

SIMATIC

PG 720 P Programming Device

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

indicates 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

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.

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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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Technical data subject to change.

Preface

Purpose of the Manual

This manual contains all the information you need for working with the PG 720 programming device. You can use this information to do the following:

- 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 to other units of equipment (programmable logic controllers, other programming devices).
- Expand your system, provided you comply with the necessary conditions.
- Analyze and eliminate simple problems.

Audience

The following persons require the manual:

- Users commissioning the programming device themselves or working with it (editing, debugging).
- System administrators operating the programming device in a network.
- Service and maintenance personnel using the PG 720 for system expansion purposes or error/fault analysis.

Where is this Manual Valid?

This manual describes the version of the PG 720 as available in June 1998. The Product Information Bulletin supplied with the PG 720 contains the latest technical specifications for your programming device.

Licenses

The approvals, certificates, and licenses for your device are supplied along with the Product Information Bulletin.

Where to Find Information

Along with your PG 720, you also receive the following documents which you require for commissioning the device:

- The Product Information Bulletin with the **valid technical specifications** of the PG 720.
- A Product Information leaflet about the software supplied with the PG 720.

For more detailed information about handling the software, please refer to the appropriate manuals (for example, the STEP 5 manual).

Structure of the Manual

Chapters 1 to 4 of the manual contain the most important instructions for commissioning and using the PG 720. Chapters 5 to 8 are reference sections required in special situations.

Setting up and getting to know your device

Before you start to use your programming device, you should read about setting up the device in Chapter 2 and about the components and functions of the PG 720 in Chapter 3.

Installation

Chapter 4 describes the basic steps necessary for commissioning the PG 720. This chapter also contains instructions for working with submodules and memory cards for programmable logic controllers and additional interfaces.

Expansion

Chapter 5 describes how to expand your PG 720 (for example, installation of memory expansions). Please observe the safety instructions in this section.

Configuration

Modifications made to the system hardware may make it necessary for you to adapt the original hardware configuration. This is described in Chapter 6.

Error/fault diagnostics

Chapter 7 explains how to deal with simple faults and problems that you can diagnose and, in some cases, eliminate yourself.

Reference data

Chapter 8 contains information about hardware addresses, interrupt assignments, and connecting cables.

ESD guidelines

The guidelines on the handling of electrostatically sensitive devices are particularly important for service and maintenance technicians who are installing expansion units or carrying out error analysis with the PG 720.

Glossary

The glossary defines and explains important terms.

Alphabetical index

The alphabetical index will help you to find passages in the text relating to important terms and keywords quickly and reliably.

Additional Assistance

If you have any questions concerning subjects not covered in the manual, simply get in touch with the Siemens representative in your area or call the SIMATIC Hotline. The addresses are listed in your Product Information Bulletin.

If you have any questions about the manual itself or would like to make or suggestions, please complete the reply card at the end of the manual. We would also appreciate it if you would include your own opinion and appraisal of the manual on the reply card.

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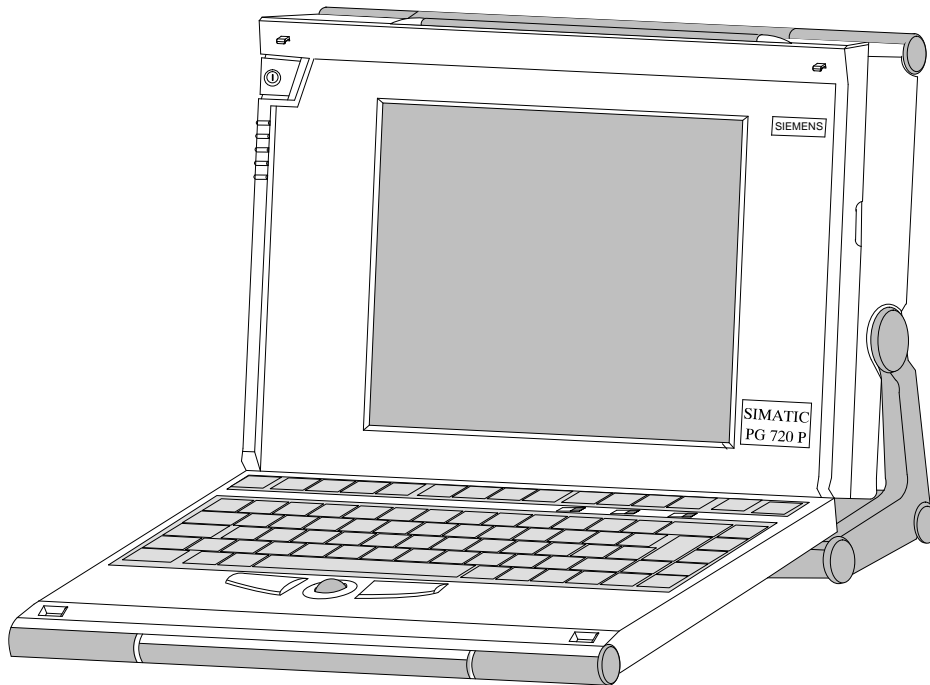
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Product Overview

1

Application

The PG 720 programming device is a self-contained unit designed specifically for an automation environment. Its performance, ergonomic design, and equipment make it a unit particularly suitable for maintenance and service as well as for programming, configuring, debugging, and installing SIMATIC programmable logic control systems.



The PG's Hardware and Software

You can use the PG 720 programming device to program SIMATIC S5 and SIMATIC S7 programmable logic controllers. It is equipped with the following:

- Interface ports for connection to programmable logic controllers.
- Programming facilities for S5 memory submodules and S5/S7 memory cards.

The PG 720 is supplied with system and automation software. The software components are listed in the Product Information leaflet.

Advantages of the PG 720

Compared with a PC with standard hardware and software, the PG 720 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 720 without the need for additional hardware or software.
- The rugged design and practical functions of the PG 720 make it particularly suitable for use on-site under tough industrial conditions. It is extremely light and easy to transport. The PG 720 meets the specific requirements of industrial environments such as noise immunity, compliance with the relevant standards, ruggedness, simple transportation, and commissioning.
- The PG 720 is equipped with a battery allowing it to be operated without a mains connection.
- The PG 720 can be set up and operated in a large number of different ways and positions, and can therefore be used practically anywhere it is needed.
- The PG 720 has all the integral ports necessary for connecting it to SIMATIC automation devices:
 - Programming interface for SIMATIC S5 memory submodules.
 - Programming interface for SIMATIC S5 and SIMATIC S7 memory cards in credit card format.
 - Communication interfaces for connection to S5 and S7 programmable logic controllers.
- The PG 720 is supplied with all the necessary system and automation software already installed on the hard disk in compressed form.
- Since Windows 95 is also already installed, you can, of course, also use the PG 720 as a stand-alone workstation, and run all the standard software available on the market that requires MS-DOS or Windows.
- In terms of performance and expansion capability, your programming device meets all the normal requirements of a PC. This means that the PG 720 can also be used as a fully-fledged personal computer.

Unpacking and Setting Up the PG 720

2

What Does This Chapter Contain?

This chapter contains important information about unpacking, setting up, and transporting the PG 720, such as:

- Opening and closing the keyboard
- Changing the angle of inclination of the device
- Using the extra pull-out support
- How to move the unit.

Chapter Overview

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2.1 Setting Up the PG 720

Unpacking Your PG 720

Unpack your PG 720 as follows:

1. Remove the packing.
2. Do not throw the original packing away. Keep it in case you have to ship or transport the unit again at some time in the future.
3. Check the packing list to make sure that no components are missing.



Caution

Risk of damage!

Moisture inside the unit can cause serious damage.

When transporting the unit in cold weather, when it may be submitted to extreme variations in temperature, make sure that the unit is allowed to reach room temperature slowly before you switch it on.

If condensation has formed, this must be allowed to evaporate before you switch on. If, for example, the unit is subjected to a temperature change from -20°C to $+20^{\circ}$ (-4°F to $+68^{\circ}\text{F}$) you should wait approximately 12 hours before switching on the unit.

Setting Up on a Desk Top

The PG 720 is used primarily on a desk or table top. To ensure a comfortable working position, the PG 720 can be adapted as follows to suit the work place:

1. Place the PG 720 on the desk or table top.
2. Open the keyboard lock by pulling up the gray handle.
3. Lower the keyboard into position.

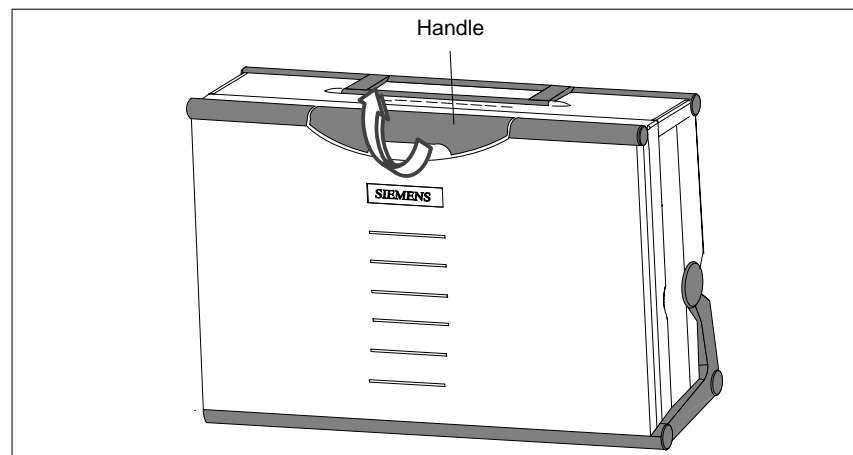


Figure 2-1 The Programming Device before Opening

Changing the Angle of Inclination

With the keyboard open, you can incline the PG 720 to any angle between 0° and 90°. To adjust the angle, proceed as follows:

1. Lower the keyboard into position.
2. Pull the support (Figure 2-4) out of the rear of the stand and, if necessary, pull out the extra support hoop.
3. Incline the unit to an angle that will allow you to work comfortably.

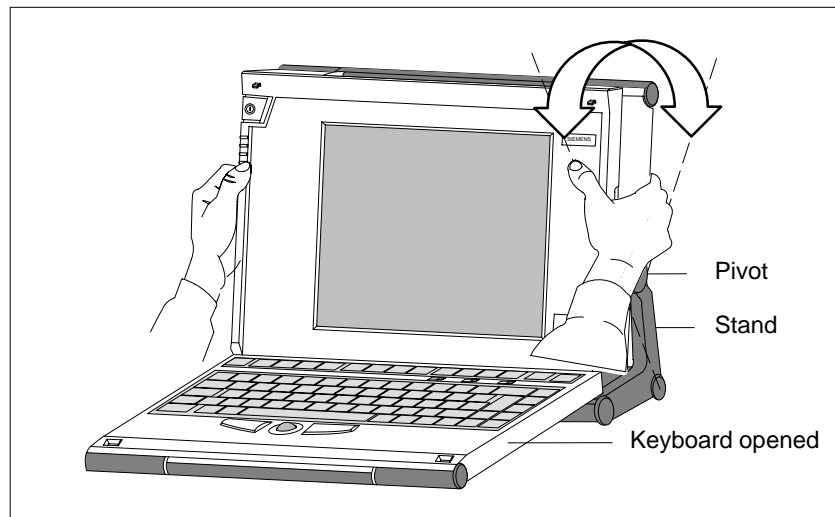


Figure 2-2 Changing the Angle of Inclination

Note

When you change the angle of inclination, make sure that the keyboard cable is **not** trapped between the device and the stand.



Caution

Risk of injury!

There is a danger of the unit tipping over if it is set up at an angle of inclination of more than 15° without using the pull-out support. 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 pull-out support and, if necessary, the extra support hoop in the stand.

Detaching the Keyboard

In certain situations, it is helpful to remove the keyboard.

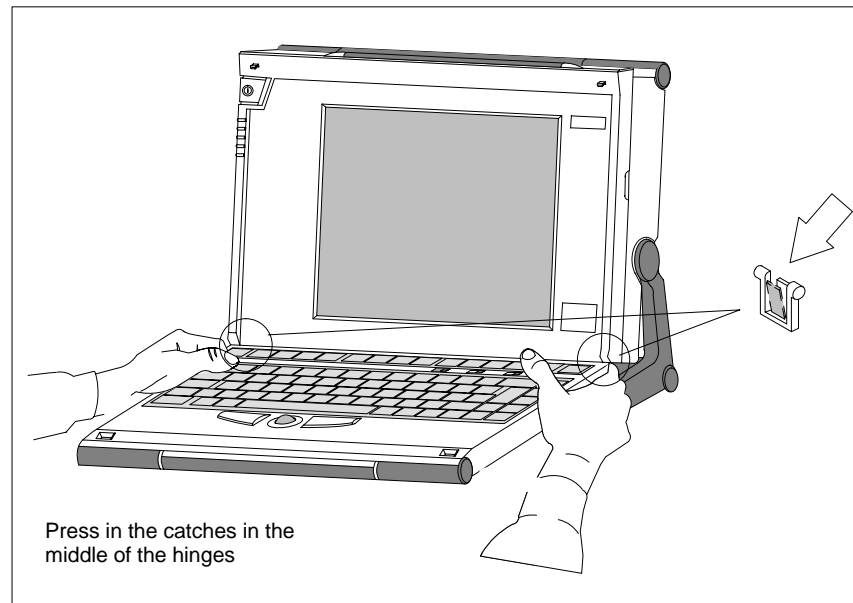


Figure 2-3 Detaching the Keyboard



Caution

Risk of tipping!

If the keyboard is detached, there is a risk of the unit tipping over. Before removing the keyboard, make sure that you pull out the support from the device stand (Figure 2-4) and pull out the additional hoop.

Detaching

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 towards the keyboard.
3. Pull the keyboard up and out.
4. Place the keyboard on a suitable surface, using the hinge assembly as a stand.

Refitting

You attach the keyboard again as follows:

1. Place the keyboard cable in the cable conduit in the stand.
 2. Snap the keyboard hinges into the receptacles in the stand.
-

Note

When attaching the keyboard, make sure that the cable is lying correctly in the cable conduit and is fixed in position.

Keyboard Angle

When the keyboard is attached to the unit, its angle of inclination is 6°, the height of the middle row of keys is 30 mm (about 1 inch). When it is detached, the angle of inclination is 4.5°, and the height of the middle row of keys is 27 mm. This is an ideal ergonomic design to allow a comfortable working position.

Horizontal Position Adjustment

If no table or desk is available, the unit can be operated on the floor. You can adjust the casing and display through approximately 90° into the horizontal plane.

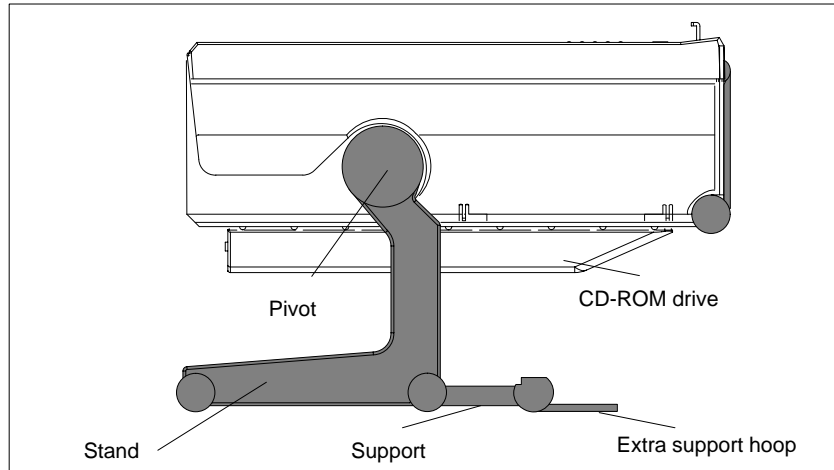


Figure 2-4 Horizontal Operating Position Without Keyboard

Wall Mounting

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

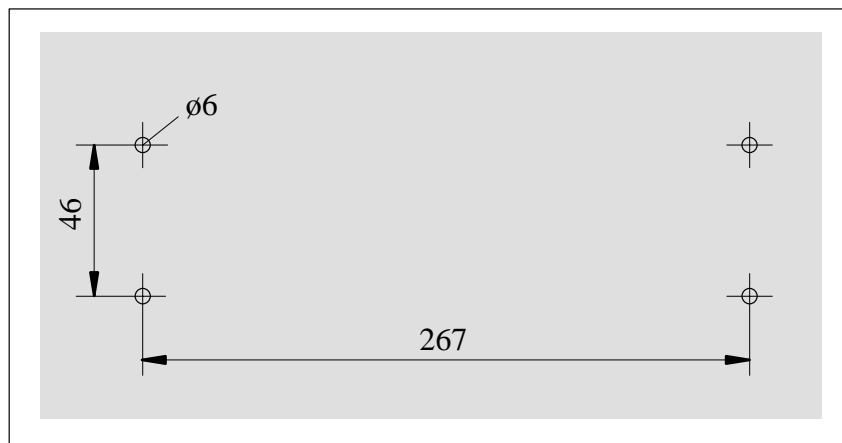


Figure 2-5 Drilling Template for Wall Mounting (dimensions in millimeters)

2.2 Moving the Programming Device

Preparations

The PG 720 is easy to carry. Before carrying it, however, you should take the following measures:

1. Shut down the operating system. To prevent data loss, you must exit Windows completely. Windows issues a message to inform you when it is safe to switch off the device.
2. After shutting down the operating system, wait approximately 5 seconds before you switch the device off. This allows the drive to come to a complete stop and ensures optimal protection.
3. Unplug all the connecting cables.
4. Close the covers protecting the ports and connections on the right-hand and left-hand side panels.
5. Bring the unit into an upright position.
6. Raise the keyboard and lock it by pressing it against the front panel of the unit. The latches on the right and left snap in. Make sure that both catches are properly **locked**.
7. If you only want to carry the unit for a short distance, use the handle.
8. If you want to move the PG 720 over larger distances, pack the unit and all its accessories in the carrying bag supplied.

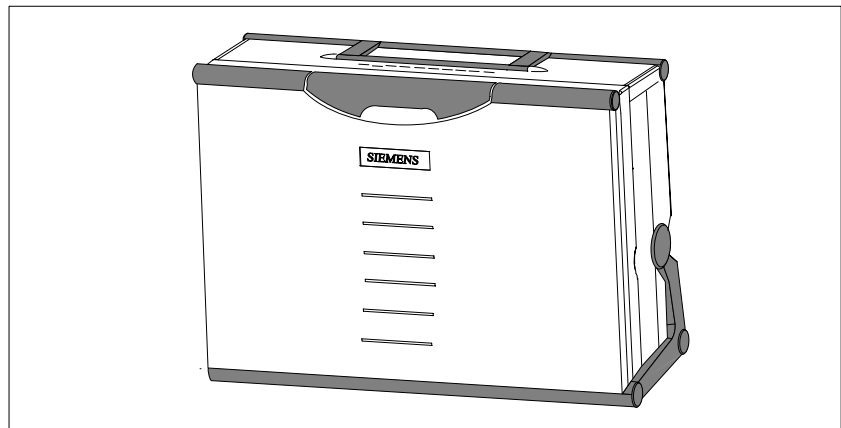


Figure 2-6 PG 720 Ready for Transport

Carrying the PG 720

Despite the rugged design of the PG 720, its internal components are sensitive to severe vibration or jolts. When moving the PG 720, you must therefore make sure that it is protected from severe mechanical forces.

Use the **original packing material** if you have to ship the PG 720 from one location to another.

3

Getting to Know the PG 720

What Does This Chapter Contain?

This chapter contains all the information you require about the most important components of the device, such as:

- LED displays
- Drives
- Keyboard
- Programming facilities of the PG 720
- External power unit and battery.

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3.1 Hardware Components of the PG 720

Front

You can access all of the important operator controls and displays from the front, base, or sides of the unit. Figure 3-1 shows the front of the PG 720.

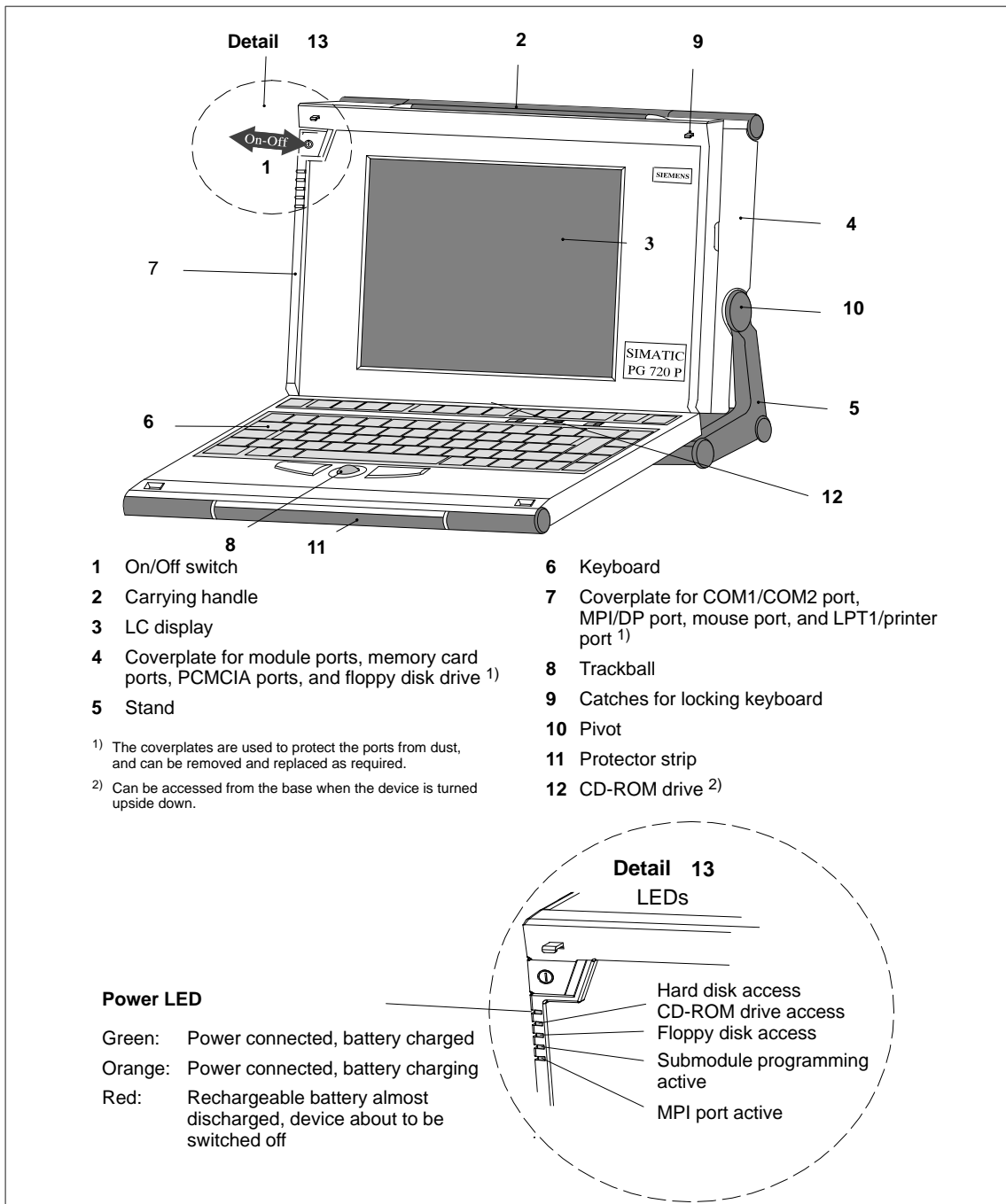


Figure 3-1 The Front of the PG 720

Left-Hand Side Panel (Communications Side)

All the connectors and interface ports for connecting to external devices are located on the left side panel of the PG 720 (communications side).

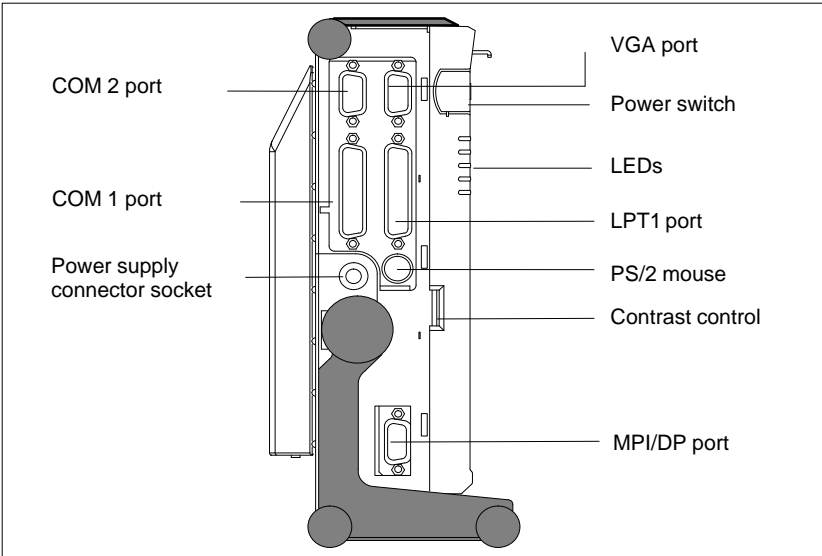


Figure 3-2 Left-Hand Side Panel with Cover Plates Removed

Connectors and Ports

The following table contains an overview of the various interface ports and connectors on the left-hand side panel:

Table 3-1 Connectors on the Left-Hand Side Panel of the Unit

Ports and Connectors	Function
VGA port	Connection for external monitor
COM 2 Serial port RS-232 / mouse Serial port	Connection for serial mouse Connection for serial printer
COM 1 RS-232 /MODEM /PLC Serial port	Connection for S5 programmable logic controller
MPI (multipoint interface)	Connection for S7 programmable logic controller
LPT 1 printer Parallel port	Connection for parallel printer
PS/2 mouse	Connection for PS/2 mouse
External power supply unit	Connection for 17 V DC from external power supply unit

Right-Hand Side Panel (Processing Side)

You access the slots for programming S5 submodules, S5/S7 memory cards, the PCMCIA port, and the disk drive from the right-hand side of the PG 720 (processing side).

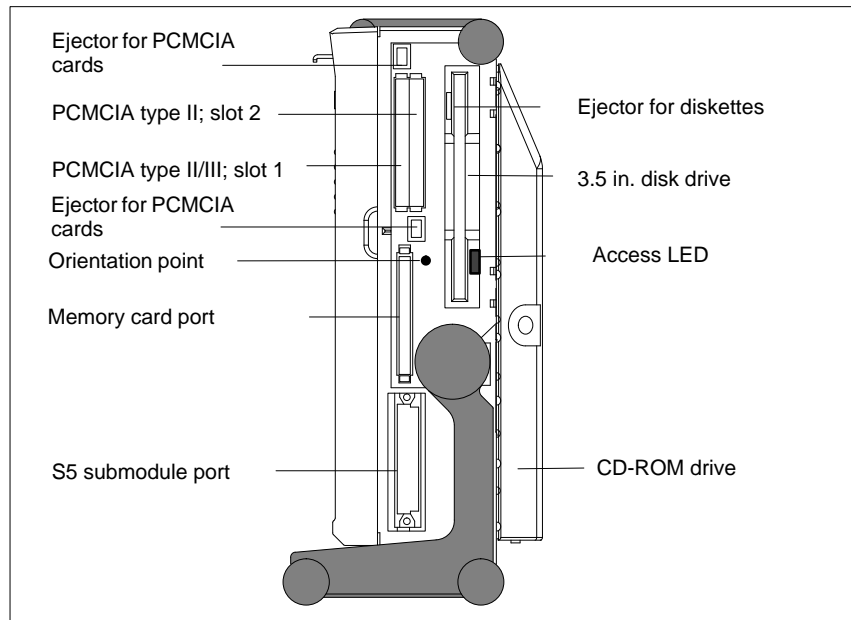


Figure 3-3 Right-Hand Side Panel (with Port Covers Removed)

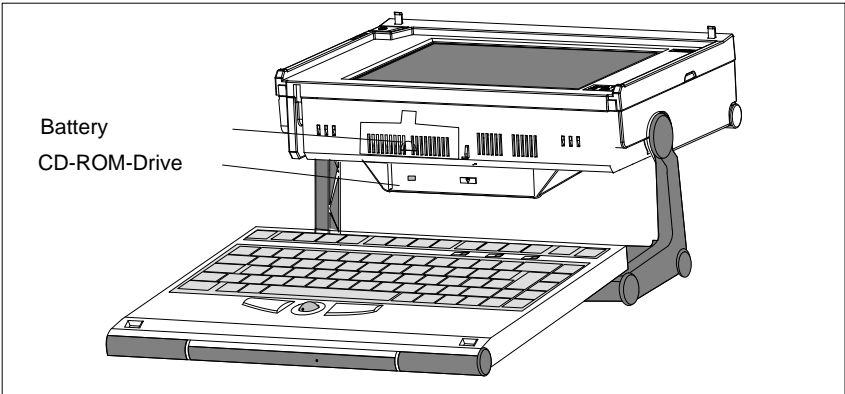
The following table contains an overview of the ports and connectors on the right-hand side panel:

Table 3-2 Connectors on the Right-Hand Side Panel of the Unit

Interface Port	Function
PCMCIA type II port ; slot 2	Connection for PCMCIA type II cards
PCMCIA type III port; slot 1	Connection for PCMCIA type II/III cards
S5 submodule port	Programming SIMATIC S5 submodules
Memory card port	Programming SIMATIC memory cards
Disk drive	Working with 3.5" disks

Base Panel

You can access the CD-ROM drive and the rechargeable battery from the base of the PG 720 device.



Ventilation Slits

There are ventilation slits on the top and bottom panels of the unit. These slits must not be covered or blocked in any way (for example, by placing the device on carpets or rugs).



Caution

Risk of overheating!

If you cover the inlet or outlet ventilation slits, you may cause damage to the PG 720.

Do not place any objects so that they obstruct the ventilating slits in any way.

3.2 Display

Available Displays The PG 720 has a color display.

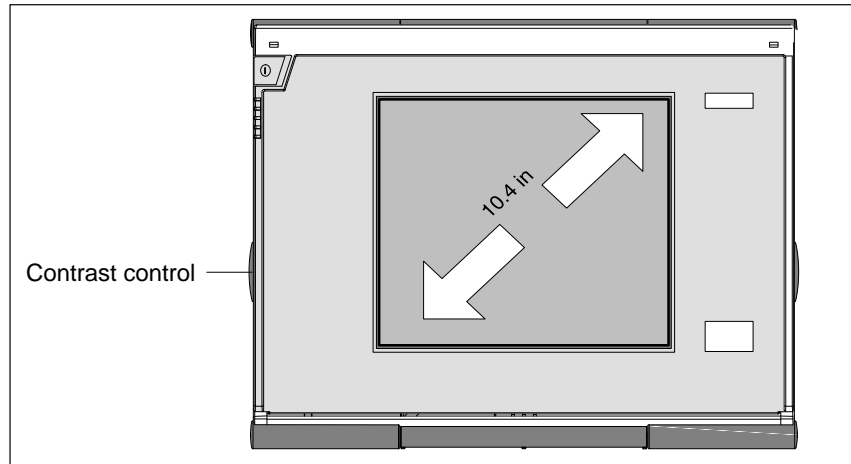


Figure 3-4 PG 720 Display

Color Display of the PG 720

The display of the PG 720 is an STN color display with a diagonal of 10.4 in. (26 cm) and a resolution of 800 x 600 pixels.

The three primary colors, red, green and blue, can each be displayed in eight different shades. This means that, including all the secondary colors, a maximum of 256 different colors can be displayed. The contrast can be adjusted with a control to the left of the display.

Note

Depending on the gray tone or color shade in the display, passive STN displays are subject to varying degrees of interference known as the Moiré effect. This is a physical characteristic and is not a fault.



Caution

Risk of injury!

If a display is **damaged**, liquid crystals 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 immediately.

Use only a cotton cloth and a neutral cleansing agent to clean the display. Do not use water or aggressive solvents (such as alcohol or acetone). Never touch the display with hard, sharp objects. Avoid exerting any pressure on the display surface.

3.3 Keyboard

Keyboard Layout The keyboard is divided into the following areas:

- Alphanumeric or typewriter keyboard with special keys
- LED displays
- Function keys
- Cursor control keys.

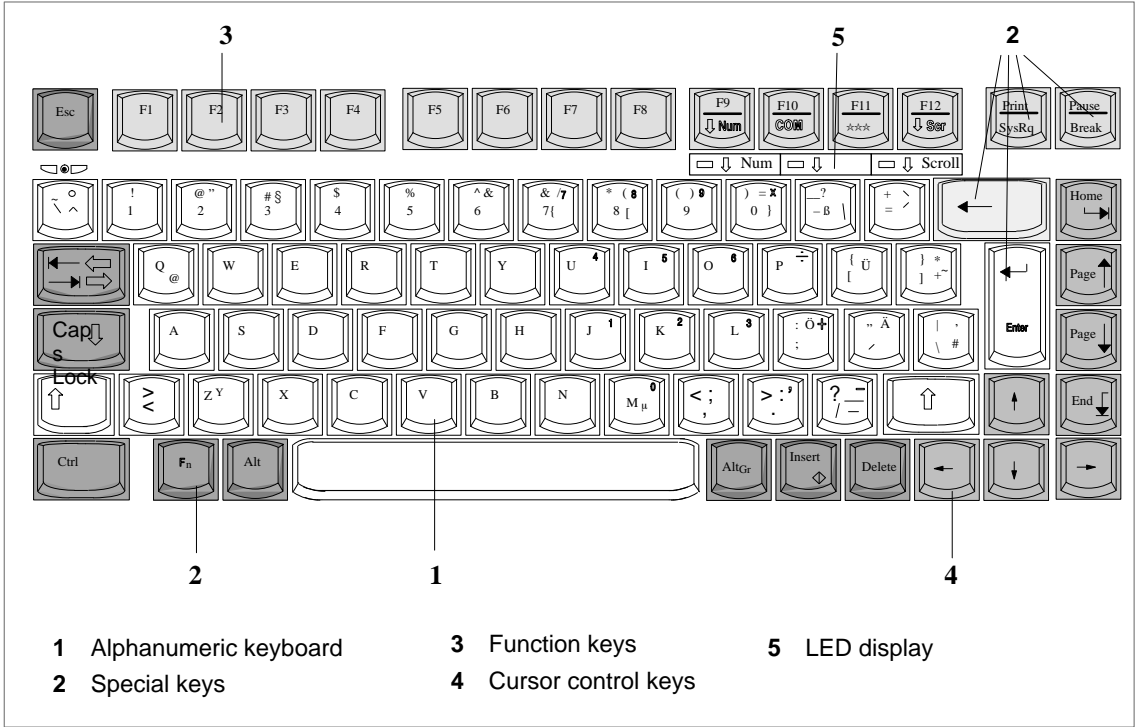


Figure 3-5 Keyboard Layout

Repeat Function All the keys on the keyboard are of the autorepeat type. The character is repeated as long as the key is pressed.

Keyboard Labeling The keyboard has international and German labeling.

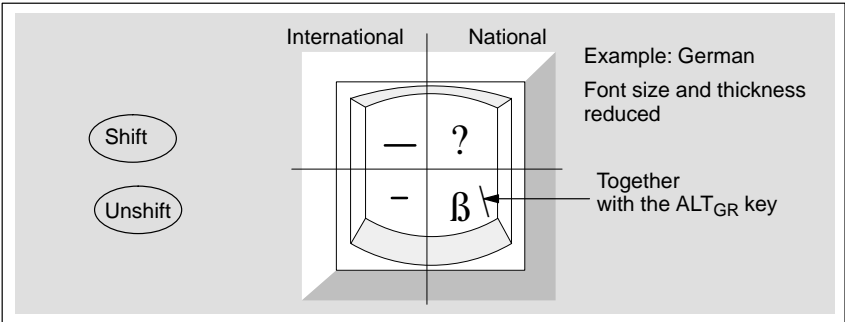


Figure 3-6 The Keyboard Labeling System

Alphanumeric Keyboard

The largest block of keys on the keyboard is the alphanumeric keyboard with all the keys for the letters of the alphabet, numerals and special characters. The characters are arranged in basically the same way as on a normal typewriter. However, there are a number of special keys which have special functions for the PG 720.

Special Keys

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

Table 3-3 Functions of the Special Keys

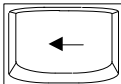

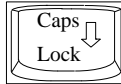

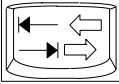






Key	Function
	<p>Backspace Key</p> <p>This key moves the cursor one space to the left and deletes the character at this position.</p>
	<p>Enter Key (Return, Enter, Line Feed (“New Line”))</p> <p>The return or enter key is used mainly to terminate a command line in the operating system; that is, the command 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 user program.</p>
	<p>CAPS LOCK Key</p> <p>If you press this key, the middle LED at the top right-hand corner of your keyboard lights up. All upper case characters and other characters are output normally. If you want to type lower case letters in this position, you must first press the shift key.</p> <p>If you are using an international keyboard, you cancel this function by pressing the CAPS LOCK key again. The LED then goes out.</p> <p>If you have a German keyboard, you must press the shift \$ key to cancel this function.</p>
	<p>NUM Key</p> <p>With these keys $F_n + \wedge \text{NUM}$, the emulated numeric block is switched from the alphanumeric keyboard to numeric keys. The LED display lights up. Press this key again to return to cursor control.</p>
	<p>Tabulator Key</p> <p>This moves the cursor depending on the selected tabulator positions.</p>
	<p>“Fn” Special Key (combination key)</p> <p>In conjunction with a second key (key combination), you activate other key codes for special applications with this key (see Figure 3-9 Function Keys). This key is also used to emulate the numeric keypad (Figure 3-8 Numeric Keypad).</p>
	<p>CTRL Key (combination key)</p> <p>This key is only used in combination with other keys. For example, you press CTRL + ALT + Delete to reset and restart the operating system. For other uses of this key, please refer to the user manual of the relevant user program.</p>

Table 3-3 Functions of the Special Keys

Key	Function
	<p>ALT Key (combination key) This key is only used in combination with other keys. For example, you can enter the hexadecimal value of an ASCII character using this key and the numeric keypad for example, F_n + ALT + 123 corresponds to “{”.</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 typing ALT_{Gr} + β.</p>
	<p>PRINT (combination key) Using the Print key, you can output the current screen display to a printer (depending on the software used).</p>
	<p>PAUSE (combination key) The Pause key interrupts program execution in the majority of applications.</p>

LED Displays

The LED displays for the keys NUM LOCK and SCROLL LOCK are located below the function keys F9 to F12 and display the current status of the keys.

- NUM LOCK
- CAPS LOCK
- SCROLL LOCK

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

Cursor Keys

The key block shown in the picture below is used for cursor control.

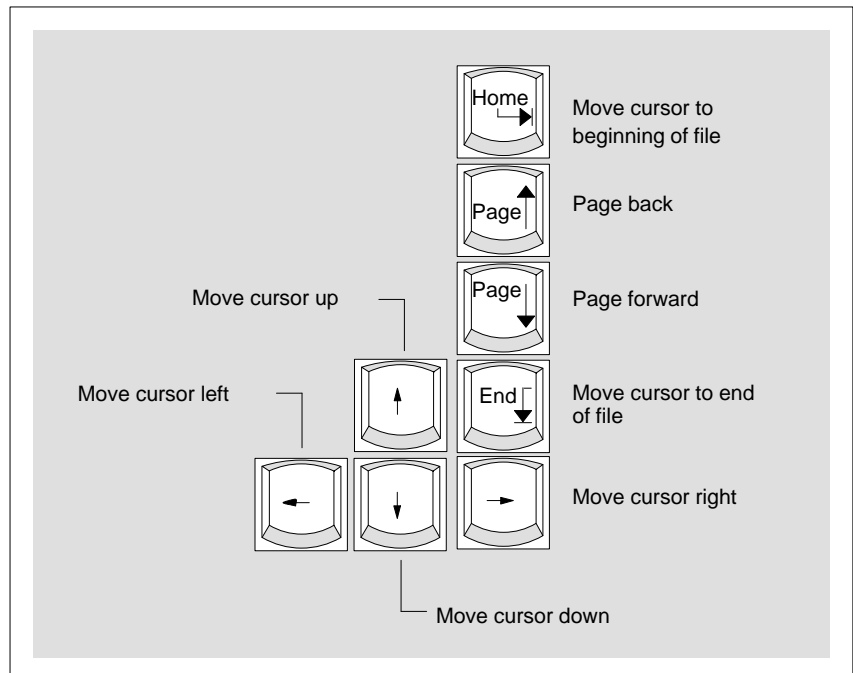


Figure 3-7 Cursor Control Keys

Numeric Keypad with Fn Key

By pressing F_n and one of these keys, the numbers and characters can be used provided Num Lock is switched on.

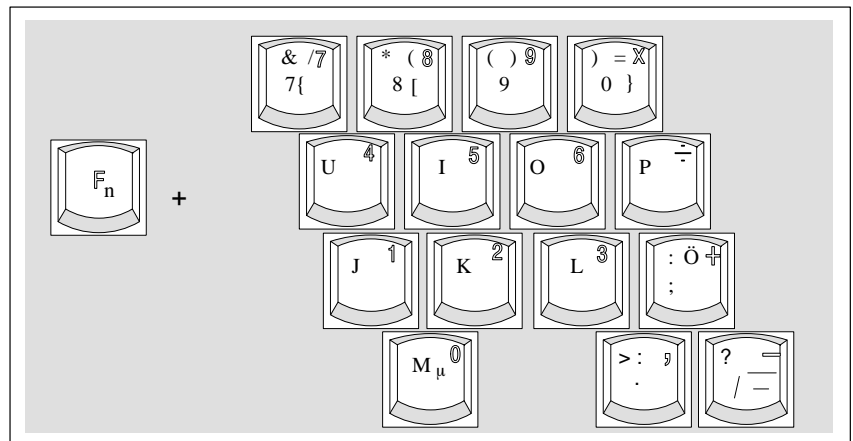


Figure 3-8 Numeric Keypad

Function Keys

There is a row with twelve function keys located above the alphanumeric keyboard. The assignment of the individual function keys depends on the software you are working with.

$F_n + F9$ can also be used to switch the numeric keypad from alphanumeric keys to numeric keys.

Keys with Specific Functions for S5

The following function keys have specific functions in conjunction with the STEP 5 programming software.




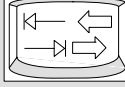































		Horizontal expand	
		Vertical expand	
		Enter key	
		Cursor right/ cursor left	
	+		Title/comment input in segments
	+		End of segment
	+		Help
	+		Insert segment 
	+		Delete segment (X)
	+		Correction (CORR)
	+		Switch the emulated numeric keypad from alphanumeric to numeric keys
	+		Zoom (in Graph 5)
	+		Zoom (in Graph 5)
			Half screen (in Graph 5)

Figure 3-9 Function Keys (STEP 5)

Key Combinations

A selection of some of the most important key combinations are shown in the following table.

Table 3-4 Key Combinations

Key Combination	Effect
 +  + 	Restart
 +  + 	Switch over to international character set
 +  + 	Switch over to German character set: the German keyboard driver must be loaded.
 + 	Trackball active / passive

3.4 Trackball

Trackball

The trackball is a pointing device for cursor control and menu selection in many programs that support mouse operation. By moving the trackball, the cursor can be positioned anywhere on the screen.

By pressing the left-hand button, you set a marker. The function of the right-hand button depends on the particular program you are using. You can select objects or items in a menu and start functions with the trackball.

Cleaning the Trackball

The trackball is in a roller housing which normally prevents dust collecting on the ball or transmission mechanism. Nevertheless, you should clean the trackball at regular intervals.

To clean the trackball, proceed as follows:

1. Switch off your programming device.
2. Remove the cover of the trackball housing by turning it anti-clockwise, for example by inserting tweezers or a similar tool into the holes in the ring.
3. You can now take the trackball out of its housing.
4. Wash the trackball in a solution of tap water and mild cleansing agent.
5. Blow any residual dust out of the trackball housing.
6. Dry the trackball and return it to its housing.
7. Replace the cover and tighten it by turning it in a clockwise direction.

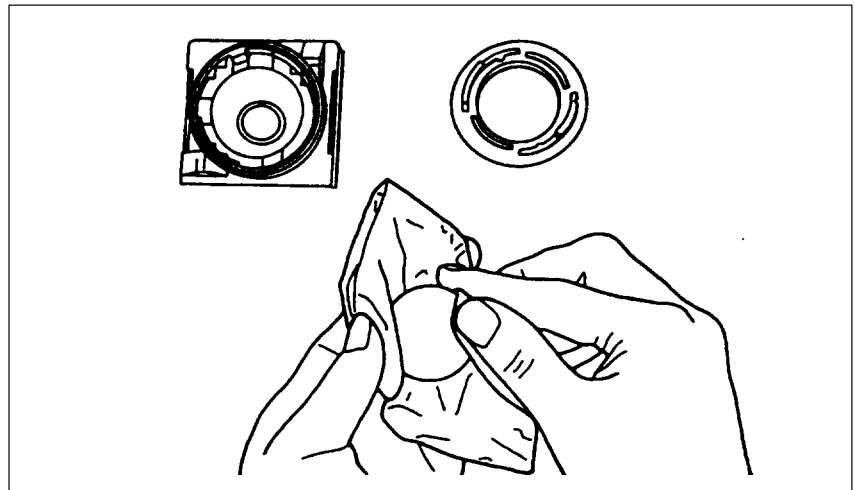


Figure 3-10 Cleaning the Trackball

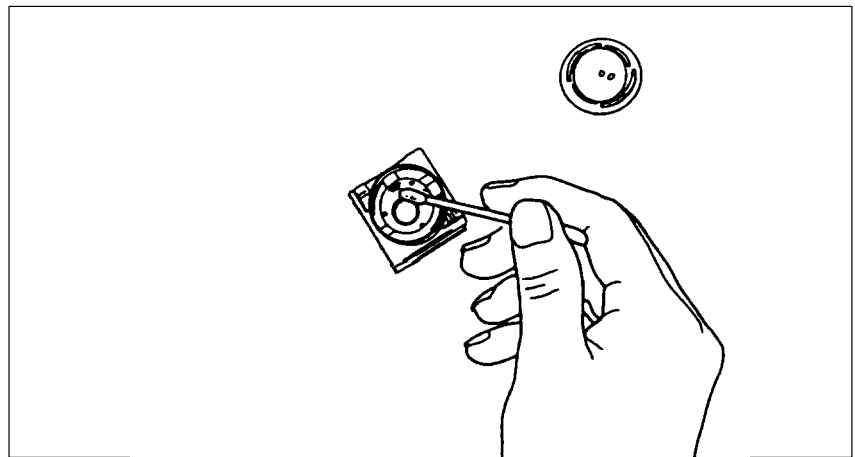


Figure 3-11 Cleaning the Trackball Housing

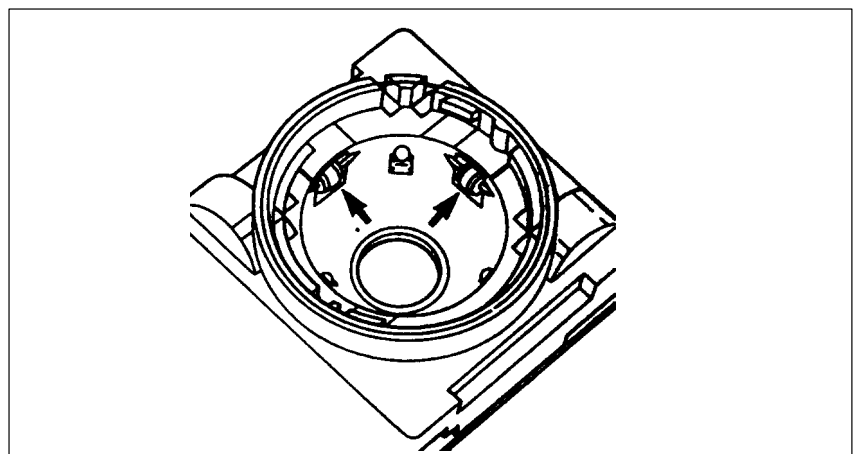


Figure 3-12 Cleaning the Rollers

3.5 Drives

Drive Types

The PG 720 is equipped with the following drives as standard:

Table 3-5 Standard Drives

Type of Drive	Format	Capacity
Floppy (diskette) drive	3.5 inch	1.44 Mbytes
Hard disk drive	2.5 inch	See Product Bulletin

Floppy Disk Drive

Using the floppy disk drive, you can save programs and data on diskettes and load them on the PG 720.

Types of Diskette

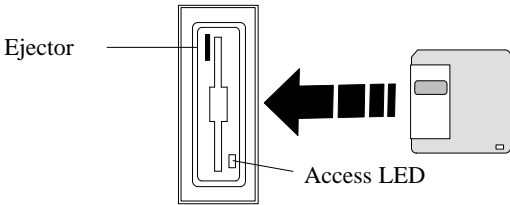
You can use the following diskettes:

Table 3-6 Types of Diskette

Double-Sided High-Density Diskette	Double-Sided Double-Density Diskette
3.5 inch	3.5 inch
1.44 Mbytes (135 TPI)	720 Kbytes
80 tracks per side	80 tracks per side

Handling Diskettes

You insert diskettes into the drive as shown below:



The access LED for the floppy disk drive lights up on the front of the device when the diskette is being accessed.



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 panel of the PG 720 has gone out.

Hard Disk Drive

You can use a number of different hard disk drives in your PG 720. The memory capacity of the particular type of hard disk can be found in the Product Information Bulletin and SETUP program.

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.

After the operating system has been shut down, wait approximately 5 seconds before switching the device off. This allows the disk to come to a complete stop and ensures optimal protection.

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.

CD-ROM Drive

The CD-ROM drive enables you to read CDs. The drive is operated as a slave parallel to the hard disk drive via the secondary IDE interface.



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.

Self-Test

Whenever the PG 720 is switched on or reset, the hard disk drive runs through a self-test which is repeated during operation.

3.6 CD-ROM Drive

Overview You can use the CD-ROM drive to display information contained on CDs on the PG 720. The CD-ROM drive is installed at the back of the PG 720. It is operated on the same port as the hard disk drive.

Opening the Drawer Swing the PG 720 into a horizontal position. The CD-ROM drive is now on the underside of the programming device. Switch the device on. By briefly pressing the eject button, the drawer springs out slightly. Now pull the drawer out until it clicks into position.

Inserting / Removing CDs When you first open the CD-ROM drive, you will find a film sheet in the drawer, to protect the drive during transport. Remove this sheet. 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.

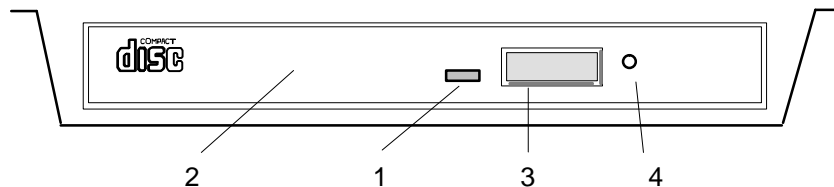
Closing the Drawer Push in the drawer until it closes completely. Do **not** press the eject button.

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.

CD-ROM Front



- 1 Access display
This display lights up when data are being read.
- 2 Drawer
This drawer can be opened and closed by hand.
The CD is inserted here.
- 3 Eject button
This button unlocks the drawer (2) for opening.
- 4 Emergency eject hole

3.7 External Power Unit and Battery

External Power Unit

The external power unit is used to supply the PG 720 with power when it is being operated with 115 V or 230 V mains supplies. The voltage range is set automatically. In mains power supply operation, the integrated battery is charged at the same time. The connecting cable to the PG 720 has an external power supply unit. For connection to the power system, the external power supply unit has a connector for non-heating appliances.

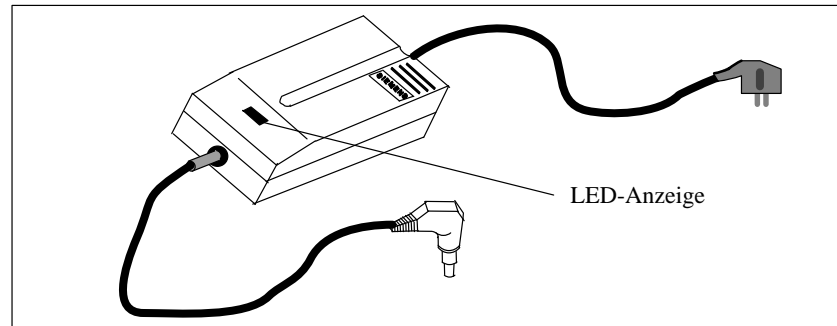


Figure 3-13 External Power Supply Unit



Caution

Danger of overheating!

The external power supply unit can be damaged if it is covered.

Battery

The PG 720 has an integrated NiMH (nickel metal hydride) rechargeable battery. This makes the device portable, meaning you can use it without the external power supply. The battery also prevents data loss occurring on power failure.

Once the external power supply unit is connected, the battery is charged. The following conditions are important:

- When charging, the battery temperature must be between + 5° C and + 40° C (40° F and 100° F).
- When the device is switched off, charging takes approximately 2 hours (fast charging).
- When the device is switched on, charging takes approximately 6 hours (reduced charging current).
- Charging stops as soon as the battery is fully charged.
- In storage, a fully charged battery runs down in approximately 2 months. It must then be recharged.

Note

Whenever possible, avoid running down the battery too far. Switch off the unit when it is not in use and remove the battery connector if it will not be used for some time (weeks).

Before the battery is completely discharged, the red power LED lights up and a warning signal is heard (see also Section 4.2).

4

Installing and Operating the PG 720

What Does This Chapter Contain?

This chapter describes what you have to do to set up your PG 720 correctly for operation. This includes:

- The basic steps for commissioning your PG 720
- Working in the battery mode and changing the battery
- Working with memory submodules and cards for the programmable logic controllers
- Connecting your PG 720 to other devices.

Chapter Overview

Section	Contents	Page
4.1	Connecting the PG 720 to the Power Supply	4-2
4.2	Battery Operation	4-3
4.3	Connecting I/O Devices	4-5
4.4	Working with SIMATIC S5 Memory Submodules	4-9
4.5	Working with SIMATIC Memory Cards	4-11
4.6	Working with PCMCIA Cards	4-12
4.7	Connecting the PG 720 to other SIMATIC S5 Units	4-13
4.8	Connecting the PG 720 to a SIMATIC S7 Network (MPI/DP)	4-17
4.9	Networking the PG 720 with Other Stations on PROFIBUS	4-19
4.10	Networking the PG 720 and Other Computers on Industrial Ethernet	4-20

4.1 Connecting the PG 720 to the Power Supply

Connecting to the Power Supply

You can operate the PG 720 on 115 V and 230 V power systems using the external power supply unit. The voltage is selected automatically.

1. Plug the power supply cable supplied with the unit into the connector on the external power supply unit.
2. Connect the power cable to a socket outlet with a grounded protective conductor.
3. Connect the low voltage connector to the connection for the external power supply on the unit. The power supply cable to the PG 720 is integrated in the external power supply unit.
4. The device is now ready for power supply operation and the battery will be charged if required.

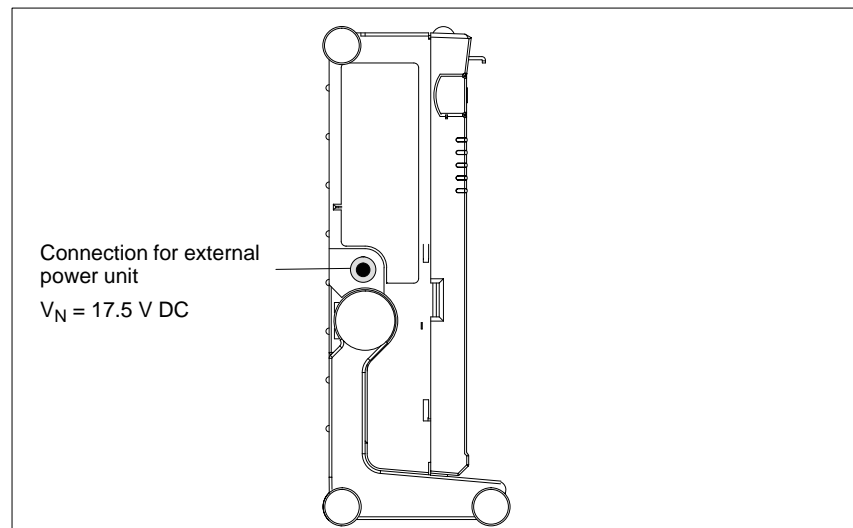


Figure 4-1 Power Supply Connection

Note

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

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

The external power supply unit is intended for operation with grounded power supply systems (TN networks according to IEC 364-3).

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

4.2 Battery Operation

Battery Operation

If no external power supply unit is connected, you can operate the PG 720 using the integrated battery.

1. Switch on the device. Make sure that the battery is sufficiently charged before you start work. The power LED is lit green as long as the battery is sufficiently charged.
2. Work as normal with your PG 720.
3. As soon as the power LED lights up red in battery operation, this indicates that the battery is almost run down. Stop working and save your data.

Note

You should only begin working in the battery mode when the battery is completely charged. Only then can you be sure that the full operating time is available and that the battery running down will be indicated in good time. The battery is fully charged when the power LED changes from charging (orange) to charged (green) after switching on with the unit connected to the mains power supply.

When you first start up, the battery may be partly or completely discharged (for example, self-discharge). Connect the programming device to the power supply using the power supply unit to charge the battery.

As soon as the device is connected to the external power supply, the connected battery will be immediately recharged if it has been discharged. If the device is switched off, this will take approximately 2 hours (fast charging); if the device is switched on, the charging will take approximately 6 hours with reduced charging current.

Replacing the Battery

You can replace a discharged or faulty battery with a fully charged spare battery (for order number, see Product Information Bulletin) as follows:

1. Switch off the device.
2. Pull out the support from the stand and open out the extra support hoop.
3. Tilt the unit through approximately 90°.
4. Open the battery cover on the base of the device by pushing it down.
5. Disconnect the battery connections and remove the battery.
6. Insert the new battery and connect it.
7. Close the cover.

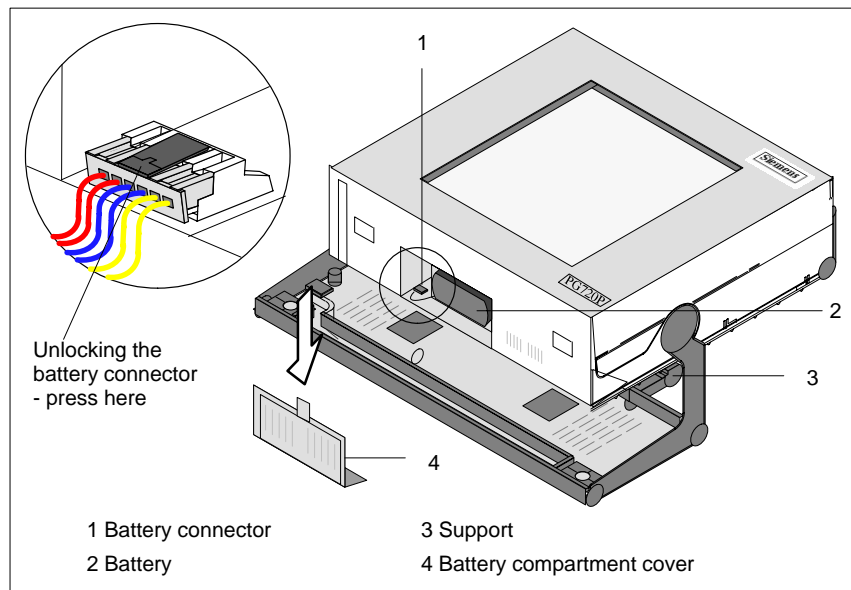


Figure 4-2 Changing the Battery

Note

Whenever possible, avoid running down the battery to a low level. Switch off the device after use. If the device will not be used for some time (for example, several weeks), you should remove the battery connector. The battery then has no connection to the device and in this way can be optimally saved for future use.

Disposal of Used Batteries

Nickel-metal hydride batteries can be recycled. Their components can be used as raw materials for new batteries or other products. Effective recycling of batteries is only possible when the used batteries are collected according to type.

Note

Observe the local regulations for disposal of materials.

4.3 Connecting I/O Devices

Recommended Printers

Siemens printers with a parallel interface and IBM character set are recommended for use with the PG 720 programming device.

Connecting the Printer to the Parallel Port

To connect your printer, proceed as follows:

1. Switch off the PG 720 and the printer.
2. Open the cover to the interface ports on the left-hand side panel.
3. Plug the printer cable into the LPT1 parallel port.
4. Connect the printer cable to the printer.
5. Screw the connector tight at the interface port.

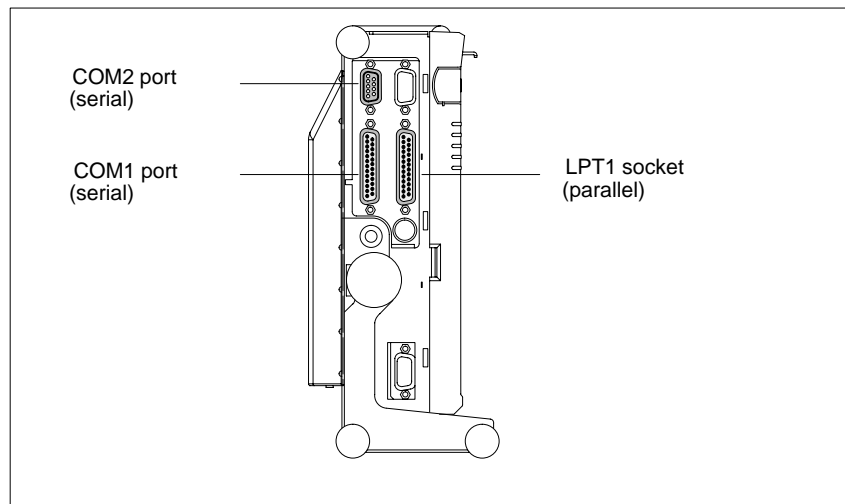


Figure 4-3 The Printer Ports



Caution

Risk of damage to the unit!

Switch the unit off before connecting the parallel printer to the LPT 1 port (the printer should also be switched off).

Make sure that you use the correct port. If you use the wrong port or wrong connecting cables, the port may be damaged.

Before plugging in the cables, the electrostatic charge of your body, the unit, and the cables must be equalized. To do this, touch the mounting plate for the ports on the left-hand side of the unit.

Only use original connecting cables.

Connecting the Printer to the Serial Port

You can also connect your printer to the PG 720 using a serial COM port. You will find information on how to adapt and set your interface and which connecting cable you require in the description of your printer.

Recommended Monitors

You connect external multisynchronous monitors using the standard VGA connector on the left-hand panel side of the unit. We recommend that you use a Siemens monitor.

Connecting Monitors

You must switch the PG 720 off before connecting the monitor cable. You will find further information about the connector pinout in Chapter 8.

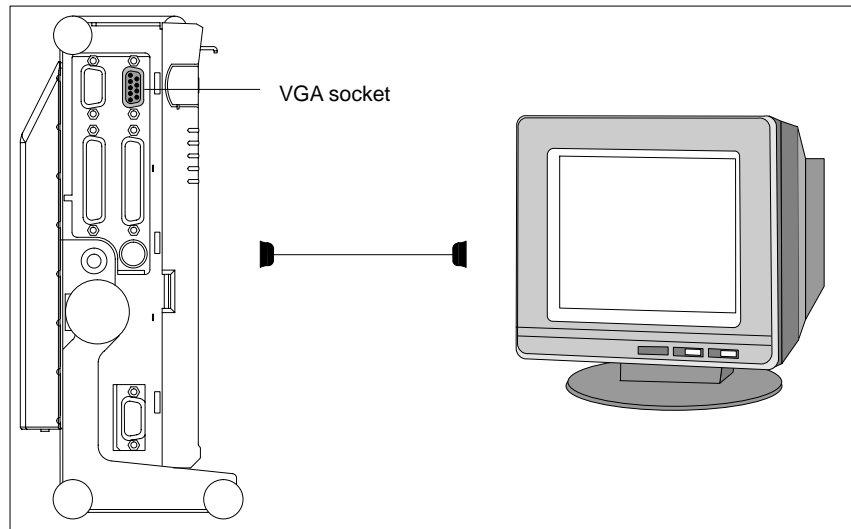


Figure 4-4 Connecting the Monitor

To connect the monitor, proceed as follows:

1. Switch off the PG 720 and the monitor.
2. Open the port cover on the left-hand side panel.
3. Plug the monitor cable into the VGA socket connector.
4. Secure the connector with the screws.
5. Plug the other end of the monitor cable into the monitor.
6. Switch on the PG 720 and the monitor.
7. Make the necessary changes in the SETUP program (menu "SIEMENS PG 720 Hardware Control", CRT/LCD selection: "Simultaneous" or with high resolutions "CRT").



Caution

Danger of damaging the monitor!

If you want to set higher clock frequencies and resolutions, first make sure that the monitor you are using is suitable for a higher clock frequency and resolution.

If the clock frequency is too high, this can cause damage to the monitor.

Using a Mouse

You can connect both a PS/2 and a serial mouse to the PG 720. When the PG 720 is supplied, the mouse driver for the trackball and PS/2 mouse is 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.

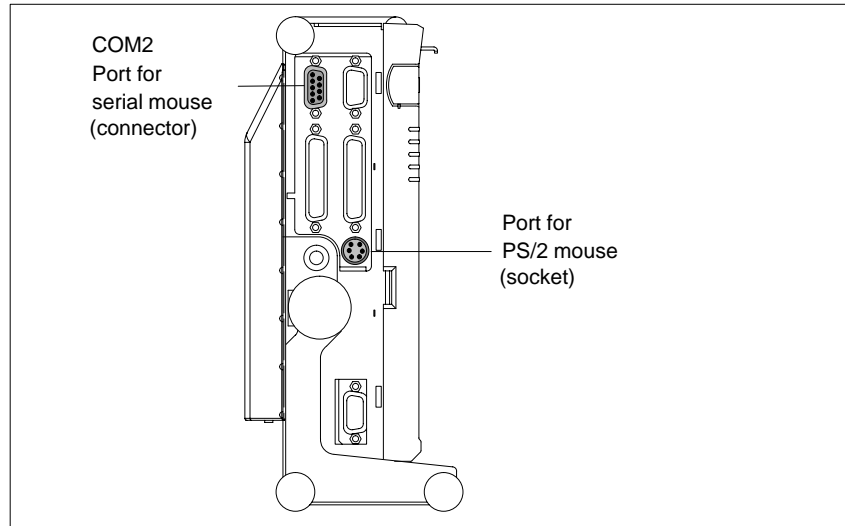


Figure 4-5 Connecting a PS/2 Mouse

To connect the mouse, proceed as follows:

1. Switch off your device.
2. Open the port cover on the left-hand side panel.
3. Plug the cable of the PS/2 mouse or another external pointing device into the mouse connector.
4. Secure the connector with the screws.
5. Switch on your PG 720 again.

Switching between Internal Trackball and External PS/2 Mouse

Once you have plugged in the external mouse and restarted your PG 720, the internal trackball is deactivated and remains inactive until the PG 720 is powered up again without the external mouse.

Table 4-1 Trackball/External Mouse Mode

State	Internal Trackball	External PS/2 Mouse
No mouse	Active	
External mouse connected	Deactivated	Active

Connecting a Serial Mouse

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

1. Switch off your device.
2. Open the cover of the interface ports on the left-hand side panel.
3. Plug the serial mouse into the mouse connector labeled COM2.
4. Secure the connector with the screws.
5. Switch on your PG 720 again.

Choosing Another Keyboard

You can connect another PS/2-type keyboard to your PG 720 instead of the one supplied with it.

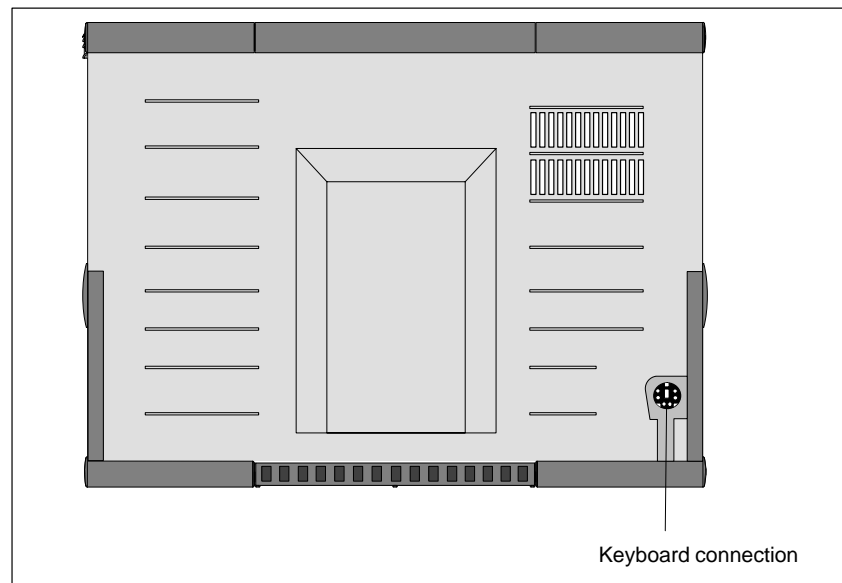


Figure 4-6 Connecting a PS/2 Keyboard

Connecting a PS/2 Keyboard

To connect the keyboard, proceed as follows:

1. Switch off your device.
2. Unplug the keyboard connector from the base of the unit.
3. Plug in the PS/2-type keyboard connector.

Note

It is advisable to use a keyboard cable with an angled connector, so that the connector does not extend beyond the back panel.

The keyboard cable must be inserted in the cable conduit on the back panel of the unit, otherwise the connector can work loose when the device is tilted.

4.4 Working with SIMATIC S5 Memory Submodules

Working with SIMATIC S5 Submodules

You can read and program SIMATIC S5 EPROMs and EEPROMs using the 48-pin S5 EPROM and EEPROM programming port. You will find information about using the programming software in the STEP 5 User Manual.

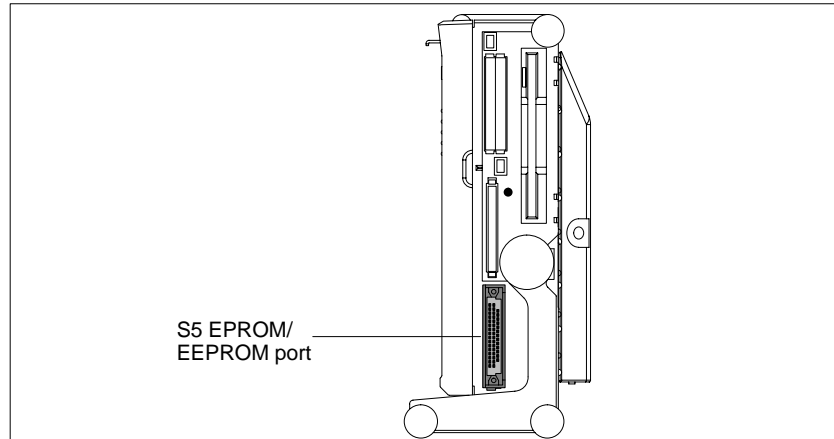


Figure 4-7 S5 Submodule (EPROM/EEPROM) Programming Port

Proceed as follows when working with the S5 submodule programming ports:

1. Switch on your device.
2. Start the EPROM function in your STEP 5 software (version V 6.x).
3. Plug the S5 memory submodule into the 48-pin programming port.
4. Read, program, or erase (EEPROMs only) your S5 memory submodule with the EPROM programming package of your STEP 5 software.
5. Remove the S5 memory submodule.
6. Terminate the EPROM programming package of your STEP 5 software.

Note

Only program SIMATIC S5 submodules when you are operating the device using the power supply system (the external power supply unit must be plugged in). Only then can you be sure that programming will not be interrupted by a power outage if the battery is low.



Caution

Risk of damage to EPROMs or EEPROMs!

If you insert or remove the EPROM or EEPROM while it is in use, there is a danger that it will be damaged.

You must not remove the S5 EPROM or EEPROM while the LED indicating that the EPROM or EEPROM is being read etc. is lit. You **cannot** work simultaneously with S5 memory submodules and memory cards.

Before inserting or removing S5 EPROMs or EEPROMs, you must equalize the static charge on your body with the potential on the unit. You can do this by briefly touching the metal mounting plate of the ports on the left-hand side panel of the unit.

4.5 Working with SIMATIC Memory Cards

Working with SIMATIC Memory Cards

SIMATIC memory cards can be read, programmed, and erased using the 68-pin connector. SIMATIC memory cards are available for SIMATIC S5 and SIMATIC S7 software.

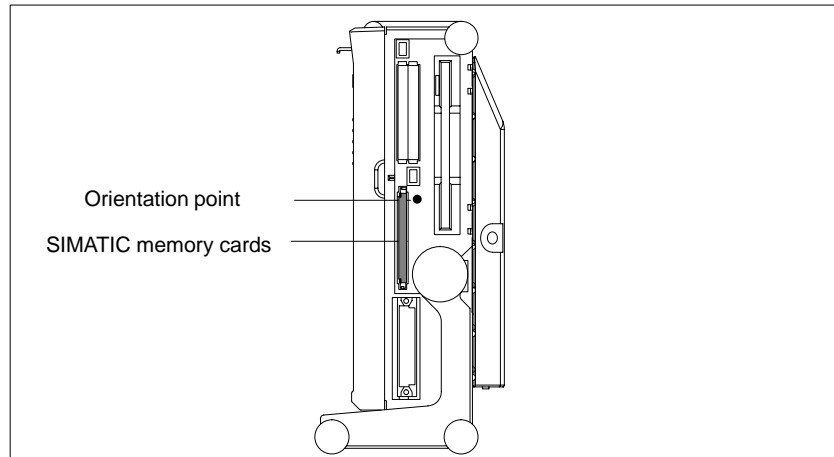


Figure 4-8 Slot for SIMATIC Memory Cards

Proceed as follows when working with SIMATIC memory cards:

1. Switch on your device.
2. Start your SIMATIC programming function.
3. Plug the SIMATIC memory card into the 68-pin connector.
4. Read, program, or erase the memory card with the programming function of your SIMATIC programming software.
5. Terminate the programming function of your SIMATIC software.
6. Remove the SIMATIC memory card from the programming port for further use in a programmable logic controller.



Caution

Risk of damage to memory cards and the PG 720!

You must insert the memory card into the 68-pin connector with the type label pointing to the rear of the unit. Make sure that the orientation point beside the slot matches the point on the card.

If you attempt to plug in the memory card the wrong way round, you may damage your PG 720 or memory card.

You must not remove the memory card while the LED indicating that the card is being read etc. is lit. You **cannot** work simultaneously with S5 memory submodules and memory cards.

4.6 Working with PCMCIA Cards

PCMCIA Cards

The PG 720 has two PCMCIA interface ports. You can plug communication modules for MODEM, FAX-MODEM, ISDN, token ring, ETHERNET, memory expansion, and SCSI interface modules in credit-card format into this port. Either two cards of type II or one card of type III can be plugged in.

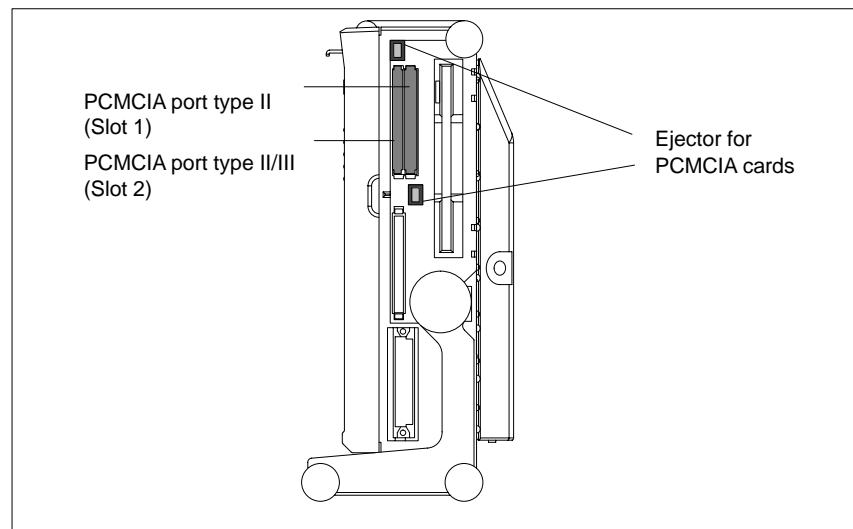


Figure 4-9 PCMCIA Port



Caution

Risk of damage to the PCMCIA cards and the PG 720!

You must insert the PCMCIA card with the front side pointing the rear of your PG 720. This side is generally labeled with a company or product designation and the wording “this side up” or words to that effect.

If you attempt to insert the PCMCIA card the wrong way round, you may damage your PG 720 and the PCMCIA card.

Note

PCMCIA cards must not be used along with a SIMATIC S5 memory submodule or a SIMATIC memory card. Read the notes in your Product Information Bulletin.

4.7 Connecting the PG 720 to other SIMATIC S5 Units

Point-To-Point Connection

In this section, you will learn how to connect your PG 720 to a programming device or S5 programmable logic controller using a point-to-point connection.

You can establish a point-to-point connection by connecting the PG 720 to another programming device or a programmable logic controller using

- An RS-232 connection
- A TTY connection

Configuring Interfaces with Line Current (TTY, 20 mA)

To ensure reliable data transfer, several factors must be taken into account.

Rules

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

- Use a shielded cable with a low line resistance ($130 \Omega / \text{km}$) (about $40 \Omega / \text{kft}$) and low capacitance ($< 90 \text{ pF/m}$) (about 27 pF/ft). Twisted-pair cables are less susceptible to noise and interference. A low line resistance results in reduced voltage excursions and shorter charge reversal times. The line resistance 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 run together. Signal lines must be installed as far away as possible from sources of strong interference (for example, 400 V 3-phase power cables).
- The active TTY interface with a 12 V no-load voltage has been tested on a 100 m (1100 ft) long cable at a transmission rate of 9600 bps in an environment with normal levels of noise (field strength $< 3 \text{ V/m}$ or 1 V/ft). If a shielded LiYCY 5 x 1 x 0.14 shielded cable is used, reliable transmission is possible over a distance of up to 100 m (1100 ft). The AS511 protocol (only one transmitter at a time) was used for testing.

Note

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

Connecting the PG 720 to S5 Programmable Controllers

You can connect the PG 720 to a SIMATIC S5 programmable logic controller using the COM1/TTY interface port. The cable for connecting to SIMATIC S5 CPUs is supplied with the PG 720 (Order no.: 6ES5734-2BD20).

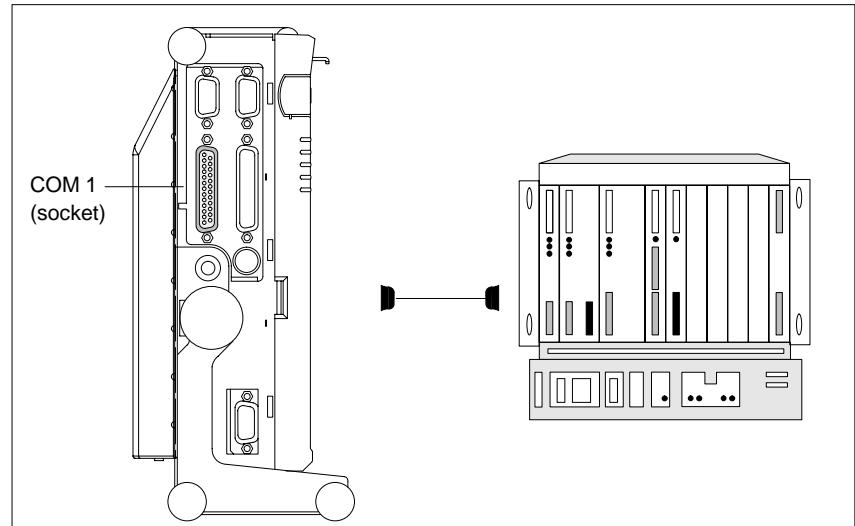


Figure 4-10 Connecting the PG 720 to an S5 Programmable Logic Controller

You connect your PG 720 to a SIMATIC S5 programmable logic controller as follows:

1. Switch off your device.
2. Open the cover of the interface ports on the left-hand side panel.
3. Plug the cable into the COM1/RS-232 modem/PLC interface port.
4. Secure the connector with screws.
5. Plug the cable into the corresponding port on the CPU of the programmable logic controller.



Caution

Risk of damage to the PG 720!

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

Make sure that the TTY cable of the PG 720 is plugged into the COM1/TTY port and not into the LPT1 port.

Before plugging the cable in, the static charge on your body, the unit, and the connecting cables must be equalized. You can do this by briefly touching the metal mounting plate for the interfaces on the left-hand side panel of the device.

Only use original cables to connect the programmable logic controller.

Connecting the PG 720 Using an Adapter

The connecting cable 6ES5 734-2BD20 is supplied with the PG 720. An adapter is available for connecting the programmable logic controller using older standard cables.

Table 4-2 Adapter for the PG 720 Connecting Cable

Port	Connection	Connecting Cable Order No.	Adapter
COM1 as TTY interface	PG 720 with SIMATIC S5 programmable logic controller	6ES5 734-2BD20	
		6ES5 731-1xxx0 15-pin	6ES5 731-6AG00
		6ES5 731-0xxx0 25-pin	6ES5 731-6AG00

To allow a data transfer rate of 9600 bps up to a distance of 100 m (1100 ft), the receiving diode is connected to ground (reference) via the connecting cable.

Note

Cables of various lengths are available under Order No. 6ES5 734-2xxx0 (xxx stands for the length in meters).

Connecting the PG 720 to Other Programming Devices (RS-232, TTY)

If you want to connect your PG 720 to another programming device, you can plug the appropriate connecting cable into the RS-232 or TTY interface port. You will find more detailed information about the connecting cables listed below in Chapter 8.

Table 4-3 Connecting the PG 720 to Other Programming Devices

Port	Connection	Connecting cable Order No:	Adapter
COM1 as RS-232 interface	PG 7xx with PG 7xx	6ES5 733-5BD20	
COM1 as 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 round (see Figure 4-11).

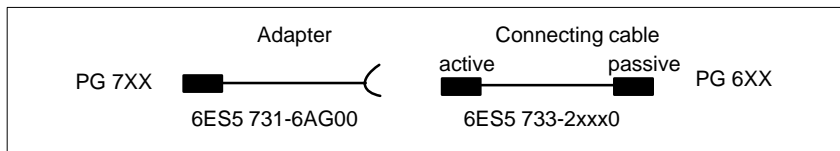


Figure 4-11 Direction of Connection: Adapter-Connecting Cable

Note

If you connect two programming devices using the TTY interface, you must deactivate the TTY interface (COM1) on one of the devices by changing the jumper settings. When supplied, this interface is always active.

**Activating/
Deactivating the
PG 720**

When your PG 720 is supplied, the COM1 (TTY) serial port is active (20 mA current loop). When you connect two programming devices using the COM1 (TTY) serial port, you must deactivate the port on one of these devices. The PG 720 has jumpers on the mother board for this purpose.

These jumpers are accessible if you open the battery compartment cover.

Jumper Settings

Change the jumper settings as shown in Figure 4-12.

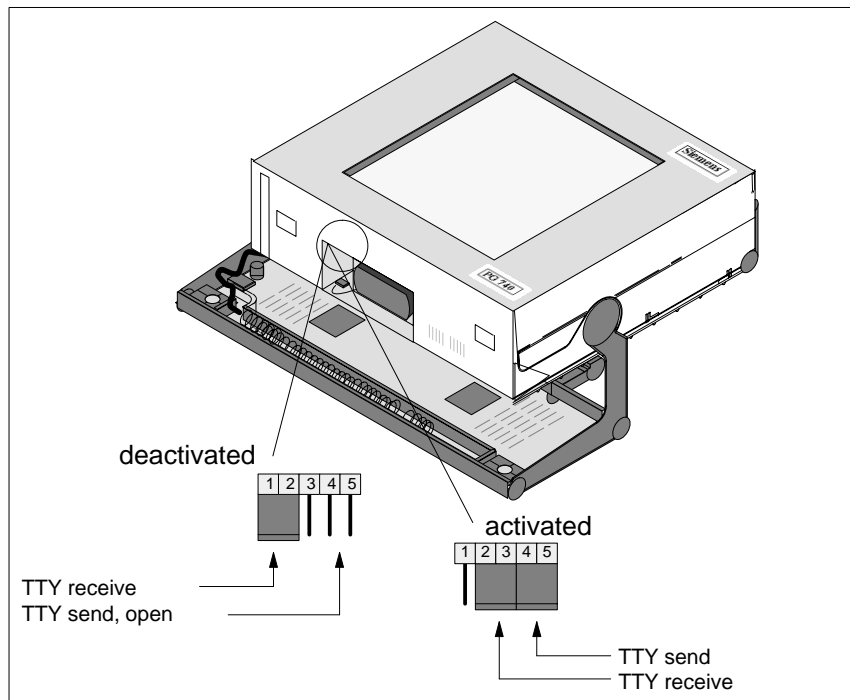


Figure 4-12 Activating/Deactivating the TTY Port Using Jumpers

**Changing the
Jumper Setting**

Proceed as follows to deactivate the port on the PG 720:

1. Switch off your device.
2. Adjust the position of the PG 720 so that it is horizontal.
3. Open the battery compartment cover.
4. Remove jumpers 2-3 and 4-5 at the top left beside the battery.
5. Insert the jumper in slot 1-2 (see Figure 4-12).
6. Close the battery compartment cover.

4.8 Connecting the PG 720 to a SIMATIC S7 Network (MPI/DP)

Connecting an S7 Programmable Controller via an MPI/DP Interface

You can connect your PG 720 to a SIMATIC S7 programmable logic controller using the floating MPI/DP interface. The MPI cable for connection to SIMATIC S7 CPUs is supplied with the PG 720. (Order No.: 6ES7901-0BF00-0AA0)

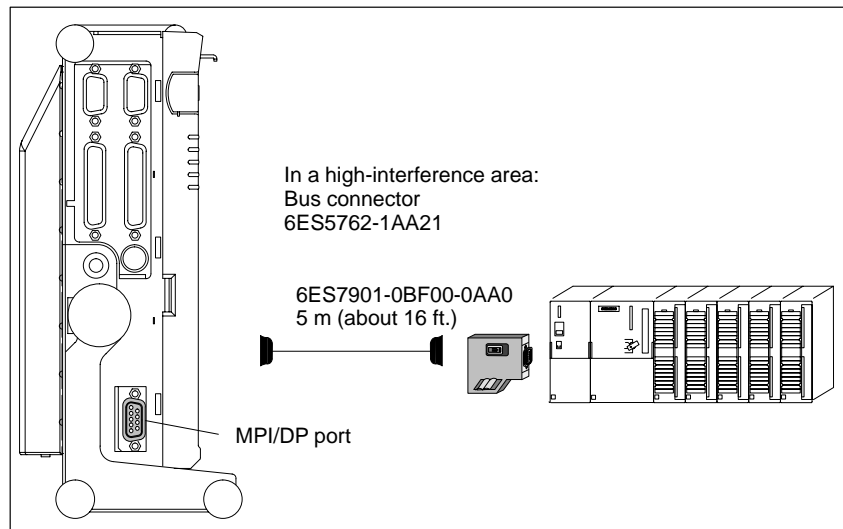


Figure 4-13 Connection Using the MPI/DP Interface

Proceed as follows when connecting to a SIMATIC S7 programmable logic controller:

1. Switch off your device.
2. Open the interface cover on the left-hand side panel of the device.
3. Connect the cable to the MPI/DP interface.



Caution

Risk of damage to the PG 720!

Before plugging in the cables, the static charge on your body, the unit, and the cables must be equalized. You can do this by briefly touching the metal mounting plate for the interfaces on the left-hand side panel.

Connecting

Via the MPI/DP interface, you can connect your programming devices to

- MPI networks (S7-200, S7-300, and S7-400) or
- PROFIBUS DP networks (DP components).

The supplied MPI cable can be used for connection to MPI networks with transmission rates up to 187.5 Kbps.

**MPI/PROFIBUS DP
Network**

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

Several MPI/PROFIBUS DP network segments can be connected via repeaters. The complete MPI/PROFIBUS DP network can comprise up to 127 stations. The data transmission rate in the MPI network is 187.5 Kbps. Data transmission rates from 9.6 Kbps to 1.5 Mbps are possible in the PROFIBUS DP via the MPI/DP interface.

Note

You can find information on setting up an MPI/DP network in the manual “S7-300 Programmable Controller, Hardware and Installation”, Order No.: 6ES 7398-8AA01-8BA0.

4.9 Networking the PG 720 with Other Stations on PROFIBUS

Networking the PG 720 on PROFIBUS

PROFIBUS is an open and robust bus system for industrial use. It can be used to configure networks with up to 32 stations per segment. The data transfer rate for PROFIBUS is 1.5 Mbps.

How the Network Functions

The network operates on the master-slave principle with token passing (complying with DIN19245, 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 Requirements

Using the following components, for example, you can connect or network the PG 720 with PROFIBUS:

- PCMCIA interface module
- RS485 interface (adapter for PCMCIA)
- Shielded, twisted pair (bus cable or connecting cable to network).

Note

You will find more detailed information about the SINEC modules in the SIMATIC NET Catalog IK 10.

For information about installing the modules and making modifications to the network configuration, please refer to the installation instructions for the appropriate modules.

Make absolutely sure that you do not use interrupt 12, since this interrupt is assigned to the integrated trackball.

4.10 Networking the PG 720 and Other Computers on Industrial Ethernet

Networking the PG 720 on Industrial Ethernet

Industrial Ethernet is a bus system for industrial use based on ETHERNET (ISO 8802/3). The main features of Industrial Ethernet are speed (10 Mbps), simple expansion, open communication, and widespread application.

How the Network Functions

Industrial Ethernet is the name of Siemens networks and network components operating according to the CSMA / CD (ETHERNET) principle. Industrial Ethernet is a bus-type LAN that uses a triaxial cable (H1) as its transmission medium.

Hardware Requirements

To connect or network the PG 720 with Industrial Ethernet, a PCMCIA-ETHERNET interface module is required.

Note

You will find more detailed information about the SINEC modules in the SIMATIC NET Catalog IK 10.

For information about installing the modules and making modifications to the network configuration, please refer to the installation instructions for the appropriate modules.

5

PG 720 Expansions

What Does This Chapter Contain?

You can enhance the performance of your PG 720 by adding additional memory. This chapter describes how to expand your PG 720. Please observe the relevant safety guidelines.

Chapter Overview

Section	Contents	Page
5.1	Opening the Unit	5-2
5.2	Components Visible After Opening the Unit	5-4
5.3	Switch Setting / Jumper	5-6
5.4	Installing Memory Expansion Modules	5-7
5.5	Replacing the Backup Battery	5-9
5.6	Closing the Unit	5-10

5.1 Opening the Unit

Prerequisites

The device is designed for easy maintenance so that any work that is necessary can be done quickly and at low cost.



Caution

The electronic components on the printed circuit boards are extremely sensitive to electrostatic discharge. Certain precautionary measures are therefore necessary when handling such components. These measures are explained in the guidelines for handling electrostatically-sensitive devices at the end of this manual.

Limitation of Liability

All technical specifications and licences apply only to expansion functions approved by SIEMENS.

No liability can be accepted for impairment of functions caused by the use of devices and components of other manufacturers.

All the modules and components in the PG 720 are electrostatically sensitive. Please read the ESD guidelines at the end of this book carefully. The following symbol warns that electrostatically-sensitive modules are present.



Before Opening the Unit

Note the following rules before opening the unit:

- Before you disconnect the power supply cable, discharge any electrostatic charge on your body. You can do this by touching the metal mounting plate for the interfaces on the left-hand side panel of the unit.
- 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 720 from its power supply and remove the battery 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.
- Never operate the PG 720 with the cover open.

Tools

Use a screwdriver to open the unit.

**Opening the
PG 720**

To open your PG 720, proceed as follows:

1. Switch off the PG 720, pull out the power supply connector, and remove all connecting cables from the unit, including the keyboard cable.
2. Lower the keyboard and detach it.
3. Incline the unit to 90°. To stabilize the unit, pull out the extra support and the fold-down bracket.
4. Open the cover of the battery compartment and disconnect the battery.
5. Push in the snap catches at the bottom with a small screwdriver.
6. Open the front section and lift it out of the main casing.
7. Remove the CD-ROM ribbon cable from the drive connector on the backplane.
8. Lay the front section with the display on a soft, flat surface.

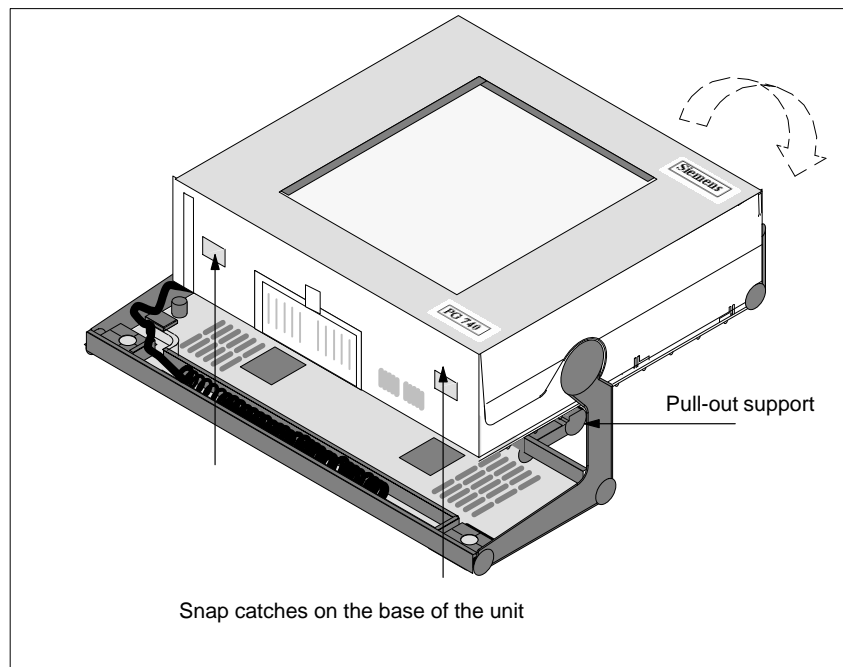


Figure 5-1 PG 720 Prepared for Opening

5.2 Components Visible After Opening the Unit

Components

Once you have removed the top cover of your unit, the components are visible.

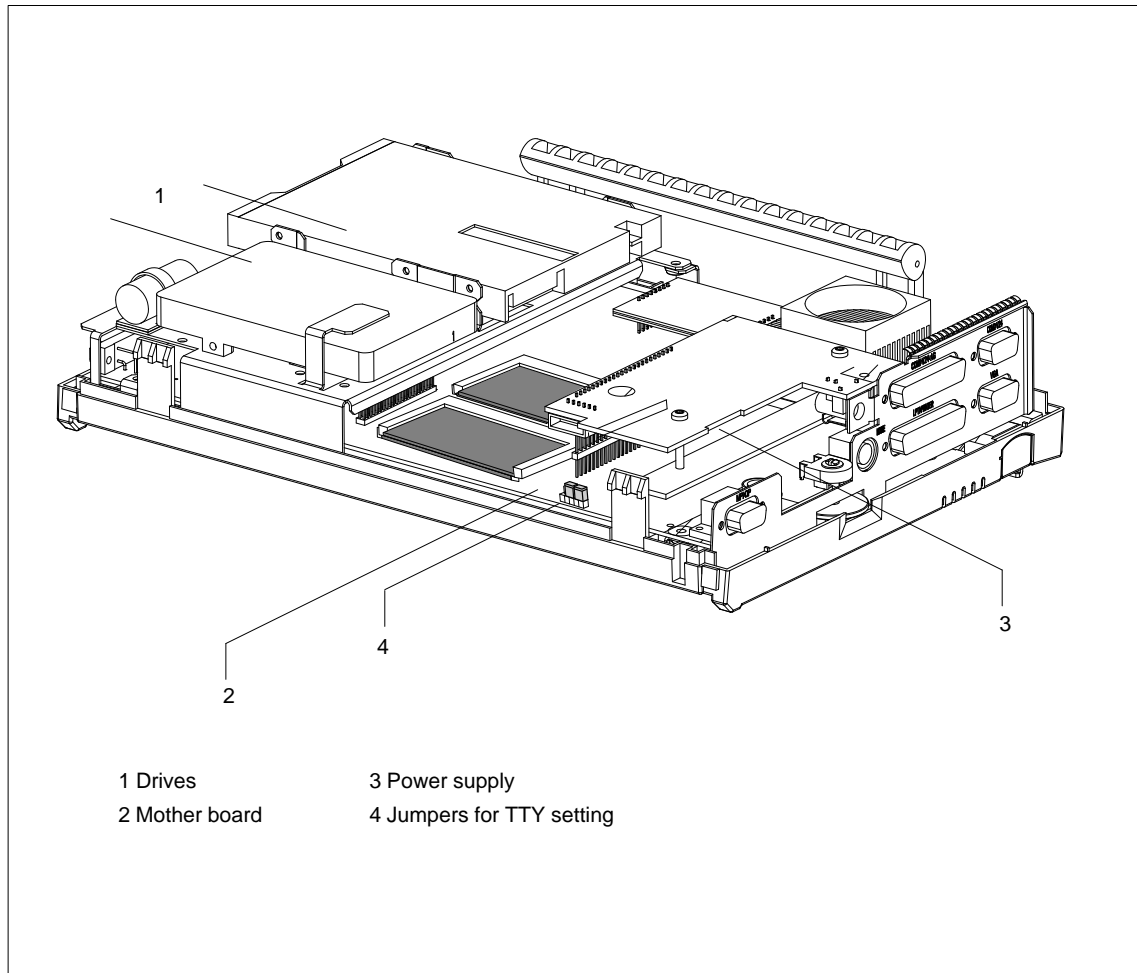


Figure 5-2 PG 720 Opened

Mother Board

The mother board is the heart of the PG 720. Here, data are processed and stored, and interfaces and device I/Os controlled and managed.

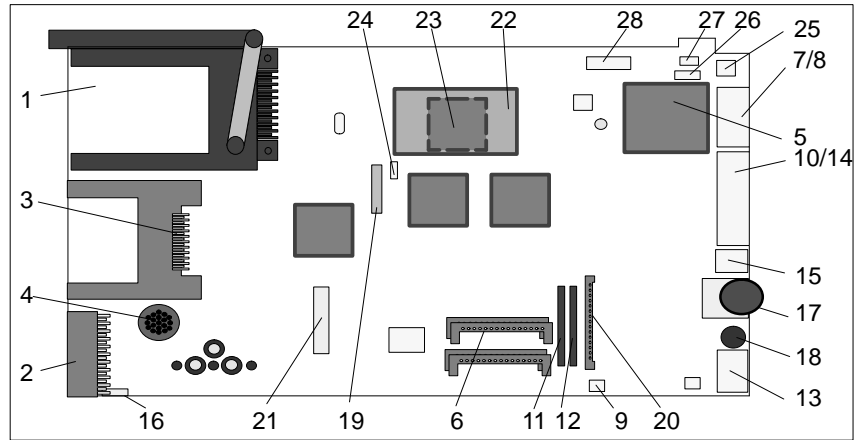


Figure 5-3 Mother Board

Components on the Mother Board

The following components are located on the mother board of the PG 720:

Table 5-1 Components of the Mother Board

No.	Function
1	PCMCIA slots
2	S5 submodule port
3	Memory card port
4	Loudspeaker
5	CPU on base with cooling unit
6	System memory, slot 0, slot 1, slot 2, slot 3
7	External VGA connection
8	COM2 serial port
9	TTY jumpers (X30)
10	COM1/TTY serial port
11	TTY receiver
12	TTY transmitter
13	MPI port
14	LPT1 parallel port
15	PS/2 mouse connection
16	Battery connector
17	Contrast
18	Keyboard and trackball connection
19	Floppy disk drive connection
20	Power supply connection (from DC converter)
21	IDE Winchester connector and CD-ROM
22	Voltage transformer for CPU, installed
23	Jumper on base of transformer
24	Clock setting (switch S1)
25	Connector for processor ventilator
26	Connector for switch
27	Connector for display unit
28	Connector for display

5.3 Switch Setting / Jumper

Clock Setting (Switch S1)

CPU-Cuore Frequency (CPU-Internal)	CPU Bus Frequency	S1/1	S1/2	S1/3	S1/4
233 MHz	66 MHz *	ON *	OFF *	OFF *	OFF *
200 MHz	66 MHz	ON	OFF	OFF	ON
166 MHz	66 MHz	ON	OFF	ON	ON
150 MHz	60 MHz	OFF	OFF	ON	ON
133 MHz	66 MHz	ON	OFF	ON	OFF
120 MHz	60 MHz	OFF	OFF	ON	OFF
100 MHz	60 MHz	OFF	ON	ON	OFF
100 MHz	50 MHz	ON	OFF	OFF	OFF
90 MHz	60 MHz	OFF	OFF	OFF	OFF
75 MHz	50 MHz	OFF	ON	OFF	OFF

* Default setting

The PCI bus frequency is generated asynchronously and is fixed at 33 MHz. The ISA bus frequency is derived from the PCI frequency and is always 8.25 MHz.

TTY Jumpers (x30)

X30	Function
2-3 4-5	Active TTY port (standard setting)
x off	TTY send loop separate from power source (passive setting)
off x	TTY receive loop separate from power source (passive setting)

Jumper Setting

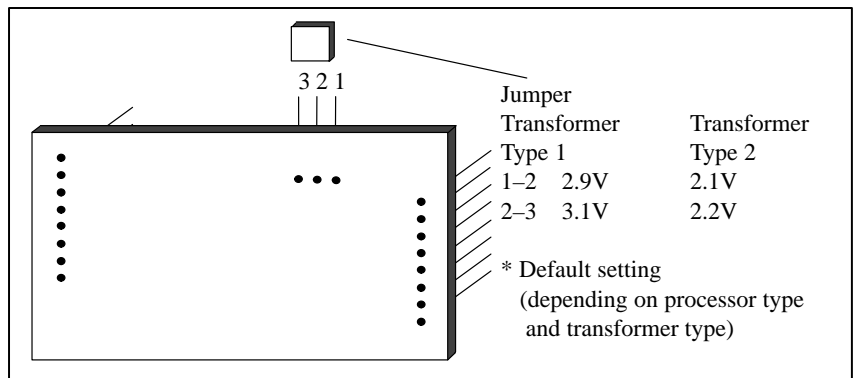


Figure 5-4 Transformer for CPU with Jumpers



Caution

Only special processors are suitable for use in the PG 720. The CPU requires a special supply voltage. The appropriate transformer must be used with the correct jumper setting.

Before upgrading, you are strongly advised to contact the Customer Support team.

5.4 Installing Memory Expansion Modules

Standard Memory

There are four slots on the mother board for DIMM memory submodules. This allows you to expand the memory capacity of your PG 720 to up to 128 MB.

Table 5-2 Slots for Memory Expansion (Double Base)

Memory	Slot 0	Slot 1	Slot 2	Slot 3
32 MB	16 MB	16 MB	–	–
64 MB	16 MB	16 MB	16 MB	16 MB
64 MB	32 MB	32 MB	–	–
96 MB	32 MB	32 MB	16 MB	16 MB
128 MB	32 MB	32 MB	32 MB	32 MB

The memory submodules must always be inserted in pairs (slot 0, 1 or slot 2, 3).

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

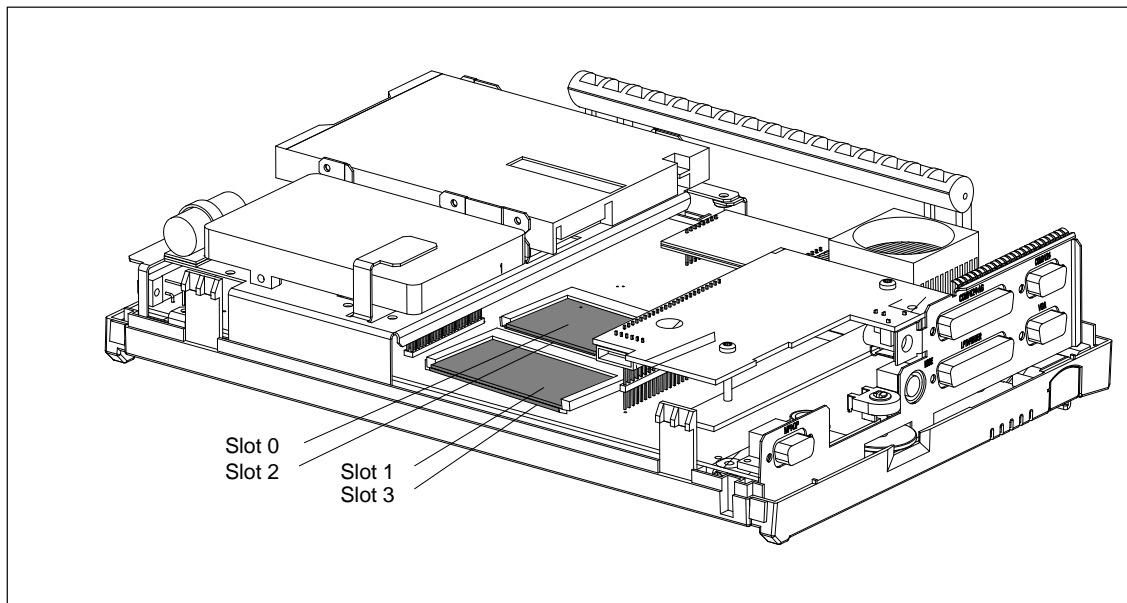


Figure 5-5 Position of the DIMM Memory Submodules



Caution

Risk of damage!

The electronic components of the printed circuit boards are extremely sensitive to electrostatic discharge. Certain precautionary measures are therefore necessary when handling such components. These measures are explained in the guidelines for handling electrostatically-sensitive devices at the end of this manual.

Installing the DIMM Cards

To plug in expansion submodules, proceed as follows:

1. Open the unit as described in Section 5.1.
2. Plug the cards into the slots. Note the safety recess on the connector side of the DIMM card.
3. Push the card down applying light pressure until it locks into place.
4. Close the unit (see Section 5.6).



Caution

Risk of damage!

Make sure that the cards sit securely in the slots, otherwise they can fall out and be damaged.

Installation

The memory configuration is detected automatically. When you switch on the unit, the distribution of base and extended memory is displayed on the screen.

5.5 Replacing the 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 720 is switched off. In addition to the time of day, all the information about the PG 720 (device configuration) is stored in RAM. If the backup battery fails or is removed, all these data are lost.

The clock uses very little power and the lithium battery has a high capacity so that the battery can provide backup power for the real-time clock for many years and seldom needs to be replaced.

Battery Voltage too Low

If the battery voltage is too low, the time of day and the device configuration data in the RAM are lost.

Replacing the Battery

In this case, you must replace the backup battery. The battery is located on the drive mounting.

To change the battery, proceed as follows:

1. Switch off your PG 720 and remove the power cable and all the connecting cables.
2. Open the unit as described in Section 5.1.
3. Now change the battery by removing the connector and releasing it from the clip.
4. Push the new battery firmly into the clip.
5. Close the unit as described in Section 5.6.

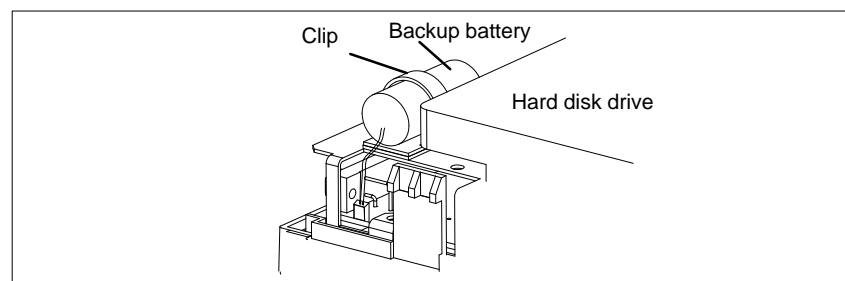


Figure 5-6 Clip for Backup Battery



Caution

Risk of damage!

Only replace the lithium battery with an identical battery or with a type recommended by the manufacturer (Order No.: W79084-E1003-B1).

Dispose of used batteries in keeping with local regulations.

Changing SETUP

After you have changed the battery, you must set the configuration data of your unit again using the SETUP program (see Chapter 6).

5.6 Closing the Unit

Closing the Unit

To close the unit, proceed as follows:

1. Tilt the unit to the horizontal position.
2. Place the front section on the casing at an angle (the guide studs at the top edge must fit into place).
3. Insert the CD-ROM ribbon cable into the drive connector on the backplane.
4. Press the front section onto the lower edge of the casing until the catches in the base engage.
5. Insert the battery into the battery compartment and connect it up.
6. Close the battery cover.
7. Connect the keyboard connector to the back of the unit. Make sure that the cable is inserted in its channel.
8. Insert the keyboard cable in the cable conduit at the base of the device.
9. Allow the keyboard hinge to slide into the receptacles in the base of the device.
10. Tilt the unit back into the operating position.

Your PG 720 is now ready for operation again.

6

Configuring the PG 720

What Does This Chapter Contain?

In this chapter, you will learn how to configure your programming device. You need to do this if you change your system by adding, removing, or exchanging expansion modules and memory expansions, or by replacing a system module.

Chapter Overview

Section	Contents	Page
6.1	Changing the Device Configuration with SETUP	6-2
6.1.1	The Main Menu	6-5
6.1.2	The Advanced Menu	6-14
6.1.3	The Security Menu	6-16
6.1.4	The Power Savings Menu	6-17
6.1.5	The Exit Menu	6-19
6.2	Configuring the PCMCIA Interface	6-22

6.1 Changing the Device Configuration with SETUP

Changing the Device Configuration

Your PG 720 device configuration is set for working with the software supplied with the unit. You should only change the preset values if you have modified your PG 720 in any way or if a fault occurs when the unit is powered up.

SETUP Program

The SETUP program is in the ROM-BIOS. Information about the system configuration is stored in the battery-backed RAM of the PG 720.

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

Incorrect SETUP Data

If incorrect SETUP data are detected when you boot 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 gives you the opportunity of starting the SETUP program by displaying the following screen prompt:

PRESS <F2> to enter SETUP

To start SETUP, proceed as follows:

1. Reset your PG 720 (warm or cold restart).
2. Press the **F2** key as long as the BIOS prompt appears on the screen.

SETUP Menus

The various menus and submenus are listed on the following pages. You can get all the information you need for 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:

```
Phoenix NoteBIOS 4.0
Copyright 1985-95 Phoenix Technologies Ltd., All Rights
Reserved.
```

```
SIEMENS PG 720 P
```

```
CPU = xxx*) 233 MHz**) Mobile
0000640K System RAM Passed
0031744K Extended RAM Passed
UMB upper limit segment address: F2xx
Fixed Disk 0: IBM DMCA 21440
```

Press <F2> to enter SETUP

If you press the F2 key while 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:

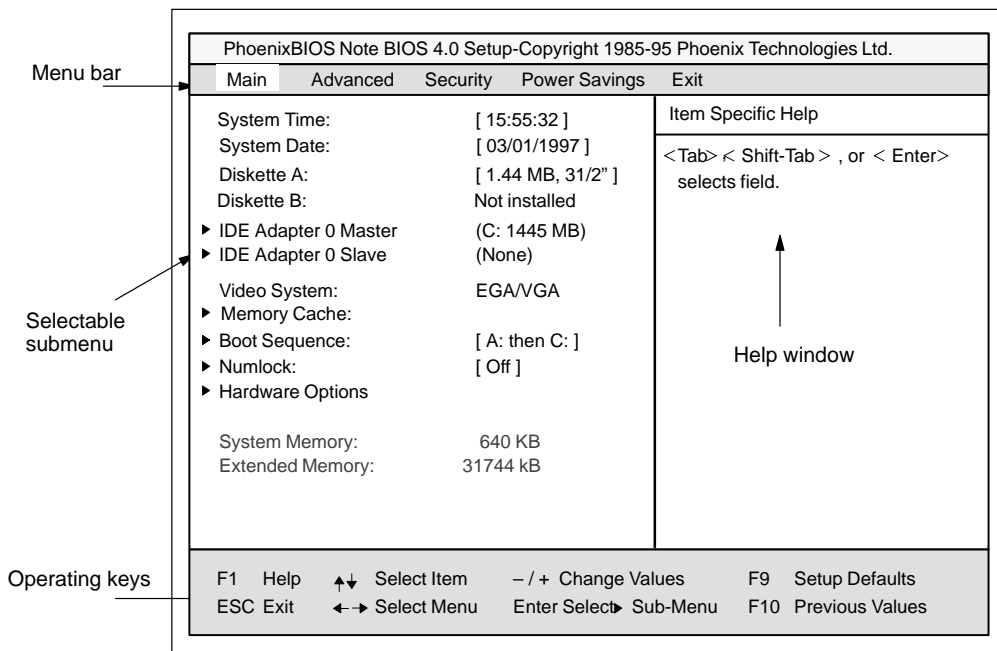


Figure 6-1 Main SETUP Menu

*) CPU-Typ
**) MHz (133 or 233 MHz)

Menu Structure

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

You can move between the menu screens 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 Savings	Power-saving functions can be selected here
Exit	Used for terminating and saving

6.1.1 The Main Menu

Overview

The Main menu is structured as follows:

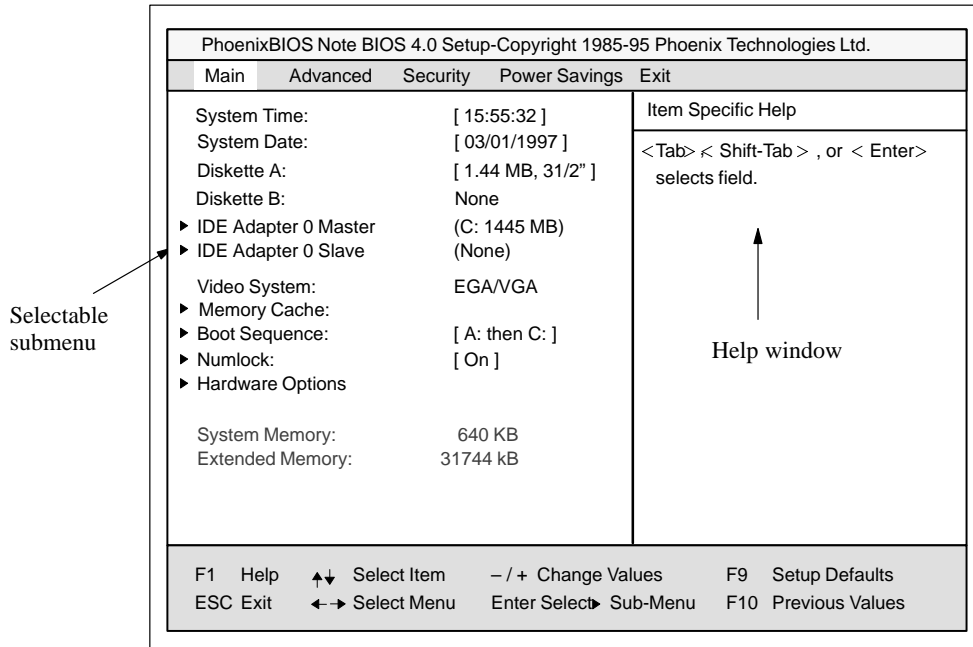


Figure 6-2 Main SETUP Menu

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 floppy disk drive
Diskette B	None
Video System	Display setting
via submenus	
IDE Adapter	Type of installed hard disks
Memory Cache	For setting memory options
Boot Sequence/Numlock	For setting boot options
Hardware Options	For setting PG 720 special functions

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 / B

The name of the installed floppy disk drive in the programming device is set here. The following entries are possible:

[Not Installed]	If a floppy disk drive is not fitted
[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"]	

IDE Adapter
Hard Disk Drive

A branch is made to the following submenu when you select this type of menu option:

PhoenixBIOS Note BIOS 4.0 Setup-Copyright 1985-95 Phoenix Technologies Ltd.		
Main Advanced Security Power Savings Exit		
IDE Adapter 0 Master (C: 1445 Mb)		Item Specific Help
Autotype Fixed Disk [Press Enter]		Attempts to automatically detect the drive type for drives that comply with ANSI specifications
Type:	[Auto] 1445 MB	
Cylinders:	[2800]	
Heads:	[16]	
Sectors/Track:	[63]	
Write Precomp:	[None]	
Multi-Sector Transfers:	[16 Sectors]	
LBA Mode Control:	[Enabled]	
32 Bit I/O:	[Enabled]	
Transfer Mode:	[Fast PIO 4]	
F1 Help	↕ Select Item	- / + Change Values
F9 Setup Defaults		
ESC Exit	←→ Select Menu	Enter Select Sub-Menu
F10 Previous Values		

Figure 6-3 “Hard Disk Drive IDE Adapter” Submenu

The parameters which you can select here are usually saved on the respective IDE drive, and are read from the drive and entered on the screen when you select the option “Autotype Hard Disk”.

CD-ROM drives with an IDE interface (ATAPI) are not entered here.

“Autotype Hard Disk” Field

The standard parameter “AUTO” is entered in this field. This enables the device to recognize the hard disk parameters automatically. If you select the “Autotype Hard Disk” field for a hard disk which does not exist, an abort is executed after a maximum of five minutes as a result of a timeout, and the existing entries remain unchanged. It is therefore only meaningful to carry out an autotype for hard disks present in the system.

In the standard configuration of your programming device, only one hard disk is entered as the master at IDE adapter 0.

In 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 “Type” field if an IDE hard disk or an IDE CD-ROM is not 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 parameters in the fields “Cylinders”, “Heads”, “Sectors/Track”, “Write Precomp”.

“Multi-Sector Transfers” Field

The number of sectors which are transmitted per interrupt are transferred in the “Multi-Sector Transfers” field. The value depends on the drive and should only be set using the autotype function.

Disabled 1 sector
2,4,6,8,16 Sectors

“LBA Mode Control” Field

“Enabled” in the “LBA Mode Control” field (enabled, disabled) means that hard disk capacities greater than 528 MB are supported. The value depends on the drive and should only be set using the autotype function.

“32 Bit-I/O” Field

The type of access to the drive is defined in the option “32 Bit I/O”:

Disabled 16-bit access
Enabled 32-bit access

“Transfer Mode” Field

The transmission rate to the IDE drive is set in the “Transfer Mode” field. The value depends on the drive and should only be set using the autotype function.

The following settings are possible:

Standard, Fast PIO1, Fast PIO2, Fast PIO3, Fast PIO4.

You should never set a higher Fast PIO mode than that set by the autotype function.

We recommend that you use the autotype function.

With specific operating systems, such as SCO OOT3.0, SORIX, etc., you may have to set the “LBA Mode” to “disabled”.

Exit the submenu using the ESC key.

**“Memory Cache”
Field**

The following submenu appears when you select the “Memory Cache” field in the main menu:

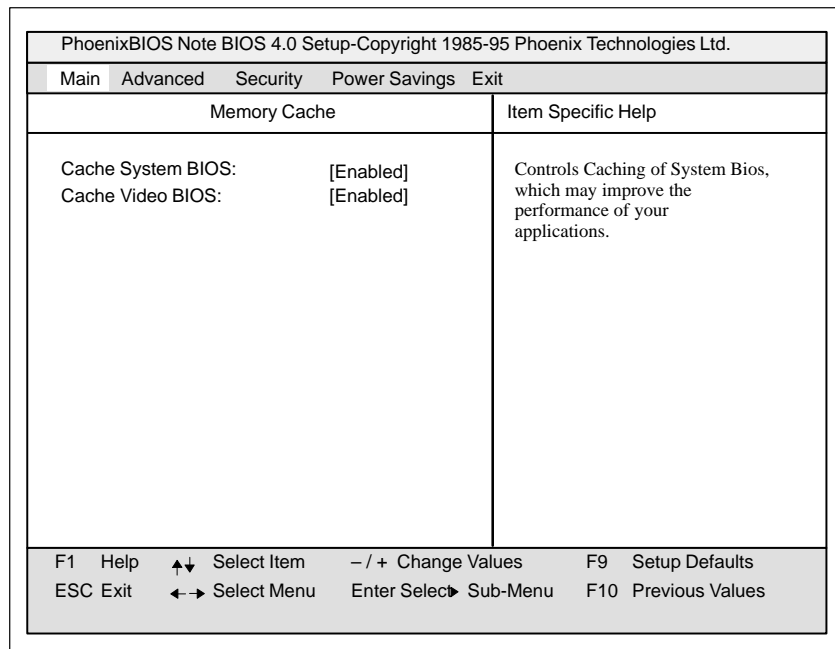


Figure 6-4 “Memory Cache” Submenu

A cache is a fast intermediate memory located in the CPU. Repeated memory access operations can be carried out more quickly via the fast cache, provided the feature is enabled. It may be necessary to disable the cache when using certain hardware or software, because intentional program run times or delay times are prevented by the fast cache.

“Boot Sequence” Field

The following submenu appears when you select the “Boot Sequence” field in the main menu:

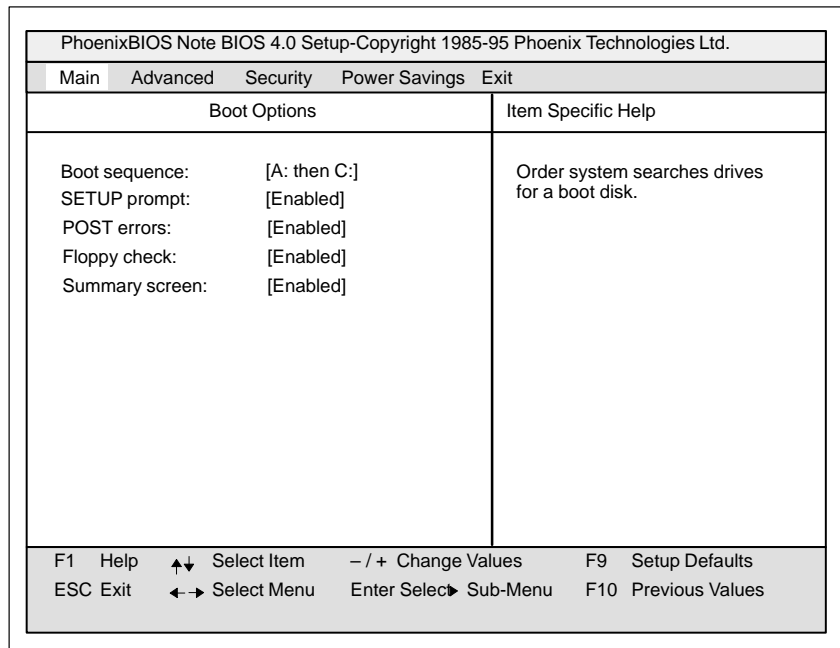


Figure 6-5 “Boot Options” Submenu

Boot sequence	Here you can define the device sequence from which a system start (boot attempt) is to be carried out first. A: then C: First from floppy A: then from drive C: C: then A: First from drive C: then from floppy A: C: only Only from drive C:
SETUP prompt	During the system loading phase, a message at the bottom of the screen tells you how to activate the Setup program. In Disabled mode, this message is not displayed.
POST Errors	The loading procedure is aborted if an error is detected during the system loading phase and an error message appears. In Disabled mode, errors which occur during the system loading phase are ignored.
Floppy check	During the system loading phase, the floppy head is moved by a number of steppings to the inside, and then back 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.

Example of a summary screen:

PhoenixBIOS 1985-95 Phoenix Technologies Ltd.			
CPU [xxx*)MHz]:		System ROM:	F2xx – FFFF
Coprocessor:	Installed	BIOS Date:	03/06/97
System RAM:	640 KB	COM Ports:	03F8, 02F8
Extended RAM:	31744 KB	LPT Ports:	0378
Shadow RAM:	384 KB	Display Type:	EGA / VGA
Cache RAM:	None	PS/2 Mouse:	Installed
Hard Disk 0:	1445 MB	Diskette A:	1.44 MB, 31/2 "
Hard Disk 1:	None	Diskette B:	None

*) CPU-Typ

“Numlock” Field

The following submenu appears if you select the “Numlock” field in the main menu:

PhoenixBIOS Note BIOS 4.0 Setup-Copyright 1985-95 Phoenix Technologies Ltd.				
Main	Advanced	Security	Power Savings	Exit
Keyboard Features			Item Specific Help	
Numlock:	[On]	Selects Power-on state for Numlock		
Key Click:	[Disabled]			
Keyboard auto-repeat rate:	[30/s]			
Keyboard auto-repeat delay:	[1/2 s]			
F1 Help	↕ Select Item	- / + Change Values	F9 Setup Defaults	
ESC Exit	←→ Select Menu	Enter Select Sub-Menu	F10 Previous Values	

Figure 6-6 “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

*) 133 or 233 MHz

“Hardware Options” Field

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

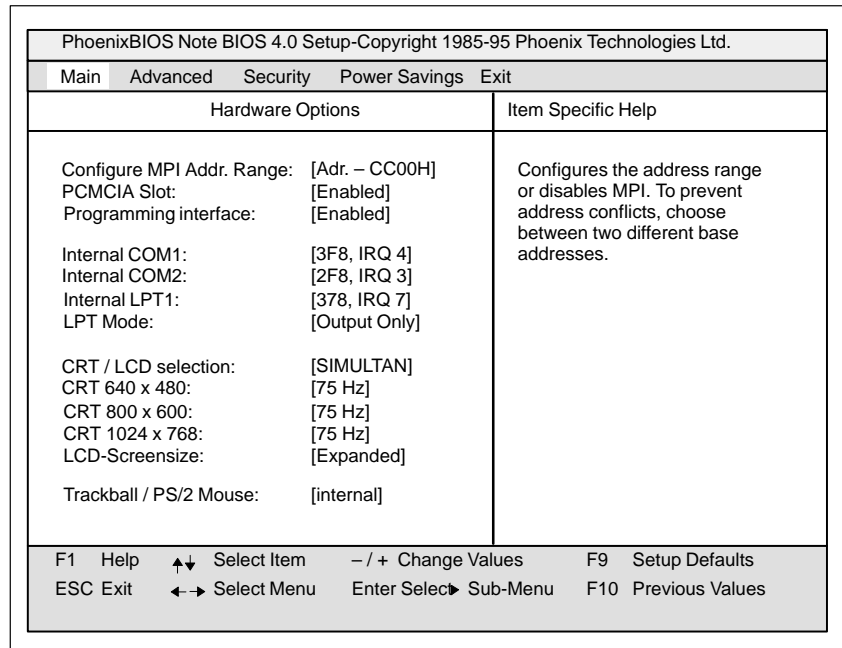


Figure 6-7 “PG 740 Hardware Options” Submenu

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

Entry	Function						
Configure MPI Addr. Range	Address range in which the multipoint interface is selected. “0CC00H” or “0DC00H” are memory addresses. The MPI occupies an address area of 2 KB. “Disabled” enables the address area and disables the interface.						
PCMCIA Slot	Enables or disables the PCMCIA interface. PCMCIA occupies the I/O address range 3E0H - 3E1H. If the interface is disabled, this area is unoccupied. Note: Note that PCMCIA cards require additional card-specific system resources.						
Programming interface	Enables or disables the S5 module interface and the interface for S7 memory cards. This interface occupies the I/O address range 300H - 31FH.						
Internal COM1	Enables or disables the COM1/TTY interface						
Internal COM2	Enables or disables the COM2 interface						
Internal LPT1	Enables or disables the printer port						
LPT Mode	The mode can be selected here if the LPT1 interface is enabled.						
	<table border="0"> <tr> <td>Output Only</td> <td>Standard mode</td> </tr> <tr> <td>Bi-directional</td> <td>Printer port can also be used as an input port or for EPP support</td> </tr> <tr> <td>EPP mode</td> <td></td> </tr> </table>	Output Only	Standard mode	Bi-directional	Printer port can also be used as an input port or for EPP support	EPP mode	
Output Only	Standard mode						
Bi-directional	Printer port can also be used as an input port or for EPP support						
EPP mode							

Entry	Function
CRT/LCD selection	Selection of monitor, SIMULTAN LCD display and external monitor activated LCD enabled Only LC display activated CRT enabled Only external monitor activated
CRT 640 x 480	Image refresh rate with a resolution of 640 x 480 pixels
CRT 800 x 600	Image refresh rate with a resolution of 800 x 600 pixels
CRT 1024 x 768	Image refresh rate with a resolution of 1024 x 768 pixels
LCD Screen Size	EXPANDED: With an LC display, various resolutions are expanded to the size of the screen. Normal: No expansion to 800 x 600 is made
Trackball / PS/2 Mouse	Internal The PS/2 interface is active. IRQ 12 is occupied. In this mode, a keyboard with integrated trackball can be connected. Disabled The PS/2 interface is inactive, IRQ12 is available. External The PS/2 interface is active. The IRQ 12 is occupied. The keyboard trackball is disabled. Changes do not become active until the device is switched on again.

* Only applies to external monitor

6.1.2 The Advanced Menu

Menu Structure

PhoenixBIOS Note BIOS 4.0 Setup-Copyright 1985-95 Phoenix Technologies Ltd.			
Main	Advanced	Security	Power Savings Exit
<p>Warning! Setting items on this menu to incorrect values may cause your system to malfunction.</p> <p>▶ PCI Devices</p> <p>Plug & Play O/S [No] Reset Configuration Data [No]</p> <p>Diskette Controller: [Enabled] Local Bus IDE Adapter: [Enabled]</p> <p>VGA Interrupt: [Enabled]</p> <p>Large Disk Access Mode: [DOS]</p>			Item Specific Help
F1 Help	↕ Select Item	- / + Change Values	F9 Setup Defaults
ESC Exit	← → Select Menu	Enter Select ▶ Sub-Menu	F10 Previous Values

Figure 6-8 “Advanced” Menu

Settings in the Advanced Menu

Plug & Play O/S		Plug and play means that fitted modules are automatically recognized and installed provided they support plug and play functions.
	[No]	The BIOS handles the complete plug and play facilities
	[Yes]	The operating system handles some of the plug and play functions
Reset Configuration Data	[Yes]	All previous installations under plug and 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 and play facilities must be entered manually.
	[No]	The system components with plug and play facilities are initialized the next time the system is loaded.
Diskette controller		Enables or disables the floppy controller of the basic module.
Local Bus IDE adapter	[Enabled]	One IDE interface for up to two drives.
	[Disabled]	No local IDE interface

Large Disk Access Mode	[DOS]	The drive tables are designed according to DOS drive access operations compatible with enhanced IDE.
	[OTHER]	The tables are not adapted.
VGA Interrupt	[Enabled]	IRQ 9 is reserved for the VGA card.
	[Disabled]	IRQ 9 is reserved for other devices.

“PCI Devices” Field

The following Submenu appears when you select the “PCI Devices” field in the advanced menu:

PhoenixBIOS Note BIOS 4.0 Setup-Copyright 1985-95 Phoenix Technologies Ltd.	
Advanced	
PCI Devices	Item Specific Help
PCI Device, Slot #1: Enable Master: [Enabled] Default Latency Timer: [Yes] Latency Timer: [0040]	Enable selected device as a PCI bus master.
F1 Help ⬆️⬆️ Select Item - / + Change Values F9 Setup Defaults ESC Exit ⬅️➡️ Select Menu Enter Select➤ Sub-Menu F10 Previous Values	

Figure 6-9 “PCI Devices” Submenu

PCI Device, Slot#1		
Enable Master	[Enable]	PCI master operation is permitted for this slot.
	[Disable]	No master operation is permitted for this slot.
Default Latency Timer	[Yes]	PCI master module defines the number of active PCI clock cycles.
	[No]	The set Latency Timer value defines the number of active PCI clock cycles.
Latency Timer	[0040]	Number of active PCI clock cycles

6.1.3 The Security Menu

Summary

You can only edit the fields enclosed in square brackets. Two passwords are assigned to protect your programming device from unauthorized use. You can use the supervisor password to prevent use of diskettes for the normal user and to limit use of the hard disk.

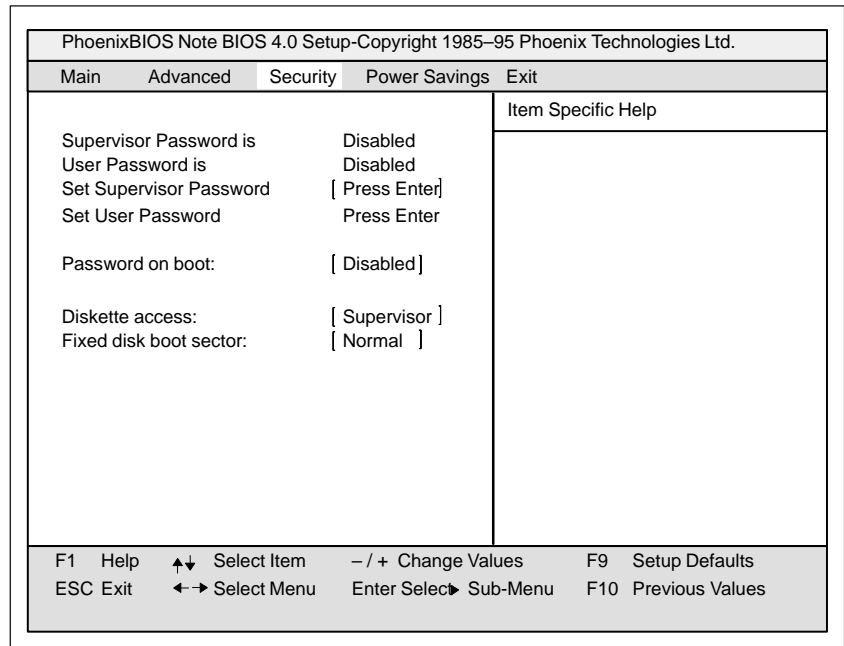


Figure 6-10 "Security" Submenu

6.1.4 The Power Savings Menu

Summary

This menu has the following structure:

PhoenixBIOS Note BIOS 4.0 Setup-Copyright 1985-95 Phoenix Technologies Ltd.				
Main	Advanced	Security	Power-Savings	Exit
APM:			[Enabled]	Item Specific Help
Power Savings:			[Disabled]	
Idle Mode:			Disabled	APM (Advanced Power Management) allows APM aware software to better manage power savings.
Standby Timeout:			Disabled	
Suspend Timeout:			Disabled	
Fixed Disk Timeout:			Disabled	
LCD/CRT Standby-Mode:			Suspend off	
Additional Powersaving Options				
Backlight:			[Full on]	
Resume on Modem Ring:			[Disabled]	
F1 Help	↕	Select Item	- / + Change Values	F9 Setup Defaults
ESC Exit	← →	Select Menu	Enter Select ▶ Sub-Menu	F10 Previous Values

Figure 6-11 “Power Savings” Submenu

Various power saving modes can be set using the Power Savings menu:

APM	[Enabled]	Allows the operating system to switch off system resources which are not required.
	[Disabled]	The operating system cannot use APM (advanced power management) access.
Power Savings	[Maximum Performance], [Disable], [Maximum Battery Life], [Customize]	Preset power-saving functions for maximum and minimum power-saving. The settings for Standby/Suspend Timeout, Fixed Disk Timeout, and LCD/CRT Mode are set accordingly. With Customize, the values can be defined by the user.
Idle Mode *)	[Disable]	No power-saving function while CPU is inactive.
	[Enable]	After 2 seconds, the CPU clock frequency is reduced. This lowers the power required.

Standby Timeout	[1, 2, 4, 6, 8, 12, 16] [Disabled]	After the set time has expired (minutes), the programming device goes to standby mode if no mouse or keyboard operation occurs. No standby mode.
Suspend Timeout	[5, 10, 15, 20, 30, 40, 60] [Disabled]	After the set time has expired (minutes), the programming device goes to suspend mode. No suspend mode.

*) The idle mode can cause online functions to be aborted. If you are using online functions it should therefore be switched to “Disable.”

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

Fixed Disk Timeout	[1min][2min] [4min][6min] [8min][10min] [15min] [Disabled]	After the set time has expired (minutes), the hard disk drive is switched off if it is not accessed. If the hard disk is accessed after it has been switched off, an access delay occurs while the hard disk is booted up again. Hard disk runs continuously.
LCD/CRT Standby Mode	[Standby Off] [Suspend Off] [Always On]	Monitor and display are switched off when standby mode is reached. Monitor and display are not switched off until suspend mode is reached. Monitor or display always remains in operation.
Resume on Modem Ring	[Disabled] [Enabled]	If this function is enabled, the programming device can be called out of suspend mode by the “RING” signal of a modem. The relevant additional hardware and software are required.

6.1.5 The Exit Menu

The Exit Menu

The setup program is always terminated using this menu.

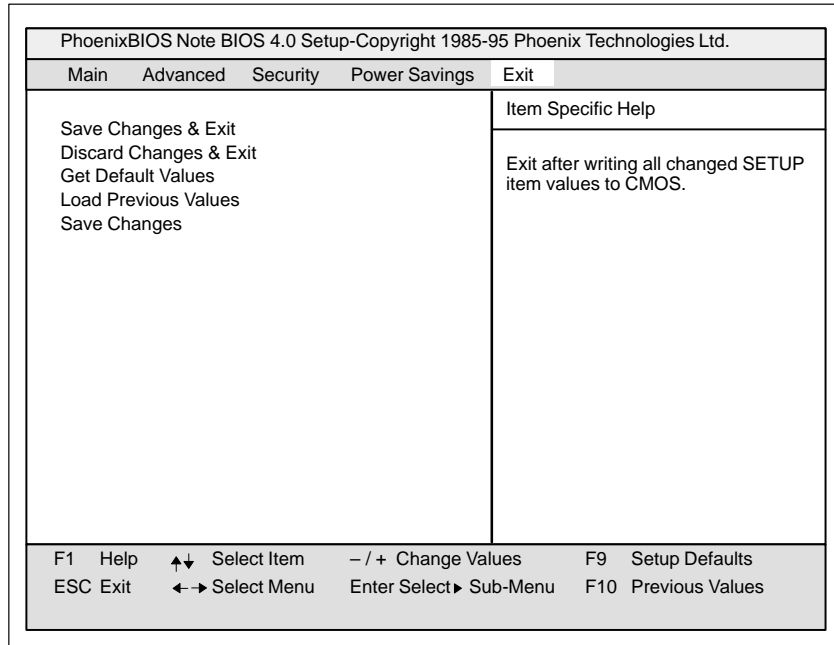


Figure 6-12 “Exit” Submenu

Save Changes & Exit	All changes are saved; a system restart is carried out with the new parameters.
Discard Changes & Exit	All changes are rejected; a system restart is carried out with the old parameters.
Get Default Values	All parameters are set to safe values. The hard disk must be entered explicitly.
Load Previous Values	The last saved values are reloaded.
Save Changes	Saves all setup entries.

Documenting Your Device Configuration

If you have made any modifications to your standard SETUP settings, you can enter them in the following table. You can then refer to these entries if you need to make any hardware modifications later.

Note

Print the following table out and keep the pages in a safe place once you have filled in your entries.

System Parameter	Standard Settings	Your Entries
Main		
System Time		
System Date		
Diskette A	1.44 MB, 31/2	
IDE Adapter 0 Master	C: 1.440 MB	
IDE Adapter 0 Slave	None	
Video System	EGA/VGA	
Memory Cache		
Cache system BIOS area	Enabled	
Cache video BIOS area	Enabled	
Boot sequence		
Boot sequence	A: then C:	
SETUP prompt	Enabled	
POST errors	Enabled	
Floppy check	Enabled	
Summary Screen	Enabled	
Numlock		
Numlock	Off	
Key click	Disabled	
Keyboard auto-repeat time	30/s	
Keyboard auto-repeat delay	1/2s	
Hardware Options		
Configure MPI address range	Address CC00	
PCMCIA Slot	Enabled	
Internal COM1	3F8, IRQ 4	
Internal COM2	2F8, IRQ 3	
Internal LPT1	378, IRQ 7	
LPT Mode	Output Only	
CRT/LCD selection	SIMULTAN	
CRT 640 x 480	75	
CRT 800 x 600	75	
CRT 1024 x 768	75	
LCD Screensize	Expanded	
Trackball / PS2 Mouse	External	

System Parameter	Standard Settings	Your Entries
Advanced		
PCI Devices		
PCI Device, Slot#1		
Enable Master	Enabled	
Default Latency Timer	Yes	
Latency Timer	0040	
Plug & Play O/S	No	
Reset Configuration Data	No	
Diskette Controller	Enabled	
Local Bus IDE Adapter	Enabled	
VGA Interrupt	Enabled	
Large Disk Access Mode	DOS	
Security		
Supervisor Password is	Disabled	
User Password is	Disabled	
Set Supervisor Password	Press Enter	
Set User Password		
Password on boot	Disabled	
Diskette Access	Supervisor	
Fixed disk boot sector	Normal	
Power Savings		
APM	Enabled	
Power Savings	Disabled	
Powersavings by Customize		
Idle Mode	Disabled	
Standby Timeout	4 Minutes	
Suspend Timeout	10 Minutes	
Fixed Disk Timeout	4 Minutes	
LCD/CRT Standby Mode	Standby off	
Additional Powersaving Options		
Backlight	Full on	
Resume on Modem Ring	Disabled	
Exit		
Save Changes & Edit		
Discard Changes & Exit		
Get Default Values		
Load Previous Values		
Save Changes		

6.2 Configuring the PCMCIA Interface

You can obtain the software you require for using PCMCIA cards under MS-DOS, such as

- Socket Services
- Card Services
- Client Drivers
- Flash File System

from your nearest Siemens sales office or representative.

Your programming device comes supplied with Windows 95 already installed; this supports the PCMCIA interface.

Error Diagnostics

7

What Does This Chapter Contain?

This chapter will help you to locate, identify, and in some cases eliminate simple errors and faults. The symptoms of the problem, possible causes, and remedies are listed in the form of a table.

Table 7-1 Errors/Faults in PG 720 Operation

Error/Fault	Cause	Remedy
Power-on LED does not light up	<ul style="list-style-type: none"> PG 720 is switched off Power supply not properly connected Battery run down 	<ul style="list-style-type: none"> Switch the unit on Check the power supply, power cable, and power connector Charge or replace battery
Display remains dark after power up	<ul style="list-style-type: none"> Back lighting is not active 	<ul style="list-style-type: none"> Wait 3 to 5 seconds until the back lighting is active
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
Message on the display: "Invalid configuration information... Press the F1 key for continue, F2 to run Setup utility"	<ul style="list-style-type: none"> Incorrect configuration data 	<ul style="list-style-type: none"> Press "F2" key, check the configuration data in the SETUP program, if necessary adapt the default values, and check the error messages in the first SETUP menu
Message on the display: "No boot device available"	<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"> Replace diskette with boot diskette Use the "Autotype Fixed Disk" function
Message: "Keyboard stuck key failure"	<ul style="list-style-type: none"> A key became blocked during the self-test of the keyboard 	<ul style="list-style-type: none"> Check the keyboard Restart the system
Booting of the PG 720 aborted with a series of beeps	<ul style="list-style-type: none"> Error occurred during the self-test 	<ul style="list-style-type: none"> Check hardware
Every time a key is pressed, a beep is heard and no character appears	<ul style="list-style-type: none"> Keyboard buffer overflow 	<ul style="list-style-type: none"> <CTRL> <PAUSE>
Not ready message when attempting to read a diskette	<ul style="list-style-type: none"> No diskette inserted Diskette is not formatted 	<ul style="list-style-type: none"> Insert diskette Format diskette
Read-only error when attempting to write to a diskette	<ul style="list-style-type: none"> Diskette is read-only Read-only hole open on 3.5" diskette 	<ul style="list-style-type: none"> Cancel the write protection
<\> key does not exist	<ul style="list-style-type: none"> Wrong keyboard driver is being used 	<ul style="list-style-type: none"> German keyboard: <ALTGr> <ß> International keyboard: <\> key
Mouse pointer cannot be moved with the trackball	<ul style="list-style-type: none"> The ball is not rotating No or wrong mouse driver 	<ul style="list-style-type: none"> Clean the trackball and its housing Load the correct mouse driver
Mouse pointer moving erratically	<ul style="list-style-type: none"> Trackball dirty 	<ul style="list-style-type: none"> Clean the trackball and its housing
Trackball not working	<ul style="list-style-type: none"> Trackball is switched off External mouse plugged in PS/2 interface is set to external or disabled in Setup 	<ul style="list-style-type: none"> Activate trackball with key combination F_n + ^ Check Setup entry

Hardware Information

8

What Does This Chapter Contain?

This chapter contains important reference data about the following:

- Hardware addresses
- Interrupt assignments
- Information about connecting cables

Chapter Overview

Section	Contents	Page
8.1	Hardware Address Table	8-2
8.2	Interrupt Assignments	8-6
8.3	PG 720 Video Modes	8-7
8.4	Connector Pinouts	8-8
8.5	Connecting Cables	8-15

8.1 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 address these areas. The following tables provide you with an overview of the address areas used. For further information, refer to the description of the individual function modules.

Table 8-1 Assignment of the Memory Addresses

From Address	To Address	Size	Basic Function Described	Possible Alternative Function
0000 0000	0007 FFFF	512k	Conventional system memory	
0008 0000	0009 FBFF	127k	Conventional system memory extended	Via Setup ISA memory
0009 FC00	0009 FFFF	1k	PS/2 mouse (BIOS) only until mouse driver is loaded	Via Setup ISA memory
000A 0000	000A FFFF	64k	VGA graphics refresh memory	Shared SMM for power management
000B 0000	000B 7FFF	32k	B/W graphics/text refresh memory	Shared SMM for power management
000B 8000	000B FFFF	32k	VGA graphics/text refresh memory	Shared SMM for power management
000C 0000	000C BFFF	48k	VGA BIOS expansion	
000C C000	000C C7FF	2k	MPI if enabled	Via EMM high DOS memory
000C C800	000C FFFF	14k	Free or PCMCIA driver	Via EMM high DOS memory
000D 0000	000D 7FFF	32k	Free or PCMCIA driver	Via EMM high DOS memory
000D 8000	000D FFFF	32k	Free or PCMCIA driver	Via EMM high DOS memory
000E 0000	000E BFFF	48k	System BIOS	Via EMM high DOS memory
000E C000	000E CFFF	4k	System BIOS Boot Message Logo	Via EMM high DOS memory
000E D000	000E DFFF	4k	System BIOS ECSD (plug & play configuration area)	Via EMM high DOS memory
000E E000	000E FFFF	8k	Setup	Via EMM high DOS memory
000F 0000	000F FFFF	64k	System BIOS	
0010 0000	00EF FFFF	14M	Extended system memory	
00F0 0000	00FF FFFF	1M	Extended system memory	Via Setup ISA memory
0100 0000	07FF FFFF	112M	Extended system memory	
0800 0000	FFFD FFFF	4G-128M-128k	PCI address area or shadowed ISA address area	
FFFE 0000	FFFF FFFF	128k	System BIOS (shadow of 000E 0000 .. 000F FFFF)	

Table 8-2 I/O Address Assignments

Address		Size	Description	
from	to	byte	Basic Function	Possible Alternative Function
0000	000F	16	82C558E → DMA 1 Control Register (DMA 0, 1, 2, 3)	
0010	001F	16	Unoccupied	
0020	0021	2	82C558E → Interrupt controller 1 Control Register	
0022		1	Integrated 82C206 and Chipset Configuration Index Register (SYSCFG)	
0023		1	82C558E → Integrated 82C206 Configuration Data Register	
0024		1	Chipset Configuration Data Register (SYSCFG)	
0025	002D	9	Unoccupied	
002E	002F	2	Configuration port ultra I/O	
0030	003F	16	Unoccupied	
0040	0042	3	82C558E → Timer Channel 0..2 (Clock,Refresh,Speaker)	
0043		1	82C558E → Timer Control Register	
0044	005F	28	Unoccupied	
0060		1	Keyboard controller date	
0061		1	82C558E → System Control Port B (Timer,Speaker control,NMI,Parity)	
0062	0063	2	Unoccupied	
0064		1	Keyboardcontroller CMD / STATUS	
0065	006F	11	Unoccupied	
0070		1	NMI enable, RTC Index	
0071		1	RTC date	
0072	0080	15	Unoccupied	
0081	0083	3	82C558E → DMA Page Register Ch2,3,1	
0084	0086	3	Unoccupied	
0087		1	82C558E → DMA Page Register Ch0	
0088		1	Unoccupied	
0089	008B	3	82C558E → DMA Page Register Ch6,7,5	
008C	008E	3	Unoccupied	
008F		1	82C558E → DMA Page Register Ch4	
0090	0091	2	Unoccupied	
0092		1	82C558E → System Control Port A (Fast Reset,Fast A20)	
0093	009F	13	Unoccupied	

Table 8-2 I/O Address Assignments, continued

from	to	byte	Basic Function	Possible Alternative Function
00A0	00A1	2	82C558E → Interrupt controller 2 Control Register	
00A2	00BF	30	Reserved	
00C0	00DF	32	82C558E → DMA Controller 2 Control Register (DMA 4, 5, 6, 7)	
00E0		1	Configuration register for MPI, COM, VGA, Progas, Trackball, etc.	
00E1	00EF	15	Unoccupied	
00F0	00F1	2	Numeric Processor	
00F2	00F7	6	Unoccupied	
00F8	00FF	8	Numeric Processor	
0100	010F	16	Unoccupied	
0110	016F	96	Unoccupied	
0170	0177	8	Secondary IDE channel (free)	
0178	01EF	120	Unoccupied	
01F0	01F7	8	Primary on-board IDE channel	Can be switched off in Setup; then free
01F8	01FF	8	Unoccupied	
0200	020F	16	Unoccupied	
0210	0277	104	Unoccupied	
0278	027B	4	LPT 2 (<i>Unoccupied</i>)	
027C	02E7	108	Unoccupied	
02E8	02EF	8	COM 4 (<i>Unoccupied</i>)	
02F0	02F7	8	Unoccupied	
02F8	02FF	8	COM2 (/ IRDA)	Can be switched off in Setup; then free
0300	031F	32	Programming interface module	Can be switched off in Setup; then free
0320	033F	32	Unoccupied	SCSI adapter for example, AHA1542C
0340	035F	32	Unoccupied	
0360	036F	16	Unoccupied	
0370	0375	6	Floppy 2	Unoccupied
0376		1	Second IDE Command Register	Unoccupied
0377		1	Second IDE Status Register	Unoccupied
0378	037F	8	LPT 1	Can be switched off in Setup; then free
0380	038F	16	Unoccupied	
0390	039F	16	Unoccupied	
03A0	03AF	16	Unoccupied	
03B0	03BB	12	SW monitor interface module or EGA / VGA	
03BC	03BF	4	LPT x (<i>Unoccupied</i>)	
03C0	03CF	16	VGA control register	
03D0	03DF	16	CGA / VGA control register	
03E0	03E1	2	PCMCIA controller	Can be switched off in Setup; then free
03E2	03E7	6	Unoccupied	
03E8	03EF	8	COM 3 (<i>Unoccupied</i>)	

Table 8-2 I/O Address Assignments, continued

from	to	byte	Basic Function	Possible Alternative Function
03F0	03F5	6	On-board floppy	
03F6		1	Primary IDE command	
03F7		1	Primary IDE status / Floppy Chg.	
03F8	03FF	8	COM1	Can be switched off in Setup; then free
0400	040A	11	Unoccupied	
040B		1	EISA DMA Extended Mode Register	
040C	04D5	202	Unoccupied	
04D6		1	EISA DMA Extended Mode Register	
04D7	0777	673	Unoccupied	
0778	077A	3	ECP LPT 1	
077B	0CF7	1405	Unoccupied	
0CF8	0CFB	4	PCI Config Index (82C558E) PCIDV0,1	
0CFC	0CFF	4	PCI Config Data (82C558E) PCIDV0,1	
0D00	0FFF	768	Unoccupied	

Table 8-3 DMA Assignments

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

Table 8-4 PCI Configuration

Bus Number	Device No.	Function No.	Description
00h	00h	00h	82C557M (System Controller PCIDV0)
00h	01h	00h	82C558E Integrated I/O Controller PCIDV1
00h	14h	00h	82C558E IDE Register Space
00h	0Dh	00h-07h	GD7548 Cirrus LCD-SVGA

8.2 Interrupt Assignments

Interrupt Assignment

The PG 720 uses the two integrated 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 9 is assigned to the software interrupt vector 0A H (IRQ 2) by the ROM-BIOS.

Priority

The priority of the interrupts is in the reverse order of their numbering. This means the following:

- Interrupt IRQ 0 has the highest priority and interrupt IRQ 7 the lowest.
- For triggering IRQ 2, interrupt IRQ 8 has the highest and IRQ 15 the lowest priority. Interrupts IRQ 8 to IRQ 15 therefore have higher priority than interrupts IRQ 3 to IRQ 7.
- The interrupt vectors are initialized and masked when the PG 720 is powered up.

I/O Addresses of the Interrupt Controllers

Interrupt	Description	Assigned Interrupt Vector, Memory Address
SMI	System management interrupt, cannot be masked	–
NMI	Expansion slots signal I/O channel check 2	INT 2 H
IRQ 0	Internal timer (system clock)	INT 8 H
IRQ 1	Keyboard	INT 9 H
IRQ 2	Cascading from interrupt controller 2	INT A H
IRQ 3	Serial port 2 (COM2/IrDA) [can be enabled in setup]	INT B H
IRQ 4	Serial interface 1 (COM1/TTY) [can be enabled in setup]	INT C H
IRQ 5	MPI port [can be enabled in setup]	INT D H
IRQ 6	Floppy controller	INT E H
IRQ 7	Parallel port 1 (printer port LPT 1/EPP/ECP) [can be enabled in setup]	INT F H
IRQ 8	Battery-backed real-time clock (RTC)	INT 70 H
IRQ 9	VGA controller [generally not used]	INT 71 H
IRQ 10	Free or PCMCIA driver	INT 72 H
IRQ 11	Free or PCMCIA driver	INT 73 H
IRQ 12	PS/2 mouse or trackball in keyboard. Can be enabled in setup if mouse/trackball function is not required.	INT 74 H
IRQ 13	Math coprocessor error	INT 75 H
IRQ 14	IDE interface	INT 76 H
IRQ 15	Free or PCMCIA driver	INT 77 H

Note the interrupts which are already occupied in the system.

8.3 PG 720 Video Modes

Table 8-5 PG 720 Video Modes

Mode No. (hex)	VESA Mode No.	Video Mode [Text/ Graphics]	Colors	CRT	LCD	Simultaneous
00+/01+	—	Text 40x25	16	70Hz	60Hz	60Hz
02+/03+	—	Text 80x25	16	70Hz	60Hz	60Hz
04/05	—	Gr.320x200	4	70Hz	60Hz	60Hz
6	—	Gr.640x200	2	70Hz	60Hz	60Hz
07+	—	Text 80x25	2 (b/w)	70Hz	60Hz	60Hz
0D	—	Gr.320x200	16	70Hz	60Hz	60Hz
0E	—	Gr.640x200	16	70Hz	60Hz	60Hz
0F	—	Gr.640x350	2 (b/w)	70Hz	60Hz	60Hz
10	—	Gr.640x350	16	70Hz	60Hz	60Hz
11	—	Gr.640x480	2 (b/w)	60/72/75Hz	60Hz	60Hz
12	—	Gr.640x480	16	60/72/75Hz	60Hz	60Hz
13	—	Gr.320x200	256	70Hz	60Hz	60Hz
14	—	Text 132x25	16	70Hz	—	—
54	10A	Text 132x43	16	70Hz	—	—
55	109	Text 132x25	16	70Hz	—	—
58, 6A	102	Gr.800x600	16	56/60/72/75Hz	60Hz	60Hz
5C	103	Gr.800x600	256	56/60/72/75Hz	60Hz	60Hz
5D	104	Gr.1024x768	16	43il/60/70/72Hz	—	—
5E	100	Gr.640x400	256	70Hz	60Hz	60Hz
5F	101	Gr.640x480	256	60/72/75Hz	60Hz	60Hz
60	105	Gr.1024x768	256	43il/60/70/72Hz	—	—
64	111	Gr.640x480	64K	60/72/75Hz	—	—
65	114	Gr.800x600	64K	56/60Hz	—	—
66	110	Gr.640x480	32K	60/72/75Hz	—	—
67	113	Gr.800x600	32K	60Hz	—	—
71	112	Gr.640x480	16M	60Hz	—	—

8.4 Connector Pinouts

Socket Connector for the External Power Unit

The socket for the external power supply unit has the following potentials:

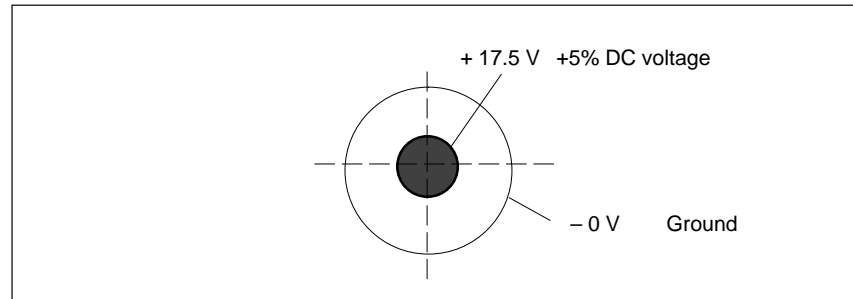


Figure 8-1 Power Supply Connector

Connecting a PS/2 Mouse

You can connect a PS/2 mouse to your PG 720. The connector has the following pinout:

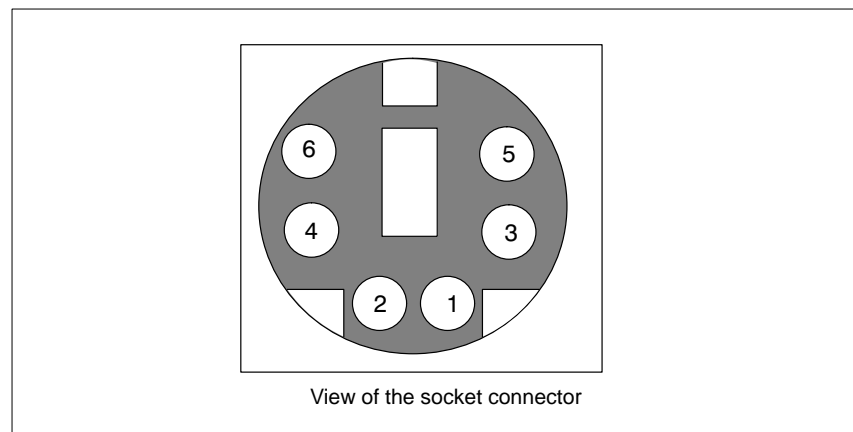


Figure 8-2 Connector Pinout for the PS/2 Mouse Cable

Pin No.	Designation	Input/Output
1	Data line	Input/output
2	Not assigned	–
3	0 V	–
4	Current-limited 5V power supply	Output
5	Clock line	Input/output
6	Not assigned	–

Connecting an External Keyboard

You can connect an external keyboard to your PG 720. The connector has the following pinout:

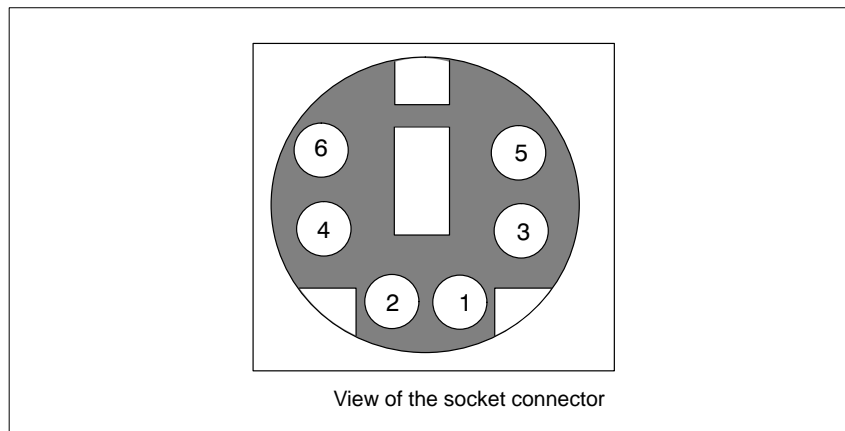


Figure 8-3 Connector Pinout for an External Keyboard

PinNo.	Designation	Input/Output
1	Data line, keyboard	Input/output
2	Data line, trackball	Input/output
3	0V	–
4	Current-limited 5V 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 720 has the following pinout:

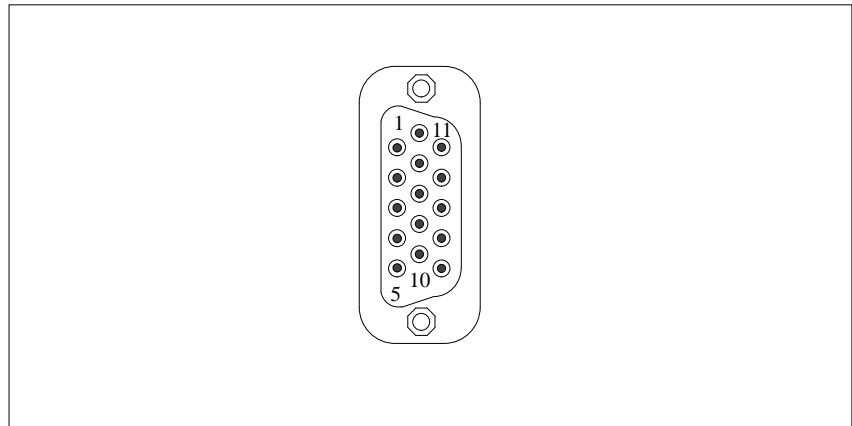


Figure 8-4 VGA Socket Connector

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	–
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 720 has the following pinout:

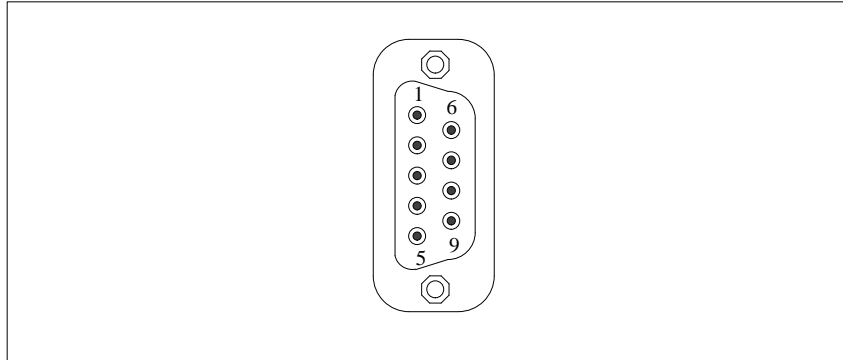


Figure 8-5 MPI/DP Socket Connector

Signal Description

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 the MPI module	Input/output
4	RTS_AS	RTSAS, control signal for received data stream. The control signal is “1” active when PLC 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 (+5V) 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
Shield	–	On connector casing	–

Parallel Port

The parallel port (LPT1) on the PG 720 has the following pinout:

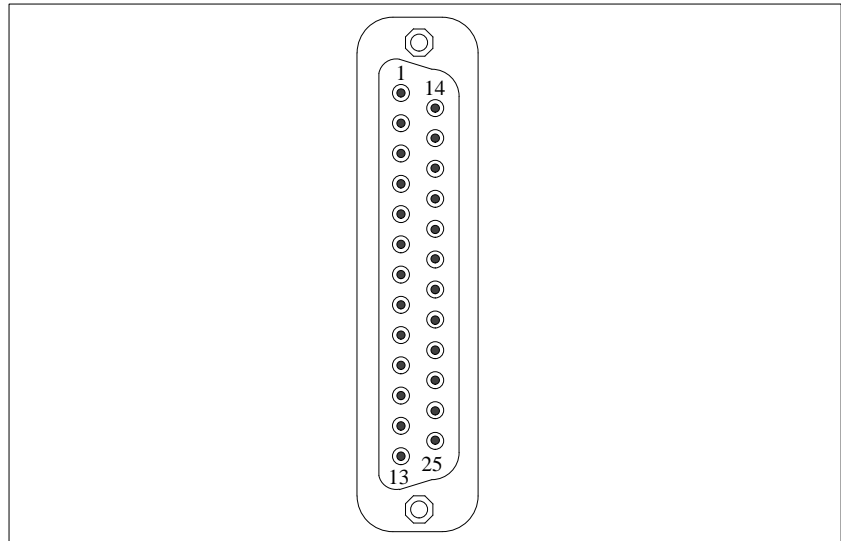


Figure 8-6 LPT1 Parallel Port (Socket)

Pin No.	Signal Description	Input/Output
1	/Strobe (CLK)	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	/INIT	Output (open collector)
17	/SELECT IN	Output (open collector)
18	GND	–
:		
25	GND	–

**Serial Port
(PLC/RS-232/
Modem)**

The serial port (COM1) on the PG 720 has the following pinout:

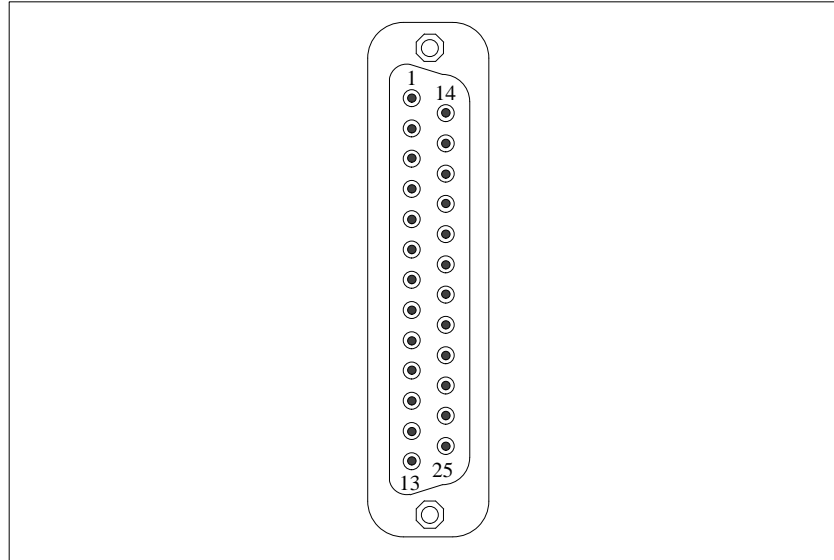


Figure 8-7 COM1 Serial Port (Socket)

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)	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	–	Not assigned	–
23-25	–	Not assigned	–

**Serial Port
(RS-232/Mouse)**

The serial port (COM2) on the PG 720 has the following pinout:

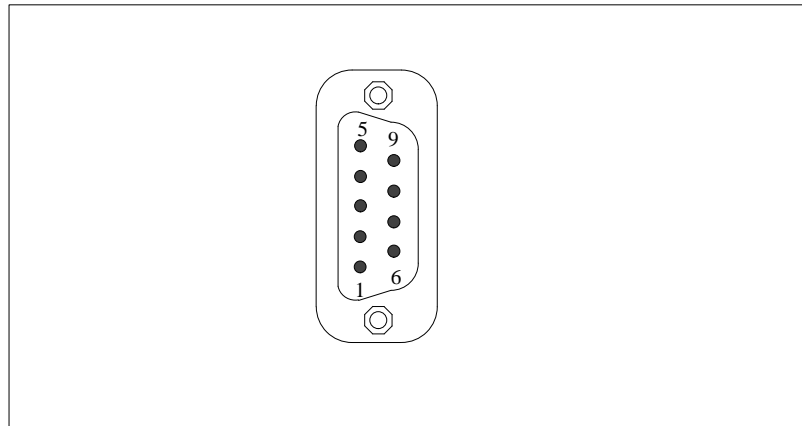


Figure 8-8 COM2 Serial Port (Connector)

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)	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

8.5 Connecting Cables

Overview

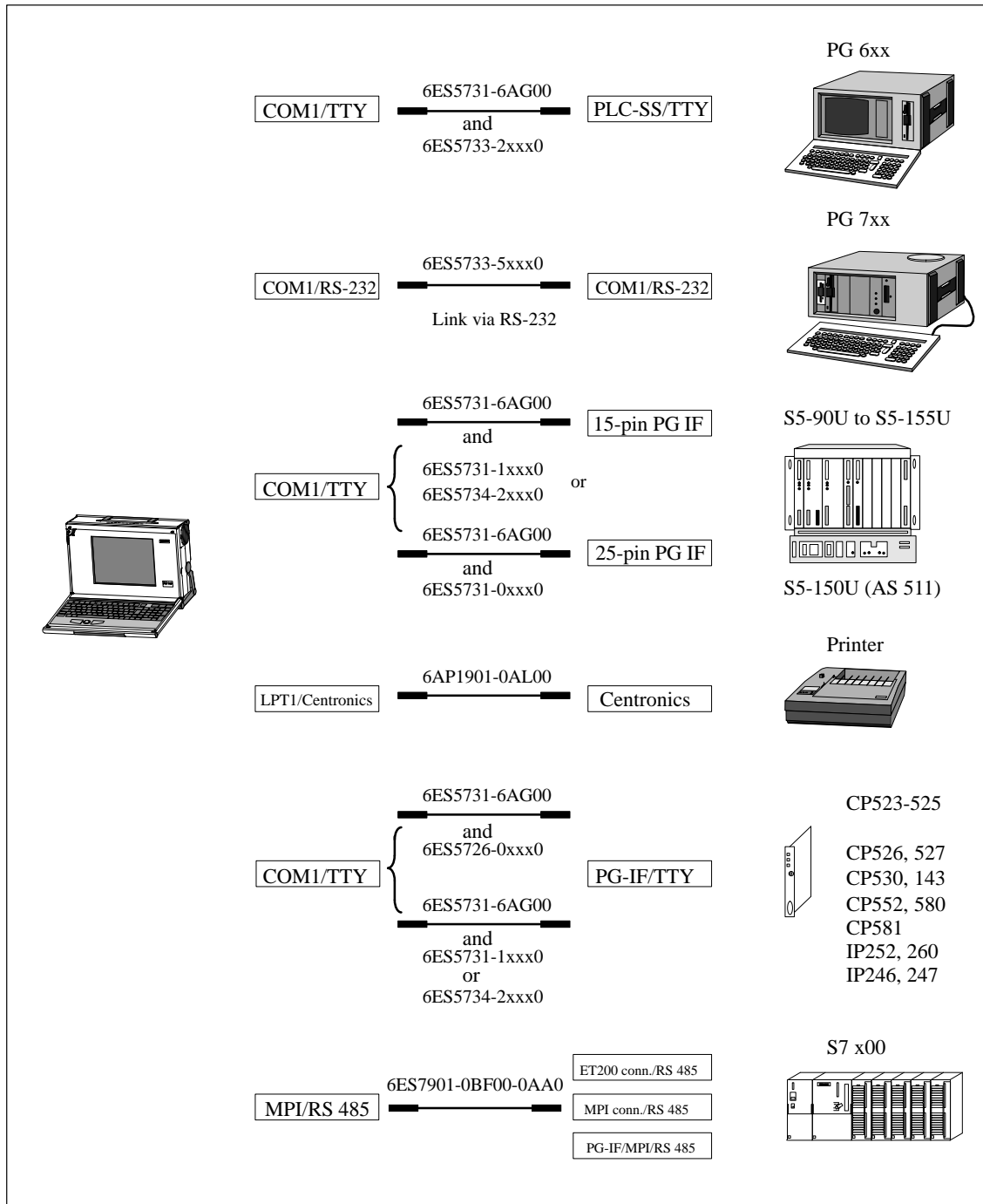


Figure 8-9 Connecting Cables

Standard Connecting Cable

Using the standard connecting cable (supplied with the unit) you can connect your PG 720 to a Siemens programmable logic controller. Please refer to the information in Chapter 3.

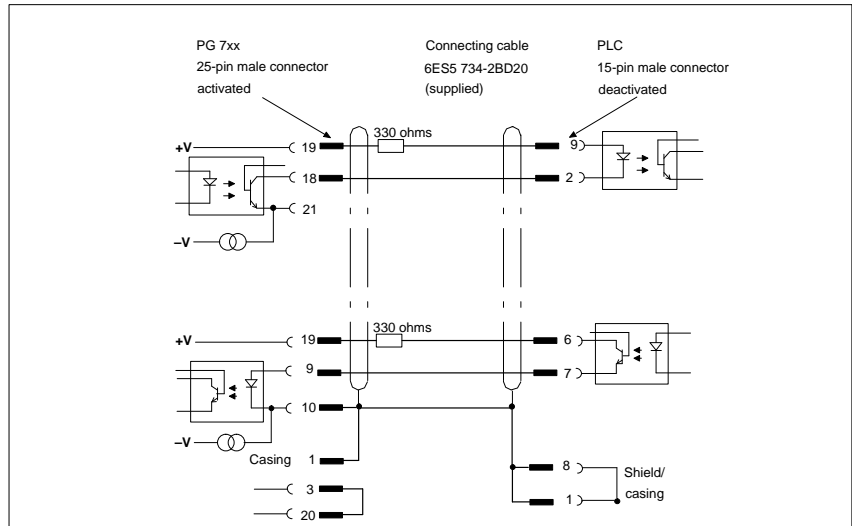


Figure 8-10 Standard Connecting Cable

Adapter for PG 6xx Cable

If you want to connect your PG 720 to a programmable logic controller using the standard connecting cable of a PG 6xx, use an adapter.

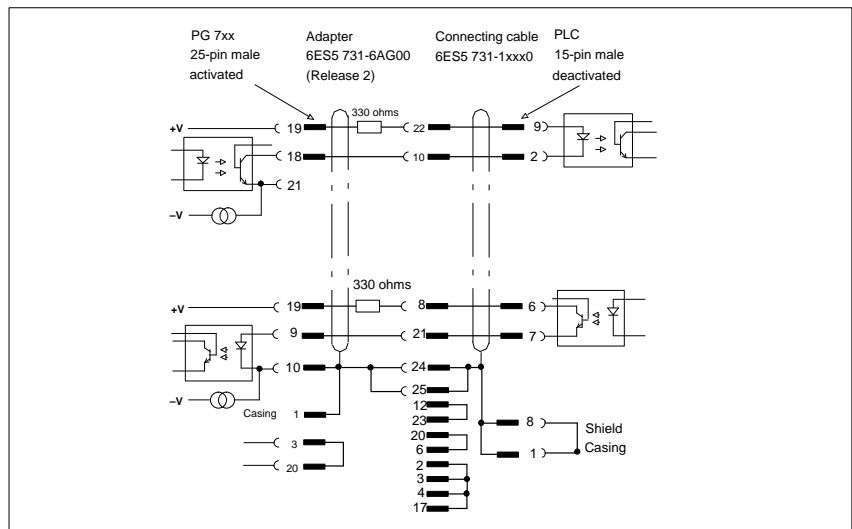


Figure 8-11 Adapter for PG 6xx Cable

Connecting Cable With 25-Pin Socket Connector

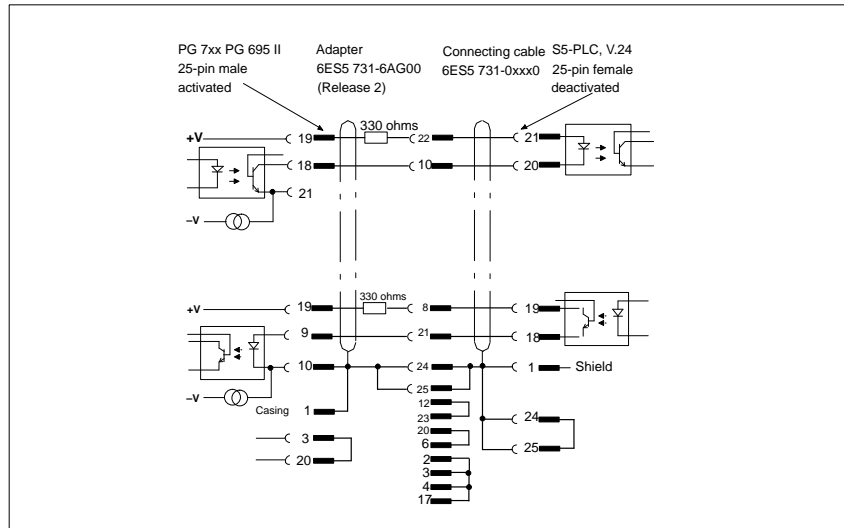


Figure 8-12 Connecting Cable With 25-Pin Socket Connector

Cable for Interconnecting Programming Devices

You can connect your PG 720 to other programming devices with this cable using the TTY/COM1 interface. This cable does not have an order number. Please read the notes in Chapter 4.

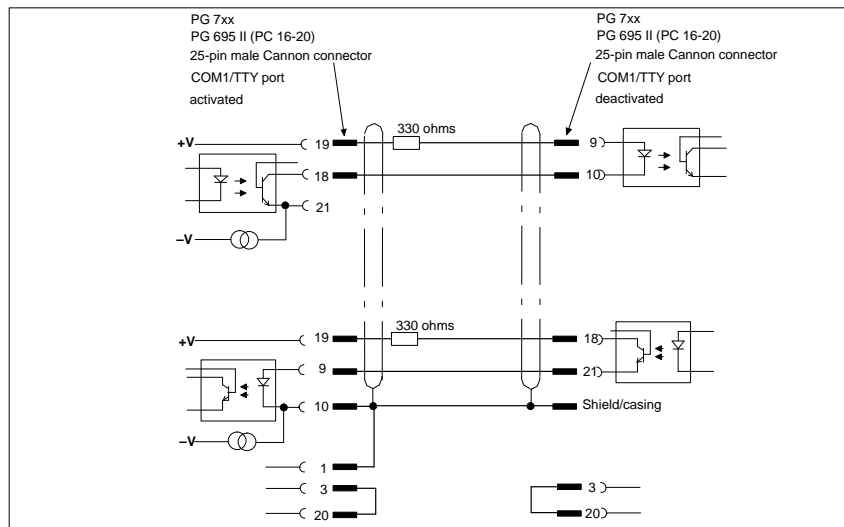


Figure 8-13 Cable for Interconnecting Programming Devices

Connection to S5 PLC/RS-232 and COM1/TTY of a PG 6xx

If you want to connect your PG 720 to the S5/RS-232 port of a PG 6xx programming device, you require an adapter. In this case, the PG 720 must be the active programming device. Please read the information about activating and deactivating the TTY/COM1 port in Chapter 4.

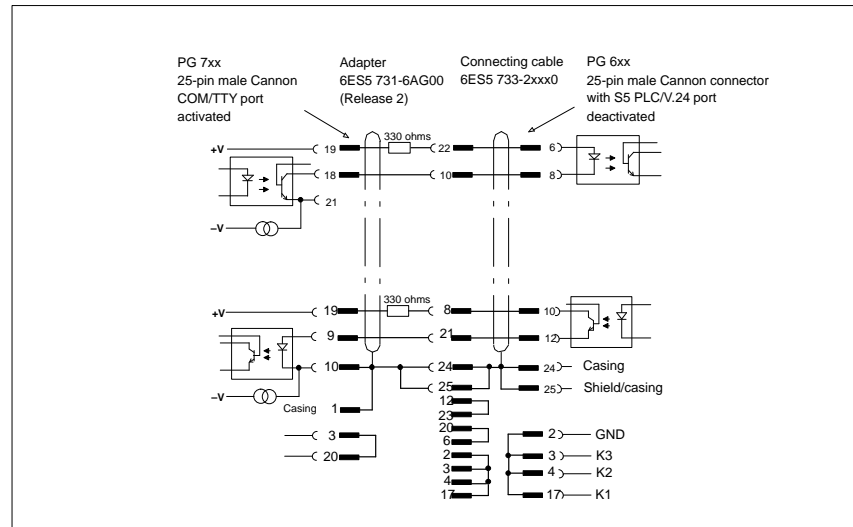


Figure 8-14 Connecting to the S5/RS-232 and COM1/TTY Ports of a PG 6xx Programming Device

Guidelines for Handling Electrostatically-Sensitive Devices (ESD)

A

**Chapter
Overview**

Section	Contents	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

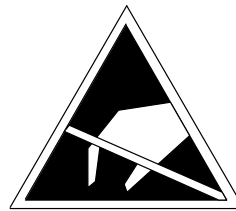
A.1 What is ESD?

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**evices 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.

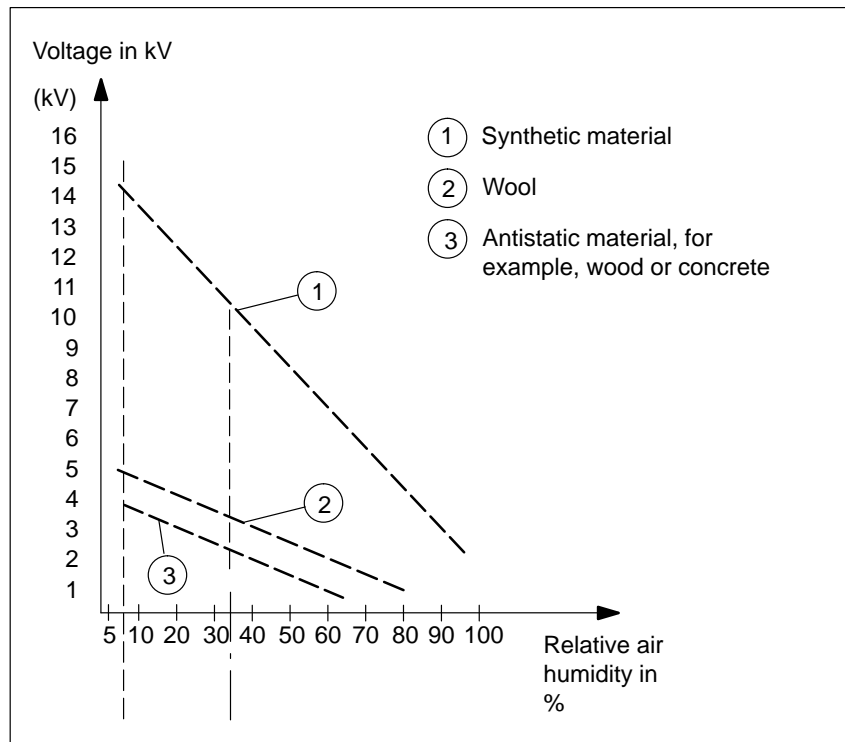


Figure A-1 Electrostatic Voltages which can Build up on a Person

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 MS-DOS/Windows operating system. Applications on your programming device are the STEP 5 Basic package, GRAPH 5, etc.

ASCII Editor With an ASCII editor you can process (that is, edit) text files which 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.

Basic Package STEP 5 This is a software package which represents the basis for all other STEP 5 software packages. With the programming device (PG 720), this package is used to program programmable logic controllers of the SIMATIC S5 family. The language used is known as STEP 5.

BIOS BASIC Input Output System

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

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

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

C**CD**

Compact Disk

Click

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

COM1 Port

The COM1 port is a serial RS-232/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 RS-232 interface which can be used to connect a mouse or a printer.

Configuration Files

These are files containing data which define the configuration after booting. Examples of such files are CONFIG.SYS and AUTOEXEC.BAT.

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 using the configuration utility.

Cursor

Collective term for mouse pointer and text cursor.

Cursor Control

Keypad on the keyboard for controlling the cursor.

D**Device Configuration**

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 parameter assignments.

If changes are made to the hardware configuration, the user can change entries in the configuration file using the SETUP program.

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).

- Diskette** The diskette (floppy disk) is an external data 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.
- Display** The flat monitor of the PG 720.
- 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** The PG 720 programming device is equipped with one hard disk drive and one floppy disk drive.
- 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 logic 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 the 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

Industrial Ethernet Bus system based on the Ethernet standard. Components of the SIMATIC S5 and S7 series (programming devices, programmable logic controllers, programmable control systems) can be networked using Industrial Ethernet interface modules.

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 which controls and extends the hardware periphery.

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

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 submodule in credit-card format containing RAMs or EPROMs.

Memory Expansion See Extended Memory

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 logic controller or programming device. They are available, for instance, as central controller modules, interface modules, or as bulk 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 a pointing 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 permits the simultaneous operation of several programming devices, text displays, and operator panels on one or more central processing units. The stations on the MPI are connected together via a bus system.
MS-DOS	(Microsoft Disk Operating System) is one of the standard operating systems for personal computers. It is a single-user system and is supplied installed on all our programming devices.
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 functions 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, MS-DOS).

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 one parallel interface (LPT1).

Password See Access Protection

PC Personal computer

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 LINK Linking two programming devices via a special connecting cable.

PLC SIMATIC S5 programmable logic controller

PROFIBUS Bus system based on the PROFIBUS standard. Components of the SIMATIC S5 and S7 series (programming devices, programmable logic controllers, programmable control systems, distributed I/Os) can be networked using PROFIBUS.

Programmable Logic Controller The programmable logic controllers (PLC) of the SIMATIC S5 system consist of a central controller, one or more CPUs and various I/O modules. The PLCs of the SIMATIC S7 system (for example, S7-200, S7-300) consist of one or more CPUs and various I/O modules.

Programmable Logic Controller System The programmable logic controllers (PLC) of the SIMATIC S5 system consist of one or more CPUs and various I/O modules. The PLCs of the SIMATIC S7 system (for example, S7-200, S7-300) consist of 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.

RS-232 Interface

The RS-232 interface is a standardized interface for data transmission. Printers, modems and other hardware modules can be connected to a RS-232 interface.

S**SCSI Interface**

Small Computer System Interface. Interface for connecting SCSI devices (hard disk drives, CD-ROM drives).

Serial Interface

Data is transmitted one bit at a time via a serial interface (port); serial interfaces are therefore slower than parallel interfaces.

SETUP

A program in which information about the device configuration (that is, the configuration of the hardware on the programming device) 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
Submodules**

Memory submodules for SIMATIC S5 which are programmed with the PG 720 and can be plugged into an S5 programmable logic controller.

**SIMATIC Memory
Cards**

Memory submodules in credit-card format for SIMATIC S5 and SIMATIC S7 which are programmed with the PG 720 and can be plugged into an S5 or S7 programmable logic controller.

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".

STN Display

Super Twist Nematic passive display

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 a pointing device for programs serviced by a mouse. On the PG 720, 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 and declarations for signal processing, by which a system (or process) is controlled or influenced.

V

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.

Working Memory The memory in which a program is stored which can be processed. Also known as main memory.

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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