

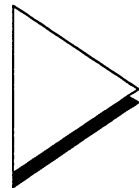
SIEMENS

SIMATIC S5

PG 730 Programmer

Manual

**6ES5834-0FC21
Release 03**



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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.

Technical data subject to change.

Safety-related 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:



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.

Only **qualified personnel** should be allowed to install and work on this equipment. Qualified persons as referred to in the Safety-Related Guidelines for the User in 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.

SIEMENS

PG 730

Programmer

Manual

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Siemens Aktiengesellschaft

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EWK Elektronikwerk Karlsruhe
Printed in the Federal Republic of Germany

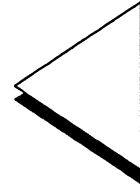
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Introduction


In this manual you will find all the information you require on the installation, setup and operation of the PG 730 programmer.

How to Use this Manual

The following information helps you become familiar with using the manual. The manual is structured so that purely technical information is clarified by examples that you can perform on your programmer.

Conventions

- Stress points individual steps in a series of actions
- Dashes items in a list
-  indicates tips and useful information
- /xx/* refers to literature listed in Chapter 6
-  you should read text following this symbol very carefully. This text, without exception, contains important information.

-  When your PG is delivered, one of the items included is a *Product Information*. This contains information on any special problems, additional tips and restrictions to the manual or the product. It should be regarded as a separate part of this manual, and in case of doubt the information in the Product Information should be given priority.

The authors of this manual would appreciate any suggestions or criticisms that would improve the quality of this documentation. For this purpose, please use one of the green forms to be found in the Appendix.

How this Manual is Organized

This manual will help you to set up and learn to operate your PG 730 and to use the software supplied.

The manual is organized into the following chapters:

1. **Introduction**
Provides an overview of the manual and tips on how to use it.
2. **Chapter 1 Setup and Installation**
This chapter guides you through unpacking and setting up your unit to the point where you switch on your PG 730 for the first time. All of the important connections are explained so you will have no hardware problems when you use the software.
3. **Chapter 2 Getting to Know your PG 730**
This chapter provides you with the hardware information you need to operate your programmer correctly.
4. **Chapter 3 Connecting Peripherals**
The PG 730 is expandable by adding other units. This chapter describes how to connect printers to your PG 730 and which cables to use to connect your programmer to a programmable controller and to a PC.
5. **Chapter 4 Working on the Open Unit**
This chapter describes all the maintenance tasks which you can perform yourself on the PG 730.
6. **Chapter 5 Error Diagnostics**
This chapter provides information on diagnosing the cause of errors which may occur.
7. **Chapter 6 Technical Data, Further Documentation**
This chapter contains the technical specifications for the PG 730 and a documentation list.
8. **Chapter 7 Index**
The index helps you to find your way quickly around the manual.

The Family of Programmers (700 Series)

The PG 710, PG 730, PG 750, PG 770-386 and PG 770-486 programmers are a family of programmers equipped to handle a wide range of applications in a modern environment.

These versatile programmers can handle all programming, service and installation tasks for SIMATIC S5 programmable controllers.

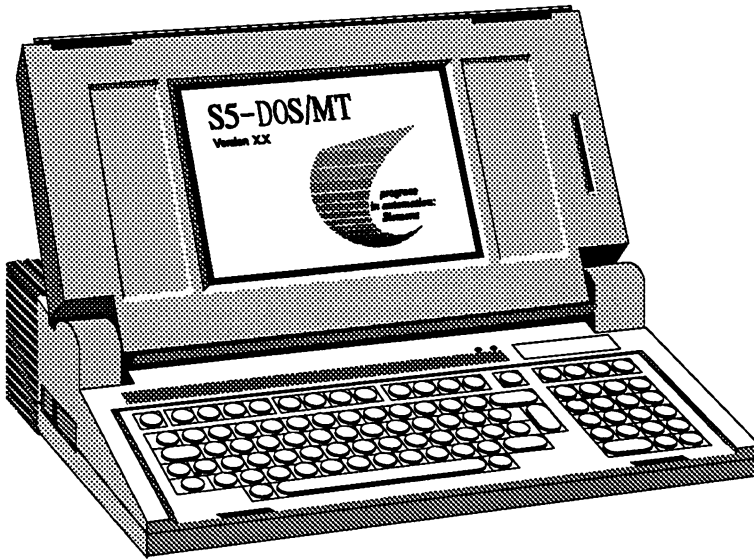
All the programmers are compatible with industry standards. You can program programmable controllers from other manufacturers who have program packages for AT-compatible hardware.

The programmers can also perform office tasks such as word processing, graphics and data management.

Hardware

The hardware for this family of programmers consists of state-of-the-art technology and covers a wide spectrum of customers' wishes and requirements.

The PG 730 Programmer



PG 730 Programmer

The PG 730 is suitable for creating, testing and documenting user programs for SIEMENS programmable controllers. With a view to future development, the PG 730 provides an operating system platform which ensures that it can be integrated into SIEMENS production automation systems.

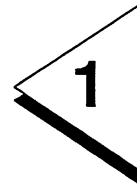
The PG 730 is a valuable addition to the range of SIEMENS programmers. Its lightweight design makes it extremely suitable for on-the-spot service tasks in automated systems.

The PG 730's robust construction makes it suitable for operation in an industrial environment.

The PG 730 is available in two versions:

- PG 730 monochrome version with liquid crystal display
- PG 730 C color version with color TFT display (Thin Film Transistor)

Both variations are described in this manual.



Setup and Installation

This chapter describes how to set up your PG 730, how to transport it safely and how to connect it correctly.

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1.1 Unpacking and Setting Up

- Unpack the box containing the PG 730.
- Do not throw away the original packing. This should be kept in case you wish to transport the unit at any time (see section 2.10 "Transport").
- The PG 730 is supplied with a carrying case. The front of the case has a compartment for mouse, mouse tablet and connecting cable. The case has been designed so you can also carry any documentation etc. you need.
- Open the upper section by pressing the dark catches on the front inwards. The upper section can now be raised. The display and keyboard are now in the operating position.

**Caution**

Make sure that the ventilation slits of the unit are not covered. The heat generated by the unit will not be adequately dissipated if the ventilation slits are covered.

Checking your delivery

After you have unpacked your PG 730, make sure that the following components are present:

PG 730 basic unit
Power cable
Mouse with tablet
Carrying case
PG adapter cable
Documentation

1.2 Connecting the Power Supply

With the exception of the EPROM programming interface, all the important connections for external units are located on the rear panel.

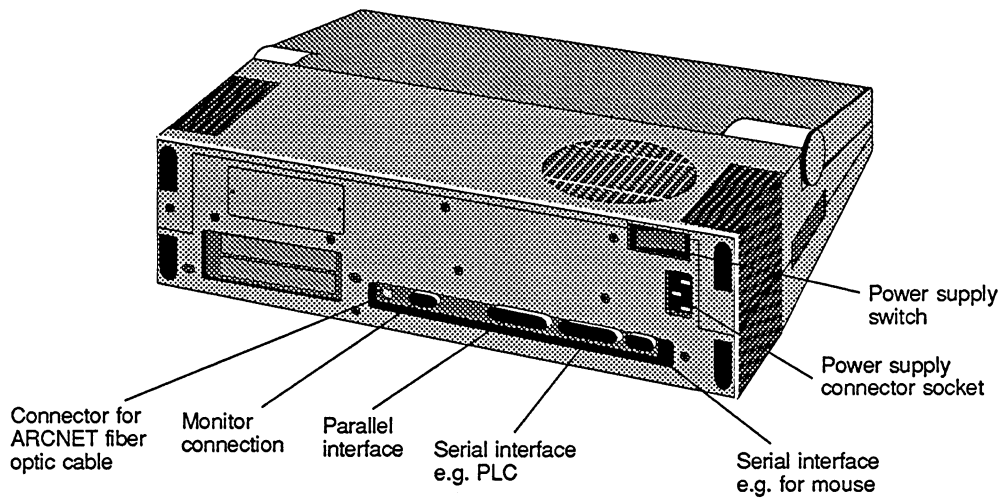



Fig. 1.1 Connections on the rear panel

- Use the accompanying power supply cable to connect the device to the mains.
- The power supply switch is directly above the power supply connector. When the PG 730 is switched on, this switch is illuminated (green).

The PG 730 can be operated with power supplies of 115 V and 230 V. The voltage is switched over automatically.

 Please refer to the details and notes for power supply connections in the USA and Canada in the chapter "Technical Data".

1.3 Connecting the Mouse

The COM2/V24/Mouse port is located below the power supply connection.

- Connect up the mouse. The mouse is required for making entries in certain programs (e.g. X/GEM applications such as X/GEM Draw, X/GEM Paint etc.).

1.4 Connecting SIMATIC S5 Programmable Controllers

To connect the PG 730 to a SIMATIC programmable controller, an adapter cable is supplied with the unit. Insert the adapter cable in interface COM1/V24 Modem/AG. The connection to the programmable controller can now be made easily with the with the appropriate connecting cable.



Caution

Only connect original programmable controller connecting cables to the adapter cable and make sure that you do not confuse the serial port COM1 with the parallel port LPT1. The interface may otherwise be damaged.

1.5 Connecting Printers

You can connect compatible printers with a parallel or serial interface to the PG 730 by using LPT1 (parallel) or COM1 and COM2 (serial). A special adapter cable allows you to connect a PT 88 printer (this type of printer is normally used with a PG 685), to the COM2 port. This connection is described in Chapter 3.



Caution

Only connect a printer with a parallel interface to the parallel port LPT1 when the device is switched off (the printer should also be switched off). An incorrect connection can damage the printer or your PG 730.

1.6 Connecting Monitors

An external monitor can be connected parallel to the display. A connector socket is present on the rear panel for this purpose.

The 15-pin socket is a VGA-compatible connection for a monochrome or color monitor.

For a resolution of 1024 x 768 pixels, a 17" monitor is recommended (see section 3.1 "Connecting an External Monitor").

1.7 Switching on the PG 730

- Press the power switch on the rear side of your PG. The unit then starts up.

Having switched on, the PG performs an internal hardware test run, during which the LEDs in the keys NUM LOCK, SCROLL LOCK, special key 'D' and LOCK light up briefly. The indicators for the drives light up in the order floppy disk drive, hard disk drive and then floppy disk drive again.

The following message appears on the screen:

Phoenix Advanced VIDEO BIOS Version xxx

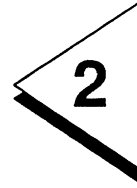
•
•
•

The LED on the hard disk drive lights up from now on whenever the hard disk drive is accessed.

One beep indicates that the PG is functioning correctly. Several beeps in sequence are signal codes which indicate errors (see Section 5.1.3).



The contrast of the liquid crystal display of the monochrome version depends on the temperature. The display warms up during the first few minutes after being switched on and the contrast of the screen improves. The contrast control on the right-hand side of the display should be turned to the lowest position before you switch on the unit. You can then use this control to select the contrast you require. Once the display has warmed up, the contrast remains stable.



Getting to Know your PG 730

In this chapter all the information you need about the hardware is provided, to be able to use your PG 730 to the full.

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2.1 Overview

The PG 730 is equipped with all necessary components. This means that it can be set up quickly and is immediately ready for operation.

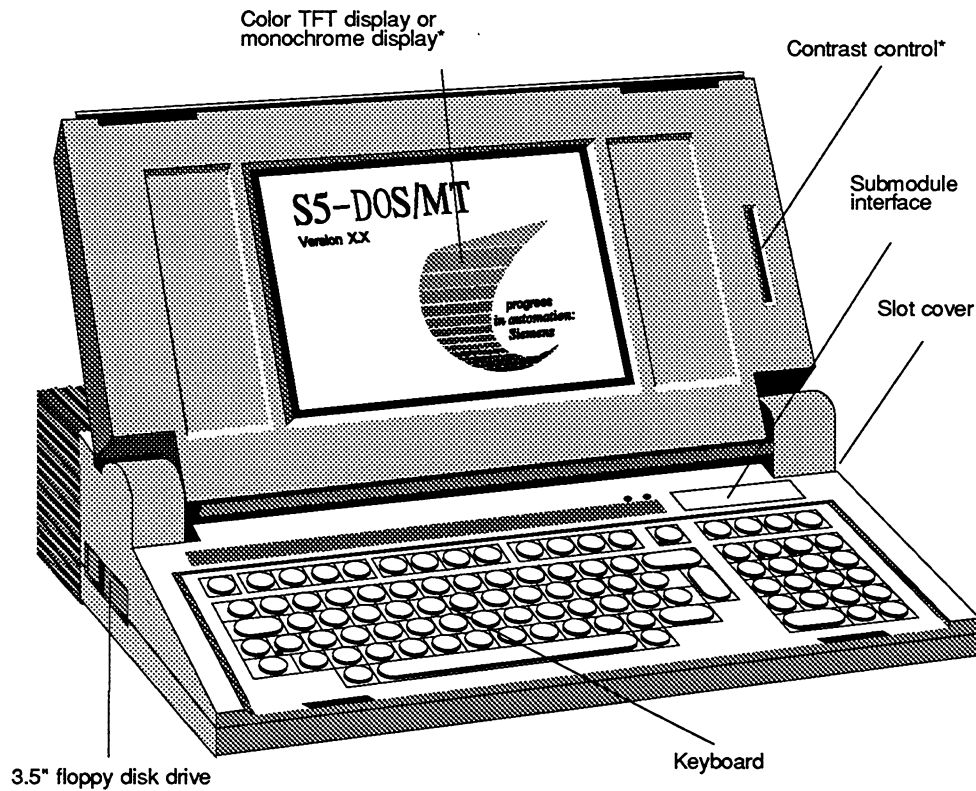


Fig. 2.1 Components of the PG 730

* Only with the monochrome version

2.2 Characteristics of the Casing

The ventilation outlet grille is raised. Raising the grille is intended to remind the operator that the opening must not be covered, otherwise there is a risk of overheating.

The PG 730 is fitted with a handle below the keyboard. This can be pulled out, allowing the PG to be carried easily.

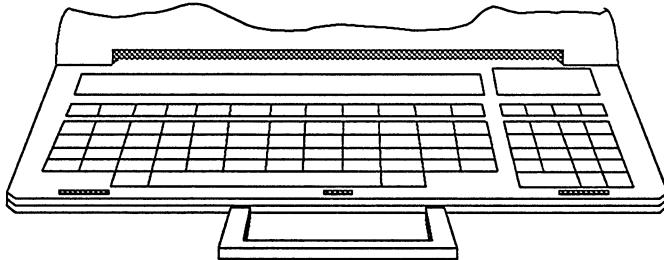


Fig. 2.2 Handle

The carrying case should be used for transport over greater distances. The main advantage of the case is that the mouse and cables can be carried in the front compartment.

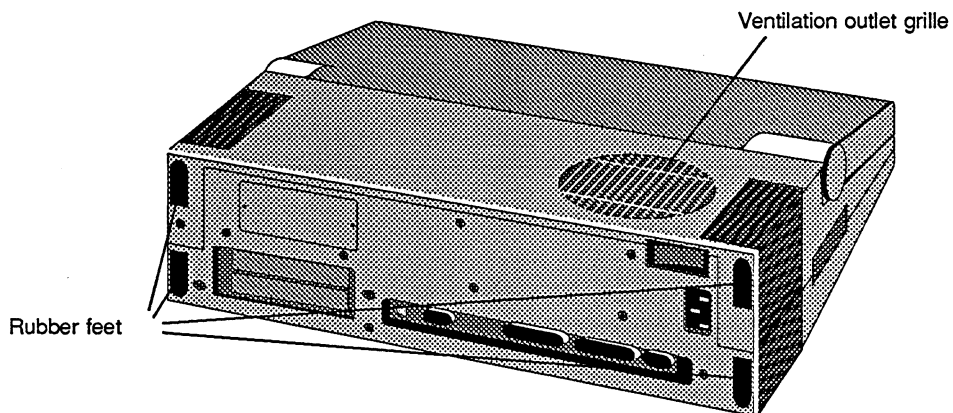


Fig. 2.3 Rear view

The side panels are well protected against knocks. The rear panel of the unit has 4 rubber feet for standing the unit on.

2.3 Drives

As standard, the PG 730 is equipped with a 3.5" hard disk drive and one 3.5" floppy disk drive.

2.3.1 Floppy Disk Drive

The PG 730 is equipped with one 3.5" floppy disk drive. The total storage capacity is 1.44 Mbytes with FlexOS and MS-DOS; with PCP/M it is 720 Kbytes (only double density diskettes). This drive (A) is a bootable drive.

The floppy disk drive is used to store programs and data on diskette and to load information from diskettes into the PG 730.

The drive is designed for double-sided diskettes (80 tracks per side, high density) and for double density diskettes. The PG automatically recognizes the diskette type by the code. Diskettes are written to or read from by two read/write heads. The read/write heads of the 3.5" floppy disk drive are lowered onto the surface of the diskette when the diskette is inserted.



Do not remove the diskette from the floppy disk drive when the LED on the drive is lit (drive active).

2.3.2 Hard Disk Drive

The PG 730 is equipped with a 3.5" hard disk drive.

Depending on the operating system, logical drives can be generated (refer to the description of the operating system).

Whenever the hard disk is accessed, the access indicator on the hard disk lights up.

Your hard disk is formatted and the software delivered with your PG already loaded on the hard disk.

2.4 Optical Indicators (LEDs)

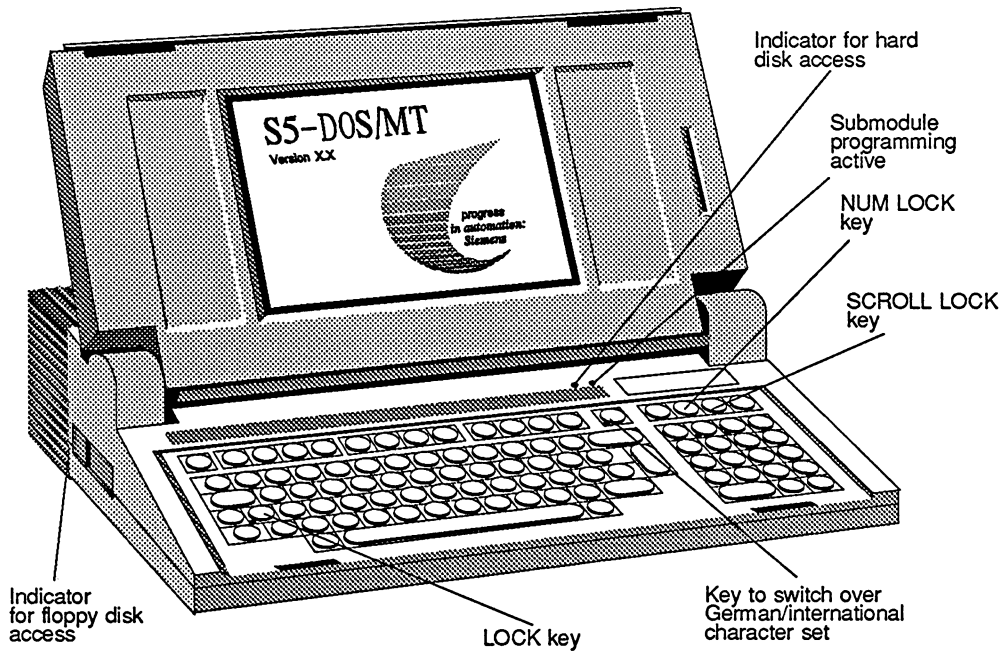


Fig. 2.4 Optical indicators on the PG 730


Four keys (LOCK, NUM LOCK, SCROLL LOCK and D) on the keyboard have LEDs in them. These indicate the current key assignment (see section "Keyboard"). When the unit is switched on, the keys NUM LOCK, SCROLL LOCK and LOCK light up briefly twice. The keyboard is then ready for use.

The two LEDs above the keyboard have the following functions:

- hard disk operating indicator
- submodule programming active



The floppy disk drive has an access indicator on the drive.

 Whenever the submodule programming indicator or the floppy disk drive indicator is lit, the EPROM submodule or the floppy disk may not be removed.

2.5 Display

The PG 730 is available in a monochrome or a color version.

2.5.1 PG 730 Monochrome Version

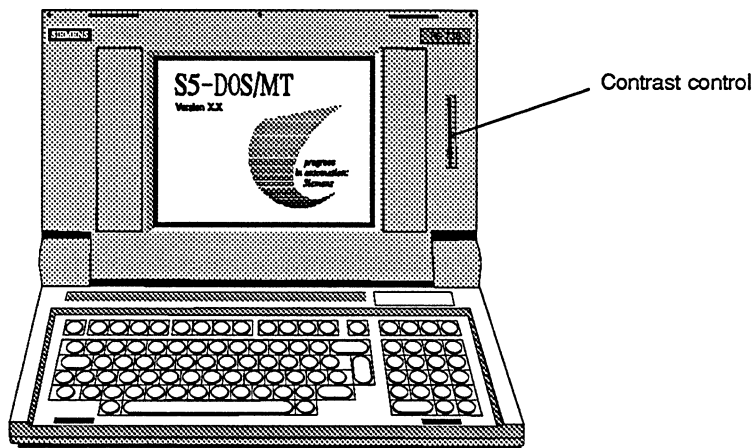


Fig. 2.5 Liquid crystal display

The upper part of the PG 730 (monochrome version) contains a 10" liquid crystal display. This operates as a black-and-white display with a resolution of 640 x 480 pixels. Shades of gray are only displayed if the graphics are working in a color mode (under MS-DOS: MODE C080).

The contrast of the liquid crystal display depends on the temperature. During the warming up phase after you have switched the PG on, the contrast must be adjusted. The contrast control is a thumbwheel potentiometer to the right of the display.

2.5.2 PG 730 C Color Version

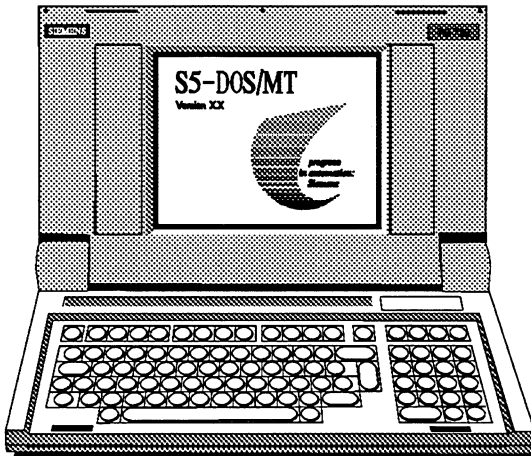


Fig. 2.6 TFT color display (color version)

A 10" TFT (Thin Film Transistor) color display is integrated in the color version, which works with a resolution of 640 x 480 pixels.

Each of the basic colors red, green and blue can be displayed in 8 different shades of color. If you include all the colors which can possibly be created by mixing, a maximum of 512 different colors can be represented. The contrast control is automatic for the color version.

To prevent the display overheating, the backlighting is automatically switched off when the upper part of the display is closed.



Caution

No hard pointed objects, water or solvents (aromatic substances and ketone) should ever come in contact with the display. Use only a soft cotton cloth and a neutral cleaner to clean the display.

If the display is damaged, liquid crystal can escape. Avoid contact with the skin and do not inhale the vapors. Any liquid should be rinsed off immediately with alcohol and then with water if it comes in contact with the skin.

2.6 Color Graphics Interface

The color graphics interface for the PG 730 is compatible with the industry standard. Two parts are integrated in the interface module:

- VGA part for standard applications
- GSP part for complex graphics applications

The GSP and VGA parts are two completely independent graphics interface components. Both are capable of controlling the internal display.

The heart of the GSP part is the graphics processor TMS 34010.

You can also run an external monitor with the color graphics interface in the PG 730 using the RGBS interface. You do not need to switch over manually, nor do you need to change any cables (see section 3.1 "Connecting an External Monitor").

2.7 Keyboard

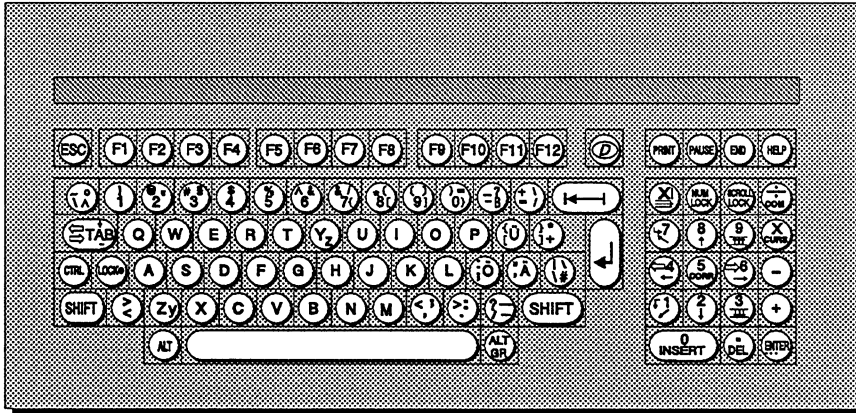


Fig. 2.7 Keyboard

The keyboard is divided into 3 key fields:

- the typewriter keyboard,
- the numeric keypad with cursor keys and
- the function keys.

2.7.1 Typewriter Keyboard (Alphanumeric Keyboard)

The largest of the three key fields is the typewriter or alphanumeric keyboard. This contains the keys for the alphabet, for numbers and special characters.

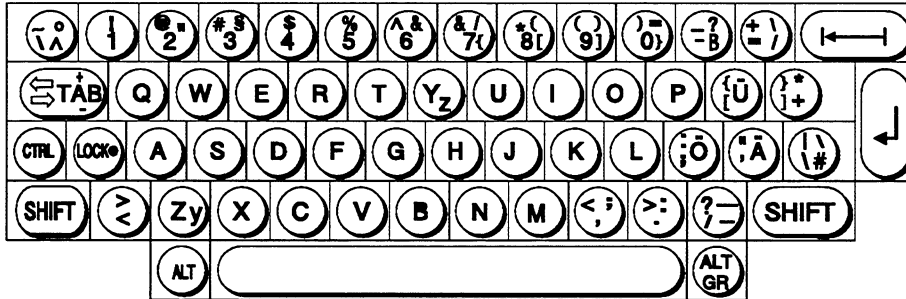
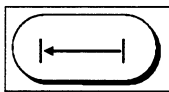
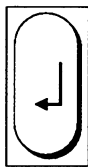


Fig. 2.8 Typewriter keyboard



The BACKSPACE key moves the cursor one space to the left and deletes the character that was at this position. The function of the backspace key depends on the application (program) selected.



The RETURN key is also called the ENTER key. If you press the return key, the cursor jumps to the first space in the next line. The application you choose determines when to use the return key.



The alphanumeric keyboard has three switchover keys. If the LOCK key is pressed, the LED in the key lights up and all the letters are written in upper case. Pressing the key again reverses the effect (international keyboard). With the German keyboard, the LOCK key functions as a permanently pressed SHIFT key. Pressing the SHIFT key again cancels this effect.



The tabulator key moves the cursor by several positions to a set tab.



The CTRL key has functions which are explained in the operating system and user program descriptions. The CTRL key is always pressed in combination with other keys.

One example of an important key combination using the CTRL key is CTRL + ALT + DEL. This key combination resets and restarts the operating system of the computer.



The ALT key, like the CTRL key, has varying functions that depend on the operating system or the program you are using. The ALT key is also used in combination with other keys. When you press the ALT key, you can enter the hexadecimal value of an ASCII character (use the numeric keypad on the right of the keyboard). The operating system interprets the ASCII character and displays it on the screen; e.g.: <ALT> 155 will give you the "ç" character.



The ALT GR key is similar to the ALT key. The ALT GR key allows you to generate additional key codes. Example for the international keyboard assignment: <ALT GR> + <7> will give you " { ".

2.7.2 Numeric Keypad with Control Functions (Cursor Keys)

The keypad to the right of the typewriter keyboard is used to control the cursor or to input numerical data.

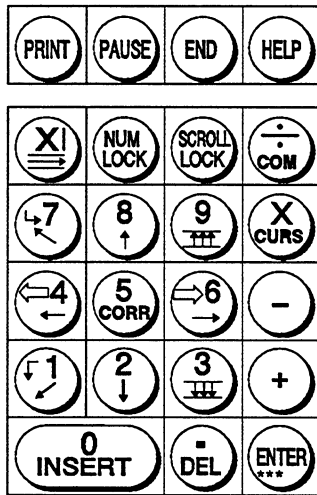
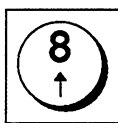
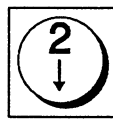


Fig. 2.9 Numeric keypad with cursor control

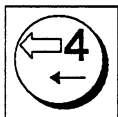
Depending on the operating system, either the cursor controls or the numeric keys are switched on when the PG is switched on. The LED on the NUM LOCK key indicates which function on the numeric keypad is currently active. Press the NUM LOCK key to switch from cursor control to numeric characters. The numeric keys make it easier to enter long columns of numbers. Press the NUM LOCK key again to switch back to cursor control.



Cursor up



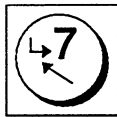
Cursor down



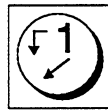
Cursor left



Cursor right



Cursor to start (home)



Cursor to end



Page backwards



Page forwards

Function keys

There is a row of twelve programmable function keys located above the typewriter keyboard.

You can insert a template above the function key field that explains the function of these keys.




In addition to the twelve numbered function keys, the following special keys ESC (left), D (language code key in the middle), PRINT, PAUSE, END and HELP are located in the same row.




Special key









The special key "D" can be used to switch from the German character set (LED is lit) to the international character set (LED is not lit). This convenient function can be used only with the appropriate operating system utility.

2.7.3 Special Key Combinations

 +  +  Starts SETUP program

 +  +  CPU = fast

 +  +  CPU = slow

 +  +  Monochrome version:
reverses LCD display
(under PCP/M and MS-DOS)

2.8 Submodule Programming Interface

You can use the interface to program SIMATIC S5 submodules. You can use one SIMATIC S5 submodule to read from or program 1 to 4 EPROMs or EEPROMs. Refer to the *STEP 5* manual, chapter 11 "Utilities for EPROM/EEPROM Submodules" for more information on using the programming software.

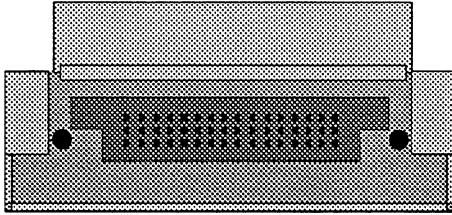


Fig. 2.10 PG 730; submodule programming interface

Use the following steps as a guideline when you want to read from or program a submodule:

- Open the protective cover to the submodule slot and insert a module.
- Adhere to the ESD guidelines.
- Do not insert or remove the module when it is being programmed.
- Remove the module after it has been programmed.
- Close the protective cover to the interface so that no foreign objects can fall into the slot.

2.9 Labeling Templates

There are recessed areas to the left and right of the display and above the keyboard where you can insert labeling templates.

You can insert current notes, such as key assignments, behind a transparent foil. You can use a foil pen to write on the foils directly. The templates provide you with easy access to information you need and keep you from having to look up the information in other sources.

2.10 Transport

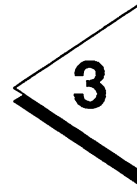
- Before transporting the unit, the connections on the rear panel must be removed.
- Fold down the upper part of the display section and let it lock in.

The unit is now ready for transport and can be carried by the handle. If you are transporting the unit over larger distances, you should use the carrying case.



When transporting the unit in cold weather, when it may be subjected to large variations in temperature, care must be taken that no condensation is allowed to form on or in the unit. The PG 730 should be allowed to reach room temperature slowly before it is started up.

If you want to send your unit by post, use the original packaging.



Connecting Peripherals

You can add to the functions of your PG 730 by connecting a range of external devices according to your own personal needs.

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3.1 Connecting an External Monitor

Parallel to the display, an external monitor can also be connected via the socket on the rear panel.

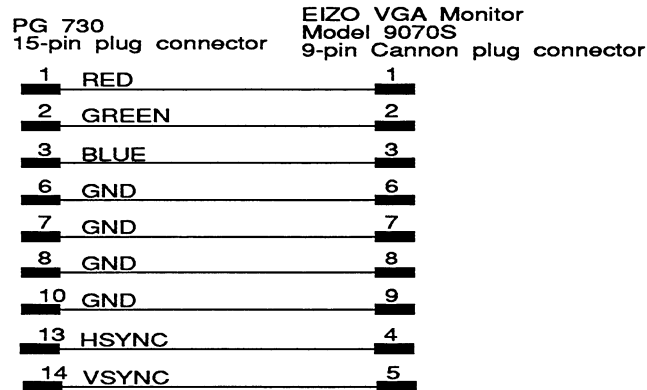


Fig. 3.1 Monitor cable (part of the monitor)

The 15-pin socket is a VGA-compatible connection for a standard VGA monochrome or color monitor. Only plug in the monitor cable when your PG is switched off.

The color graphics support a maximum resolution of 1024 x 768 pixels with a refresh frequency of 50 - 70 Hz. When buying a monitor, you should ensure that it is capable of processing a line frequency of 30 - 37 kHz. This will enable you to take full advantage of the maximum resolution of the PG 730.



Caution

Before plugging in the interface cable you should discharge the electrostatic charge from your body and from the interface cable by briefly touching a grounded object.

3.2 Connecting Printers

The printers PT88/PT89, PT88S/PT89S, PT90, the laser printer PT 10 and all HP Laserjet Series II and Series III-compatible printers are recommended and can be connected via the parallel interface.

If you already have a PT88/PT89 with a different interface, contact your local service department for assistance. If you intend to install a parallel interface yourself, please refer to the User's Guide for your printer.



Caution

The interface cable for the LPT interface may only be plugged in when the unit is switched off.

3.2.1 Connecting PT88/89 and PT88S/PT89S Printers (example)

Setting the code switch

On the PT88, PT89 and PT90 printers, you can select certain standard functions and the character set.

These options are selected with a code switch located behind the opened cover of the printer. The PT88S/PT89S printers have two code switches.

The following functions are examples of those you can set using the code switch:

PT88/PT89

(German character set, LF = CR* + LF, CR = CR, page length 12", line feed 1/6", 80 characters/line)

PT88S/PT89S

(German character set, CR = CR, pitch 1/10", normal print, zero printed without slash, page length 12", line feed 1/6", no form feed at the end of the fixed page length, printer is always selected, 8th bit = 1; bit 8 is evaluated)

* LF - Line Feed, CR - Carriage Return,

For more detailed information about the significance of the switch settings, refer to the description of your printer.

Connection via a serial interface

You can use a serial interface to connect your printer to the PG 730. The user's guide for the PT88/PT89 describes the cable you need, and tells you how to set the interface to adapt it to the PT88/PT89. Refer to the description of the interface adapter module in the user's guide for information about the PT88S/PT89S. You must also change the printer output mode on your PG 730.

A cable for connecting a PT88/89 printer with a V.24 interface to the PG 730's COM2 port is available as an option.

Order number: C79195-A3638-E600 (adapter cable)
 6ES5735-2xxx0 (printer cable)



Both the adapter cable and the printer cable are required to connect the PT88/89 printer to the COM2 port.

Printer output mode

When using the MS-DOS operating system, you must enter the following command sequence for the V.24/V.28 interface. (PCP/M users should refer to the printer output information in the *PCP/M Pocket Guide*):

C:MODE LPT1:=COM1:

Printer 1 is assigned to serial communications port 1.

C:MODE COM1:96,n,8,1,p

Modes: 9600 bps, no parity, 8 data bits, 1 stop bit.

P indicates that in case of a "time out", data transmission is continued until the printer acknowledges it.

The mouse interface can, if necessary, be used as a serial interface. Use the following command sequence to enter the mouse interface:

C:MODE LPT1:=COM2:

The mouse interface is assigned to serial communications port 2.

C:MODE COM2:96,n,8,1,p

Mode: 9600 bps, no parity, 8 data bits, 1 stop bit.

Enter the following command sequence to switch LPT1 to the parallel interface again:

C:MODE LPT1:

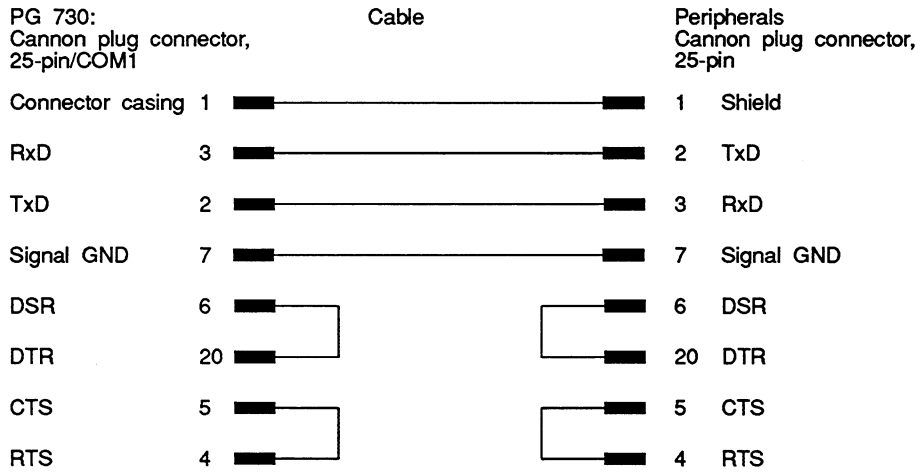
For further information about the MODE command, refer to the operating system description.



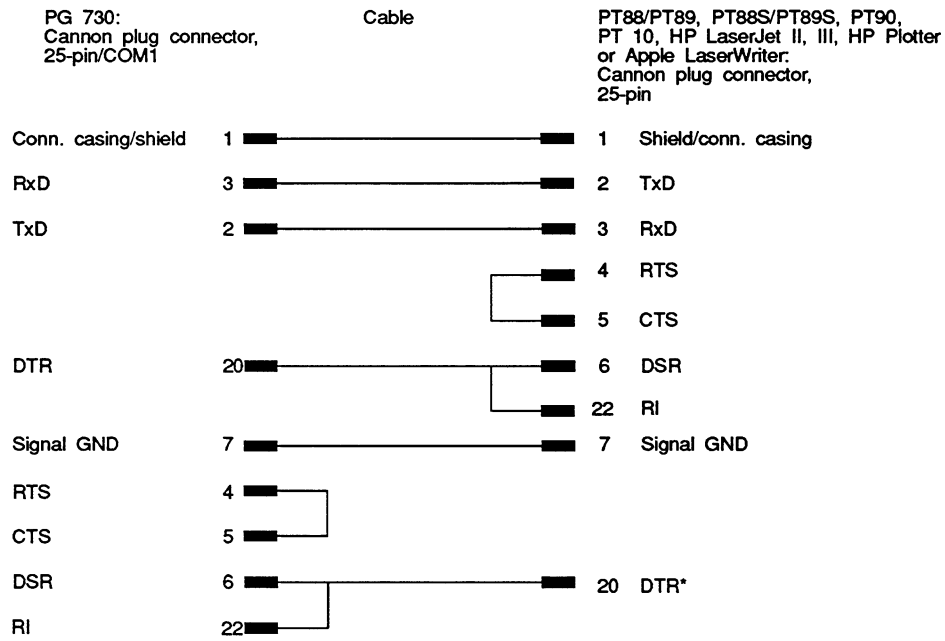
To avoid having to enter the command sequence each time the hardware is switched off or reset, write the command sequence in a STARTUP or a BATCH file. If you need additional information, please refer to the operating system description.

Examples of cable connections to the serial ports

Simple cable connection from the periphery to the V.24/V.28 interface on the COM1/V.24/V.28 port of the PG 730 (XON-XOFF protocol).

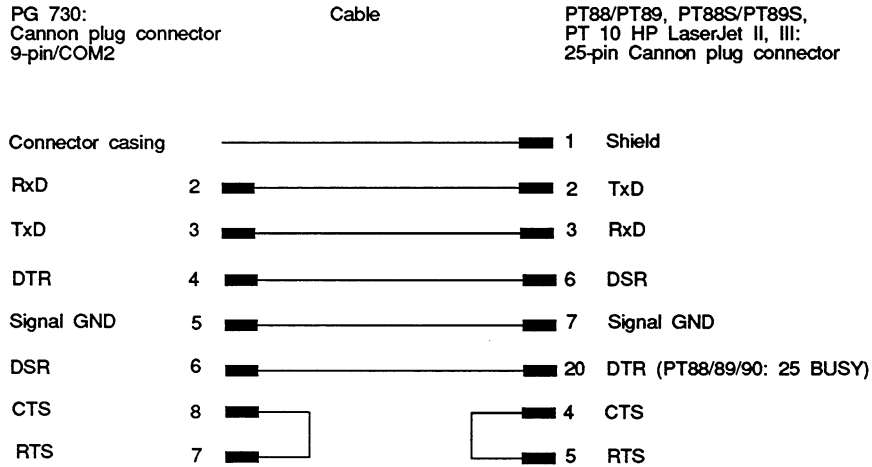


Example of a simple null modem cable connection between the PG 730 and a printer with a V.24/V.28 interface. Here, the V.24/V.28 COM1 port on the PG 730 is used.



* on the PT88/PT89/PT90 the BUSY pin 25 can be switched to DTR pin 20 (code switch)

Example of a simple cable connection to link a printer (PT88/PT89, PT88S/PT89S, PT10, HP Laserjet II, III) to the COM2 V.24/V.28 port of the PG 730.



Interface adapter (example)

To adapt the PT88/PT89 and PT88S/PT89S printer interfaces, you must set the operating mode switches on the SAP-S1 interface adapter module as follows:

Setting of the mode switches:

- Baud rate: 9600 bps, operation with signal busy
- Line busy (negative potential)

3.2.2 Connecting a Laser Printer

All HP Laserjet Series II, HP Laserjet III-compatible printers are connected via the parallel interface. Use the interface cable V22112-A31-A801 (Centronics). Set the HP Laserjet Series II by using the menu key while offline (for more information, refer to the installation instructions for your printer).

Recommended printer settings (e.g.: HP Laserjet Series II)

SYMSET	=	IBM-US
AUTO CONT	=	OFF
I/O	=	PARALLEL
COPIES	=	01
MANUAL FEED	=	OFF
FONT SOURCE	=	I
FONT NUMBER	=	00
FORM	=	064LINES

3.3 Connecting to ARCNET

ARCNET stands for "Attached Resource Computer Network". It can connect computer systems (SIMATIC programmers, SIEMENS PCs and other computers) via fiber optic cables.

As standard, the PG 730 is equipped with a plastic fiber optic module. The maximum possible length of the fiber optic cable is 20 m. Transmission lines of up to 1000 m can be achieved using glass fiber optic cable modules and glass fiber optic cables via a node switching point (HUB). The main advantage of this system is the complete immunity to electromagnetic influence on the network and the absence of network interference.

The whole network should not exceed an overall distance of 6000 m. The gross data transfer rate is 2.5 Mbps.

ARCNET corresponds to a tree structure. This means that the stations are connected to a common node. If there are more than two stations, a node switching point (HUB) is necessary. Depending on the extent of the network, several node switching points can be linked together. A maximum of 255 stations can be connected to the network.

The "modified token passing" technique used by ARCNET works on the principle that a token is passed from node (RIM = **R**esource **I**nterface **M**odule) to node. If a node has the token, the network is at its disposal and it can send messages while all other nodes listen and receive. Acknowledgements of transmissions and messages about the status of the receive buffer are recorded. This avoids time being wasted and data being lost. When nodes are switched in or out of the network, it reconfigures itself.

If the ARCNET section is released by entering a node number with the program "SETUP", interrupt IRQ5 is reserved for ARCNET.

3.3.1 Setting the Node Number

The node number is set by the software utility in the SETUP program.

The node number 0 is not available, since this is used for "broadcast messages". Broadcasting allows a station to send data to all other stations simultaneously. If you enter 0 as the node number, ARCNET is treated as being not installed and the interrupt IRQ5 is free.

3.3.2 Setting the Response Time

In the normal situation, a response time of 74.7 μ s is set. This setting can be retained in almost all cases. A different response time can be selected with the program SETUP. A change is only required with extremely large networks, in which the token may be significantly delayed. Such networks are those with stations more than 6 km apart or with more than 64 stations. The delay is caused by the transmission medium and the number of HUBs installed.

It is important that all network stations have the same delay set, otherwise the network will continuously attempt to reconfigure itself.

Response time in μ s	Reconfiguration time in μ s
74.7	840
283.4	1680
561.8	1680
1186	1680



When using EMS drivers you should ensure that no address conflicts arise with ARCNET in the address range E0000h..E0FFF and D0000h..D0FFF. For further information on how you avoid address conflicts, refer to the description of the EMS drivers.

3.3.3 Setting the Address Range

Two address ranges are available:

- 0E0000h to 0E07FFh for the message buffer; 0E0800h to 0E0FFFh for commands
and
- 0D0000h to 0D07FFh for the message buffer; I/O addresses 2E0h to 2EFh for commands

The addresses are selected by means of the SETUP program. The selection of the correct address is dependent on the network driver software used. As standard, the first address range 0E0000h is used (see operating system software).

3.3.4 Fiber Optic Cable for ARCNET

For transmission with fiber optic cables, lengths of 10 m and 25 m are available.

Order number:

- 10m 6ES5733-8CB00
- 25m 6ES5733-8CC50

3.4 Connections for PG LINK

The programmer can be linked via a connection cable with a PLC or another programmer.



Caution

Before plugging in the connection cables you should discharge the electrostatic charge from your body and from the cable by briefly touching a grounded object. Ensure that the TTY cable is plugged in the COM1/AG port on the PG and not in the LPT1 port. If the TTY cable is plugged incorrectly the LPT1 port can be damaged.

Suggestions for configuring interfaces with current loops (TTY, 20 mA)

Accurate data transfer is dependent on several factors. The data transfer rate you can achieve (baud rate) depends on the distance, the cable type, the interface selection, and the interference factors.

You can reduce interference by correctly selecting and installing the transmission cable. Use the following guidelines when selecting and installing the transmission cable.

- Use shielded cable with a low line resistance and a low capacity. (Note: shielded LiYCY cables with a resistance of 130 ohms/km and a capacity of 90 pF/m work well). Improved performance against inductive interference can be achieved with twisted pair cables. A low line resistance leads to a low voltage deviation in the cable and causes short load transfer times. As the diameter of the cable increases, the resistance for a given cable length increases.
- Use the shortest possible cables. The shorter the transmission distance, the higher the maximum transmission rate possible.
- Choose the correct sequence of access priority to the transmission circuit if there is both an active sender and an active receiver on the same transmission side. Do this to achieve the best transmission rate possible.
- **Under no circumstances** should signal lines and supply lines be wired together in a **single string**. Signal lines must be installed as far away from strong interference sources (e.g. 400 V three-phase power cable) as possible. (Note: the interference field decreases exponentially with the distance).
- The active TTY interface with 12 V no-load voltage was tested with a cable length of 1000 m at a transmission rate of 9600 bps in a normal interference environment (field strength <3 V/m). If an LiYCY 5x1x0.14 shielded cable is used, it is possible to have an error-free transmission for up to 1000 m. The transmission was tested with the AS511 protocol (only one transmitter at a time).

Ref.: SIEMENS SN31170 ff (EMC) standard

3.4.1 Linking the PG 730 to a PLC

The PG 730 can be linked to a SIMATIC S5 programmable controller via the TTY interface using a connecting cable.

Standard connecting cable:

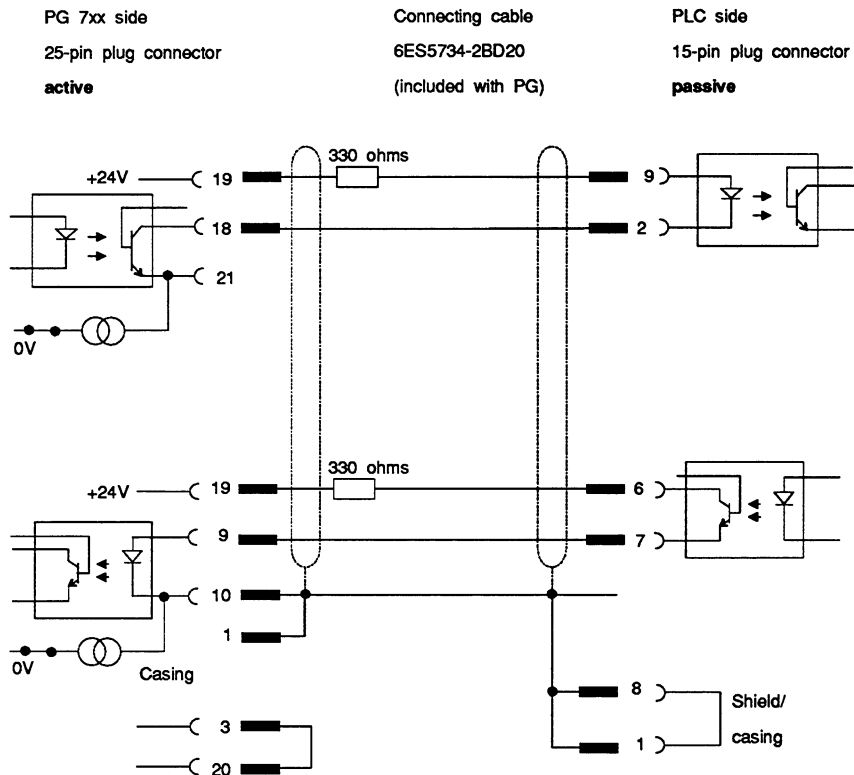


Fig. 3.2 Linking the PG 730 with PLCs

In order to maintain a baud rate of 9600 bps up to a distance of 100 m the receiving diode is connected via the adapter cable to ground as a reference.

If you need longer cable lengths, you can order them by using this order number: 6ES5734-2XXX0 (xxx represents lengths up to 1000 m).

Connecting a PG 7xx instead of a PG 6xx to SIMATIC PLCs

Should you wish to use an existing PG 6xx-to-PLC link with the standard connecting cable 6ES5731-0xxx0 or 6ES5734-1xxx0 with a PG 7xx, you need the adapter provided:

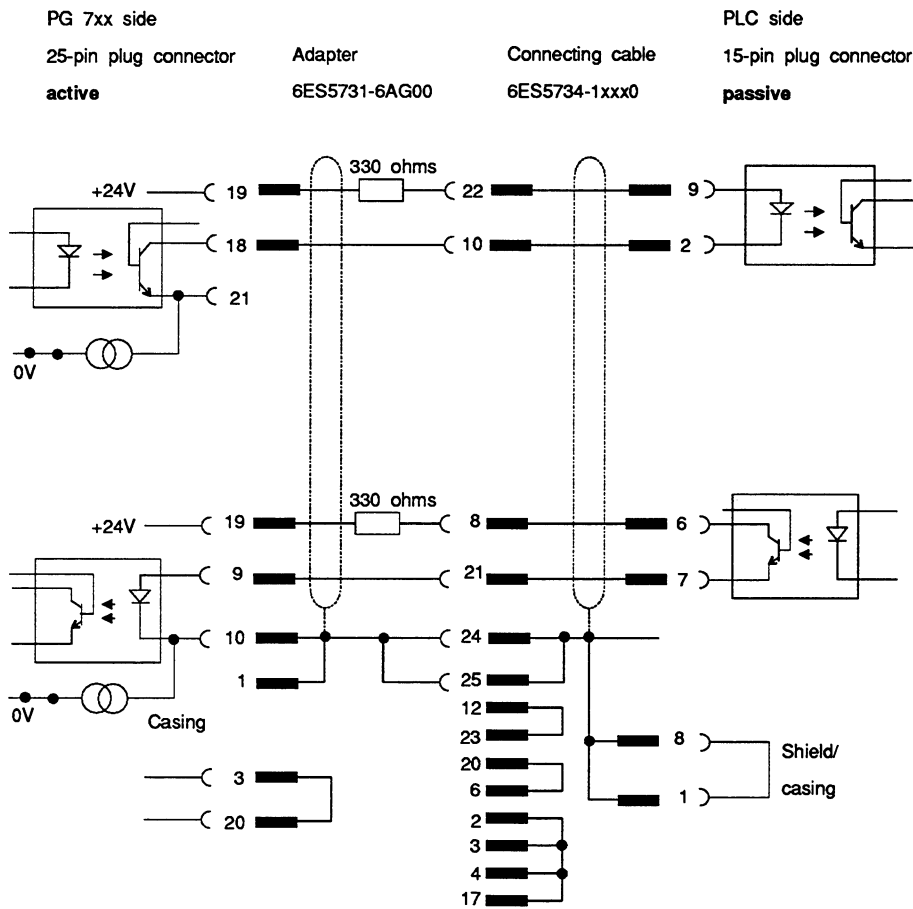



Fig. 3.3 Connecting cable with 15-pin connector and adapter

 For the connecting cable 6ES5734-1xxx0, the adapter 6ES5731-6AG00 is required when connecting a PLC to a PG 7xx.
For the connecting cable 6ES5734-2xxx0 no adapter is required when linking with the PLC.

Connecting cable with 25-pin socket

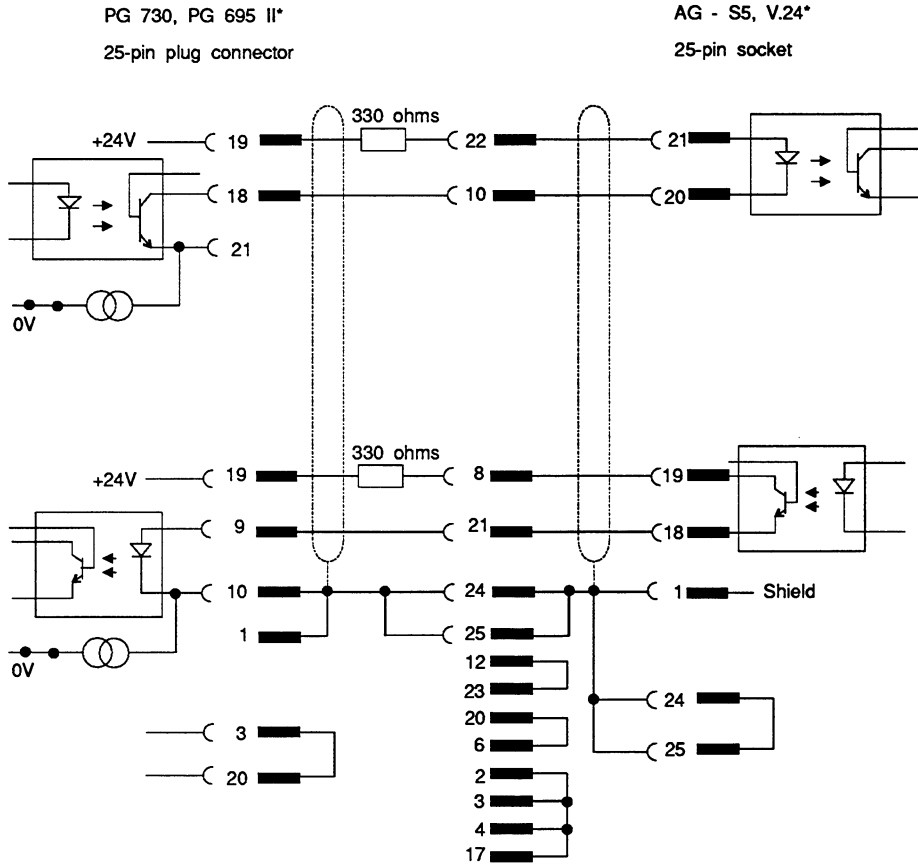


Fig. 3.4 Connecting cable with 25-pin socket

* Label on the casing of the connector

3.4.2 Linking the PG 730 to other PGs

You need one PG 7xx with an active TTY interface and one PG 7xx with a passive TTY interface for this connection.

PG 730 with active COM1/TTY interface (default on delivery): jumper X30/1-2 and X30/ 3-4 plugged.

PG 730 with passive COM1/TTY interface: jumper X30/1-2 and X30/3-4 open.

The jumper X30 is found below the power unit. The power unit must be removed in order to insert or remove the jumpers. See also the sections "Removing the power supply unit" and "Replacing the power supply unit" in chapter 4.



The terms "active" and "passive" TTY interfaces are hardware terms, not to be confused with the terms ACTIVE and PASSIVE in the PG LINK package.

Connecting the PG 730 with a PG 7xx or PG 695 II (PC 16-20)

PG 7xx, PG 695 II (PC 16-20)

25-pin Cannon plug connector

interface: COM1, TTY **active**

PG 7xx, PG 695 II (PC 16-20)

25-pin Cannon plug connector

interface: COM1, TTY **passive**

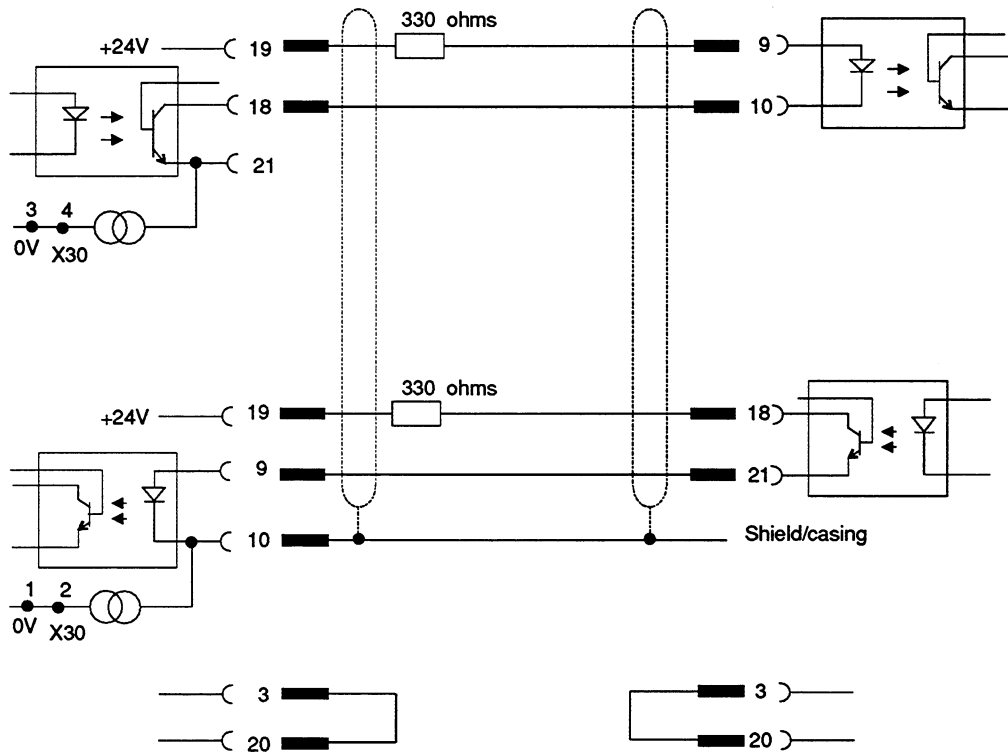


Fig. 3.5 Connecting the PG 730 with a PG 7xx or PC

Connecting the PG 730 with other PGs (PG 635, PG 675, PG 685, PG 695 I)

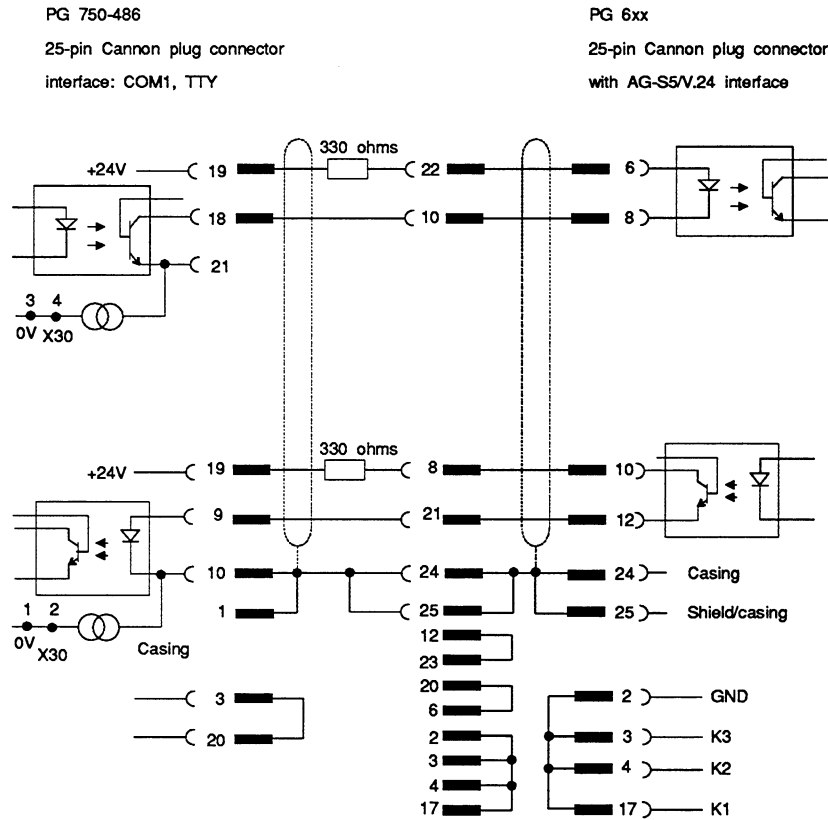


Fig. 3.6 Connecting the PG 730 with other PGs

For this connection, the PG 730 is used as the active programmer (default on delivery). This is achieved by connecting the cables 6ES5 731-6AG00 and 6ES5 733-2xxx0 in series.

When connecting in series, be sure to connect the lines in the correct direction.





Working on the Open Unit

You can add to the functions of your PG 730 by extending the hardware according to your own personal needs.

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4.1 Opening the Unit

The installation of expansions and options as well as repair work on the PG 730 should only be done by trained and authorized personnel. The following section is intended for such personnel. The unit is designed for easy maintenance, so that any work can be performed quickly while keeping costs to a minimum.



Caution

The electronic components of the printed-circuit boards are extremely sensitive to electrostatic discharge. When handling the boards, you must follow the guidelines for electrostatically sensitive components. Please read these guidelines carefully.

ESD Guidelines

Please note that all modules and components of the PG 730 are ESD-sensitive.

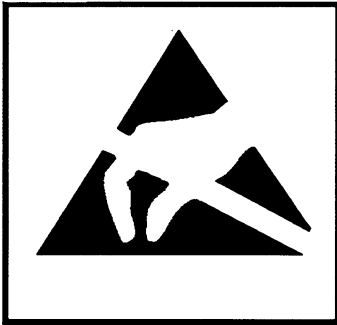


Fig. 4.1 Warning sign

The following information is very important if you are working on an open PG 730:

- Discharge any electrostatic charge on your body before you open the unit. You can do this by touching metallic parts on the rear panel of the PG 730 before you disconnect the power supply cable.
- Discharge any electrostatic charge on tools or units that you use inside the PG 730.
- Wear a grounding wrist strap if you are handling components.
- Leave components and modules in their packing until you are ready to install them.
- Plug or unplug components and modules only when no voltage is applied. Turn off the power supply first.
- Touch components and modules only on their edges. Above all, do not touch the connecting pins and conductors.

4.1.1 Procedure for Opening the Unit

In the factory, the PG 730 is assembled by machine using combination TORX screws.

To open the unit, you need the appropriate TORX screwdriver. Use a size T10 TORX screwdriver with M3 TORX screws.

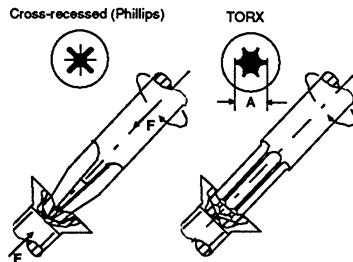



Fig. 4.2 Cross-head TORX screwdriver

Removing the upper display section

To open the PG 730, you first remove the upper display section. Proceed as follows:

- Switch off the PG 730 and remove the power supply plug. Remove all other connecting cables from the rear panel.
- Remove the covers from the hinges on the right and left. The hinge pins are then accessible.
- Release the clips locking the display section at the front of the unit.
- The hinge pins can now be pulled out. If this proves difficult, move the upper section gently up and down while pulling the pins. Do not use force.
- After the hinge pins have been removed, pull the display section 5 cm toward the front. The ribbon cable for the display passes through an opening behind the keyboard. Remove the connector from the module.
- The display can now be removed.

 The springs in the hinges stop the upper display section from slamming shut, thus preventing any damage.

Opening the casing

**Warning**

Do not operate the unit with the cover open.

Once you have removed the display panel, proceed as follows:

- Loosen the slot cover on the right-hand side of the unit, by loosening the screw on the rear panel.
- Stand the PG 730 on the rubber feet on the rear panel, so that the 5 TORX screws in the base of the unit are accessible.
- Loosen the screws and lay the unit down again in the normal position. Caution: the screws will fall out of the holes.
- Press the catch at the center of the rear panel slightly and lift the cover upwards via the rear panel. The cable connection to the keyboard is now accessible.
- Unplug the keyboard connecting cable from the connector on the main board.
- Lift the cover towards the front out of the mounting clips.
- The unit is now open and you can install any required options.

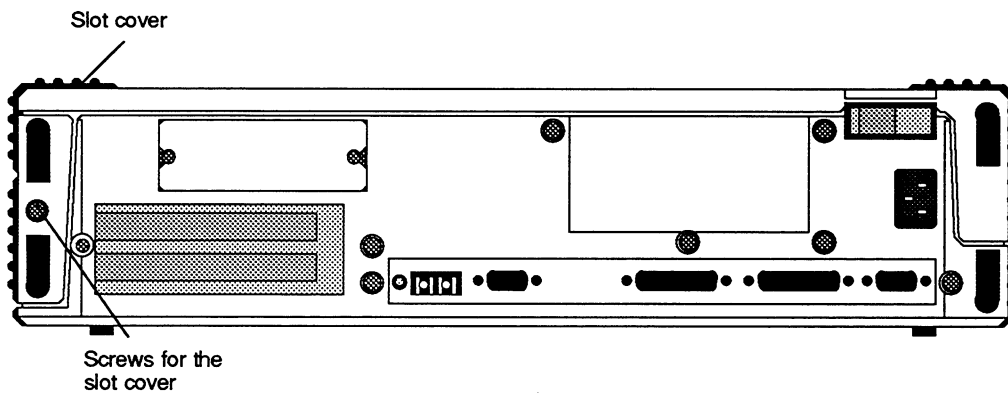


Fig. 4.3 PG 730; rear panel

4.1.2 Functional Units

Once you have opened the PG 730, all of the important functional units are accessible.

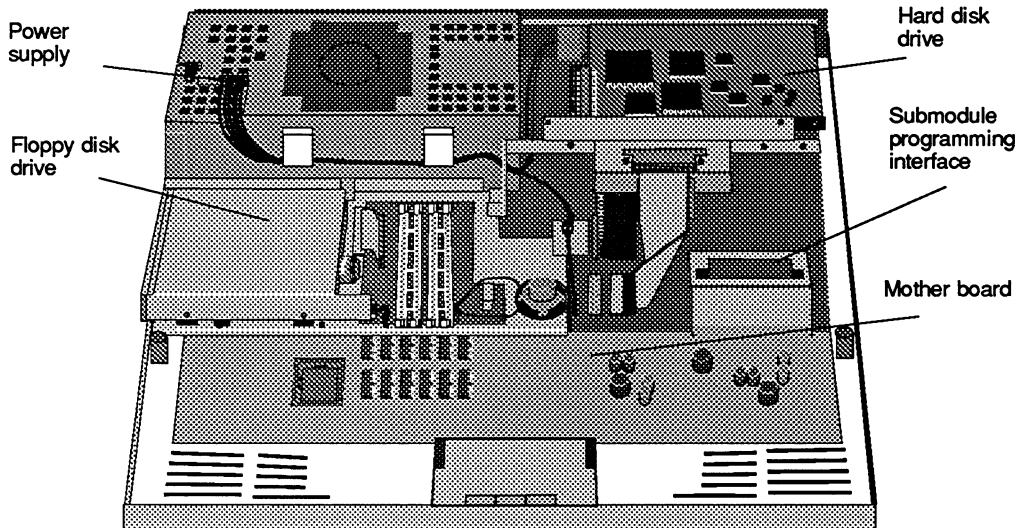


Fig. 4.4 PG 730 opened

4.1.3 Mother Board

The mother board is the heart of the PG 730. From here, data is processed and stored, and interfaces and I/Os are controlled and managed. The most important signals go via the bus of the mother board to the connectors of the peripherals. All the necessary components for the PG 730 are mounted on the mother board:

- 32-bit microprocessor 80386 SX as central processor (CPU), Chip Set
- memory (4 Mbytes active RAM)
- interfaces (2 serial, 1 parallel)
- ARCNET controller (for PG-PG linking, networks)
- 1 slot for bus board (with 2 ISA-compatible slots)
- slot for arithmetic processor 80387 SX
- TMS-34010 graphics processor
- VGA controller

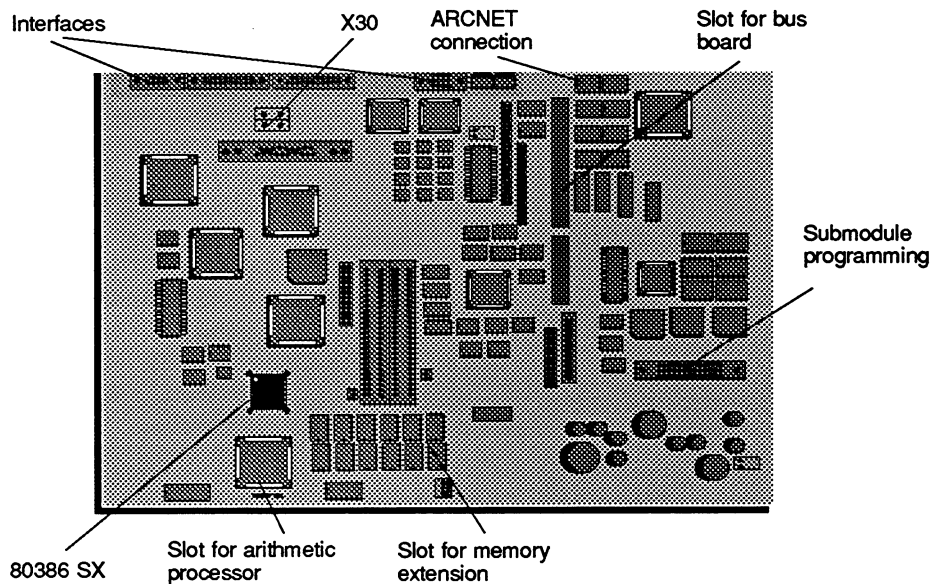


Fig. 4.5 Mother board (main board)

4.1.4 Installing an Arithmetic Processor

On the mother board of your PG 730, at the front, is a free slot for the coprocessor 80387 SX. A coprocessor allows arithmetic, logarithmic and trigonometric operations to be executed more quickly and more exactly.

It is available under order no. 6EA9645-2AA11-1AX0.

Installation

To install the arithmetic processor the PG 730 must be opened as described in the previous sections.



Caution

The 80387 SX chip is particularly sensitive to electrostatic discharge. When handling the processor, the operator must be grounded (put on a grounding wrist strap). Read the general notes at the beginning of section 4.1.

The slot for the 80387 SX processor is on the front left of the mother board. Having removed the display and the cover, the free 68-pin socket for the mounting of the 80387 SX will be accessible.

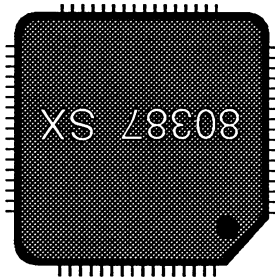


Fig. 4.6 Installing the arithmetic processor

The arithmetic processor 80387 must be positioned correctly (see Fig. above). The corner of the mounting where pin 1 is located is marked by a triangle. The processor is fitted onto this mounting and pressed in (the outer row remains free).

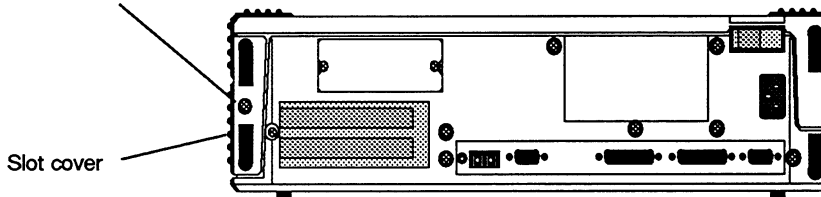
**Caution**

The arithmetic processor should only be removed by maintenance personnel, since special tools are required. If it is handled incorrectly the mounting can easily be damaged.

4.1.5 Installing a Module

Before you can install a module, remove the slot cover located on the right-hand side of the casing.

Remove screw and pull slot cover
out toward the rear



On the bus board there are two connectors for the connection of two XT/AT-compatible I/O modules. This location is intended for TTL-compatible bus signals. Modules connected to this strip must not require more than one low power Schottky load per signal.

The current taken up by the expansion modules may not exceed the following values:

- +5V : 2.8A
- +12V : 0.25A
- 5V : 0.05A
- 12V : 0.05A

The interrupts IRQ 3, IRQ 4 and IRQ 7 on the mother board are used by the mouse, the V.24/V.28 and the parallel interface. They can, however, be blocked in the SETUP program and are then available for other applications.

4.1.6 Installing the Memory Extension

Two slots (slots 2 and 3) are provided on the mother board for SIMM memory extension modules, with which the memory capacity of the PG 730 can be extended by 4, 8 or 16 Mbytes to 8, 16 or 20 Mbytes accordingly.

In order to plug in the modules, proceed as follows:

- Open the unit as described above.
- Always begin the installation from the left.
- Insert the modules into the slots diagonally (approx. 70°).
- Gently move the module into an upright position so that the locking is engaged.
- Close the device as described above.
- Change the configuration data with the SETUP program.

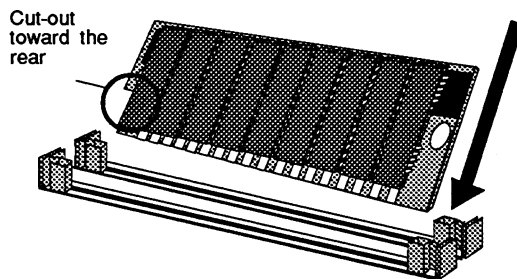
Order numbers for the extension modules:

— 4 Mbytes	6EA9643-3CA01-0AX0
— 8 Mbytes	6EA9643-3CA02-0AX0
— 16 Mbytes	6EA9643-3CA03-0AX0

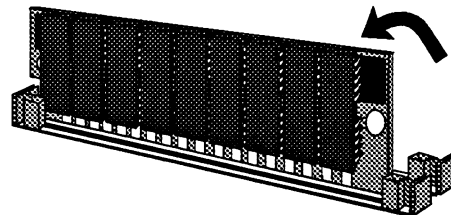


Caution

Combining 4-Mbyte extension modules with 8/16-Mbyte extension modules is not permitted.



Slot the module in at an angle from the right.



Move toward the middle until it locks into place.

4.1.7 Removing the Power Supply Unit

After taking off the display and cover as described in section 4.1.1, remove the power supply by loosening the four screws on the rear panel and removing the bracket for the hard disk drive.

- Disconnect the cable (which for reasons of safety is particularly secure) to the power supply. The cable is easily loosened with two flat-headed screwdrivers, so that the connectors can be lifted out from both sides.
- Once you have removed the cable the power supply may be lifted out of the contact slot on the mother board.
- Lift the power supply upward out of the PG 730.

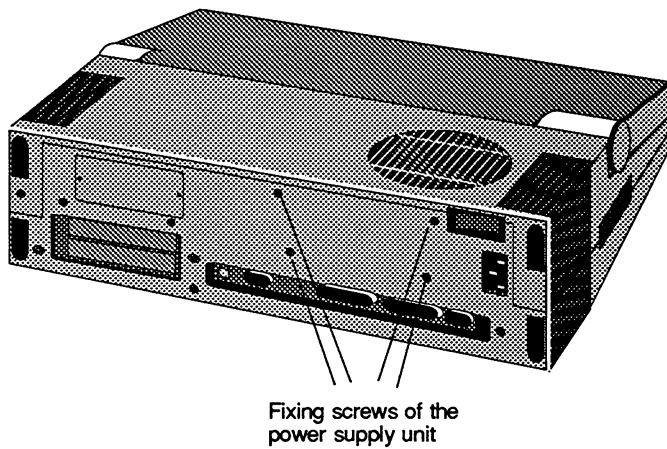


Fig. 4.7 Fixing screws of the power supply unit

4.1.8 Changing the Backup Battery

The PG 730 is equipped with a hardware clock. So that you do not have to reset the clock each time the PG is switched off, the clock is backed up by a 3.6 V lithium battery whenever the PG is switched off. The clock therefore continues to run when no power is connected to the PG.

Apart from the time, all information about the configuration is also retained. If the backup battery fails, this data is lost.

If the battery voltage is too low, the current time is lost and the configuration data stored in the RAM is lost. The hard disk drive is automatically cancelled from the configuration, meaning that booting from the hard disk is not possible. If no diskette containing the operating system is inserted, the boot procedure is abandoned after you confirm with "F1".

The following message appears:

No boot device available....?

In this case the backup battery must be replaced. Lithium batteries usually have a working life of several years, therefore changing the battery is seldom necessary.

Only change the battery when the unit is switched off.

Because the system parameters are lost when the battery is changed, these must be re-entered (see section 4.3). On page 4-23 you will find a blank table with the device configuration. You can enter your own specific changes in this table.

The lithium battery is located in a mounting behind the slot cover.

After removing the cover, the backup battery is easily changed.

The appropriate lithium battery can be obtained from your SIEMENS representative.



Caution

Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions. On return the used battery can be recycled.

4.1.9 Closing the Unit

To close the PG 730, proceed as follows:

- Push the cover over the guides on the rear panel.
- Lift the keyboard a little and connect the cable to the plug on the mother board.
- Pull the cover to the front so that it latches into the clips when pressing gently from above.
- Place the programmer on its rubber feet on the rear panel and secure the cover using the 5 TORX screws.
- Slide the side slot cover into the guide grooves and screw down securely.
- Screw the slot cover on to the rear panel.

4.1.10 Installing the Upper Display Section

To install the top display part of the PG 730, proceed as follows:

- Place the top part of the display onto your keyboard without it latching in.
- Lift up at the rear and connect the ribbon cable to the module plug.
- Move the top part of the display into its correct position between the hinges and insert the hinge axes on the left and right. Round damping disks are fitted on the axes. Make sure you insert the axes with the flat side down.
- Gently press the hinge axes inward until they are in their correct position behind the guide panels. The spring mounting of the top part of the display is now effective.
- Connect the hinge covers on the left and right.

4.2 Switching the TTY Interface of the PG 730 Active or Passive

The TTY interface (TTY) is set as active as the default on delivery for the PG 730 (current loop 20 mA).

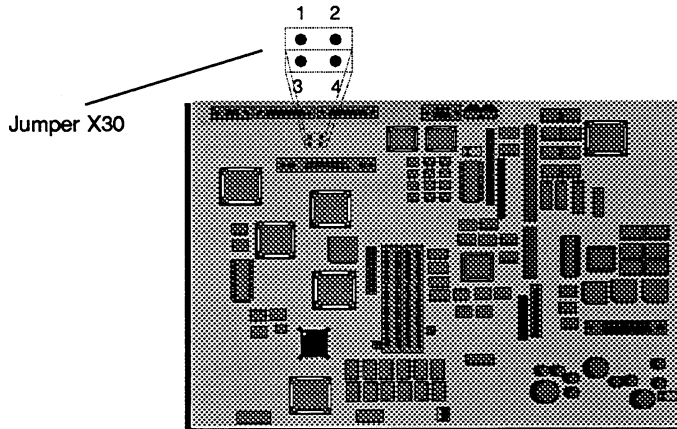
When two programmers are being linked together via the serial interface, you must set one of the interfaces as passive. Two jumpers are located on the mother board of the PG 730, below the power supply unit, for this purpose.

To change the setting of the jumpers, proceed as follows:

Removing the power supply unit

The removal of the power supply is described in section 4.1.7.

Replugging the jumpers



Jumpers plugged:

The 20 mA transmit and receive current loops are linked to each other and each to an internal power source.

Jumpers removed:

Each transmit and receive current loop is separate from the power source and fully floating. Only passive TTY operation is now possible.

Replacing the power supply unit

To reinstall the power unit, proceed as follows:

- Place the power supply unit on the contact slot on the mother board.
- Press the power unit in gently.
- Plug the power supply cable into the connector.
- Screw the power unit to the rear panel of the programmer.
- Close the unit as described in section 4.1.9.

4.3 Changing the Device Configuration (SETUP)

The configuration of your PG is preset. You only need to make changes using the SETUP program if you change your hardware configuration or if an error occurs when you turn on your PG.


If you want to work with your PG 730 using the preset configuration, then you can skip this section.

The ROM BIOS contains the "SETUP" program. This program is used to transfer information about the system configuration to the battery-backed memory of the PG 730.

You can use the SETUP program to inform the system about which components, such as memory and drives, you are using. SETUP is also used to reset the date and time in the clock module. In MS-DOS, this is done using the DATE and TIME commands.

The SETUP program is self-explanatory and menu-driven, making it easy to operate. Start the program by pressing the following key combination:



 If incorrect SETUP data is recognized during booting, BIOS prompts you to run the SETUP program with <F2> or to continue booting with <F1>.

Some operating systems and user programs reject the command:

<CTRL><ALT><S>

Remedy:

Reset your PG and wait for the memory test. This is aborted with the "blank" key. Before the operating system is loaded you can start up the SETUP program resident in the ROM by simultaneously pressing the keys <CTRL>, <ALT> and <S>.

SETUP menu for PG 730 (page 1)

Phoenix SETUP Utility (version 1.00) 03		(c) Phoenix Technologies Ltd. 1985, 1991 All Rights Reserved	
** Standard System Parameters **		Page 1 of 2	
System Time:	17:36:23		
System Date:	Nov 04, 1991		
Diskette A:	3.5", 1.44 MB		
Diskette B:	Not Installed	Cyl	Hd Pre LZ Sec Size
Hard Disk 1:	Type 17	873	13 -1 873 36 199
Hard Disk 2:	Not Installed		
Base Memory:	640 KB	NumLock on at boot:	NO
Extended Memory:	3072 KB	GSP-Interpt. select:	IRQ 11
Video Card:	VGA/EGA	GSP-Address select:	340H
Keyboard:	Installed	Eprom-Interface:	ON
CPU Speed:	Fast	Internal COMA:	Enable
Arcnet Node No:	123456789	Internal COMB:	Enable
Arcnet Memory Addr:	E0000h	Internal LPT1:	Enable
Arcnet Response Time:	75us		

Esc Menu	F1 Help	F2 Sys Info	^ v Field	+/- Value	PgUp/Dn Page
-------------	------------	----------------	--------------	--------------	-----------------

selected entry

Fig. 4.8 SETUP menu

Operation:

You can use the following keys:

- <ESC> allows you to toggle between an additional menu and the standard menu.
- <F1> provides help screens for the current menu.
- <F2> provides information on the current system data.
- <↑ ↓> allow you to jump from one field to the other in the current menu.
- <+ /-> changes the values in the menu.
- <PgUp/Dn> allows you to scroll from the first screen to the second one and back.

System parameters	Remarks
System clock	Enter the correct time and the date: System Time: hour: minute: second System Date: month: day: year
Floppy disk drive (Diskette A)	Standard entry for drive A; 3.5 inch, 1.44 Mbyte (compatible with S5 programmers)
Hard disk drive	Standard entry for the 40 Mbyte hard disk drive C: - Hard Disk 1: Type 17 40 Mbyte Type 33 100 Mbyte
Base memory	The base memory capacity of the PG 730 is 640 Kbytes. You must, therefore, enter 640 Kbytes for the "Base Memory" option: - Base Memory: 640 KB
Extended memory	Memory extension boards are available for the PG 730. The figure you are required to enter for the "Extended Memory Size" depends on the memory extension already used and its configuration. It is standard for the PG 730 to be fitted with a 4 Mbyte RAM. Of this, 640 Kbytes are used as base memory and 384 Kbytes as background memory (e.g. RAM-BIOS). A further 3072 Kbytes remain as extended memory that are entered here. If an additional memory extension is incorporated then there remain: - 4-Mbyte extension 7168 Kbytes - 8-Mbyte extension 11264 Kbytes - 16-Mbyte extension 14208 Kbytes. In the case of the 16-Mbyte extension, 5 Mbytes are missing mathematically. The 16th Mbyte is intended for modules with dual-port memory and is therefore blocked. The 80386 SX cannot directly access the 17th to the 20th Mbyte. In any case, the extended memory ascertained during the memory's internal test must agree with the value set here.
Video Card	The standard setting is VGA/EGA.
Keyboard	Here you have the possibility of setting "Not Installed", so that the system runs up without the keyboard.
CPU Speed	CPU Speed FAST Standard setting -- the processor operates at maximum frequency CPU Speed SLOW The processor is fitted with a 13.3 MHz clock frequency while the system bus is on 8 MHz. This setting is only required when the software does not run correctly owing to fixed programmed time loops. If an error is detected during the self-test following power on, the CPU speed is automatically set to SLOW.

System parameters	Remarks
ARCNET Node No.	The decimal node number for the ARCNET interface is entered here. If 0 is entered, "Not Installed" is displayed. In this case, the interface is deleted from the configuration and the interrupt and the address area used by the interface is then free (see also section 3.3.1).
ARCNET Memory Address	The ARCNET memory address range can be set here: E0000h ARCNET memory lies in the range E0000h..E07FFh ARCNET control register lies in the range E0800h..E080Fh D0000h ARCNET memory lies in the range D0000h..D07FFh ARCNET control register lies in the I/O range 2E0h..2EFh
ARCNET Response Time	The response time for the ARCNET controller is given here (see also section 3.3.2).
	GSP-Interrupt: IRQ 11 standard setting for the interrupts used by the graphic processor GSP-Address: 340H standard setting for the I/O address occupied by the graphic processor EPROM-Interface: ON standard setting for the programming submodule Internal COM A/B, LPT1: Enable the interfaces on the mother board are enabled (standard setting)

SETUP menu for PG 730 (page 2)

Feature Control

By pressing <9> in the numeric keypad (<PgUp>) you can call the second menu of the SETUP program. This controls the loading of the BIOS in the 16-bit memory.

The **Enable** setting enables this feature for the given memory range.

The **Disable** setting cancels this feature.

Upon delivery of your PG, the Feature Control is set up as follows:

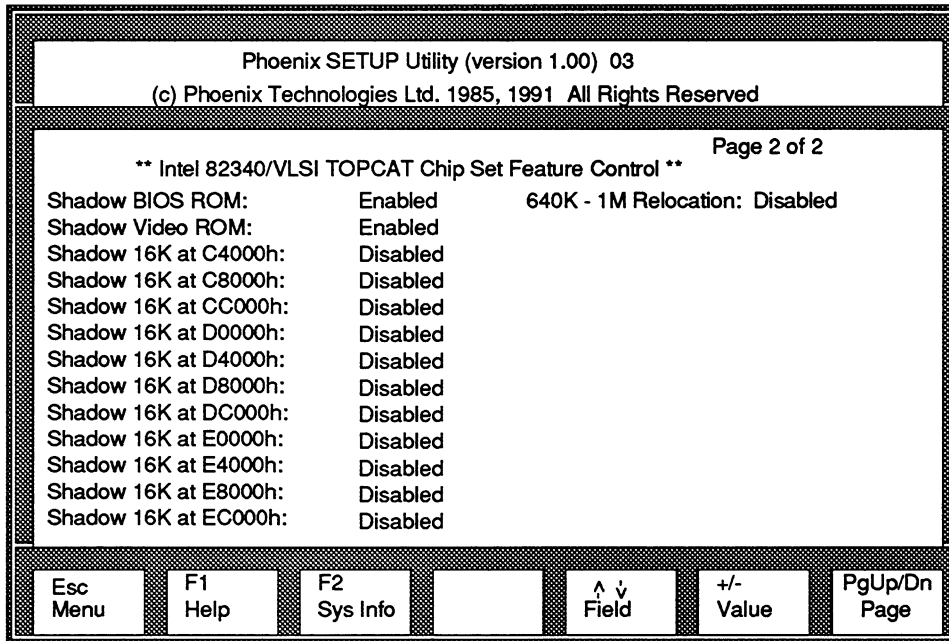



Fig. 4.9 SETUP Feature Control; as delivered

 We recommend that you do not change the settings on the feature control screen.

Exiting SETUP

The SETUP program has its own exit menu, called "Exiting SETUP".

- To exit the program, press the <ESC> key in your SETUP menu.

Exiting SETUP	
<ESC>	Continue with SETUP.
<F4>	Save values, exit SETUP, and reboot.
<F5>	Load default values for all pages.
<F6>	Abort SETUP without saving values.

Fig. 4.10 Exiting SETUP

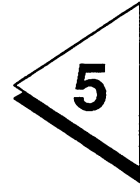
Table for the device configuration:

After you have changed your device configuration, you can enter the new SETUP entries in the following table.

If you make any hardware changes at a later date, the preset SETUP entries are then easily and quickly available to you.

System parameters	Default value	Space for your entries
Diskette A	3.5", 1.44 MB	
Diskette B	Not Installed	
Hard Disk 1	Type 33	
Hard Disk 2	Not Installed	
Base Memory	640K	
Extended Memory	3072KB	
Video Card	VGA/EGA	
Keyboard	Installed	
CPU Speed	Fast	
ARCNET Node No.	Not Installed	
ARCNET Memory Address	E0000h	
ARCNET Response Time	75 μ s	
NumLock on at boot	No	
GSP-Interrupt select	IRQ 11	
GSP-Address select	340 h	
EPROM-Interface	On	
Internal COM A	Enable	
Internal COM B	Enable	
Internal LPT 1	Enable	

System parameters	Default value	Space for your entries
Shadow BIOS ROM	Enabled	
Shadow Video ROM	Enabled	
Shadow 16K at C400h	Enabled	
Shadow 16K at C800h	Disabled	
Shadow 16K at CC00h	Disabled	
Shadow 16K at D000h	Disabled	
Shadow 16K at D400h	Disabled	
Shadow 16K at D800h	Disabled	
Shadow 16K at DC00h	Disabled	
Shadow 16K at E000h	Disabled	
Shadow 16K at E400h	Disabled	
Shadow 16K at E800h	Disabled	
Shadow 16K at EC00h	Disabled	
640K-1 μ Relocation	Disabled	



Error Diagnostics

This chapter contains information and tips to help you with troubleshooting.

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5	Error Diagnostics	5 - 1
5.1	Locating Errors and Troubleshooting	5 - 3
5.1.1	Errors on the PG Side	5 - 3
5.1.2	Errors on the PLC Side	5 - 5
5.1.3	Acoustic Signals	5 - 6

5.1 Locating Errors and Troubleshooting

5.1.1 Errors on the PG Side

Error	Cause	Remedy
Mains switch does not illuminate	PG is switched off	
	Power supply connection is incorrect	Check the power supply/mains cable
The screen remains dark after switching on	Contrast too bright or too dark *)	Adjust contrast *)
	Background lighting is not active **)	Wait 3 - 5 secs. until the background lighting is activated
The message: "Invalid configuration information-.... Press the F1 key for continue, F2 to run the Setup utility" appears on the screen	Configuration data is faulty	Press "F2", check the configuration data in the SETUP menu, and if necessary, enter the default settings, check any error messages in the first SETUP menu
The message: "No boot device" appears on the screen	Incorrect hard disk type entered in the SETUP	Select; Type 17 for 40 MB Type 33 for 100 MB insert bootable diskette
Message: "Keyboard stuck, key failure"	A key was blocked during the internal self-test for the keyboard	Check keyboard restart system
The running up of the PG was aborted after several beeps	An error was detected during the power-on self-test	Check hardware, see "Acoustic Signals"
Every time you try to press a key, a beep is heard and no characters appear	The keyboard buffer is overloaded	<CTRL><PAUSE>
Not-ready error when trying to read a diskette	No diskette has been inserted	Insert diskette
	Diskette is not formatted	Format diskette

Error	Cause	Remedy
Write-protection error when you try to write on a diskette	The diskette is write-protected; for a 3.5" diskette, the hole is open (the plastic catch is not across)	Remove the write-protection
The "D" key has no function	When the D key is pressed, the keyboard sequences <CTRL><ALT><F1> and <CTRL><ALT><F2> are being sent and are not being evaluated by the operating system	Load the keyboard driver, e.g. KEYB GR
"^" key not available	Incorrect keyboard driver being used	With German keyboard driver: <ALTGR><ß> with international keyboard driver <^> key
Mouse not working correctly	The mouse is connected to the wrong interface	Use the COM2 interface
	The mouse tablet is placed incorrectly	The blue stripes should be placed vertically, the gray stripes horizontally
	The mouse driver is not installed for applications which do not run under FlexOS/GEM	Refer to your software description

* only for monochrome version

** only for the color version

5.1.2 Errors on the PLC Side

Error	Cause	Remedy
Communication with PLC not possible	PLC cable incorrectly connected	Connect the PLC cable properly
	Wrong cable	Connect correct cable
	Cable too long	Use a shorter cable
	Active/passive setting incorrect	Adjust the setting with the jumper X30

5.1.3 Acoustic Signals

After the PG 730 is switched on, the BIOS firmware carries out a Power-On-Self-Test (POST). If a fatal error occurs at the beginning of the self-test, you hear a sequence of beeps and the screen remains dark. In some cases, if the self-test has progressed sufficiently, an error message appears on the screen in addition to the beep sequence. If a non-fatal error is detected, an error message always appears on the screen and you will be prompted to acknowledge the error by pressing F1.

In the following tables the possible acoustic signals and their corresponding error description are listed. The signal sequences are given as follows:

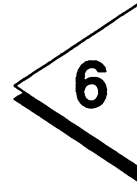
1 short beep	<i>POST ended</i>
2 short beeps*	Error, acknowledgement expected - hard disk error - Setup error (e.g. following battery failure) - non-fatal error
1 short, 1 short, 1 long, 1 short	Error or defective monitor interface

1-1-3 means e.g.: one beep is followed by another single beep and three more beeps. No signal sequence means that a test run or process was aborted, in which case no acoustic signal will sound.

Signal sequence	Port 80H	Error description
none	01H	CPU register test running
1-1-3	02H	CMOS write/read error
1-1-4	03H	ROM BIOS checksum error
1-2-1	04H	Programmable timer interval error
1-2-2	05H	DMA initialization error
1-2-3	06H	DMA page register write/read error
1-3-1	08H	Error in checking RAM refresh
none	09H	First 64K RAM test running
1-3-3	0AH	64K RAM chip or data transmission error (multi-bit error)
1-3-4	0BH	64K RAM odd/even logic error
1-4-1	0CH	64K RAM address transmission error
1-4-2	0DH	64K RAM parity error
1-4-3	0EH	Fail-safe timer error
1-4-4	0FH	Software NMI + port error
2-1-1	10H	64K RAM error bit 0
2-1-2	11H	64K RAM error bit 1
2-1-3	12H	64K RAM error bit 2
2-1-4	13H	64K RAM error bit 3
2-2-1	14H	64K RAM error bit 4
2-2-2	15H	64K RAM error bit 5
2-2-3	16H	64K RAM error bit 6
2-2-4	17H	64K RAM error bit 7
2-3-1	18H	64K RAM error bit 8
2-3-2	19H	64K RAM error bit 9
2-3-3	1AH	64K RAM error bit A
2-3-4	1BH	64K RAM error bit B
2-4-1	1CH	64K RAM error bit C
2-4-2	1DH	64K RAM error bit D
2-4-3	1EH	64K RAM error bit E

Signal sequence	Port 80H	Error description
2-4-4	1FH	64K RAM error bit F
3-1-1	20H	Slave DMA register error
3-1-2	21H	Master DMA register error
3-1-3	22H	Master interrupt register error
3-1-4	23H	Slave interrupt register error
none	25H	Interrupt vector not loaded
3-2-4	27H	Error in keyboard controller test
none	28H	CMOS error, checksum being formed
none	29H	CMOS being configured
3-3-4	2BH	Error in initialization of the screen
3-4-1	2CH	Error in picture repetition test
3-4-2	2DH	Check video-ROM is available
none	2EH	Video-ROM has started up
none	30H	Assumes that screen is ready
none	31H	Assumes that monochrome screen is ready
none	32H	Assumes that color monitor (40 columns) is ready
none	33H	Assumes that color monitor (80 columns) is ready

Non-fatal errors Signal sequence	Port 80H	Error description
4-2-1	34H	Time not being counted
4-2-2	35H	Software reset (shut-down)
4-2-3	36H	Gate A20 error
4-2-4	37H	Unexpected interrupt in protected mode
4-3-1	38H	Error in address transmission in memory address >FFFFH
4-3-3	3AH	Faulty timer chip counter 2
4-3-4	3BH	Time clock not running
4-4-1	3CH	Serial interface error
4-4-2	3DH	Parallel interface error
4-4-3	3EH	Arithmetic processor error



Technical Data

Further Documentation

This chapter contains information on the technical specifications of the PG 730 and a list of further reading.

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6	Technical Data, Further Documentation	6 - 1
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6.1 Technical Data

Environmental conditions	during operation	during storage and transport
Temperature	+10 °C to 40 °C (+50 to 104 °F)	-20 °C to +60 °C (-4 to +140 °F)
Relative humidity	8 % to 80 % (no condensation)	5 % to 95 % (no condensation)
Shock resistance	< 5 g (< 10 ms)	< 50 g (< 10 ms)
RI specification according to DIN VDE 0871 ¹⁾	Limit value class B	
Degree of protection	IP 30	

Both versions of the PG 730 are certified as corresponding to the interference suppression regulations of the BMPT (federal German telecommunications authority) provision number 1046/1984. The PG 730 SX version also carries the VDE interference protection label with the addition "0871-B/P" indicating that it is a peripheral unit as well as a stand-alone unit which meets the interference suppression requirements of limit value class B according to DIN VDE 0871/6.78¹⁾ and the German telecommunications authority provision 1046/1984 only as a stand-alone unit.

If the unit is operated in a system as a peripheral, then to qualify for the "general operating license" according to the German telecommunications authority provision 1046/1984, the whole system must correspond to limit value class B according to DIN VDE 0871/6.78, the prerequisites stated in paragraph 2 and the conditions stated in paragraph 3 of the German telecommunications authority provision 1046/1984.

These prerequisites are usually only met if the units operate in a system that is type-tested and approved with:

- FTZ approval number (Germany) or local regulations
- radio interference suppression label
- manufacturer's conformity certificate.

This digital apparatus does not exceed the class B limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

¹⁾ corresponds to CISPR (International Special Committee for Radio Interference), Publication No. 11 and CENELEC, HD 344

Certificate of the Manufacturer/Importer

This is to certify that the

PG 730 C Programmer, 6EA1730-XBA01-XAA1

device, type, designation

meets the RI specifications in accordance with the

Provision 1046/1984 and 483/1986, as well as

DIN VDE 0871/6.78 limit value class B

(Official Gazette)

The federal German telecommunications authority (BMPT) has been informed of the placing on the market of this device and is authorized to inspect the product range for compliance with the provisions.

Technical data for the PG 730	
Weight	8.8 kg
Degree of protection	IP 30
Power unit	
Power consumption	max. 120 VA
Power supply	115 V AC or 230 V AC + 10 % /-15 % (automatic switchover)
Mains frequency	48 Hz to 63 Hz
Safety standards	IEC 950 / EN 60950 / VDE 0805 / UL 1950, CSA 950
Mother board	
Central processor	80386 SX (20 MHz)
Slot for arithmetic processor	80387 SX (20 MHz)
Main memory	4 Mbytes
Slots	2 expansion modules max. 175mm long (compatible with industrial standards, 16-bit data bus, 24-bit address bus)
Extended memory	4 slots for memory extension submodules
Graphics	VGA-compatible with a resolution of max. 640 x 480 pixels Graphic processor TMS 34010 with resolutions from 640 x 480 pixels via the LCD display and 1024 x 768 via an external monitor
Interfaces	V24/V28 or 20 mA (TTY) active or passive (COM 1) and SIEMENS PLCs, V24 primarily for the mouse (COM2), Centronics primarily for a printer (parallel LPT 1), ARCNET for fiber optic cable (2.5 Mbit/s), Submodule interface for SIMATIC submodules, Connection for an external VGA or Multisync monitor
Display - monochrome version	Monochrome liquid crystal display with 640 x 480 pixels resolution and 8 shades of gray
Display - PG 730C (color version)	Color TFT display with 640 x 480 pixels resolution and 512 colors



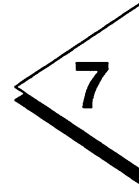
For operation in Canada and in the USA, a CSA or UL-listed power supply cable must be used.

The unit is intended for operation with normal grounded power supply networks (referred to as TN systems according to IEC 364-3, (VDE 0100)).

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

6.2 Further Documentation

- /1/ *Personal CP/M-86 Manual*
Order No. 6ES5998-2SA21
- /2/ *Personal PCP/M Pocket Guide*
Order No. C79000-B8576-C352
- /3/ *MS-DOS Pocket Guide*
Order No. C79000-M8576-C648
- /4/ *STEP 5 Basic Package, Manual*
Order No. 6ES5998-0SC21
- /5/ *STEP 5/MT Basic Package, Manual*
Order No. 6ES5998-0FC21
- /6/ *GRAPH 5, Manual*
Order No. 6ES5998-1SA01
- /7/ *KOMDOK, Manual*
Order No. 6ES5998-1SD01
- /8/ *PGNET (Software), Manual*
Order No. 6ES5998-1SC01
- /9/ *GEM New Collection (for PG 6xx), Manual*
Order No. C79000-G8576-C583
- /10/ *X/GEM New Collection, Manual*
Order No. C79000-G8576-C210
- /11/ *GEM New Collection, Manual*
Order No. C79000-G8576-C383
- /12/ *FlexOS 386, Manual*
Order No. 6EA9200-0AA10-0AB0



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This index should help you to find your way around this manual much better.

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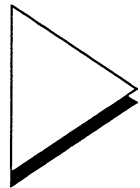
SIEMENS

SIMATIC S5

PG 730 Programmer

**Manual
Part II: PG Operation**

C79000-N8576-C024-01



SIEMENS

PG 730

Programmer

Manual

Part II: PG Operation

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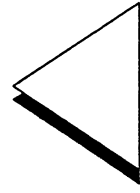
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Introduction


Introduction

This part of the manual is intended to guide you through the operation of your PG and the software supplied with it.

The introduction which follows shows you an overview of the contents of the individual chapters, making it easier for you to locate the information you require.

The authors of this manual would appreciate any suggestions or criticisms that would improve the quality of this documentation. For this purpose, please use one of the green forms to be found in the Appendix.

Conventions used in this manual

- Stress points individual steps in a series of actions
- Dashes items in a list
-  indicates tips and useful information
- /xx/* refers to literature listed in Part I of this manual (Chapter 6).
- ◆ Lozenge this character is used to represent the ALT key which you will need to use a lot in special key combinations and keyboard shortcuts.

Overview of Documentation

More details on the operating systems used, the graphic user interface PlantTop or the applications themselves can be found in the following manuals:

Title	Contents
FlexOS™ 386	Installation Guide, User's Guide, Reference Guide, DR EDIX, FlexNet
X/GEM New Collection	e.g. GEM DRAW PLUS, GEM 1st WORDPLUS, ADIMENS
STEP® 5 Basic Package	STEP 5 Basic Package under S5-DOS/ST, or S5-DOS/MT

How this Manual is Organized

The brief descriptions of the individual chapters will help you to find your way around Part II of this manual.

Chapter 1 Introduction to Operating the PG

With this introduction, we will guide you through the first steps in operating a programmer. We will start by switching on the installed PG and guide you step-by-step until you can start an application. As an example, we will start the STEP 5/MT Basic Package.

You also learn here what you need to do **once**, after installing the hardware. So it is most important that you do not skip this chapter.

Chapter 2 Basic Information on PlantTop

PlantTop is a graphic user interface to the operating system FlexOS 386. PlantTop helps you to communicate with your PG and its operating system more easily.

This chapter contains basic information on the graphic user interface PlantTop and its significance.

Chapter 3 Network Operation

This chapter describes how you can access devices in remote computers via PlantTop. You will learn how to

- load network drivers
- install remote devices and
- work with the remote devices.

Chapter 4 Menus and Commands

This is a reference chapter. All the PlantTop menus are introduced in the sequence they appear in the menu bar and all commands are described which appear in the menus.

Chapter 5 Output Application

Here you learn how to output documents to printers, plotters or screens.

Chapter 6 FlexPrep Application

If you are an experienced and authorized user of FlexOS and X/GEM you will be in a position to alter the standard configuration of your PG after studying this chapter.

Chapter 7 Index

This chapter contains references for the most important terms in the manual. The terms listed allow you to find your way quickly to the information you require.

Chapter 8 Glossary

This chapter lays down the definition of terminology used and describes functions which are central to the hardware and the operation of your PG.

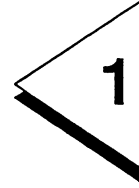
Chapter 9 Appendix

Here you will find important notes and information which you should read before starting to work with your PG.

What you should already know..

You should be familiar with the terminology and the basic operation of a Personal Computer, for example, working with

- a mouse and the keyboard,
- diskettes and disk drives.



Introduction to Operating the PG

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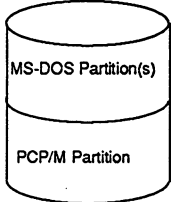
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1.1 System Software

Your programmer is *always* supplied complete with the system software. The system software includes all software components which were already installed on the hard disk at the factory. This has the advantage that you do not need to:

- create partitions on your hard disk,
- copy the operating system onto the hard disk or
- copy the applications based on it onto the hard disk.

The operating systems S5-DOS/MT, S5-DOS/ST and S5-DOS and the applications based on them make up the system software.



Operating system	Application or program
S5-DOS/MT based on FlexOS 386 with PlantTop as graphic user interface	X/GEM New Collection: - the X/GEM 1st Word Plus editor - graphics program X/GEM Draw Plus - data base system ADIMENS STEP 5/MT Basic Package - STEP 5/MT packages - utilities and - overlays
S5-DOS/ST based on MS-DOS with emulator and P Tools	STEP 5/ST Basic Package - STEP 5 packages - utilities and - overlays
S5-DOS based on PCP/M-86	STEP 5 Basic Package - STEP 5 packages - utilities and - overlays


 You will find the current releases and a list of the *scope of delivery* of the system software in the *Product Information* which you will receive together with your PG.

Fig. 1.1 shows you an overview of the structure of the system software:

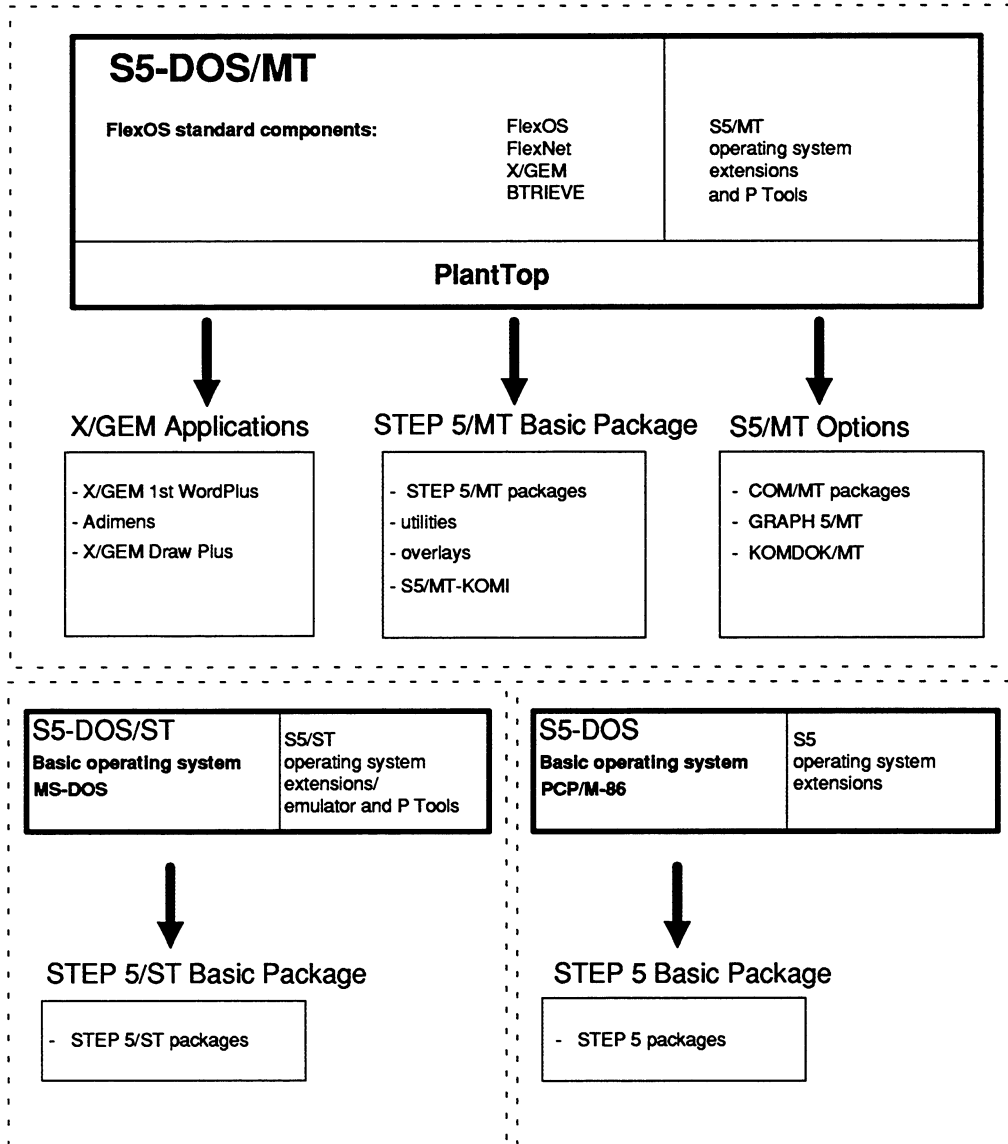


Fig. 1.1 Overview of the system software

1.1.1 S5-DOS/MT and its Applications

S5-DOS/MT is the Multitasking operating system ("Disk Operating System for SIMATIC S5") for the S5 programmers of the 7 series. All S5/MT packages use the same common operating system S5-DOS/MT. The S5-DOS/MT operating system includes the following:

<p>FlexOS standard components</p> <p>FlexOS™ 386</p> <p>FlexNet</p> <p>Btrieve</p> <p>X/GEM</p>	<p>FlexOS 386 is a realtime, multiuser, multitasking operating system. It represents the basis of S5-DOS/MT. It is used by the operating system extension X/GEM.</p> <p>FlexNet is the network operating system extension for FlexOS 386. It allows access to remote computers and their resources via networks.</p> <p>Btrieve is a record-oriented data storage system under FlexOS.</p> <p>X/GEM™ (Extended Graphics Environment Manager) forms the graphics mouse-oriented application environment. X/GEM uses the advantages of multiuser multitasking operating systems as well as the advantages of intelligent graphics hardware.</p>
<p>PlantTop</p>	<p>PlantTop is a graphic user interface that allows you to execute commands simply and quickly using a mouse or track ball.</p>
<p>S5/MT specific extensions</p> <p>S5/MT command interpreter (S5/MT-KOMI)</p> <p>drivers, e.g. for the PLC interface</p> <p>tools, e.g. to administer STEP 5/MT blocks or COM/MT data</p> <p>utilities</p> <p>overlays</p> <p>P Tools</p>	<p>allows you to select S5 packages and S5 programs by means of menus.</p> <p>enable every S5 package to be run on every type of PG without making any changes.</p> <p>is a group of programs which make it possible to perform complex tasks such as e.g. reading a file on diskette, programming an EPROM or communicating with the PLC.</p> <p>independent program parts which you can select in the package selection screen (S5/MT-KOMI).</p> <p>externally placed program parts.</p> <p>for data exchange between PCP/M and S5-DOS/MT</p>

Table 1.1 Operating system S5-DOS/MT

Applications under S5-DOS/MT

STEP 5/MT Basic Package and **S5/MT** options are S5-DOS/MT applications with which you can plan, program, test and document your automation tasks. Due to the multitasking capability, you can work with several programs at once.

 The STEP 5/MT packages are described in detail in the STEP 5/MT Basic Package /5/, GRAPH 5 /6/ and KOMDOK /7/ manuals.


"X/GEM Applications" contain the following PC programs:

X/GEM Draw Plus: an electronic drawing package, for creating simple graphics and diagrams.

X/GEM 1st Word Plus: a high-powered word processing system, into which you can also integrate graphics.

ADIMENS GTX: a data base system with many applications and easy to use for beginners.

The MS-DOS data from the corresponding GEM applications are compatible with these X/GEM applications.

 These programs are described in more detail in the "X/GEM New Collection" manuals /10/.

1.1.2 S5-DOS/ST and its Applications

S5-DOS/ST is a single-tasking operating system for the S5 programmers of the 7 series. It serves as a basis for various applications and allows you to use S5 applications, software for further automation systems as well as other general programs for PC.


S5-DOS/MT and S5-DOS/ST have the same hierarchical file system. This means you can store the files for both systems in the same DOS partition.

The S5-DOS/ST operating system includes the following:

MS-DOS	MS-DOS is a single-tasking operating system developed by the company Microsoft. It forms the basis of S5-DOS/ST.
S5-DOS/ST operating system extension	S5-specific operating system extension to MS-DOS with the same functions as S5-DOS/MT.
Emulator	The emulator allows you to run the STEP 5/ST packages (together with the operating system extension S5-DOS/ST) under MS-DOS.
P Tools	The P Tools enable you to have access to PCP/M data medium (floppy disk drive or hard disk). You can therefore transfer programs, which you created with other SIMATIC S5 programmers, to MS-DOS.

Applications under S5-DOS/ST

The STEP 5/ST Basic Package with its individual packages enables you, as does S5-DOS/MT, to solve all the automation tasks you encounter. You **cannot**, however, work with several programs at once under this system.

 The STEP 5/ST Basic Package is described in detail in the STEP 5 Basic Package manual /4/.

1.1.3 S5-DOS and its Applications

S5-DOS is the single-tasking operating system of the S5 programmers PG 635 and PG 685.

It is also installed on the PG 710, PG 730, PG750 and PG 770 programmers to provide a bridge to the new 7 series devices.

The S5-DOS operating system includes the following:

- the basic operating system PCP/M-86
- specific S5 extensions
 - S5 command interpreter (S5-KOMI)
 - drivers, e.g. for the PLC interface
 - tools, e.g. to manage STEP 5 blocks or COM data
 - utilities and overlays.

S5-DOS and the files that run under it are stored on the PCP/M partition of the hard disk.

STEP 5 packages and **the optional COM** packages run under S5-DOS, i.e. on the basis of PCP/M-86. With these packages, you can plan, program, test and document your automation tasks.

1.1.4 Compatability of the Data Media

Different devices and operating systems use different diskette formats and capacities (DD, HD):

- all common MS-DOS diskette formats can be worked with under S5-DOS/MT in the same way as under S5-DOS/ST (MS-DOS).
- diskettes formatted on the PG 685 under S5-DOS/ST (MS-DOS) (DD, 720 Kbyte) can be read and written to under S5-DOS/MT.

1.2 What to do once after Hardware Installation

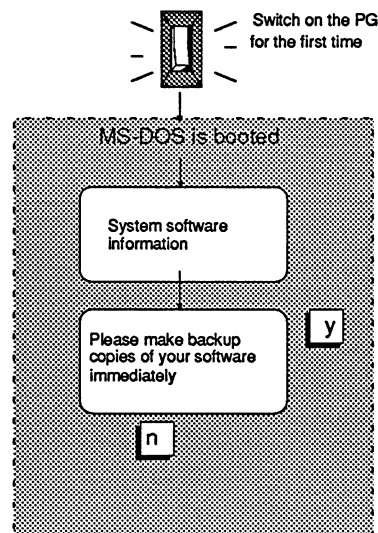
Once the hardware is installed as described in the instructions for your PG, you should perform the following:

- **make backup diskettes of the contents of the hard disk,**
- match the device park of PlantTop to your requirements,
- set up the configuration of the system if you want to change the standard configuration of the PG.

Ready to start?

When you switch on the programmer for the first time, it displays the system software installed on the hard disk.

You can exit this menu by pressing any key. The next screen form prompts you to back up the system software of the DOS partition on diskette.




1.2.1 Making Backup Diskettes

To protect your system software (files) on the hard disk from being accidentally destroyed, due to incorrect handling or for any other reason, you should, in your own interest, make backup copies of your software immediately. Only then can you be sure that no files or data have been lost, damaged or changed.

You will require these copies to keep a record of the original state of your software as it was when delivered, and also to modify the size of the partitions during reinstallation.

Texts and menus which appear on the screen lead you through the steps required to back up your software. Read the explanations and follow the instructions that appear on the screen during the backup procedure.

The actual steps you take depend on the type of partition you want to back up (MS-DOS or PCP/M). The following sections explain the procedures and what you must look out for.

 If either no messages or messages different from those described in the following sections appear on the screen, refer to chapter 5 "Error Diagnostics" in Part 1 of this manual.
If the screen prompts you to press "any" key, then you should press an alphanumeric key.

The labels for the backup diskettes have already been filled out for you and were delivered with the software. Please use these diskette labels to avoid mixing up the disks.

Always insert the diskette in the disk drive with the label facing upward.

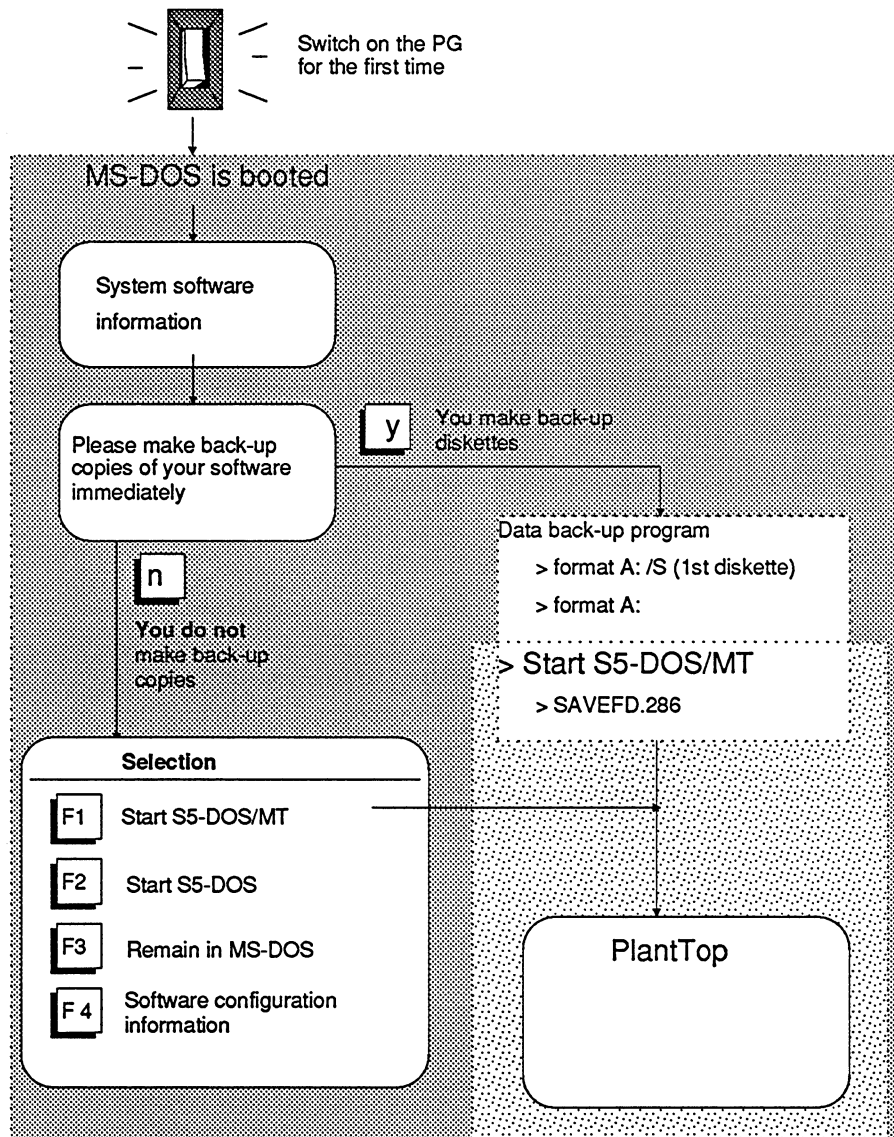



Fig. 1.2 Starting the system before backing up the DOS partition

1.2.2 Creating Backup Diskettes of the DOS Partition(s)

 Depending on the type of floppy disk drive (A:) use the following disk qualities:

- 3 1/2" diskettes: DS, HD, 135 tpi
- 5 1/4" diskettes: DS, HD, 96 tpi.

The PG displays a prompt requesting you to create the backup diskettes for the DOS partition.

- Press **Y** (yes)

The remaining steps are described in the menus that are now displayed.

Once you have backed up all the data on the DOS partition, you automatically go into PlantTop.

Where do I go from here?

You should now make backup copies of the PCP/M partition as described in the following section.

1.2.3 Creating Backup Diskettes of the CP/M Partition

 **Do not use HD diskettes**, but rather the following disk qualities depending on your floppy disk drive (A.):

- 3 1/2" diskettes: DS, **DD**, 135 tpi
- 5 1/4" diskettes: DS, **DD**, 96 tpi.


You will find a **printout** of the S5-DOS files automatically backed up in the *Product Information* delivered with your PG, as well as completed labels for the backup diskettes in the inner pocket of this manual.

Ready to start?

You have already backed up the data of the DOS partition.
PlantTop is displayed on the screen.

To change to the PCP/M-86 operating system:

- Position the mouse pointer on the drop-down menu **Options**
- Click on the **Load PCP/M** function
PCP/M-86 is then automatically booted and a menu is displayed.
- Press any key
The PG then guides you through the backup procedures by means of menus.

 The SAVES5.SUB submit is part of the data backup. It performs the following functions:

- copies the operating system PCP/M-86 to diskette along with the utilities,
- renames the file STARTUP.SUB on the hard disk, which triggered the request for a backup, in START.SUB.

If you have already generated your own start-up submit, you will find this on the PCP/M backup diskette under the name START.SUB.

After you have made the backup diskettes, whenever you boot under S5-DOS or PCP/M-86, the PG displays a **selection menu** on the screen. In this menu, you can select various functions with the function keys:

- F1: start STEP 5,
- F2: format, check and duplicate diskettes under PCP/M-86,
- F6: load the MS-DOS operating system,
- F7: load the S5-DOS/MT operating system,
- F8: input PCP/M commands.

Where do I go from here?

If you are not happy with the sizes of the partitions, you can modify the partitions and then reinstall the software (installation instructions in the "FlexOS 386" manual). Reinstalling the system software is described later in this manual.

Otherwise, check the PlantTop device park that was installed before delivery.

1.3 Operating a Programmer under S5-DOS/MT

Once you have switched on or reset the PG, PlantTop is loaded automatically. Working with PlantTop is convenient and saves time. You should only work at the S5-DOS/MT command level in exceptional cases.

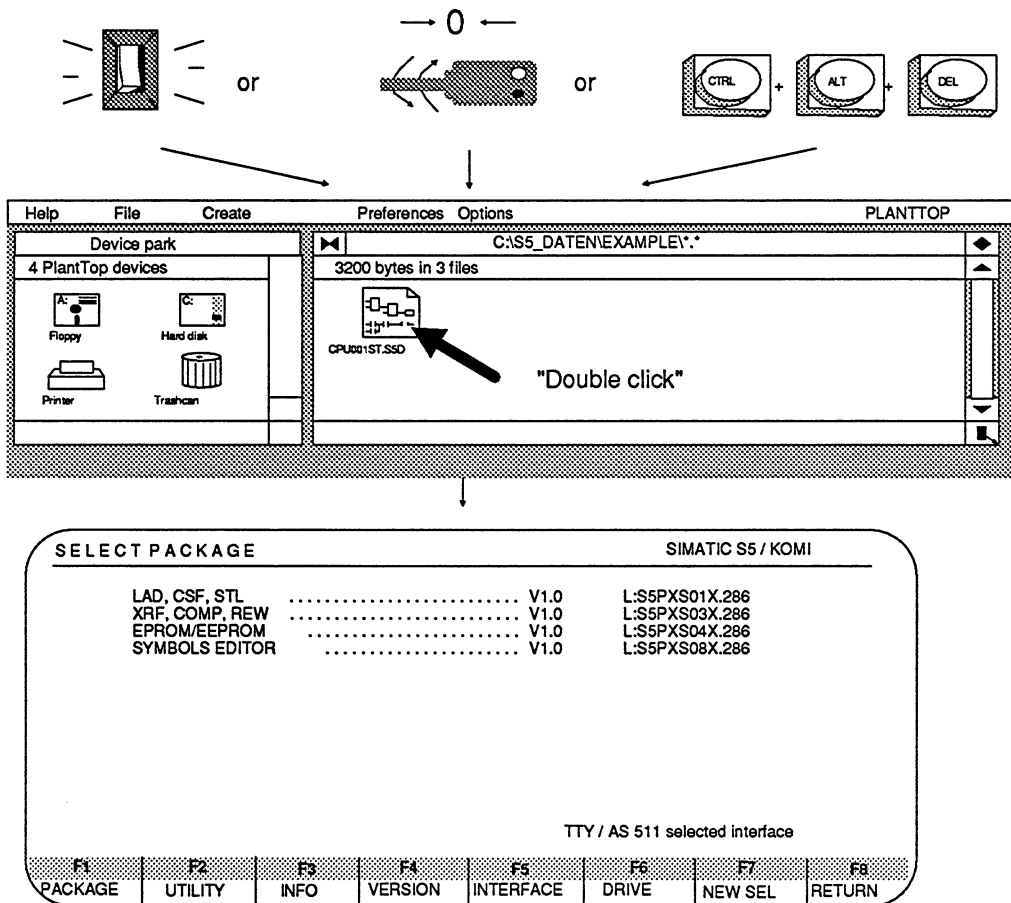


Fig. 1.3 Operating sequence for PlantTop

1.4 Operator Interfaces under S5-DOS/MT

Under S5-DOS/MT, there are three types of user interface, as follows:

- the non-graphic interface of the S5-DOS/MT operating system level
- the semi-graphic interface of the STEP 5/MT packages
- the full graphic interface of PlantTop and the X/GEM applications of the New Collection.

Screen layout

The screen layout of the individual applications depends on the following:

- the application itself,
- where you started the software package from; from PlantTop or from the S5-DOS/MT operating system level, e.g. with the STEP 5/MT Basic Package,
- the resolution of your monitor.

The screen layout in PlantTop

You can open a maximum of 7 windows (directories). Alongside these, there are also a varying number of application windows depending on the memory configuration of your PG.

The screen layout of the S5/MT packages

The operator interface of an S5/MT package, e.g. the STEP 5/MT package or COM 552 is semi-graphic.

The full screen display of a screen form or menu is a maximum of 25 lines each with 80 characters. The remaining screen area is not used.

S5/MT package in PlantTop

- With the **standard resolution** (640 x 480) of the monitor you can only display a screen form completely if you do without the slider on the right-hand side of the screen.

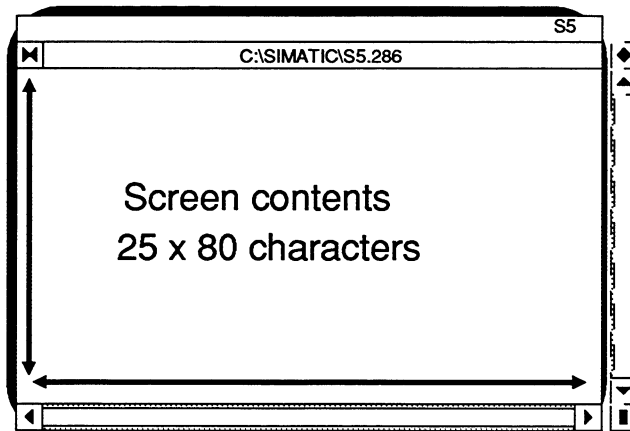


Fig. 1.4 Screen layout in STEP 5/MT

- On a monitor with a higher resolution (1024 x 768) the total screen form and the slider are permanently visible and you can display S5/MT packages completely on the screen.

1.5 Starting an Application

Ready to start?

When supplied, the system software is installed so that when you have switched on the PG and created the backup diskettes

- a console is opened,
- the window with the "device park" and the \S5_DATEN\EXAMPLE\ directory is displayed in PlantTop and
- the COM2 interface is configured for the mouse.



Online Help

To start the STEP 5/MT Basic Package, you can display help texts by selecting the **Give specific help** function in the **Help** menu or by pressing the HELP key.

There are four ways of starting an application

1. From PlantTop:
Double click on the required application or on a file for which an application has been created, see section 4.3.3.
2. From the S5-DOS/MT command level:
Type in the command. e.g. **S5** and press the return key.



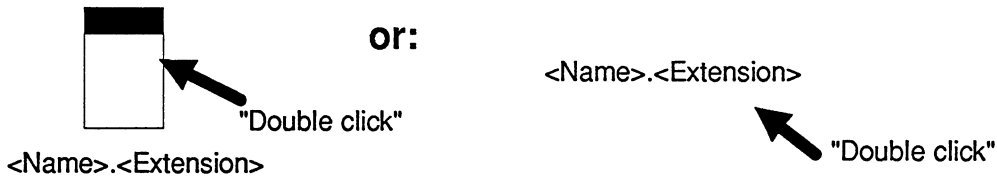
Before you use the next two methods, you should be familiar with the FlexOS 386 operating system, particularly with the user ID, i.e. the LOGON/LOGOFF procedure. The start-up procedure is configured with the "FlexPrep" application in PlantTop. FlexPrep is described in detail in the PlantTop User's Guide, Volume 1 of the "New Collection" manuals.

3. Starting an application automatically **without** the user ID. This means that the required application is started immediately after you switch on the PG.
4. Starting an application automatically **with** the user ID. This means that you will be prompted to type in a user ID before the application is started.

1.5.1 Starting from PlantTop

You start applications by double clicking

- on the icon or on the file name of the application itself, depending on the representation you selected in PlantTop
- on a file set up as an application.



Exercise: starting the STEP 5/MT Basic Package



Online Help

You can display help texts explaining how to start the basic STEP 5/MT Basic Package using the **Give specific help** command in the **Help** menu or by pressing the HELP key.

Aim: display the SELECT PACKAGE screen form

Ready to start?

The file CPU001ST.S5D is in the directory \S5_DATEN\EXAMPLE\ and the directory is open.

- Click twice on the icon of the file CPU001ST.S5D.
When supplied, the application S5.286 is already set up for this file, the SELECT PACKAGE menu is now displayed in the active window.

To open the full screen

- Click on the lozenge in the top right corner (full box).

To make the slider visible again

- Press the key combination ALT+minus.

1.6 Running Applications (Tasks) Simultaneously

The number of applications that can run simultaneously depends greatly on the capacity of the user memory.

With the standard user memory configuration of 4 Mbytes, the following applications can run simultaneously **with X/GEM and PlantTop in the background**:

- two STEP 5/MT packages, e.g. the "LAD, CSF, STL" package and
- one overlay, e.g. "PC functions".

You can increase the number of STEP 5 packages and overlays as follows:

- by starting the packages only with X/GEM and without PlantTop **or** without X/GEM and without PlantTop
- by installing a memory extension in the PG.

1.6.1 Opening or Deleting a New Console

When supplied, only one console is open.

- Press the key combination ALT+plus.
The console status is displayed. Here, you can decide whether to open or to delete a console.

To open

- Type in the character **C** (**CREATE** screen) to set up the console.

To delete

- Type in the character **D** (**DELETE** screen) to delete the console.
- Type in the number of the console to be deleted.

You exit the console status function by pressing the return key.

1.6.2 Changing the Active Application in PlantTop

There are several ways of switching over between applications:

- clicking on the required application in the **PlantTop** menu,
 - clicking on a visible window in which the required application is displayed,
 - switching over to a different console
 - type in the key combination CTRL+plus or CTRL+minus
 - or
 - call the console status with ALT+plus and select the required console.
- You exit the console status function by pressing the return key.

1.6.3 Terminating an Application

Terminating means either that you return to the FlexOS shell in PlantTop, i.e. to the S5-DOS/MT command level and/or you close the window of the application. You should only exit PlantTop when all applications of the currently active console have been terminated.

Exercise: terminating the STEP 5/MT Basic Package

You can only terminate the STEP 5/MT Basic Package in the SELECT PACKAGE menu.

Ready to start? you are in **PlantTop**, the SELECT PACKAGE menu is displayed.

- Press **F8** followed by the enter key (INSERT).
- Press any key
The window is closed. The application is cleared from the **PlantTop** drop-down menu.

1.7 Changing Operating Systems

When supplied, your PG has three operating systems installed, S5-DOS/MT, S5-DOS/ST and S5-DOS.

Remember the following:

- Changing from S5-DOS to S5-DOS/MT within the selection menu is only possible after you have made all the backup diskettes.
- After switching off or resetting, the last active operating system is booted. This also applies to S5-DOS/MT.

The following table shows all the possible combinations. Following this, the individual commands are explained.

from \ to	S5-DOS/MT Basis: FlexOS 386	S5-DOS Basis: PCP/M-86	S5-DOS/ST Basis: MS-DOS
S5-DOS/MT	--	Options → load PCP/M or PCPM.286	Options → load MS-DOS or DOS.286
S5-DOS	Selection menu → F7 or FLEX.CMD	--	Selection menu → F6 or DOS.CMD
S5-DOS/ST	Selection menu (BSYS.EXE) or FLEX.EXE with LOADFLEX.EXE	Selection menu (BSYS.EXE) → F2 or PCPM.EXE	--

 = PlantTop operation

1.7.1 Programs for Changing Operating Systems

Starting from S5-DOS/ST:

- BSYS.EXE loads the selection menu for selecting operating systems
- FLEX.EXE switches to the FlexOS partition and
C:\BOOT\LOADFLEX.EXE boots FlexOS
- PCPM.EXE boots PCP/M-86

Starting from S5-DOS/MT:

- DOS.286 boots MS-DOS
- PCPM.286 boots PCP/M-86

Starting from PCP/M-86:

- DOS.CMD boots MS-DOS
- FLEX.CMD boots FlexOS



If you are unable to change from PCP/M-86 to S5-DOS/ST or S5-DOS/MT, you can change to MS-DOS using the HDMAINT.CMD utility and can then select S5-DOS (F2) in the selection menu.

1.8 Working at the S5-DOS/MT Command Level

The following actions are described for working at the S5-DOS/MT command level:

- Starting an application
- Changing the active application
- Terminating an application
- Data exchange between S5-DOS and S5-DOS/MT media.

1.8.1 Switching to the S5/DOS-MT Command Level

Within PlantTop, there are two ways of switching to the S5-DOS/MT command level.

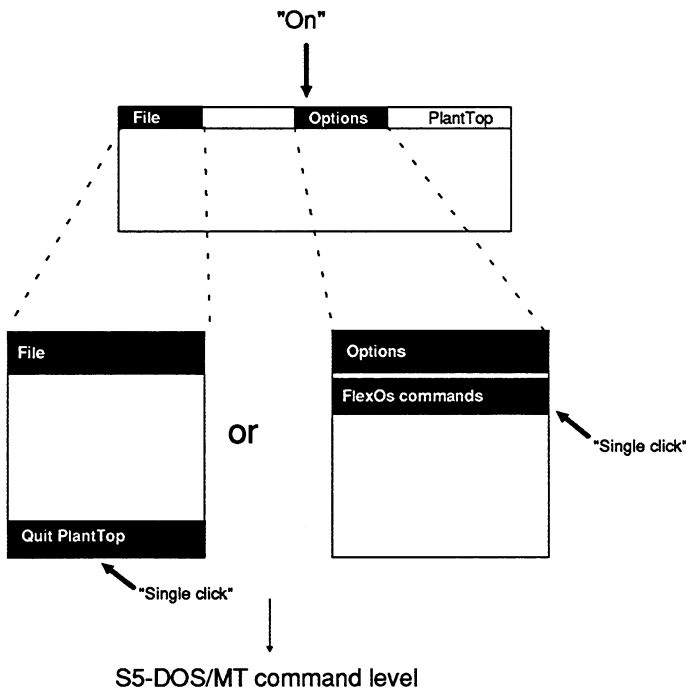


Fig. 1.5 Switching over to the S5-DOS/MT command level

1.8.2 Starting from the S5-DOS/MT Command Level

The syntax of the commands depends on the following:

- the drive and directory in which you are working and
- the paths that have been created.

Exercise: starting the STEP 5/MT Basic Package

Aim: to display the SELECT PACKAGE menu

Ready to start?

The S5-DOS/MT command level is displayed on the screen. When the PG left the factory, the path for system files of the basic package was already created. All the system files are in the SIMATIC directory in drive C:.

- Type in the command **S5** and press the return key
S5-KOMI is loaded and the SELECT PACKAGE menu is displayed on the screen.

1.8.3 Changing the Active Application

You change the application by switching over to the console of the required application.

- Press the key combination CTRL+plus or CTRL+minus
or
- Call the console status function using ALT+plus and select a console.

1.8.4 Terminating an Application without PlantTop

The system returns to the command level.

Example: terminating the STEP 5/MT Basic Package

Ready to start?

You started the basic package from the S5-DOS/MT command level. The SELECT PACKAGE screen form is displayed.

- Press **F8** followed by the enter key (INSERT).
The S5-DOS/MT command level system prompt is displayed.

1.8.5 Processing PCP/M Files under S5-DOS/MT and S5-DOS/ST

STEP 5 user programs and files which were programmed with S5-DOS (PCP/M), can also be processed with your PG under the operating systems S5-DOS/MT (or S5-DOS/ST).

You will need several commands to convert the data.

These are:

PCOPY	copies files from or to PCP/M media
PDEL	deletes files on PCP/M media
PDIR	displays the PCP/M media directory
PFORMAT	formats diskettes for PCP/M (only for S5-DOS/ST)
PSET	changes file attributes on PCP/M media
PTYPE	displays the contents of a PCP/M file

You can therefore also continue processing STEP 5 user programs and files generated under S5-DOS/MT (or S5-DOS/ST) in S5-DOS (PCP/M). Assuming that the programs are present on diskette, proceed as follows:


1. Insert diskette with or for S5-DOS (PCP/M) files in disk drive, e.g. A:.
2. Enter the commands and parameters in the command line of the respective operating system, e.g. to copy an S5 file with the name EXAMPLE from diskette onto the hard disk in the directory \SIMATIC:
PCOPY 0A:EXAMPLE.CMD C:\SIMATIC.
3. Press Return.
The file is copied from the diskette to the hard disk.

HELP function

You should be familiar with the PCP/M and MS-DOS file conventions. You can output an explanation of the operating syntax with the aid of the Help function. To do this, type in "program name ?" (e.g. "PCOPY ?"). The corresponding text then appears on the screen.

Syntax

When typing in the commands, do not include the square brackets, they only signify optional parameters. Also note the position of the blanks you need to include.

 When you copy data from PCP/M media to MS-DOS media and vice versa, a Disk Cache Program which is often used with MS-DOS must not be in operation. This will lead to errors or even to loss of data.

PCP/M media can be:

- hard disks or diskettes formatted under PCP/M and
- data stored under PCP/M.

These utilities are explained in detail in the following table.

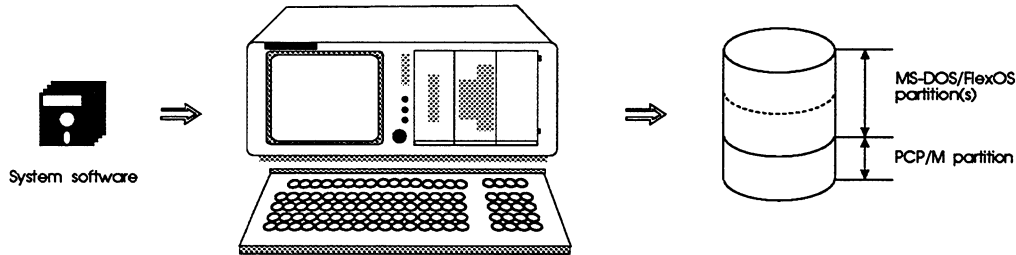
Program name	Explanation
PCOPY	<p>copies files from or to PCP/M media</p> <p>Call up: PCOPY nd:[name].[ext] d:[path][file] [-Q] or PCOPY d:[path][file] nd:[name].[ext] [-Q] You always copy from the source to the destination</p> <p>n: User level, 0 to 15 d: Drive, e.g. A:, B: for diskettes and C: for hard disk name: File name, according to PCP/M conventions ext: File extension, according to PCP/M conventions path: Path, according to MS-DOS conventions file: File, according to MS-DOS conventions Q: Optional parameter, scanning mode if file already exists</p> <p>Example: PCOPY 0A:S5.CMD C:\SIMATIC In this example file S5.CMD is copied from the PCP/M diskette in drive A: to MS-DOS drive C: in the SIMATIC directory.</p> <p>Note: CTRL+C aborts the copying process and the destination file is deleted.</p>

Program name	Explanation
PDEL	<p>deletes files on PCP/M media</p> <p>Call up: PDEL [n]d:[name].[ext] [-Q] n: User level, 0 to 15 d: Drive, e.g. A:, B: for diskettes and C: for hard disk name: File name, according to PCP/M conventions ext: File extension, according to PCP/M conventions Q: Optional parameter. Scanning to see if a deletion is needed.</p> <p>Example: pdel b:.* Before the files in user 0 on drive B: which are not write-protected can be deleted, you will be prompted to confirm your delete command. Confirm with Y or N. pdel 5b: -q Before each individual file in user 5 on drive B: can be deleted, you will be prompted to confirm your delete command. Confirm with Y or N. Write-protected files cannot be deleted.</p>
PDIR	<p>displays the PCP/M media directory</p> <p>Call up: PDIR [n]d:[name].[ext] n: User level, 0 to 15 d: Drive, e.g. A:, B: for diskettes and C: for hard disk name: File name, according to PCP/M conventions ext: File extension, according to PCP/M conventions</p> <p>Example: pdir *c: All files on drive C: (user 0 to 15) are listed on the screen. With the key combination CTRL and S, you can halt the listing, with CTRL and Q you can continue the output of the listing.</p>
PFORMAT (only possible with S5-DOS/ST)	<p>formats diskettes for PCP/M</p> <p>Call up: PFORMAT d: [-4 -V] d: Drive, e.g. A: or B: -4 Optional parameter (only required for the PG 675) with which disks are generated in 40-track format. -V: Optional parameter. Checks diskettes.</p>

Program name	Explanation
PSET	<p>changes file attributes on PCP/M media</p> <p>Call up: PSET [n]d:[name].[ext] [-RO -RW -SYS -DIR]</p> <p>n: User area, 0 to 15 d: Drive, e.g. A:, B: for diskettes and C: for hard disk name: File name, according to PCP/M conventions ext: File extension, according to PCP/M conventions RW: Read/write attribute is set RO: Read only attribute is set SYS: SYS attribute is set DIR: DIR attribute is set</p> <p>Note: The -RW and -RO attributes are mutually exclusive. The -SYS and -DIR attributes are also mutually exclusive.</p> <p>Example: pset 0b:alpha*. * -dir -ro All files on drive B:, user 0 with the name ALPHA*. * are assigned the attributes DIR and RO. The characters *. * are wildcards.</p>
PTYPE	<p>displays the contents of a PCP/M file</p> <p>Call up: PTYPE [n]d:[name].[ext] [-h]</p> <p>n: User area, 0 to 15 d: Drive, e.g. A:, B: for diskettes and C: for hard disk name: File name, according to PCP/M conventions ext: File extension, according to PCP/M conventions h: Optional parameter. Output in hex.</p> <p>Example: ptype 5b:?????LS.INI The contents of the selected files from drive B:, user 0 are listed on the screen. With the key combination CTRL and S, you can halt the listing, with CTRL and Q you can continue the output of the listing.</p>

1.9 Reinstalling the System Software

Reinstalling means that you copy the supplied software components from your backup diskettes to the appropriate partition on your hard disk. As you already know, your PG was supplied with one PCP/M partition and - according to the capacity of the hard disk - one or two MS-DOS/FlexOS partitions.



Reinstalling the software is command-led and divided into three steps. You will be guided through the procedure by menus and the corresponding installation programs. The individual steps can be broken down as follows:

1. Installing the basic operating system on the PCP/M partition.
2. Installing the operating systems S5-DOS/ST and S5-DOS/MT on the first MS-DOS/FlexOS partition.
3. Installing the STEP 5/ST and STEP 5/MT Basic Packages and other software components.

We recommend that you proceed in the following order:

1.9.1 Reinstalling the PCP/M Partition

It is assumed that you have partitioned and formatted the PCP/M partition with the PCP/M utility HDMAINT. Otherwise, please read the instructions in your PCP/M Pocket Guide.

- Insert the PCP/M-86 backup diskette in drive A: and closed the drive.
- Switch on or reset the PG.
PCP/M-86 is booted from diskette and the initial menu is displayed.
- Switch to inputting PCP/M commands with **F8** and using the command **PIP...** start the copying procedure; enter the following commands:


PG with one floppy disk drive:

- Type in the command **PIP B:=A:*. *[RVW]** and press the return key.

PG with two floppy disk drives:

- Type in the command **PIP C:=A:*. *[RVW]** and press the return key.

- Activate drive B: or C:.
This means you type in **B:** or **C:** and press the return key.
- Now change to the operating system MS-DOS by exchanging the PCP/M backup diskette for the MS-DOS system diskette and restarting the PG with the key combination **CTRL+ALT+DEL**.

 The PCP/M-86 backup diskette only contains the PCP/M operating system with its commands. Only these files are transferred to the PCP/M partition during the copying process. The files in the S5 operating system extension are transferred later from the newly installed MS-DOS/FlexOS partitions to the PCP/M partition.

1.9.2 Reinstalling the MS-DOS/FlexOS Partition

It is assumed that the MS-DOS/FlexOS partition(s) have been partitioned with the MS-DOS utility FDISK.EXE and formatted with the command FORMAT.EXE. If this is not the case, please refer to your MS-DOS Pocket Guide.

Reinstalling the operating systems

- Insert the backup disk of the MS-DOS operating system in drive A: and close the drive.
- Perform a system start, e.g. by pressing the key combination **CTRL+ALT+DEL**. The PG boots MS-DOS from the diskette in drive A:. Following this, a form is displayed on the screen that explains the remaining steps required to reinstall the software.
- Type in the characters **INSTALL** and press the return key. MS-DOS, FlexOS and X/GEM with PlantTop are installed on hard disk C:. Following this, the system prompt C: appears on the screen.
- Remove the backup diskette from drive A: and perform a system start. S5-DOS/MT is loaded and PlantTop is automatically started.

1.9.3 Reinstalling Further Software Components

The backup diskettes are numbered twice (see section 1.2.1):


- once with reference to the complete number of backup diskettes for the DOS partition and
- once with reference to the number of backup diskettes of the particular software package, e.g. "New Collection", "STEP 5/MT Basic Package".

It is assumed that PlantTop is loaded and on the screen. Proceed as follows:

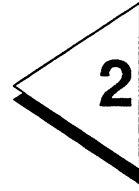
- Insert the first backup diskette of a software package in drive A: and close the drive.
- Double click on the icon for drive A: in the device park.
- Double click on the icon of the **INSTALL.286** application.

All further steps for the reinstallation are explained in menus as you proceed.

- Repeat these steps for all other software packages you require.

 In the installation program for the software package "STEP 5/ST Basic Package", you are asked whether the STEP 5 Basic Package should be installed under PCP/M. If you answer this question with "INSTALL", the STEP 5 files are automatically transferred from the STEP 5/ST Basic Package to the PCP/M partition.

The reinstallation of the PCP/M partition is then complete when these files have been transferred.



Basic Information on PlantTop

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This chapter:

defines PlantTop and

describes what PlantTop is for.

What is PlantTop?

PlantTop is a graphic user interface to the operating system FlexOS 386. PlantTop runs as an application on X/GEM. X/GEM (Extended Graphics Environment Manager) is an operating system extension, which forms a graphics mouse-oriented application environment independent of the CPU, the operating system and the graphics hardware. X/GEM uses the advantages of high-level multitasking-multiuser operating systems as well as the advantages of advanced intelligent graphics hardware. X/GEM, in this case, runs on the realtime multitasking-multiuser operating system FlexOS 386.

What is the purpose of PlantTop?

PlantTop helps you to communicate with your computer and its operating system more easily. Objects like files, directories and devices are represented as icons. Thus the abstractions inflicted on you when you work in a command line are no longer necessary. Under PlantTop commands are menu-driven, you no longer have to learn them by heart or look them up in manuals.

All this enables you to work with FlexOS more comfortably. If you are an inexperienced user you learn to use new application programs far quicker and if you are already experienced you can do your work faster and more efficiently.

This section contains the basic information you need about the user environment PlantTop. You learn:

- how to start PlantTop
- how to operate the user environment and its controls
- how to open, copy and delete objects.

2.1 Starting PlantTop

In the state in which it is delivered PlantTop is started automatically when you load the operating system FlexOS; access protection is not activated. Once you have terminated PlantTop and want to start it again you can input the "XGEM" command under FlexOS.

If you work in a multi-user system, the system manager or super user can allocate access rights by means of the X/GEM application FlexPrep (see Chapter 6). Thus only authorized users are permitted to access the computer. The system manager enters authorized users in the user table and allocates each user his own working directory and particular rights.

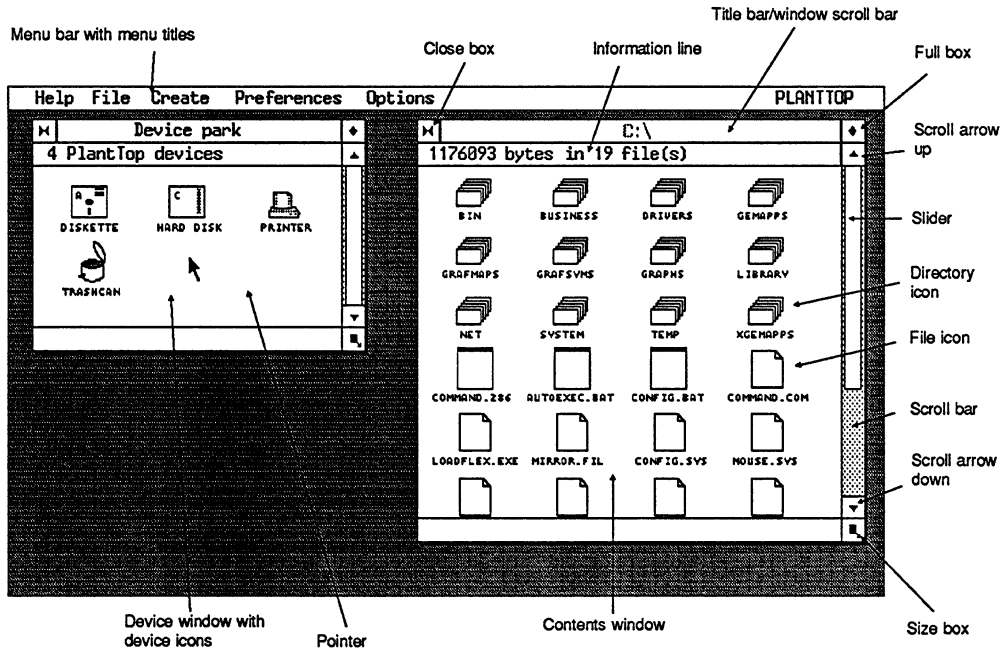
If access protection is activated, PlantTop is not started automatically, the user is prompted for his user name and password:

user name:

password:

2.2 User Environment and Controls

PlantTop appears with the following display, in which the number and size of the open windows vary according to the selected preferences.



The individual elements of the PlantTop environment shown in the illustration above are explained in the following sections.

2.2.1 Pointer

The *pointer* (cursor) moves on the surface of PlantTop when you move your mouse. By means of the pointer you select the objects you want to manipulate: open, close, move etc. Position the pointer on the object and press the left mouse button (click). The object is now selected. The icon is displayed highlighted. If you wish to select several icons, press the SHIFT key and then click on the other required icons.

You can select a group of adjacent icons simultaneously by using a lasso (rubber rectangle), i.e. you keep the mouse button pressed and pull the mouse pointer over the screen so that the displayed rectangle includes or touches all the icons you wish to select. By clicking further icons while pressing the SHIFT key, you can add (clicking not yet selected icons) or remove (clicking already selected icons) further files and directories. Please note that the upper left corner of the rectangle must **not** touch an icon. If the pointer is positioned directly on the icon, the rectangle cannot be formed and the icon is copied instead.

Note: Only use the left mouse button! PlantTop does not respond to inputs from the other buttons.

2.2.2 Menu Bar



PlantTop *menus* contain commands you can choose to execute certain functions under PlantTop.

Move the pointer up to the left corner of the PlantTop surface and touch the word "Help". Depending on the default, the help menu either drops down below the menu bar automatically or you have to pull down the menu by clicking on the word "Help" (see section 4.3.4).

Each line in a menu is a command. Some commands are "dimmed" or "grayed out". You cannot choose these dimmed commands because they have no relevance in the context of what you are doing at the time.

For example if no icon is selected when you display the "Help" menu, the "Information" command is dimmed because PlantTop does not know on which object information is required.

Slide the pointer along the menu bar. When it touches the other menu titles or you click on these titles, the respective menu is displayed.

If you want to leave the menus, move the pointer to an open area of the PlantTop surface and press the left mouse button.

Applications windows usually have a scroll bar along the bottom of the window as well as a vertical one at the side, with which you can shift the contents of the window from side to side (horizontally).

2.2.3 Windows

Under PlantTop you can open up to seven *windows* simultaneously. The devices are assigned their own window (device window) which is open as long as PlantTop is running. The size and position of the individual windows can be selected as required. The contents window is a subset of the device window.

You can only work with the window in the foreground. Although the other windows in the background are updated, the foreground window is known as the "active window". It can be recognized by the black writing in the title and the symbols at the right edge. If you position the windows in such a way that parts of them are visible, you simply click on one of the other windows to make it the active window, i.e. to bring it to the foreground. If a window is completely obscured, you can get to it by moving or closing the window in front of it.

You can close all PlantTop windows again apart from the device window. If you close the device window, you terminate PlantTop.

Regardless of their contents all windows have the same controls.

The information in the *title bar* tells you which drives and directories are open. You can also use the title bar to move the window: move the pointer to the title bar, press the mouse button and keep it pressed while you move the entire window to the new position.

You can also use the title bar to determine the type of files to be displayed in the window. Click on the title bar without moving it. A menu appears in which a file name can be specified. The wildcard characters you are familiar with from FlexOS can be used.

- * Represents an optional character string.
- ? Represents an optional character.
- ^ Is input as the first character of the file name. The files specified are not displayed.

If for example "*.286" is specified, all files ending in ".286" are displayed.

Click on the *close box*:



- a) Contents window: change from a subdirectory to the higher directory (parent directory).
If you are in a root directory, (e.g. C:\) the contents window is closed.
- b) A file opened by an application is closed along with the window set up by the application when the file was opened.
- c) If you close the device window, you terminate PlantTop.



By clicking on the full box you change the size of the open window to full image (the window uses the whole screen) and by clicking on the box again, you return to the initial size (providing you have not changed the size of the full image).



By clicking on one of the arrows, you move the screen contents one raster unit in the direction of the arrow, making more of the window contents visible. The raster unit in the contents window of PlantTop which can only be scrolled vertically, is one icon line. The applications use their own units when their windows are scrolled.



By moving this box while pressing the mouse button, you can enlarge or reduce the size of the corresponding window continuously.



From the ratio of the white bar (slider) to the shaded bar area, you can see what proportion of the window contents is visible and where the displayed part is located.







By selecting the shaded bar area above or below the white bar, the visible section is shifted by one full screen (if possible) in the corresponding direction.

You can, however, scroll the screen by moving the white bar with the mouse button pressed.

The same applies to the horizontal bars used in certain applications.

2.2.4 Icons

Icons are pictures of files and devices you use with PlantTop. A different type of icon represents each of the following types of files and devices:

- | | | |
|--------------------------|---|---|
| – Disk drives |  |  |
| | Floppy | Directory |
| – Directories | | |
| – Applications |  |  |
| | COMMAND.286 | CONFIG.SYS |
| – Documents (user files) | | |
| – Printers |  |  |
| | Printer | Trashcan |
| – Trashcan | | |

Disk drive and directory icons

Disk drive icons are labeled with their corresponding drive identifier letters: A,B,C etc. If the disk drive icons shown on your PlantTop do not exactly match your computer system, use the "PlantTop device" command in the "Create" menu to make the necessary additions or deletions. You can also use this command to change drive identifier letters and icon labels.

Directory icons are labeled with the directory name (up to eight characters) and the type identifier (up to three characters) you provide when you create the directory. Directories always appear as the first icons in a window, they can be sorted by name, date or type. Directories of the same type are always in alphabetical order. If you select "Size" as sorting criterium for files in the "INSTALL DISPLAY" dialog ("Preferences" menu, "Display..." field), directories are still listed in the alphabetical order of their names. When you open a directory the directory name is displayed in the title bar of the window.

Application and document icons

Application and document icons are labeled with their name (up to eight characters) followed by a type identifier (up to three characters). Name and type are separated by a period (.).

Printer and trashcan icons

local printers	Dragging files to the icon of a local printer starts the Output application for printout and enters the selected files in the output list.
trashcan	If you drag files or directories to the trashcan icon, they are deleted with all their subdirectories.

2.2.5 Applications

Applications are software programs you run on your computer (PC, PG) to create and process information. They appear as files with special name extensions (type identifier).

All applications and their document files have names consisting of up to eight characters and a type identifier consisting of up to three characters. A period (.) separates the name and the type. Example:

DRAW.286 Program file of the X/GEM application Draw Plus

Only applications with type identifiers .286 or .386 can run under PlantTop.

Some applications create and process only files of a certain type (e.g. DRAW.286 only creates files with type identifier .GEM). The type identifier indicates which application was used to create the file and can now be used to process it.

These "document" files can be allocated to applications by means of the "INSTALL FLEXOS APPLICATION" dialog (see section 4.3.3). Double-clicking on a document file automatically starts the application the file is allocated to.

Executable files are also command batch files of the type .BAT. They include several FlexOS commands which are executed one after the other when the file is processed (e.g. boot files CONFIG.BAT and AUTOEXEC.BAT).

Starting applications

There are three different ways of starting applications under PlantTop:

- double-clicking on the application's icon
- selecting the application's icon and then choosing the **Open** command from the "File" menu
- double-clicking on a document file, the type of which is allocated to an application.

2.2.6 Dialogs

Dialogs appear on your screen when PlantTop needs to communicate with you. The dialog conveys information you need or asks you for information PlantTop needs to complete your instructions. Dialogs are of two types:

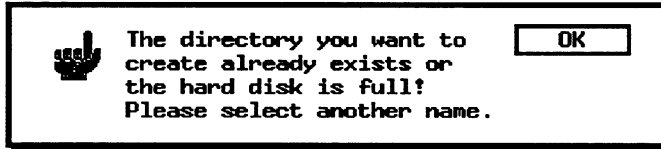
- information
- data entry

Before discussing the dialog types, we will describe *exit buttons*, a component found in all dialogs.

Exit buttons

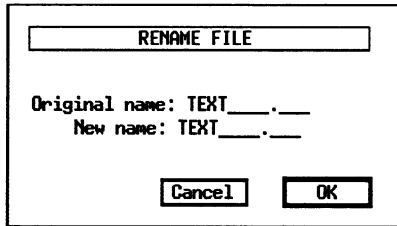
Every dialog has at least one exit button. In its simplest form, an exit button provides the means to remove a dialog from your screen.

The dialog in the following illustration has one exit button labeled "OK":



After reading the dialog's message, place the pointer on the exit button and click. The dialog disappears and you can resume work where you left off.

Many dialogs contain more than one exit button. Each button offers an alternative means of exiting the dialog.



Note that the "OK" button has a heavier border than the "Cancel" button. In this case pressing the RETURN key is the same as clicking on the button with a thick border like this.

Information dialogs

Some dialogs only convey information. When you choose the "Information" command in the "Help" menu after selecting a directory icon, the following information dialog is displayed:

DIRECTORY INFORMATION	
Path: C:_____	
Name: XGEMAPPS.____	
Directory name mode:	
<input type="checkbox"/> upper case	
<input checked="" type="checkbox"/> upper and lower case	
Access rights:	
<input checked="" type="checkbox"/> read and write	
<input type="checkbox"/> read only	
Directory state:	
<input type="checkbox"/> archived	
<input type="checkbox"/> system directory	
<input type="checkbox"/> hidden	
Files: 155	
Subdirectories: 6	
Size: 2862843__bytes	
Creation: 07.06.1989 16:59 33	
User id: 0_____ (owner)	
Group id: 0_____ (owner)	
	<input type="button" value="OK"/>

Many information dialogs contain only one exit button. After reading the dialog's message, click on the exit button to close the dialog and continue your work.

Some information dialogs warn you of a problem that has occurred or might occur if you continue what you are doing. Most dialogs of this type contain one of the following symbols:



This symbol indicates you should take notice of the message conveyed and then continue with your work.



This symbol means that if you continue what you are doing, you could run into a problem. These dialogs usually contain a "Cancel" exit button so you can abort the procedure if necessary.



This symbol usually means you should stop what you are doing because an error has occurred.

This is a general description of how these symbols are used. In practice you may see them used differently.

Data entry dialogs

Data entry dialogs appear when PlantTop needs information from you to complete an operation.

Data entry dialogs contain areas where you type in the required information. These areas are called data entry fields. The dialog might also ask you to enter the information by clicking on various buttons. For example, if you select a document icon and then choose the "Information" command in the "File" menu, you see the FILE INFORMATION dialog as shown below.

FILE INFORMATION

Path: C:\XGEMAPPS\
Name: WORDPLUS.286

Last modification: 07.11.1998 18.27.33
 Size: 154992_ byte
 User id: 0_____ (owner)
 Group id: 0_____ (owner)

File name mode:
 upper case
 upper and lower case

Access rights:
 read and write
 read only

File state:
 archived
 system
 hidden

Security:

Owner:	Group:	World:
<input type="checkbox"/> read	<input type="checkbox"/> read	<input type="checkbox"/> read
<input type="checkbox"/> write	<input type="checkbox"/> write	<input type="checkbox"/> write
<input type="checkbox"/> delete	<input type="checkbox"/> delete	<input type="checkbox"/> delete
<input type="checkbox"/> execute	<input type="checkbox"/> execute	<input type="checkbox"/> execute

The FILE INFORMATION dialog is a combination of information and data entry dialogs; it contains some information you can change and some you cannot change.

The "Name" field is a data entry field, as indicated by the text cursor (a vertical bar) at the end of the field. The field contains the name of the icon you selected.

You can enter information only in the field where the text cursor is located. To move the text cursor to a different field, place the cursor anywhere and click. If the text cursor does not appear in the field, you cannot enter information.

The next two fields in the dialog ("Last modification" and "Size") are not data entry fields. You cannot change the information they contain.

The buttons labeled "Security", "File name mode", "Access rights" and "File state" however are also data entry fields. Current defaults are inverted; they can be changed by clicking on alternative fields.

At the bottom of the dialog are the exit buttons. If you make changes in the dialog, click on the "OK" button and PlantTop saves your changes. If you do not make any changes, or if you make changes you do not want to save, click on the "Cancel" button.

The following table lists the keys you can use to move the text cursor and enter information in data entry dialogs.

Key	Effect
←	Moves the text cursor to the left one character at a time without deleting.
→	Moves the text cursor to the right one character at a time without deleting.
↓ or Tab	Places the text cursor in the next data entry field.
↑ or Shift-Tab	Places the text cursor in the previous data entry field.
DEL	Deletes the character to the right of the text cursor.
Backspace	Deletes the character to the left of the text cursor.
ESC	Erases all characters from the data entry field.

Note that except for ESC, a key's effect is continuous while you keep it pressed.

2.2.7 Opening Objects

To open an object, e.g. a file, position the pointer on the file icon and

- either press the mouse button twice (double-click) or
- select the file and choose the "Open" command in the "File" menu.

In both cases the content of the selected file is displayed.

Example: Insert a disk in floppy disk drive A:. Position the cursor on the icon of the disk drive and double-click on the icon.

A window with title bar A:*. * is opened and the files which are on the disk are displayed.

Depending on which object you open, the following reactions are triggered:

Object	Reaction on opening
File	File is opened, content displayed
Application	Application is started
Directory	Directory is opened, content displayed
Disk drive	Disk drive is opened, content displayed
Printer	Output application is started
Trashcan	Cannot be opened

2.2.8 Copying Objects

To copy an object, e.g. a file, position the pointer on the file icon, press the mouse button and while keeping it pressed drag the icon to where you want it copied.

Example: Select a text file (extension .TXT or .DOC) on your disk in drive A: by clicking on its icon once.



Keep the mouse button pressed and drag the icon to an open area in window C:\. Notice that when you drag, the pointer changes from an arrow to a hand. When you release the mouse button, you will see the "COPY FLEXOS FILE(S)" dialog on your screen.

Click on the "OK" button or press the RETURN key. Copying is started. The file now exists on your disk in drive A: as well as on hard disk C:.

Depending on the destination you are copying your object to, the following reactions are triggered:

Destination	Reaction on copying
Directory	File or directory including all subdirectories is copied into the directory.
Disk drive	File or directory including all subdirectories is copied to the drive.
Local printer	Output application is started, selected files are entered in the output list.
Trashcan	File or directory including all subdirectories is deleted.

2.2.9 Deleting Objects

To delete an object, e.g. a file, select the file icon and

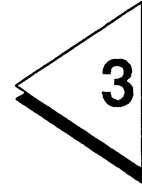
- either click on the "Delete" command in the "File" menu or
- drag the icon into the trashcan.

Example: Select the icon you have copied to drive C:\ in the previous example.

Click on the "Delete" command in the "File" menu.

Click on the "OK" button in the "DELETE FLEXOS FILE(S)" dialog.

If you decide not to delete the file, click on the "Cancel" button or press the RETURN key.



Network Operation

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In this section you learn to access remote devices via PlantTop, in particular:

- how to load network drivers
- how to install remote devices and
- how to work with remote devices.

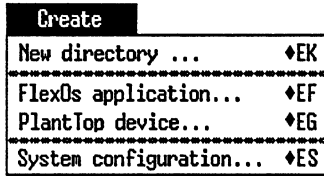
PlantTop can address devices (drives, printers) in remote computers (e.g. other PG 750s) via the operating system expansion FlexNet, provided these are interconnected via a physical network such as ARCNET or ETHERNET (SINEC H1). FlexNet is included in the PG delivery package. The manual of your operating system also contains a description of this network software. For a first attempt you simply require a second PG connected to your unit by means of an inexpensive plastic fiber optic cable (ARCNET). The local ARCNET node address can be set with the SETUP program, which you start with the key combination CTRL-ALT-S under MS-DOS, before booting FlexOS (see instructions or the system manual for your PG).

3.1 Loading Network Drivers

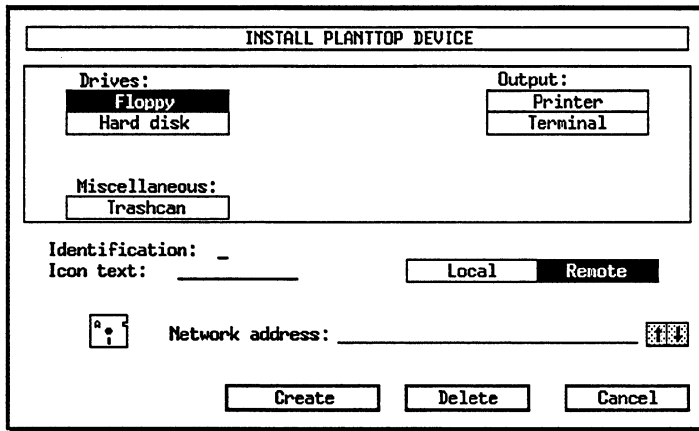
Network drivers are loaded and assigned parameters via the PlantTop application FlexPrep (see section 6.4).

3.2 Installing Remote Devices in PlantTop

To install a device, select the field "PlantTop device" in the "Create" menu (see sections 4.2.3 and 4.3.3).



Remote devices are distinguished from local devices in PlantTop by means of the network address. You are prompted to enter the network address after you click on the "remote" field in the "Install PlantTop device" dialog (see section 4.3.3).



In the illustrated dialog there are two arrows to the right of the input line for the network address. If the FlexNet drivers are loaded, the network addresses (node addresses) in the NETNAMES.DAT file can be scrolled through by clicking on these arrows. NETNAMES.DAT serves as a form of telephone book; it can be edited via FlexPrep (see Chapter 6).

The following steps are required to install a new remote device:

1. Via FlexPrep enter the network address of the remote node in the respective NETNAMES file on your local unit.
2. Correspondingly, enter the network address of your node in the respective NETNAMES file on the remote computer.
3. When FlexNet is next loaded, the extended NETNAMES table is available to PlantTop.

After exiting the "Install PlantTop device" dialog, the installed device is displayed as an icon in the device window. Make sure that you assign clear icon names for the remote devices (e.g. the node name). You will find it easier later when you may have a large number of different devices displayed in the device window.

3.3 Working with Remote Devices

Once the remote device is installed in the device window, you can use it in the same way as a local device. Clicking twice will display the contents or start programs, dragging icons initiates copying procedures.

Just as with your local computer, you must log on as the user at the remote computer, if access protection has been activated. Select the remote device by clicking once; the icon of the unit is then displayed inversely. Select the field **LOGON command** in the "Options" menu (see section 4.2.5). You then obtain the "LOGON command" dialog (see section 4.3.5).

LOGON COMMAND

Net node: ___
User name: _____
Password: _____

Table entry:

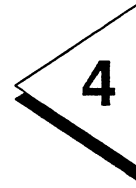
Cancel Delete Update LOGON

Enter the user name and the password for the remote device in the dialog and click on the LOGON button. PlantTop establishes the link via FlexNet. If an error occurs (address, user name or password incorrect, network not loaded, etc.) the LOGON dialog is displayed again and you can check and, if necessary, correct your entries. You can exit the dialog in several different ways. These are described in section 4.3.5. Do not forget to save the LOGONs you have created via the "Preferences/Save PlantTop entries" menu. When you then work with devices whose LOGON command is already stored, you can suppress the display of the network LOGON dialog using the "Preferences/PlantTop" menu (see section 4.3.4).

The **LOGOFF command** is the counterpart of the LOGON command. With the LOGOFF command you can log off devices which you have logged on with FlexNet. The procedure is the same: select the "LOGOFF command" dialog in the "Options" menu.

Once you have successfully logged on in the remote device, working with remote devices does not differ from working with local devices. Copying, deleting, renaming, creating directories etc. is the same with remote devices under PlantTop as with local devices.

There is one difference between printing out on a local printer and printing out on a remote printer. When you copy a file by dragging its icon to the printer icon of a local printer or when you double-click on the printer, the Output application is always started. On a remote printer, you can, at present, only print out files by copying the file concerned to the remote printer. These procedures are described in more detail in section 5.2.2.



Menus and Commands

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This section describes the PlantTop menus as they appear in the menu bar and all the commands which appear in the menus.

Move the mouse pointer to one of the titles in the menu bar (Help, File, Create, Preferences, Options, PLANTTOP). If a menu drops down as soon as the mouse pointer touches one of the titles, the menu type "drop down menus" is set. If nothing happens, the menu type "pull down menus" is set; you must then click on the menu title to roll the menu down. The type of menu can be selected with the "PlantTop" command in the "Preferences" menu and saved as the default using the command "Save PlantTop entries".

In the menus, commands are displayed which you can use in the PlantTop environment to execute certain functions. Move the pointer through the displayed menu and the commands are displayed highlighted one after the other. You select a command by moving the pointer to the selected menu and then click on the required command.

4.1 Shortcuts via the Keyboard

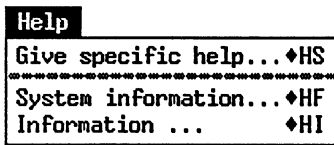
All commands which can be triggered in the PlantTop menu using the mouse can also be started at the keyboard by pressing certain key combinations.

All commands in PlantTop have a short form; the key sequence appears to the right of the command in the menu. For example, in the "Help" menu, there is a diamond or lozenge (◆), followed by the letters "H" and "I" beside the command "Information...". The diamond stands for the ALT key. If you enter the letters "HI" while pressing the ALT key, this is the same as displaying the "Help" menu and selecting the "Information..." command. All the shortcuts in PlantTop consist of two letters. The ALT key is only necessary when typing in the first letter.

If it is not possible to select a command in a menu in the current status, entering the shortcut has no effect.

4.2 The PlantTop Menus

4.2.1 Help Menu



Give specific help... Shortcut: ♦HS

Provides help in the current status (not yet implemented).
At this point you are only informed how to start
STEP 5/MT.

System information... Shortcut: ♦HF

Provides information about FlexOS, logon, console,
memory, hardware and date and time.

Information... Shortcut: ♦HI

Provides information about the currently selected object
(icon). If no icon or several icons have been selected or if
there is no information available for an object, this
command cannot be selected.

4.2.2 File Menu

File	
Open	◆DO
Close	◆DS
Delete	◆DL
Rename...	◆DU
To output...	◆DA
Format...	◆DF

Close window	◆DQ

Quit PlantTop	◆DX

- Open** Shortcut: ◆DO
- Opens the currently selected element (e.g. program start; corresponds to a double-click on the element).
- Close** Shortcut: ◆DS
- Goes back one directory level in the active window or closes the window, if the highest directory level is displayed. (Corresponds to one click on the close box; in device window: quit prompt).
- Delete** Shortcut: ◆DL
- Deletes all the selected elements (cannot be undone).
- Rename...** Shortcut: ◆DU
- This command is only active, if a file has been selected. The selected file can be renamed.

To output...	Shortcut: ♦DA Transfers the selected files to the application program Output.
Format...	Shortcut: ♦DF Used to format a diskette in a local disk drive.
Close window	Shortcut: ♦DQ Closes the active window (In device window: quit prompt).
Quit PlantTop	Shortcut: ♦DX Terminates PlantTop (with prompt for confirmation). PlantTop can also be terminated via the key combination CTRL-Q (no prompt for confirmation).

4.2.3 Create Menu

Create	
New directory ...	◆EK
FlexOs application...	◆EF
PlantTop device...	◆EG
System configuration...	◆ES

- New directory...** Shortcut: ◆EK
Creates a new directory in the active window (not possible in the device window).
- FlexOS application...** Shortcut: ◆EF
Used to configure the selected application (document types, parameters, icon).
- PlantTop device...** Shortcut: ◆EG
Used to install, delete or reconfigure a device. You can also install remote devices and use them via the network (FlexNet).
- System configuration...** Shortcut: ◆ES
Starts the FlexPrep application, which enables a super user or system manager to determine the configuration of FlexOS and X/GEM for the next booting process (see Chapter 6).

4.2.4 Preferences Menu

Preferences	
PlantTop ...	◆VP
Display...	◆VA
Change language	◆VF
Save PlantTop entries	◆VS

PlantTop...

Shortcut: ◆VP

Used to configure PlantTop (icons, layout, languages,...)

Display...

Shortcut: ◆VA

Allows you to select the type of display for PlantTop (text/icons, sorting files/devices, display of file stamps).

Change language

Shortcut: ◆VF

Switches to the other of the two preset languages.

Save PlantTop entries

Shortcut: ◆VS

Stores all the PlantTop settings in a configuration file with the file type .INF.

If you simply press the RETURN key in response to the prompt for the user name and the user ID when logging on in FlexOS, PlantTop uses the standard configuration file S5STD.INF to load and save its configuration.

The file S5STD.INF is also used if you have not set up your own file of the type .INF under your user name (see section 4.3.4).

4.2.5 Options Menu

Options	
FlexOS commands...	◆UK
Search for file...	◆US
LOGON command...	◆UL
LOGOFF command	◆UX
Load PCP/M	◆UP
Load MS-DOS	◆UM

FlexOS commands... Shortcut: ◆UK

Starts the "X/GEM shell" in its own window in which you can enter FlexOS commands. The size of the window in full-frame display is 80 x 25 characters.

Search for file... Shortcut: ◆US

Searches for one or more files in the selected drive or directory. When you specify the files you can use the wildcards ?, * and ^. The result is displayed in a window (X/GEM shell) in text mode.

LOGON command... Shortcut: ◆UL

Used to log on in a drive available via FlexNet. Only necessary when access protection is activated for the remote computer.

LOGOFF command Shortcut: ◆UX

Logs off at a drive available via FlexNet.

Load PCP/M

Shortcut: ♦UP

Changes to the PCP/M partition and boots PCP/M.

Load MS-DOS

Shortcut: ♦UM

Boots MS-DOS and displays the dialog in which you can choose the operating system.

4.2.6 PLANTTOP Menu

PLANTTOP
INFO PLANTTOP
OUTPUT
⋮
CLOCK

INFO

No shortcut possible

Provides information about the PlantTop version (version, date).

PLANTTOP

No shortcut possible

PlantTop is entered in this menu as the active application. The entry of this command in this situation, however, has no effect, since PlantTop is already active, i.e. is in the foreground.

Further menu entries

No shortcut possible

The list of entries in the PlantTop menu is extended by the number of applications you start. Using this menu, you can bring one of the started applications to the foreground.

4.3 Description of the Individual Commands

4.3.1 Commands in the Help Menu

Help

Not yet implemented. Currently you are only informed how to start STEP 5/MT.

System Information

With this command, you obtain comprehensive information about the computer system and system software.

The following dialog appears on the screen:

SYSTEM INFORMATION	
Logon information	FlexOS
User name: framue	Version: 2
User: 0	Release: 2
Group: 0	Hardware
Family: 2	Graphic: HIGRAPH+
Process: 59	CPU: 80386
Physical console	Memory (bytes)
Name: con0	All: 9781248
Identification: 0	System: 1998848
Virtual console: 173	Free: 6737920
Pixel (vertical): 480	System time
Pixel (horizontal): 640	Time: 14:47:02
Lines: 34	Date: 14.12.1990
Columns: 80	Day: Friday
Language (countrycode): 1670	Time zone: 960
<input type="button" value="OK"/>	

Information

If you have selected a single icon, you can use this command to display information about this specific element, providing information is available (no information available for printers at present).

File information

If you select a single file in a window and then click on the "Information" field in the "Help" menu, a dialog is displayed on the screen similar to that shown in the following example:

FILE INFORMATION			
Path: C:\XGEMAPPS\ Name: WORDPLUS.286			
Last modification: 07.11.1990 18.27.33		File name mode:	
Size: 154992_ byte		upper case	
User id: 0 (owner)		upper and lower case	
Group id: 0 (owner)		Access rights:	
Security:		read and write	
Owner:	Group:	World:	read only
read	read	read	
write	write	write	
delete	delete	delete	
execute	execute	execute	
			File state:
			archived
			system
			hidden
		Cancel	OK

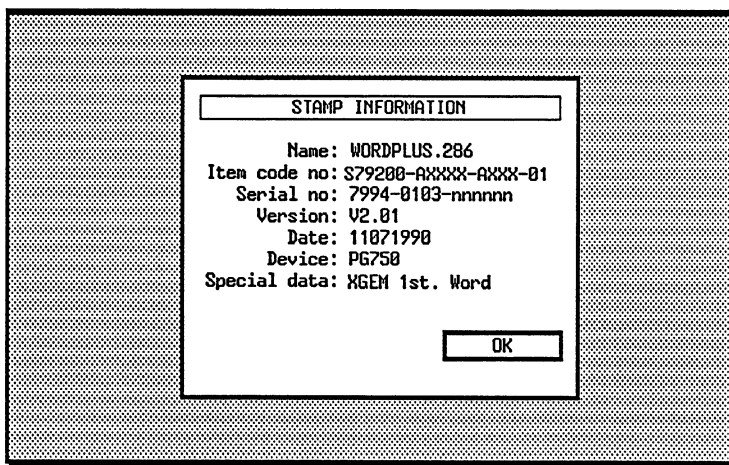
The first line of information indicates the search path which leads to the file, the second line shows the name of the selected file. Further information includes the date and time at which the file was generated or last modified, its size in bytes, the user and group ID of the owner. The current settings are displayed inversely.

You can modify the name, the security, the mode for the file name, the access rights and the file status in this screen form, providing you have the required user rights. When you exit the menu by clicking on the OK field, the modified data is stored.



You should be careful about setting the file states "hidden" and "system". A file with the attributes "hidden" or "system" is no longer displayed by PlantTop. If you wish to make the file visible again, this is only possible with the FlexOS command FSET.

The stamp at the bottom left is only displayed when you are dealing with a "stamped" file. A stamped file contains additional information about the file which is stored at its end. If you wish to see this information, click on the stamp in the "File Information" dialog. The stamp information is displayed in the following form:



Directory information:

When you select a directory and request information, the following dialog appears:

DIRECTORY INFORMATION	
Path: C:_____	
Name: XGEMAPPS.____	
Directory name mode:	
<input type="checkbox"/> upper case	
<input checked="" type="checkbox"/> upper and lower case	
Access rights:	
<input checked="" type="checkbox"/> read and write	
<input type="checkbox"/> read only	
Directory state:	
<input type="checkbox"/> archived	
<input type="checkbox"/> system directory	
<input type="checkbox"/> hidden	
	Files: 155
	Subdirectories: 6
	Size: 2862843__bytes
	Creation: 07.06.1989 16:59 33
	User id: 0_____ (owner)
	Group id: 0_____ (owner)
	<input type="button" value="OK"/>

The information dialog contains the same information as displayed for files. The number of subdirectories and the number of files contained in this directory are also displayed.

Disk drive information:

If you select a floppy or hard disk drive in the device window and then enter the command "Information", the following dialog appears on the screen:

DISK DRIVE INFORMATION	
Drive name:	C_
Drive identification:	_____
Drive type:	Winchester
Driver:	hd0_____
Directories:	83_____
Files:	2358_____
Bytes occupied:	23890370_____
Bytes free:	5904384_____
<input type="button" value="OK"/>	

From the "Driver" field, you can see which logical hard disk drive the information refers to (hd0: for the first, hd1: for the second). The "Drive name" indicates under which name the hard disk drive can be addressed.

Information can also be obtained about disk drives of remote devices.

Information - trashcan/terminal

In the same way you can obtain information about a trashcan or a terminal located in the device window.

4.3.2 Commands in the File Menu

Open

The effect of the "Open" command depends on the type of icon selected before the command was selected.

Icon type	Effect of the command
Drive	The content of the drive is displayed in a new window, providing an additional window is available.
Printer	The Output application is started without parameters (empty output list).
Directory	The content of the directory is displayed in the window in which the directory was selected.
User program	The user program is started (possibly with parameter input).
Document	If a user program has been configured with this document type, the user program is started. If there is no application for this document type, a message is displayed.

Close

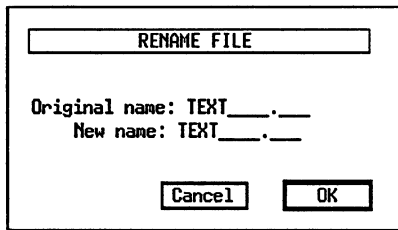
With this command, the directory displayed in the window in the foreground is closed. If there is a further directory level above this directory, this is then displayed, otherwise the window is closed completely. If the window in the foreground is the device window, you will be prompted to decide whether to terminate PlantTop or not.

Delete

With this command, you can delete a single file, a whole directory, a group of files and directories and the contents of a whole drive. Depending on the selected preference, you will be prompted to confirm whether the files/directories should be deleted or not.

Rename

With this command, you can rename a single file. If the new name already exists, a message is output.



A dialog box titled "RENAME FILE" with a title bar. Inside the box, there are two text input fields: "Original name: TEXT ____." and "New name: TEXT ____.". At the bottom of the dialog, there are two buttons: "Cancel" and "OK".

To output

If one or more files have been selected, this command can be used to start the Output application. The selected files are transferred to the Output application as parameters (Output is described in Chapter 5).

Format

If you have selected a floppy disk drive in the device window which is installed locally on your computer you can format diskettes with this command. X/GEM Shell is started in a window. FlexOS checks whether the selected floppy disk drive is a 5¹/₄ inch or a 3¹/₂ inch drive. FlexOS then displays one of the following menus on the screen:

Choose one of the following:

1. 320k (8 sector, 40 track, double-sided, 5.25")
2. 160k (8 sector, 40 track, single-sided, 5.25")
3. 360k (9 sector, 40 track, double-sided, 5.25")
4. 180k (9 sector, 40 track, single-sided, 5.25")
5. 1,200k (15 sector, 80 track, double-sided, 5.25")

Press ESC to quit.

Enter choice: █

Choose one of the following:

6. 720k (9 sector, 80 track, double-sided, 3,5")
7. 1,440k (18 sector, 80 track, double-sided, 3,5")

Press ESC to quit.

Enter choice: █

Enter the number of the format and press the RETURN key.

Before FlexOS starts formatting, it informs you that all data on the diskette will be destroyed by the formatting function and prompts you to confirm your intention. With Y, you start the formatting and with N, the formatting program is abandoned.

Close window

This command closes the active window completely. When you close the device window, you are asked whether you want to terminate PlantTop or not.

Quit PlantTop

By selecting this command, you terminate PlantTop. Occupied memory space is released. If other applications are still active, one of these will be brought to the foreground. Before the command is executed, you will be prompted to confirm that you really wish to quit PlantTop.

4.3.3 Commands in the Create Menu**New directory**

With this command, a new directory is created in the window in the foreground. The directory name must be entered in a dialog box.

If you enter an already existing directory name or if there is no space for this directory, a message to that effect appears. You must then either select a different directory name or create space on your diskette or hard disk.

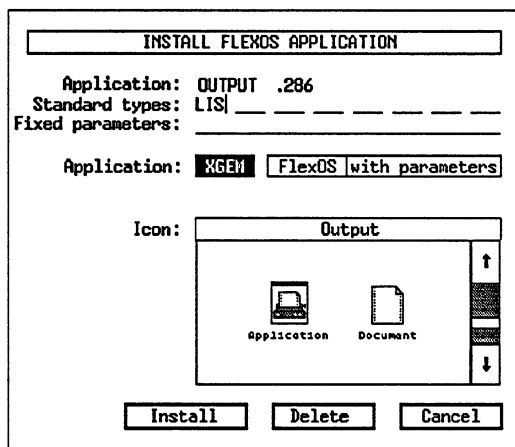
Under PlantTop a **maximum nesting depth of eight directory levels** is possible. If you exceed the maximum permissible nesting depth in trying to create a new directory, a message is displayed.

FlexOS applications

By configuring an application, you inform PlantTop of the standard file types which can be processed with the application. You can also select other icons to display the application and its files in PlantTop. You cannot determine document files as standard types for command batch files.

You configure an application as follows:

1. Select an application icon. The type of application must be 286, 386 or BAT (e.g PLANTTOP.286).
2. Select the "FlexOS application" command in the "Create" menu. The following dialog then appears in which you make the required entries.



3. In the field "Standard types", you enter the file types you wish to use with the application (e.g. application WordPlus.286, standard types DOC, TXT). You can specify up to eight types. Use the TAB key, the SHIFT-TAB keys or the mouse pointer to move from field to field. The file types permitted for an application can be found in the manual for the appropriate application. If you use a file type with several applications, the last assignment created is valid.

4. In the "Fixed parameters" field, you can specify the parameters to be transferred automatically to the application each time it is started.
5. In the "Application" field, you specify whether the application is an X/GEM application (graphics), a FlexOS application or a FlexOS application with parameters. These parameters are requested whenever the application is started.
6. In the "Icon" field, you can select the application and document icons used by PlantTop to display the application and your document types. You can page through the existing pairs of icons just as with a normal display window using the scroll bars, the slider and the scroll arrows. Scroll the contents of the icon window until a suitable pair of icons is displayed in the window. If you do not like any of the pairs of icons, leave the "general" icons in the window. The text in the header of the window (e.g. "general") is used to make the assignment of applications to certain groups easier; later, it has no further use.
7. When you have completed all the fields to your satisfaction, click on the "Install" box. If you wish to quit the dialog without making any changes, click on the "Cancel" box. If you wish to delete the configuration of an application, click on the "Delete" box. This is only possible when the application is already installed.

Note: please remember that the installation or deleting of an application configuration is only valid until you terminate PlantTop, i.e. such modifications are lost when you exit PlantTop. If you would like to save a change, you must select the command "Save PlantTop entries" in the "Preferences" menu. The "Save PlantTop entries" command is discussed in detail later.

PlantTop devices

With this command, you can bring a new device into your device window, delete a device already in the window, or modify the parameters of an existing device. You can also install remote devices, which you wish to operate via the network. When working with remote devices, the operating system extension FlexNet must be loaded (see FlexNet User's Guide) and the node address of the new device must be entered in the "telephone book" (NETNAMES file). You install a network by means of the FlexPrep application (see Chapter 6).

The "PlantTop device" command can be selected in two ways:

1. No device is currently selected in the device window. The device installation dialog with the default "local disk drive" appears without identification and without icon text.
2. You have selected a particular device in the device window. In this case, the "Install device" dialog appears with the previously selected parameters for the selected device.

After selecting the command, the following dialog is displayed on the screen (The field "Network address" only appears when you have selected "remote".):

The screenshot shows a dialog box titled "INSTALL PLANTTOP DEVICE". It contains the following elements:

- Drives:** A list with "Floppy" (highlighted) and "Hard disk".
- Output:** A list with "Printer" and "Terminal".
- Miscellaneous:** A list with "Trashcan".
- Identification:** A vertical bar and a radio button for "Local" (selected) and "Remote".
- Icon text:** A text input field.
- Network address:** A text input field and a flag icon.
- Buttons:** "Create", "Delete", and "Cancel".

In the upper field, you select the device you wish to install, delete or modify. The icon with which the device is displayed in the device window appears to the lower left in the dialog box.

In the "Identification" input field, you specify the identifier with which the device is addressed by the system. An identifier must always be specified for floppy disk and hard disk drives (A, B, C etc).

In the "Icon text" input field, you assign a text of up to 12 characters to the device. This text is then displayed in the device window below the icon.

With the buttons "local" and "remote", you stipulate whether the device is connected locally to your computer or whether it is available via a network to another computer. If you select the "remote" button, a further input field appears: the node address of a remote device must be entered in the "Network address" field. Providing the network software is active, i.e. all network drivers are loaded, you can page through the node names which can be reached by your computer by clicking on the arrows to the right of the network address (the file NETNAMES.DAT functions as a "telephone book"). You now simply enter the device (drive,...) on the network node. This setting is retained when paging through the various nodes. (The possible network nodes depend on the configuration of the network software. This configuration is determined via the FlexPrep application.)

If all the device parameters are set, clicking on the button "Create" brings this device into the PlantTop device window.

With the "Delete" button, you can remove a selected device. If you wish to exit the dialog without changing the device configuration, click on the "Cancel" button.

Note: please remember that the changes in the device configuration only remain effective during the PlantTop session. If you wish to retain them after exiting PlantTop, you must click on the command "Save PlantTop entries" in the "Preferences menu". The "Save PlantTop entries" command is described in detail later.

System configuration

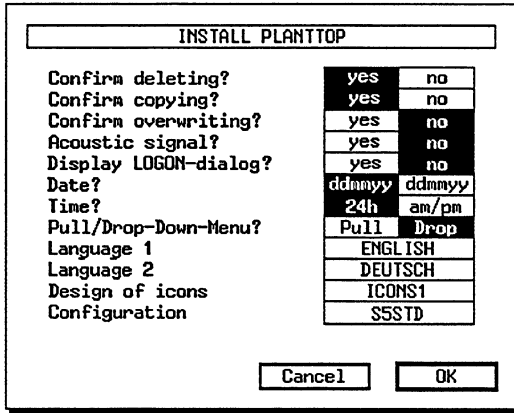
With this command you can change the configuration of FlexOS and X/GEM for the next booting process. The X/GEM application FlexPrep.286 is loaded and you can, via menus, edit system tables and determine which drivers are to be loaded with certain parameters. (If access protection has been activated, only a user with user ID=0 and group ID=0, i.e. the super user or system manager in multi-user systems, can give this command.)

The FlexPrep application is briefly described in Chapter 6. For further details see the "Help" texts you can call under FlexPrep.

4.3.4 Commands in the Preferences Menu

PlantTop

The reactions and appearance of PlantTop can be selected with this command. The following dialog appears on the screen:



The individual settings:

Confirm deleting?

If you select "yes", you will be prompted to confirm your intention whenever you select the delete function. The number of directories and files to be deleted is also indicated.

If you select "no", the selected files and directories are deleted without your confirmation.

Note: to avoid accidentally deleting files and directories, you should always set "Confirm deleting?" to "yes".

Confirm copying?

If you select "yes", the number of directories and files to be copied is indicated in a dialog before each copying function. You will be prompted to confirm your intention ("OK") or to renounce it ("Cancel").

If you select "no", the copying function is executed without your confirmation.

Confirm overwriting?

"Yes":

If you are trying to copy a file and the name and name extension of this file already exist in the destination directory, a dialog is displayed in which you can modify the name of the copy.

"No":

A file with the same name and name extension in the destination directory is overwritten without further notice.

Acoustic signal?

If you select "yes", PlantTop outputs an acoustic signal at certain points.

If you select "no", this signal is suppressed.

Display LOGON dialog?

If you select "yes", a dialog box is displayed each time the command "LOGON command" is started in the "Options" menu.

If you specify "no", this dialog is not displayed.

Date?

The setting "ddmmyy" means that all dates are displayed in the form day/month/year (e.g. 24.12.1988). If you select "mmddy", the order is month/day/year.

The date display does not change automatically if you switch to a different language, i.e. the date display is independent of the respective language version of PlantTop.

Time?

If you select "24h", time will be indicated using the 24 hour clock (e.g. 18:35). If you select "am/pm", the time is indicated using the 12 hour clock (e.g. 6:35 pm).

The time display does not change automatically if you switch to a different language, i.e. the time display is independent of the respective language version of PlantTop.

Pull/drop down menu?

Here you specify the way in which menus are selected, irrespective of the application. This preset is stored for the specific user when the PlantTop entries are saved.

- With drop down menus, the menu is displayed immediately when you position the mouse pointer on the required menu title in the menu bar.
- With pull down menus, the menu only appears when you click on the menu title.

Language 1

This is the currently valid language. You obtain a different language by clicking on the field. The program then pages through all the available foreign language files.

Language 2

The second language to which you can switch over is displayed here (see below "Change language").

Setting language 2 is the same as for language 1.

Design of icons

The currently valid icon file containing the icons representing devices, files and directories is displayed here (files of type .PIC). By selecting a different icon file, devices, files and directories can be represented with completely different icon symbols.

You select the icon file by clicking on the file name field until the required icon file appears.

The icon files IKONEN1.PIC and IKONEN2.PIC are supplied with the package.

Configuration

The current PlantTop configuration file is displayed here (file type INF). It contains e.g. information about the size and position of the displayed windows, about installed applications, installed devices and the settings in this dialog. It is possible to have several such configurations. You can then switch through various working environments quickly without having to reconfigure PlantTop.

To select a different configuration file, click on the file name field. The file selection window of the "home:" directory appears in which you can select any configuration file. The selected file is then entered in the PlantTop preferences dialog.

New configuration files are generated by copying an existing file, e.g. the standard file S5STD.INF. You must rename the copy in which you can then stipulate and freeze the alternative configuration.

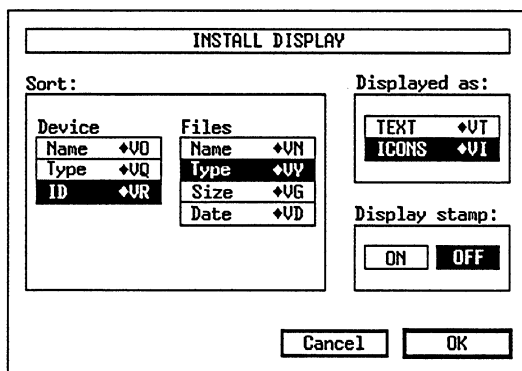
If you wish to enter the set values, you must click on the "OK" button. PlantTop is then reconfigured according to the settings in the configuration file.

If you wish to exit the dialog without entering the modifications, click on the "Cancel" button.

Note: please remember that modifications in the PlantTop preferences are only effective for the duration of a PlantTop session. If you wish to retain the modifications after exiting PlantTop, you must click on "Save PlantTop entries" in the "Preferences" menu.

Display

This command determines the sorting of files, directories and devices in the PlantTop contents window and the representation of these elements as text or icons.



In the *Sort* field, you have the choice between several separate sorting criteria for devices as well as FlexOS files and directories. Devices can be sorted according to name, type and device ID, while files and directories can be sorted according to name, type (name extension), size and date. The sorting criterium size is only relevant for files. You select the setting by clicking on the corresponding box.

In the *Displayed as* field, you select between icon representation and text representation.

- In icon representation, the files and directories are displayed symbolically as stored in the selected icon file, the icon text containing the file or directory name. Files and directories have different icons. The icon text for a device contains the name assigned when the device was installed.
- In text representation, the directory and file names are listed one beneath the other. Apart from the name and the file type, the size in bytes, the date of generation or last modification, the time and stamp information "S" (if the stamp identification is active) are displayed. Directories, in contrast to files, are preceded by a lozenge (◊). Devices are displayed with the lozenge (◊), the device ID and the icon text assigned when they were installed.

Display stamp on/off: by clicking on the appropriate box, you decide whether or not the stamp identifier "S" of stamped files is displayed when a directory is output in the *TEXT* output mode. As long as you do not need this information, you should refrain from marking stamped files (Display stamp: off), since in this case the output of the window contents is much quicker. In the *ICONS* display mode, no stamp identifier is displayed.

In future, SIEMENS will assign a stamp identifier to all applications. This contains additional information about the version of the application stored at the end of the file. Refer to section 4.3.1 under "File Information" for more detailed information about stamps.

When the stamp identifier is on, stamped files are displayed in a contents window as shown in the following example:

A:\					
231556 bytes in 10 file(s)					
ATREIBER	DRV	1032	18.09.1989	07:15	S
HELLO	286	29168	24.10.1989	14:10	S
KURVE	286	34928	06.06.1989	06:36	
NOTIZEN	TXT	210	15.09.1989	11.28	
SONGS	286	29440	03.08.1989	16:30	

To enter the values set in the INSTALL DISPLAY dialog, you click on the "OK" button. The screen display of PlantTop is then configured again according to the settings for sorting and display.

If you click on the "Cancel" button, you exit the dialog without entering the new settings.

Please remember that modified settings are only saved when you click on the menu line "Save PlantTop entries".

Change language

Using this command, you can switch between the two languages selected in the PlantTop preferences dialog. The language selection is passed on to the FlexPrep application.

Save PlantTop entries

With this command, you save all the important PlantTop data. Once they have been saved, these values are then valid the next time PlantTop is loaded. When the data is saved, the start-up file (.STA) and the layout file (.INF) are modified. The following entries are involved:

Start-up file:

- layout file
- icons file
- language file 1 (for PlantTop run up)
- language file 2

Layout file:

- preferences (confirm deleting, confirm copying, confirm overwriting, acoustic signal, display LOGON dialog, date, time, stamp display, pull/drop down menu)
- display window (position, size, displayed directory)

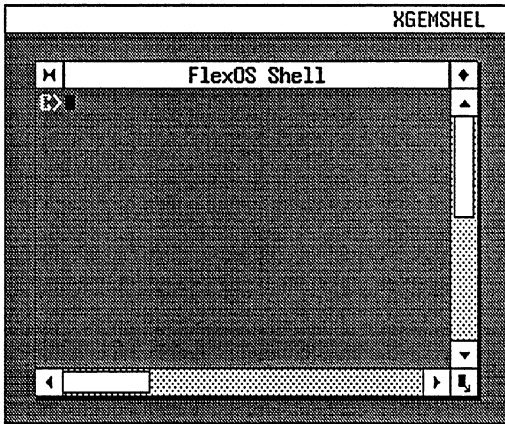
- device window (position, size)
- installed LOGONs (node number)
- installed devices (icon, ID, text, if applicable, network address)
- installed applications (documents, type, icon)

All the values set in the various PlantTop dialogs must be saved with this command, otherwise they are valid only until PlantTop is exited. Changes made after entries have been saved are lost unless they are saved again.

4.3.5 Commands in the Options Menu

FlexOS commands

This command allows commands to be entered at the FlexOS level. If this is required, "X/GEM Shell" is started in a window.



You use the window in exactly the same way as PlantTop windows.

To return to PlantTop, type the "EXIT" command, press the RETURN key and then any other key. You can also close the X/GEM shell window by clicking on the close box.



If you have started an application in the X/GEM shell window and click on the close box, the application is aborted without saving any modifications you may have made. Opened files remain open.

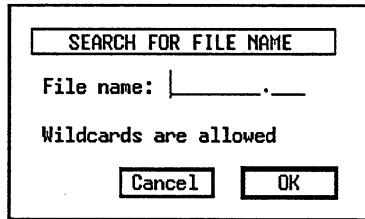
Handling X/GEM Shell is analogous to FlexOS (refer to the FlexOS User's Guide).

You have another possibility to issue commands to FlexOS without terminating PlantTop on this console. If the window manager is installed (it is installed in the status in which PlantTop is delivered), you can open another console to issue FlexOS commands by pressing the key combination CTRL-ALT-+ and issuing the

"c" command. If a second character-oriented console has already been opened, you can switch to this console by pressing CTRL+ or CTRL--.

Search for file

With this command, you can search for a file or group of files on a drive or in a directory and its subdirectories. First select the required drive or directory and then click on the menu line "Search for file". The "Search for file name" dialog then appears, in which you enter the file name of the required file. By using wildcards in the file name, you can search for a variety of files.



SEARCH FOR FILE NAME

File name: _____

Wildcards are allowed

Cancel OK

LOGON command

Whenever access to a remote device via a network is restricted, a dialog is necessary to log on.

The screenshot shows a dialog box titled "LOGON COMMAND". It contains the following elements:

- A title bar with the text "LOGON COMMAND".
- Three input fields: "Net node: ___", "User name: _____", and "Password: _____".
- A "Table entry:" section with a sub-dialog box containing three buttons: "Delete", "Update", and "LOGON".
- Four buttons at the bottom of the main dialog: "Cancel", "Delete", "Update", and "LOGON".

The *Net node* field displays the selected device. This setting cannot be changed.

The user name required to LOGON in the remote device must be entered in the *User name* field.

If a password is required to allow you access to the remote device, this must be entered in the *Password* field.

Cancel button:

The dialog is exited without further actions.

Delete button:

The entry made earlier in the PlantTop LOGON table is deleted.

Update button:

Clicking on this button generates a new entry in the PlantTop LOGON table. This table contains "installed LOGONs" for remote devices. If an entry exists for a remote device in the table, the display of the LOGON dialog can be suppressed in the "Install PlantTop" dialog.

LOGON button:

With LOGON, an entry is made in the PlantTop LOGON table as with the "Update" button and then the LOGON command is called, i.e. the link to the remote device at the set network node is established. If the network is not active, an error message is displayed.

Changes in the PlantTop LOGON table must be saved with the "Save PlantTop entries" command.

LOGOFF command

With this command, you can log off at a remote device, i.e. the link to a device at a different network node is terminated.

Load PCP/M

With this command you can load the operating system PCP/M. You have to confirm that you really intend to change to another operating system. PlantTop is terminated and PCP/M is booted.

Load MS-DOS

With this command you can terminate PlantTop and load the operating system MS-DOS. As soon as you confirm that you really intend to change to another operating system, MS-DOS is booted and the dialog for the selection of operating systems is displayed.

4.3.6 Commands in the PLANTTOP Menu

The PLANTTOP menu is managed by the X/GEM system. Only the first entry can be assigned by PlantTop. The remaining entries are assigned dynamically by X/GEM, depending on the number of active applications. All active applications including PlantTop are entered in this menu. As soon as an application is terminated, it is deleted from the menu. The menu is used on the one hand for information about the system status, and on the other hand to switch between the various active applications. It may happen, for example, that the Output application is completely obscured by PlantTop. Using the PLANTTOP menu, it is then possible to bring the Output application to the foreground (the Output application is discussed in Chapter 5).

Info

With this command you obtain information about PlantTop itself. This information includes the version number and date of generation of this PlantTop release.

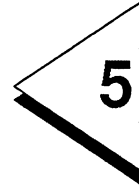
PLANTTOP

Selecting this menu entry does not trigger an action, since PlantTop is already the active foreground application.

Further menu entries

Other active applications running in the background and which may be completely or partly obscured by PlantTop can be entered here. Selecting one of these entries fetches the application to the foreground. It is then possible to work with this application while PlantTop is in the background.

To return to PlantTop, select the PlantTop entry in the system menu of the active foreground application or click on a visible part of PlantTop.



Output Application

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This section provides an overview on how to output documents to printers, plotters and screens by means of the application program Output.

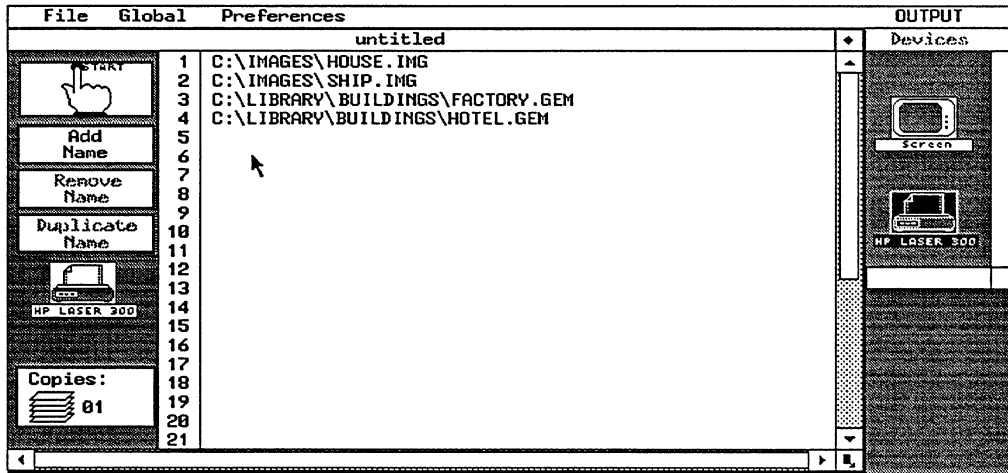
Output comprises the following files: OUTPUT.286, OUTPUT.PRF, OUTPUT.RSC and OUTPUT.INF. All four files are included in directory C:\BIN\. They are essential for Output and may not be deleted.

5.1 Starting Output

There are several different ways of starting Output:

- The PlantTop "File" menu contains the **To output** command. You can start Output by choosing this command.
- You can also start Output from most X/GEM application programs. For example, if you are using X/GEM Draw Plus, display the "File" menu and choose the **To output** command. When you start Output from an X/GEM application program, you have the option of returning either to the application program or to the application window below.
- You can also start Output by clicking twice on the OUTPUT.286 icon in directory C:\BIN\ or on the icon of a local printer displayed in the device window of PlantTop.
- Since Output is an X/GEM application program, you can load it by opening one of its document icons. .LIS files are allocated to Output (see "FlexOS application" field in "Create" menu). If, under Output, you have created a list of files to be output (output list), this list can be saved in a .LIS file (e.g. DEMO.LIS). A double-click on the icon of this file loads Output and the documents in the output list are printed.

5.2 User Environment



Similar to the PlantTop screen, there is a *menu bar* at the top of the screen, it lists the titles of the Output menus: "File", "Global", "Preferences" and "OUTPUT".

The left side of the screen contains the *control window*, the icons in the control window are explained in detail in section 5.2.1.

The center portion of the screen is the *output list box*. It contains the names of the documents, which were selected before Output was started or which were saved in an output list (.LIS file) (see section 5.2.2).

On the right side of the screen are icons that represent the output devices attached to your computer. Typically a screen and a printer are shown. Depending on the configuration of your computer there can also be more icons displayed in the *device window*. Under Output only those devices are available whose drivers have been loaded either automatically via FlexPrep or by means of the FlexOS command DVRLOAD (e.g. DVRLOAD VDI21: DRV:PSDRV.DRV Inrws). Beneath each icon is the name of the corresponding device.

Output highlights the default icon; this is the device it will use unless you select a different device. Click on a different icon to select its device. Use the **Save preferences** command from the "Global" menu to make that device the default.

5.2.1 Icons in the Control Window

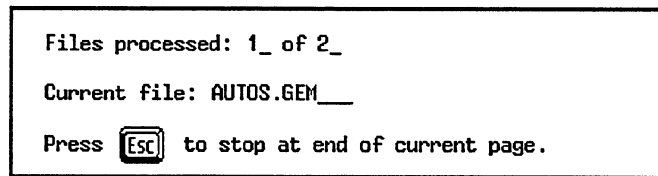
The icons displayed in the control window and their keyboard shortcuts are briefly described below

Start



Click on the "START" icon to begin producing the documents whose file names are listed in the output list box. Output produces these documents on the output device whose icon is highlighted. The keyboard shortcut for "START" is ALT-S.

The following dialog appears to indicate which document is being printed.



The dialog disappears from the screen when printing is completed.

Adding document names

Add Name

You can add one or more document names to an empty output list or to a list already containing document names. (To start with an empty list, click on the **New** command from the Output "File" menu.)

To add one or more names, either click on the "Add Name" icon in the control window or hold down the **ALT** key and press the **A** key. The ITEM SELECTOR dialog appears on your screen and you can select the files for the output list.

To add a name to the list from the ITEM SELECTOR dialog:

- Double-click on the document's name in the directory window. This is the fastest method.
- Click on the name when it appears in the directory window. The name appears on the line following "Selection:". Click on the "OK" button or press the RETURN key.
- Type the document name on the "Selection" line. Click on the "OK" button or press the RETURN key.

To add more names, repeat the procedure as many times as necessary.

To add all the documents contained in the ITEM SELECTOR to your list (up to 43), leave the "Selection" line empty and click on the "OK" button or press the RETURN key.

Note: When the ITEM SELECTOR appears, it covers a portion of the output list box. Therefore, you should make note of the document names you already have in the box *before* you click on the "Add Name" icon.

Removing document names

To remove a name from the document list:

**Remove
Name**

- Select the name you want to remove.
- Click on the "Remove Name" icon in the control window or hold down the **ALT** key and press the **D** key.

"Remove Name" only removes the document from the output list, it has no effect on the document as such.

Duplicating document names

To duplicate document names already in an output list:

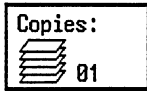
**Duplicate
Name**

- Select the name you want to duplicate.
- Click on the "Duplicate Name" icon in the control window or hold down the **ALT** key and press the **C** key.

Moving document names

To move a document name to a different place in the output list, select it, then drag it to the desired location. When you release the mouse button, Output inserts the name and rearranges the list, if necessary. You can only move one name at a time.

Copies



To tell Output to produce more than one copy of the documents in the output list, delete the number 1 in the "Copies" icon and type instead the number of copies required (between 1 and 99).

Output sounds a tone and returns the copies setting to 01 when:

- two minutes have elapsed since it processed the last document
- two minutes have elapsed since you moved the pointer or issued a command.

5.2.2 Output Lists

This section explains how to create, edit and use *output lists* to print or display your documents.

Output lists let you print or display several documents in the order you want. For instance, chapters in a book or sections in a report might make up an output list. You can save these lists and revise them.

In addition to the document names the path names (drive, directory) are also entered in the output list. Please take care that the files can be found in the paths specified when printing is started (e.g. insert relevant floppy disk).

ASCII file and printable files (see below) can be output in PlantTop to a remotely installed device via the FlexNet network by copying the file(s) to the appropriate remote output device. To do this, select the file icon(s) and drag it (them) to the icon of the remote output device.

If you want to output a printable file on a local printer without starting Output, create a remote printer under PlantTop (field "PlantTop device..." in the "Create" menu) and specify PRN: as network address. By dragging the file icon to the printer icon the document can be output.

Printable files are files other than pure ASCII files (e.g. pixel pictures, graphics, publisher files), which you capture in a file with the appropriate output program. These files then contain the required printer control characters and can be copied directly to the required printer.

Preselecting documents

You can preselect the documents you want in your output list by selecting them from PlantTop *before* you choose the **To output** command from PlantTop's "File" menu. When the output list appears, it contains the names of the documents you preselected.

You can preselect up to ten documents at a time, depending on the combined number of characters in the folder and document names. The maximum number of characters Output can accept is 128.

Another way to preselect a document for an output list is to start Output directly from a FlexOS application program. The application passes the name of your current document to Output.

Saving an output list

You may have an output list that includes a sequence of documents and graphics to be used in a presentation. You might want to save this sequence and perhaps modify it and run it again on a different occasion.

To save an output list:

1. Choose the **Save as** command from the "File" menu. The ITEM SELECTOR dialog appears.
2. Type a name for your list (up to eight characters) on the "Selection" line. You do not have to add the file extension ".LIS"; Output supplies it automatically when you exit the ITEM SELECTOR.
3. Click on "OK" or press the RETURN key to save your list.

Note that the "File" menu also contains a **Save** command. Use this command to save an existing output list after having changed it.

Opening output lists

When you open an output list, Output places its document names in the output list box. You can use the list as it is - you can also add, duplicate, move or remove names from it. The title bar shows you the name and location of the output list.

Output allows you to open only files with the .LIS filename extension.

There are two ways to open an output list:

- Double-click on the output list icon from within PlantTop - Output starts automatically.
- Choose the **Open** command in the "File" menu after you have started Output.

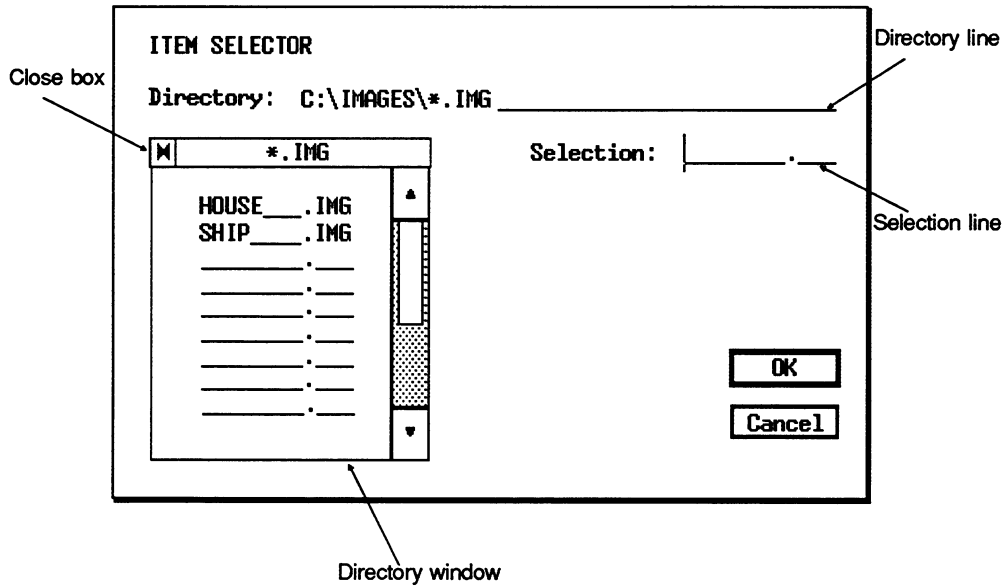
When you use the latter method, the ITEM SELECTOR dialog appears - it shows you the .LIS-type documents in your current directory.

If you open an existing list, make changes to it and want to save both the original and revised versions, select the **Save as** command from the "File" menu to preserve the revised version under a different name. Your original version remains unchanged.

5.2.3 ITEM SELECTOR Dialog

The ITEM SELECTOR dialog is used to:

- add one or more document names to your output list
- save an output list on disk
- retrieve an output list



Directory line

The directory line shows the drive and the directories that contain the items listed in the *directory window*. By clicking on the close box, you reach the next higher directory level. The documents stored on this level are listed and can be selected by double-clicking. You can however also list and select documents by typing their names in the directory line.

To change the information on the directory line, place the pointer anywhere on the line and click. The text cursor appears after the *last* character on the line. Press the backspace key to erase individual characters or press the ESC key to erase the entire line. Type the name of the drive and directory you want to use.

Once you have entered the information on the directory line, click inside the directory window or press the RETURN key to update the window with a list of items in that directory.

Wildcard characters

You can use asterisks (*) or question marks (?) in the directory line as wildcard characters. Question marks replace individual characters; asterisks replace entire file names or types. For example **C:\IMAGES*.GEM** means all files with extension .GEM in a directory called IMAGES on drive "C" (wildcard characters cannot be used for drive names or directory names).

You can also combine wildcard expressions in a directory line as follows:

C:\.GEM,*.OUT,*.GMP

In this case, you must separate each element with a comma. Refer to your operating system manual for more information about wildcard characters.

Selection line

You can enter the following information on the selection line:

- the name of a document you want to add to your output list
- the name of an output list you want to save on disk
- the name of an output list you want to retrieve from disk.

Directory window

The directory window lists the directories and files stored in the directory specified on the directory line. The window can display nine directories and document names at a time. Use the scroll bar, arrows and slider to scroll through the window if it contains more than nine entries.

5.3 The Output Menus

5.3.1 File Menu

File		
New	[^] W	Clears all names from your current output list (without saving them) and displays an empty, untitled list.
Open...	[^] O	Displays the ITEM SELECTOR dialog so that you can select an existing output list.
Save	[^] V	Saves your current output list under its present name.
Save as...	[^] M	Displays the ITEM SELECTOR dialog so that you can save and name a new output list, or save an existing list under a different name.
To <application>	[^] R	If you start Output from an application program, the name of the application appears here. You can select the name to return to the application. (If you start Output from PlantTop, this entry does not appear).
Quit	[^] Q	Stops Output and returns you to the application window below Output.

5.3.2 Global Menu

Global	
Shortcuts...	F1
Global...	F2
Device window on/off	^D
Control window on/off	^C
Save preferences	^V

Displays a two-page dialog explaining the keyboard shortcuts available under Output.

Displays the global preferences of the output mode.

Switches the display of the device window on/off.

Switches the display of the control window on/off.

Saves global preferences as currently set.

5.3.3 Preferences Menu

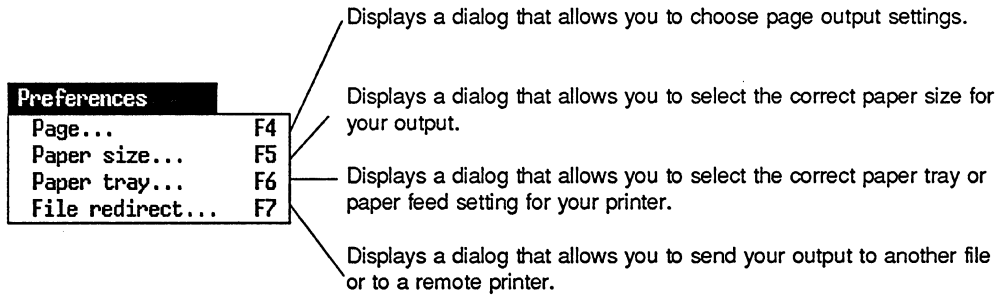
Screen preferences

Preferences	
Screen...	F3

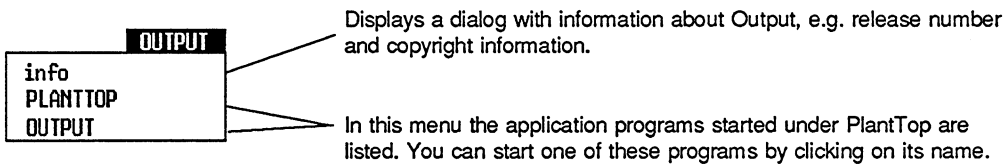
Controls how long files are displayed on your screen.

Printer/Plotter Preferences

Select either the printer or plotter device icon before choosing one of the commands in this menu.



5.3.4 OUTPUT Menu



5.4 Commands in the Global and the Preferences Menus

The commands in the "Global" menu and the "Preferences" menu make it possible for you to "customize" Output. The Global Preferences commands affect Output as a whole. The Preferences commands affect specific output devices.

Global Preferences Dialog

GLOBAL PREFERENCES

Confirm .LIS changes? Yes No

OUTPUT mode:

Path:

polling interval: 07 seconds

Top OUTPUT? Yes No

Print pages numbered 001 through 999

Confirm .LIS changes? Yes/No

By setting "No", changes you make to an output job list under Output are saved in a .LIS file without checking with you first. By setting "Yes" a dialog appears each time you make changes to an output job list and you can decide whether these changes should be saved or not.

OUTPUT mode

Normal mode

The output is started when you click on the start button.

Auto start

The output starts automatically, i.e. when the list contains one or more elements, these are output without you taking any further action.

Auto start and auto exit

As "auto start", however the Output application is terminated after the printout.

Spooling from directory

In this spool mode Output checks whether files exist in the spool directory (see *path* below) at preset intervals (see *interrogation interval* below). You must first set up the spool directory under PlantTop or with the operating system command "MD". You can select any suitable name for the spool directory.



The directory you wish to use as the spool directory must not be used to save files, since the files stored in the directory are automatically printed out and deleted.

Path

In the "path" field you enter the search path for the directory you have set up as the spool directory (see note above).

Interrogation interval

In this line you enter the interval in seconds at which the Output application checks the spool directory to see whether it contains files.

In the spool mode, the spool directory is displayed in the window title of the output list. In the output list, all the file names entered in the output list via the spool directory have the prefix SPL: instead of a path. Please note that the files with prefix SPL: are deleted in the spool directory after they have been printed out. File names added to the output list in Output using the "Add Name" function from other directories are **NOT** deleted after they are printed out!

Top OUTPUT ?

If files are sent to the output list by an application e.g. by PlantTop, Output either becomes the foreground application (setting "Yes") or it does not (setting "No").

Preferences menu

The "Preferences" menu allows you to choose how your output devices (screen, printer, plotter etc.) work with Output. You can choose:

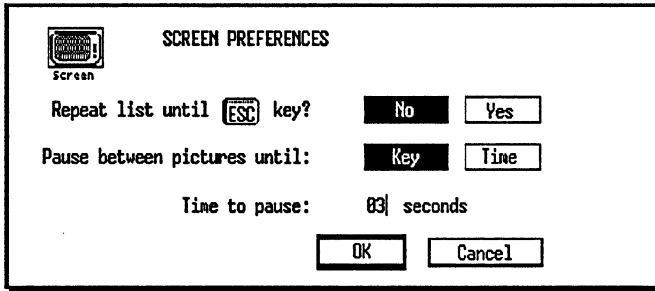
- Output screen preferences
- paper size/paper tray options
- page layout options
- printer functions
- plotter functions

To display the options available for a device, first select the device by clicking on its icon and then move the pointer to the **Preferences** menu in the menu bar. Here the appropriate options are shown for the device you selected.

Note: Output devices must first be installed via FlexPrep before Output can customize them for you. Once they are installed, you can adjust how your output will look and how it will be produced.

Screen Preferences

The "Screen Preferences" dialog shown below can be displayed either by clicking on the **Screen** command in the "Preferences" menu or pressing the F3 function key. Output lets you change between either graphics or text for display purposes. This would typically be used at exhibitions or conventions where a presentation could be running unattended for some time. Press the ESC key to abort screen output and return to the Output application.



Repeat list until ESC key?

"Yes" means Output continuously cycles through the documents in your output list. You set the time to pause between pages (pictures) by setting the number of seconds below.

Pause between pictures until

"Key" means that you must press a key or the mouse button to display the next file in the output list. "Time" means that Output will automatically cycle through the output list, pausing between documents for the time specified in "Time to pause" (see below).

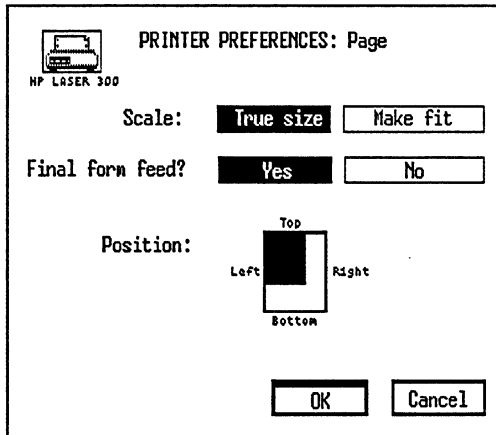
Time to pause

When you click on the number the text cursor appears. Use the backspace key to erase the previous number and then type in the number of seconds to pause between document pages.

Printer and Plotter Preferences

Output uses dialogs so you can set preferences for your printer's or plotter's page layout, paper size, paper tray and file redirection settings. You display these dialogs by clicking on the appropriate command in the "Preferences" menu or by pressing the appropriate function key.

Page Preferences



Scale

"True size" prints documents in their actual size and scale. If the document exceeds the paper format specified by you in the **Paper Size** command, a part of the document is not printed out. "Make fit" scales documents to fit the paper size you selected. Note, the proportions of the original can be altered.

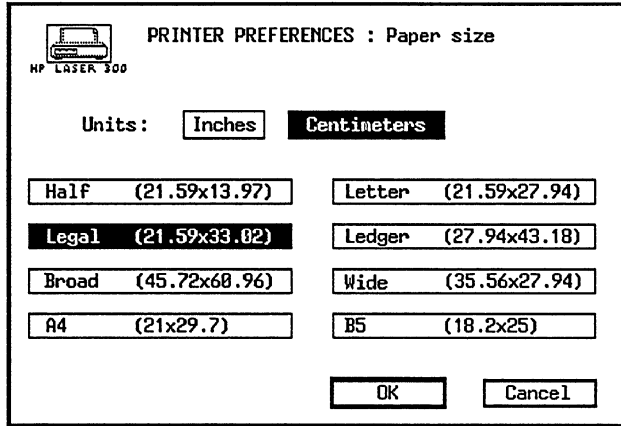
Final form feed?

Select "Yes" to tell the printer to advance a blank sheet after the last printed page. (This is not an option for plotters and most stacked-paper printers, i.e. printers that do not use continuous, "fan-fold" paper).

Position

Position the small black rectangle in the larger rectangle to select the boundaries of printed text on the page.

Paper Size Preferences



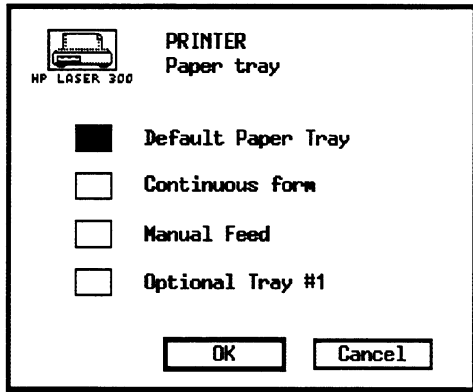
Units

These buttons let you switch from inches to centimeters for the display of the paper sizes.

Paper size

Popular paper sizes are listed. Click on a specific size to specify the length of your document. For example, if you are printing on legal paper, choosing the "Legal" paper size ensures that text and graphics are positioned correctly on the paper.

Paper Tray Preferences



Default Paper Tray

For printers and plotters with one or more paper trays, choose this setting to use the paper tray designated by the printer as the default.

Continuous Form

Choose this setting to print documents on continuous form or roll paper.

Manual Feed

Choose this setting if your printer or plotter has a manual feed option or if you want it to pause between pages. This option is useful with single-sheet printers and most plotters.

Optional Tray #1

Use this option for printers or plotters with more than one paper tray. To specify a tray, use the backspace key to erase the current number and then type the new number.

File Redirection Preferences

PRINTER PREFERENCES: file redirect

HP LASER 300

Send output to: PRN: File

Print file in background? Yes No

Delete file after printing in background? Yes No

Path: c:\xxxxxxx\yyyyyyyyy\uuuuuuuu\fdfdsdfs\dsfsdf\sd\dsdf\sdf\
 File: _____

OK Cancel

Send output to

Use this option to redirect your output files from one destination to another. For example, instead of sending your output files to your printer port, you can redirect them to a file, which you can send to a remote printer over a network.

Print file in background

Select "Yes" to work under PlantTop while printing. If you select "No", you cannot exit Output while printing (This option is available only for parallel printers.).

Delete file after printing in background

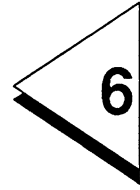
Select "Yes", if you want the temporary output file created for each document to be deleted automatically after printing. Select "No", if you want it to be saved. (This option is available only for parallel printers.)

Path

This is where you can specify a directory in which you want output files saved. Enter the full path name of the directory.

File

Shows the name you assign to files that you create.



FlexPrep Application

Contents

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The application FlexPrep offers the super user and the system manager a comfortable tool (provided User ID=0 and Group ID=0), which via menus, allows the most important tables and batch files to be edited, which, after booting, determine the configuration of FlexOS and X/GEM. At each step in the program the user can open a window with up-to-date information/assistance either by selecting the menu entry "Help" in the "File" menu in FlexPrep or more simply by pressing the "HELP" key.

Prerequisites

It is advisable that the FlexPrep user should have experience with FlexOS and X/GEM. The information necessary on the settings which can be made with the help of FlexPrep can be found in the respective manuals (e.g. User's Guides and Programming Guides on FlexOS, FlexNet and X/GEM).

Note: FlexOS and X/GEM are delivered with a standard configuration which is set to fulfil the needs of the normal user to an optimum standard. Any changes to the configuration should only be undertaken by an authorized person with sufficient technical knowledge. A multi-user system with access protection should be set up so that only the system manager and the super user can start FlexPrep.

This description gives a basic outline on the operation of FlexPrep, points out any special features and gives information which cannot be called up in the Help texts in FlexPrep. The Help texts are not intended to replace the documentation; they are intended to support the user and serve to jog his memory. The Help texts also contain tips on the operation of FlexPrep and further functions in the program.

6.1 Overview of Functions

The main features and functions of FlexPrep are:

Boot files	Direct editing of the boot files AUTOEXEC.BAT, CONFIG.BAT and the user table
Output devices	Selecting and assigning parameters to printer drivers, loading print spoolers and selecting the screen driver
Network	Installing one of the networks available under FlexOS
Other drivers	Loading other drivers

Note: The chosen configuration is only activated after the next booting of the system.

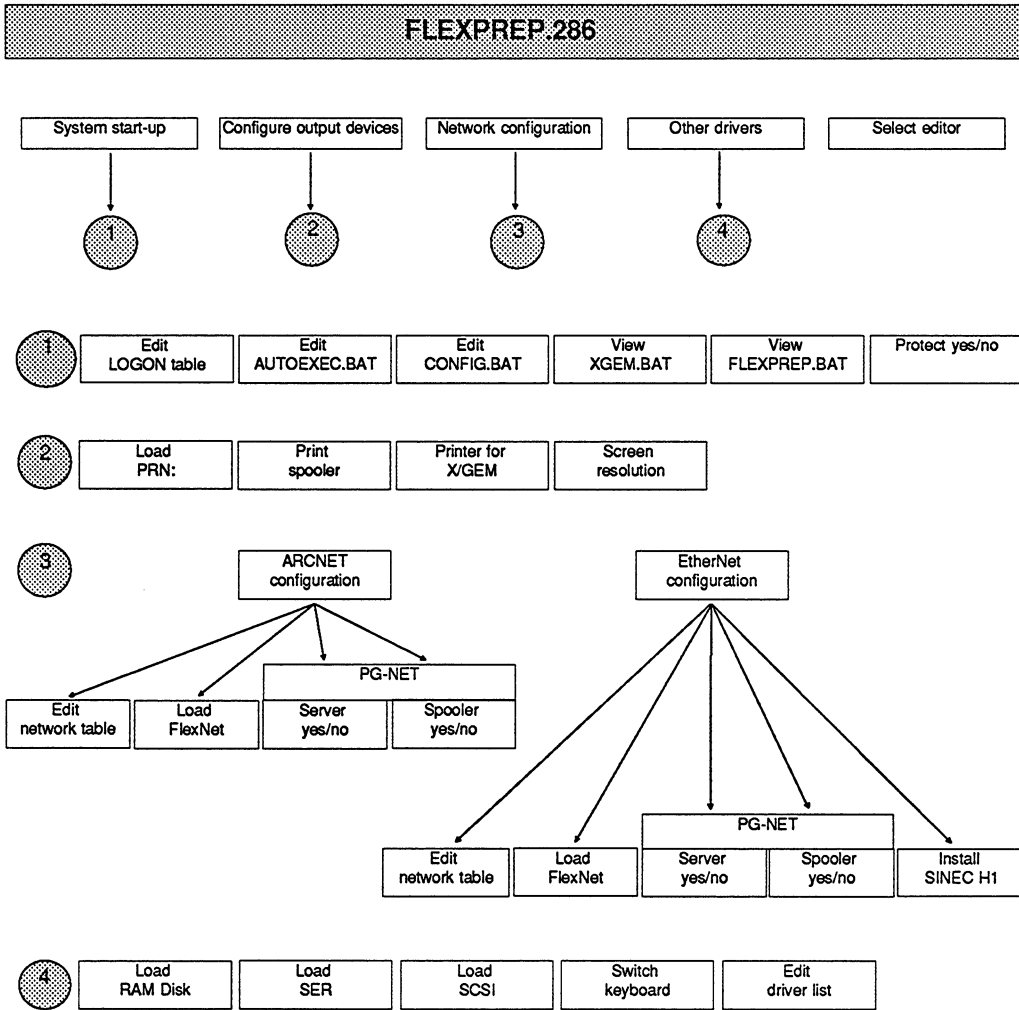
6.2 Starting FlexPrep

FlexPrep can be started in the following ways:



- from PlantTop:
 - select the function "System configuration ..." in the PlantTop menu "Create"
 - quick start from FlexPrep using the key combination ♦ES (ALT-E-S)
- from the FlexOS operating system level:
 - command: XGEM FlexPrep

FlexPrep starts with the last screen configuration which was saved.

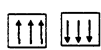
6.3 The Functions of FlexPrep and their Structure



6.4 Operation

- By double-clicking on an icon you can open
 - a submenu or
 - a dialog or
 - a file with the help of an editor.
- By clicking once on an icon you can
 - display information on the chosen feature via the "Help" function or
 - assign parameters to a driver (RAM Disk, SER, SCSI, ARCNET, ...)
- Via the close box you can
 - move into the higher operating level or
 - close the "Search" dialog or
 - close the "Help" window or
 - end FlexPrep.
- To position the cursor in the dialogs for the user table, the network table and the driver list
 - Using the cursor keys  and  position the cursor within an entry on the entry field to be edited.
- To leaf through a dialog to a particular table/list the following possibilities exist:

using the cursor keys:



to move backwards and forwards one entry at a time.
The dialog continues to move forwards/backwards as long as the PageUp/PageDown key is held pressed.



to jump to the first or the last entry.

using the scroll bar:

- * With the slider you can move the cursor very rapidly in the area of the table/list in which you wish to search for a particular entry.
 - * By clicking on the shaded bar area above or below the slider you can jump backwards or forwards by a large or smaller number of entries depending on the total size of the table/list.
 - * By clicking on the scroll arrow you can move one entry forwards or backwards.
- A particular entry in a large table or list can be found very quickly using the function "Search for..." in the "Options" menu.

Loading a driver

There are two methods of determining whether a driver should be loaded the next time a cold restart is executed (booted) or not:

- Clicking on either the "yes" or "no" switch, which means load the driver/do not load the driver.
- Double-clicking on the driver icon opens a dialog in which you can either click on "load" or "not load" depending on the current driver status (yes/no). Using "Cancel" you can quit the dialog without changing the status.

Note on FlexOS print spooler: Loading this print spooler includes the installation of the printer interface PRN: (LPT0:).

Finish editing a file with the ASCII editor

After editing or viewing a file with the preset ASCII editor, the editor can be exited with or without saving the file. On returning to FlexPrep it makes a difference whether you called up an editor with the extension .286 or whether you started the editor via a batch file (.BAT). In the first case after exiting the editor you simply press any key to return to FlexPrep (setting "Wait For Close = True" in the XGEMSHL.PRF file). If you are using a batch file you will be in the FlexOS command mode after you exit the editor. Input the command EXIT (RETURN) and then press any key.



If you close the editing window using the close box when the editor is running and the file is open, any changes you have made in the file will be lost.

6.5 The FlexPrep Menus

File	
Help...	◆H
Save settings	◆P

Quit FlexPrep	^Q

Options	
Search for...	◆S
Assign parameters...	◆C

FLEXPREP	
info	
PLANTTOP	
FLEXPREP	

Shortcuts:

As is the case in PlantTop, some FlexPrep menu functions also have shortcuts which can be used to call them quickly. Here the following examples mean:

- ◆H Hold the **ALT** key pressed and press the **H** key simultaneously
- ^Q Hold the **CTRL** key pressed and press the **Q** key simultaneously

6.5.1 File Menu

Help...

This "Help" function can also be called by pressing the HELP key.

At each step in the FlexPrep application you can open a window via the "Help" function, which gives information on the current menu or dialog. Within a dialog you can obtain help for each input field. As you move around the help information is constantly updated. The "Help" window remains open until you close it again using the RETURN key or the close box.

You can place the Help window so that it always remains visible. If it should be partly covered, you can bring it to the foreground (make it active) by clicking on a visible part of the window. If it should be completely hidden then you can bring it to the foreground by calling up the help function again.

Save settings

In the following files it is possible to determine what the configuration of FlexOS and X/GEM should look like after booting:

```
CONFIG.BAT
AUTOEXEC.BAT
XGEM.BAT
FLEXPREP.BAT
```

The function "Save settings" stores in the FLEXPREP.BAT settings file the information on the drivers to be loaded and their parameters, which you have entered via FlexPrep menus and dialogs. FlexPrep displays during the saving process exactly which settings are being saved in FLEXPREP.BAT at a particular point in time. The horizontal bar below fills from left to right at the same rate as the information is being stored.

This batch file is executed within the boot file CONFIG.BAT.

FlexPrep saves the following information in the files which are listed in the righthand column:

with "Save settings":

Structure of the FlexPrep windows (FlexPrep internal information)	FLEXPREP.INF
Internal FlexPrep preset of an ASCII editor	FLEXPREP.INF
Drivers and their parameters installed via FlexPrep menus/dialogs	FLEXPREP.BAT
Integration in the boot file FLEXPREP.BAT of drivers which have been entered in the driver list	FLEXPREP.DRL --> FLEXPREP.BAT

directly after exiting the input dialog:

LOGON table	USER.TAB
Network tables for ETHERNET/ARCNET	NETNAMES.ARC, NETNAMES.ETH: on loading a network overwrite the file NETNAMES.DAT with the respective file.
FlexPrep-internal driver list which first becomes effective through "Save settings" (transfer to FLEXPREP.BAT)	FLEXPREP.DRL (extension file to FLEXPREP.INF)

directly via the ASCII editor preset for FlexPrep:

edited boot files	CONFIG.BAT, AUTOEXEC.BAT
parameters assigned to a PG-NET server	PGSERV.CNF

Note: The files XGEM.BAT and FLEXPREP.BAT cannot be edited because they are open. FLEXPREP.BAT should only be edited via the FlexPrep application.

Quit FlexPrep

If you have made changes to the configuration and have not saved them via "Save settings" FlexPrep asks you at the end of the application whether you wish to save the changes or abandon them when you quit the program. If you are unsure you can return to FlexPrep again with "Cancel" in order to check the settings again.

If you have *only* made changes to the surface of FlexPrep (FLEXPREP.INF) (positioning of the windows, preset menu) these must first be saved with "Save settings" if they are not to be lost when quitting FlexPrep.

6.5.2 Options Menu

Search for...

This function aids the search in large **user tables** or **driver lists** for a particular string of characters. In this way you can, for example, carry out a search for a particular user name or display user entries where no password has been entered (search for the code *****).

Once you have opened the user table or the driver list, the function "Search for..." can be selected (by clicking once). A dialog is then displayed where you can input a search pattern.

Start the search routine as follows:

- Click on the field "Search for... ♦S" or
- the RETURN key or
- the key combination ALT-S (♦S).

The search begins with the entry which follows the entry currently displayed. The window "Configure LOGON table ..." shows in each case the first entry to be found after the current one. When the search routine reaches the end of a table/list it automatically goes to the beginning again and continues the search from there.

The "Search for" window remains in the foreground (active), so that the search routine can be started again either until you have seen all entries which contain the desired string, or until you have found a particular entry. You may also modify the search pattern at any time.

All input fields are searched in all cases.

If you wish to modify an entry you have found, 'top' the respective window by clicking on it.

When you quit the table/list the "Search for" window is automatically closed; you can also close it as usual by means of the close box.

Assign parameters...

The following drivers may have parameters assigned to them:

- RAM Disk
- serial interface SER
- SCSI interface
- ARCNET
- EtherNet
- PG-NET server

After selecting one of these driver icons with a single click "Assign parameters" can be selected.

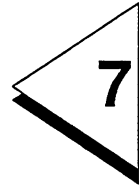
6.5.3 FLEXPREP Menu**info**

Here you will find information on the FlexPrep version.

other fields

Any other fields contain the names of current X/GEM applications (corresponds to the PlantTop menu "PLANTTOP"). By clicking on one you can bring one of these displayed applications to the foreground.

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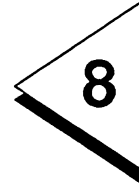
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Glossary

A

- Access protection** In a multi-user system it is clearly defined who can have access to which files and how (read, write, delete, execute). Every user is allocated a user name, a password, a user ID, a group ID, a "home" directory and access rights in the network by the system manager. In his "home" directory, a user has all access rights to his files. He can also write his own configuration files (CONFIG.BAT, AUTOEXEC.BAT). The user can determine for his own files, which user group can have access to which file and how. Otherwise every user, whose user ID and group ID are the same as or lower than (higher priority) that of the user who created the files, can have access to the files.
- Acoustic signals** When you switch on your PG, the BIOS firmware performs a self-test. If a serious fault occurs at the beginning of this self-test, a series of acoustic signals (beeps) are sounded to enable you to identify the fault. In some cases, an error message will be displayed on the screen in addition to the acoustic signals.
- Active window** Up to seven windows can be opened simultaneously in → PlantTop. You can only ever work with the top window. This is known as the active window and can be recognized by the heavy black writing in the title bar and the symbols in the right margin. You can activate another window by clicking on it with the mouse or by selecting it via the applications menu.
- Application** An application is a program which lies directly on the operating system. The operator (user) is able to work with this program.
Applications on your PG are the STEP 5 Basic Package and the X/GEM New Collection.

ARCNET	ARCNET (Attached Resource Computer Network) is a network for office use. Programmers can be linked together in an ARCNET network using → fiber optic cable.
ASCII editor	With an ASCII editor you can process (i.e. 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 programmers. This size is entered in the SETUP menu under the entry "Base Memory" and this entry is not changed even if the memory is extended. The operating system, drivers, utilities and network software are stored in the base memory, i.e. programs which are vital to operate the computer.
Basic Package STEP 5	This is a software package which provides the software basis for all other S5 packages. Using this package and a programmer (PG) you can generate logical control programs. The language used is → STEP 5.
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 system memory.

C

Click	Pressing and immediately releasing the left mouse button; this selects objects or commands.
COM1 interface	The COM1 interface is a serial V24/Modem interface. This interface is suitable for asynchronous data transmission. It can also be used to connect printers with a serial port.
COM2 interface	The COM2 interface is a serial → V.24 interface which can be used to connect a → mouse or a printer.
Configuration files	These are files which define the configuration of FlexOS and X/GEM after booting. These files are e.g. CONFIG.BAT, XGEM.BAT and FLEXPREP.BAT, CONFIG.SYS and AUTOEXEC.BAT. The configuration is the information (settings) on the drivers to be loaded and their parameters, and on the arrangement of the windows and network tables.
Configuration software	The configuration software brings the device configuration up to date when EISA modules are installed. This is done either by copying the configuration files supplied with the module or by manual configuration using the configuration utility.
Coprocessor	In the SETUP menu the system indicates automatically whether the 80387 arithmetic processor is present or absent under the entry "Coprocessor". The arithmetic processor allows faster and more accurate calculation of arithmetic, logarithmic and trigonometric operations.
CPU	→ Microprocessor
Cursor	Collective term for mouse pointer and text cursor.

D

Device configuration → SETUP

Dialog window This is a square window which appears on the screen when PlantTop, X/GEM or another graphics-oriented program wishes to output or receive information.

Directory A directory is a list where the names of and references to files and to subdirectories are stored.

Disk drive Disk drives are 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 direct access memory on which all types of files and programs can be stored. The storage medium is a round magnetic disk in a plastic cover to protect it from getting scratched.

Display The programmers PG 710 and PG 730 have an electronic display as a screen. This display is very slim and uses very little power.

Double-click Pressing and releasing the left mouse button very quickly twice in succession without moving the mouse.

Drives The programmers are usually equipped with one hard disk drive and one or two floppy disk drives.

Drivers These are programs which are part of the operating system. They adapt the different hardware components, such as printers and monitors, to the system.

Drop-down menu In graphics-supported programs (e.g. PlantTop) 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

Editing Processing texts and/or graphics using an editor.

Editor The component of a data processing system for the processing of texts and/or graphics in a dialog. Texts can be figures, programs, correspondence, tables, documents and any other types of data.

EGA (Enhanced Graphics Adapter)
Graphics interface which considerably improves the resolution of graphics.

EISA bus system The EISA bus system has a bus width of 32 bits and can address 4 Gbytes of memory.

EISA module EISA (Extended Industry Standard Architecture) is the standard for 32-bit computers.
EISA modules are configured automatically.

Emulator A microprogram for the STEP 5 software for adaptation to the operating system MS-DOS.

EPROM/EEPROM submodules	These are printed circuit boards which can be plugged in. S5 user programs can be stored on them. These programmed submodules are then plugged in specially designed slots in the programmable controller.
ETHERNET	A local network for text and data communication with a bus topology (structure).
Expanded memory	Expanded memory is used to describe the possibility for a program to access up to 32 Mbytes of memory above its conventional memory.
Extended memory	The extended memory is the memory which lies beyond the 1 Mbyte memory limit. The size of the extended memory must be entered in the SETUP menu and is compared with the existing extended memory. A memory extension can be installed in a PG to increase the size of the memory. The entry in the SETUP must, however, be changed if a memory extension is added.
F	
Fiber optic cable	This is the general description for glass fiber and plastic cables. Fiber optic cables are interference-free and allow extremely fast data transmission using modulated laser light.
File	A file is the collection of homogeneous data in data records. A file contains data, collected together under their own name, which are required by the user or the program for specific purposes or tasks.
FlexNet	FlexNet is the network operating system extension for FlexOS 386. This allows access to remote computers and their operational equipment via the networks ARCNET or SINEC H1.

FlexOS 386	This is a realtime multiuser-multitasking operating system. It is the basis of S5-DOS/MT.
FlexPrep	FlexPrep is an X/GEM application, with which the system manager can, via menus, generate important tables and batch files which determine the configuration of FlexOS and X/GEM when the system is booted again.
Formatting	Formatting divides the memory area on a magnetic data medium into tracks and sectors. In PlantTop you can format diskettes with the command "format" in the menu File, in FlexOS using the command FORMAT.
Function keys	Function keys can be divided into two different types: the normal function keys which are assigned a particular function of the computer (e.g. delete key), and programmable function keys (softkeys).
G	
GSP part	(Graphics System Processor) Screen graphics controller.
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.
Hardware	The technical equipment of a computer or PG.

I

Icons	Icons are graphic representations of files and devices which are used under PlantTop. There are different icons for drives, directories, user programs, documents (user files), printers and the trashcan.
Interface	<ul style="list-style-type: none">a) An interface is the connection between individual hardware elements such as PLC, PG, printer or monitor via physical connections (cables).b) An interface is also the connection between different programs, to enable them to work together. Program submodules are used to do this. They determine the access to files and the way data are displayed, and harmonize the method of operation of the programs.
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 external interrupt.
I/O modules	Input/output modules

J

Jokers	→ Wildcards
---------------	-------------

K**Keyboard**

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

L**Lasso**

Using the lasso (→ rubber rectangle) a group of icons or objects situated close together can be selected. To do this the mouse pointer should be pulled across the screen with the left mouse button pressed, so that the resulting rectangle is seen to enclose or touch all the icons or objects required.

Logging off

The process of interrupting the logical connection for a network user between the PG and the → server is known as logging off. The user can then no longer access the → drives and the printer of the server.

Logging on

A user must log on in a network in order to establish the logical connection to another computer within that network.

M**Main memory**

The main memory is the complete physical memory of the CPU in a computer.

Menu	Menus can be set in PlantTop as drop-down or as pull-down menus. They roll down when a title in the menu line is selected. The commands which appear can then be triggered by clicking with the mouse pointer or by inputting keyboard shortcuts.
Menu line	The menu line is to be found at the top edge of the PlantTop screen. It contains commands and functions in drop-down or pull-down menus which can be selected with the mouse pointer to perform certain actions (e.g. formatting diskettes or making a new directory).
Microprocessor	This term describes a complete central processing unit (CPU) as regards its functions, but without any register array in the form of a chip. In the S5 range of programmers the 80x86 microprocessors made by Intel are used.
Modem	<u>M</u> odulator and <u>d</u> emodulator 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 slotted into a programmable controller or programmer. They are available as e.g. central modules, interface modules or as memory modules.
Monitor	The monitor or screen is a visual display unit via which the computer communicates with the user. Because there are different types of monitor, the type in use in your configuration must be entered in the device configuration (SETUP).

Mother board	<p>The mother board is the core of the programmer. From here data are processed and stored, interfaces and device peripherals are controlled and managed. The most important components on the mother board are:</p> <ul style="list-style-type: none">– the central processor (CPU),– RAM memory and– interfaces for I/O devices and interface modules.
Mouse	<p>The mouse is an input device. 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.</p>
Mouse pointer	<p>The mouse pointer is a control. It is moved across the worktop (screen) by means of the mouse. The mouse pointer selects objects which are to be processed and selects commands in the menu line.</p>
MS-DOS	<p>(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 PGs.</p>
Multuser-multitasking operating system	<p>An operating system (e.g. S5DOS/MT on the basis of FlexOS) which is used simultaneously by several users (multuser) and in which a user can have several applications running at once in real time (multitasking).</p>

N

Network address	A network address (node address) must be allocated to every device which is to be used as a remote device, e.g. with the help of FlexNet.
Network	Link between several computers (PC, PG, PLC) by means of interface modules, physical cables and the corresponding software to allow data exchange between the devices.
Network nodes	→ Nodes
Nodes	Nodes are participants i.e. PCs or PGs which are connected to a network, e.g. server, requester, spooler. They must be easy to identify by an unambiguous name.
Node number	Each participant (node) in a network is allocated a node number (network address), e.g. 01::, 07::. The colon is included as part of the node number.

O

Operating system	Collective term for all programs which, in conjunction with the → hardware, control and monitor <ul style="list-style-type: none">– the execution of the user programs,– the distribution of the operational equipment among the individual user programs– and the maintenance of the operating mode.
Output	Output is a PlantTop application with which documents can be output to a printer or plotter, to a file or to the screen.

P

Parallel interface	Information is transmitted a byte at a time via a parallel interface. This means that the transmission rate is very fast. The programmers have one parallel interface (LPT1).
Partition	A partition is a formatted area on a storage medium.
Password	→ Access protection
PC	Personal computer
PG	Programmer
PG LINK	Linking two programmers directly via a special connecting cable is known as PG LINK.
PG-NET	A software package for SIMATIC S5 programmers; it allows programmers access to the operational equipment of the server via the networks SINEC H1 (ETHERNET) or ARCNET.
PG NETWORK	This is a software component which solves the problem of decentral access to central data. Several PGs connected in a SINEC H1 (ETHERNET) bus system or in an ARCNET network can access the central operational equipment of the server. Programmers logged on in the network (requesters) can therefore call up user programs from the server via the network.
PlantTop	A fully-graphic user interface for the programmers.
PLC	→ Programmable controller
Pointer	→ Mouse pointer

Printer	Output device for data, texts and graphics. Several printers are defined as standard printers for PGs. These are, for example, the Siemens printers PT88, PT89 and the PT10 Laserjet.
Programmable controller	The programmable logical controllers (PLC) of the SIMATIC S5 system consist of one central controller, one or more → CPUs and various input/output modules.
Programming	For SIMATIC S5 the term programming means generating a STEP 5 program using the STEP 5 Basic Package.
P Tools	These are utilities which allow STEP 5 user programs/files, which were generated under S5-DOS/MT (or S5-DOS/ST), to be copied to the PCP/M partition and vice versa.
Pull-down menu	→ Drop-down menu
R	
RAM	RAM (Random Access Memory) is a read/write memory in which every memory location can be addressed individually and its contents be changed. RAM is used to store data and programs.
Remote device	Remote devices are devices, e.g. printers or computers, which can be accessed via a network. They differ from local devices in the network address which must be entered when the device is installed.
ROM	ROM (Read Only Memory) is a memory in which every memory location can be addressed individually. The stored programs and data have been programmed at the factory before delivery and cannot be changed by the user.

S

S5-DOS An operating system based on PCP/M.

S5-DOS/ST An operating system based on MS-DOS.

S5-DOS/MT An operating system based on FlexOS. This is the standard operating system for all S5/MT applications. Due to its multitasking capabilities in conjunction with the fully-graphic user interface (X/GEM and PlantTop), the foundation for data management (Btrieve) as well as the network software FlexNet and SINEC, all the tools are present which are required.

S5 package The complete programmer software cannot be loaded into the working memory (RAM). Thus it is divided according to its functions into so-called packages. These packages are displayed by the S5 command interpreter and loaded into the working memory only when they have been selected. In addition to the LAD, CSF, STL package there are other packages, e.g. SYMBOLS EDITOR, EPROM/EEPROM, GRAPH 5 etc.

S5 tools All S5 packages which are based on S5-DOS use the operating system utilities by calling up "tools". The tools are a collection of subroutines which make complex tasks such as reading a file on diskette or communicating with the PLC possible. The tools do this by accessing the S5 drivers and functions of the basic operating system.

Serial interface Data is transmitted one bit at a time via a serial interface, therefore serial interfaces are slower than parallel interfaces.

Server	The server is a node in the network which processes the requests from other nodes (requesters). A server cannot send requests. In PG NETWORK there is only one server or spool server.
SETUP	This is a program for transferring information about the device configuration (i.e. the configuration of the PG hardware) to the battery-backed memory. The device configuration of the PG is preset with defaults. Changes must therefore be entered in the SETUP if a memory extension, modules, a new drive or a coprocessor are added to the hardware configuration or if the ARCNET interface is to be activated.
SINEC H1	This network (bus system) is intended for use in industry according to IEEE 802.3 (ETHERNET). Programmers, personal computers and programmable controllers can all be connected.
Sliders	The sliders are positioned at the bottom and on the right-hand side of each window. You can use them to move the contents of the window if it is not possible to see all icons and objects in the window simultaneously. From the relationship of the white slider to the black scroll bar it is possible to see what proportion of the contents of the window is displayed and which part this is.
Software	The collective term for all programs which are used on a computer. The operating system, the firmware (resident parts of the operating system), the user programs and also any online documentation belonging to the programs are all part of the concept "software".
Spool mode	In spool mode, the PlantTop application "Output" checks at set intervals, whether files are present in the spool directory and it then prints these out.

- Stamp information** "Stamped" files contain additional information added at the end of the file, e.g. details on the type of driver and the date the software was generated. The stamp information can be displayed under PlantTop. In STEP 5, the stamp information can be displayed together with the version of the files.
- STEP 5** The programming language STEP 5 with the types of representation ladder diagram, control system flowchart and statement list is part of the STEP 5 Basic Package. Programs can be generated offline at the PG and transferred to the PLC memory online and tested. User programs can be transferred to EPROM/EEPROM submodules via an EPROM programming interface module. Programs and plant statuses can be documented via the printer and the user programs stored on diskette or hard disk.
- Super user** → System manager
- System configuration** The system configuration of FlexOS and X/GEM can be changed in PlantTop for the next time you boot the system. To do this, load the X/GEM application FlexPrep and enter the new settings, or select the command "System configuration" in the menu "Create" directly under PlantTop.
- System manager** The system manager controls the write protection of files and the allocation of passwords in a multi-user system. He enters registered users in the user table and allocates every user his own working directory. In networked systems with several system managers, a super user is responsible for the general allocation for the whole system.

T

Text cursor	The cursor shows where text may be entered, e.g. 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 or with the cursor keys.
Title bar	The title bar is found across the top edge of each window. It informs you of the path of the drives and directories opened and of the files which can be selected. In this line you can specify which file names or which types of files (according to their extension) are to be displayed. The title bar is also used to move the position of the window.
Token	The token is used to control access to the network in a computer bus system in the form of a ring or a tree. In ARCNET a token is passed from node to node. If one node has possession of the token, it has active control of the network and can transmit information while the other nodes have to listen and receive.
Tools	→ S5 tools / P tools
Trashcan	The trashcan is an icon in the device park in PlantTop. It can be used to delete files and directories. To do this, click on the icon to be deleted with the mouse pointer and pull it to the trashcan. When you delete a directory, all subdirectories and files in it will also be deleted.

U

User environment → User interface

User interface A user interface is the collective term for the points where the user comes in direct contact with the system he is working with (i.e. an interface between user and computer). This means specifically the operation of the computer using commands which are displayed on the screen. There are three types of user interfaces under S5-DOS/MT:

- non-graphic e.g. that of the S5-DOS/MT operating system level
- semi-graphic e.g. the STEP 5/MT packages
- fully-graphic e.g. PlantTop.

User level An area on diskette or hard disk under the operating system PCP/M-86.

User program A collection of all the instructions and arrangements for signal processing, by which a system (or process) is controlled or influenced.

Utility Utilities belong to the operating system of the computer. They mainly serve to make working with the computer easier, faster or more comfortable for the user, e.g. formatting diskettes, copying files, outputting the contents of directories/disk drives.

V

V.24/V.28 interface	The V.24 interface is a standardized interface for data transmission. Printers, modems and other hardware modules can be connected to a V.24 interface.
Version	The version number and the date of the PlantTop version can be output with the command INFO. Some applications display their version without the need for PlantTop.
VGA	(Video Graphics Array) Color graphics control mode
Virtual devices	Devices which are not physically connected to the computer (e.g. printers), but which can be addressed via the network.
Virtual drive	A part of the memory of a computer which can be compared to a very fast disk. Files can be saved on it as on a physical hard disk. Any data stored on a virtual drive are lost when the computer is switched off or the operating system restarted. The virtual drive is also described as a RAM drive.

W

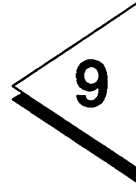
- Warm restart** A warm start is a restart after a program has been aborted. The operating system is reloaded and restarted. A warm start is performed with the key combination CTRL+ ALT+ DEL.
- Wildcards** Wildcards or jokers are: ? and *. These characters can be used to represent one or more characters in a file name, in order to list a particular group of files. The question mark ? stands for one character at that position in a file name, the asterisk * stands for any number of characters at that position in a file name.
- Window** A window is a square field on the screen, in which related information has been collected. In PlantTop, for example, there are windows for the device park, for drive contents or for directories. Their contents is displayed in the form of icons or in text form. The windows can be moved around the screen and their size can be set as required. Only the active window can be worked on.
- Working directory** In a multiuser system each user is allocated a working directory by the → system manager, in which only that user can work. User access to → directories and → files is controlled by directory and file attributes, the group ID and the respective user access rights which the system manager has allocated to each user.
- Working memory** The memory in which a program is stored which can be processed. The working memory is a direct access memory.

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

X

X/GEM (Extended Graphics Environment Manager) forms the interface between the operating system and the graphic user interface or a user program. X/GEM uses the advantages of multiuser-multitasking operating systems.

X/GEM Shell The FlexOS operating system level, which is shown in a graphics window, is described as the X/GEM Shell. It can be called from PlantTop in the Options menu with the command "FlexOS commands".



Appendix

Guidelines for Handling Electrostatically Sensitive Devices (ESD)

1 What is ESD?

VLSI chips (MOS technology) are used in practically all SIMATIC S5 and TELEPERM M modules. These VLSI components are, by their nature, very sensitive to overvoltage and thus to electrostatic discharge:

They are therefore defined as
"Electrostatically Sensitive Devices".

"ESD" is the abbreviation used internationally.

The following warning label on the cabinets, subracks and packing indicates that electrostatically sensitive components have been used and that the modules concerned are susceptible to touch:



ESDs can be destroyed by voltage and energy levels which are far below the level perceptible to human beings. Such voltages already occur when a component or a module is touched by a person who has not been electrostatically discharged. Components which have been subjected to such overvoltages cannot, in most cases, be immediately detected as faulty; the fault occurs only after a long period in operation.

An electrostatic discharge

- of 3500 V can be felt
- of 4500 V can be heard
- must take place at a minimum of 5000 V to be seen.

But just a fraction of this voltage can already damage or destroy an electronic component.

The typical data of a component can suffer due to damage, overstressing or weakening caused by electrostatic discharge; this can result in temporary fault behavior, e.g. in the case of

- temperature variations,
- mechanical shocks,
- vibrations,
- change of load.

Only the consequent use of protective equipment and careful observance of the precautions for handling such components can effectively prevent functional disturbances and failures of ESD modules.

2 When is a Static Charge Formed?

One can never be sure that the human body or the material and tools which one is using are not electrostatically charged.

Small charges up to 100 V are very common; these can, however, very quickly rise up to 35 000 V!

Examples of static charge:

- Walking on a carpet	up to	35 000 V
- Walking on a PVC flooring	up to	12 000 V
- Sitting on a cushioned chair	up to	18 000 V
- Plastic desoldering unit	up to	8 000 V
- Books etc. with a plastic binding	up to	8 000 V
- Plastic bags	up to	5 000 V
- Plastic coffee cup	up to	5 000 V

3 Important Protective Measures against Static Charge

- Most plastic materials are highly susceptible to static charge and must therefore be kept as far away as possible from ESDs!
- Personnel who handle ESDs, the work table and the packing must all be carefully grounded!

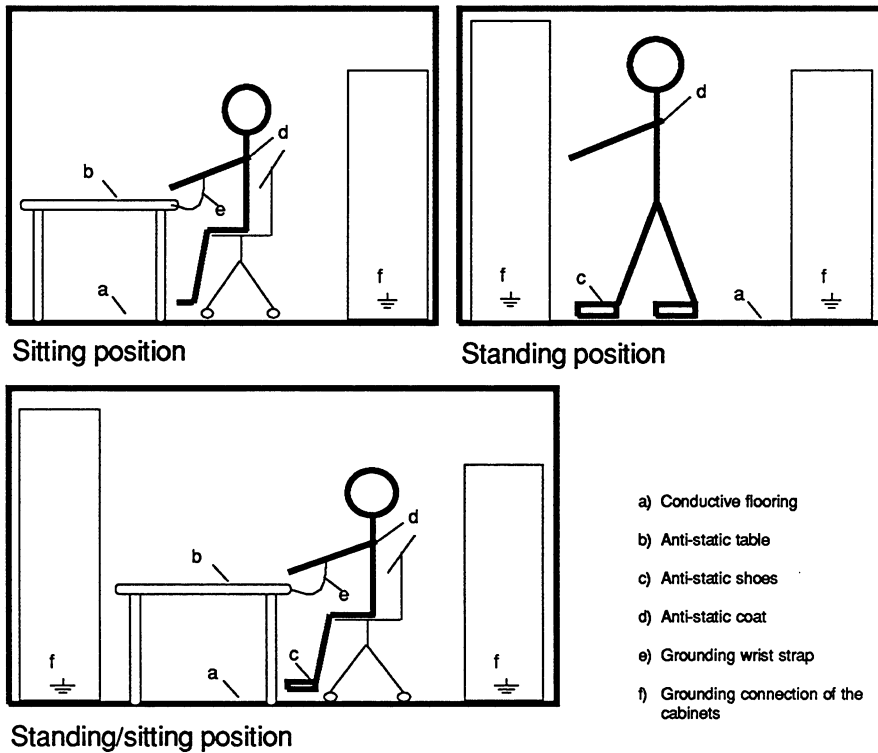
4 Handling of ESD Modules

- One basic rule to be observed is that electronic modules should be touched by hand only if this is necessary for any work to be done on them. Do not touch the component pins or the conductors.
- Touch components only if
 - the person is grounded at all times by means of a wrist strap
 - or
 - the person is wearing special anti-static shoes or shoes with a grounding strip.
- Before touching an electronic module, the person concerned must ensure that (s)he is not carrying any static charge. The simplest way is to touch a conductive, grounded item of equipment (e.g. a blank metallic cabinet part, water pipe, etc.) before touching the module.
- Modules should not be brought into contact with insulating materials or materials which take up a static charge, e.g. plastic foil, insulating table tops, synthetic clothing, etc.
- Modules should only be placed on conductive surfaces (table with anti-static table top, conductive foam material, anti-static plastic bag, anti-static transport container.)
- Modules should not be placed in the vicinity of visual display units, monitors or TV sets (minimum distance from screen > 10 cm).

The diagram on the next page shows the required protective measures against electrostatic discharge.

5 Measurements and Modification to ESD Modules

- Measurements on modules may only be carried out under the following conditions:
 - the measuring equipment is grounded (e.g. via the PE conductor of the power supply system) or
 - when electrically isolated measuring equipment is used, the probe must be discharged (e.g. by touching the metallic casing of the equipment) before beginning measurements.
- Only grounded soldering irons may be used.



6 Shipping of ESD Modules

Anti-static packing material must always be used for modules and components, e.g. metalized plastic boxes, metal boxes, etc. for storing and dispatch of modules and components.

If the container itself is not conductive, the modules must be wrapped in a conductive material such as conductive foam, anti-static plastic bag, aluminium foil or paper. Normal plastic bags or foils should not be used under any circumstances.

For modules with built-in batteries ensure that the conductive packing does not touch or short-circuit the battery connections; if necessary cover the connections with insulating tape or material.

Remarks Form

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