

SIMATIC

Programming Device PG 740 PII

Manual

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Safety Guidelines

This manual contains notices which you should observe to ensure your own personal safety, as well as to protect the product and connected equipment. These notices are highlighted in the manual by a warning triangle and are marked as follows according to the level of danger:



Danger

means that death, severe personal injury or substantial property damage **will** result if proper precautions are not taken.



Warning

indicates that death, severe personal injury or substantial property damage can result if proper precautions are not taken.



Caution

indicates that minor personal injury or property damage can result if proper precautions are not taken.

Note

draws your attention to particularly important information on the product, handling the product, or to a particular part of the documentation.

Qualified Personnel

The device/system may only be set up and operated in conjunction with this manual.

Only **qualified personnel** should be allowed to install and work on this equipment. Qualified persons in the sense of the safety guidelines of this Manual are defined as persons who are authorized to commission, to ground and to tag equipment, systems and circuits in accordance with established safety practices and standards.

Correct Usage

Note the following:



Warning

This device and its components may only be used for the applications described in the catalog or the technical description, and only in connection with devices or components from other manufacturers which have been approved or recommended by Siemens.

This product can only function correctly and safely if it is transported, stored, set up, and installed correctly, and operated and maintained as recommended.

Trademarks

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Disclaimer of Liability

We have checked the contents of this manual for agreement with the hardware and software described. Since deviations cannot be precluded entirely, we cannot guarantee full agreement. However, the data in this manual are reviewed regularly and any necessary corrections included in subsequent editions. Suggestions for improvement are welcomed.

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Preface

What this Manual is About

This manual contains all the information you need for working with the PG 740 PII programming device. You can use it to

- unpack the programming device and power it up.
- familiarize yourself with the functions and settings of the various components (display, keyboard, programming facilities etc.).
- connect the programming device up to other units of equipment (programmable controllers, other programming devices).
- expand your system, provided you comply with the necessary conditions.
- analyze and eliminate simple faults.

Who is the Manual Intended For?

The following persons require the manual:

- Users commissioning the programming device themselves or working with it (editing, programming or debugging).
- System administrators operating the programming device in a network.
- Service and maintenance personnel using the PG 740 PII for system expansion purposes or error/fault analysis.

Other Manuals

This manual does not contain information on the operating system or programming software. You will find this information in the relevant software manuals.

Operating Instructions

The Operating Instructions supplied with the PG 740 PII contains the latest technical specifications of the programming device, and the addresses and telephone numbers of the repair and maintenance centers authorized from Siemens.

Queries	<p>If you have any questions concerning subjects not covered in the manual, just get in touch with the Siemens representative in your area.</p> <p>If you have any questions on the manual itself or would like to make remarks or suggestions, please complete the reply card at the end of the manual. We would also appreciate it if you would include your own personal opinion on the manual on the reply card.</p>
Pointers through the Manual	<p>The manual contains both the most important instructions for starting up and using the programming device, as well as reference sections you will only require in special cases.</p>
Installation	<p>Before you use the PG 740 PII for the first time, read Chapter 2 on the PG 740 PII's components and functionality.</p>
Startup	<p>Chapter 3 describes the basic steps necessary for starting up the PG 740 PII. This section also contains instructions for working with memory cards for programmable controllers and for connecting the programming device to other devices.</p>
Expansion	<p>Chapter 4 describes how to expand your PG 740 PII (installation of memory expansion or additional modules). Please observe the safety notes.</p>
Configuration	<p>Modifications to the system hardware may make it necessary for you to adapt the original hardware configuration. Chapter 5 tells how to proceed in this case.</p>
Error/Fault Diagnostics	<p>Chapter 6 will tell you how to deal with simple faults that you can diagnose and, in some cases, eliminate yourself.</p>
Reference Data	<p>Chapter 7 contains hardware addresses, interrupt assignments and information on connecting cables.</p>
Glossary	<p>The glossary explains important terms.</p>
Alphabetical Index	<p>The index will enable you to quickly find passages in the text pertaining to important keywords.</p>

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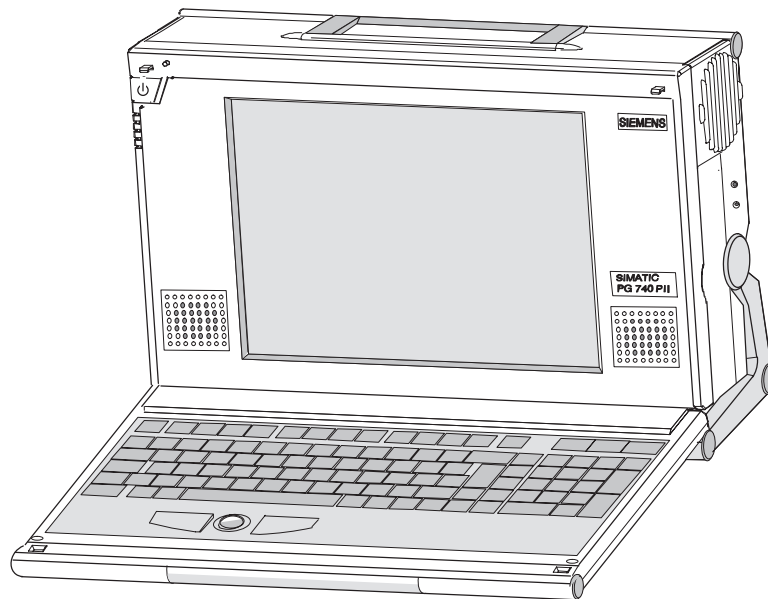
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Product Overview

1

Application

The PG 740 PII programming device is a high-performance device, equipped with the optimum hardware features and software for programming, debugging, and starting up programmable controllers in an automation environment.



Hardware/Software Complement

You can use the PG 740 PII programming device to program SIMATIC S5 and SIMATIC S7 programmable controllers. It has

- interface ports for connection to the programmable controllers
- programming facilities for S5 and S7 memory cards.

The PG 740 PII is shipped with the software listed in the Operating Instructions.

Advantages of the PG 740 PII

Compared to a PC with standard hardware and software, the PG 740 PII programming device of the SIMATIC family has numerous advantages:

- You can develop, debug and document user programs for SIMATIC S5 and SIMATIC S7 programmable logic controllers with the PG 740 PII without the need for additional hardware or software.
- The rugged design and functionality of the PG 740 PII make it particularly suitable for use on site under hostile industrial conditions. The PG 740 PII meets the specific requirements of industrial environments, such as noise immunity, compliance with the relevant standards, ruggedness, simple transportation, and startup.
- The PG 740 PII can be set up and operated in a large number of different ways and positions, and can therefore be used practically everywhere it is needed.
- The PG 740 PII has all the integral ports necessary for connecting it to SIMATIC automation devices:
 - Programming interface for SIMATIC S5 EPROMs and EEPROMs
 - Programming interface for SIMATIC S5 and SIMATIC S7 memory cards in credit-card format
 - Interfaces for connection to S5 and S7 programmable controllers.
- The PG 740 PII is supplied with all the necessary system and automation software already installed on the hard disk.
- Since Windows 98 is also already installed, you can, of course, also use the PG 740 PII as a stand-alone workstation, and run all the standard software available on the market that requires Windows 98.
- The PG 740 PII has the power and expansion capability of normal PCs, and can therefore also be used as a fully-fledged personal computer.
- A PCI slot and a PCI/ISA slot are available for expansions.
- The BIOS has the following functions:
 - Bootable CD-ROM
 - PCI interrupt routing
 - Reserving of ISA interrupts
 - The area from 15 to 16 Mbytes can be reserved for the ISA memory (memory gap)
- The mother board has been greatly improved:
 - Slot 1 with Pentium II
 - Sound interface compatible with a soundblaster.
 - Interface for microphone and headphone connections. The PG 740 PII has two loudspeakers to the left and right of the display which switch off automatically when headphones are connected.

2

Installing the PG 740 PII

What Does this Chapter Contain?

This chapter describes how you install your PG 740 PII. It provides you with comprehensive information on the major components of the PG 740 PII, such as:

- drives
- keyboard, and
- programming facilities.

Chapter Overview

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2.1 Setting up the PG 740 PII

Unpacking the PG 740 PII

Unpack your PG 740 PII as follows:

1. Remove the packing.
2. Do not throw the original packing away. Keep it in case you have to transport the unit again sometime in the future.
3. Check with the packing list to make sure no components are missing.



Caution

Risk of damage

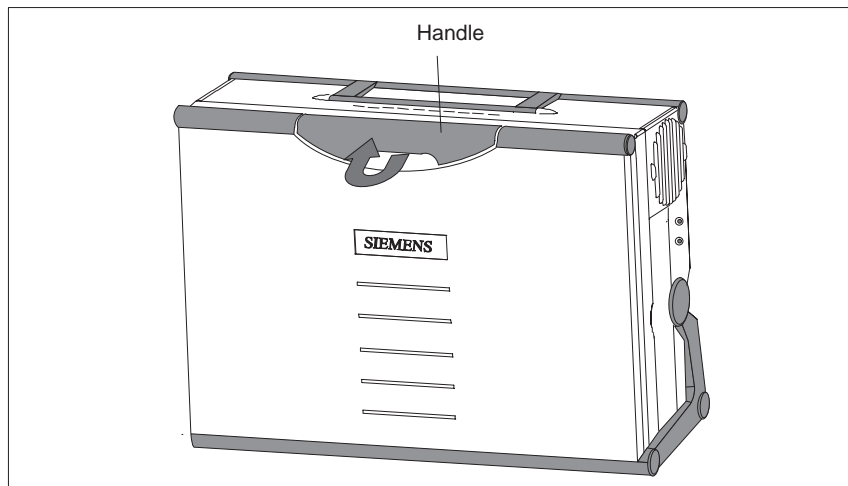
When transporting the unit in cold weather, when it may be submitted to extreme variations in temperature, make sure that no condensation is allowed to form on or in the unit.

The unit should be allowed to reach room temperature slowly before it is started up. If condensation has formed, the unit should be left for approximately 12 hours (with a temperature difference of -20°C to $+20^{\circ}\text{C}$ (-4°F to $+68^{\circ}\text{F}$)) before being switched on.

Desk-Top Mounting

The PG 740 PII is usually mounted on a desk or table top. To make working with the PG 740 PII easier, it can be adapted as follows to the particular workplace:

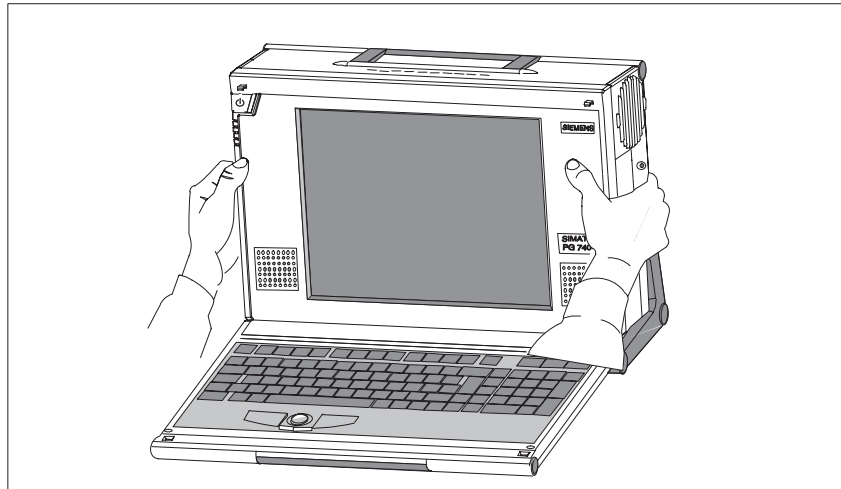
1. Set the PG 740 PII down on the desk or table top.
2. Open the keyboard lock by pulling up the anthracite-colored handle.
3. Swing the keyboard down into position.



Changing the Angle of Inclination

With the keyboard open, you can incline the unit to any angle between 0 and 90° around the axis of rotation of its stand. Proceed as follows:

1. Swing the keyboard down.
2. Pull the extra support (Figure 2-1) out of the rear of the stand.
3. Incline the unit to the angle you prefer.



Caution

Risk of injury

There is a danger of the unit tipping over if it is set up without extra support and at an angle of inclination of more than 15°. This could lead to personal injury and also damage to the unit.

If the angle of inclination is greater than 15°, you must use the extra slide-out support in the stand.

Horizontal Mounting

If you do not have a desk or table on which to mount the unit, you can work with it standing on the floor. You can swing the casing with display through about 90° into the horizontal plane.

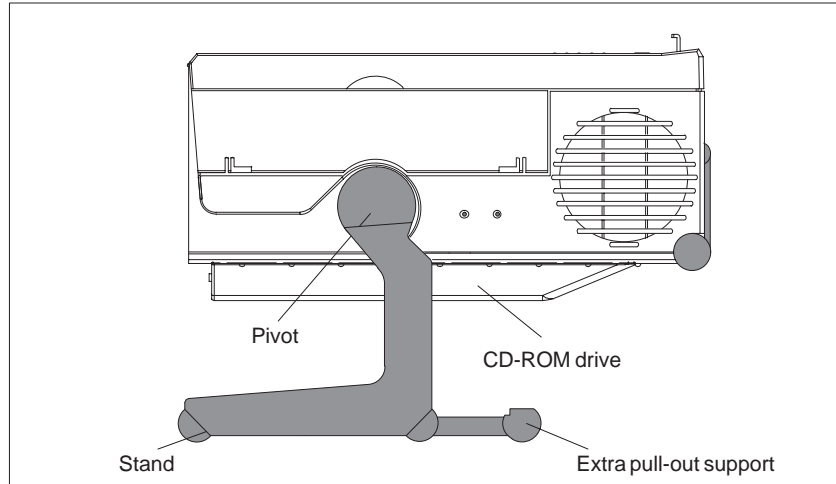


Figure 2-1 Horizontal Operating Position without Keyboard

Detaching the Keyboard

You can remove the keyboard if you are operating the unit in the position shown in Fig. 2-1.

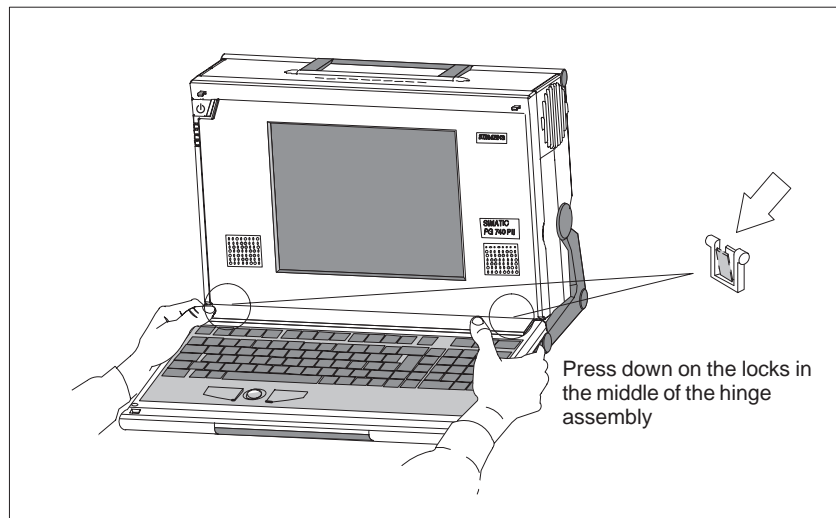


Figure 2-2 Detaching the Keyboard



Caution

If the keyboard is detached, there is a risk of the unit falling over. Pull out the extra support.

You detach the keyboard as follows:

1. Grip the keyboard hinges in the stand behind the keyboard.
2. Pull the locks in the middle of the hinge assembly toward the keyboard.
3. Pull the keyboard up and out.
4. Set the keyboard down on a suitable surface, using the hinge assembly as a stand.
5. Make sure the cable is not pinched or squashed in any way.
6. To attach the keyboard again, snap the keyboard hinges into the matching receptacles in the stand.

Wall Mounting

The basic unit can be attached to a wall. Four drilled holes (6 mm diameter) are provided in the base of the unit for this purpose.

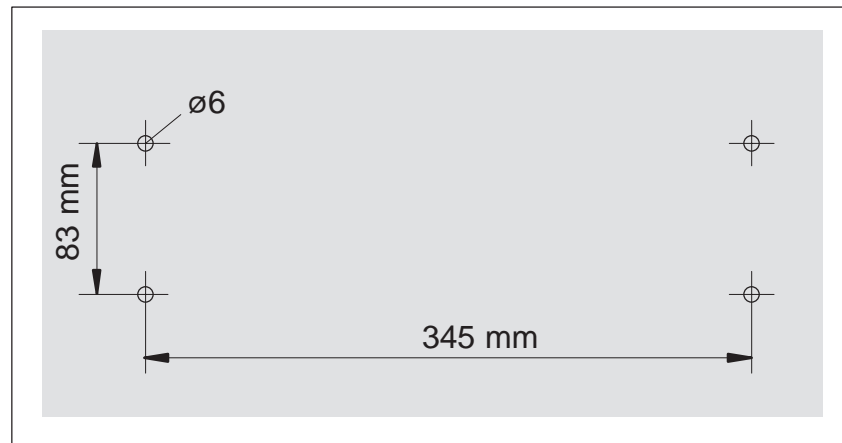


Figure 2-3 Drilling Template for Wall Mounting

2.2 Hardware Components of the PG 740 PII

Front

You can access all important operator controls and displays from the front or sides of the unit. The CD-ROM drive is accessible from the bottom of the unit.

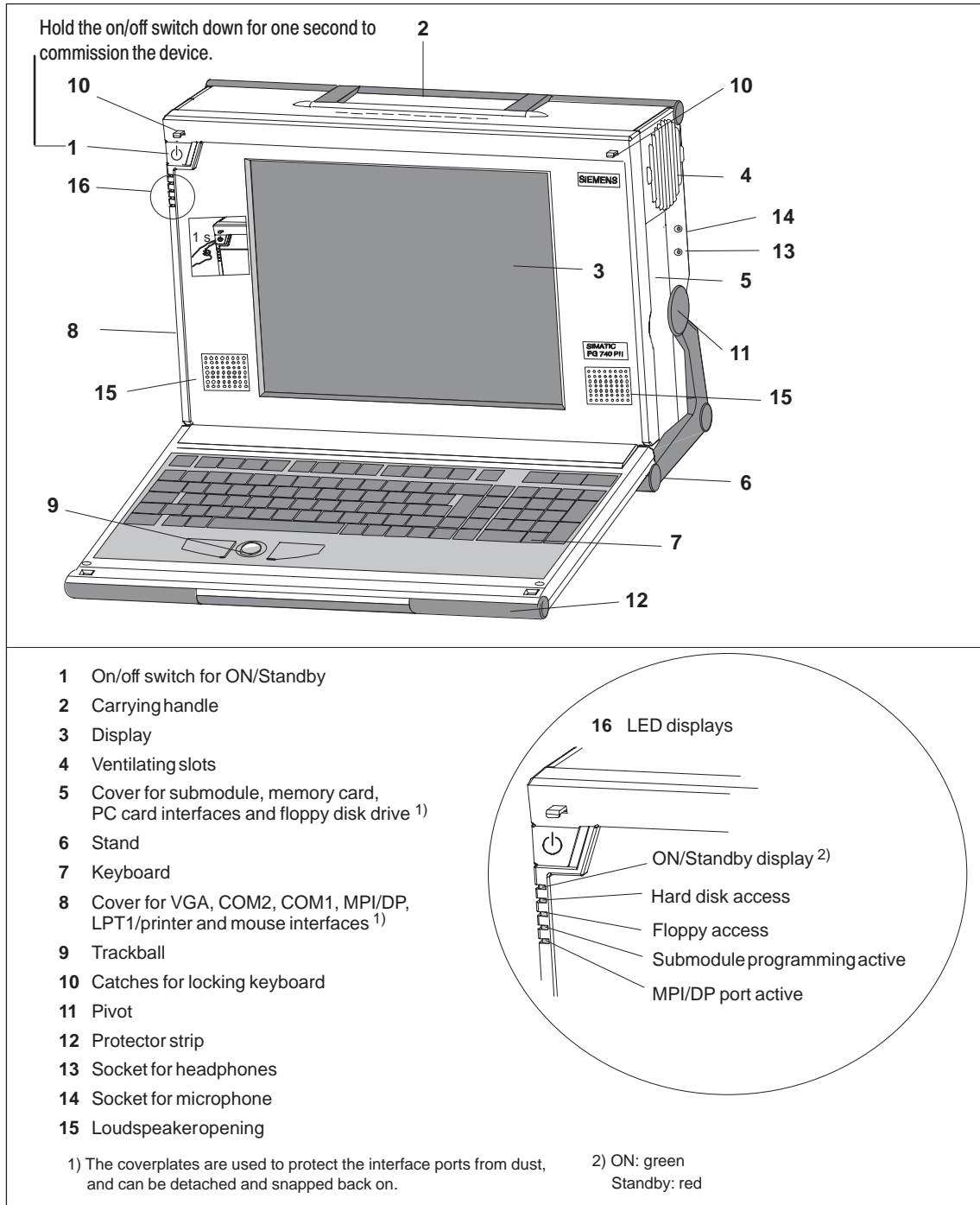


Figure 2-4 The Front of the PG 740 PII

Note

You can use the On/off switch to switch to Power/Standby. You can connect peripheral equipment to the PG 740 PII in this mode. When the network connection is withdrawn, the device is completely without power.

If the device was switched off previously using the On/off key or via Windows, it will remain in Power Standby mode when it is reconnected to the power supply. If, however, the programming device was switched off by pulling the network connector from its socket, the device will start up automatically when reconnected to the power supply. To ensure that the device switches off automatically when Windows is exited, set "Power OFF Source Software" to Enabled in the BIOS Setup menu.

Left Hand Casing Side Panel (Communications Side)

All the connectors and interface ports for connecting to external devices are located on the left-hand side panel of the PG 740 PII (communications side).

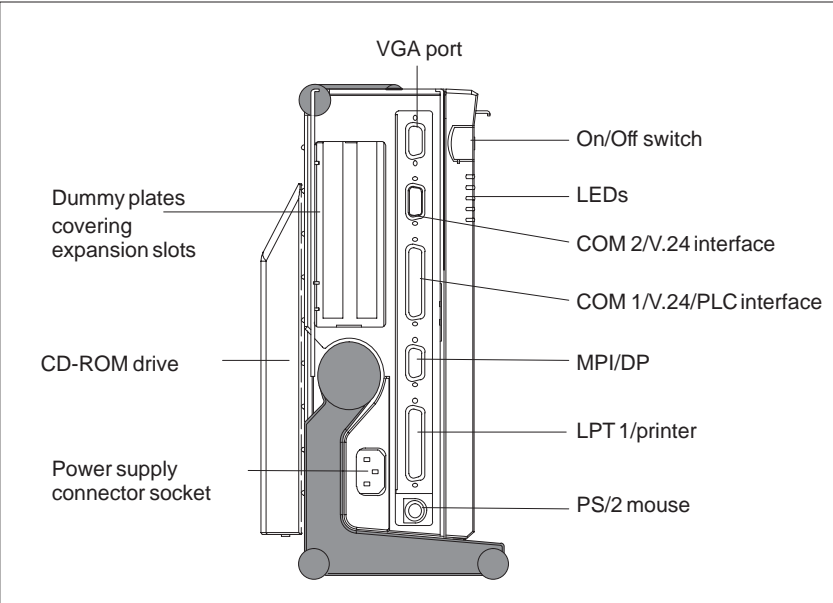


Figure 2-5 Left-Hand Casing Side Panel with Coverplates Removed

Connectors and Ports

The following table contains an overview of the various interface ports and connectors:

Ports and Connectors	Function
VGA port	Connection for external monitor
COM2 V.24/mouse Serial port	Connection for serial mouse Connection for serial printer
COM1 V.24/MODEM/PLC Serial port	Connection for S5 programmable controller
MPI /DP (Multipoint interface/ distributed I/Os)	Connection for S7 programmable controller and for distributed I/Os (CP5611-compatible)
LPT1 Printer Parallel interface	Connection for parallel printer
PS/2 mouse	Connection for PS/2 mouse
Connector for power supply	Connection for power supply

Right-Hand Casing Side Panel (Processing Side)

You access the slots for S5/S7 memory submodule programming, the Cardbus/PC card interface and the disk drive from the right-hand side panel of the PG 740 PII's casing (processing side).

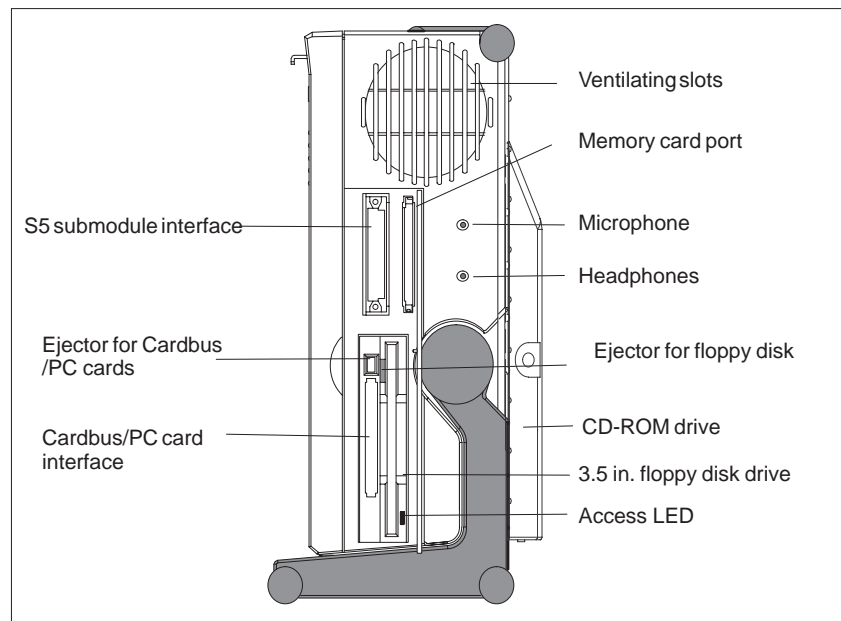


Figure 2-6 Right-Hand Casing Side Panel

The following table contains an overview of the various interface ports and connectors:

Interface Port	Function
S5 module interface	Programming of SIMATIC S5 memory submodules
Memory card interface	Programming of SIMATIC memory cards
Cardbus/PC card port	Connection for Cardbus/PC cards
Disk drive	Processing of 3.5 in. disks

Ventilating Slots

The raised air outlet slots for ventilation are located above the interface ports. There are also ventilating slots on the underside of the base. These slots must not be covered or blocked in any way (by carpeting, for instance).



Caution

Risk of overheating

If you cover up the slots for the inlet and outlet air in any way, there is a risk that your PG 740 PII will be damaged.

Do not place any objects over, or lay them on, the ventilating slots.

2.3 Display

The PG 740 PII's Color Display

The PG 740 PII has a TFT (thin-film transistor) color display with a 13.3 in. diagonal and a resolution of 1024 x 768 pixels.

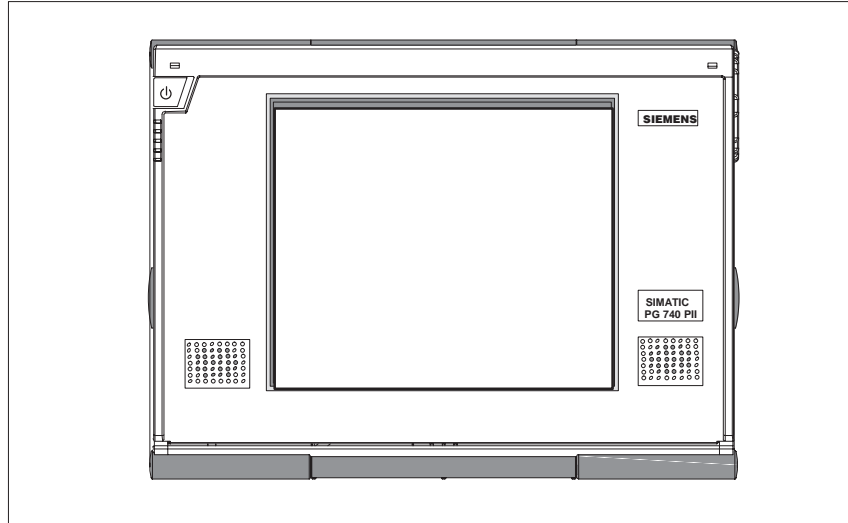


Figure 2-7 The PG 740 PII's Color Display

Color Shades

The three primary colors, red, green and blue, can each be displayed in six different shades. This means that, including all secondary colors formed, a maximum of 262144 different colors can be displayed, where the number of colors can be set in the respective graphic driver. The display has automatic contrast control.



Caution

Risk of injury

If a display is damaged, liquid crystal may escape. Do not touch this liquid or allow it to come into contact with your skin in any way, and do not breathe in the vapors. If you do come into contact with the liquid, wash those parts of the skin affected immediately with alcohol, and rinse with plenty of water. Then consult a physician right away.

Use only a cotton cloth and a neutral cleansing agent to clean the display. Do not use water or aggressive solvents (like alcohol or acetone, for instance). Never touch the display with hard, pointed objects.

Typewriter or Alphanumeric Keyboard

The largest block of keys on the keyboard is the alphanumeric or typewriter keyboard with all the keys for the letters of the alphabet, numerals, and special characters. The characters (letters, numerals, and special characters) are arranged in generally the same way as on a normal typewriter. However, there are a number of special keys which have specific special functions for the PG 740.

Keyboard Labeling

The keyboard has international labeling.

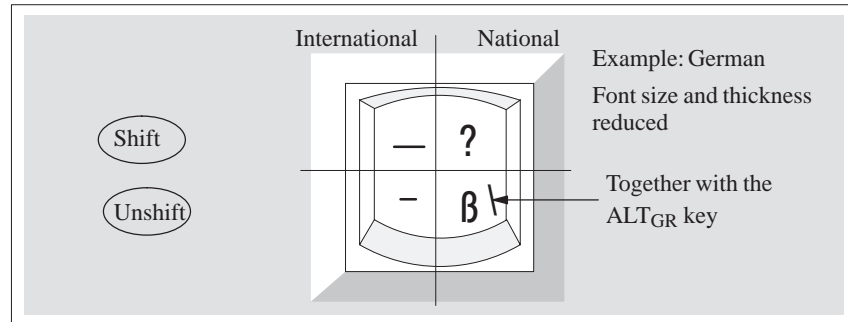
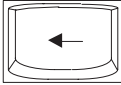
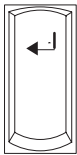
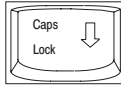

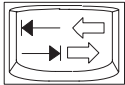








Figure 2-9 The Keyboard Labeling System

Special Keys

The special keys in the alphanumeric keyboard have the following functions:

Key	Function
	Backspace Key This key moves the cursor one space to the left and deletes the character at this position
	Return Key (Enter) The Return or Enter key is used mainly to terminate a command line in the operating system; that is, the command you have typed in is executed when you press this key. For other uses of this key, please refer to the user manual of the relevant application program.
	CAPS-LOCK Key If you press this key, the middle LED at the top right-hand corner of your keyboard lights up. All letters then appear in upper case and the upper of the two characters on the individual keys applies. If you wish to type in lower-case letters in this position, you must first strike the Shift key. If you are using an international keyboard, you cancel this function by pressing the CAPS-LOCK key again. The LED goes out. If you have a German keyboard, you must strike the Shift key to cancel this function.

Key	Function
	<p>NUM Key You switch from the numeric block to cursor control with this key (Num LED lights up). Press the key again to return to cursor control.</p>
	<p>Tabulator Key This key moves the cursor by one or more positions to the right.</p>
	<p>“Fn” Special key (combination key) Together with a second key (key combination), you activate other key codes for specific applications with this key.</p>
	<p>CTRL Key (combination key) This key is only used in combination with other keys. For example, you press Ctrl + ALT + DEL to reset and restart the operating system. For other uses of this key, please refer to the user manual of the relevant application program.</p>
	<p>ALT Key (combination key) This key is only used in combination with other keys. For instance, you can enter the hexadecimal value of an ASCII character (and consequently additional special characters) using this key and the numeric keypad.</p>
	<p>ALT_{Gr} Key (combination key) You can use this key together with the other combination keys to generate other key codes. For example, you can generate the "¨" character on the German keyboard by striking ALT_{Gr} + ß.</p>
	<p>PRINT Key (combination key) You can output the current screen display to a printer by pressing the PRINT key.</p>
	<p>PAUSE Key (combination key) The PAUSE key interrupts program execution in the majority of applications.</p>

Location and Labeling of the LED

There are three LEDs on the keyboard. They are located to the right of the function keys in the top row of the keyboard directly above the numeric keypad.

- NUM LOCK
- CAPS LOCK
- SCROLL LOCK

When the programming device is powered up, the NUM LOCK, CAPS LOCK, and SCROLL LOCK LEDs light up briefly twice. The keyboard is then ready for operation.

Cursor Keys

The keyblock shown below is used for cursor control.

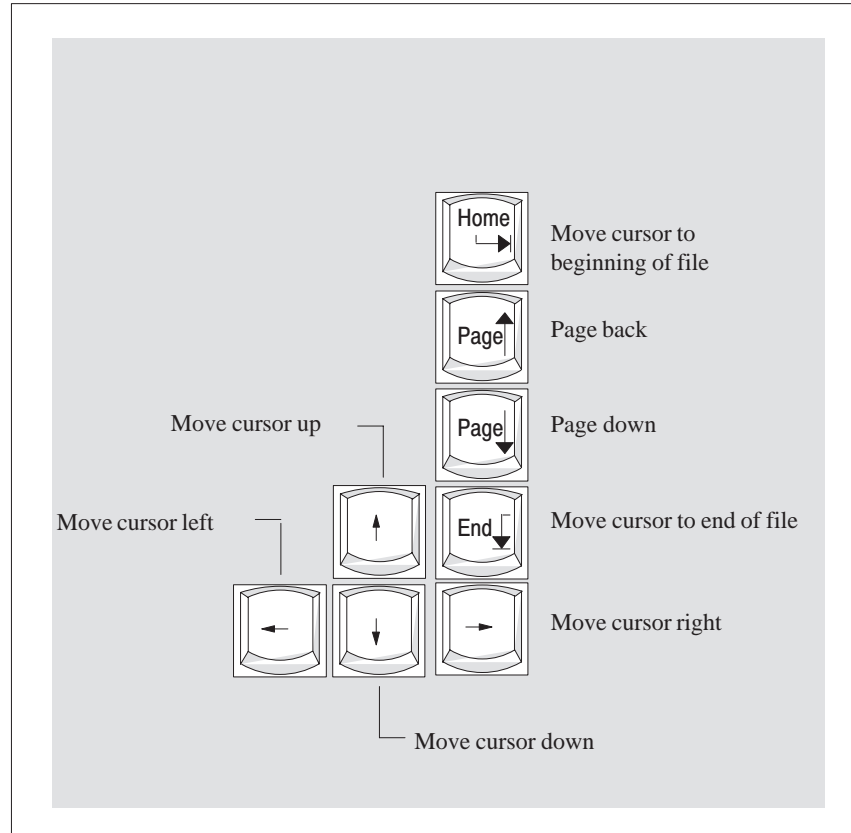







































Figure 2-10 Cursor Control Keypad

Key Combinations The various key combinations are shown in Table 2-1.

Table 2-1 Key Combinations

Key Combination	Function									
 +  + 	Warm restart									
 +  +  	Switch to international character set Switch to German character set; the German character set must have already been loaded.									
 + <table border="0" data-bbox="673 835 964 1125"> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>										By pressing the Fn key and a cursor control key in the numeric keypad simultaneously, you can change over to the cursor control functions of the key.
										
										
										
 + 	Trackball active/passive									

LEDs The LEDs for the NUM LOCK, CAPS LOCK, and SCROLL LOCK keys are located at the top right of the keyboard, and indicate the current status of these keys.

2.5 Trackball

Trackball

The trackball serves as an input device for cursor control and menu selection in many programs (with mouse operation). By moving the trackball, the cursor can be repositioned on the screen.

By pressing the left-hand button, you set a marker. The right-hand button is assigned differently according to the application. You can select objects or items in a menu, and start functions with the trackball.

Cleaning the Trackball

The trackball runs in a self-cleaning roller housing which is capable, under normal conditions, of preventing dust collecting on the trackball and transfer mechanism. However, you should clean the trackball from time to time.

Proceed as follows:

1. Switch off your programming device.
2. Remove the cover of the trackball housing by turning it counterclockwise; for example, by inserting tweezers or a similar gadget in the holes in the ring.
3. You can now lift the trackball out of its housing.
4. Wash the trackball with tap water to which a mild cleansing agent has been added (Figure 2-11).
5. Clean the trackball housing (Figure 2-12).
6. Clean the rollers (Figure 2-13).
7. Dry the trackball and return it to its housing.
8. Replace the cover and tighten it by screwing it clockwise.

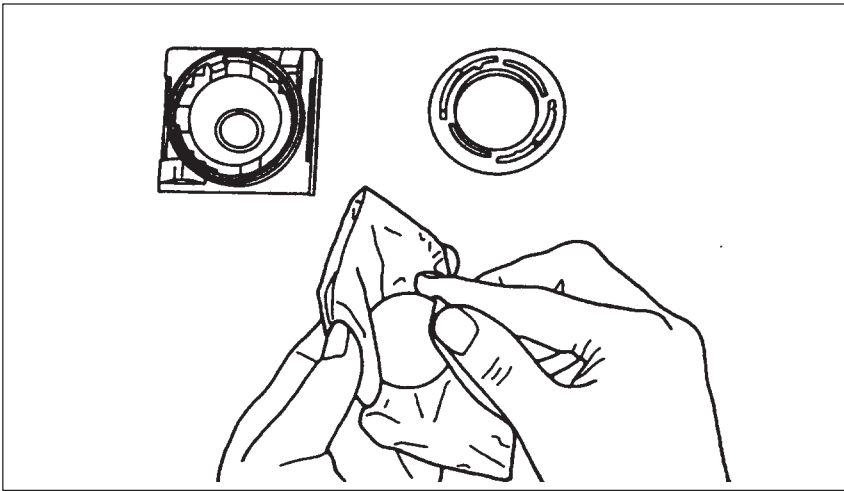


Figure 2-11 Cleaning the Trackball

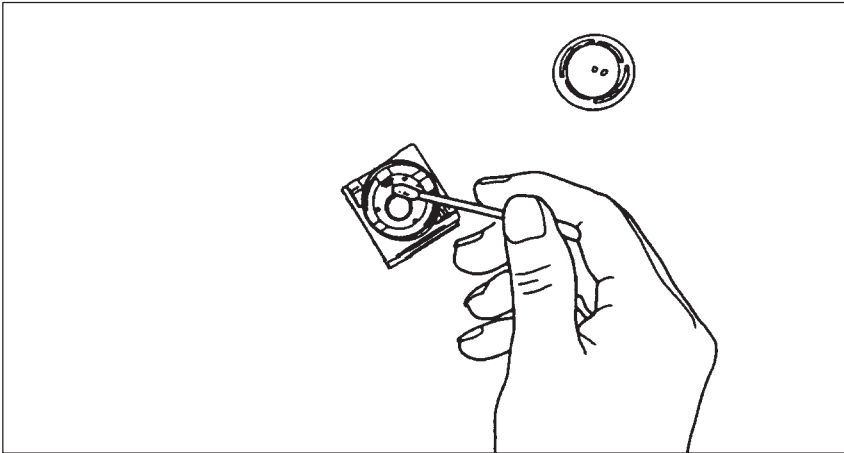


Figure 2-12 Cleaning the Trackball Housing

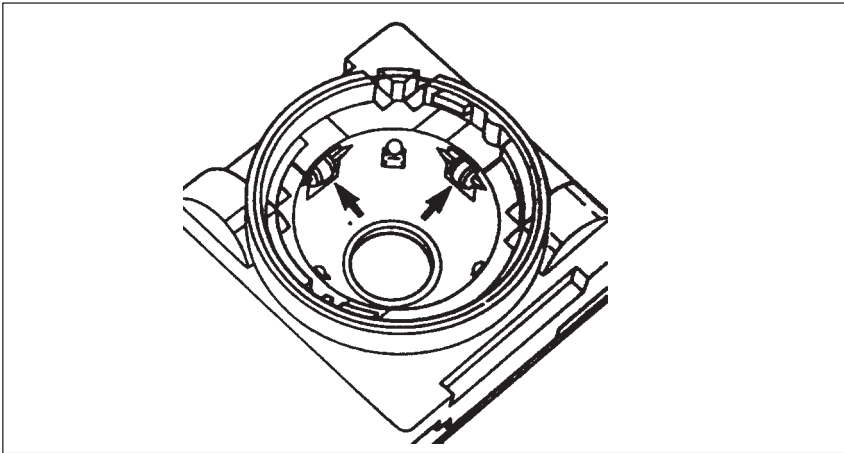


Figure 2-13 Cleaning the Rollers

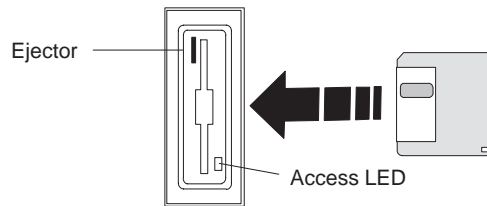
2.6 Floppy Disk Drive

Memory Capacity The PG 740 PII is equipped as standard with a 3.5" diskette drive and a 3.5" hard disk drive. You can store programs and data on diskettes with the diskette drive and load them from diskettes into the PG 740 PII.

Types of Diskette You can use the following diskettes:

Double-Sided High-Density Diskette	Double-Sided Double-Density Diskette
3.5 in.	3.5 in.
1.44 MB (135 TPI)	720 KB
Programming device recognizes diskettes by their coding	Programming device recognizes diskettes by their coding

Handling Diskettes The diskette is inserted in the diskette drive as shown below:



Caution

Risk of data loss

You must not remove the diskette as long as the access LED is lit. Otherwise, you may lose the data on the diskette.

Do not remove the diskette until the access LED on the drive or on the front of the PG 740 PII has gone out.

2.7 Hard Disk Drive

Memory Capacity

You can use a number of different hard disk drives in your PG 740 PII. The memory capacity of the particular type of hard disk can be found in the Product Information Bulletin.

Self-Test

Every time the PG 740 PII is switched on or reset, the hard disk drive performs a self-test, which is repeated during operation.

Whenever the hard disk drive is accessed, the access LED on the front of the unit lights up.



Caution

Risk of data loss and damage to drive

Drives are sensitive to vibrations and shock. Any vibrations occurring during operation can lead to the loss of data or damage to the drive.

If you intend transporting the unit, switch it off, and wait until the drive has come to rest (about 20 seconds) before you move it.

2.8 CD-ROM Drive

The CD-ROM drive enables you to read CDs.

Opening the Drawer

Swing the PG 740 PII into a horizontal position. The CD-ROM drive is now on the underside of the programming device. Switch on the PG. By briefly pressing the eject button, the drawer springs out slightly. Now pull the drawer out until it clicks into position.

Inserting / Removing CDs

Now insert the CD in the drawer with the labeling face up, and press it firmly down into the center of the turntable. To remove the CD, hold it by the edges and pull upwards.

Closing the Drawer

Push in the drawer until it closes completely. Do **not** press the eject button.

Note

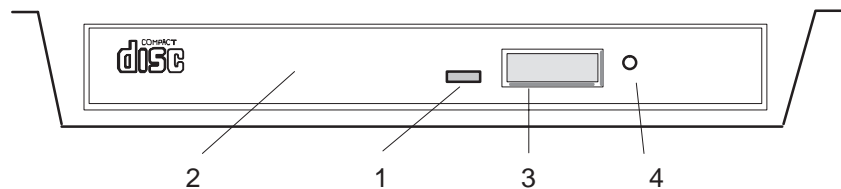
To avoid too much pressure on the open drawer, **always** hold the drawer at the front with one hand when inserting or removing a CD.

The EJECT function offered by various applications for opening the CD-ROM drawer does not work with this drive.

After the drawer has been closed, the CD is tested and the access display light on the drive starts to flash:

- If the display flashes continually, the CD is faulty but can still be read,
- If the display flashes several times and then remains lit, the CD you have inserted is defective and cannot be read.

CD-ROM Front



- 1 Access display
- 2 Drawer
- 3 Eject button
- 4 Emergency eject



Caution

Risk of data loss and damage to the drive!

CD-ROM drives are sensitive to vibrations and shock. Any vibrations occurring during operation can lead to damage to the drive or CD.

2.9 Transport

Preparatory Measures

The PG 740 PII is easy to transport. Before transporting it, however, you should take the following measures:

1. Switch the PG 740 PII to standby mode.
2. Unplug all connecting cables.
3. Close the covers protecting the ports and connections on the right-hand and left-hand casing side panels.
4. Bring the unit into an upright position.
5. Swing the keyboard up and press it against the front plate of the unit. Make sure that the latches on the left and right sides snap in.
6. Use the carrying handle if you only intend transporting the unit over a short distance.
7. If you are transporting the PG 740 PII over large distances, pack the unit with all its accessories in the carrying bag supplied.

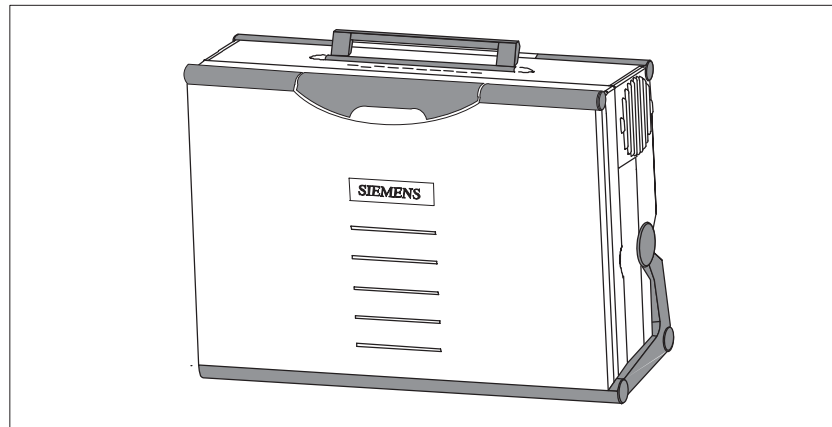


Figure 2-14 Prepared for Transport

Transport

Despite the fact that the PG 740 PII is of rugged design, its internal components are sensitive to severe vibrations or impact. You must therefore protect your PG 740 PII against severe mechanical stressing when transporting it.

Use the **original packing material** if you have to ship the PG 740 PII from one location to another.



Caution

Risk of mechanical damage

Moisture or condensation in the unit can result in defects.

When transporting your PG 740 PII in cold weather when it may be exposed to extreme variations in temperature, make sure that no moisture or condensation can form on or in the unit.

The unit should be allowed to reach room temperature slowly before it is started up. If condensation has formed, the unit should be left for about 12 hours (with a temperature difference of -20°C to $+20^{\circ}\text{C}$ (-4°F to $+68^{\circ}\text{F}$)) before being switched on.

Starting Up the PG 740 PII

What does this Chapter Contain?

This chapter describes what you have to do to set up your PG 740 PII successfully for operation. This includes

- the basic steps for starting up your PG 740 PII
- working with memory submodules and cards for the programmable controllers
- connecting your PG 740 PII to other devices.

Chapter Overview

Section	Description	Page
3.1	Connecting the PG 740 PII to the Power Supply	3-2
3.2	Connecting I/O Devices	3-3
3.3	Working with SIMATIC S5 Memory Submodules	3-9
3.4	Working with SIMATIC Memory Cards	3-10
3.5	Working with Headphones and Microphone	3-12
3.6	Working with PCMCIA Cards	3-13
3.7	PG 740 PII Connections (Point-To-Point Connections)	3-14
3.8	Multipoint Interface (MPI/DP)	3-18
3.9	PROFIBUS (SINEC L2)	3-20
3.10	Industrial Ethernet (SINEC H1)	3-21

3.1 Connecting the PG 740 PII to the Power Supply

Connecting to the Power Supply

You can operate the PG 740 PII on 115 V and 230 V power systems. The voltage is selected automatically.

1. Plug the power supply cable supplied with the unit into the connector labeled "Power".
2. Connect the unit to a socket outlet with grounded protective conductor.

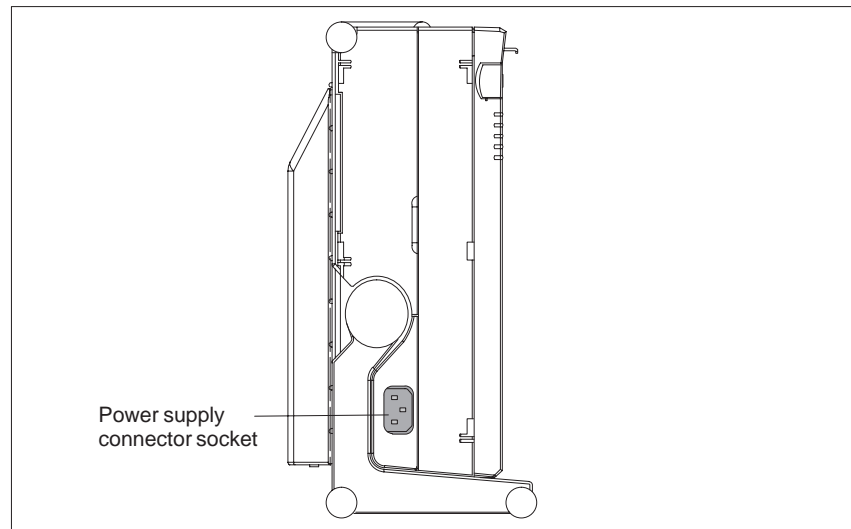


Figure 3-1 Connecting the Power Supply

Note

The power plug must be disconnected to isolate the unit completely from the supply.

Note

For operation in Canada and the US, a CSA or UL listed power supply cable must be used.

The unit is intended for operation with normal grounded power supply networks (TN networks, VDE 0100 part 300 or IEC 364-3).

The unit is not intended for operation with non-grounded or impedance-grounded systems (IT systems).

3.2 Connecting I/O Devices

Recommended Printers

Siemens printers with parallel interface are recommended for use with the PG 740 PII programming device.

Printer Connection Via the Parallel Port

To connect your printer, proceed as follows:

1. Switch the PG 740 PII to standby mode.
2. Open the cover over the interface ports on the left-hand casing side panel.
3. Plug the printer cable into the LPT1 parallel port.
4. Plug the printer cable into the printer.
5. Screw the connector tight at the interface port.

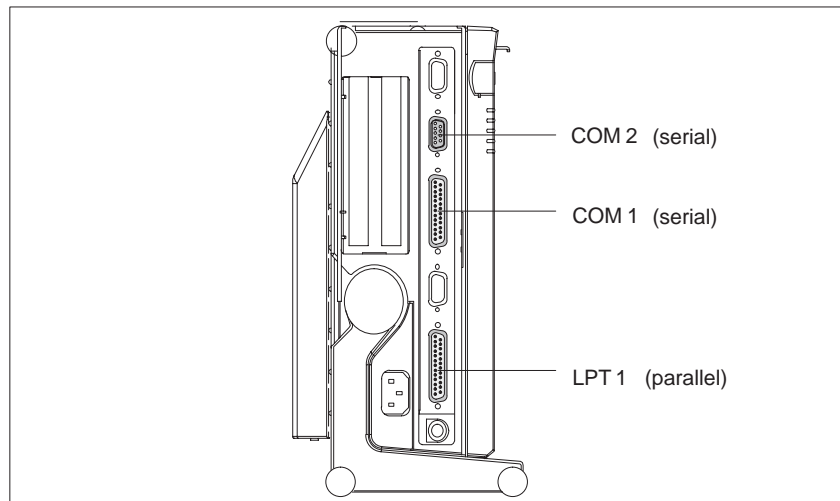


Figure 3-2 The Printer Ports



Caution

Risk of damage to the unit

Switch the unit to standby mode before connecting the parallel printer to the LPT1 port. (The printer should be switched off.)

Make sure you use the right interface port. If you use the wrong port, the printer or PG 740 PII may be damaged.

The interface port may be damaged if you reverse the polarity of the connections or use the wrong connecting cables.

Before plugging in the cables, you must discharge the electrostatic charge in your body and the connecting cables by briefly touching a grounded object (ESD guidelines).

Only use original connecting cables.

**Printer Connection
Via a Serial Port**

You can also connect your printer to the PG 740 PII through a serial COM port. You will find information on how to adapt and set your interface and on the connecting cable you require in your printer manual.

**Rerouting Printer
Outputs in
MS-DOS**

The standard interface for printer output is LPT1. You can reroute printer outputs to another interface port (COM2). The following table lists examples of how to change over the interface with the

Mode

command of the MS-DOS operating system:

Interface	Command	Effect
Reroute LPT1 parallel interface to COM2/V24/V28 serial interface	C:MODE LPT1:=COM2	Printer is assigned to communication port 2
Configure COM2 for printer	C:MODE COM2:96,n, 8,1,p Mode:9600 bps, no parity, 8 databits, 1 stopbit	COM2 is initialized for printer
Switch LPT1 interface back to parallel interface	C:MODE LPT1:	The LPT1 is switched back to the parallel interface

Note

To prevent your having to type in the command sequence every time you restart or reset the hardware, you are advised to store the command sequence in your AUTOEXEC.BAT file or another BATCH file.

Recommended Monitors

You connect external multisynchronous monitors to the right-hand casing side panel with the standard VGA connector. We recommend you use Siemens monitors.

Connecting Monitors

You must switch the PG 740 PII to standby mode before connecting the monitor cable. You will find more details in the connector pinout in Chapter 7.

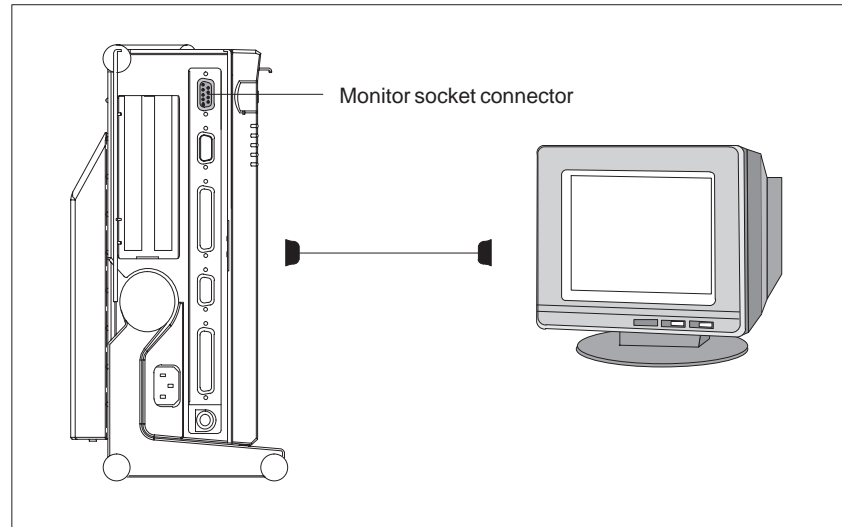


Figure 3-3 Connecting the Monitor

Connect the monitor as follows:

1. Switch the PG 740 PII to standby mode and switch off the monitor.
2. Open the port cover on the left-hand casing side panel.
3. Plug the monitor cable into the VGA socket connector.
4. Plug the other end of the monitor cable into the monitor.
5. Adjust the monitor settings with the SETUP program.

Additional Graphics Card

You can plug an additional graphics card into one of the two ISA slots for special applications.

Connecting Monitors to Additional Graphics Cards

Proceed as follows:

1. Switch the PG 740 PII to standby mode and switch off the monitor.
2. Open the cover for the expansion module connectors on the left-hand casing side panel.
3. Plug the monitor cable into the VGA socket of the graphics card.
4. Connect the monitor cable to the monitor.
5. Adjust the monitor settings with the SETUP program.

Switching Additional Graphics Cards On and Off

When the PG 740 PII is powered up, the system automatically recognizes the additional graphics card. The display and the built-in VGA graphics interface module are switched off. To switch the display and the built-in VGA graphics interface module back on, proceed as follows:

1. Switch on the PG 740 PII.
2. While the PG 740 PII is being powered up, keep the INSERT key pressed until you hear two signal tones.

The additional graphics card is reactivated the next time you switch the PG 740 on without pressing the INSERT key.

Using a Mouse

You can connect both a PS/2 and a serial mouse to the PG 740 PII. The PG 740 PII is delivered with the mouse driver for the trackball and PS/2 mouse already loaded.

Connecting a PS/2 Mouse

You can connect an external PS/2 mouse or another external pointing device to an additional PS/2-compatible mouse connector.

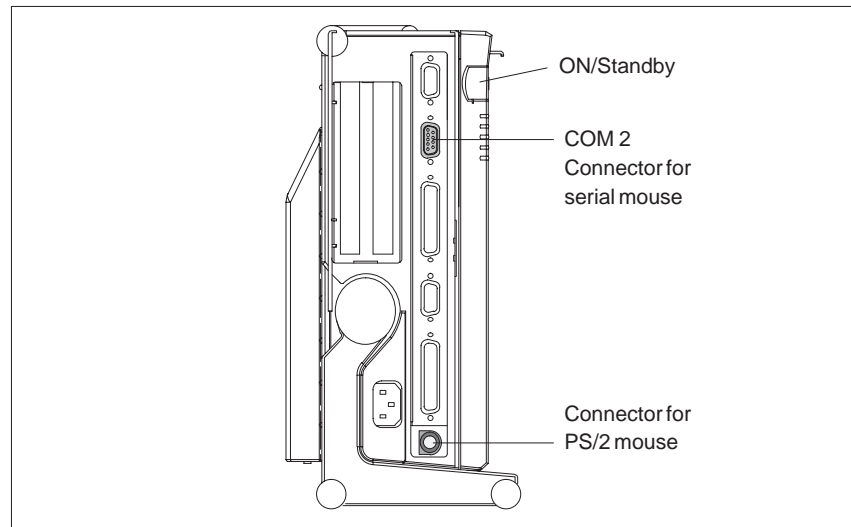


Figure 3-4 Connecting a PS/2 Mouse

Connect the mouse as follows:

1. Switch your PG 740 PII to standby mode.
2. Open the port cover on the left-hand casing side panel.
3. Plug the cable of the PS/2 mouse or another external pointing device into the mouse connector.
4. Switch your PG 740 PII on again.

Switching between Internal Trackball and PS/2 Mouse

Once you have plugged in the external mouse and restarted your PG 740 PII, the internal trackball is inactive, and remains inactive until the PG 740 PII is powered up again without the external mouse.

Table 3-1 Trackball/External Mouse Mode

Situation	Internal Trackball	External PS/2 Mouse
No mouse	Active	
External mouse	Passive	Active

Connecting a Serial Mouse

You can connect a serial mouse to the COM2 serial port. To operate a serial mouse, you must assign the relevant parameters to the mouse driver. You will find the information you need to do this in the description of your mouse or in the description of the operating system.

Proceed as follows:

1. Switch your PG 740 PII to standby mode.
2. Open the cover of the interface ports on the left-hand casing side panel.
3. Plug the PS/2 mouse cable or the cable for another external pointing device into the mouse socket.
4. Switch your PG 740 PII on again.

Choosing Another Keyboard

You can connect another PS/2 keyboard to the PG 740 PII instead of the one supplied with it.

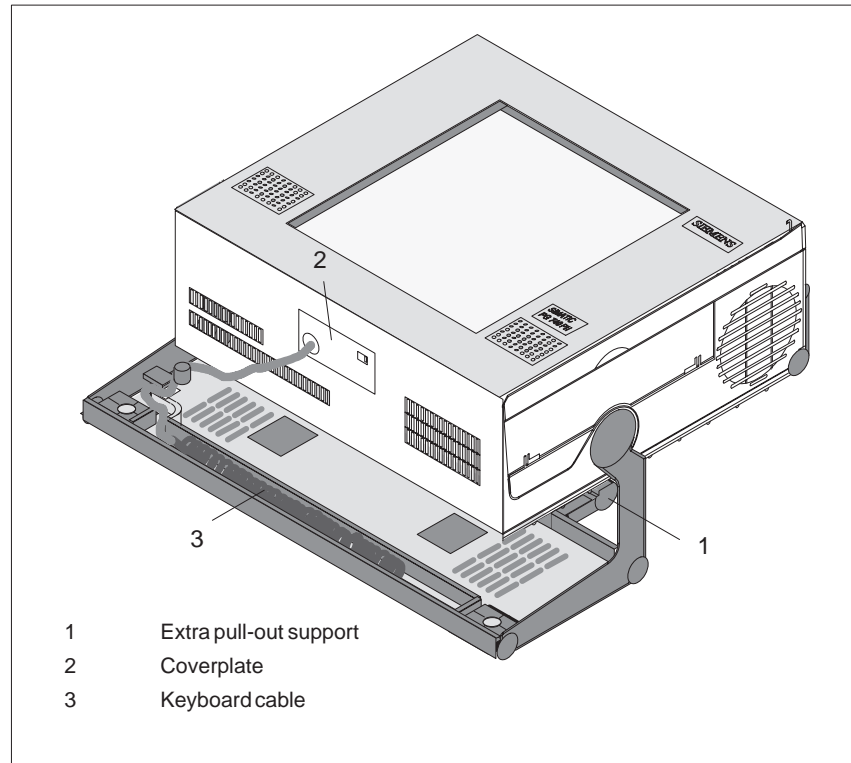


Figure 3-5 Connecting a PS/2 Keyboard

Connecting a PS/2 Keyboard

You connect the keyboard as follows:

1. Switch your PG 740 PII to standby mode.
2. Pull out the extra support.
3. Turn the casing through 90°.
4. Open the cover on the underside of the unit, using a screwdriver.
5. Unplug the keyboard connector and cable.
6. Plug in the PS/2 keyboard connector and cable.
7. Close the cover.

Note

It is advisable to use a keyboard cable with angled connector. If the connector is straight, you will not be able to close the cover and this will restrict the swivel range of the unit.

3.3 Working with SIMATIC S5 Memory Submodules

Working with SIMATIC S5 EPROMs and EEPROMs

You can read and program SIMATIC S5 EPROMs and EEPROMs via the 48-pin S5 EPROM and EEPROM programming port. You will find details on how to use the programming software in the STEP 5 Manual.

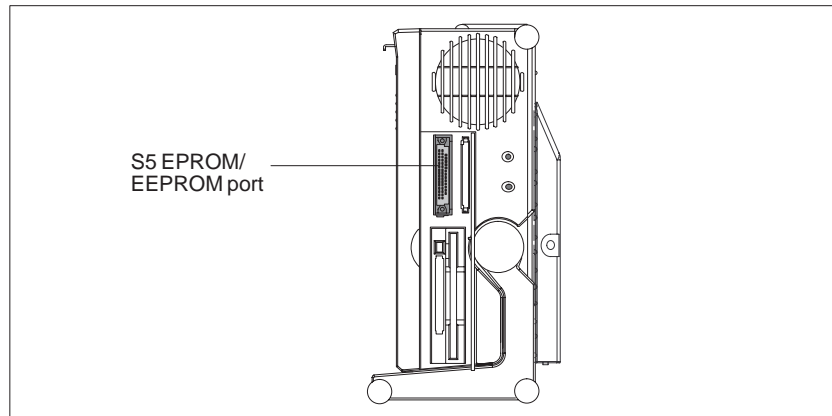


Figure 3-6 S5 EPROM/EEPROM Port



Caution

Risk of damage to EPROMs or EEPROMs

If you plug the EPROM or EEPROM in or take it out while its processing software is running, there is a danger that it will be damaged.

You must not take out the S5 EPROM or EEPROM while the LED showing that the EPROM or EEPROM is being read etc. is lit. You cannot work simultaneously with S5 EPROMs or EEPROMs and memory cards.

Before plugging in or taking out S5 EPROMs or EEPROMs, you must discharge the electrostatic charge of your body by briefly touching a grounded object (ESD guidelines).

Note

In order to be able to program the SIMATIC S5 EPROM or EEPROM, "Programming Interface" must be set to "Enabled" in the BIOS-SETUP program in submenu "Hardware Option".

3.4 Working with SIMATIC Memory Cards

Working with Memory Cards

You can read, program, or erase SIMATIC memory cards via the 68-pin programming port.

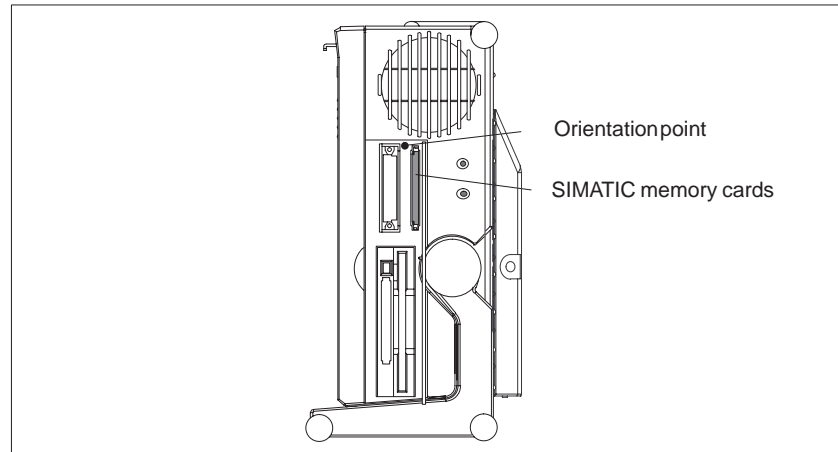


Figure 3-7 SIMATIC Memory Cards

Proceed as follows when working with the SIMATIC memory cards:

1. Switch on your PG 740 PII, start your SIMATIC programming function.
2. Plug a SIMATIC memory card into the 68-pin connector.
3. Read, program or erase the memory card with the programming function of your SIMATIC programming software.
4. Terminate the programming function of your SIMATIC programming software.
5. Take the SIMATIC memory card out of the programming port for further use in a programmable controller.



Caution

Risk of damage to memory cards

If you try to plug the memory card in the wrong way around, your PG 740 PII or memory card may be damaged!

You must not take out the memory card while the LED showing that the card is being read etc. is lit. You cannot work simultaneously with S5 EPROMs or EEPROMs and memory cards.

Before plugging in or taking out memory cards, you must discharge the electrostatic charge of your body by briefly touching a grounded object (ESD guidelines).

Note

In order to be able to program the SIMATIC S5 EPROM or EEPROM, "Programming Interface" must be set to "Enabled" in the BIOS-SETUP program in submenu "Hardware Option".

**Installing ISA and
PCMCIA Cards**

Note the following when installing these cards:

Note

Depending on the configuration of the PG740 PII, there may not be any free interrupts available for operating ISA/PCMCIA modules. In this case, you must reserve interrupts in the setup.

To reserve the interrupts, proceed as follows:

In the BIOS setup menu “Advanced,” set the interrupt required by the PCMCIA or ISA module to “reserved” for “PCI/PNP ISA IRQ Resource Exclusion” in the line “PCI Configuration” (the default setting is “available”).

3.5 Working with Headphones and Microphone

Headphone Connection

Headphones and active loudspeakers equipped with a 3.5-mm stereo jack plug can be connected to the socket.

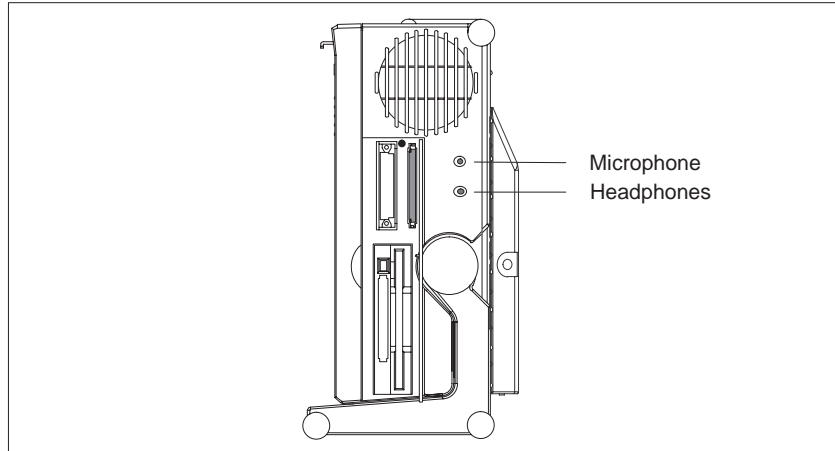


Figure 3-8 Sockets for Headphones and Microphone

The loudspeaker volume control is set via the loudspeaker button in the taskbar or in the Windows 98 Start menu via **Programs > Accessories > Multimedia > Volume Control**. When you use headphones, the internal loudspeakers are switched off.

Microphone Connection

Microphones with the following connector assignments can be connected to the 3.5-mm microphone socket.

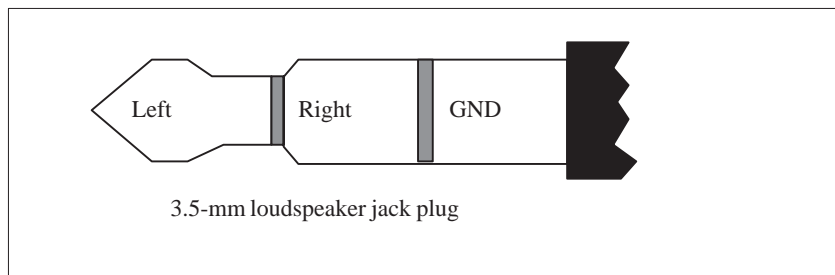


Figure 3-9 Assignments of the Microphone Jack

To record using the microphone, select **Programs > Accessories > Multimedia > Sound Recorder** in the Windows 98 Start menu.

3.6 Working with Cardbus/PC Cards

Cardbus/PC Cards The PG 740 PII has a PC card port of type II. You can plug communications cards for MODEM, FAX-MODEM, ISDN, token ring, Ethernet, memory expansion, and SCSI interface cards in credit-card format into this port.

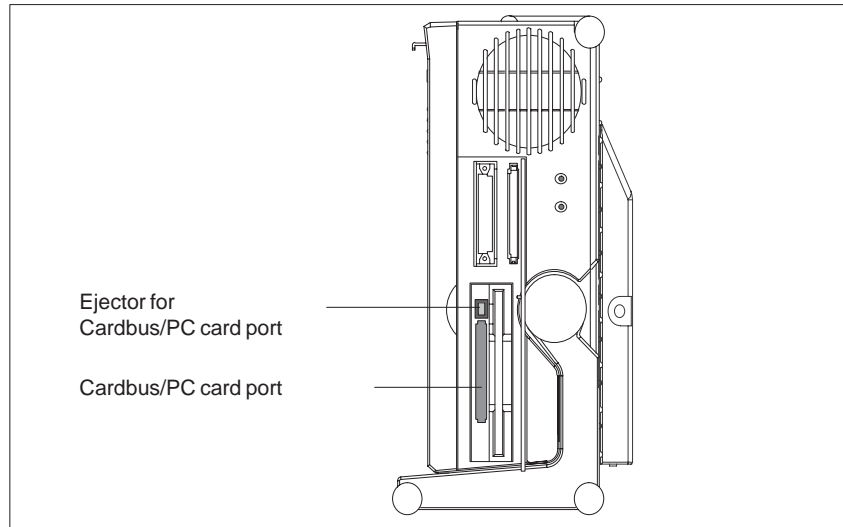


Figure 3-10 Cardbus/PC Card Port



Caution

Risk of damage

You must insert the Cardbus/PC card with the front side pointing to the rear of your PG 740 PII. This side generally bears a company or product designation and the wording “This side up” or a similar labeling.

If you try to insert the Cardbus/PC card the wrong way around, your PG 740 PII and the Cardbus/PC card may be damaged.

Before plugging in or taking out memory cards, you must discharge the electrostatic charge of your body by briefly touching a grounded object (ESD guidelines).

Note

In order to use the Cardbus/PC card, “Cardbus/PCMCIA Slot” must be set to “Enabled” in the BIOS-SETUP program in menu “Main”, submenu “Hardware Option”.

3.7 PG 740 PII Connections (Point-to-Point Connections)

Point-to-Point Connection

In this section, you will learn how to connect your PG 740 PII to a programming device or programmable controller over a point-to-point connection.

You establish a point-to-point connection by connecting the PG 740 PII to another programming device or a programmable controller via

- a V.24 connection
- a TTY connection

Suggestions for Configuring TTY (20 mA) Interfaces

Reliable data transfer depends on several factors. The data transfer rate you can achieve depends on the distance, the type of cable, the type of interface, and any interference present.

Rules

You can reduce interference by choosing the right transmission cable and connecting it properly, and observing the following guidelines.

- Use a shielded cable with a low line resistance ($< 130 \Omega / \text{km}$) and low capacitance ($< 90 \text{ pF/m}$). Twisted-pair cables enhance immunity to noise due to inductance. A low surge impedance results in reduced voltage excursions and shorter charge reversal times. The surge impedance decreases with increasing conductor cross-section for the same length of cable.
- The shorter the transmission link, the higher the maximum possible data transfer rate.
- If there is an active sender and an active receiver at the same end of the transmission link, the sequence of access priority to the transmission circuit must be taken into account in order to achieve the longest possible transmission link.
- Signal lines and power lines must not be run together. Signal lines must be installed as far away as possible from strong interference sources (400 V three-phase power cables, for example).
- The active TTY interface with 12 V no-load voltage has been tested on a 1000 m (3300 ft.) long cable at a transmission rate of 9600 bps in a normal noisy environment. If a shielded LiYCY 5x1x0.14 is used, reliable transmission is possible over a distance of up to 1000 m (3300 ft.). The AS511 protocol (only one transmitter at a time) was used for testing.

Note

The contaminating field of the interference source decreases exponentially with the distance.

PG to PG Connection (TTY, V.24)

If you want to connect your PG 740 PII to another programming device, you can plug the appropriate connecting cable into the V.24 or TTY interface port. You will find the necessary information on the connecting cables listed below in Chapter 7.

Interface	Link	Connecting Cable	Adapter
V.24 interface	PG 7xx with PG 7xx	6ES5 733-5BD20	
TTY interface	PG 7xx with PG 6xx	Series connection of 6ES5 733-2xxx0 and 6ES5 731-6AG00 ¹⁾	6ES5 731-6AG00

Note

¹⁾When connecting the programming devices in series, make sure you connect the cable the right way around (see Figure 3-11).

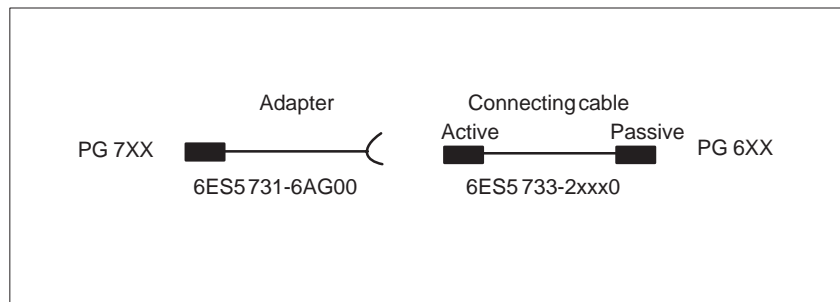


Figure 3-11 Direction of Connection: Adapter - Connecting Cable

Note

When connecting two programming devices via the TTY interface, you must deactivate one of the TTY interfaces in the circuit (COM1) by changing the switch position (see Chapter 4). When the PG 740 PII leaves the factory, this interface is always set to active.

Connecting the PG 740 to S5 Programmable Controllers

You can connect the PG 740 PII to a SIMATIC S5 programmable controller via the COM1/TTY interface port. The cable for establishing the connection to the SIMATIC S5 CPUs is included with the PG 740 PII (order no. 6ES5734-2BF00).

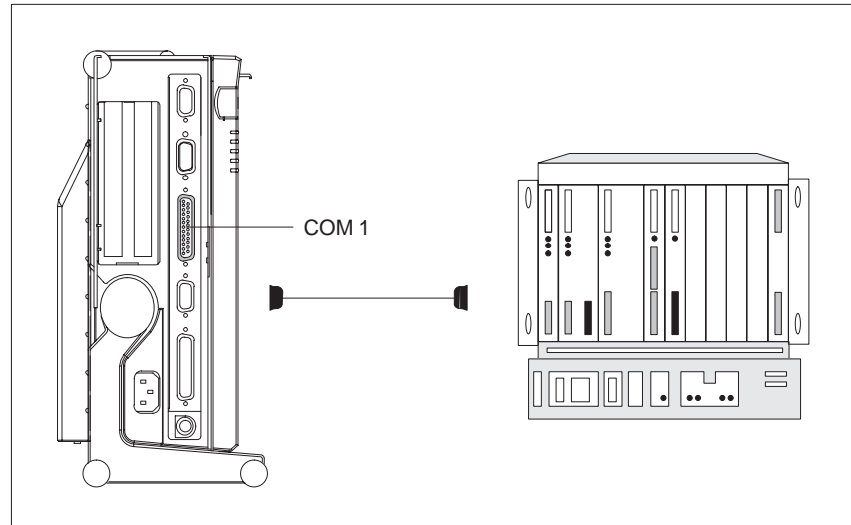


Figure 3-12 Connecting the PG 740 PII to an S5 Programmable Controller

You connect your PG 740 PII to a SIMATIC S5 programmable controller as follows:

1. Switch the PG 740 PII to standby mode.
2. Open the cover over the interface ports on the left-hand casing side panel.
3. Plug the cable into the COM1/V.24 modem/PLC interface port.



Caution

Risk of damage to the PG 740 PII

The interface port may be damaged if you confuse the connections or use the wrong connecting cables. Make sure the TTY cable of the PG 740 PII is plugged into the COM1/TTY port and not into the LPT1 port.

Before plugging the cables in, you must discharge your body's electrostatic charge by briefly touching a grounded object (ESD guidelines).

Use only original cables to establish the connection to the programmable controller.

Connecting the PG 740 PII via an Adapter

The connecting cable 6ES5 734-2BD20 is supplied with the PG 740 PII. An adapter is available for connecting the programmable controller using old standard cables.

Interface	Link	Connecting Cable	Adapter
TTY interface (COM1)	PG 740 PII to SIMATIC S5 programmable controller	6ES5 734-2BD20	
		6ES5 731-1xxx0 15-pin	6ES5 731-6AG00
		6ES5 731-0xxx0 25-pin	6ES5 731-6AG00

Higher Data Transfer Rates at Distances of up to 1000 m (3300 ft.)

In order to maintain a data transfer rate of 9600 bps up to a distance of over 1000 m (3300 ft), the receiving diode is connected to ground (reference) via the connecting cable. Cables of various lengths are available under the order no. 6ES5 734-2xxx0 (xxx stands for the length in metres).

Point-To-Point Connection in Windows 9x

Proceed as follows to establish an interface connection:

Select the “Add/Remove Programs” icon via the taskbar *Start > Settings > Control Panel*.

Select “Connection” in the menu “Windows Setup.” Under “Details,” select “PC Direct Connection.” Once these settings become effective, you can select “PC Direct Connection” under *Start > Programs > Accessories*.

You can then establish a connection to the other programming device via the standard serial or parallel data lines.

3.8 Multipoint Interface (MPI/DP)

Connection of an S7 Programmable Controller via the MPI/DP Interface

You can connect your PG 740 PII to a SIMATIC S7 programmable logic controller using the floating* MPI/DP interface. The MPI cable (5 m) for connection to SIMATIC S7 CPUs is supplied with the PG 740 PII (order no. 6ES7901-0BF00-0AA0).

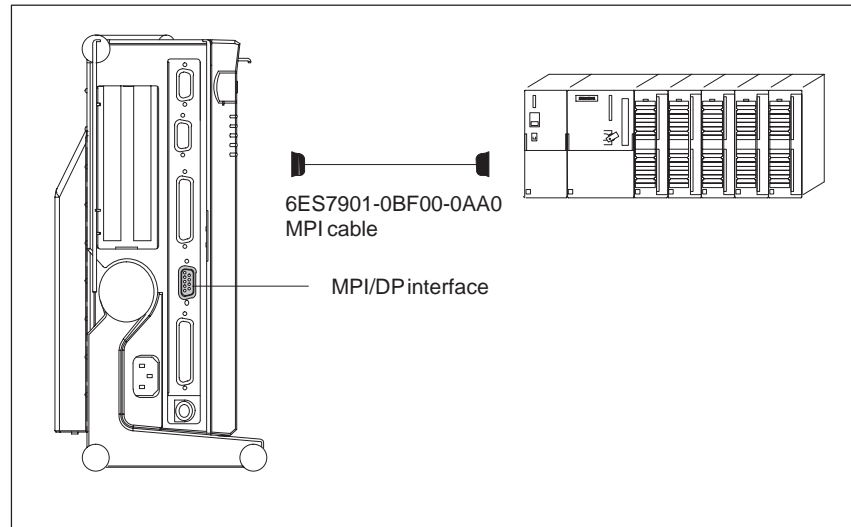


Figure 3-13 Connecting via MPI/DP Interface

You connect your PG 740 PII to a SIMATIC S7 programmable controller as follows:

1. Switch the PG 740 PII to standby mode.
2. Open the cover over the interface ports on the left-hand casing side panel.
3. Plug the connecting cable into the MPI/DP port.



Caution

Risk of damage to the PG 740 PII

Before plugging the cables in, you must discharge your body's electrostatic charge by briefly touching a grounded object (ESD guidelines).

Connecting

Via the MPI/DP interface, you can connect your PGs to the S7-200, S7-300, and S7-400 programmable controllers, and also to the PROFIBUS DP.

*) Electrical isolation within the safety extra-low voltage (SELV) circuit

**MPI/PROFIBUS DP
Network**

Up to 32 devices (PC, programming device, programmable controller, or DP components) can be connected to the MPI/DP interface to form a network segment. The physical connection of the MPI/DP interface to the PROFIBUS DP network is via a floating* RS485 interface which is a component of the PG mother board.

Several PROFIBUS DP network segments can be connected using repeaters. The complete PROFIBUS DP network can comprise up to 127 stations. The data transmission rate in the MPI network is 1.5 Mbps. Data transmission rates from 9.6 Kbps to 12 Mbps are possible in the PROFIBUS DP.

Note

You can find information on setting up a PROFIBUS DP network in the *S7-300 Programmable Controller, Hardware and Installation* manual, order no. 6ES7398-8AA02-8BA0.

*) Electrical isolation within the safety extra-low voltage (SELV) circuit

3.9 PROFIBUS (SINEC L2)

Networking PG 740s via SINEC L2

SINEC L2 is an open and ruggedly designed bus-type local area network (LAN) for industrial applications. It can be used to configure networks with up to 127 stations. SINEC L2 has a data transfer rate of 1.5 Mbps.

Principle of Operation

SINEC L2 operates on the master-slave principle with token passing (to DIN 19245, PROFIBUS). It distinguishes between active and passive stations. An active station receives the token and passes it on to the next station within a specified time.

Hardware

You need the following components, for instance, for networking with SINEC L2:

- CP 5412
- RS 485 bus terminal
- RS 485 interface
- Shielded twisted two-wire cable (LAN cable)

Note

You will find more detailed information on the SINEC modules in the SINEC Catalog IK 10 (order no. E86060-K6710-A101-Ax).

For information on how to install the modules and make any modifications to the network configuration, please refer to the installation instructions for the various modules.

3.10 Industrial Ethernet (SINEC H1)

**Networking
PG 740 PIIs via
SINEC H1**

SINEC H1 is an industry-standard bus-type local area network (LAN) based on Ethernet (ISO 8802/3), and has the following characteristic features: high speed (10 Mbps), simple expansion capability, open communications and widespread application.

**Principle of
Operation**

SINEC H1 is the most professional product available for networks and network components operating on the CSMA/CD (Ethernet) principle. SINEC H1 is a bus-type LAN that uses a triaxial cable (H1) as its transmission medium.

Hardware

You need the following module for networking with SINEC H1:

- CP 1413

Note

You will find more detailed information on the SINEC modules in the SINEC Catalog IK 10 (order no. E86060-K6710-A101-Ax).

For information on how to install the modules and make any modifications to the network configuration, please refer to the installation instructions for the various modules.

4

PG 740 PII Expansions

What Does this Chapter Contain?

You can enhance the functionality of your PG 740 PII by installing additional modules or powerful processors. This chapter describes how to expand your PG 740 PII. Please observe the relevant Safety Guidelines.

Chapter Overview

Section	Description	Page
4.1	Opening the Unit	4-2
4.2	Functional Units Visible after Opening the Unit	4-4
4.3	Block Diagram of the Mother Board	4-5
4.4	Installing Expansion Modules	4-11
4.5	Installing Memory Expansion Cards	4-13
4.6	Backup Battery	4-16
4.7	Processor Upgrade	4-17
4.8	Closing the Unit	4-17

4.1 Opening the Unit

Prerequisites

The programming device is designed to enable any necessary maintenance work to be carried out quickly and at low cost.



Caution

The electronic components of the printed-circuit boards are extremely sensitive to electrostatic discharge. When handling the boards, you must follow the guidelines for electrostatically-sensitive components (ESD guidelines) at the end of this book.

Limitation of Liability

All technical specifications and licenses apply only to expansion functions approved by Siemens.

No liability can be assumed for functional constraints caused by the use of devices and components of other manufacturers.

All modules and components in the PG 740 PII are electrostatically sensitive. Please read the ESD guidelines at the end of this book carefully. The following sign on cabinets, module racks or packaging warns that electrostatically-sensitive modules are present.



Before Opening the Unit

The following rules are mandatory when carrying out any work on the open unit, and should be read carefully before opening the unit:

- Before you disconnect the power supply cable, discharge any electrostatic charge on your body. You can do this by touching metallic parts, such as screws, on the rear panel of the PG 740 PII.
- Discharge any electrostatic charge from tools that you are using.
- Wear a grounding wrist strap if you are handling components.
- Leave components and modules in their packing until you are ready to install them.
- Disconnect the PG 740 PII from its power supply before plugging in or removing any modules or components.
- Touch components and modules only on their edges. Above all, do not touch the connecting pins and printed conductors.
- Do not operate the PG 740 PII with the cover open.

Tools

Use a suitable TORX or Phillips screwdriver to loosen the M3 combi TORX screws.

Opening the PG 740 PII

Open your PG 740 PII as follows:

1. Switch off the PG 740 PII, pull out the power plug, and remove all connecting cables.
2. Swing the keyboard down into position.
3. Now undo the two screws on the rear panel. Bring the unit into the 90° (horizontal) position. Use the extra pull-out support in the stand to improve the stability of the unit.
4. Push in the snap catches at the bottom with a small screwdriver.
5. Pull off the rear panel to the rear using the carrying handle.
6. Swing the unit back into the vertical position.

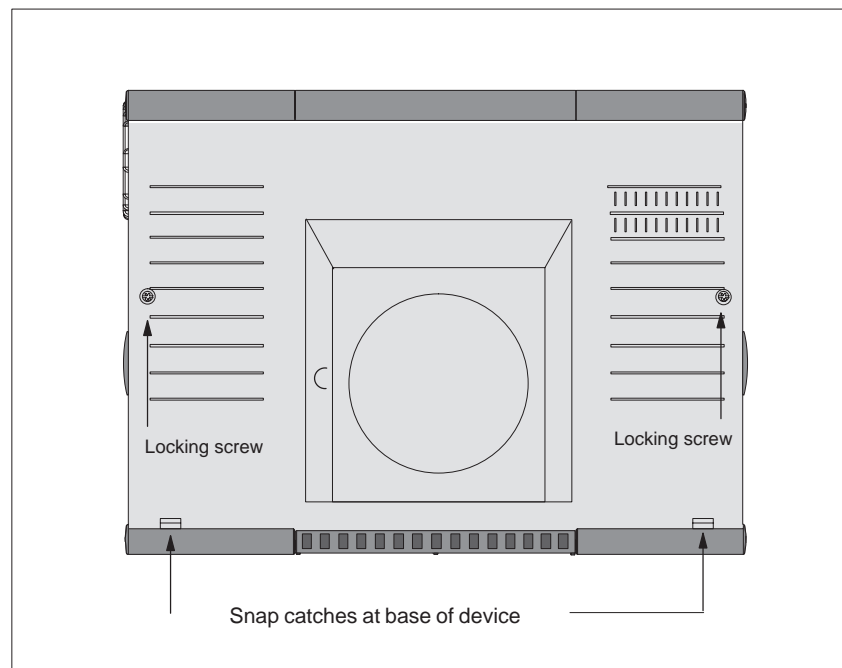


Figure 4-1 Rear View of the PG 740 PII

4.2 Functional Units Visible after Opening the Unit

Functional Units

The functional units are visible once you have removed the top section of the unit.

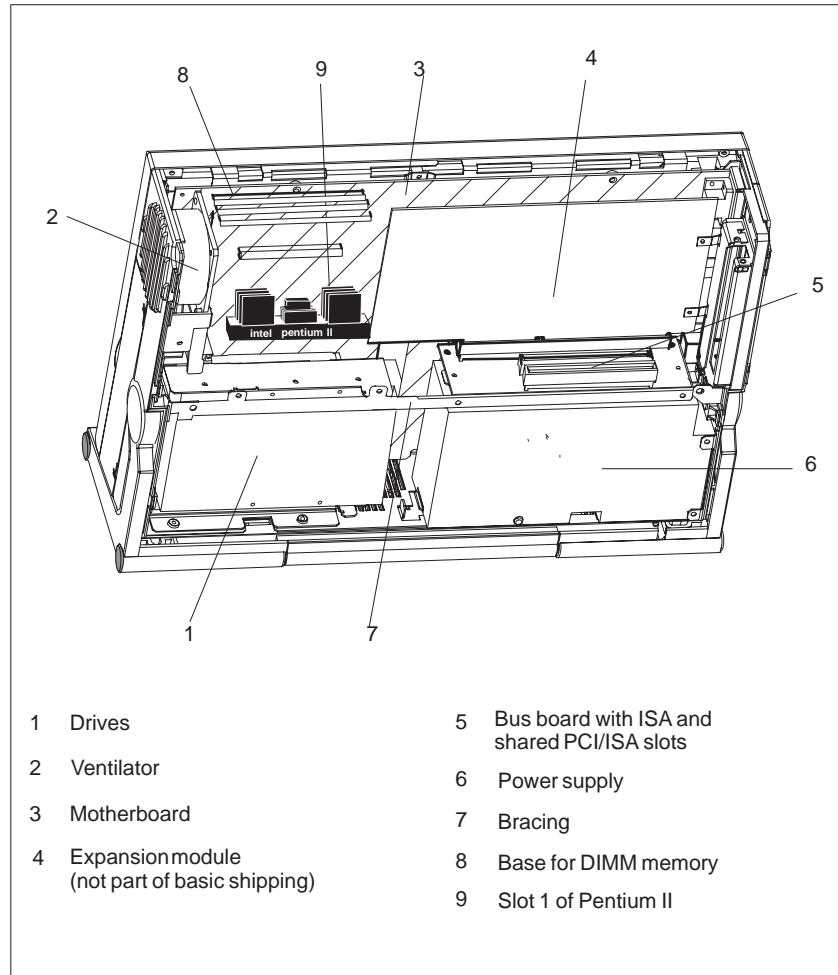


Figure 4-2 The PG 740 PII Opened

4.3 Block Diagram of the Mother Board

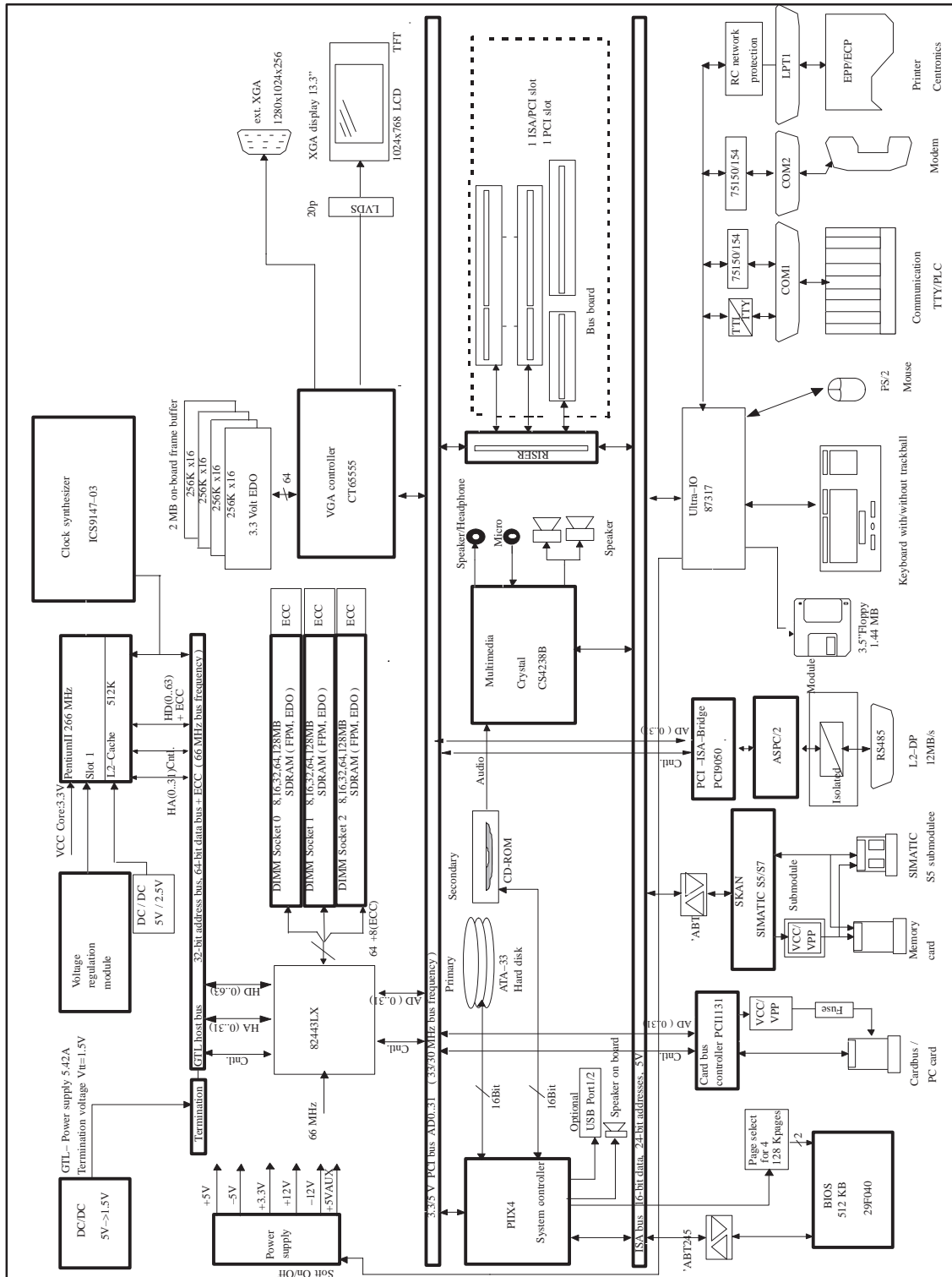


Figure 4-3 Block Diagram of the PG 740 PII

Mother Board

The mother board is the heart of the PG 740 PII. Here, data are processed and stored, and interfaces and device I/Os controlled and managed.

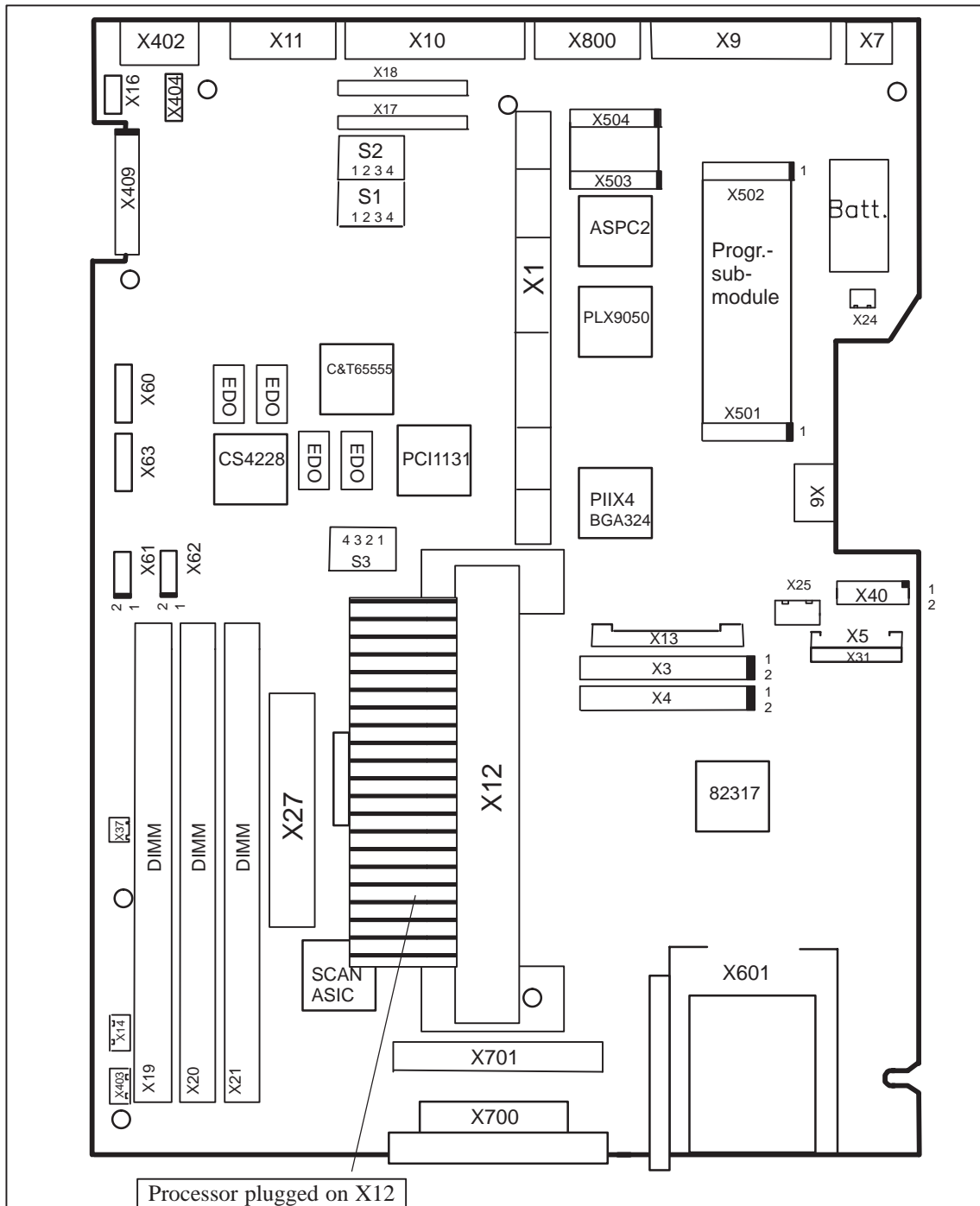


Figure 4-4 Mother Board

Components on the Mother Board

The following components are located on the mother board of the PG 740 PII:

Designation	Name	Functions
X1	Slotbus	ISA/PCI connector between mother board and bus module
X3	CD ROM	Secondary IDE interface, standard ribbon cable
X4	HD prim.	Primary IDE interface, standard ribbon cable
X5	Floppy disk	Floppy disk interface
X6	Keyboard connection	DIN keyboard plug
X7	Mouse connection	PS/2 mouse plug
X9	LPT	Parallel interface for LPT1/printer connection (25-contact Centronics)
X10	COM 1	Serial port 1 (25-contact)
X11	COM 2	Serial port 2 (standard 9-contact)
X12	CPU	Processor with heat sink (Slot 1)
X13	Power	Power supply connection for mother board
X14	Fan	Connection for device fan
X16	Display module	Connection for flexible cable to display module
X17	Receptacle	Receptacle for TTY transmitter module
X18	Receptacle	Receptacle for TTY receiver module
X19/X20/X21	RAM	Receptacle for DRAM DIMM
X24	Battery	Plug for lithium battery
X25	Hard disk power supply	Power supply for hard disk drives
X27	VRM	Voltage regulation module: voltage supply for the processor
X31	Secondary IDE	Secondary IDE-Port für LS120
X37	Fan	Fan connection +12V, CPU
X40	USB	Plug connector for USB option
X402	VGA	Standard VGA (15-contact)
X403	Display inverter	Plug connector for display inverter
X404	On/off switch	Plug connector for on/off switch
X409	Display	LVDS interface for display
X60	Microphone	Plug connector for microphone interface
X61	Headphones	Plug connector for headphone interface
X62	Loudspeaker	Connection for internal loudspeaker
X63	CD audio	Plug connector for CD-ROM audio output
X601	PCMCIA PG 740 PII	Cardbus/PCMCIA interface
X700	Programming submodule	SIMATIC programming submodule interface
X701	Memory card	SIMATIC memory card interface
X800	MPI/DP 12	MPI/DP interface
S1	Switch 1	Display type, clock
S2	Switch 2	CPU clock, flash EPROM, TTY interface
S3	Switch 3	Switch CPU clock

Designation	Name	Functions
X501/ 502	Programming submodule	Plug/socket connector in which the programming submodule is positioned
X503/ 504	RS 485/hybrid	Plug/socket connector in which the RS 485/hybrid is positioned

Switching the PG 740 PII to Active/Passive

When the PG 740 PII leaves the factory, the COM1 (TTY) serial port is switched to active (20 mA current loop). If you are connecting two programming devices via the COM1 (TTY) serial port, you must switch one of the ports to passive. The PG 740 PII has a switch on its mother board for this purpose.

Switch Position

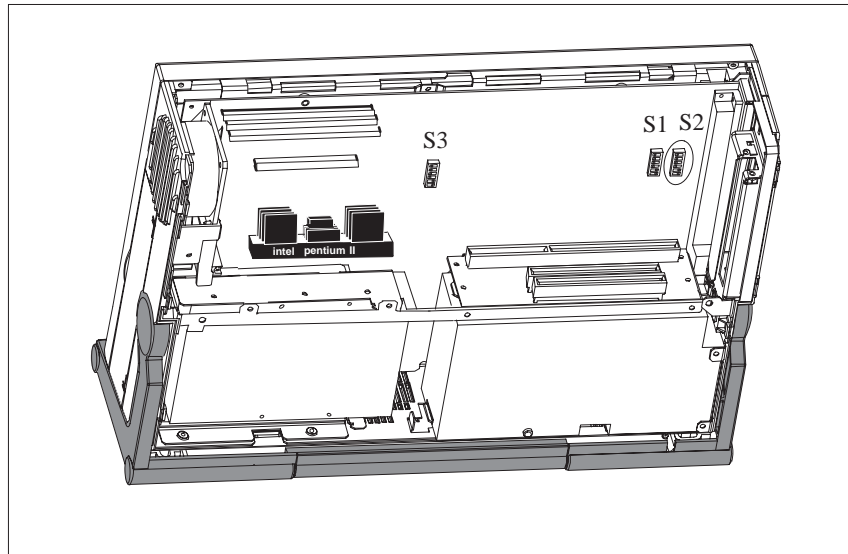


Figure 4-5 Position of Switches S1, S2, and S3

Switch Settings

The following switch settings are only listed for information purposes. They are set in the factory and must not be changed.

x means that this switch is irrelevant to the described function.

BIOS Source

S2 (3)	Function
off	Boot EPROM activated (standard setting)
on	Boot EPROM deactivated (boot module required)

**TTY Settings
S2**

S2 (1)	S2 (2)	Function
on	on	Active TTY interface (standard setting)
off	x	TTY transmitter loop, isolated from current source (passive setting)
x	off	TTY receiver loop, isolated from current source (passive setting)

**Clock Settings
S2, S3**

S2(4)	S3(4)	S3(3)	S3(2)	S3(1)	ISA Bus Clock	PCI Bus Clock	CPU Bus Clock	CPU Core Clock (CPU-Internal)
off	off	off	on	off	8.25MHz	33MHz	66MHz	266MHz
off	off	off	off	off	8.25MHz	33MHz	66MHz	133MHz
off	off	on	off	off	8.25MHz	33MHz	66MHz	200MHz
off	off	on	on	off	8.25MHz	33MHz	66MHz	333MHz

Note

Processor upgrade

If the processor is upgraded, for example, to a processor with a different frequency, a BIOS upgrade must also be executed.

Standard Settings



Figure 4-6 Standard Settings of Switches S2 (1 to 4) and S3 (1 to 4) for 333 MHz Pentium PII CPU

Standard Settings for the Display

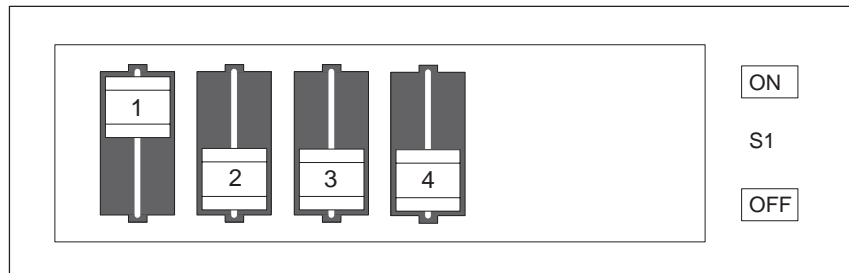


Figure 4-7 Standard Settings for the Display

The switch settings are set up correctly for the display and must not be changed.

4.4 Installing Expansion Modules

Installing Expansion Modules

You can extend the functionality of your PG 740 PII by installing additional modules. Two expansion slots are provided on the bus board for this purpose.

The following modules can be fitted:

Slot	Module
1	ISA \leq 170 mm long
2	ISA or PCI Δ 170 mm

The current drawn per ISA or PCI module must not exceed the following values:

+ 5 V	1.6 A
+ 12 V	0.3 A
- 12 V	50 mA
- 5 V	50 mA
Signals	one TTL load

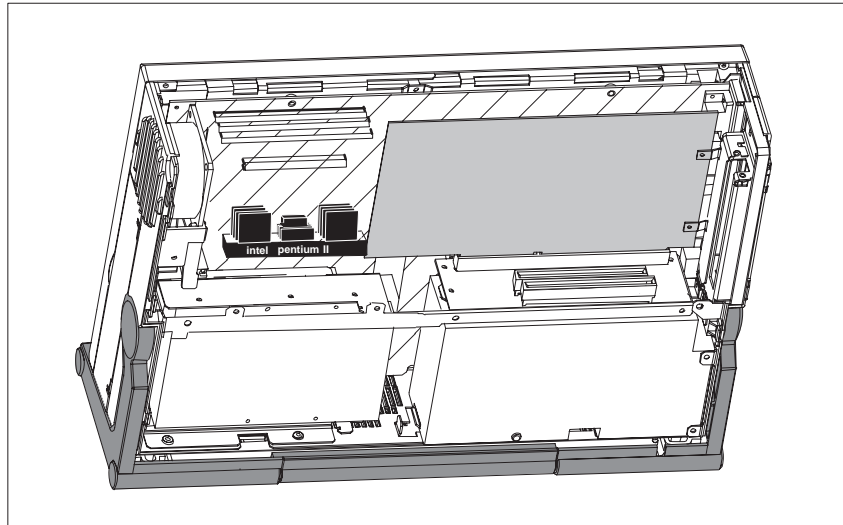


Figure 4-8 Open PG 740 PII with Expansion Module



Caution

Risk of damage

The electronic components of the printed-circuit boards are extremely sensitive to electrostatic discharge. Please observe the guidelines for electrostatically-sensitive devices (ESD guidelines), otherwise the module or device may be damaged.

Plugging in the Module

You plug expansion modules in as follows:

1. Open the unit as described in Section 4.1.
2. Remove the dummy plate on the casing side panel.
3. Plug the module into a free slot.
4. Bolt the module backplane to the casing side panel.
5. Close the unit (see Section 4.8).

4.5 Installing Memory Expansion Cards

Standard Memory

There are three ECC-compatible slots for 72-bit DIMM memory expansion submodules on the mother board. The basic configuration consists of 64 Mbytes. You can extend it up to a maximum of 384 Mbytes.

Only one submodule must be fitted. You can fit a combination of EDO and SDRAM submodules.

If ECC submodules are fitted in combination with non-ECC submodules, the memory works without ECC backups or correction.

Organization	Size in Mbytes	Type	Access Time/ Frequency
8Mx64	64	EDO	60 ns
16Mx64	128	EDO	60 ns
8Mx72	64	EDO with ECC	60 ns
16Mx72	128	EDO with ECC	60 ns
8Mx64	64	SDRAM	>=83 MHz
16Mx64	128	SDRAM	>=83 MHz
8Mx72	64	SDRAM with ECC	>=83 MHz
16Mx72	128	SDRAM with ECC	>=83 MHz

You will find the order numbers for the memory expansion cards in the Product Information Bulletin.



Caution

Risk of damage

The electronic components on the printed circuit boards are highly sensitive to electrostatic discharge. When handling the boards or cards, you must follow the guidelines for electrostatically-sensitive components (ESD guidelines at the end of this manual).

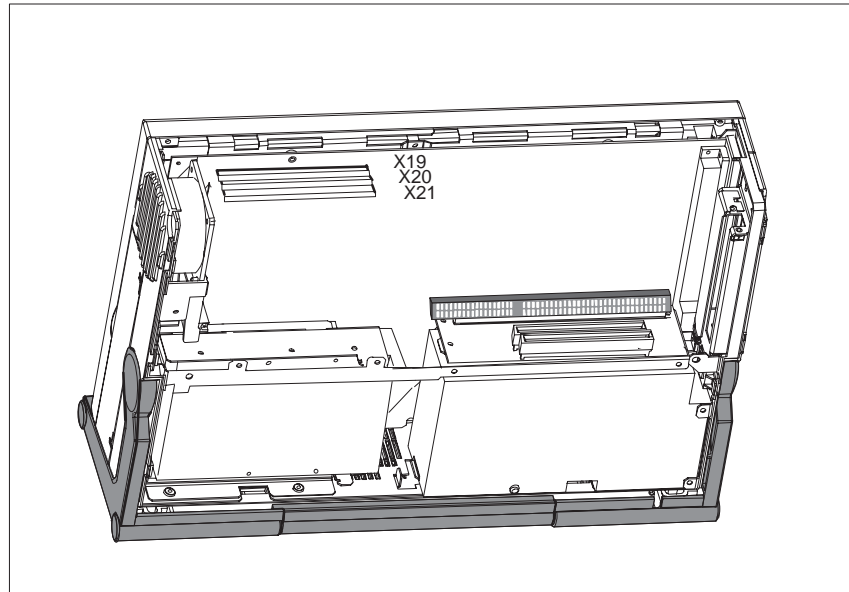


Figure 4-9 Location of the Memory Slots

Installing the DIMM Cards

Plug the DIMM memory cards in as follows:

1. First open the unit as described in Section 4.1.
2. Plug the cards in vertically, making sure the cut-out on the connector end of the DIMM card engages properly.
3. Gently press the card downwards.



Caution

Risk of damage

Note that only qualified personnel should be allowed to work on the open unit, so the warranty on the device is not affected. Authorized Siemens maintenance and repair centers listed at the end of the Product Information Bulletin offer you a specialist maintenance service.



Caution

Expansion cards are sensitive components. It is essential that you observe the information in the manual (Section 4.5).

4. Close the device (see Section 4.8).



Caution

Risk of damage

The cards must sit firmly in their sockets, otherwise they might be damaged. Plug the cards into their sockets vertically.

Installation

The system recognizes the new memory configuration automatically. When you power up the unit, the base and extended memory information appears automatically on the screen.

4.6 Backup Battery

Battery Power Supply for Real-Time Clock and Configuration

A backup battery (3.6 V lithium battery) powers the real-time clock even after the PG 740 PII is switched off. In addition to the time of day, all the information about the PG 740 PII's configuration is stored in RAM. If the backup battery fails or is removed, all this data is lost.

Because the clock uses very little power and the lithium battery has a high capacity, the battery can provide backup power for the real-time clock for several years.

Battery too Low

If the battery voltage is too low, the current time and the configuration data stored in the RAM are lost.

Changing the Battery

In this case, you must replace the backup battery. The battery is located behind the power supply module on the mother board.

To change the battery, proceed as follows:

1. Switch your PG 740 PII off, unplug the power cable and detach all connecting cables.
2. Open the unit as described in Section 4.1.
3. Undo the three screws of the bracing between the mother board and the drive support.
4. Remove the power supply by undoing the two screws on its right-hand side and the two screws on the mother board.
5. Unplug the power supply cable from the power supply.
6. Slide the power supply to the left as far as the stop. You can now lift the power supply out of the unit.
7. Now replace the backup battery, which is attached to the mother board by a short length of cable.
8. Fix the new battery to the mother board with a cable binder.
9. Replace the power supply and close the unit as described in Section 4.8.



Caution

Risk of damage

You may only replace the lithium battery with an identical battery or a battery type recommended by the manufacturer of your PG 740 PII (order no. W79084-E1003-B1).

You should dispose of used batteries in keeping with local regulations. If returned to the manufacturer, the batteries will be disposed of correctly.

Resetting SETUP

If you change the backup battery, you must reset your PG 740 PII's configuration with the SETUP program (Chapter 5).

4.7 Processor Upgrade

You can increase the power of your PG 740 PII by installing other Pentium II processors. Please contact your nearest service center or sales representative for more information.

Note

Processor upgrade

If the processor is upgraded, for example, to a processor with a different frequency, a BIOS upgrade must also be executed.

4.8 Closing the Unit

Closing the Unit

To close the unit, proceed as follows:

1. Bring the unit into its upright position.
2. Place the rear panel (top edge with guides) on the casing in an inclined position.
3. Swing the rear panel down over the casing until the catches on the underside of the casing engage.
4. Bolt the rear panel tight with the two screws.
5. The unit is now ready for operation again.

5

Configuring the PG 740 PII

What Does this Chapter Contain?

In this chapter, you will learn how to configure your programming device. This will be necessary if you have made any changes to your system by adding, removing or replacing an adapter card, a memory expansion card or a system module.

Chapter Overview

Section	Description	Page
5.1	Changing the System Configuration with SETUP	5-2
5.1.1	The Main Menu	5-5
5.1.2	The Advanced Menu	5-15
5.1.3	The Security Menu	5-21
5.1.4	The Power Menu	5-23
5.1.5	The Exit Menu	5-25

5.1 Changing the Device Configuration with BIOS SETUP

Changing the Device Configuration

The device configuration of your programming device is set for working with the software supplied with the unit. You should only change the preset values if you have modified your device in any way, or if a fault occurs when the unit is powered up.

The changes you make will not become effective until the device is restarted. When you exit the setup program, the device is automatically rebooted.

SETUP Program

The SETUP program is in the ROM-BIOS. Information on the system configuration is stored in the battery-backed clock memory of the PG 740 PII.

You can use SETUP to set the hardware configuration (for example, type of hard disk) and define the system characteristics. You can also use SETUP to set the time and date in the clock chip.

Incorrect SETUP Data

If incorrect SETUP data are recognized when booting the system, the BIOS prompts you to:

- Start SETUP by pressing **F2** or
- Continue booting by pressing **F1**.

Starting SETUP

On completion of the startup test, the BIOS requests you to start the SETUP program with the following screen prompt:

PRESS <F2 > to enter SETUP

Start SETUP as follows:

1. Reset your PG 740 PII (warm or cold restart).
2. Press the **F2** key as long as the BIOS prompt is on the screen.

Default Setting

The **F9** key or “Get Default Values” command in the exit menu sets the default parameters in the screen forms.

SETUP Menus

The various menus and submenus are listed on the following pages. You can obtain information on the SETUP entry selected from the **Item Specific Help** part of the relevant menu.

**Screen Display
Following
Power-On**

With the standard setting of your programming device, the display shown below appears following power-on:

PhoenixBIOS Release 6.0 - G849-A901
Copyright 1985-1995 Phoenix Technologies Ltd., All Rights Reserved.

SIEMENS PG 740 Pentium II V06

CPU = Pentium 333 MHz
640K System RAM Passed
064M Extended RAM Passed
0512K Cache SRAM Passed
System BIOS shadowed
Video BIOS shadowed
UMB upper limit segment address: F1xx
Fixed Disk 0: [name of installed disk drive]
ATAPI CD-ROM: [name of installed CD-ROM drive]

Press F2> to enter SETUP

If you press the F2 key when the above display is shown, you select the ROM-based BIOS setup program. In this program you can set a number of system functions and hardware configurations of your programming device.

The standard settings are effective on delivery. You can change these settings using the BIOS setup. The modified settings become effective when you have saved them and terminated the BIOS setup.

The following screen form appears when you start the BIOS setup:

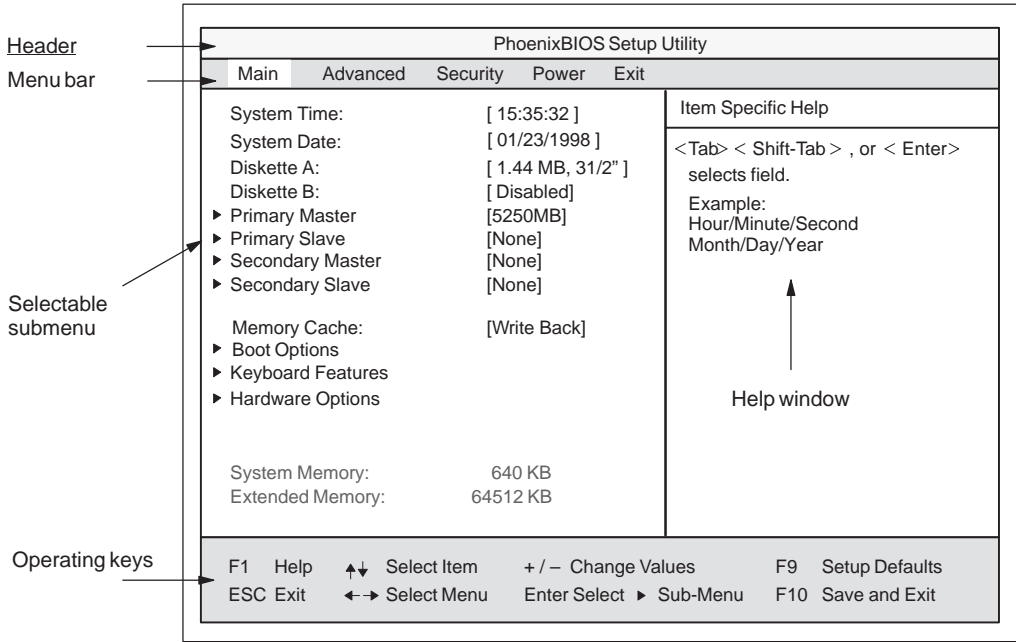


Figure 5-1 Main SETUP Menu

Menu Structure

The screen is divided into four parts. In the top part, you can select the menu forms [Main], [Advanced], [Security], [Power], [Exit]. In the left of the center part you can select various settings or submenus. Brief help texts appear on the right for the currently selected menu entry. The bottom part contains information for operator inputs.

Yellow stars to the left of the interface designation (for example, Internal COM 1) indicate a resource conflict between the interfaces managed by the BIOS. In this case you should select the default settings (F9) or eliminate the conflict by changing the setting.

You can move between the menu forms using the cursor keys [←] and [→].

Menu	Meaning
Main	System functions are set here
Advanced	An extended system configuration can be set here
Security	Security functions are set here, for example, a password
Power	Power saving functions can be selected here
Exit	Used for terminating and saving

ENTER Key

Press the Enter key to open a drop-down menu in which you can use the cursor keys to move to and select the values. To exit one of these menus, press either ESC (exit without changes) or Return (selected setting becomes effective when device is rebooted).

If a line is marked with a triangle it contains a submenu. You can exit a submenu by pressing ESC. The changes you have selected will become effective when the device is rebooted.

5.1.1 The Main Menu

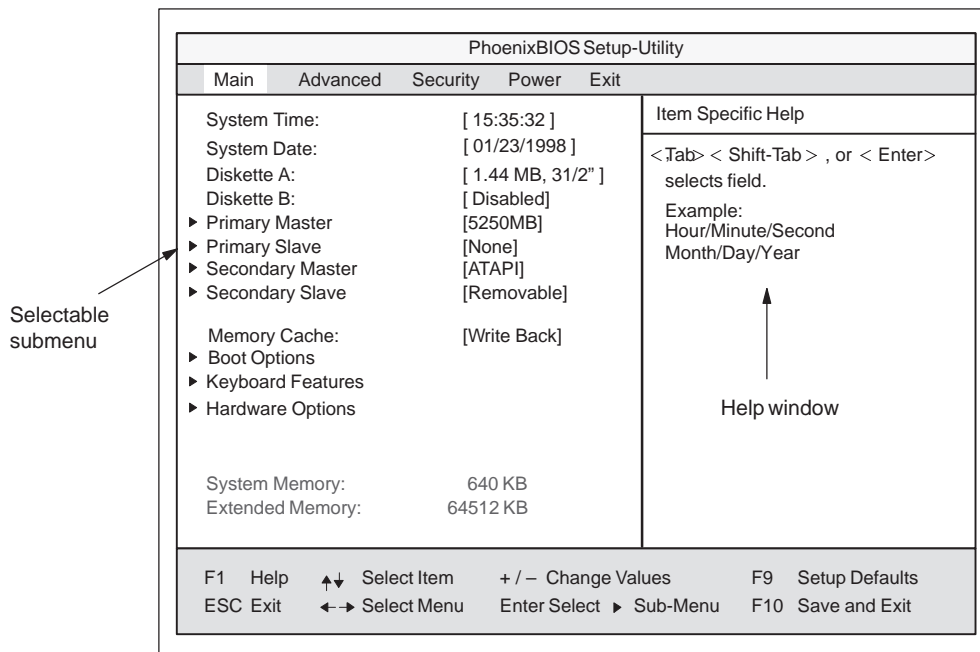


Figure 5-2 Main SETUP Menu

Settings in the Main Menu

In the **Main** menu you can move upwards and downwards using the cursor keys [↑] and [↓] to select the following system parameters:

Menu Item	Function
System Time	Used to display and set the current time
System Date	Used to display and set the current date
Diskette A	Name of installed disk drive
Diskette B	Type setting for a second disk drive
Memory Cache	For setting cache options
Via submenus	
Primary	Name of installed drives
Secondary	Name of installed drives
Boot Options	For setting boot options
Keyboard Features	For setting keyboard interface (for instance, NUM-LOCK, typematic rate)
Hardware Options	For setting PG 740 PII hardware options

System Time and System Date

System Time and System Date indicate the current values. Once you have selected the appropriate option, you can use the [+] and [-] keys to modify the time setting

Hour:Minute:Second

and the date

Month/Day/Year.

You can move between the entries in the date and time options (for example, from hour to minute) using the tabulator key.

**Diskette A/
Diskette B**

The names of the installed disk drives in the programming device are set here. The following entries are possible:

[Disabled]	If a disk drive is not fitted (standard setting for disk drive B)
[360 KB, 5 1/4"]	
[1.2 MB, 5 1/4"]	
[720 KB, 3 1/2"]	
[1.44 MB, 3 1/2"]	Standard setting for installed disk drive A
[2.88 MB, 3 1/2"]	

Primary Master/sxa
 Primary Slave
 Secondary Master –
 Secondary Slave

The system jumps to the following submenu when you select this type of menu option:

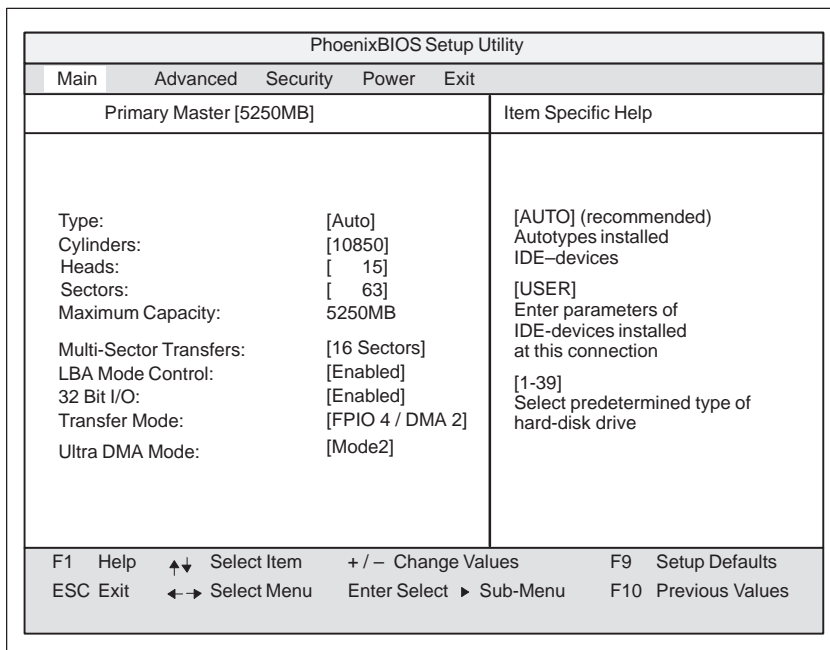


Figure 5-3 Example: “Primary Master”

The parameters which you can select here are usually saved on the respective IDE drive. With the setting “Auto” in the “Type” these values are automatically read from the drive and saved (**Autodetect**).

Option “Type”

If you select the option “Type” for a drive which does not exist, an abort is executed after approximately one minute as a result of a timeout and the existing entries remain unchanged. It is therefore only meaningful to carry out an autodetect for interfaces to which drives are connected.

Under certain circumstances it may be necessary to deviate from the proposed hard disk parameters. In this case, select the corresponding menu option and then the desired value using the [+] and [-] keys. Enter “none” in the option “Type” if no drive is connected, or a number from 1 to 39 if a predefined type of hard disk is to be used.

Select “User” if you wish to define your own type of hard disk; you must then additionally enter the hard disk-specific parameters in the options “Cylinders,” “Heads,” “Sectors/Track,” “Write Precomp.”

- Option “Multi-Sector Transfers”* The number of sectors which are transmitted per interrupt are transferred in the option “Multi-Sector Transfers.” The value depends on the drive and should only be set via the “Type” field by setting the “Auto” option.
- Disabled
2, 4, 8, 16 sectors
- Option “LBA Mode Control”* “Enabled” in the option “LBA Mode Control” (enabled, disabled) means that hard disk capacities greater than 528 Mbytes are supported. The value depends on the drive and should only be set via the “Type” field by setting the “Auto” option.
- Option “32 Bit I/O”* The type of access to the drive is defined in the option “32 Bit I/O”:
- Disabled 16-bit access
Enabled 32-bit access (default)
- Option “Transfer Mode” or Ultra DMA Mode* The interface transmission rate is set in the option “Transfer Mode.” The value depends on the drive and should only be set via the “Type” field by setting the “Auto” option.
- You leave the submenu using the ESC key.

Option “Memory Cache”

The following pop-up menu appears when you select the option “Memory cache” in the main menu:

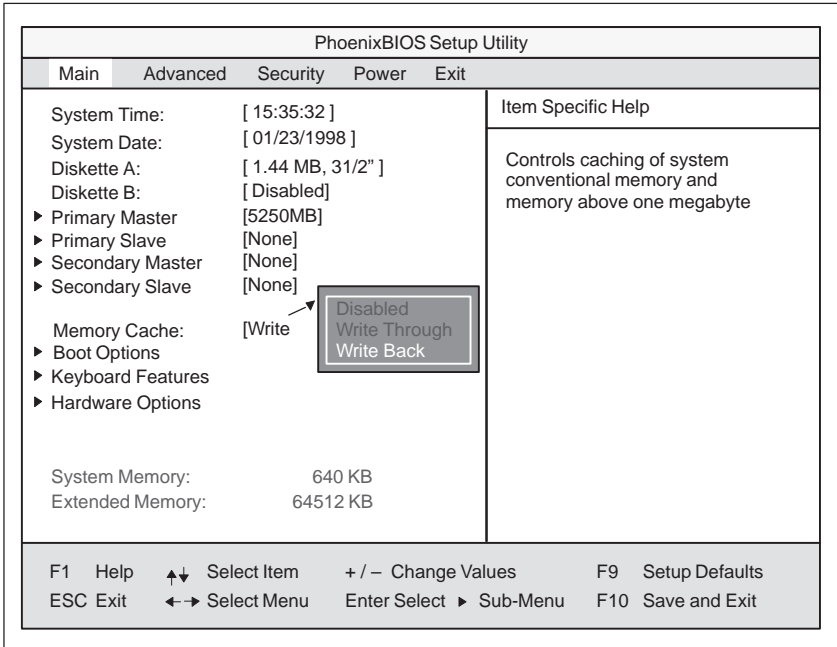


Figure 5-4 “Memory Cache” Menu

A cache is a fast intermediate memory located between the CPU and the memory (DRAM). Repeated memory access operations are executed in the fast cache, and not in the main memory, provided the function is enabled. Occasionally, it may be necessary to disable the cache with certain hardware and software because required program run times or wait times are shortened by the fast cache.

[Disabled]	Cache is disabled.
[Write Through]	Write access is only concluded when an entry is made in the main memory.
[Write Back]	Write access is concluded immediately, the entry in the main memory takes place in the background. (default)

Option “Boot Options”

The following submenu appears when you select the option “Boot Options” in the main menu:

PhoenixBIOS Setup-Utility			
Main	Advanced	Security	Power Exit
Boot Options			Item Specific Help
QuickBoot Mode:	[Enabled]	Allows the system to skip certain tests while booting. This will decrease the time needed to boot the system.	
SETUP prompt:	[Enabled]		
POST Errors:	[Enabled]		
Floppy check:	[Disabled]		
Summary screen:	[Enabled]		
Boot Sequence:			
1.	[Diskette Drive]		
2.	[Removable Devices]		
3.	[Hard Drive]		
4.	[ATAPI CD-ROM Drive]		
▶ Hard Drive Boot Device			
▶ Diskette Boot Device			
F1 Help	↕ Select Item	+ / - Change Values	F9 Setup Defaults
ESC Exit	← → Select Menu	Enter Select ▶ Sub-Menu	F10 Save and Exit

Figure 5-5 “Boot Options” Submenu

Quick Boot Mode	Allows the system to skip certain tests while booting. This will decrease the time needed to boot the system.
SETUP prompt	During the system loading phase, the following SETUP prompt is output at the bottom of the screen: <i>PRESS <F2> to enter Setup.</i>
POST errors	The loading procedure is aborted and must be acknowledged with F1 if an error is detected during the system loading phase.
Floppy check	During the system loading phase, the floppy head is moved by a number of steppings to the inside, and then returned again. This test is useful because the drive is initialized again in the process.
Summary screen	The most important system parameters are output on the display at the end of the system loading phase.
Boot Sequence	Here you can define the device sequence from which a system start (boot attempt) is to be carried out first. Removable devices: allows you to designate future ATAPI drives such as LS120, for instance.

Option “Hard Drive Boot Device”

In this dialog box you can determine whether the device should be booted from the IDE primary master first. The hard disk is connected to the primary-master interface at the factory.

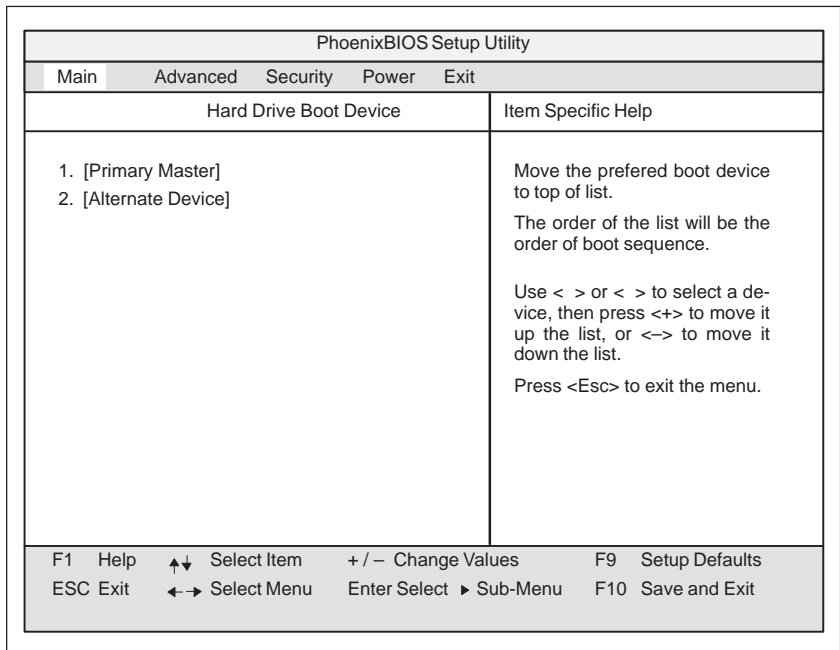


Figure 5-6 “Hard Drive Boot Device” Submenu

Submenu “Diskette Boot Device”

In this dialog box, you define from which disk drive the system is to be booted. The 1.44 MB disk drive is installed as default.

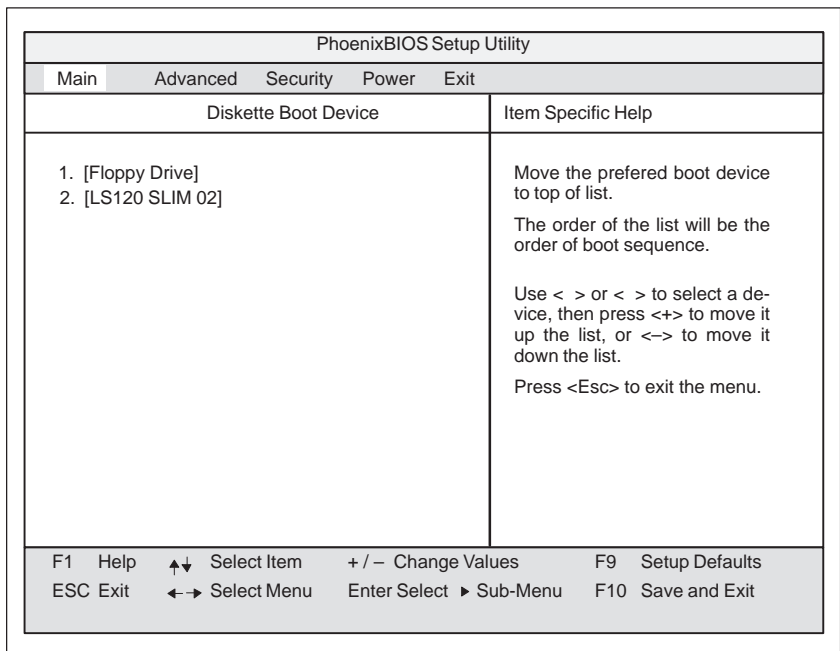


Figure 5-7 “Diskette Boot Device” Submenu

Option “Keyboard Features”

The following submenu appears when you select the option “Keyboard Features” in the main menu:

PhoenixBIOS Setup Utility			
Main	Advanced	Security	Power Exit
Keyboard Features		Item Specific Help	
Numlock:	[Off]	Selects Power-on state for Numlock	
Key Click:	[Disabled]		
Keyboard auto-repeat rate:	[30/sec]		
Keyboard auto-repeat delay:	[1/2 sec]		
F1 Help	↕ Select Item	+ / - Change Values	F9 Setup Defaults
ESC Exit	← → Select Menu	Enter Select ▶ Sub-Menu	F10 Save and Exit

Figure 5-8 “Keyboard Features” Submenu

Numlock	Switches Numlock on or off following power on
Key Click	A keystroke can be heard
Keyboard auto-repeat rate	Increase in automatic key repeat rate
Keyboard auto-repeat delay	Switch-on delay in automatic key repeat

Option “Hardware Options”

The following submenu appears when you select the option “Hardware Options” in the main menu:

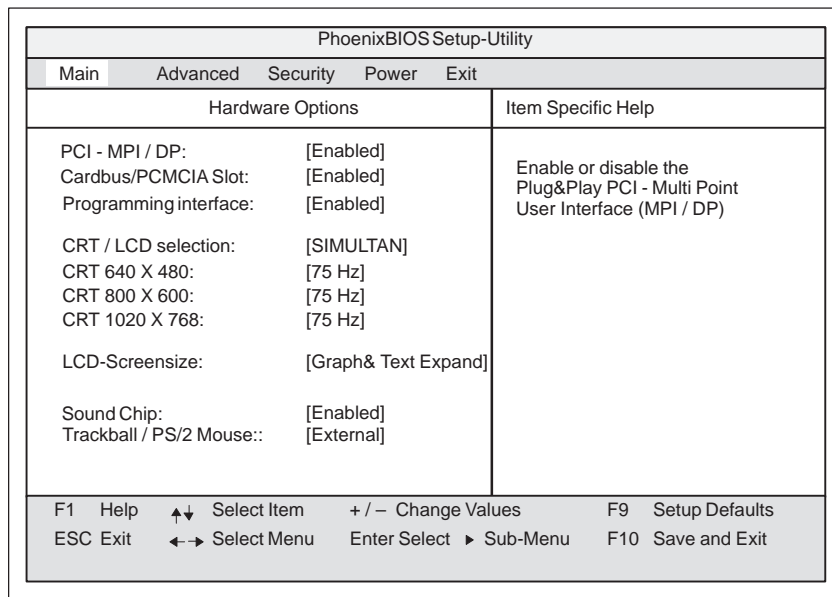


Figure 5-9 “Hardware Options” Submenu

The parameters of the interfaces present on the basic module are set here.

Entry	Function
PCI-MPI/DP	Enables the CP5611-compatible MPI/DP interface. The resources are managed by the BIOS PCI plug & play mechanism.
Cardbus / PCMCIA Slot	[Disabled] Enables the Cardbus / PCMCIA interfaces. [Enabled] The resources are managed by the BIOS PCI plug & play mechanism.
Programming interface	Enables or disables the interface for S7 memory cards. This interface occupies the I/O address range 300h - 31fh.
CRT / LCD selection	LCD [Enabled] All data are only output on the internal LCD, the 15-way VGA interface is disabled. CRT [Enabled] For the highest resolution the display signals are only output to the 15-way VGA interface, the LCD interface of the VGA controller is disabled. [SIMULTAN] Both display interfaces are run simultaneously. Not all resolutions are then possible on the LCD.
CRT 640 x 480	Picture refresh rate with a resolution of 640 x 480 pixels
CRT 800 x 600	Picture refresh rate with a resolution of 800 x 600 pixels
CRT 1024 x 768	Picture refresh rate with a resolution of 1024 x 768 pixels

Entry	Function	
LCD Screensize	[Normal]	The representation in Text and Graphic modes is not expanded to the full screen size.
	[Text expand]	Only the Text modes are expanded to the full screen size.
	[Graph&Text expand]	The Graphic+Text modes are expanded to full screen size.
Sound Chip	The audio functions can be switched off.	
Trackball / PS/2 Mouse	[Internal]	The PS/2 interface is activated. This is the default setting for the PG 740 PII, the trackball is therefore activated. An externally connected PS/2 mouse has priority, however, meaning the PS/2 interface is automatically switched over from the trackball to the external mouse. The IRQ12 is assigned.
	[External]	The PS/2 interface is activated, IRQ12 is assigned. The keyboard trackball is disabled, an external PS/2 mouse must be connected. If no external mouse is connected at system startup, the PS/2 interface is deactivated by the BIOS.
	[Disabled]	The PS/2 interface is deactivated, IRQ12 is available.
	Note: All changes to this interface only become effective after the PG is switched off/on.	

5.1.2 The Advanced Menu

Menu Structure

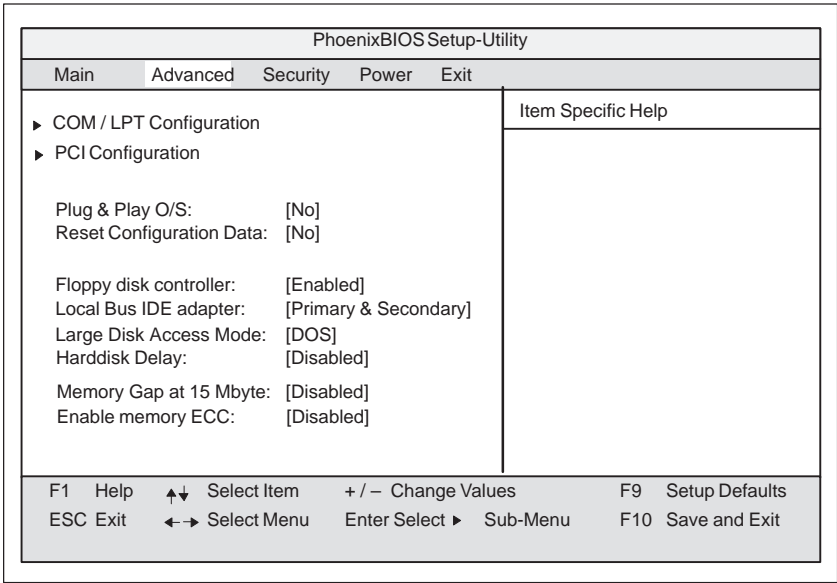


Figure 5-10 “Advanced” Menu

Settings in the Advanced Menu

Plug & Play O/S	Plug & play means that fitted modules are automatically recognized and installed provided they support plug & play functions. [No] The BIOS handles the complete plug & play facilities [Yes] The operating system handles some of the plug & play functions
Reset Configuration Data	[Yes] All previous functions under plug & play are deleted, and the configuration is retrIGGERED the next time the system is loaded. The entry is then set to [No]. System components which have no plug & play facilities must be entered manually.
Diskette controller	Enables or disables the floppy controller of the basic module.
Local Bus IDE adapter	[Primary] One IDE interface for up to two drives. [Secondary] Two IDE interfaces for up to four drives. [Primary and Secondary] Two IDE interfaces for up to four drives. [Disabled] No local IDE interface
Large Disk Access Mode	[DOS] The drive tables are designed for DOS drive access operations compatible with enhanced IDE. [OTHER] The tables are not adapted.

Harddisk Delay	[Disabled] 3 to 30	No additional startup time for hard disk Additional startup time for the hard disk can be selected
Memory Gap at 15 MBytes	[Disabled] [Enabled]	The area from 15 to 16 Mbytes is not available for ISA RAM The area from 15 to 16 Mbytes is enabled for the ISA memory.
Enable memory ECC	[Disable] [Enable]	No "Error checking and correction" "Error checking and correction" is active Only meaningful in connection with DIMM cards with ECC

**Submenu
COM/LPT
Configuration**

PhoenixBIOS Setup Utility		
Main	Advanced	Security Power Exit
COM / LPT Configuration		Item Specific Help
Internal COM 1:	[Enabled]	Configure internal COM port using options: [Disabled] No configuration [Enabled] User configuration
Base I/O address:	[3F8]	
Interrupt:	[IRQ 4]	
Internal COM2:	[Enabled]	[Auto] BIOS or OS chooses configuration [OS Controlled] Displayed when controlled by OS
Base I/O address:	[2F8]	
Interrupt:	[IRQ 3]	
Internal LPT1:	[Enabled]	
Mode:	[Output only]	
Base I/O address:	[378]	
Interrupt:	[IRQ 7]	
F1 Help	↕ Select Item	+ / - Change Values
ESC Exit	← → Select Menu	Enter Select ▶ Sub-Menu
		F9 Setup Defaults
		F10 Save and Exit

Figure 5-11 "COM / LPT Configuration" Submenu

If you set an interface to Disabled, the resources occupied by it are released. The I/O addresses and interrupts are preset and therefore recommended.

**Printer Port
Internal LPT1**

Mode:	You can use this setting to select the operating mode of the printer interface. You must adapt this setting to match the data terminal device which you have connected. You can find the setting in the corresponding device documentation.
-------	---

**Submenu
PCI Configuration**

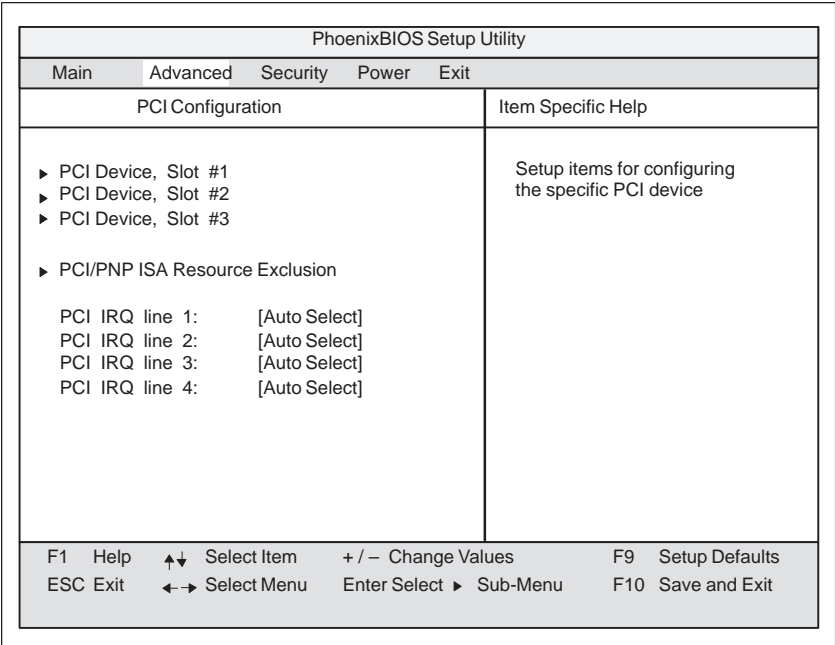


Figure 5-12 “PCI Configuration” Submenu

Option “PCI Devices”

The following submenu appears when you select the option “PCI Devices” in the advanced menu:

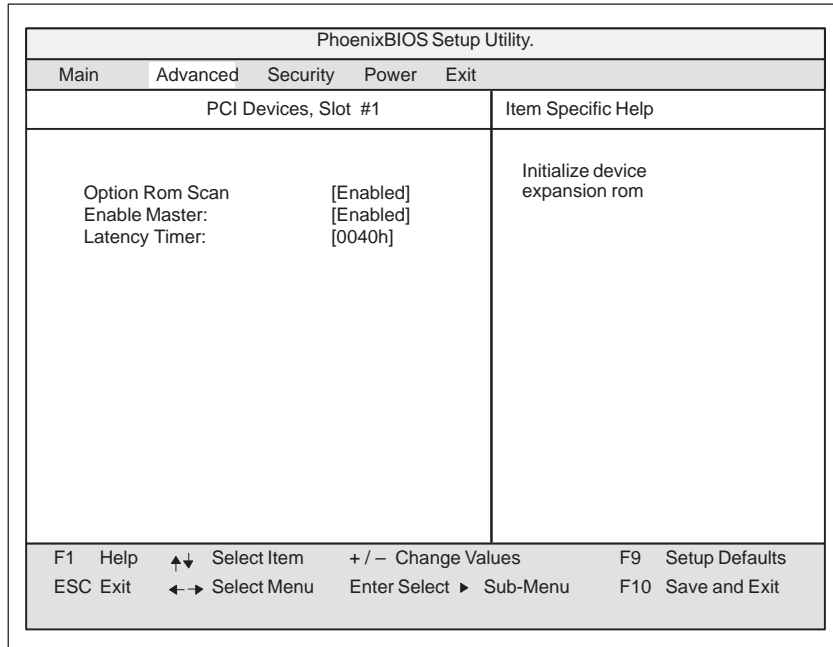


Figure 5-13 “PCI Devices, Slot #1” Submenu

Option ROM Scan:	[Enabled] [Disabled]	The ROM option of the PCI module (if present) is enabled The ROM option of a PCI module is disabled.
Enable Master:	[Enabled] [Disabled]	This slot can assume the PCI master function This slot can only work as a PCI slave.
Latency Timer	[Default] [0020H to 00E0H]	The number of active PCI clock cycles of the master modules are determined by the module. You can use these settings to set the maximum number of active PCI clock cycles to the chosen value.

**Submenu PCI/PNP
ISA IRQ Resource
Exclusion**

Available means that the IRQ can be allocated to plug and play modules or given a mother board function by the plug and play mechanism of the BIOS.

You should only use the Reserved setting if the interrupt does not have to be assigned to plug and play ISA modules in the application software.

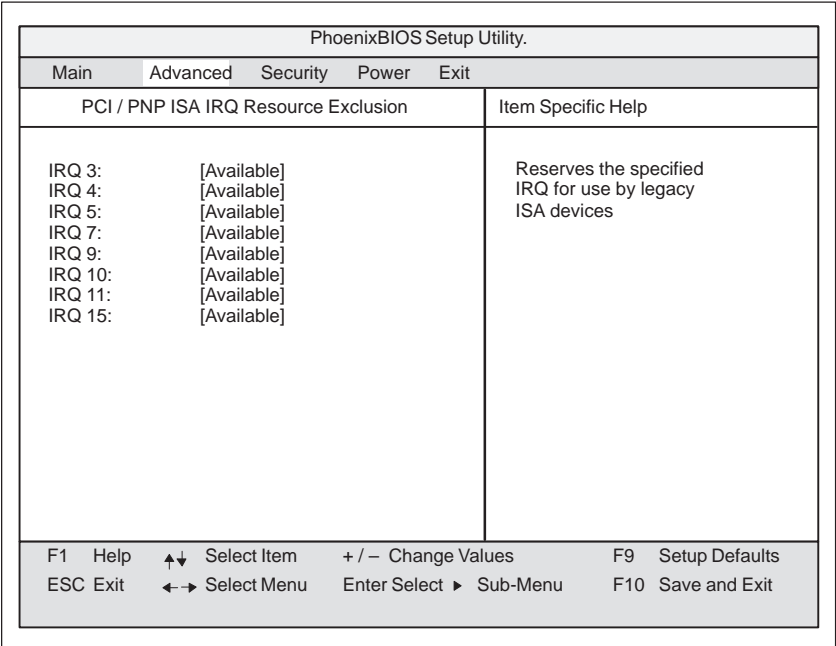


Figure 5-14 “PCI / PNP ISA IRQ Resource Exclusion” Submenu

**Option
“PCI IRQ line”**

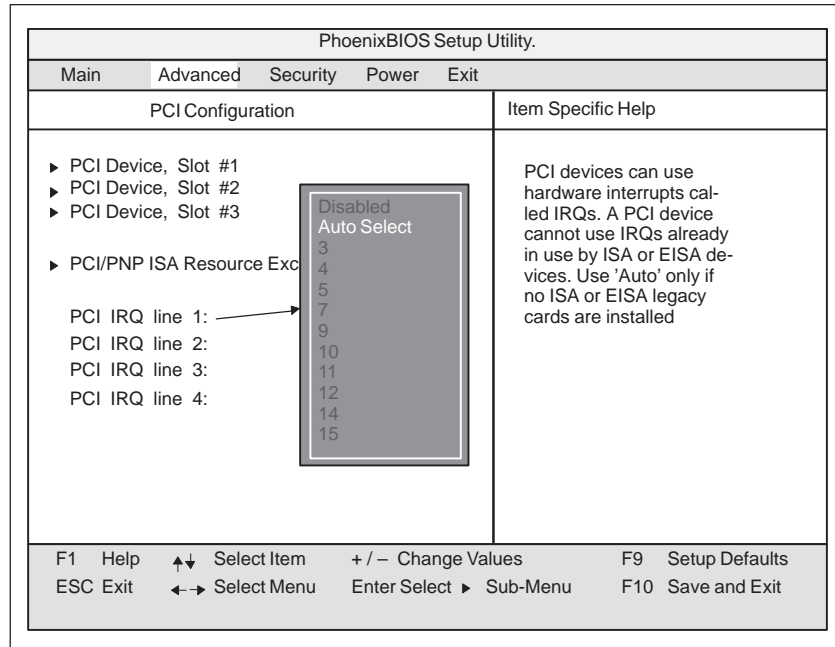


Figure 5-15 “PCI Configuration” Submenu

Disabled 1	No interrupt possible for the selected PCI IRQ line
AutoSelect	Plug & play mechanism of the BIOS selects free interrupts and assigns them to the PCI module. (default)
3 to 15	The selected PCI IRQ line is assigned to the selected interrupt. You should only select this setting if it is specifically required in the documentation for your PCI module or application.

5.1.3 The Security Menu

Summary You can only edit the options enclosed in square brackets. Two passwords are assigned to protect your programming device from unauthorized use.

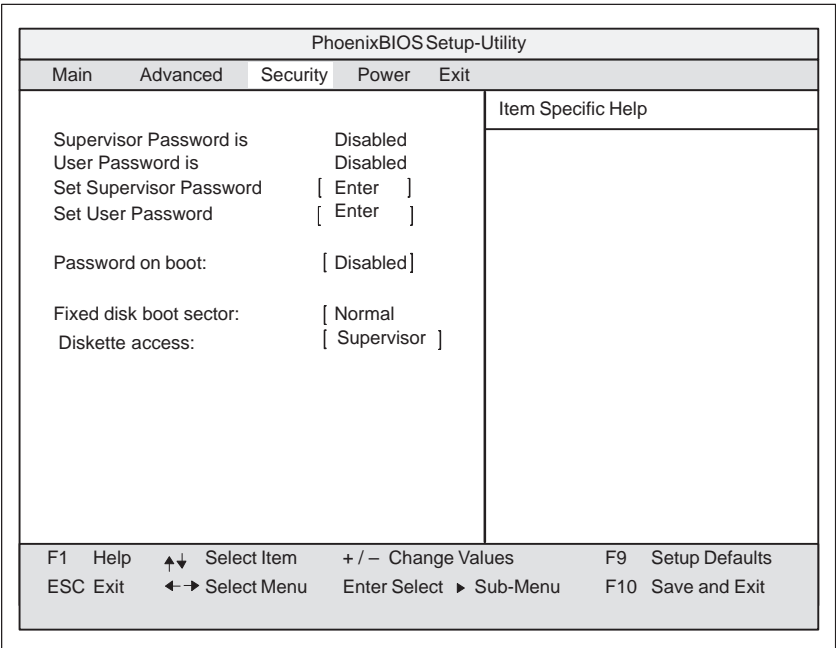


Figure 5-16 “Security” Submenu

Settings

Supervisor Password is	<p>[Disabled] Password is not active</p> <p>[Enabled] Password is active. Changes to the BIOS Setup can only be made after the password has been entered. A user password can be entered.</p> <p>When the password is entered, the field is automatically switched from [Disabled] to [Enabled].</p>
User Password is	<p>[Disabled] Password is not active</p> <p>[Enabled] Password is active. BIOS-Setup can only be opened after the password is entered. No changes can be made, except to the user password.</p> <p>When the password is entered, the field is automatically switched from [Disabled] to [Enabled].</p>
Set Supervisor Password	<p>This field opens the “Enter Password” dialog box. After the supervisor password has been entered, it can be modified, deleted with the “Return” key and deactivated.</p>
Set User Password	<p>This field opens the “Enter Password” dialog box. After the user password has been entered, it can be modified, deleted with the “Return” key and deactivated.</p>
Password on boot	<p>[Disabled] No password required on booting.</p> <p>[Enabled] Supervisor- oder user-password must be entered on booting.</p>
Fixed disk boot Sector	<p>Normal All types of access to the hard disk are permitted.</p> <p>Protected No operating system can be installed. This also provides protections against boot viruses.</p>
Diskette access	<p>This protection is only active if “Password on boot” is [enabled].</p> <p>Supervisor: Access to the diskette is only possible if the supervisor password was entered on booting.</p> <p>User Access to the diskette is only possible if the user password was entered on booting.</p>

5.1.4 The Power Menu

Summary

This menu has the following structure:

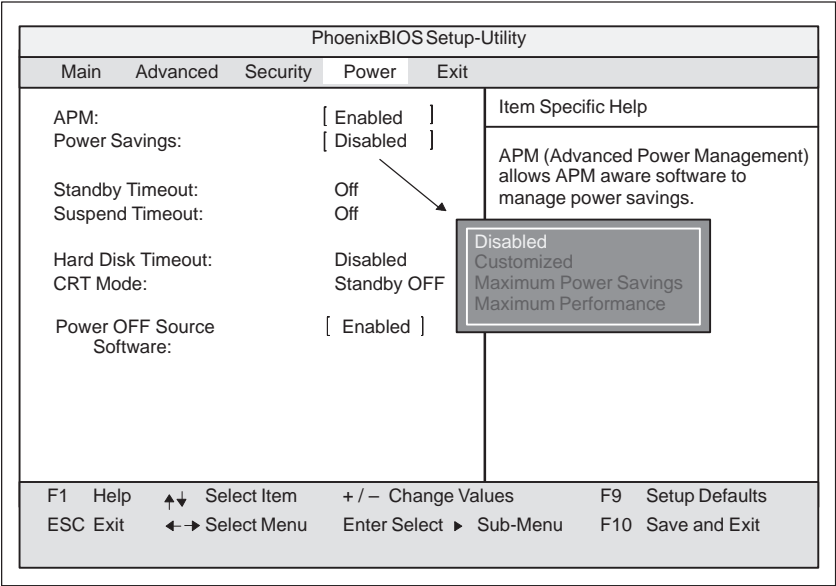


Figure 5-17 “Power” Submenu

APM (Advanced Power Management)	[Enabled] [Disabled]	Permits the switching off of system resources not required by the operating system. APM access not permissible for operating system.
Power Savings	[Disabled] [Customize, Maximum Power Savings, Maximum Performance]	No power saving functions Customized or preset power saving functions by maximum and minimum amounts. The settings for Standby/Suspend Timeout, and Fixed Disk Timeout can be customized or are set accordingly.
Standby Timeout	[Off] [1, 2, 4, 6, 8, 12,] [16]	No standby mode ...minutes after your PC goes to standby mode
Suspend Timeout	[Off] [5, 10, 15, 20, 30] [40, 60]	No suspend mode ...minutes after your PC goes to suspend mode
Power OFF Source Software	[Enabled]	If the Power OFF/ON Source Software is enabled, Windows 95 switches the PG 740 PII off when it shuts down.

In suspend mode, the CPU is stopped and can only be restarted by an interrupt, for example, keyboard, mouse, COM 1/2, hard disk.

Hard Disk Timeout	[Disabled]	The hard disk is not switched off.
	[10, 15, 30, 60]	Minutes after which the hard disk drive is switched off, provided it is not being accessed. If you attempt to access the hard disk after it has been switched off, there will be an access delay while the disk is run up again.

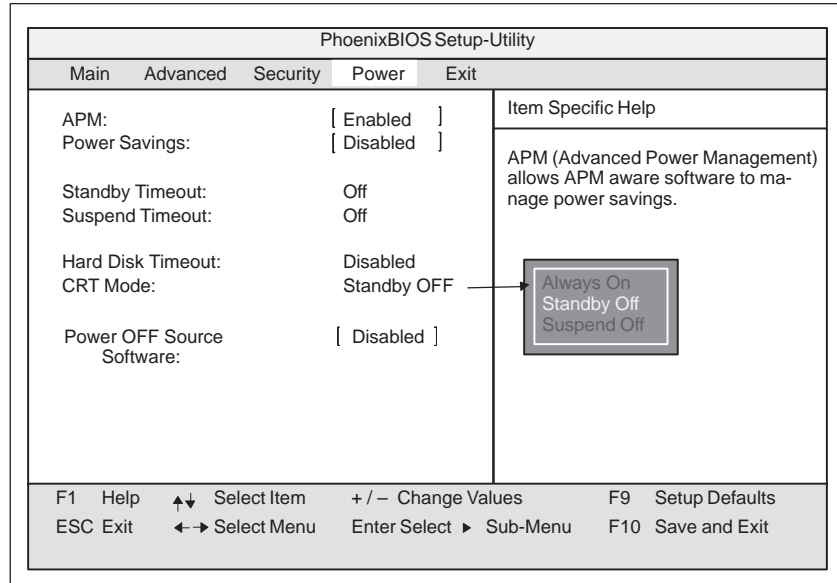


Figure 5-18 “Power” Submenu

CRT	[Standby Off]	This means that the sync signals to the VGA interface are switched off in standby mode, causing the monitor itself to enter standby mode.
	[Suspend Off]	This means that the sync signals to the VGA interface are switched off in suspend mode.
	[Always On]	Monitor always remains in operation.

5.1.5 The Exit Menu

The Exit Menu

The setup program is always terminated using this menu.

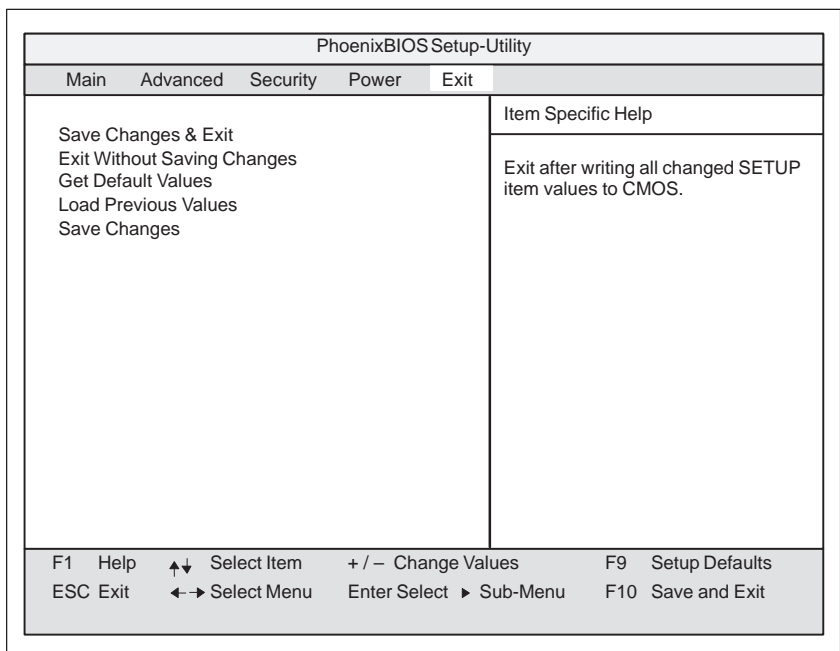


Figure 5-19 "Exit" Submenu

Save Changes & Exit	All changes are saved; a system restart is carried out with the new parameters.
Exit Without Saving Changes	All changes are rejected; a system restart is carried out with the old parameters.
Get Default Values	All parameters are set to safe values.
Load Previous Values	The last saved values are coded again.
Save Changes	Saves all setup entries.

Error Diagnostics

6

What Does this Chapter Contain?

Chapter 6 will support you in handling simple errors and faults that you yourself can diagnose and, in some cases, eliminate. The chapter describes all the possible errors and faults, explains their causes and makes suggestions as to how to eliminate them.

6.1 Faults in PG Operation

Error/Fault	Cause	Remedy
Power-ON LED does not light up	<ul style="list-style-type: none"> Power supply not properly connected 	<ul style="list-style-type: none"> Check the power supply connections, power cable and power plug
Display remains dark after power on	<ul style="list-style-type: none"> Back-lighting is not active Additional graphics card installed 	<ul style="list-style-type: none"> Wait 3 to 5 s until back-lighting becomes active Switch PG 740 PII on with the "INSERT" key depressed
External monitor remains dark	<ul style="list-style-type: none"> LCD enabled is entered in SETUP 	<ul style="list-style-type: none"> Enter CRT enabled or SIMULTAN in SETUP
The "Invalid configuration information".... "Press F1 key to continue, F2 to run SETUP utility" message appears on the screen	<ul style="list-style-type: none"> Incorrect configuration data 	<ul style="list-style-type: none"> Press "F2" key, check the configuration data in SETUP, enter any default values, and check error messages in the first SETUP menu
The "No boot device available" message appears on the screen	<ul style="list-style-type: none"> Diskette in drive A: is not a boot diskette Wrong hard disk type entered in SETUP 	<ul style="list-style-type: none"> Insert boot diskette Use "Autodetect Fixed Disk" function
"Keyboard stuck; key failure" message	<ul style="list-style-type: none"> A key has become blocked during the system keyboard self-test 	<ul style="list-style-type: none"> Check the keyboard Restart the system
Bootling of the PG 740 PII aborted after several beeps	<ul style="list-style-type: none"> An error has occurred during the system self-test 	<ul style="list-style-type: none"> Check the hardware
Every time a key is pressed, a beep is heard and no characters appear	<ul style="list-style-type: none"> Keyboard buffer overflow 	<ul style="list-style-type: none"> <CTRL> <PAUSE>
Not-ready message when trying to read a diskette	<ul style="list-style-type: none"> No diskette has been inserted Diskette has not been formatted 	<ul style="list-style-type: none"> Insert diskette Format diskette
Write-protect error when trying to write to a diskette	<ul style="list-style-type: none"> Diskette write-protect activated Write-protect hole open on 3.5 in. diskette 	<ul style="list-style-type: none"> Cancel write protection
<\> key missing	<ul style="list-style-type: none"> Wrong keyboard driver is being used 	<ul style="list-style-type: none"> German keyboard: <ALT_{Gr}> <ß> International keyboard: <\> key
Mouse pointer cannot be moved with the trackball	<ul style="list-style-type: none"> Trackball will not rotate No/wrong mouse driver 	<ul style="list-style-type: none"> Clean trackball and housing Load the right mouse driver
Mouse pointer moving erratically	<ul style="list-style-type: none"> Trackball dirty 	<ul style="list-style-type: none"> Clean trackball and housing
Trackball not working	<ul style="list-style-type: none"> Trackball is switched off External mouse is plugged in The PS/2 interface is set to external or disabled in the SETUP 	<ul style="list-style-type: none"> Activate trackball with key combination Fn + ^ Check SETUP entry

6.2 Programming Device Self-Test Prior to Booting

When the PG 740 PII is powered up, it runs a self-test (POST = Power On Self Test).

If the POST detects a fault, it outputs the sequence of beeps (beep code) assigned for the fault.

Each beep code consists of 2 x 2 sequences.

Conversion table for the beep codes to hexadecimal representation:

Beeps		Hex Code
B	B	0
B	BB	1
B	BBB	2
B	BBBB	3
BB	B	4
BB	BB	5
BB	BBB	6
BB	BBBB	7
BBB	B	8
BBB	BB	9
BBB	BBB	A
BBB	BBBB	B
BBBB	B	C
BBBB	BB	D
BBBB	BBB	E
BBBB	BBBB	F

Example:

Beeps			
B	BBBB	BB	BBB
3		6	
Check shutdown code			

Hex Code	Meaning	Description
02	TP_VERIFY_REAL	Test whether CPU in Real mode
1C	TP_RESET_PIC	Reset interrupt controller
12	TP_RESTORE_CR0	Restore control register
13	TP_PCI_BM_RESET	PCI Bus Master reset
36	TP_CHK_SHUTDOWN	Check shutdown code
24	TP_SET_HUGE_ES	Set ES to special mode
03	TP_DISABLE_NMI	Disable NMI
0A	TP_CPU_INIT	Early initialization of CPU
04	TP_GET_CPU_TYPE	Determine CPU type
AE	TP_CLEAR_BOOT	Edit boot flag
06	TP_HW_INIT	Initialize basic hardware
18	TP_TIMER_INIT	Initialize timer
08	TP_CS_INIT	Initialize chip set
C4	TP_PEM_SIZER_INIT	Reset system fault
0E	TP_IO_INIT	Initialize IO
0C	TP_CACHE_INIT	Initialize cache
16	TP_CHECKSUM	EPROM checksum test
28	TP_SIZE_RAM	Determine RAM size
3A	TP_CACHE_AUTO	Determine cache size
2A	TP_ZERO_BASE	Set basic 512K RAM to 0
2C	TP_ADDR_TEST	Test basic RAM address lines
2E	TP_BASERAML	Basic RAM, check 1st 64K
38	TP_SYS_SHADOW	BIOS shadow
20	TP_REFRESH	Refresh chip test
29	TP_PMM_INIT	Initialize Post Memory Manager
33	TP_PDM_INIT	Initialize dispatch manager
C1	TP_PEM_INIT	Initialize Post Error Manager
09	TP_SET_IN_POST	Start Power On Self Test
0A	TP_CPU_INIT	Initialize CPU
0B	TP_CPU_CACHE_ON	Switch on cache
0F	TP_FDISK_INIT	Initialize hard disk
10	TP_PM_INIT	Initialize power management
14	TP_8742_INIT	Initialize 8742 chip
1A	TP_DMA_INIT	Initialize DMA chips
1C	TP_RESET_PIC	Reset interrupt controller

Hex Code	Meaning	Description
32	TP_COMPUTE_SPEED	Compute clock speed
C1	TP_740_INIT	Initialize PG 740 PII I/O
3C	TP_ADV_CS_CONFIG	Configure advanced chip set
42	TP_VECTOR_INIT	Initialize interrupt vectors
46	TP_COPYRIGHT	Check copyright
49	TP_PCI_INIT	Initialize PCI interface
48	TP_CONFIG	Check configuration
4A	TP_VIDEO	Initialize video interface

If the INSERT key is pressed during booting of the system, three short beeps are sounded. This signalizes that the initialization of the special programming device hardware is being skipped.

If your PG 740 PII does not boot correctly, you can inform the hotline of the POST hex code.

Hardware Information

7

What Does this Chapter Contain?

This chapter contains important reference data:

- Hardware addresses
- Interrupt assignments
- Information on connecting cables

Chapter Overview

Section	Description	Page
7.1	Hardware Address Table	7-2
7.2	Interrupt Assignments	7-6
7.3	PG 740 PII Video Modes	7-7
7.4	Connector Pinouts	7-8
7.5	Connecting Cables	7-16

7.1 Hardware Address Table

There are two kinds of address area:

- Memory address area
- I/O address area.

Different read/write signals (I/O WR, I/O RD, MEMR, MEMW) are used to reference these areas. The following tables will give you an overview of the address areas used. Please refer to the descriptions of the individual functional groups for more details.

Table 7-1 Assignments of the Memory Addresses

From Address	To Address	Size	Assignment	Remark
0000 0000	0007 FFFF	512k	Conventional system memory	
0008 0000	0009 FBFF	127k	Conventional system memory extended	
0009 FC00	0009 FFFF	1k	Conventional system memory extended BIOS data	
000A 0000	000A FFFF	64k	Graphics refresh memory	VGA
000B 0000	000B 7FFF	32k	SW graphics interface module	Free
000B 8000	000B FFFF	32k	Graphics refresh memory	VGA/CGA
000C 0000	000C AFFF	44k	VGA BIOS expansion	VGA
000C C000	000C DFFF		Texas Instruments PC1131 cardbus controller	
000C E000	000D FFFF		Free	
000C B000	000D CBFF		Free	
000E 0000	000E FFFF	64k	System BIOS	
000F 0000	000F FFFF	64k	System BIOS	
0010 0000	00EF FFFF	14M	Extended system memory	
00F0 0000	00FF FFFF	1M	Extended system memory or Memory hole	Via BIOS SETUP
0100 0000	17FF FFFF	368M	Extended system memory	
1800 0000	FFEF FFFF	4G-128M-1023k	PCI expansion	
FFF8 0000	FFFD FFFF	1023k-128k	ISA memory, reserved for dual-port RAM	Free
FFFE 0000	FFFF FFFF	128k	Shadow of system BIOS (000E 0000 .. 000F FFFF)	

Table 7-2 I/O Address Assignments

Address		Function	
From	To	Basic Function	Possible Alternative Function
0000	000F	DMA controller 1	
0020	0021	Interrupt controller 1	
002E	002E	Configuration port Ultra I/O Index	
002F	002F	Configuration port Ultra I/O Data	
0040	0043	Timer 1	
0048	004B	Timer 2	
0060	0060	Keyboard controller data	
0061	0061	NMI, speaker control	
0063	0063	Reserved	
0064	0064	Keyboard controller CMD/STATUS	
0070	0070	NMI enable, RTC index	
0071	0071	RTC date	
0078	0079	Reserved, board configuration	
0080	008F	DMA page register	
00A0	00A1	Interrupt controller 2	
00C0	00DE	DMA controller 2	
00E8	00E8	PM port Ultra I/O Index	
00E9	00E9	PM port Ultra I/O Data	
00F0	00F0	Reset numeric error	
00F8	00FF	Numeric processor	
0100	010F	Not used (alternative for CP 1413)	
0170	0177	Secondary IDE channel	Can be deactivated
01F0	01F7	Primary IDE channel	
0200	020F	Reserved for game port, otherwise free	Reserved/free
0240	0243	Reserved for SINEC L2 (5412(A2)), otherwise free	Reserved/free
0278	027B	Reserved for LPT 2, otherwise free	Reserved/free
02E8	02EF	Reserved for COM 4, otherwise free	Reserved/free
02F0	02F8	Reserved for GBIP	Reserved/free
02F8	02FF	COM 2	Can be deactivated
0300	031F	Programming equipment	Can be deactivated
0320	032F	Not used	Safecard
0330	033F	Generally not used	Free
0340	035F	HighGraph (CPU) host interface expansion card, otherwise free	Reserved/free
0360	036F	Generally not used	Free
0376	0376	Second IDE command	Can be deactivated
0377	0377	Second IDE status	Can be deactivated
0378	037F	LPT 1	Can be deactivated

Table 7-2 I/O Address Assignments

From	To	Basic Function	Possible Alternative Function
0380	038F	Generally not used	Free
0388	038C	Sound synthesizer	Can be deactivated
03A0	03AF	Can be deactivated	Free
03B0	03BB	Monochrome video or EGA/VGA	
03BC	03BF	Reserved for LPTn, otherwise free	Reserved/free
03C0	03CF	VGA control register	
03D0	03DF	CGA/VGA control register	
03E8	03EF	Reserved for COM 3, otherwise free	Reserved/free
03F0	03F5	Floppy disk controller	
03F6	03F6	Primary IDE command	
03F7	03F7	Primary IDE status	
03F8	03FF	COM 1	Can be deactivated
0390	0397	Reserved for SINEC H1 (CP1413), otherwise free	Reserved/free
0400	+LPT	ECP LPT	PCI BUS
0CF8	0CFB	PCI config index	PCI BUS
0CFC	0CFF	PCI config data	PCI BUS
FF00	FF07	IDE bus master register	PCI BUS

Table 7-3 DMA Assignments

DMA Channel	Data Transfer	Description
0	8 / 16 bits	Free
1	8 / 16 bits	Free
2	8 / 16 bits	Floppy
3	8 / 16 bits	Free
4		Cascading of DMA controllers
5	16 bits	Free
6	16 bits	Free
7	16 bits	Free

I/O and Memory Assignments

Below are listed the I/O and memory assignments of a number of expansion modules set in the factory. Please consult the relevant hardware descriptions since you can also select other settings.

Table 7-4 I/O and Memory Assignments

I/O Address	Memory Address	Module	HW Interrupt	DMA Channel
03B0 H-03DF H 0340 H-0347 H	000A 0000 H - 000C 7FFF H	HIGRAPH	IRQ 11* IRQ 9	–
03E0 H-03E3 H	FFFF 0000 H - FFF3 FFFF H 0000 0000 H - 000D FFFF H	CP1413 (H1)	IRQ 10*	–
–	000D 0000 H - 000D FFFF H	CP5410 (L2)	IRQ 12**	–
4040 H-4061 H	–	DF20	IRQ 10*	–
0330 H-0333 H	000D C000 H - 000D FFFF H	SCSI AHA1542	IRQ 12**	DRQ 5

*) Default; you can select IRQ 10, 11, 12 or 15, depending on the module.



Caution

Malfunction

** You must not select IRQ 12 for the PG 740 PII since this interrupt is already assigned to the trackball and/or PS/2 mouse.

You must not select IRQ 15 for the PG 740 PII if it is occupied by the CD-ROM drive (secondary IDE).

7.2 Interrupt Assignments

Interrupt Assignment

The PG 740 PII uses two integral interrupt controllers of type 82C59 to handle the 16 hardware interrupts (IRQ 0 to IRQ 15).

The INT output of the slave controller is connected to the IRQ 2 input of the master controller. Interrupt 9 (IRQ 9) can be used on the bus for the assigned interrupt 2 (IRQ 2). In the initialization phase, IRQ is programmed for the software interrupt vector 0A H (IRQ 2) by the ROM-BIOS.

Priority

The interrupts are priority-scheduled in the reverse order of their numbering. Interrupt IRQ 0 has the highest priority and interrupt IRQ 7 the lowest. For triggering IRQ 2, interrupt IRQ 8 has the highest priority and interrupt IRQ15 the lowest. Interrupts IRQ 8 to IRQ 15 therefore have priority over interrupts IRQ 3 to IRQ 7. The interrupt vectors are initialized and masked when the PG 740 PII is powered up.

I/O Addresses of the Interrupt Controllers

Interrupt	Assignment	Remark	Vector
SMI	System management interrupt, cannot be masked	-	-
NMI	Signal IO channel check 2	Fixed	INT2H
IRQ 0	Timer output 0	Fixed	INT8H
IRQ 1	Keyboard	Fixed	INT9H
IRQ 2	Cascaded (slave interrupt controller)	Fixed	INTAH
IRQ 3	Serial port 2	Can be switched off *)	INTBH
IRQ 4	Serial port 1	Can be switched off *)	INTCH
IRQ 5	Sound	Free	INTDH
IRQ 6	FD controller	Can be switched off *)	INTEH
IRQ 7	Parallel port 1	Can be switched off *)	INTFH
IRQ 8	Real-time clock (RTC)	Fixed	INT70H
IRQ 9	VGA (generally not used)	Free (AT 9 = XT 2)	INT71H
IRQ 10	CP1413 (depends on driver used)		INT72H
IRQ 11	Free	Free	INT73H
IRQ 12	PS/2 mouse	Can be switched off *)	INT74H
IRQ 13	Numeric processor	Fixed	INT75H
IRQ 14	1st HD controller (primary)	Fixed	INT76H
IRQ 15	2nd HD controller (secondary)	Can be switched off *)	INT77H

Do not use interrupts already assigned in the system.

7.3 PG 740 PII Video Modes

Table 7-5 PG 740 PII Video Modes

Mode No. (Hex)	VESA Mode No.	Video Mode (Text/Graphics)	Colors	CRT	LCD/Simultan
00+/01+	—	Text 40x25	16	70Hz	60Hz
02+/03+	—	Text 80x25	16	70Hz	60Hz
04/05	—	Gr.320x200	4	70Hz	60Hz
6	—	Gr.640x200	2	70Hz	60Hz
07+	—	Text 80x25	2 (sw)	70Hz	60Hz
0D	—	Gr.320x200	16	70Hz	60Hz
0E	—	Gr.640x200	16	70Hz	60Hz
0F	—	Gr.640x350	2 (sw)	70Hz	60Hz
10	—	Gr.640x350	16	70Hz	60Hz
11	—	Gr.640x480	2 (sw)	60Hz	60Hz
12	—	Gr.640x480	16	60Hz	60Hz
13	—	Gr.320x200	256	70Hz	60Hz
20	120h	Gr.640x480 (L)	16	60/75/85	256
22	122h	Gr.800x600 (L)	16	56/60/75/85	256
24	124h	Gr.1024x768 (L)	16	43(I)/60/75/85	384
28	128h	Gr.1280x1024 (L)	16	43(I)/60/75	640
30	101h	Gr.640x480 (L)	256	60/75/85	300
31	100h	Gr.640x400 (L)	256	70	256
32	103h	Gr.800x600 (L)	256	56/60/75/85	469
34	105h	Gr.1024x768 (L)	256	43(I)/60/75/85	768
38	107h	Gr.1280x1024 (L)	256	43(I)/60/75	1280
40	110h	Gr.640x480 (L)	32K	60/75/85	600
41	111h	Gr.640x480 (L)	64K	60/75/85	600
42	113h	Gr.800x600 (L)	32K	56/60/75/85	938
43	114h	Gr.800x600 (L)	64K	56/60/75/85	938
44	116h	Gr.1024x768 (L)	32K	43(I)/60/75/85	1536
45	117h	Gr.1024x768 (L)	64K	43(I)/60/75/85	1536
50	112h	Gr.640x480 (L)	16M	60/75/85	900
52	115h	Gr.800x600 (L)	16M	56/60/75/85	1407
6A	102h	Gr.800x600	16	56/60/75/85	256
64	104h	Gr.1024x768	16	43(I)/60/75/85	384
68	106h	Gr.1024x768	16	43(I)/60	640
70	101h	Gr.640x480	256	60/75/85	300
71	100h	Gr.640x480	256	70	256
72	103h	Gr.800x600	256	56/60/75/85	469
74	105h	Gr.1024x768	256	43(I)/60/75/85	768
78	107h	Gr.1280x1024	256	43(I)/60	1280

7.4 Connector Pinouts

Connecting a PS/2 Mouse

You can connect a PS/2 mouse to your PG 740 PII. The connector has the following pinout:

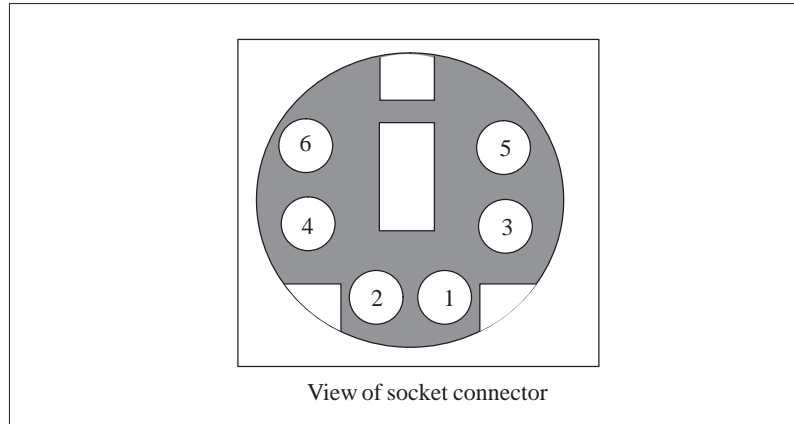


Figure 7-1 Connector Pinout for a PS/2 Mouse Connecting Cable

Pin No.	Designation	Input/Output
1	Data line	Input/output
2	Unassigned	-
3	0 V	-
4	Current-limited 5 V power supply	Output
5	Clock line	Input/output
6	Unassigned	-

Connecting a Keyboard

You can connect an external keyboard to your PG 740 PII. The connector has the following pinout:

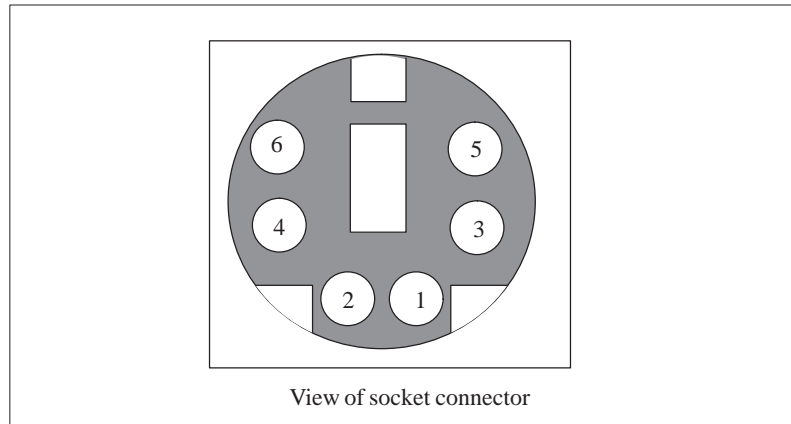


Figure 7-2 Connector Pinout for an External Keyboard Connecting Cable

Pin No.	Designation	Input/Output
1	Data line, keyboard	Input/output
2	Data line	Input/output
3	0 V	-
4	Current limited, 5 V power supply	Output
5	Clock line, keyboard	Input/output
6	Clock line, trackball	Input/output

VGA Socket Connector

The VGA socket connector on the PG 740 PII has the following pinout:

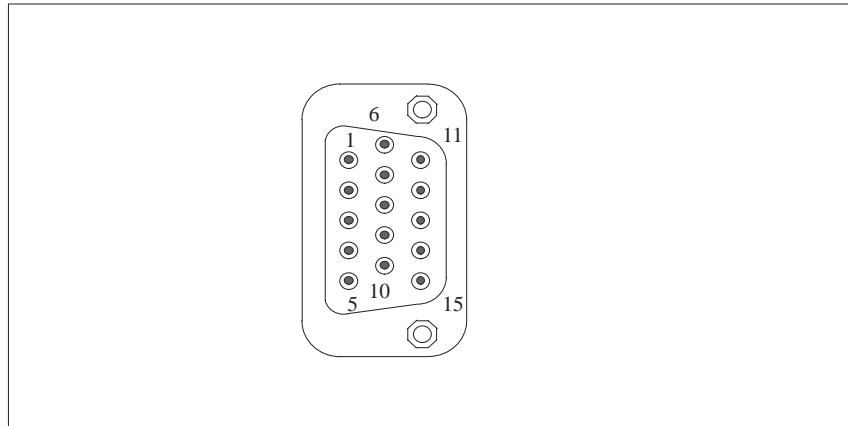


Figure 7-3 VGA Socket Connector

Pin No.	Designation	Description	Input/Output
1	R_EXT	Red	Output
2	G_EXT	Green	Output
3	B_EXT	Blue	Output
4	-	NC	-
5	M	Ground	Ground
6	M	Ground	Ground
7	M	Ground	Ground
8	M	Ground	Ground
9	-	NC	-
10	M	Ground	Ground
11	-	NC	-
12	-	NC	-
13	EXT_H	Horizontal sync	Output
14	EXT_V	Vertical sync	Output
15	-	NC	-

MPI/DP Socket Connector

The MPI/DP socket connector on the PG 740 PII has the following pinout:

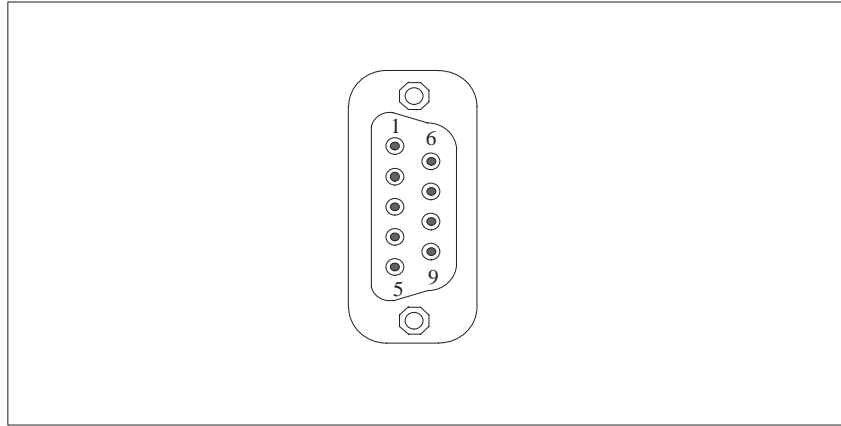


Figure 7-4 MPI/DP Socket Connector

Pin No.	Designation	Description	Input/output
1	NC	Pin 1 is not assigned	–
2	NC	Pin 2 is not assigned	–
3	LTG_B	Signal line B of MPI module	Input/output
4	RTS_AS	RTSAS, control signal for received data stream. The signal is “1” active when the programmable controller is sending.	Input
5	M5EXT	M5EXT return line (GND) of the 5 V power supply. The current load caused by an external user connected between P5EXT and M5EXT must not exceed max. 90 mA.	Output
6	P5 EXT	P5EXT power supply (+5 V) of the 5 V power supply. The current load caused by an external user connected between P5EXT and M5EXT must not exceed max. 90 mA.	Output
7	NC	Pin 7 is not assigned.	–
8	LTG_A	Signal line A of the MPI module.	Input/Output
9	RTS_PG	RTS output signal of the MPI module. The control signal is “1” when the programming device is sending.	Output
Screen		On connector casing	

Parallel Port

The parallel port (LPT1) on the PG 740 PII has the following pinout:

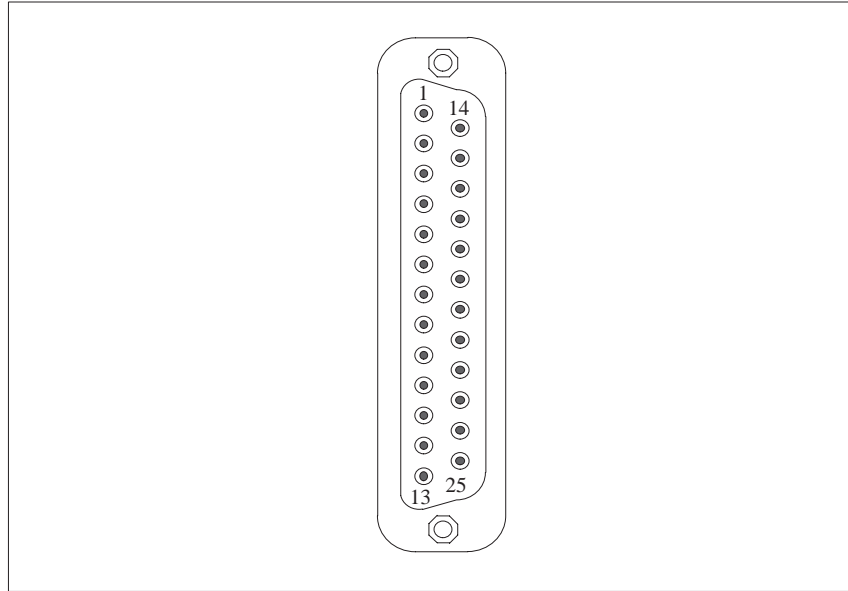


Figure 7-5 LPT1 Parallel Port (Socket Connector)

Pin No.	Signal Designation	Input/Output
1	/ Strobe	Output (open collector)
2	Data - Bit 0	Output (TTL level)
3	Data - Bit 1	Output (TTL level)
4	Data - Bit 2	Output (TTL level)
5	Data - Bit 3	Output (TTL level)
6	Data - Bit 4	Output (TTL level)
7	Data - Bit 5	Output (TTL level)
8	Data - Bit 6	Output (TTL level)
9	Data - Bit 7	Output (TTL level)
10	/ACK (Acknowledge)	Input (4.7 k Ω pull up)
11	BUSY	Input (4.7 k Ω pull up)
12	PE (PAPER END)	Input (4.7 k Ω pull up)
13	SELECT	Input (4.7 k Ω pull up)
14	/ AUTO FEED	Output (open collector)
15	/ ERROR	Input (4.7 k Ω pull up)
16	/ INIIT	Output (open collector)
17	/ SELECT IN	Output (open collector)
18	GND	-
:	:	:
25	GND	-

**Serial Port (PLC/
V.24/Modem)**

The serial port (COM1) on the PG 740 PII has the following pinout:

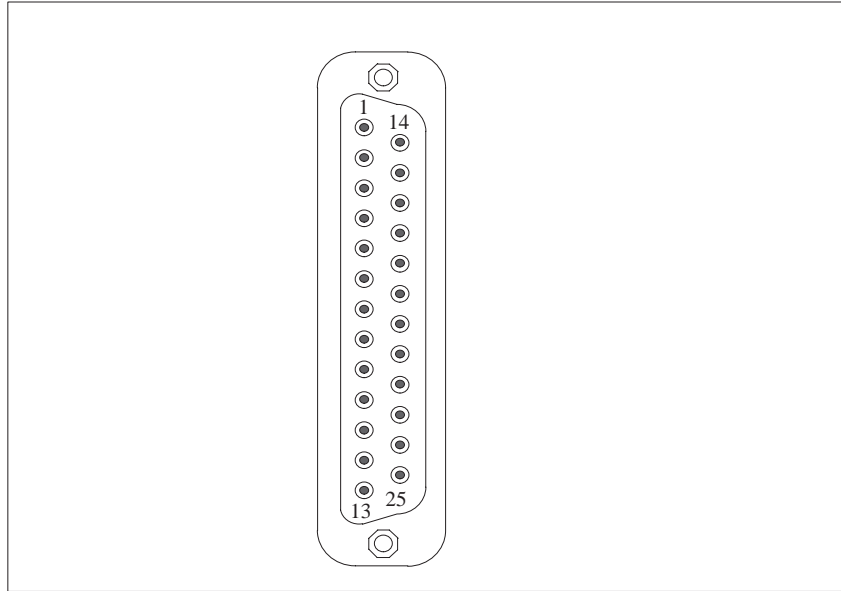


Figure 7-6 COM1 Serial Port (Socket Connector)

Pin No.	Designation	Description	Input/Output
2	TxD (D1)	Serial transmit data	Output
3	RxD (D2)	Serial receive data	Input
4	RTS (S2)	Request to send	Output
5	CTS (M2)	Clear to send	Input
6	DSR (M1)	Data set ready	Input
7	GND (E2)	Functional ground (reference potential)	-
8	DCD (M5)	Data carrier detect	Input
9	+TTY RxD	TTY receive	Input
10	-TTY RxD	TTY receive	Input
18	+TTY TxD	TTY send	Output
19	+20mA	Isolated current source	-
20	DTR (S1)	Data terminal ready	Output
21	-TTY TxD	TTY send	Output
22	RI (M3)	Incoming call	Input
1	-	Shield	-
11-17	-	Unassigned	-
23-25	-	Unassigned	-

**Serial Port
(V.24/Mouse)**

The serial port (COM2) on the PG 740 PII has the following pinout:

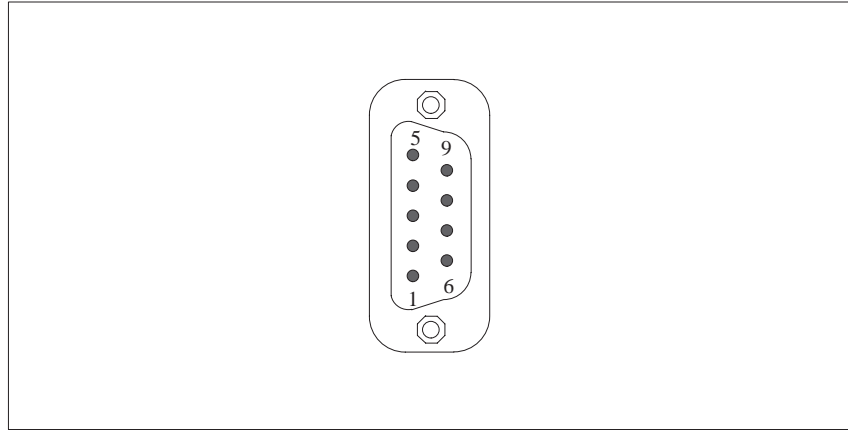


Figure 7-7 Serial Port COM2 (Plug Connector)

Pin No.	Designation	Description	Input/Output
1	DCD (M5)	Data carrier detect	Input
2	RxD (D2)	Receive data	Input
3	TxD (D1)	Transmit data	Output
4	DTR (S1)	Data terminal ready	Output
5	GND (E2)	Functional ground	-
6	DSR (M1)	Data set ready	Input
7	RTS (S2)	Request to send	Output
8	CTS (M2)	Clear to send	Input
9	RI (M3)	Incoming call	Input

Microphone

3.5 mm jack socket, suitable for active and passive microphones.

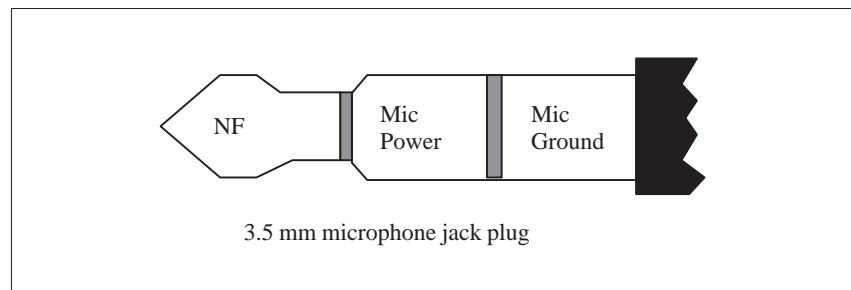


Figure 7-8 Microphone

Loudspeaker

3.5 mm jack socket for active and passive stereo loudspeaker (suitable for ohms).

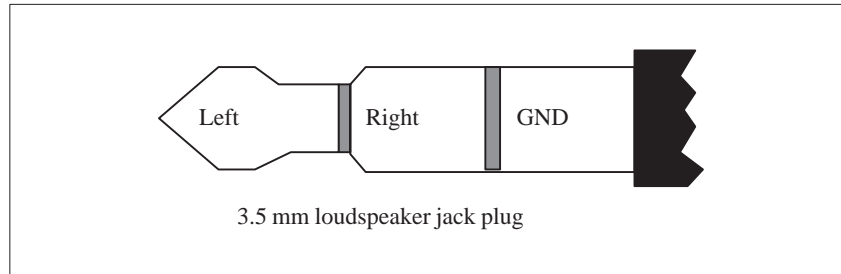


Figure 7-9 Loudspeaker

7.5 Connecting Cables

Overview

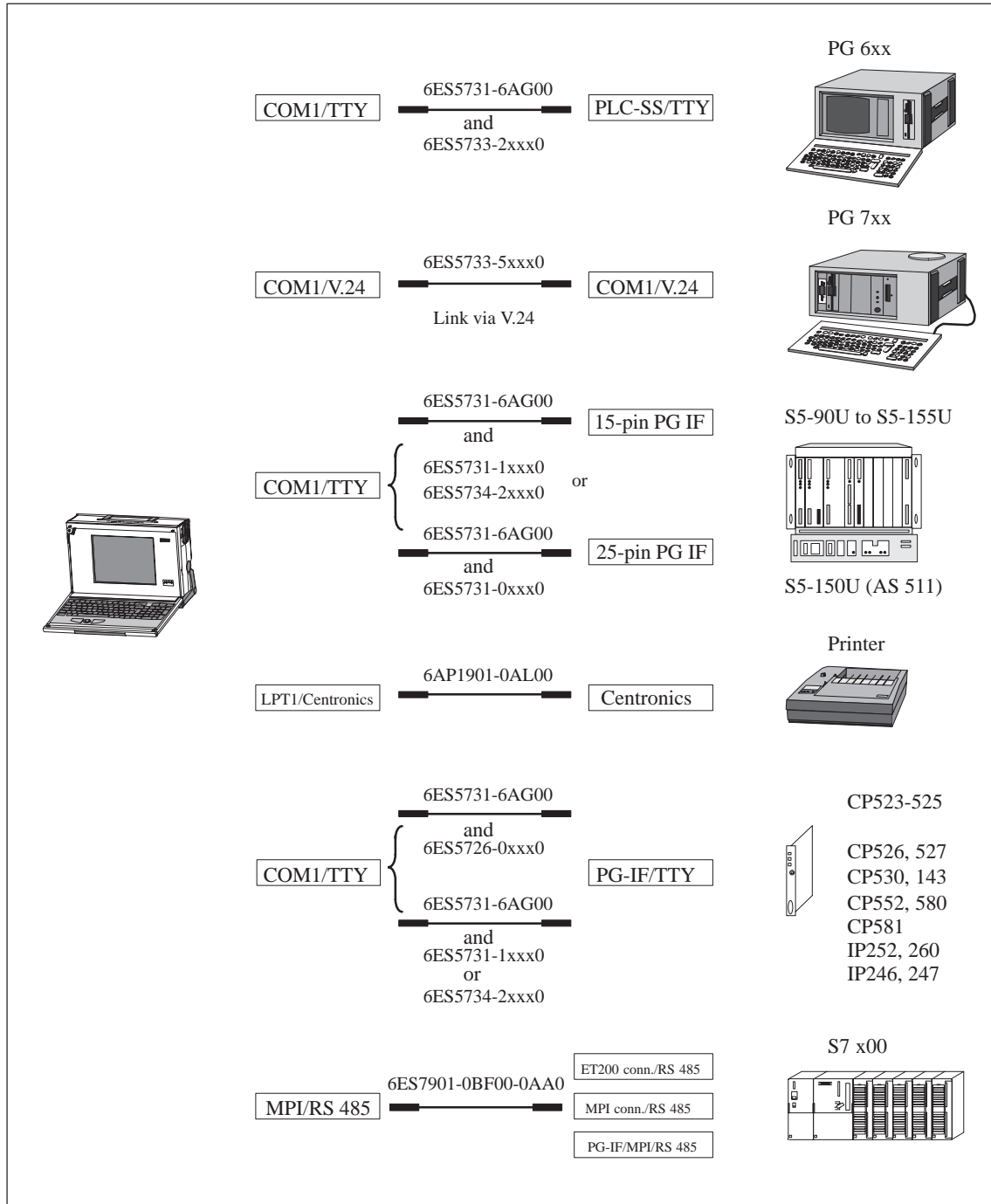


Figure 7-10 Connecting Cables

Standard Connecting Cable

You can use the standard connecting cable (supplied along with your PG 740 PII) to connect your PG 740 PII a Siemens programmable controller. Please read the notes in Chapter 3.

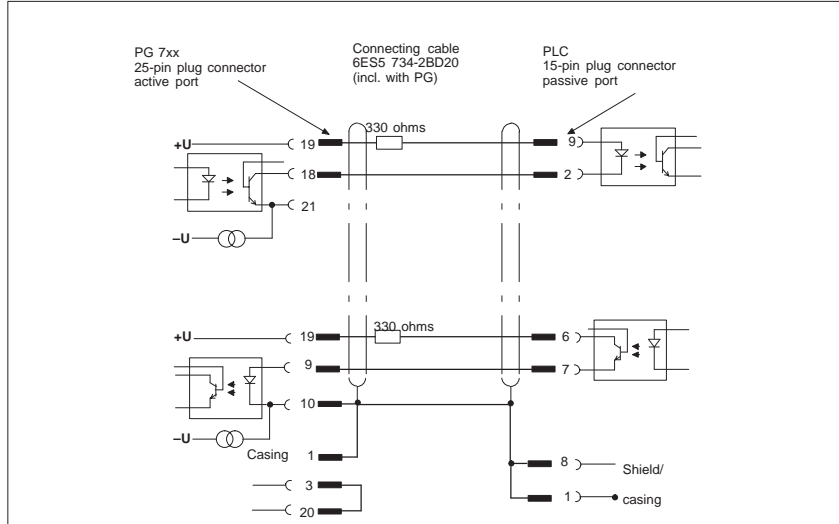


Figure 7-11 Standard Connecting Cable

Adapter for PG 6xx Cable

If you want to connect your PG 740 PII to a programmable controller with the standard connecting cable, you will need an adapter.

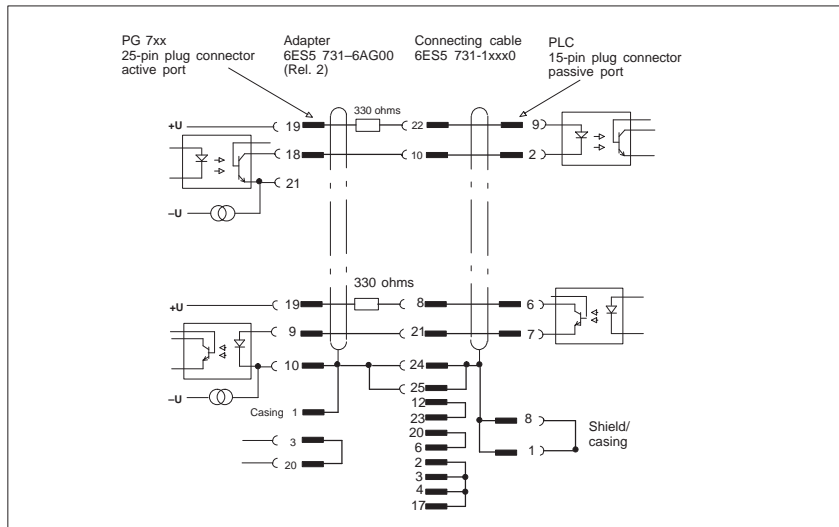


Figure 7-12 Adapter for a PG 6xx Cable

**PG 7xx - PLC
Connection via
PG 6xx
Connecting Cable
with 25-Pin Socket
Connector**

With the 25-pin plug connecting cable, you can connect your programming device via an adapter to a PLC, for example S5-150U (AS 511).

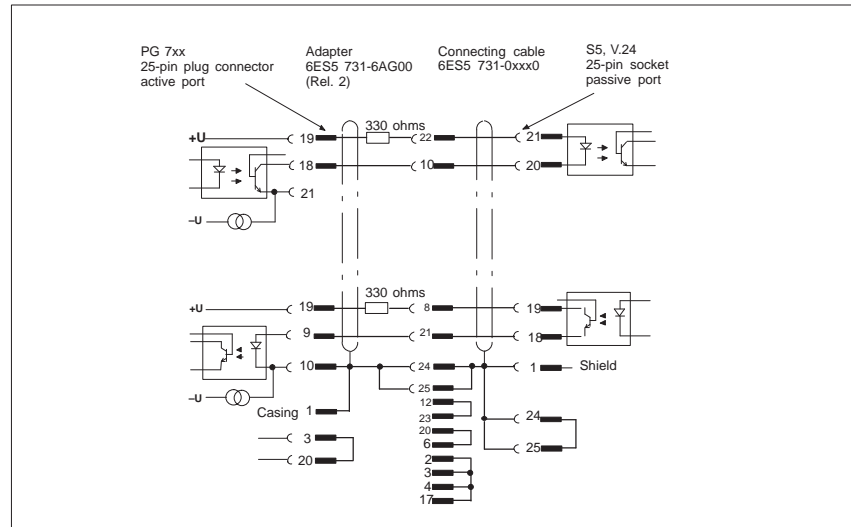


Figure 7-13 PG 7xx - PLC Connection via PG 6xx Connecting Cable with 25-Pin Socket Connector

**Cable for
Interconnecting
Programming
Devices**

You can connect your PG 740 PII to other programming devices via the TTY/COM 1 interface with this cable. This cable does not have an order number. Please read the notes in Chapter 3.

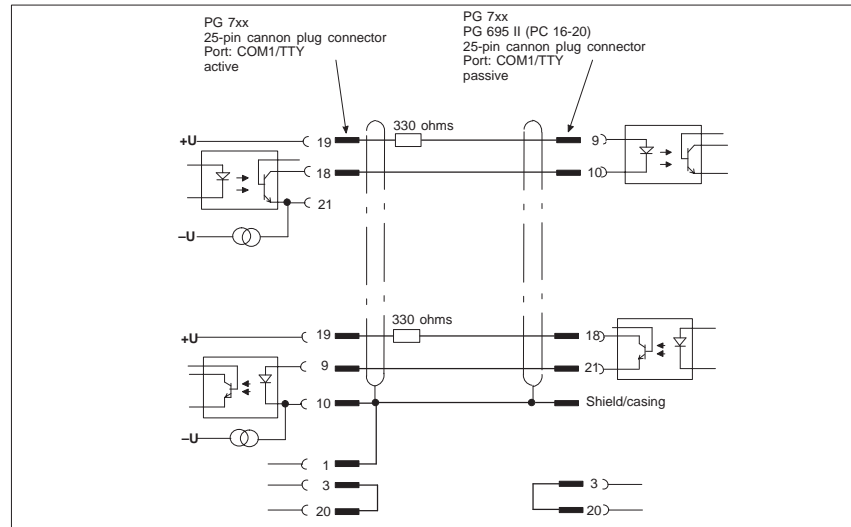


Figure 7-14 Cable for Interconnecting Programming Devices

**PG 7xx - PG 6xx
Connection to
PLC-S5 Port**

If you want to connect your PG 740 PII to the PLC-S5 port of a PG 6xx programming device, you will need an adapter. In this case, the PG 740 PII must be switched to active. Please read the notes on changing over the TTY/COM 1 port to active in Chapter 4.

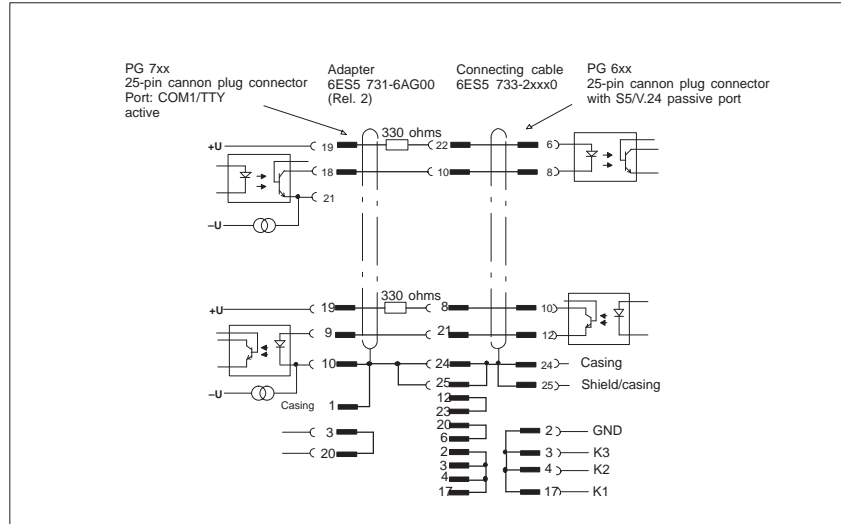


Figure 7-15 PG 7xx - PG 6xx Connection to PLC-S5 Port

**PG 7xx - PG 7xx
Connection in
V.24 Operation**

With this connecting cable you can connect to any PG 7xx.

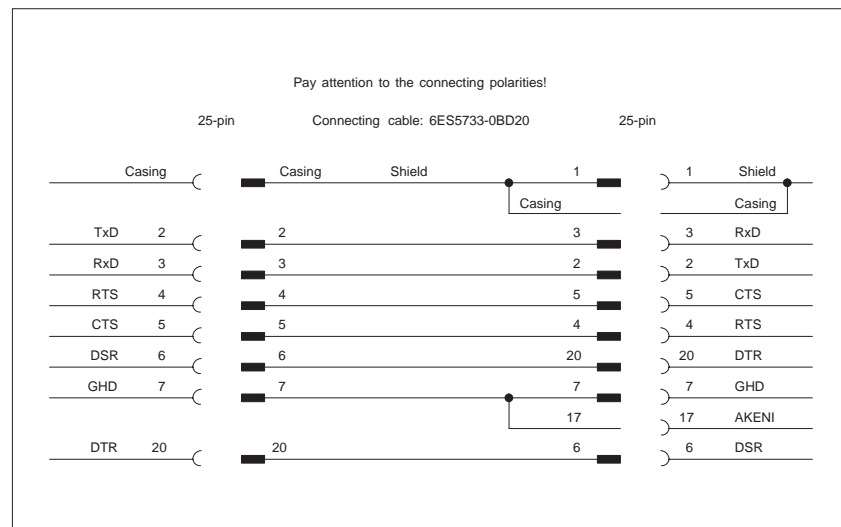


Figure 7-16 PG 7xx - PG 7xx Connection in V.24 Operation

Note

The Operating Instructions enclosed with your computer contain further technical information.

Guidelines for Handling Electrostatically-Sensitive Devices (ESD)

A

Chapter Overview

Section	Description	Page
A.1	What is ESD?	A-2
A.2	Electrostatic Charging of Persons	A-3
A.3	General Protective Measures Against Electrostatic Discharge Damage	A-4

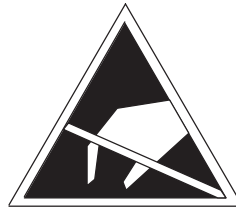
A.1 What is ESD?

Definition

All electronic modules are equipped with large-scale integrated ICs or components. Due to their design, these electronic elements are very sensitive to overvoltages and thus to any electrostatic discharge.

These **E**lectrostatically-**S**ensitive **D**evelopments are commonly referred to by the abbreviation **ESD**.

Electrostatically-sensitive devices are labeled with the following symbol:



Caution

Electrostatically-sensitive devices are subject to voltages that are far below the voltage values that can still be perceived by human beings. These voltages are present if you touch a component or the electrical connections of a module without previously being electrostatically discharged. In most cases, the damage caused by an overvoltage is not immediately noticeable and results in total damage only after a prolonged period of operation.

A.2 Electrostatic Charging of Persons

Charging

Every person with a non-conductive connection to the electrical potential of its surroundings can be charged electrostatically.

Figure A-1 shows you the maximum values for electrostatic voltages which can build up on a person coming into contact with the materials indicated in the figure. These values are in conformity with the specifications of IEC 801-2.

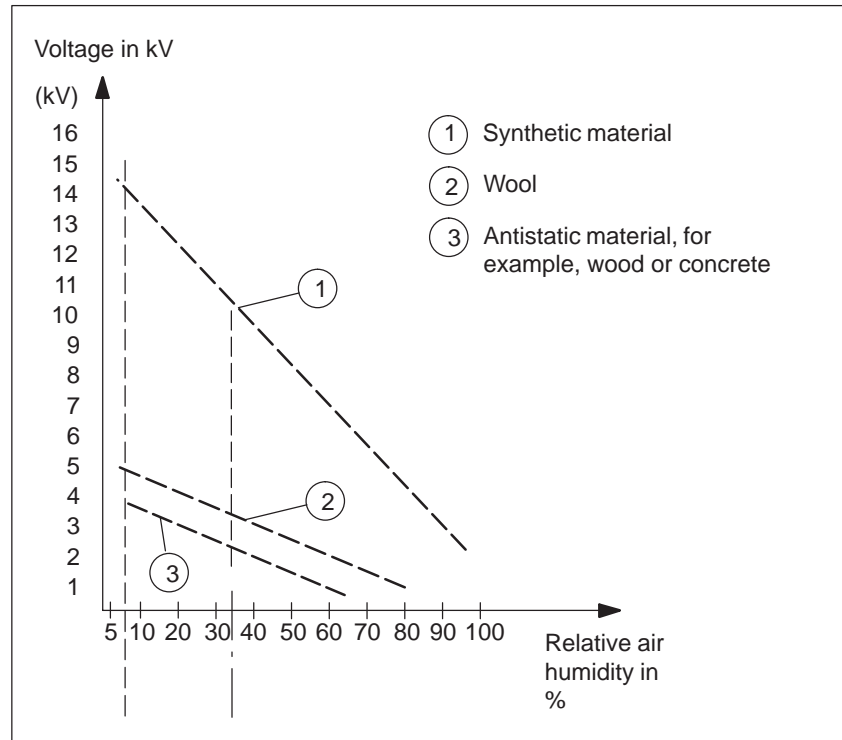


Figure A-1 Electrostatic Voltages which can Build up on a Person

A.3 General Protective Measures Against Electrostatic Discharge Damage

Ensure Sufficient Grounding

Make sure that the personnel, working surfaces, and packaging are sufficiently grounded when handling electrostatically-sensitive devices. You thus avoid electrostatic charging.

Avoid Direct Contact

You should touch electrostatically-sensitive devices only if it is unavoidable (for example, during maintenance work). Hold modules without touching the pins of components or printed conductors. In this way, the discharged energy cannot affect the sensitive devices.

If you have to carry out measurements on a module, you must discharge your body before you start the measurement by touching grounded metallic parts. Use grounded measuring devices only.

Glossary

What does this Chapter Contain?

This chapter contains a glossary in which you will find a list of the terminology used in conjunction with the Siemens range of programming devices and a brief explanation of each of the terms.

A

Access Protection Access to the programs and data of a programming device can be protected by passwords.

Application An application is a program which builds directly on, for example, the operating system. Applications on your programming device are MS-DOS/Windows, the STEP 5 Standard package, GRAPH 5 etc.

ASCII Editor With an ASCII editor you can edit text files that are stored in ASCII code (American Standard Code of Information Interchange).

B

Base Memory The base memory is a part of the main memory. It is 640 Kbytes for all programming devices. The size is entered in the SETUP menu under the entry "Base Memory" and is not changed even if the memory is extended.

Bps The speed (in bits per second) with which information is transmitted over a data link.

BIOS BASIC Input Output System

Boot Diskette A diskette which includes a boot sector, enabling it to load the operating system from the diskette.

Bootling A loading operation which transfers the operating system to the main memory.

C

Cache Fast intermediate memory between the work memory and the CPU.

Click Pressing and immediately releasing the left mouse button; this selects objects or trigger commands.

COM1 Port The COM1 port is a serial V.24/modem interface. This interface is suitable for asynchronous data transmission. It can also be used to connect printers with a serial interface.

COM2 Port	The COM2 port is a serial V.24 interface which can be used to connect a mouse or other external devices (for example, printers).
Configuration Files	These are files which define the configuration after booting. Examples of such files are CONFIG.SYS and AUTOEXEC.BAT and registry files.
Configuration Software	The configuration software brings the device configuration up to date when modules are installed. This is done either by copying the configuration files supplied with the module or by manual configuration.
Cursor	Pointer that shows the position on the screen at which the next entry will appear.
Cursor Control	Keypad on the keyboard for controlling the cursor.
D	
Device Configuration	<p>The configuration of a programming device contains information on the hardware and options of the device, such as memory configuration, drive types, monitor, network address etc. The data are stored in a configuration file and enable the operating system to load the correct device drivers and assign the correct device parameters.</p> <p>If changes are made to the hardware configuration, the user can change entries in the configuration file using the SETUP program.</p>
Diskette	The diskette (floppy disk) is an external direct access memory on which all types of files and programs can be stored. The storage medium is a round magnetic disk in a plastic cover to protect it from getting scratched.
Disk Drive	The disk drive (floppy disk drive) is used to store programs and data on diskette (write access) or to load from diskette to the computer (read access).
Display	The monitor of the PG 740 PII.
Double-Click	Pressing and releasing the left mouse button very quickly twice in succession without moving the mouse. This action is normally to open an object or program.
Drives	Drives are used to hold rotating storage media (diskettes, hard disk, CDs).

Drivers These are programs which are part of the operating system. They adapt the data from user programs to the specific formats required by the I/O devices such as hard disk, printers and monitors.

Drop-Down Menu In graphics-supported programs, a menu line is positioned on the top edge of the screen. The menu titles contained in this line can be set either as drop-down or pull-down menus. Drop-down menus “roll” down as soon as the mouse pointer passes over a menu title. Pull-down menus only “roll” down when the menu title is clicked on. Different functions can then be called from these menus by moving the mouse and clicking on an item in a menu.

E

EPROM/EEPROM Submodules These are plug-in submodules with EPROM/EEPROM chips. S5 user programs can be stored on them. These programmed submodules are then plugged in specially designed receptacles in the programmable controller.

Extended Memory A memory extension can be installed in a programming device to increase the size of the memory.

F

File A file is a collection of data under one name.

Formatting Formatting divides the memory area on a magnetic data medium into tracks and sectors. Formatting deletes all the data on a data medium. Every data medium must be formatted before it is used for the first time.

Function Keys Function keys can be divided into two different types; the normal function keys which are assigned a particular function of the computer (for example, delete key), and programmable function keys (softkeys).

H

Hard Copy The output of the complete contents of the screen on a printer is called a hard copy.

Hard Disk Drive Hard disk drives (Winchester drives) are a form of magnetic disk memory where the magnetic disks are permanently built into the drive.

I**Interface**

- An interface is the connection between individual hardware elements such as PLCs, programming devices, printers or monitors via physical connections (cables).
- An interface is also the connection between different programs, to enable them to work together.

Interface Module

Module used to connect the hardware I/O.

Interrupt

The interruption of program processing in the processor of a programmable controller by an interrupt event.

IRQ

Interrupt Request

ISA

Industrial Standard Architecture (bus for expansion module)

J**JEIDA**

(Japanese Electronics Industry Development Association) Association of Japanese electronics manufacturers whose aim is to set up standards worldwide for the miniaturization and flexible application of PC expansion cards. Cooperates with PCMCIA.

K**Keyboard**

The keyboard is the collection of keys which are used to input data, text, characters, letters, numbers, special characters and control commands in a computer. The keyboard forms the input interface between the user and the computer.

L**LED**

Light-emitting diode (for display and indicating purposes).

LPT1 Port

The LPT1 port (Centronics port) is a parallel interface that can be used to connect a printer.

M

- Main Memory** The main memory is the complete RAM memory of a programming device.
- Memory Card** Memory cards are memory for user programs and parameters in credit-card format, for example, for programmable modules and CPs.
- Modem** Communications device that enables a computer to send and receive data over a telephone line. **Modulator** and **demodulator** of a signal transmission facility. It converts the digital pulses from a computer into analog signals (and vice versa).
- Module** Modules are boards (printed-circuit boards) which can be plugged into a programmable controller or programming device. They are available, for instance, as central controller modules, interface modules, or as mass memory modules.
- Monitor** The monitor or screen is a visual display unit via which the programming device communicates with the user.
- Mother Board** The mother board is the core of the programming device. From here data are processed and stored, interfaces and device I/Os are controlled and managed.
- Mouse** The mouse is an input device, with which the user inputs coordinates (x,y). By moving the mouse, the mouse pointer can be moved at will around the screen. By pressing the left mouse button, the position is marked. The other mouse keys may have different assignments according to the application. With the mouse, objects can be selected, menus processed and functions started.
- Mouse Pointer** The mouse pointer is moved across the worktop (screen) by means of the mouse. The mouse pointer selects, for example, objects which are to be processed.
- MPI/DP** The multipoint interface (MPI) is the programming device interface of SIMATIC S7. It enables access to programmable modules, text displays, and operator panels from a central point. The stations on the MPI can communicate with each other.
- MS-DOS** (Microsoft Disk Operating System) is one of the standard operating systems for personal computers. It is a single-user system.

Multipoint Interface	The multipoint interface (MPI) is the programming device interface of SIMATIC S7/M7. It enables access to programmable modules, text displays, and operator panels from a central point. The stations on the MPI can communicate with each other.
N	
Network	Link between programming devices and programmable controllers by means of interface modules, physical cables, and the corresponding software to allow data exchange between the devices.
O	
Operating System	Collective term for all programs which, in conjunction with the hardware, control and monitor execution of the user programs, the distribution of resources among the individual user programs, and the maintenance of the operating mode (for example, Windows 98).
P	
Parallel Interface	Information is transmitted a byte at a time via a parallel interface (port). This means that the transmission rate is very fast. The programming devices have a parallel interface (LPT) to connect a printer.
Password	See Access Protection
PC	Personal computer
PCI	Peripheral Component Interconnect (fast expansion bus).
PCMCIA	(Personal Computer Memory Card International Association). Association of about 450 computer companies with the aim of setting worldwide standards for miniaturizing PC expansion cards and making their use more flexible, offering the market a basis for development. Cooperates with JEIDA.
PG	Programming device
PG Interface	The PG (programming device) interface is a serial port; it is located on a CPU, a CP/IP, or a coordinator module (PG-MUX) and is used to connect a programming device. Some CPUs may have two PG interfaces as an option.

PLC	SIMATIC programmable controller
Programmable Controller	The programmable logical controllers (PLC) of the SIMATIC systems (S5 or S7) consist of a central controller, one or more CPUs, and various I/O modules.
Pull-Down Menu	See Drop-Down Menu
R	
RAM	RAM (R andom A ccess M emory) is a read/write memory in which every memory location can be addressed individually and its contents changed. RAM is used to store data and programs.
ROM	ROM (R ead O nly M emory) is a memory in which every memory location can be addressed individually. The stored programs and data are permanently programmed at the factory before delivery and are not lost in the event of a power failure.
RTC	Real-time clock
S	
SCSI Interface	Small Computer System Interface. Interface for connecting SCSI devices (hard disk drives, CD-ROM drives).
Serial Interface	Data are transmitted one bit at a time via a serial interface (port); they are used where large distances have to be covered using the minimum amount of cabling.
SETUP (BIOS Setup)	A program in which information about the device configuration (that is, the configuration of the programming device's hardware) is defined. The device configuration of the programming device is preset with defaults. Changes must therefore be entered in the SETUP if a memory extension, new modules, or a new drive are added to the hardware configuration.
SIMATIC S5 Memory Submodule	Memory submodules for SIMATIC S5 that can be written with the programmer and inserted in an S5 programmable controller.

SIMATIC Memory Cards	Memory submodules in credit-card format for SIMATIC S5 and SIMATIC S7 which are programmed with the PG 740 PII and can be plugged in an S5 or S7 programmable controller.
SINEC L2 (PROFIBUS)	Bus system on the basis of the PROFIBUS standard. Components of the SIMATIC S5 and S7 series (for example, programming device, programmable controller, remote I/O) can be networked directly using SINEC L2.
SINEC H1 (ETHERNET)	Bus system on the basis of the ETHERNET standard. Components of the SIMATIC S5 and S7 series (for example, programming device, programmable controller, remote I/O) can be networked directly using SINEC H1 interface modules.
Software	The collective term for all programs which are used on a computer. The operating system and the user programs are part of the concept “software”.
STEP 5 Basic Package	This is a software package which represents the basis for all other STEP 5 software packages. With the programmer (PG), this package is used to program PLCs in the SIMATIC S5 family. The language used is known as STEP 5.
STEP 7 Standard Package	This is a software package which represents the basis for all other SIMATIC S7 packages. With the programming device (PG), this package is used to program, debug, and document PLCs in the SIMATIC S7 family. The language used is known as STEP 7.
T	
Text Cursor	The cursor shows where text may be entered, for example, in text editors and in dialog windows. In many applications the position of the cursor can be changed by moving and clicking the mouse pointer.
TFT Display	Thin-film-transistor color display
Trackball	The trackball is used as an input device for programs serviced by a mouse. On the PG 740 PII, the trackball is integrated in the keyboard.

U

User Interface The software-controlled menus and screens on the monitor through which the user communicates with the program.

User Program A collection of all the instructions, declarations, and data for signal processing, by which a system (or process) is controlled or influenced. It is linked to a programmable module (for example, CPU, FM) and can be structured in smaller units (blocks).

V

V.24 Interface The V.24 interface is a standardized interface for data transmission. Printers, modems, and other hardware modules can be connected to a V.24 interface.

VGA (Video Graphics Array)
Color graphics control mode

W

Warm Restart A warm restart is a restart after a program has been aborted. The operating system is reloaded and restarted. A warm restart is performed with the key combination CTRL+ALT+DEL.

Work Memory The work memory is a RAM memory in the CPU which the processor accesses during user program processing.

Write Protection Write protection for files or diskettes

- Write protection for files; this type of write protection is stored in the computer and is allocated by the system manager.
- Diskette write protection; for 5 1/4 in. diskettes by blanking out the hole on the right-hand edge with an adhesive label, for 3 1/2 in. diskettes or EOD disks by opening the write protection hole.

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Siemens AG
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Federal Republic of Germany

From:

Your Name: _ _ _ _ _

Your Title: _ _ _ _ _

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Street: _ _ _ _ _

City, Zip Code _ _ _ _ _

Country: _ _ _ _ _

Phone: _ _ _ _ _

Please check any industry that applies to you:

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|--|--|
| <input type="checkbox"/> Automotive | <input type="checkbox"/> Pharmaceutical |
| <input type="checkbox"/> Chemical | <input type="checkbox"/> Plastic |
| <input type="checkbox"/> Electrical Machinery | <input type="checkbox"/> Pulp and Paper |
| <input type="checkbox"/> Food | <input type="checkbox"/> Textiles |
| <input type="checkbox"/> Instrument and Control | <input type="checkbox"/> Transportation |
| <input type="checkbox"/> Nonelectrical Machinery | <input type="checkbox"/> Other _ _ _ _ _ |
| <input type="checkbox"/> Petrochemical | |

