by B&R.

7.1 Removing the Housing Cover

The housing cover must be removed in order to change the battery or the fuse. The marked screws must be removed.

IPC5000 / IPC5000C	IPC5000C / IPC5600C
	

7.2 Maintenance Work on the Mainboard

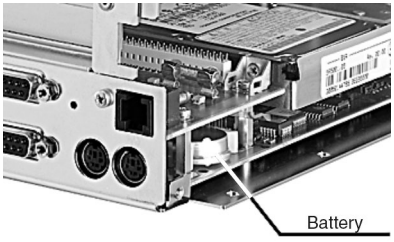
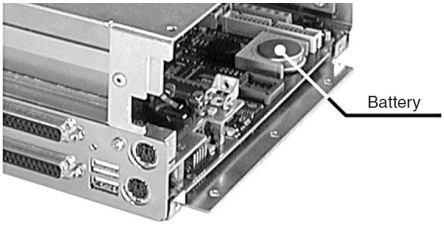
7.2.1 CMOS Battery

Provit 5000 controllers are equipped with a lithium battery (for technical data see section "Lithium Battery").

Changing the battery

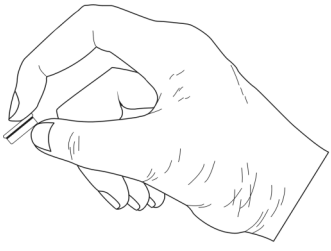
1. Disconnect the lines to the power supply
2. Touch the housing or earth connection (not the power supply!) in order to discharge any electrostatic charge from your body
3. Remove the housing cover (see section "Removing the Housing Cover")

4. Battery position:

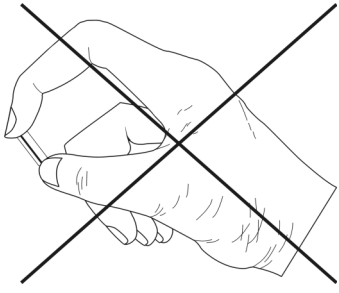
IPC5000/IPC5600	IPC5000C / IPC5600C
	

5. Remove the battery from the holder by pulling the removal strip (don't use uninsulated tools - risk of >short circuiting). The battery should not be held by the edges. **Insulated** tweezers may also be used for removing the battery.

Right



Wrong



6. Insert the new battery with the correct polarity. The removal strip should be protruding from the battery holder and the "+" side of the battery should be facing downward. To remove the battery again, the removal strip must protrude from the upper side of the battery.

7 Now wrap the end of the removal strip over the top of the battery and insert it underneath the battery so that it does not protrude from the battery holder.

8. Put on the housing covering and fasten the screws.

9. Connect the lines to the power supply.

10. Set the date and time

Lithium batteries are considered hazardous waste. Used batteries should be disposed of accordingly.

7.2.2 Fuse

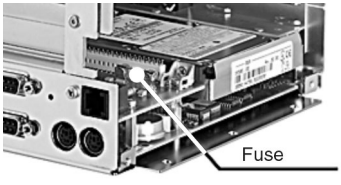
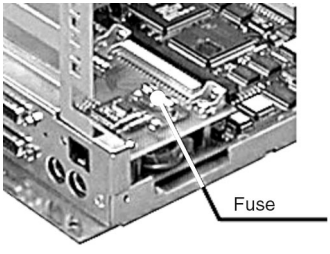
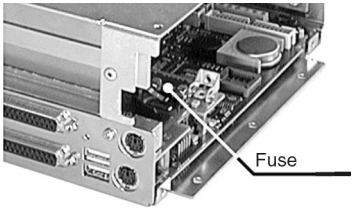
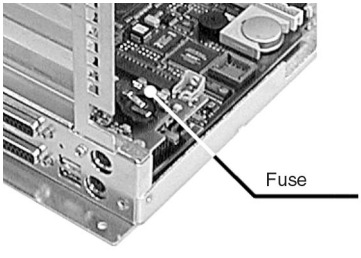
Provit 5000 controllers are protected by a fuse from overloading.

Type: Glass tube fuses 5 x 20 mm: T 1A / 250 V

Before changing the fuse, the power supply must be disconnected.

Changing the fuse:

1. Disconnect the power supply
2. Touch the housing or earth connection (not the power supply!) in order to discharge any electrostatic charge from your body
3. Remove the housing cover (see section "Removing the Housing Cover")
4. Position of the fuse

IPC5000	IPC5600
	
IPC5000C	**IPC5600C**
	

5. Remove the old fuse.

6. Place the new fuse in the fuse holder.

7. Put on the housing covering and fasten the screws.

8. Connect the lines to the power supply.

7.3 Maintenance Work for the Interface Board

7.3.1 SRAM Battery (RTC)

The SRAM on the interface board is buffered by a lithium battery (for technical data see section "Lithium Battery").

SRAM

The content of the SRAM can be secured with MS-DOS drivers for SRAM and FlashPROM memory cards or standard PCMCIA card drivers available from B&R. These can either be found on the Provit Drivers & Utilities CD-ROM 5S0000.01-090 or downloaded directly from B&R's homepage (www.br-automation.com).

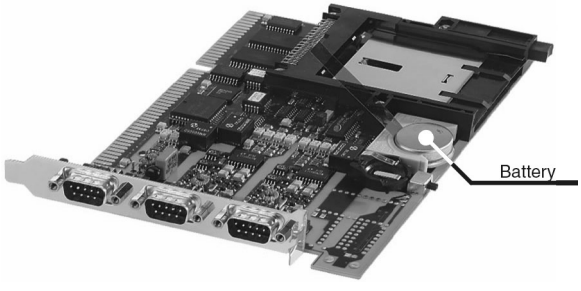
Changing the battery

1. Disconnect the power supply

2. Touch the housing or earth connection (not the power supply!) in order to discharge any electrostatic charge from your body

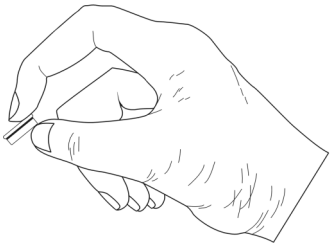
3. Remove the housing cover (see the section "Removing the Housing Cover")

4. Battery position

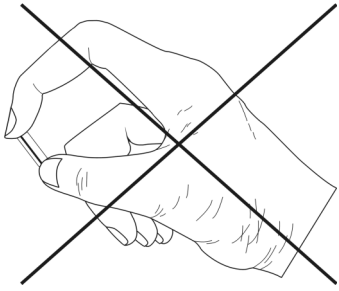


5. Remove the battery from the holder by pulling the removal strip (don't use uninsulated tools - risk of >short circuiting). The battery should not be held by its edges. **Insulated** tweezers may also be used for removing the battery.

Right



Wrong



6. Insert the new battery with correct polarity. The removal strip should be protruding from the battery holder and the "+" side of the battery should be facing downwards. To remove the battery again in future, the removal strip must protrude from the upper side of the battery.
7. Now wrap the end of the removal strip over the top of the battery and insert it underneath the battery so that it does not protrude from the battery holder.
8. Put on the housing covering and fasten the screws.
9. Connect the lines to the power supply.

Lithium batteries are considered hazardous waste. Used batteries should be disposed of accordingly.

8. Glossary

BIOS

An abbreviation for »**B**asic **I**nput/**O**utput **S**ystem«. On computers conforming to the PC standard, a set of important software routines, which carry out a hardware test after start up, load the operating system and provide routines for data transfer between hardware components. BIOS is stored in ROM, so that the contents are not lost after the PC is switched off. Although BIOS is used to configure a system's performance, the user does not usually come into contact with it.

Bus Unit

Provit bus units consist of the housing, interface board slots and the power supply for the system units.

CAN

An abbreviation for »**C**ontroller **A**rea **N**etwork« (serial bus system) CAN was developed by Bosch and was originally designed for use in motor vehicles. CAN is used in numerous applications.

CD-ROM

An abbreviation for »**C**ompact **D**isc **R**ead-**O**nly **M**emory« A data carrier which is distinguished by its high capacity (approx 650 megabytes) and its use of laser optics instead of magnetic scanning for reading data. Although CD-ROM drives can read and not write, they still have much in common with CD-R drives and optical WORM drives (which can write to a disk once). They are also similar to optical drives, which can write to a disk several times.

CMOS

»CMOS« is a battery powered memory area where fundamental parameters of an IBM (or compatible) personal computer are stored. Information such as the type of hard drive, size of the working memory and the current date and time are required when booting the computer. As the name suggests, the memory is based on CMOS technology standards.

COM

A device name used to access serial ports in MS-DOS. The first serial port can be accessed under COM1, the second under COM2 etc. Typically, a modem, mouse or serial printer is connected to a serial port.

COM1

Device name for the first serial port in a PC system. The input-output area for COM1 is usually found at address 03F8H. Generally, the COM1 port is assigned IRQ 4. In many systems, an RS232 serial mouse is connected to COM1.

COM2

Device name for the second serial port in a PC system. The input-output area for COM2 is usually found at address 02F8H. Generally, the COM2 port is assigned IRQ 3. In many systems, a modem is connected to COM2.

COM3

Device name for a serial port in a PC system. The input-output area for COM3 is usually found at address 03E8H. Generally, the COM3 port is assigned IRQ 4. In many systems, COM3 is used as an alternative for COM1 or COM2 if peripheral devices are already connected to COM1 and COM2.

Compact IPC

The B&R Compact IPC is a very cost effective industrial PC with an integrated 10.4" TFT touch display. It is also known as the IPC2002.

Controller

A device component which allows access to other devices on a computer subsystem. A disk controller, for example, allows access to hard disks and disk drives and is responsible both for physical and logic drive access.

CPU

An abbreviation for »**C**entral **P**rocessing **U**nit« Interprets and executes commands. It is also known as a "microprocessor" or "processor" for short. A processor is able to receive, decode and execute commands, as well as transfer information to and from other resources via the computer bus.

CRT

An abbreviation for »**C**athode **R**ay **T**ube« The main component of a television set or a standard computer screen. A cathode ray tube consists of a vacuum tube, in which one or more electron guns are installed. Each electron gun creates a horizontal electron beam, which appear on the front of the tube (the screen). The inner surface of the screen is coated with phosphor, which is lit when hit by the electrons. Each of the electron beams move in a line from top to bottom. In order to prevent flickering, the screen content is updated at least 25 times per second. The sharpness of the picture is determined by the number of pixels on the screen.

CTS

An abbreviation for »**C**lear **T**o **S**end« A signal used when transferring serial data from modem to computer, indicating its readiness to send the data. CTS is a hardware signal which is transferred via line number 5 in compliance with the RS-232-C standard.

DCD

An abbreviation for » **D**ata **C**arrier **D**etected« A signal used in serial communication which is sent by the modem to the computer it is connected to, indicating that it is ready for transfer.

DRAM

An abbreviation for »**D**ynamic **R**andom **A**ccess **M**emory« Dynamic RAM consists of an integrated semiconductor circuit, which stores information based on the capacitor principle. Capacitors lose their charge in a relatively short time. Therefore, dynamic RAM circuit boards must contain a logic that allows continual recharging of RAM chips. Since the processor cannot access dynamic RAM while it is being recharged, one or more waiting states can occur when reading or writing data. Although it is slower, dynamic RAM is used more often than static RAM, because the simple design of the circuits means that it can store four times more data than static RAM.

DSR

An abbreviation for »**D**ata **S**et **R**eady« A signal used in serial data transfer, which is sent by the modem to the computer it is connected to, indicating its readiness for processing. DSR is a hardware signal which is sent via line number 6 in compliance with the RS-232-C standard.

DTR

An abbreviation for »**D**ata **T**erminal **R**eady« A signal used in serial data transfer which is sent by the computer to the modem it is connected to, indicating the computer's readiness to accept incoming signals.

DVD

An abbreviation for »**D**igital **V**ersatile **D**isc« The next generation of optic data carrier technology. Using this technology it is possible to code video, audio and computer data on CD. DVDs can store a higher volume of data than conventional CDs. Standard DVDs , which have a single coating, can hold 4.7 GB. Double coated DVDs can hold 8.5 GB. Double sided DVDs can hold up to 17 GB. A special drive is needed for DVDs. Conventional CDs can also be played on DVD drives.

EDO-RAM

An abbreviation for »**E**xtended **D**ata **O**ut **R**andom **A**ccess **M**emory« Dynamic RAM, which provides data for the CPU, while the next memory access is being initialized. This increases speed.

EIDE

An abbreviation for »**E**nhanced **I**ntegrated **D**rive **E**lectronics« An expansion of the IDE standard. Enhanced IDE is considered the standard for hardware interfaces. This interface is designed for drives, with an integrated drive controller.

Ethernet

An IEEE 802.3 standard for networks. Ethernet uses bus or star topology and controls the traffic on communication lines using the access procedure CSMA/CD (Carrier Sense Multiple Access with Collision Detection). Network nodes are connected using coaxial cables, optical fiber cables or twisted pair cabling. Data transfer on an Ethernet network takes place in frames of variable lengths, which consist of supply and controller information as well as 1500 bytes of data. The Ethernet standard provides baseband transfers at 10 megabit and 100 megabit per second.

FDD

An abbreviation for »**F**loppy **D**isk **D**rive«

FIFO

An abbreviation for »**F**irst **I**n **F**irst **O**ut«. A queuing organization method whereby elements are removed in the same order as they were inserted. The first element inserted is the first one removed. Such an organization method is typical for a list of documents, which are waiting to be printed.

Floppy

Also known as a diskette. A round plastic disk with an iron oxide coating, which can store a magnetic field. When the floppy disk is inserted in a disk drive, it rotates, so that the different areas (or sectors) of the disk's surface are moved under the read-write head, allowing the magnetic orientation of the particle to be modified and recorded. Orientation in one direction represents binary 1, while the reverse orientation represents binary 0.

FPC

An abbreviation for »**F**lat **P**anel **C**ontroller«

FPD

An abbreviation for »**F**lat **P**anel **D**isplay«

HDD

An abbreviation for »**H**ard **D**isk **D**rive«

IDE

An abbreviation for »**I**ntegrated **D**rive **E**lectronics« A drive interface where the controller electronics are integrated in the drive.

IPC

An abbreviation for »**I**ndustrial **PC**«

IPC2000

Product from the B&R industrial PC family.

IPC2001

Product from the B&R industrial PC family. A further development on the IPC2000

IPC2002

see Compact IPC

IPC5000

Product from the B&R industrial PC family. Pentium processors (100 MHz - 200 MHz and AMD K6-166 MHz or K6-266 MHz) can be used.

IPC5600

Product from the B&R industrial PC family. Pentium processors (100 MHz - 200 MHz and AMD K6-166 MHz or K6-266 MHz) can be used.

IPC5000C

Product from the B&R industrial PC family. Celeron (300, 366, 433, 566 MHz) and Pentium III (600 und 850 MHz) processors can be used.

IPC5600C

Product from the B&R industrial PC family. Celeron (300, 366, 433, 566 MHz) and Pentium III (600 und 850 MHz) processors can be used.

ISA

An abbreviation for »**I**ndustry **S**tandard **A**rchitecture« A term given for the bus design which allows expansion of the system with plug-in cards which can be inserted in the expansion slots provided in the PC.

Jumper

A small plug or wire link for adapting the hardware configuration used to connect the different points of an electronic circuit.

LCD

An abbreviation for »**L**iquid **C**rystal **D**isplay« A display type, based on liquid crystals which have a polarized molecular structure and are enclosed between two transparent electrodes as a thin layer. If an electrical field is applied to the electrodes, the molecules align themselves with the field and form crystalline arrangements, which polarize the light passing through. A polarization filter, which is arranged using lamellar electrodes, blocks the polarized light. In this way, a cell (pixel) containing liquid crystals can be switched on using electrode gates, thus coloring this pixel black. Some LCD displays have an electroluminescent plate behind the LCD screen for lighting. Other types of LCD displays can use color.

LED

An abbreviation for »**L**ight **E**mitting **D**iode« A semiconductor diode which converts electrical energy into light. LEDs work on the principle of electroluminesence. They are highly efficient because they do not produce much heat in spite of the amount of light they emit. For example, "operational status indicators" on floppy disk drives are LEDs.

LPT

Logical device name for line printers. In MS DOS, names are reserved for up to three parallel printer ports with the names LPT1, LPT2 and LPT3. The first parallel port (LPT1) is usually identical to the primary parallel output device PRN (in MS-DOS the logical device name for the printer). The lettering LPT was originally stood for "Line Printer Terminal".

LS-120

A disk drive which holds up to 120 MB on a 3.5" diskette. LS-120 drives can be also used for other diskette formats.

Mkey

An abbreviation for »**M**odule **Key**block«, a common term given to keys found on Provit display units. They can be freely configured with Mkey utilities.

MTBF

An abbreviation for »**M**ean **T**ime **B**etween **F**ailure« The average time which passes before a hardware component fails and repair is needed. This time is usually expressed in thousands or ten thousands of hours, sometimes known as power-on hours (POH).

MTC

An abbreviation for »**M**ain**t**enance **C**ontroller« The MTC is an independent processor system, which provide additional functions that are not available with a normal PC. The MTC communicates with the PC via the ISA bus (using a couple register).

Panel

A common term for display units (with or without keys).

Panelware

A generic term given for standard and special keypad modules offered by B&R.

PC Card

A registered trademark from Personnel Computer Memory Card International Association (PCMCIA), which indicates the add-on card's conformity with PCMCIA specifications. A PC Card is approximately the size of a credit card and can be inserted in a PCMCIA slot. Version 1(introduced September 1990) specifies a type I card with a depth of 3.3 milimeters, which is intended mainly for use as external memory. PCMCIA specification version 2 (introduced September 1991) defines a 5 mm depth for a type II card and a 10.5 mm depth for a type III card. Devices such as modems, fax and network cards can be implemented on type II cards. Type III cards can accommodate devices with greater space requirements, such as wireless communication devices or rotating memory media (e.g. hard drives).

PCMCIA

An abbreviation for »**P**ersonal **C**omputer **M**emory **C**ard **I**nternational **A**ssociation« An association of manufacturers and dealers, who are dedicated to the cultivation and further development of common standards for peripheral devices based on PC cards with a slot for such cards. PC Cards are mainly used for laptops, palmtops (and other portable computers) and intelligent electronic devices. Version 1 of the PCMCIA standard was introduced in 1990.

PnP

An abbreviation for »**P**lug and **P**lay« Specifications developed by Intel. Using Plug and Play allows a PC to automatically configure itself, so that it can communicate with peripheral devices (e.g. monitors, modems and printers). Users can connect a peripheral device (plug) and it is immediately runs (play), without having to manually configure the system. A Plug and Play PC requires a BIOS that supports Plug and Play and a respective expansion card.

POH

An abbreviation for »**P**ower **O**n **H**ours« see MTBF

POST

An abbreviation for »**P**ower-**O**n **S**elf **T**est« A set of routines which are stored in ROM on the computer and test different system components e.g. RAM, disk drive and the keyboard, in order to determine that the connection is operating correctly and ready for operation. POST routines notify the user of problems that occur. This is done using several signal tones or by displaying a message, which frequently accompanies a diagnosis value, on the standard output or standard error devices (generally the monitor). If POST runs successfully, control is transferred over to the system's bootstrap loader.

Power Panel

Power Panel is part of the B&R product family and is a combination of an operator panel and controller in one device. This covers products PP21 and PP41.

PP21

B&R Power Panel type. It is equipped with an RS232 interface, a CAN interface, a PCMCIA slot and integrated digital input/output channels. Additionally, up to six B&R SYSTEM 2003 screw-in modules can be connected. LC display 4 x 20 characters.

PP41

B&R Power Panel type. It is equipped with an RS232 interface, a CAN interface, a PCMCIA slot and integrated digital input/output channels. Additionally, up to six B&R SYSTEM 2003 screw-in modules can be connected. 5.7" QVGA black/white LC display

Provit

An abbreviation for »**PRO**cess**VI**sualization**T**erminal« Product family name for B&R industrial PCs.

Provit 2000

Product family name for B&R industrial PCs. It is divided into the following products: IPC2000, IPC2001, Compact IPC (IPC2002) and the display units belonging to them.

Provit 5000

Product family name for B&R industrial PCs. It is divided into the following products: IPC5000, IPC5600, IPC5000C, IPC5600C and the display units belonging to them.

RAM

An abbreviation for »**R**andom **A**ccess **M**emory« A semiconductor memory which can be read or written to by the microprocessor or other hardware components. Memory locations can be accessed in any order. While ROM types cannot be written to, RAM memory allows both read and write access.

ROM

An abbreviation for »Read-Only Memory« A semiconductor in which programs or data have already been permanently stored during the production process.

RTS

An abbreviation for »**R**equest **T**o **S**end« A signal used in serial data transfer for requesting send permission. For example, it is sent from a computer to the modem connected to it. The RTS signal is assigned according to hardware specifications of the RS-232-C standard for connection 4.

RXD

An abbreviation for »Receive (**RX**) **D**ata« A line for the transfer of serial data received from one device to another - e.g. from a modem to a computer. For connections complying with the RS-232-C standard, the RXD is controlled by connection 3 of the plug.

SDRAM

An abbreviation for »**S**ynchronous **D**ynamic **R**andom **A**ccess **M**emory« A construction of dynamic semiconductor components (DRAM), which can operate with higher clock rates than conventional DRAM switching circuits. This is made possible using block access. For each access, the DRAM determines the next memory addresses to be accessed.

Special Keypad Modules

The following keypad modules are offered by B&R: Dummy module, emergency stop module, key switch module (made up of 1 key switch and 1 on /off switch) and a start/stop module (made up of 2 buttons and a label field).

SRAM

An abbreviation for »**S**tatic **R**andom **A**ccess **M**emory« A semiconductor memory (RAM) made up of certain logic circuits (flip-flop), which only keeps stored information while the operating voltage is active. In computers, static RAM is generally only used for the cache memory.

Standard Keypad Module

The following keypad modules are offered by B&R: 16 keys with 16 LEDs, 12+4 keys with 4 LEDs, 8 keys with 4 LEDs and a label field and 4 keys with 4 LEDs and 4 label fields.

SVGA

An abbreviation for »**S**uper **V**ideo **G**raphics **A**rray« A graphic standard which was created in 1989 by the Video Electronics Standards Association (VESA) in order to offer the option of high resolution color screens for IBM compatible computers. Although SVGA is a single standard, compatibility problems can occur with the video BIOS.

System Units

Provit system units consist of a mainboard (without processor), slots for RAM modules, VGA controller, serial and parallel interfaces, and connections for the FPD, monitor, PS/2 AT keyboard, PS/2 mouse, USB, Ethernet (for system units with Intel Celeron and Pentium III processors), Panelware keypad modules and external FDD.

Keypad Modules

Keypad modules are divided into two groups: **Standard Keypad Modules** (can be daisy chained to a controller) and **Special Keypad Modules** (must be connected by an electrician according to the function e.g. Emergency Stop)

TFT Display

An LCD (Liquid Crystal Display) technology where the display consists of a large grid of LCD cells. Each pixel is represented by a cell, whereby electrical fields produced in the cells are suppported by thin film transistors (TFT) resulting in an active matrix. In the simplest form, there is exactly one thin film transistor per cell. Displays with an active matrix are generally used in laptops and notebooks because they are thin, offer high quality color displays and can be viewed from all angles.

TXD

An abbreviation for »Transmit (**TX**) **D**ata« A line for the transfer of serial data sent from one device to another - e.g. from a computer to a modem. For connections complying with the RS-232-C standard, the TXD is controlled by connection 2 of the plug.

UART

An abbreviation for »**U**niversal **A**synchronous **R**eceiver-**T**ransmitter« Generally, a module consisting of a single integrated circuit, which combines the circuits required for asynchronous serial communication for both sending and receiving. UART represents the most common type of circuit in modems for connection to a personal computer.

UDMA

An abbreviation for »**U**ltra **D**irect **M**emory **A**ccess« A special IDE data transfer mode that allows high data transfer rates for drives. There has been some variations in the recent times.
The UDMA33 mode transfers 33 megabytes per second.
The UDMA66 mode transfers 66 megabytes per second.
The UDMA100 mode transfers 100 megabytes per second.
A condition for modifications is that both the mainboard and the hard drive support the specification.

Bootstrap Loader

A program that automatically runs when the computer is switched on or restarted. After some basic hardware tests have been carried out, the bootstrap loader starts a larger loader and hands over control to it, which in turn boots the operating system. The bootstrap loader is typically found in ROM on the computer.

USB

An abbreviation for »**U**niversal **S**erial **B**us« A serial bus with a bandwidth of up to 12 megabits per second (Mbit/s) for connecting a peripheral device to a microcomputer. Up to 127 devices can be connected to the system using a single multipurpose connection, the USB bus (e.g. external CD drives, printer, modems as well as the mouse and keyboard). This is done by connecting the devices in a row. USB allows devices to be changed when the power supply is switched on (hot plugging) and multi-layered data flow.

UPS

An abbreviation for »**U**ninterruptible **P**ower**S**upply« UPS supplies power to systems which cannot be connected directly to the power mains for safety reasons because a power failure could lead to loss of data. The UPS allows the PC to be shut down securely if a power failure occurs without losing data.

UPS

Abbreviation for »**U**ninterruptible **P**ower **S**upply« see UPS

VGA

An abbreviation for »**V**ideo **G**raphics **A**dapter« A video adapter which can handle all EGA (Enhanced Graphics Adapter) video modes and adds several new modes.

XGA

An abbreviation for »E**X**tended **G**raphics **A**rray« An expanded standard for graphic controllers and monitors which was introduced by IBM in 1990. This standard supports a 640 * 480 resolution with 65,536 colors or a 1024 * 768 resolution with 256 colors and is generally used in workstation systems.

9. Year 2000 Problem / Year 2000 Compliance

With Provit 5000 IPCs, only the behavior of the BIOS used can be described, which is 100% year 2000 compatible for all models. An application's behavior is the responsibility of the author of the software. Make sure that the application is evaluating the year correctly, especially when using 2 digit values.

Support Contact

If you have any further questions regarding the year 2000 issue, please contact your local B&R sales representative. In Eggelsberg, the International Support department is handling this issue (support@br-automation.co.at, Fax ext. 26).

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