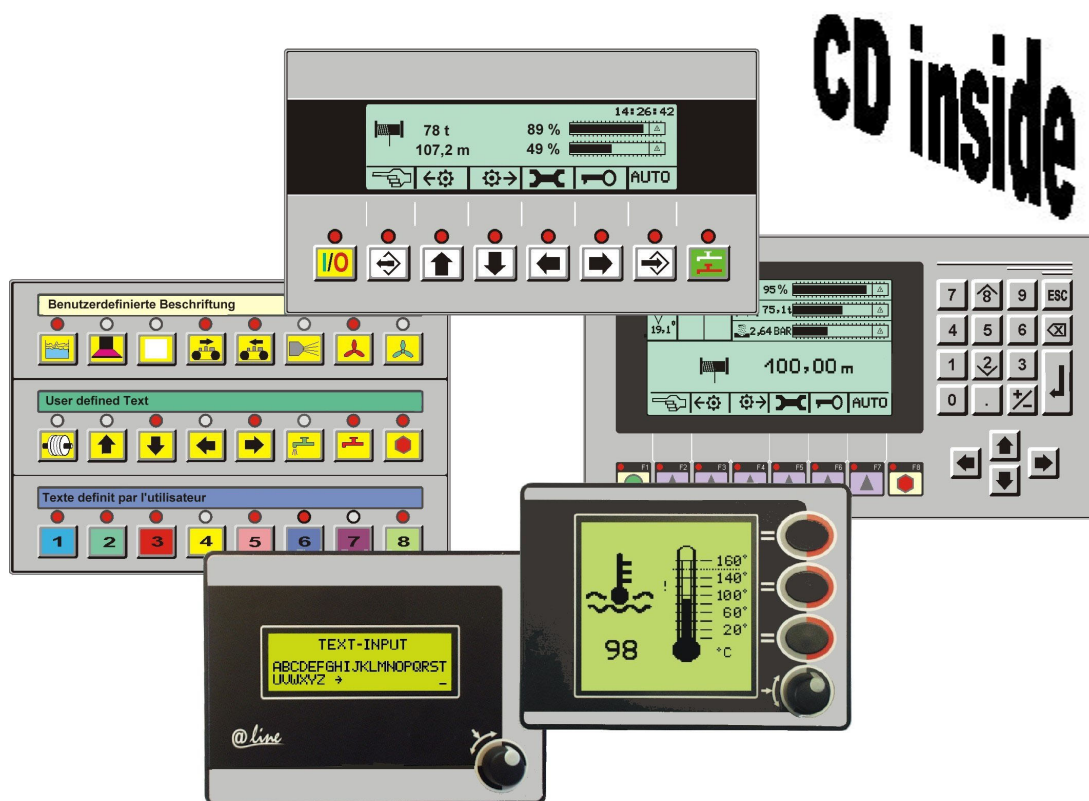


GRAF-SYTECO

Operating and Monitoring Manual



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1 Introduction

1.1 General information on this manual

The operating panels of the ITS and AT series are parameterised and programmed with the ITE editor. The editor is a 32-bit Windows application and only runs under all 32-bit Windows versions. The operating panels cannot be efficiently used without the editor and vice versa.

Apart from the settings and the program operation of the ITE editor, this manual also describes the functionality of the operating panels.

Whenever the term "operating panel" is used in the following text, this refers synonymously to all device series. Deviations between the individual devices will be specifically mentioned.

1.2 Required versions

This manual describes the ITE editor as of version 6x18, which is supplied together with the LD control program and the integrated C-development environment. The device must meet the following requirements:

BIOS:	as of IB052S00	(ITS6)
	as of IB153S00	(ITS7)
	as of IB201S00	(AT devices)
TOS:	as of IO039S00	(ITS6)
	as of IO153S00	(ITS7)
	as of IO185S00	(AT devices)

The TOS (Terminal Operating System) is included within the scope of delivery of the ITE editor and has already pre-assembled with all AT devices. For the current TOS version, please refer to the Internet under <http://www.graf-sytec.de>

1.3 Device description

The operating panels of the AT and ITS series have been developed for industrial use in practically all environments. Their application area ranges from vehicles and building systems to the monitoring and operation of production sequences. The devices are characterised by the following features:

- Full graphic LCD display with LED illumination (ITS/AT-7 also CFL)
- Freely assignable function keys, 8 to 56 keys, optional number block
- TOUCH screen (AT/ITS-7 series)
- Small mounting depth
- CAN interface, optionally other bus systems
- Serial interface
- Protection class IP 65, front
- Drivers for various programmable logic con-

trols (PLC drivers) available

- Separated page and message level
- Large variety of functions
- Firmware updates possible via interface
- Integrated inputs/outputs (optional)
- Simple, non-time-critical control logic functions are possible.

Programming of own functionality in C (only devices of the AT series).

For further details on the devices, particularly pin assignments and technical data, please refer to the respective device data sheet.

1.4 Editor description

The ITE editor serves the generation and editing of user-specific display texts and pages. With the Windows graphical user interface, all functions and editing steps can be carried out comfortably. For frequently used functions, the so-called "speed buttons", i.e. operating buttons, are directly available on the user interface. Settings can be made in individually created input masks, which can be easily accessed via menus or buttons and which perform a plausibility check of the entered data. The input masks are "intelligent". Interdependent settings are automatically checked against each other and, if required, corrected or displayed or blanked out. In order to be able to gain an impression of the results already on the stage of data generation, the ITE editor has been equipped with a special WYSIWYG¹ technology for the representation of the operating panel display. This means that the character set of the device is presented on the screen exactly the way it will appear on the device display. The same applies to graphics, which are also shown the way they will appear on the LCD display.

In order to simplify data generation, different colours are assigned to individual functions. Thus, the different entries can be directly identified on the display.

Basically, all functions required for the creation of a project are provided for.

Different additional programs are supplied together with the editor, which must, however, be activated by means of a software copy protection module, hereinafter referred to as "dongle".

The extension stages are named as follows:

1.4.1 ITE version A

This version is the so-called sample version. It is normally supplied in connection with a sample device and a respective sample dongle for testing hard- and software. It can only be run with the don-

1. WYSIWYG = What You See Is What You Get

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gle plugged in and is limited to 50 program starts. It offers, however, the maximum function scope to be able to test all device characteristics.

1.4.2 ITE version C

By means of this free-of-charge editor freeware variant, fixed message texts and pages with fixed texts can be generated. Fixed graphics and graphical displays as well as nominal and actual values can be integrated into pages.

1.4.3 ITE version D

In addition to the functions of the ITE version C, the ITE version D allows for the generation of simple, non-time-critical control programs. The programming can be carried out as ladder diagram or in C, which would be the more compact and faster solution for AT panels.

1.4.4 ITE version E

This version additionally offers for AT devices the automated creation of variable objects for the call-up and control of parameters stipulated by the SAE J1939 standard.

1.4.5 Program components

The following programs are installed with all versions:

- ITE.EXE: ITE editor for pages, messages etc.
- ITR.EXE: This program component is used by the editor for transferring data to the operating panel.
- OSLOAD.EXE: Utility for loading the operating system (TOS) into terminals of the AT series
- CAN_UTIL.EXE: Program by means of which the GRAF-SYTECO CAN-bus-modules can be configured at the operating panel.
- KOP.EXE: Ladder diagram editor for the creation of control programs which run on the operating panel. The saving and transferral of projects is, however, only possible with ITE version D or higher.
- GCE.EXE development environment for control programs which have been written in C. This program can be used only in connection with AT devices. The saving and transferral of projects is, however, only possible with ITE version D or higher.
- INFO.EXE: The program displays the installed variant as well as the versions of the individual program components.

All program components are normally called up internally by the ITE.

During installation, a "Graf_ITE" subfolder is created in the "Programs" folder where copies of all files

belonging to the software package are saved. The only file which is not installed into the editor directory is WE6000.INI. This file contains the editor settings. It is located in the WINDOWS directory of the PC (normally C:\WINDOWS).

1.5 Terms

First of all, some terms have to be introduced and explained to make the function descriptions in this manual understandable.

1.5.1 Term: Page

A page is a display full of information: i.e. a collection of fixed texts, graphics (icons), nominal and actual values. Consequently, a page is not only the presentation of a graphic, but the reproduction of information the user views on the display.

Pages are activated and deactivated via a page number. A page call-up can also be performed via flags, inputs or the control program.

1.5.2 Term: Message

Independently of the page, single-line information can be shown on the display, which are referred to as "messages". Thanks to the messages, an error display can be realised independently of the activities performed by the operator at the panel.

Messages are activated via a message number by means of the same functions as pages.

1.5.3 Term: Menu / menu control

The menu editing is a frequently required function, within the scope of which an operator can scroll to a desired function through one or several pages. The operating panel is very comfortable in this respect and enables structures with a tree depth of 16 levels.

1.5.4 Term: Actual value

Actual value describes the display of a value, such as the temperature at a temperature sensor or the speed at a motor.

In the simplest case, an actual value can be also a single bit (flag) (e.g. emergency STOP pressed).

1.5.5 Term: Nominal value

A nominal value is a value which is specified by the operator directly at the operating panel. The operating panel executes a plausibility check during the entry and checks the value entered by the operator for the programmed upper and lower limit. These values therefore need not be further checked by a control system (which would have to be programmed).

1.5.6 Term: Variable

The term "variable" refers to all values which are

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transferred as data to the operating panel. This includes all nominal and actual values, flags, as well as inputs and outputs at the bus modules. There are different variable "types" such as flags (bit), numbers, date, time, etc.

The graphical variables are completely special variables, which visualise an actual value as a bar, position or symbol.

1.6 Preparations for commissioning

Please observe the following aspects when installing the editor or commissioning the first devices:

1.6.1 System requirements

- Editor ITE (installation CD)
- PC with one of the Windows versions 95, 98, NT (V4.0 service pack 6), 2000, XP
- Serial connection cable or an ITK140 and a CAN cable
- 24 V DC power supply

1.6.2 Editor installation

1.6.2.1 Preparation

Please read the software-licence agreement in the annex of this manual first!

With all Windows systems: insert the CD into your CD-ROM drive. If the "auto play" option is activated, the CD starts automatically and calls up your Internet browser with the CD welcome page. If auto play has not been activated, you may start the installation with a double-click on the Index.htm file. After the language selection, you can continue with the actual software installation in the browser window.

Observe the instructions displayed on the screen during installation.

Upon completion of the installation program, please proceed as follows:

1.6.2.2 Activation

Plug the dongle onto a free parallel interface or USB interface of your PC. Start ITE. The activated ITE version is displayed.

If the dongle should not be recognised as expected, please contact our sales department. After the activation has been successfully completed, you may pull off the dongle as it is not required for operation.

By purchasing the dongle, you obtain a company licence which entitles you to install and activate the software on an unlimited number of corporate PCs to ensure that several employees are able to create projects. The licence includes the installation of the program on service laptops of your company.

Any activation of the editor beyond the aforementioned purposes is not allowed. We hereby refer to our licence regulations (see Annex).

Keep the dongle at a safe place, since we do not supply replacement dongles free of charge!

Older, parallel dongles which have been delivered with software versions 6.17 and older are no longer supported since there is no driver software available for Windows operating systems NT 4.0 and higher. Customers who possess such dongles may purchase an upgrade in return for the old dongle and against a handling charge.

The installed licences are not affected by this, they will remain valid with the new installation of the editor.

1.7 Commissioning

Connect the operating panel to the power supply (for the pin assignment, please refer to the backside of the device) and the transfer cable (CAN or serial) to the PC and the operating panel.

Start the ITE editor and create your pages. Carry out the basic settings and save your data.

Please also refer to the following chapter.

1.8 Transfer data to the terminal

Normally, the operating panel is ready to receive project data from the PC after the connection has been completed. If the data transmission does not work despite correct cabling, check the settings of the serial or CAN interface via which the project data are to be loaded.

In case you do not know how the interface at the device is configured, you may set the device to a defined state during the switch-on process by pressing a key combination. The key combination varies from device to device. The interface is then initialised to a permanent basic setting.

Please also refer to the respective device manual. If the project does not start after the data have been successfully transferred, maybe no operating system has yet been loaded into the device. In this case, specify an operating system file in the basic settings (refer to Chapter 9) and select "Project and operating system" during transmission.

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2 The ITE6 configuration interface under Windows

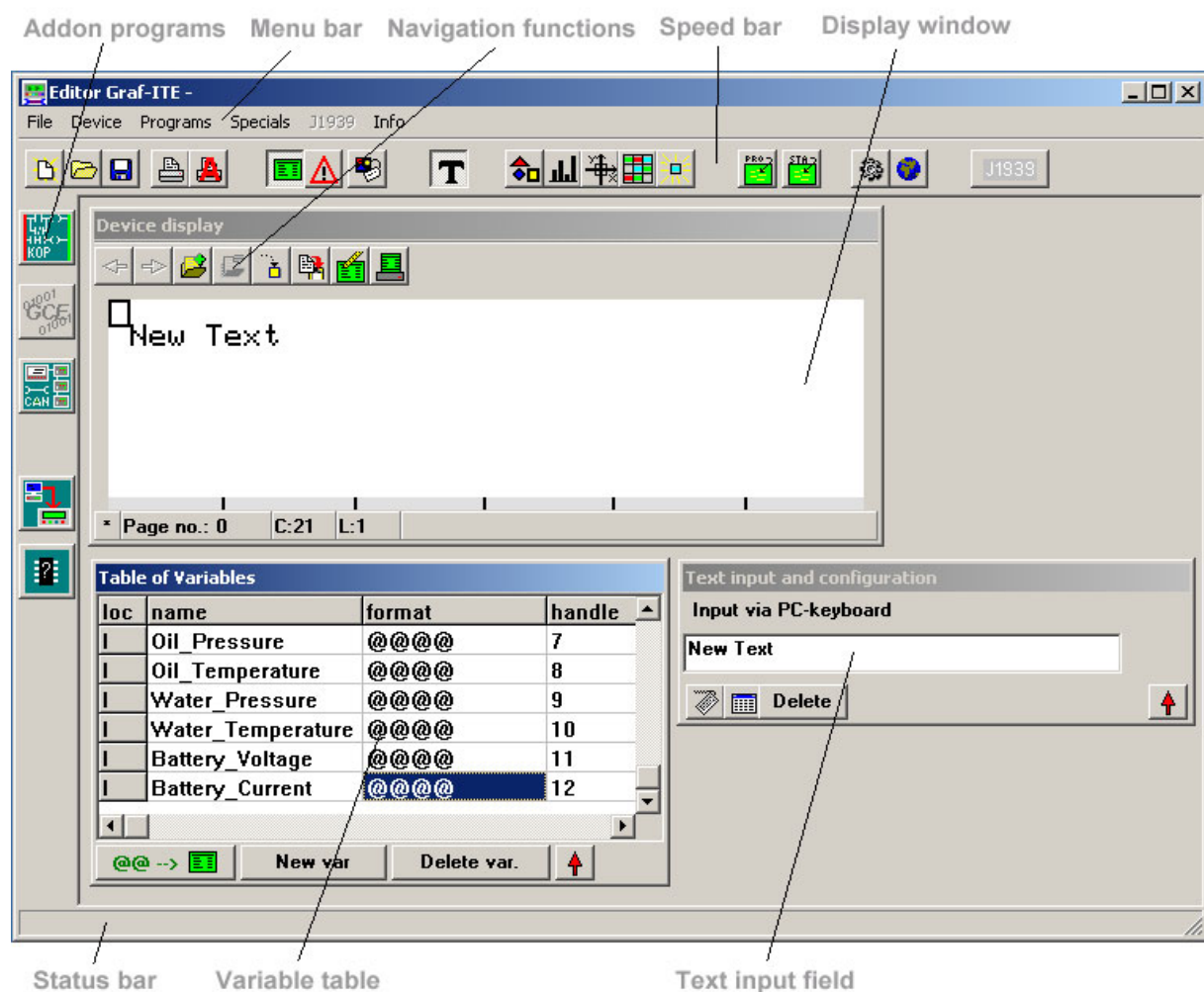
For the operating panel, a comfortable ITE configuration interface (**Industry Terminal Editor**) is available. During the installation of the editor, icons are created in the start menu under Programs > Graf_ITE.

Initially, we would like to give you an overview of the different input masks of the configuration system. Images say more than 1000 words, this is why the respective masks are only briefly described in this chapter. The masks are illustrated and you will find out that they are self-explanatory.

2.1 Main window

Click the ITE editor program icon in the start menu under Programs>Graf_ITE to start the ITE editor. Alternatively, the program can be started by simply starting the ITE.EXE program in the installation directory.

The program then calls up the following window: The central element in the ITE is the display window which offers you an almost scaled illustration of the operating panel display. Even the panel's pixel character set is displayed true to the original. Graphics appear exactly the same way as they are subsequently shown on the panel.



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2.2 Configuring the user interface

The user interface can be adjusted to your requirements. The windows "Device display", "Text input.." and "Table of variables" can be modified and the editor's start-up properties can be predefined for new projects. All properties are permanently saved by the interface.

2.2.1 Language selection

Refer to the menu Specials>Language selection.

2.2.2 Preferences

Refer to the menu Specials>Preferences.

2.2.3 Window positions

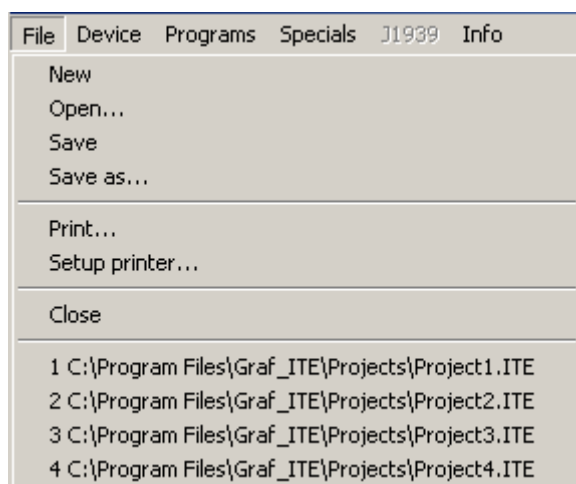
The windows "Device display", "Text input", "Table of variables" as well as the optional windows "Cyrillic keyboard" and "ASCII-table" can be freely positioned within the editor window. If required, the editor extends its desktop by adding scrollbars on the right and at the bottom.

All window positions are saved when exiting the program and restored with a new start.

2.3 Menu bar

The menu bar comprises all required functions. Some important functions and the external programs can be directly called up via the operating buttons of the speed bar. The following commands are available in the menus:

2.3.1 "File" menu



The menu entries in the "File" menu have been largely matched to the menu items in other Windows programs. Underneath the "Close" menu item, the editor displays up to four project files that you have opened last.

2.3.2 New

Creates a new ITE project under consideration of

the preferences mask.

2.3.3 Open

Opens an existing ITE project. Project files with the .TXT file extension, which was common with older versions, can be directly opened since project files with the .ITE extension have the same file format as project files with the .TXT extension. The modification has been carried out to ensure that ITE projects can be directly opened in the Windows Explorer by double-clicking the project file.

2.3.4 Save

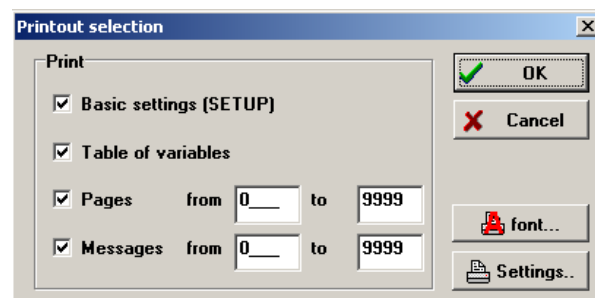
Saves a loaded project. If no project file name has yet been determined, you will be asked to enter a respective project name.

2.3.5 Save as

Saves a loaded project under a new name and, if required, into a new directory. The editor copies all project-related files into the new directory. This command can be used, for example, for back-up purposes or if you want to forward the project.

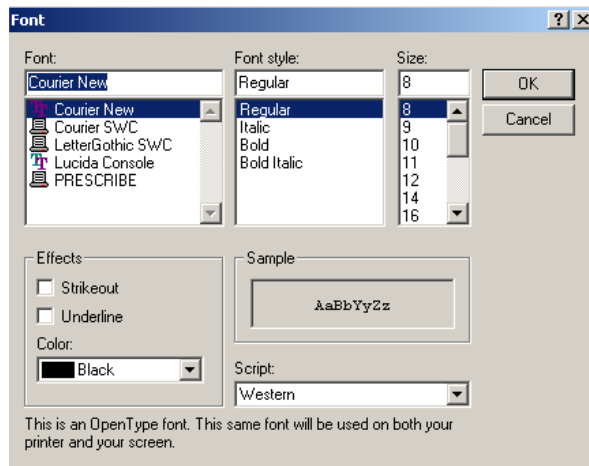
2.3.6 Print

Opens the following selection mask:

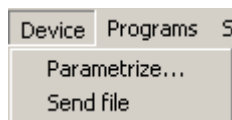


Here you can select which parts of your project (in text form) are to be printed. For all print orders, the Windows standard printer is used. The standard dialogue for fonts is opened via a click onto the "font" button.

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2.4 "Device" menu



This menu comprises settings which are related to the device itself.

2.4.1 Parameterise

By clicking the "Parametrize" menu item, an index card dialogue opens where all device-relevant settings can be made. For a detailed description of this dialogue, please refer to Chapter 9.

2.4.2 Send file

A click on the "Send file" menu item opens the interface dialogue. This dialogue offers you the possibility to tell the ITR transmission program via which interface you would like to load which project components into the device and to specify the additional device settings. You can determine whether the files are to be directly loaded into the terminal or written into a file.

With each call-up, the dialogue checks the availability of interfaces in the PC. Depending on availability and presets, the respective interface can be selected. The last used interface is saved as preset for the next transmission.

Serial interfaces used by Windows itself or by other programs are not listed !

Details on the interface settings may be displayed or blanked out as certain settings are permanent anyway.

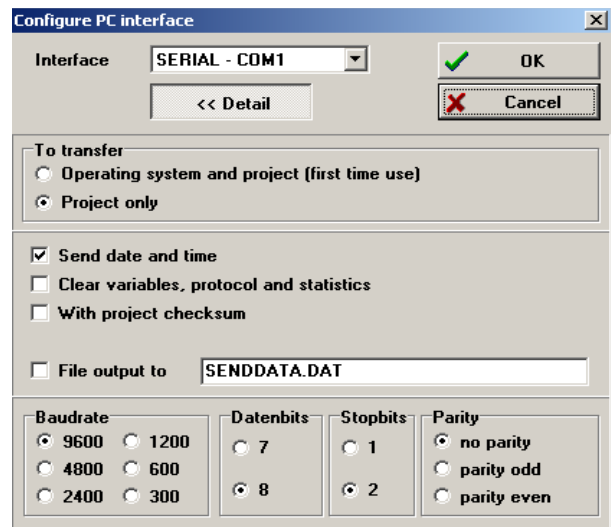
Important notes for user of USB2 serial adapters:

If a USB2 serial adapter is connected to the PC after the editor start-up, the newly added serial interface is not included in the list !

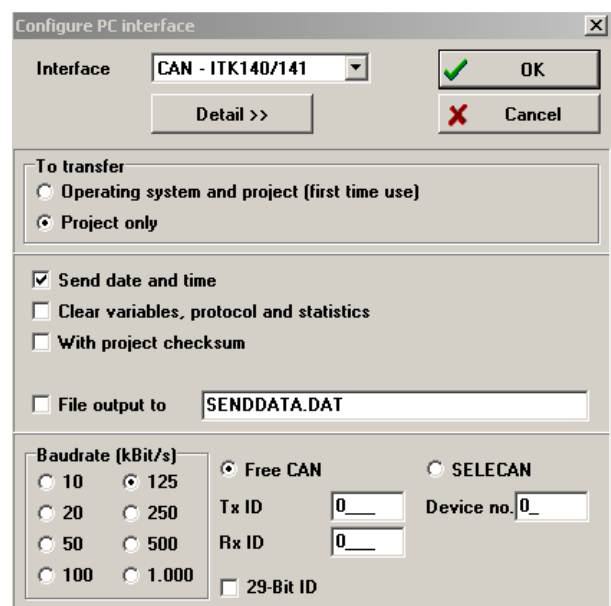
The editor can detect only once during program

start which serial interfaces are available in the system. If a new interface is to be used, the editor must be re-started.

The following setting options are available when selecting a serial interface:

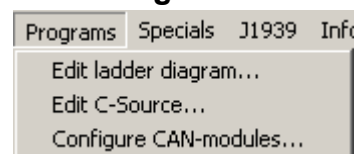


and when selecting the CAN-ITK140 interface:



The integration of further CAN interfaces has partially already been implemented; the mask has been individually matched to the respective interface.

2.5 "Programs" menu

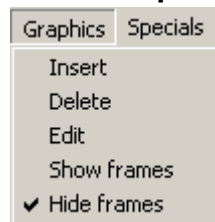


The "Programs" menu comprises the entries for

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the external programs LD, C and CAN module configuration. The functions of these programs are described in the other volumes of this manual.

2.6 "Graphics" menu



If you would like to include any graphics into your pages, this menu offers you the basic functions for graphic editing. This menu only appears if one of the following buttons is active:



2.6.1 Graphic: Insert graphic

By clicking "Insert", an "Open file" dialogue is called up, which allows you to load a bitmap file (file with the .BMP file extension) into the current page. The graphic may also be coloured, even though operating panels with monochrome displays show this graphic only single-coloured.

2.6.2 Graphic: Delete graphic

By clicking the "Delete" button, the active graphic is removed from the page. This menu item only works with a currently selected graphic (refer to status line). A selection is made by simply clicking the mouse into the graphic.

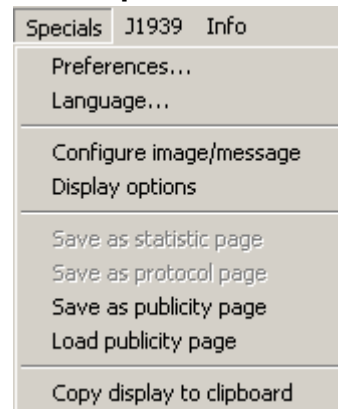
2.6.3 Graphic: Edit graphic

The image-editing program entered in the preference mask is activated via the "Edit" menu item. The file name is passed on to the bitmap as parameter. Also his menu item can only be activated if a graphic has been selected.

2.6.4 Show frames/hide frames

With the "Show frames" and "Hide frames" functions, you can instruct the editor to display a dashed red frame around each graphic. This may be helpful for editing purposes, for example if you search for a graphic.

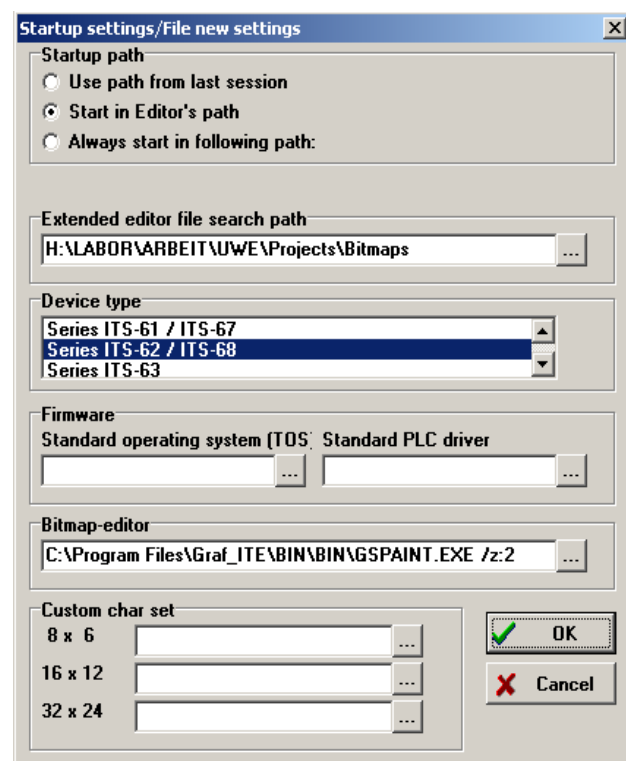
2.7 "Specials" menu



This menu contains some special functions.

2.7.1 Specials: Preferences

Via Specials>Preferences, the start-up properties of the editor and the basic settings for projects can be specified.



The field "Startup path" indicates the location where the editor searches projects when the "File>Open" menu item is clicked. The setting options are self-explanatory.

The "Device type", "Firmware" and "Custom char set" settings refer to the "File>New" command. The settings which are made in this dialogue are preset in newly created projects.

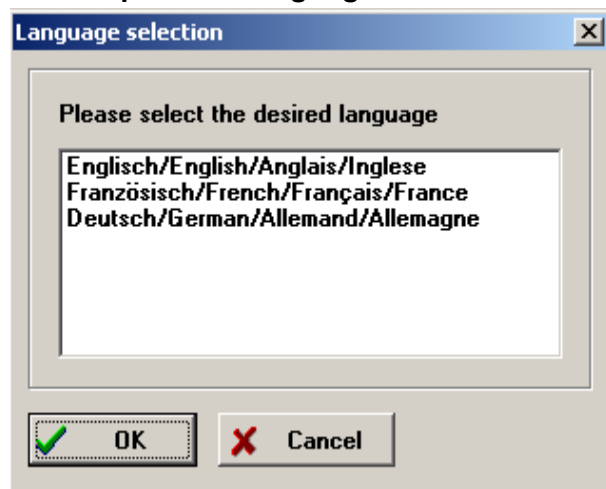
In the "Bitmap-editor" field, you can specify the program to be used by the editor for editing bitmap graphics.

In the "Extended editor file search program" field,

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you can specify the directory in which the editor should search for bitmaps, text lists and operating system files if the files have not been saved in the project directory. You may enter absolute paths (e.g. C:\bitmaps) or relative paths (e.g. ..\BMP) in this field. The relative path always refers to the current project directory.

2.7.2 Specials: Language



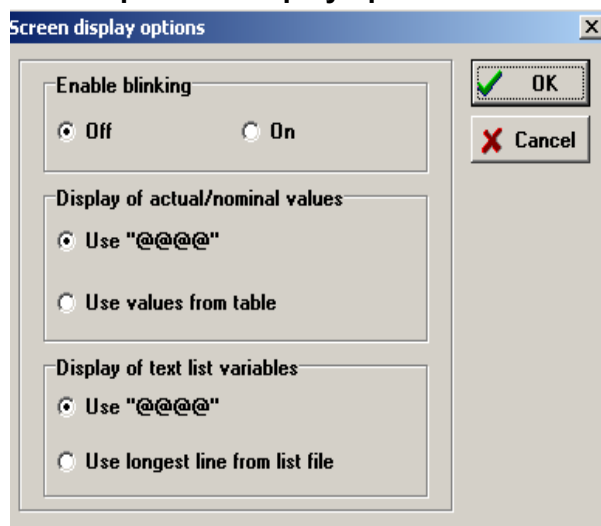
Select your desired language and close the window by clicking the OK button. The interface immediately changes to the new language without a program re-start.

2.7.3 Specials: Configure page/message

Depending on whether a page or a message is currently edited, diverse dialogues are called up. The information whether a page or a message is edited must be provided by you via the  button for pages and the  button for messages on the "speed bar".

For further information, please refer to Chapter 3 "Creating and editing pages" and Chapter 4 "Creating and editing messages".

2.7.4 Specials: Display options



Via this menu item, the display options of the configuration interface can be set. The settings only refer to the PC configuration interface.

Enable blinking

This field shows the options "On" and "Off". As a standard, "Off" is set. Texts and graphics with the blinking function enabled are always shown statically in the standard setting. For a realistic representation, this setting can be changed to "On". Under Windows, the blinking of graphical interface components would require considerable computational efforts, which in turn would result in a slow page formation and other side effects. Therefore, it is recommendable to activate this function only if you wish a close-to-reality project preview to see what it looks like on the ITS/AT.

Display of nominal/actual values

You have the possibility to display an actual value instead of the @ sign for variables. This is helpful for documentations. Open the page content table (red arrow in the "Text input" window) and enter the display values in the "Param2" field.

Display of text lists

Here you can choose whether the editor should display texts in text lists as @ signs or whether it should present the longest line of the list file.

2.7.5 Specials: Save as statistic page

Saves a statistic page.

2.7.6 Specials: Save as protocol page

Saves a protocol page.

2.7.7 Specials: Save as publicity page

Saves the current page as publicity page. The publicity page is displayed whenever the device is switched on.

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2.7.8 Specials: Load publicity page

Loads the publicity page file into the current page. You may modify the page and save it again as publicity page.

Statistic page/protocol page are intended as additional functions for devices with protocol and statistics function. The current page can be saved as standard protocol/statistic page.

2.7.9 Specials: Copy display to clipboard

Copies the content of the display window as bit-map into the clipboard. As a result, you can insert your pages directly into the data processing program.

2.8 Information Menu



The "Version information" menu item opens an external program which displays contact information and the versions of the individual programs of the software package. In cases of software problems, please contact our customer support and state the version information contained therein.

2.9 Speed bar (operating buttons)



Using the speed bar buttons you may call up frequently used functions by a single mouse click - there is no easier way.

All operating buttons are equipped with a help text, which pops up if you position the mouse cursor onto the button for approx. 1 sec.

The following section describes the individual buttons.



Create new project

By clicking this button, a new project is created. For this purpose, the editor's standard settings are selected for the project. This button has the same function as the "File"/"New" menu item.



Open project

This button opens an already existing project. A selection window opens in which you can select the desired project. This button has the same function as the "File"/"Open" menu item.



Save project

Using this button, you can save the status of the currently processed project on the hard disk or a floppy disk. If you have not named the project yet, the editor will ask you to do this. This button has the same function as the "File"/"Save" menu item.



Print

Clicking this button, the project print-out is initiated on the currently set standard printer. The project data are printed in text form. The button has the same function as the "File"/"Print" menu item.

Note:

If you wish to print a page as a graphic on the printer, you must click the "Print page" button (will be specified in the following).



Printer font

In order to be able to present the print data in the form of a table, a font with a fixed character spacing must be selected. Therefore, only fonts which support a fixed character spacing are displayed in the selection window. Select a font size which clearly shows the print data on your printer. We are not able to give you any recommendations as the number of printers and fonts is just too high. It is, however, recommendable to adjust the output format to "landscape orientation", particularly when using A4 paper.



Edit pages

This button activates the "Edit pages" mode. The button remains pressed after operation and is deactivated by clicking the "Edit messages" button.



Edit messages

This button activates the "Edit messages" page. The button remains pressed after operation and is deactivated by clicking the "Edit pages" button.



Configure page/message

Depending on the selected mode, the configuration mask is either called up for the current page or the current message. The button has the same function as the "Configure page/message" menu item.



Edit text

Via this button, you can select the "Edit texts" function. If this button is pressed, only texts are edited in the display. Line and column positions of the cursor are displayed in the status line; the cursor appears as a black rectangle on the display.



Alternative character set

This button appears if you have specified an alternative character set in the "Programs/char set" index card. Thanks to this function, you can enter also texts with an alternative character set.



Static bitmap

If this button is active, you can insert static (non-changing) graphics into a page. You can either insert an already existing graphic via "Graphics"/"Insert" or draw a window on the display using the mouse. Then, the editor automatically calls up the bitmap-editor specified in the preferences menu on the basis of which you can create or edit the graphic.



Bar graph

If this button is active, you can insert bar graphs into the page. By means of a bar graph, you may visualise actual values, for example temperature or pressure, in a graphical way.



XY graphic

This button allows for a creation of X/Y position displays. It is therefore possible, for example, to graphically display the position of a drill or a pick-and-place machine.



Diashow bitmaps

This button enables you to edit diashow bitmaps. In this type of graphic, several single pages are filed in a kind of table. The individual partial bitmaps can then be displayed via an index.



Attribute bitmaps

By activating this button, you may edit attribute bitmaps. With an attribute bitmap you can control the attributes "blinking" and "reverse" via a variable.



Make protocol page

This button serves to load a saved protocol page. This way, the protocol display can be adjusted to your individual requirements.



Make statistics page

This button serves to load a saved statistics page. This way, the statistics display can be adjusted to your individual requirements.



Get publicity page

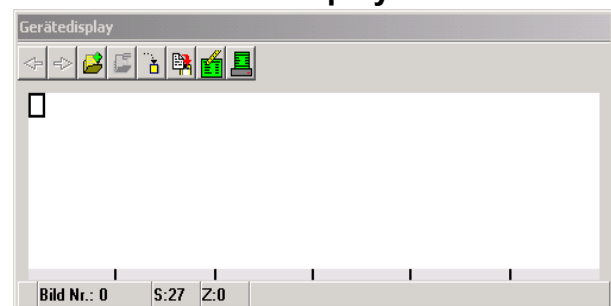
Since the publicity page cannot be directly edited, it must first be loaded into an (empty) page.



Use page as publicity page

Takes over the contents of the current page as a publicity page.

2.10 The "Device display"



The "Device display" window consists of three parts.

2.10.1 The device display area

This area provides an accurate preview of the contents that will be displayed on the respective page or the current message of the device.

2.10.2 The scrolling function field

This field comprises all functions required for access to the different pages/messages of your project. The "Copy page", "Delete page" commands are also integrated within this control button group. Of course, these buttons are also accompanied by a help text. The buttons scroll or work automatically in the activated page or message mode.



Scrolling backward

Press this button to scroll to the previous page.

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Scrolling forward

Press this button to scroll to the following page.



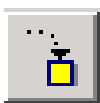
Add new page

Press this button if you want to create a new page. The editor asks for the desired page number and creates a new, still empty page.



Delete page

By activating this button, the current page is irrevocably deleted from the project after a respective query has been displayed.



Go to page

This function enables you to directly access a page. You have to state the number of the desired page.



Copy page/message

Via this button, you may copy the content of the page being edited into another page.



Redraw page

If a lot of graphic functions have been executed, the display contents may not be displayed correctly. This button enables you to re-compute and show the display contents.



Print page

This button directly initiates the print-out of the current page / message as a graphic. During the print-out process, the graphic is automatically adjusted to the size of the paper format.

2.11 Status bar



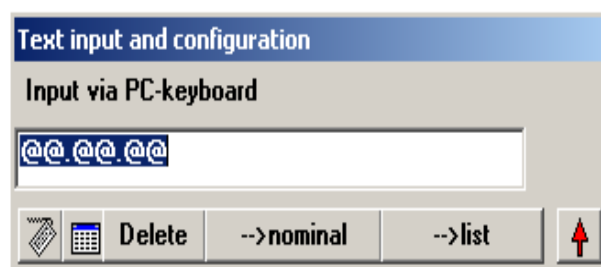
A status bar with 4 fields, which is positioned directly at the bottom of the display, provides information on the cursor position, page/message number, etc.:

The first field indicates whether the currently loaded project has been modified. If this is the case, a star (*) appears there. The second field always displays the current page number. The third and fourth field indicate the cursor position on the display - either the line and column in the text mode or the pixel position as X and Y in the graphic mode.

The fifth field finally contains information on the current processing step. In the graphic mode, the file name of the currently active graphic is displayed.

2.12 Text input window

This window contains the input field in which you can edit the text part you have just clicked on. Depending on the edit mode, the field also changes its status.

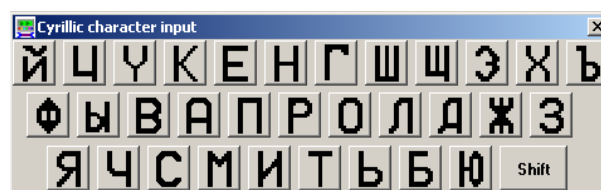


Depending on the edit mode, the control buttons "->Nominal value" and "->List" may also have other designations. A more detailed explanation of this function is available in the manual later on. The other buttons are assigned the following functions:



Cyrillic keyboard

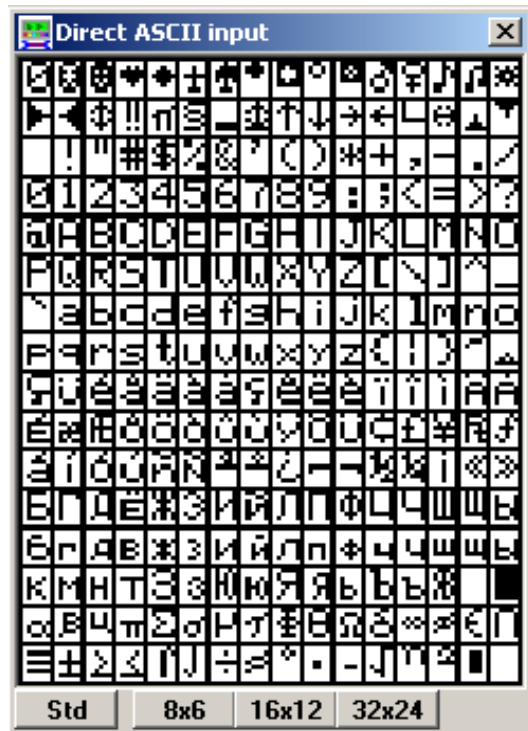
If you have to create Cyrillic text parts, you can use these buttons to activate a window with a Cyrillic keyboard. Entries can be made by "operating the keys" with the mouse.





ASCII table

If you have to enter characters which are not available on the keyboard, you can open the ASCII table for your entry. Simply click the respective character with the mouse. You are also offered the option to display alternative character sets and enter the characters in the input field.



STD: Standard character set
8x6: Customised character set 8x6
16x12: Customised character set 16x12
32x24: Customised character set 32x24



Edit table of page contents

Using this button, you can maximise the table of page contents to screen size to see all table columns simultaneously. You can modify entries directly in the table - though it is easier to double-click the display text in the text mode. You are then presented the respective entry mask for the configuration of the text entry.

2.13 Table of variables

loc	name	format	handle	type	low limit	
1	Oil_Pressure	@@@@	7	1		
1	Oil_Temperature	@@@@	8	1		
1	Water_Pressure	@@@@	9	1		
1	Water_Temperature	@@@@	10	1		
1	Battery_Voltage	@@@@	11	1		
1	Battery_Current	@@@@	12	1		

In the table of variables, you must list all variables required for your project (of course only those you want to edit and/or see in the ITS/AT). Within this table, the lower and upper limits of nominal values as well as the source and target information (where does the variable originate from) are managed.

The buttons are assigned the following functions:



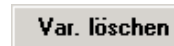
Move variable to page

The selected variable is taken over into the page - initially as an actual value.



New variable

Creates one or more new variables. All required data are to be provided by you.



Delete variable

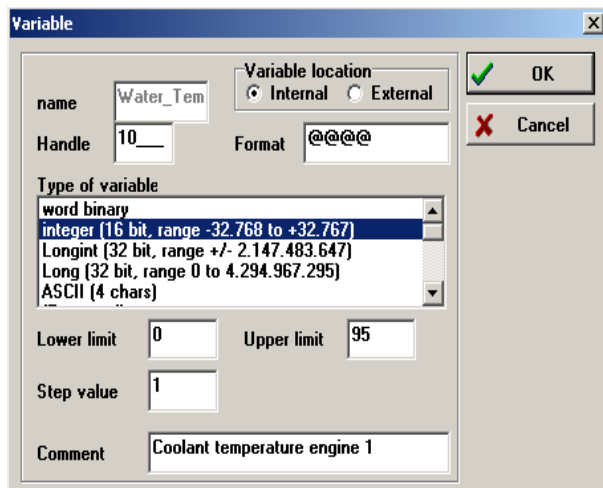
The selected variable is deleted. It is, however, not checked whether the variable occurs somewhere else. When saving the project, the editor creates a new variable with the name "NEWVARxx" if it comes across variables which are not listed in the table.



Maximise table of variables

This button maximises the tables of variables to screen size to display more information.

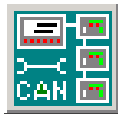
If you double-click an entry, the input mask for the respective variable is called up. This mask offers you the possibility to comfortably configure your variable.



The variable mask can be called up by double-clicking in the maximised table, too.

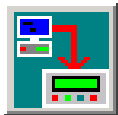
2.14 Additional programs

The editor can be supplemented by additional programs which, depending on the version (A,D or E), are offered as options.



Configure CAN modules

A special program is started which enables you to comfortably configure the CAN modules of the GCM series and add them to the project.



Transmit data to device

Starts the ITR transmission program which transmits the project to the terminal. This program is also available individually as a set-up version and may be passed on free of charge (e.g. to make sure that the final customer is able to load a corrected project into the terminal).



Check memory usage

The ITR transmission program is called up to compute the occupied memory space. This way, you can estimate whether you can, for example, add a further language to the project.



C-development environment

Starts the C-development environment on the basis of which you can realise your own control programs in the programming language C. This is, however, only possible with version D or higher.



Start LD editor

Starts the ladder diagram editor on the basis of which you can realise your own control programs as a ladder diagram. This is, however, only possible with version D or higher.

3 Creating and editing pages

The previous chapter offered you an overview of the ITE configuration tool. This chapter describes the creation and editing of pages.

Basically, pages are a numbered collection of display contents.

3.1 Page number


As soon as you create the page, you are required to determine a page number for the page. The editor requests the desired page number via an input dialog. It is not possible to assign page numbers double.

Page No. 0 must always be available within a project. It is displayed whenever no other page has been activated.

Page No. 0 cannot be deleted. The editor does not allow for a deletion. The page numbers must be between 0 and 9999.


The page numbers need not be consecutive, therefore individual numbers can be skipped. The editor sorts the pages in ascending order.

If you insert, delete or process pages, the edit mode for pages must be activated.

This function is assigned to the  button.


Once activated it remains switched on as long as you change to another mode.


3.2 Adding new pages


Press the  "Add new page" button and enter the desired page number (1 - 9999)

upon request. You then receive a new page with the indicated number which contains the static text "New page". You can either modify this text to use it or simply delete it.

3.3 Scrolling through pages


For scrolling purposes, three buttons are available which are positioned above the display: 

(scroll forward),  (scroll backward) and

 (jump directly to page number xy).

These functions are self-explanatory.

3.4 Deleting pages

Scroll to the page you want to delete. Then, press the  button. The page is irrevocably deleted after an acknowledge request has been made and the previous page is displayed.

3.5 Page elements


Different elements can be integrated into a page.

- *Fixed text*
- *Actual values*
- *Nominal values*
- *Menu items*
- *Text list variables*
- *Text list nominal values*
- *Static bitmaps (icons)*
- *Bar graphs*
- *XY graphics (position display)*
- *Diashow bitmaps*
- *Attribute bitmaps*

More detailed information on the individual page elements are available in the following sections.

3.6 Fixed text on the page

Most applications require fixed text. Fixed text can be displayed in 3 different sizes with normal, reverse, blinking and/or underlined characters. Within the table of page contents, all fixed texts characterised by "T" appear in the left column.

In any case, press the  button if you would like to edit texts. This button remains active and indicates that you are in the text edit mode.

3.7 Inserting text on the page

Move the mouse cursor to the desired position on the display and press the left mouse key. "New text" appears at this position.

Now, enter directly your desired text. The text first appears in the "Text input..." field and - slightly delayed- on the display as well.

A multiple-line text has to be made up of several single-line fixed texts. Click the starting position of every text section and enter the line.

3.7.1 Editing existing texts

Click the text on the display. The entire text is selected in the "Text input" field. If you move the cursor to the respective position using the cursor keys, you may modify the text the way you are used to it from the input fields.

3.7.2 Moving existing texts

Position the mouse cursor on the text. Press the left mouse key and keep it pressed. Now, move the mouse. A rectangle in the size of the text is "attached" to the mouse cursor. Move this rectangle to the position where you would like to enter the text. If you release the mouse key, the text moves from its original position to the new position.

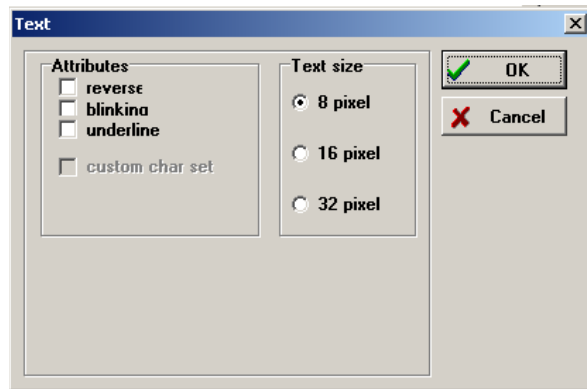
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3.7.3 Deleting texts

Click the text on the display and press the "Delete" button in the "Text input..." window.

3.7.4 Setting text attributes

Double-click the desired text on the display. A mask is opened by means of which you can set the desired text attributes.



3.7.5 Other fonts

The display of the operating panel supports only one font. You may, however, use any Windows font if you save it as a .BMP graphic and paste the font as static graphic into the page. Compared to the display font, the disadvantage of Windows fonts are the considerably increased memory requirements. Second option: You load your own character set into the display. For more information on this topic, please refer to Annex "Using customised character sets".

3.7.6 Little exercise

This exercise is to make you familiar with fixed texts. Also menu items, nominal and actual values are edited on the basis of the following procedures. For this reason, you are recommended to take some time for this exercise.

- Start the ITE editor. The normal initial page is opened.
- Now, click the mouse anywhere in the centre of the display. "New text" appears at your mouse position.
- The editor expects you to enter the desired text. For exercise purposes, please enter "My first text". This text then shows up on the display.
- Move the text to the bottom-left corner by keeping the mouse button pressed and dragging the text down.
- Double-click the text to call up the attribute functions. Select "16 pixel" and "reverse". Press OK.
- Move the text to the centre of the display. As you can see, the rectangle size has been adapted to the text size.


- Now, click the mouse on the display below the text. "New text" appears again with small letters. Enter "This is easy." and position the text below the first text.
- Now we want to modify the first text. For this purpose, click the mouse in the display on the text. The entire text is selected in the field "Text input".
- If you start to write now, the text is completely deleted and replaced by the new written text. If you want to avoid this, click the mouse into the input field or press a cursor key. Then you can modify the text.
- Modify the text to "The first text". You already see the modifications with a short delay on the display while writing.
- Now, we just want to insert some new texts into the page. Randomly click free places on the display, the editor always inserts "New text".
- Now, clean the page from the randomly positioned texts. For this purpose, click the mouse on the text you want to remove and press the "Delete" button. The text is now deleted from the page.

After having executed these steps, you can now practise a little on your own. Try out the different attributes (double-click the text) and see how the text changes with the setting of these attributes. To ensure that the text really blinks if the "Blinking" option has been activated, enable the blinking option in the editor display via the Specials>Display options menu.

3.8 Creating page menus

A more detailed description of menus is available in Chapter 5.

This section only documents the editing of menu items and explains the function by means of an example.

When editing menu items, always press the  button. This button remains active and indicates that you are in the text edit mode. Menu items are edited in the text mode.

3.8.1 Creating menu items

Enter the text of the menu item like a fixed text. Then, click the text once and press the "Menu" button in the "Text input" window. The text is immediately converted into a menu item, which is indicated on the display by a blue text colour.

If you click a menu text, the switch in the "Text input" window switches to "Text". This means that the menu item can be reconverted to normal text using this switch.

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You can specify a project-related menu tree for the operator. Your scope of options is (almost) unlimited: The operating panel allows for the editing of up to 18 menu/nominal value entries per page and up to 16 menu tree levels.

3.8.2 Assigning functions

If you double-click a menu item (on the display), the attribute mask with an additional selection of menu items functions is opened.

The desired function can be assigned now. With some functions, an additional field shows up for entering a page number. This means that this function releases a page call-up and the number of the page to be called up is to be entered here.

For a more detailed description of the functions, please refer to Chapter 5.

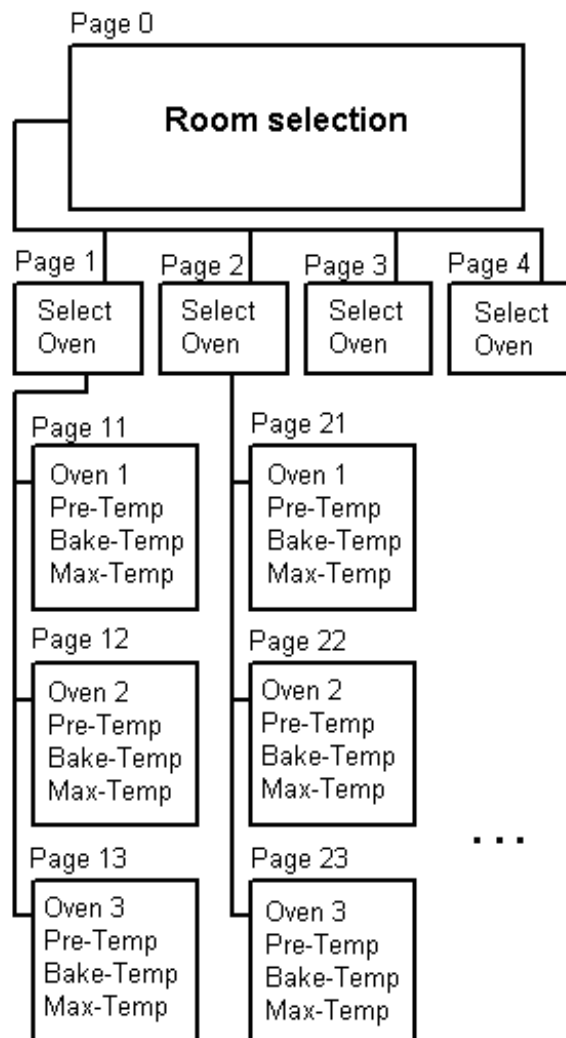
3.8.3 Menu example

To put our theoretical knowledge into practice, we will design a small menu system.

3.8.3.1 Menu planning

Imagine you are the owner of a bakery with 4 baking rooms. Each baking room is equipped with 3 ovens, each of which has a pre-heat temperature, a baking temperature and a maximum temperature as nominal values.

We will now enter these nominal values into a menu with the following structure.



3.8.3.2 Creating the menu structure

We start with page 0. Start the editor or select "File"/"New" to set the editor to its basic state. Create page 0 with the following texts and arrange them as illustrated on the following page.

Papa Joe's bakery			
Oven supervision			
Please select desired room			
1	2	3	4

Click "1" once. A small rectangle appears. Press the "-->Menu" button in the "Text input" window. The "1" is now displayed in blue. Proceed identically with the figures 2,3 and 4.


Double-click figure "1". The menu for the configuration of menu items shows up.

In our example, the menu item "1" must call-up the page for baking room 1, consequently page 1. For

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this purpose, the following settings must be made:

Click "OK" and proceed identically with figures 2, 3 and 4 (enter page numbers 2, 3 and 4 respectively). At first, save the work under the file name KAP3_B2.TXT (or any other name). Next, we want to create page no. 1. On this page, the selection of the oven is realised. Create the page by following the below steps:

1. Press the  button and enter page number 1.
2. Create the page in accordance with the following illustration.

3. Convert the texts "Oven 1"... into menu items (click once and press "-->Menu"). Proceed identically with "Back" and "Cancel".
4. Parameterise the page call-up in accordance with the menu graphic (Oven 1 --> Page 11, Oven 2 --> Page 12, Oven 3 --> Page 13)
5. Parameterise the "Back" menu item to "Return in menu". The "Cancel" menu item must be parameterised to "Cancel all".
6. Save your work.

The pages 2 to 4 have all the same structure. Therefore we simply want to copy page 1. Press the 3rd button on the right above the display (help text "Copy page/message"). Enter 2 as target page (preset).

Edit the page as follows:

1. Modify the text "baking room 1" to "baking room 2".

2. Parameterise the page call-up of the menu items in accordance with the menu graphic (Oven 1 --> Page 21, Oven 2 --> Page 22, Oven 3 --> Page 23).
3. Save your work.

Copy this page into page 3 and parameterise the menu entries. Proceed identically with page 4.

Now, the levels 1 and 2 of our menu structure have already been parameterised. Only the pages 11, 12, 13, 21, 22 etc. are still missing.

To simplify matters, we want to design all pages identically and use the copy function for copying.

At first, however, we must anticipate the entry of nominal values. Since the functioning of nominal values is described more precisely later on, simply follow the instructions; even if some of the settings are (still) unclear.

For the entry of nominal values, a variable (a memory location) must be created first. This can be achieved as follows:

1. Click on the "New var." switch. Enter "PREHEAT11" as name.


This way, a memory location is created for this nominal value. Confirm with "OK".

2. Enter the following data into the next window.

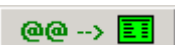
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- Now, add the variables "BAKE11" and "MAX11" in the same way. Vary the lower and the upper limits arbitrarily. Please observe that the string "@@.@@" is displayed in the "Format" field, which determines the number of digits of the entry; and the type of variable must be set to "integer".
- As always: Save your work.

Next, page 11, the input mask for nominal values, is to be created. First, we insert the fixed texts and the "normal" menu items. The nominal values are integrated subsequently. Only now, you create the fixed page components:

- Press the  button to create a new page. Assign the number 11 to this page.
- Lay out the texts in accordance with the following illustration:

Nominal values for oven	
Pre-heat temperature :	
Baking temperature :	
Maximum temperature :	
back	cancel

- Configure the menu items "Back" and "Cancel" as you did it with the previous pages.
- A nominal value has to be entered into the page.
- Click the variable "PREHEAT11" once in the table of variables and press the  button.
- The variable is integrated in the page. (Left top corner, green.)
- Press the "Nominal value" button. Initially, the editor regards a variable as an actual value, therefore the nominal/actual button must be explicitly set to "nominal value". The variable is now displayed in red.
- Use the mouse to move the variable behind the "Pre-heat temperature" text. Proceed identically with the variables "BACK11" and "MAX11" and position them accordingly. The completed page should look like this:

Nominal values for oven	
Pre-heat temperature :	@@@.@
Baking temperature :	@@@.@
Maximum temperature :	@@@.@
back	cancel

- Save your work.

Copy this page into the pages 12, 13 etc. (The nominal value variables are not created anew for every page). If you want to have own values on each page, create the respective variables and individually insert them in each page).

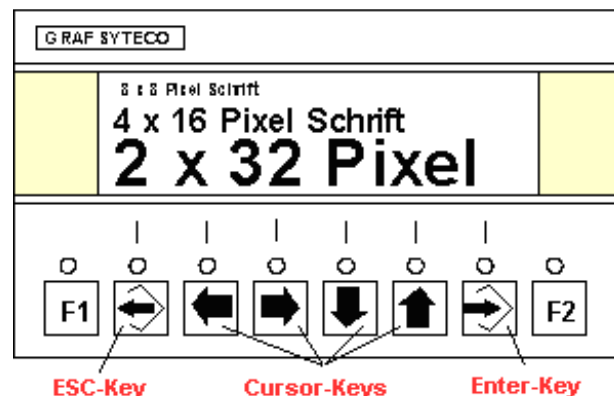
Select the panel series under "Device"/"Parameterize" /"Device" and confirm with "OK". Save the complete example.







Now, the example can be loaded into the operating panel.

3.9 Operating the example menu

General notes on the operation of menus are available in the Chapter "Menus". This exercise is to give an impression of the capacities.


The operating panels have different keyboard mappings. In our example, we assume the following (standard) mapping:









As soon as you have loaded the example into the operating panel, page 0 "Papa Joe's Bakery" appears after the data transmission. Press the  key to activate the menu. The figure "1" is now displayed reversely. Using the   keys, you can now change between the figures (rooms). With the  key, you can select the desired room; the  key deactivates the menu. Select a room. Now, you can select the desired oven or a menu option with the cursor keys. The "Back" menu item takes you back to the initial page (also the  key). The "Cancel" menu item deactivates the menu system and displays the initial page.





If you have selected an oven, the input page for nominal values shows up. Now, you can select a nominal value or a menu item using the cursor keys.

With ITS/AT 6100, 6200 and 7200:

In order to modify a nominal value, you must select the value first and then press the  key. Now, a figure starts to blink.

With the ITS/AT 6100, you can now enter the nominal value directly via the numerical keys (try it!). With the ITS/AT 6200/7200, the   keys are used to choose the figures which you can then modify with the   keys . Finally, confirm your entry with the  key. The  key deletes your entry and resets the old value.

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With ITS/AT 7100: Here, you can start directly with the nominal value entry, without pressing . The arrow keys  and  take you to the next menu item or the next nominal value entry. In doing so, the currently entered nominal value is taken over. The  key deletes your entry and resets the old value.


Upon entry completion, the nominal value is checked for its limits. If the lower limit is underrun, the lower limit is automatically inserted as entry. The same applies to the upper limit.

If no "Exit nominal value entry with storing" menu item is available on the page (as in our case), the value is directly saved; otherwise the storage is not initiated until this menu item has been specifically selected.

Just try out the key functions now. You will realise that the keys always have a logical function in the actual operating step.


3.10 Inserting actual and nominal values

These two types can be summarised in one chapter.

Whenever you edit nominal/actual values, always press the  button. This button remains depressed

and indicates that you are in the text edit mode. Nominal/actual values are edited in the text mode. Actual and nominal values can be taken from the variables which you have created in the table of variables. In order to add a variable to the page, proceed as follows:

1. Select the variable in the table of variables by clicking the "Format" field of the variables. A grey frame appears.

2. Press the  button below the table of variables. The variable is taken over as actual value (green) into the page.

The display is taken over from the format field of the variable.

If you want to modify the display format, proceed as described under "Nominal and actual values, variables". You should, however, consider that the display of the actual/nominal value may then be faulty (e.g. displaced decimal point).

3.10.1 Switching between nominal and actual values

In order to switch between the nominal and actual value, the nominal/actual value must be clicked on the display. Using the "-->Nominal value" or "-->Ac-

tual value" switch, you can switch over. Actual values are displayed in green, nominal values in red.

3.10.2 Editing format of nominal/actual values

Click the nominal/actual value on the display. The format appears in the "Text input..." field. The entire text is now selected. If you move the cursor to the respective position by means of the cursor keys, you may modify the text the way you are used to it from the input fields. Use the "@" sign for numerical digits and the full stop as decimal point. For time entries you can also use the colon.

3.10.3 Moving existing nominal/actual values

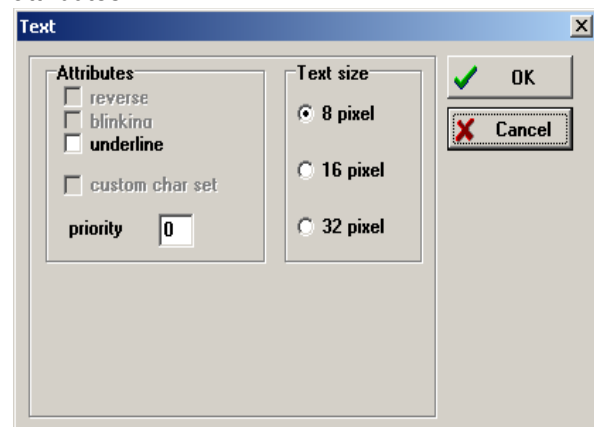
Move the mouse cursor to the value. Press the left mouse key and keep it pressed. Now, drag the mouse. A rectangle in the size of the value is "attached" to the mouse cursor. Move this rectangle to the position where you would like to insert the value. If you release the mouse key, the text moves from its original position to the new position.

3.10.4 Deleting nominal/actual values

Click the mouse on the text on the display and press the "Delete" button in the "Text input..." window.

3.10.5 Display attributes for nominal/actual values

Double-click the mouse on the desired nominal/actual value on the display. A mask appears by means of which you can set the desired text attributes:



Don't get confused by the "Text" heading. For nominal and actual values the same display attributes can be selected as for texts with the exception of "reverse" and "blinking". Experience has proved that these options cause confusion, as nominal and actual values may be mixed up at the operating panel etc. Therefore it is not possible for you to select this option. Detailed information on the "Priority" field are available in Chapter 3.

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3.11 Inserting text lists and selections

Text lists and selections can also be summarised in one chapter.

What are "text lists" and "selections"?

Imagine you have to lacquer car body parts in different colours. You can assign a number to each colour and enter it as nominal value. You can certainly picture that this method is not very comfortable...

Therefore, there are text lists. You simply create a list with texts (in this example: colours). The first entry in the list receives the number 0 (we start to count with 0!), the next entry the number 1 etc.

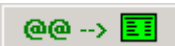
If you now assign a variable to this list (or vice versa), instead of the variable value, the text which corresponds to the variable value is shown on the display. If you have e.g. the colours red, yellow, green, blue, violet, and black in the text list and assign the value 3 to the text list variable, then you receive "Blue" as display text. On the other hand, you can also use a text list as a nominal value - we call it a selection as this term is more appropriate. The texts appear then one after the other on the display (the operator can scroll in the list via the arrow keys) and if the operator confirms, the entry number is sent to the control as nominal value. Quite simple, isn't it?

Whenever you edit text lists/selections, always press the **T** button.

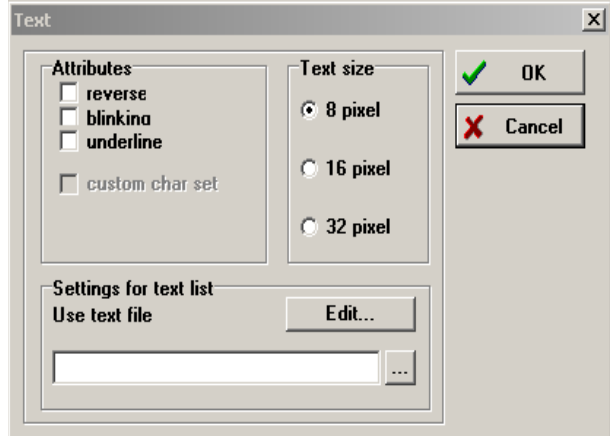
This button remains depressed and indicates that you are in the text edit mode. Text lists and selections are edited in the text mode.

Text lists and selections are generated via variables. Therefore, you first have to take the variable into the page, on the basis of which you want to generate the text list/selection:


1. Select the variable in the table of variables by clicking the "Format" field of the variable. The field is selected.

2. Press the  button below the table of variables. The variable is taken over as actual value (green) into the page. Now, press the "List" button. The actual value variable is

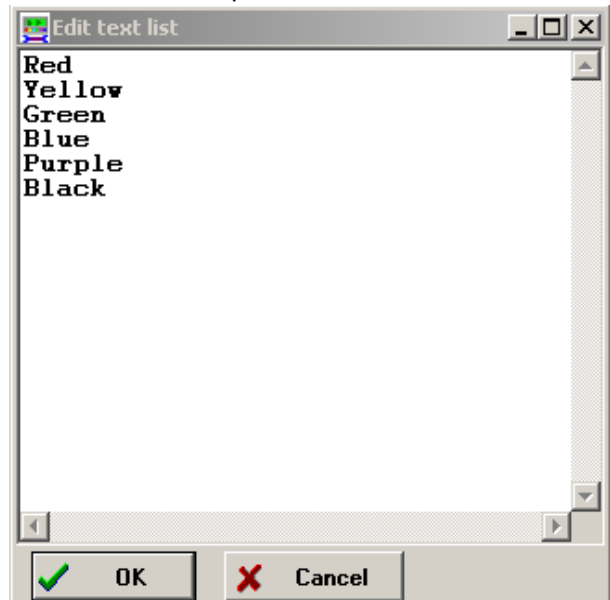
now linked with a text list via the following mask:



3. If you want to generate a new list, specify a file name in the "Use text file" field. The editor then saves the list related to the variable into this file. If you want to use an already generated list, you can call-up a selection window

for the file via the  button. One tip: We have assigned the extension ".TXL" to the files. The editor suggests these files as a standard.

4. You can call-up a small editing window by pressing the "Edit" button, with which you can edit the list entries. If you add a new list (enter the file name "manually"), the editor creates the file with an entry "New list" and calls up the editing window. This editing window functions the way you are used to it from a simple text editor. An example for a list:



5. Exit the windows with "OK".

The editor now computes the display format for the text list variables. For this purpose, it searches the list file and takes the longest line as format.

If the display becomes too confusing due to the many @-signs, you can also select "Use longest

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line from list file" under the "Display" menu item. The longest line of the selection list appears. You should not change the display format of text lists manually; this could impair the operating panel.

3.11.1 Switching between text list/selection

In order to switch between text list and actual value, the respective variable must be clicked on the display. Using the "-->Selection" or "-->Text list" switch, you can switch over. Text lists are displayed in violet and selections in grey.

You can reconvert the text list variable to a "normal" nominal/actual value variable via the "-->Actual value" or "-->Nominal value" button.

3.11.2 Moving existing text lists

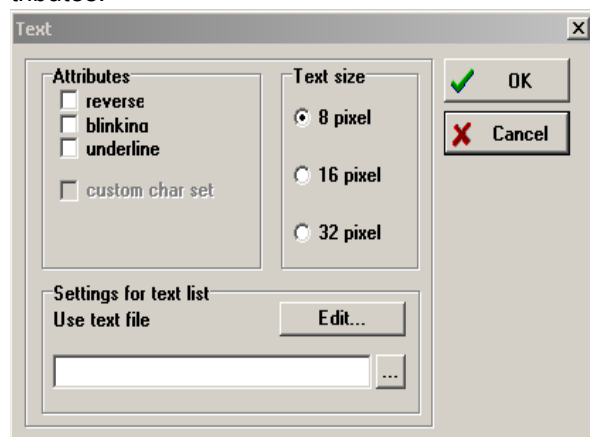
Move the mouse cursor to the variable. Press the left mouse key and keep it pressed. Drag the mouse now. A rectangle in the size of the value is "attached" to the mouse cursor. Move the rectangle to the position where you would like to enter the variable. If you release the mouse key, the variable moves from its initial position to the new position.

3.11.3 Deleting text lists/selections

Click the mouse on the text in the display and press the "Delete" button in the "Text input" window.

3.11.4 Attributes for text lists/selections

Double-click the mouse on the desired nominal/actual value on the display. A mask appears by means of which you can set the desired text attributes:



For text lists and selections the same display attributes can be selected as with text. (For "Selections", the options "reverse" and "blinking" are not available. Experience has proved that these options cause confusion, as nominal and actual values can be mixed up at the operating panel etc. Therefore it is not possible for you to select this option).


3.12 Static bitmaps

You can insert graphics into pages which are

available in the bitmap format (BMP files). A suitable image-processing program must therefore be entered in the Preferences menu by means of which the files are created or edited. The "Paint" paint program, supplied with Windows, can be used for the creation of your own graphics (e.g. icons), simply enter it in the preferences mask.

3.12.1 "Static bitmaps" mode

If you want to edit static bitmaps, you first have to change into the "Edit

static bitmaps" mode. Press the  button, which remains depressed and indicates

that you have activated the correct mode.

3.12.2 Creating a new bitmap

Only graphics in bitmap format (*.BMP) are acceptable. Nearly every graphic program running under Windows supports this format, as it has been standardised for a long time.

The creation of a new graphic requires several steps:


1. Switch over to the "Static bitmaps" mode.
2. Use the mouse to drag a window in the size of the desired graphic.
3. Determine the file name for the graphic.
4. Edit the graphic with the image-processing program.
5. Save the graphic in the image-processing program (very important !!!)
6. Exit the image-processing program to return to the editor.
7. The graphic is displayed on the page. If required, a page refresh must be executed.

For this purpose, press the  button.

These steps must all be carried out by the operator.

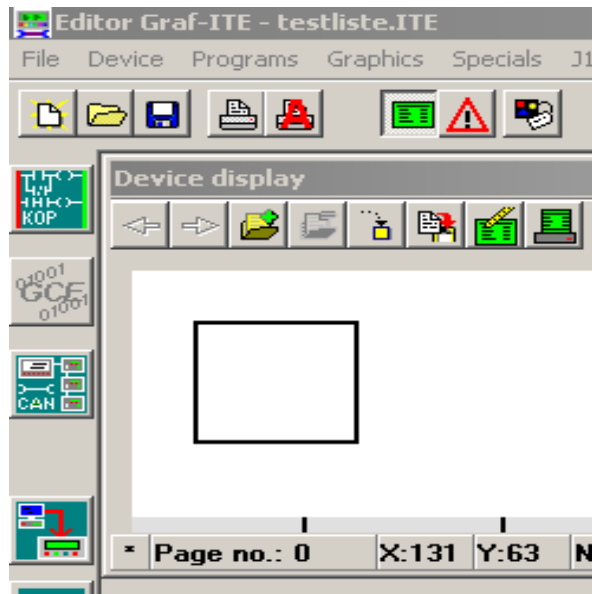
3.12.3 An example

Restart the ITE or select "File"/"New") to create a new project. The editor now switches to its basic state and displays page 0.

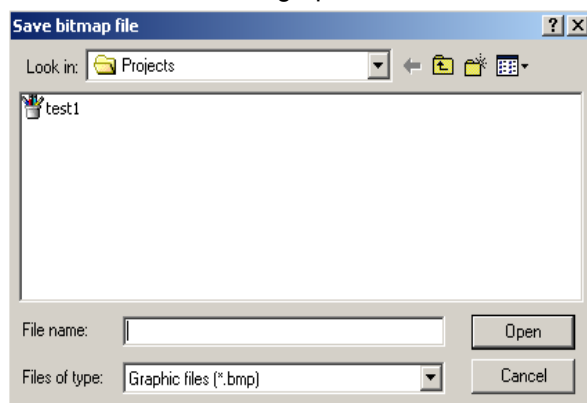
Press the  button to switch to the "Static bitmaps" mode.

Use the mouse to drag a window. For this purpose, position the mouse cursor in the top-left corner of the graphic area. Keep the left mouse key pressed and drag the pointer to the bottom-right corner:

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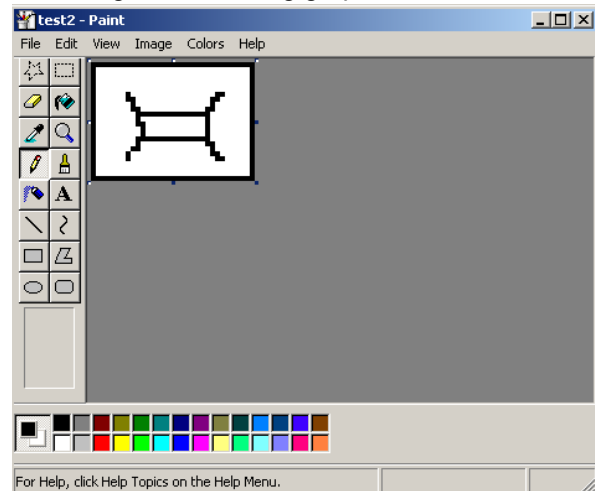
As soon as you have drawn the window and released the mouse key, the editor asks for a file name under which the graphic is to be saved.



Enter any name and confirm with OK. The editor now creates a bitmap file under the entered file name with a black frame, which has a width of 1 pixel and the size of the dragged rectangle. It then starts the image-processing program set in the preferences mask (e.g. MS-Paint) and transfers the file name of the bitmap file to this program, which directly opens the file.

This bitmap file can now be edited as required. Please observe that with monochrome terminals only the colours black and white may be used.


Draw, e.g., the following graphic:



For the editing of graphics in Paint, the following tips are useful:


- Via "View>Zoom>Large size" you can maximise page cutouts and position or reset individual pixels. "View>Zoom>Show thumbnail" displays a window in its original size. The zoom-in and the thumbnail options are useful with fine drawings.
- You can leave the maximised view via "View>Zoom>Normal size", the thumbnail is automatically blanked out.
- You can draw with two colours: Both with the left and the right mouse key. If you want to set the colour for a mouse key, click the respective mouse key on the colour field in the colour bar.

Finally, you must store the graphic. Exit the image-processing program to return to the ITE. ITE loads the graphic designed by you and displays it on the page.


If your graphic does not appear, press the  button to redraw the page.

The graphic should now be displayed on the page.

3.12.4 Inserting existing graphics

First ensure that the mode "static bitmaps" is active ( pressed).

Via the "Graphics"/"Insert" menu items you receive a selection window in which you can indicate the file name of the graphic to be inserted. Select a file and press "OK".

The editor loads the graphic into the page on position (0,0) (top-left) and displays the page. (If required, draw the graphic anew with the  button.)

3.12.5 Moving graphics

Click the left mouse key onto a graphic and keep the key pressed. If you now move the mouse, a rectangle in the size of the graphic is attached to the mouse. If you release the key, the graphic is placed on the current position.

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Observe that the editor continuously displays the position of the upper left corner below the display-window. This is very useful for a precise positioning.

3.12.6 Deleting graphics

Click the left (or right) mouse key once onto the graphic to be deleted. Select the "Graphics"/"Delete" menu items. The graphic is now deleted from the page.

3.12.7 Editing an existing graphic

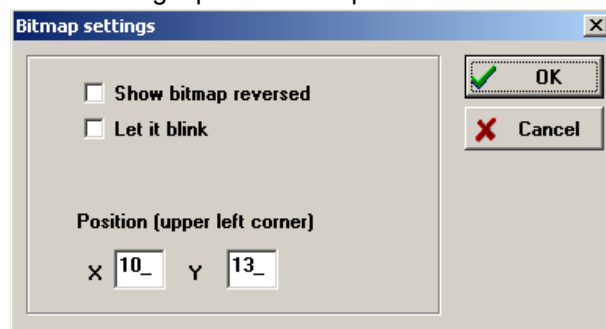
Click the left mouse key once onto the graphic and select the "Graphics"/"Edit" menu items or click the right mouse key onto the graphic. The editor now loads the graphic into the image-processing program. Edit and save the graphic.

3.12.8 Configuring graphics

The editor offers the possibility to display graphics reversely or/and in a blinking way:

1. Make sure that you are in the "Static bitmaps" mode.
2. Double-click the graphic.

The following input window opens:



Tick the appropriate setting and confirm with "OK". Via the "X" and "Y" input fields you can position the graphic more precisely than with the mouse.

3.13 Bar graphs on the page

A bar graph serves to represent an actual value as a bar. This type of information can be realised very easily and quickly by the operator. These bars are also very suitable for the comparison of 2 actual values. A bar graph always consists of 2 components:

1. "A "background graphic" over which the bar is led. This graphic must be at least as large as the area over which the bar is led. It may also be larger.
2. The bar itself. You have to specify both the size of the area to be covered by the bar and the direction of the bar.
3. A variable whose value is visualised by means of the bar.

Two processing steps are necessary for the gen-

eration of a bar graph:

1. Determination of the (background) graphic.
2. Determination and configuration of the bar.



3.13.1 Generating a new bar graph

There are two ways to generate a new bar graph:

1. We have no background graphic yet and must create a new one.
2. We already have a background graphic (e.g. a scale) and want to use it as background.

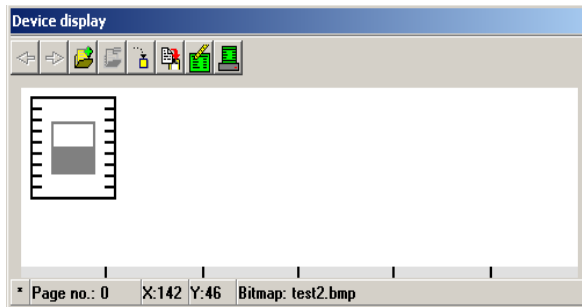
3.13.1.1 New bar and background

Let us first concentrate on the first option. We want to insert a bar into the page, but we do not have any suitable background graphic as we want to determine the bar size on the page. Please follow the below steps:

1. Select the "Edit bar graphs" mode by activating the  button.
2. Press this button, it remains depressed and indicates the mode.
3. Use the mouse to drag, analogue to the static graphic, a window in the size of the area which is to be covered by the background graphic.
4. After you have dragged the window, the editor asks you for a name for the background graphic. Enter a name and confirm with "OK".
5. The editor now generates a bitmap file under the entered file name with a black frame, which has a width of 1 pixel and the size of the dragged rectangle. Then it starts the image-processing program set in the preferences mask (e.g. MS-Paint), and transfers the file name of the bitmap file to this program, which directly opens the file.
6. This bitmap file can now be edited as required. Please observe that with monochrome terminals only the colours black and white may be used.
7. Save the completed graphic and exit the image-processing program. ITE then loads the graphic created by you and displays it on the page.
8. If your graphic does not appear, press the  button to redraw the page. This could, e.g.,

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look like this:



9. You may now position the bar by dragging a window over the desired bar area with the mouse (for this purpose, stay within the background graphic!). The editor then shows the bar area with a grey frame and a half-size bar, which is also coloured in grey.

3.13.1.2 New bar, background available


If you have already prepared a background graphic for a bar, the bar insertion is easier:

1. Activate the "Edit bar graphs" mode with the  button.
2. Click the "Graphics"/"Insert" menu items and select a background graphic. Confirm with "OK".
3. The editor loads the graphic and displays it. The bar is now set to default values within this graphic (grey frame, half-size). Now, drag a window with the mouse over the area which is to be covered by the bar.

That's it. Now, you only have to move the bar and the graphic to the desired position:

3.13.2 Moving the bar graph within the page

The bar graph can be moved in the "Static bitmaps" mode:


1. Make sure that you are in the "Static bitmaps" mode. This mode can be activated by the  button.
2. Click the desired bar using the left mouse key and keep it pressed. Drag the bar together with the background graphic to the desired position. If you release the mouse key, the editor places the bar and the graphic at this position.

3.13.3 Editing bar-background graphic

In order to edit the background graphic of a bar, you must have set one of the graphic modes "Static bitmaps", "Edit bar graphs" or "Edit XY-graphics".


1. Click the left mouse key once onto the graphic and select "Graphics"/"Edit" from the menu or click the right mouse key onto the graphic. The editor now loads the graphic into the image-

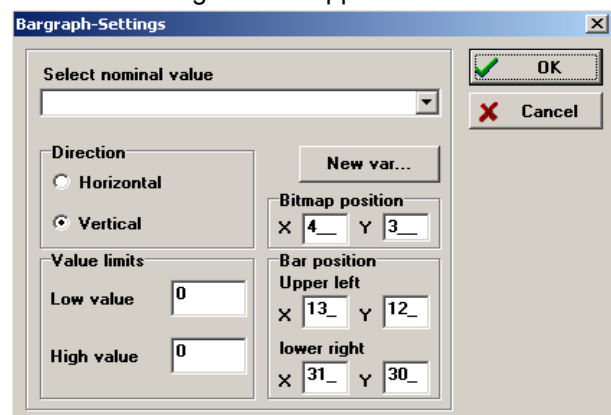
processing program.

2. Edit the graphic and save it via the "File"/"Save" menu items.
3. Exit the image-processing program. The editor loads the edited graphic and inserts the bar into the graphic just as before.
4. If the graphic created by you does not appear, press the  button to redraw the page.

3.13.4 Configuring bar graphs

How do I assign the display value to the bar? And how can I specify the bar direction?

1. Switch to the "Edit bar graphs" mode by pressing the  button.
2. Double-click the bar graph to be configured. The following window appears:



3. Carry out the desired settings and confirm with "OK".

3.13.4.1 Name of the bar's actual value

You have to specify the variable which provides the value for the bar. You can unfold a list with the arrow which contains all available variables of the project. If no variable has been created yet for this actual value, press the "New var...." switch to create a new actual value.

3.13.4.2 Direction

A bar can grow horizontally from the left to the right or vertically from the bottom to the top. Adjust the desired direction.

3.13.4.3 Limit values (adjusting the bar)

What is the purpose of limit values?

The operating panel can modify the bars only in units of so-called "pixels". If you integrate a bar with a height of 40 pixels and you have an actual value which indicates the temperature range from -30° to +30°, you would first have to convert this range into the values 0-40 ... this is what we wanted to spare you.

Simply specify the value which represents the bar

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value 0 and the value which should have the maximum bar deflection. If you leave both limit values at 0, the bar is continued to be displayed in pixels. (Pixel height=variable value)

3.13.4.4 Graphic position

If you want to position graphics accurately by the pixel, you can enter the position of the top-left corner of the background graphic here. With the mouse, this procedure is sometimes difficult.

3.13.4.5 Bar position

Here you can determine the area which may be covered by the position indicator. The position is absolute in the display, not relative to the graphic! It must be further observed that the bar must not overshoot the area of the background bitmap. Otherwise, this leads to strange effects on the display (pixels stop or do not even appear, etc.)

3.13.5 Deleting bar graphs

To delete a bar graph, you must have activated one of the graphic modes "Static bitmaps", "Edit bar graphs" or "Edit XY-graphics".

1. Click bar graph to be deleted once.
2. Select the "Graphics"/"Delete" menu items.
The selected graphic is deleted together with the bar.

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3.14 XY-graphics on the page

What is an XY-graphic?

An XY-graphic is a display element by means of which, for example, the position of a tool can be graphically displayed in two dimensions. It is comparable with a pin plotter, which indicates the position of a pin on a drafting board on the display. The editing of XY-graphics is nearly identically with the editing of bar graphs. The editing of XY-graphics must, however, be carried out in the "Edit XY-graphics" mode. An XY-graphic consists of 4 components:

1. A "background graphic" which serves for position indication. This graphic must be at least as large as the area over which the position indicator is led. The graphic may also be larger.
2. The area of the position indicator itself. The size of the area to be covered by the position indicator must be indicated.
3. An X-position variable.
4. An Y-position variable.

Two processing steps are necessary for the creation of an XY-graphic:

- *Determination of the background graphic.*
- *Determination and configuration of the positioning area itself.*


3.14.1 Creating new XY-graphics

There are two ways to create a new XY-graphic:

1. We do not have a background graphic yet and must create a new one.
2. We already have a background graphic (e.g. a card) and want to use it as background.

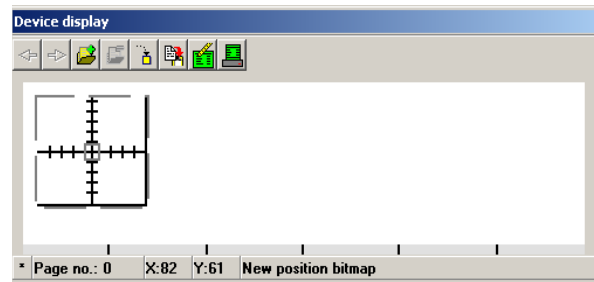
3.14.1.1 New XY-graphic and background

Let us first concentrate on the first option. We want to add a position indication to the page, but we do not have any suitable background graphic, as we want to determine the size of the position field on the page. Please follow the below steps:

1. Select the "Edit XY-graphics" mode by activating the  button. Press this button, it remains pressed and indicates the mode.
2. Use the mouse to drag, analogue to the static graphic, a window in the size of the area which is to be covered by the background graphic. After you have dragged the window, the editor asks you for a name for the background graphic.
3. Enter a name and confirm with "OK".

The editor now starts the image-processing program. Process the graphic and save it. Exit the im-


age-processing program. The editor now loads the new graphic and inserts the position indication into the graphic. This could, e.g., look like this:



4. Now you can place the positioning area by dragging a window over the requested area with the mouse. The editor then displays the positioning area with a grey frame and a rectangle in the centre.

3.14.1.2 Background already available


If you have already prepared a background graphic for a position indication, the insertion of a position indication is easier:

1. Activate the „Edit XY graphics“ mode by pressing the  button.
2. Click the "Graphics"/"Insert" menu items and select a background graphic. Confirm with "OK".
3. The editor loads the graphic and displays it. The positioning area is now set to default values within this graphic (grey frame, with rectangle in the centre).
4. Drag a window with the mouse over the area to be covered by the position indicator.

That's all. Now, you only have to move the position indicator and the graphic to the desired position.

3.14.2 Moving XY-graphics on the page

An XY-graphic can be moved in the "Static bitmaps" mode.

1. Activate the "Edit static bitmaps" mode with the  button.
2. Click the desired position indicator using the left mouse key and keep the key pressed. Drag the bar position indicator (with the graphic) to the desired position.
3. Release the mouse key and the editor places the graphic and the position indicator at this position.

3.14.3 Editing XY-background graphics


In order to edit the background graphic of an XY-graphic, you must have set one of the graphic modes "Static bitmaps", "Edit bar graphs" or "Edit XY-graphics".

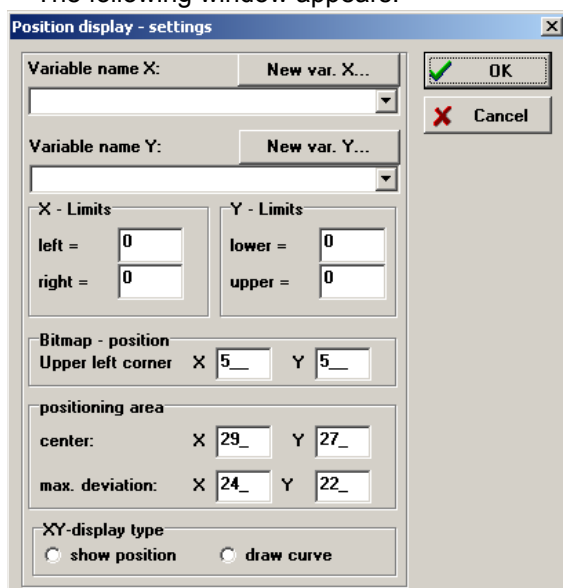
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1. Click the left mouse key once onto the graphic and select "Graphics"/"Edit" from the menu or click the right mouse key onto the graphic. The editor now loads the graphic into the image-processing program.
2. Edit the graphic and save it. Exit the program.
3. The editor now loads the edited graphic and inserts the positioning area into the graphic just as before. This is all you have to do.

3.14.4 Configuring XY-graphics

How do I assign a position to the position indicator?

1. Switch to the "Edit XY graphics" mode by pressing the  button.
2. Double-click the XY-graphic to be configured. The following window appears:



The dialog box titled "Position display - settings" contains the following fields and controls:

- Variable name X:** A text field with a "New var. X..." button.
- Variable name Y:** A text field with a "New var. Y..." button.
- X - Limits:** Two input fields labeled "left" (value 0) and "right" (value 0).
- Y - Limits:** Two input fields labeled "lower" (value 0) and "upper" (value 0).
- Bitmap - position:** Two input fields labeled "Upper left corner" with X (value 5) and Y (value 5).
- positioning area:** Two input fields labeled "center:" with X (value 29) and Y (value 27), and two input fields labeled "max. deviation:" with X (value 24) and Y (value 22).
- XY-display type:** Two radio buttons: "show position" (selected) and "draw curve".
- Buttons:** "OK" (green checkmark) and "Cancel" (red X).

3. Carry out the desired settings and confirm with "OK".

3.14.4.1 Name of the X-actual value

You have to specify the variable which specifies the X-position for the display. You can unfold a list with the arrow which contains all currently available variables of the project. Select one.

If no variable has been created yet for this actual value, press the "New var...." switch to create a new actual value.

3.14.4.2 Limit values X

The operating panel can modify the X-position only in units of so-called "pixels". If you integrate an XY-graphic with a width of 150 pixels and your positioning area X is 200 cm, you would first have to convert this range into the values 0-150. This conversion is automatically performed by the operating panel.

Simply specify the value by means of which the left maximum deflection is to be reached and the value which should have the maximum right deflection. The operating panel executes all further processes.

If you enter 0 for both limit values, you may also address the pixel position.

3.14.4.3 Name of the Y-actual value

You have to specify the variable which provides the value for the vertical position. You can unfold a list with the arrow, which contains all variables available in the project. If no variable has been created yet for this actual value, press the "New var...." switch to create a new actual value.

3.14.4.4 Limit values Y

As with the X-position, you must enter the values at which the upper and lower maximum deflection should be reached into the operating panel. Simply determine which value represents the maximum downward deflection and which value should stand for the maximum upward deflection. The calculation of the correct position is executed by the operating panel.

3.14.4.5 Graphic position

If you want to position graphics accurately by the pixel, you can enter the position of the top-left corner of the background graphic here. With the mouse, this procedure is sometimes difficult. It must be observed that the positioning area must not overshoot the area of the background graphic as otherwise single pixels remain as page fragments on the display.

3.14.4.6 Positioning area

Here you can determine the area to be covered by the position indicator. The position is absolute in the display, not relative to the graphic!

3.14.5 Deleting XY-graphics

To delete an XY-graphic, you must have activated one of the graphic modes "Static bitmaps", "Edit bar graphs" or "Edit XY-graphics".

1. Click the XY-graphic to be deleted once.
2. Select "Graphic"/"Delete" from the menu. The selected graphic is deleted.

3.15 Diashow bitmaps

What are diashow bitmaps?

A diashow bitmap is a graphic which contains individual bitmaps in a grid pattern. At all times, only one bitmap is visible. You may determine the bitmap to be visualised via an index. Normally, a variable is used for this purpose.

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What is all this for?

Imagine you have drawn a container, whose filling-level is indicated by means of a bar. The container has an inlet and outlet, each to be opened and closed via a valve.

You now have the option to display the states of the valves via messages (e.g. "Outlet open"). It would be much more elegant if the valve would have been graphically realised as "open" or "closed".

This is where the diashow bitmap comes in. You can draw several individual bitmaps into a page and transfer the index of the individual bitmap to be displayed to the operating panel via a variable. For the valve, you would then have a graphic with two individual bitmaps: The first individual bitmap shows the valve in the closed, the second in the open state. Thus, we have two components with one diashow bitmap:

- *The main graphic into which all individual bitmaps must be drawn.*
- *The variable by means of which you select the number of the individual bitmap.*

The following rules must be observed when creating a graphic:

- *All individual bitmaps must have the same size.*
- *All individual bitmaps must be stored in one graphic-file (.BMP-file).*
- *Several individual bitmaps can be arranged horizontally.*
- *If individual bitmaps are also vertically arranged, the number of individual bitmaps which are horizontally arranged must be identical. This is not valid for the last line, it may contain fewer bitmaps than the other lines, which must all have the same number of graphics.*
- *The size of a individual bitmap must be known (height and width in pixels).*
- *The maximum number of individual bitmaps must not exceed 63 (0 - 63).*

Again, we have two processing steps:

1. Creation of the graphic file with the individual bitmaps.
2. Adjustment of the size of the individual bitmap and the variables.


3.15.1 Creating new diashow bitmaps

There are two ways to create a new diashow bitmap:

1. We have not drawn any individual bitmaps yet and must create them first.
2. We have already drawn individual bitmaps (e.g. a valve) and want to use them.

3.15.1.1 New diashow bitmap and individual bitmaps

Let us first concentrate on the first option. We want to represent a valve, but we have not yet drawn one, as we want to determine the size of the valve in the graphic. Please follow the below steps:

1. Select the "Edit diashow bitmaps" mode by activating the  button. Press this button, it remains pressed and indicates the mode.
2. Use the mouse to drag, analogue to the static graphic, a window in the size of the area which is to be covered by the background graphic. After you have dragged the window, the editor asks you for a name for the background graphic. Enter a name and confirm with "OK".
3. The editor now starts the image-processing program.
4. Determine the size of the graphic. (If you use Paint, select "Image"/"Attributes..." and enter the pixels in the measurement field of the following dialogue.
5. Modify the size of the entire bitmap on the basis of your settings for the size of the individual bitmaps and confirm the size modification with OK.

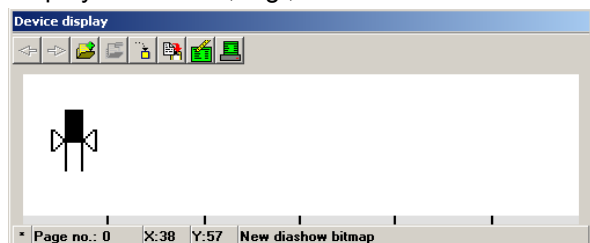
Example: In total, you need 16 graphics.

Four graphics each must be arranged next to each other

and one graphic has to be 10 pixels wide and 20 pixels high. This results in a total width of $4 \times 10 = 40$ pixels.

The height results from four "lines" with a height of 20 pixels each. This results in a total height of $4 \times 20 = 80$ pixels.

6. First, save the graphic, but do not modify the file name! The file must be stored under the name which has been entered to the editor.
7. Edit the individual bitmaps. Observe the size.
8. Save the graphic and exit the image-processing program.
9. The editor now loads the new graphic and shows the first individual bitmap on the display. This could, e.g., look like this:



10. If you now double-click the graphic, you could adjust the width and height as well as the number of the graphics, if required.

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3.15.2 Individual bitmaps already available


If individual bitmaps are already available, the further proceeding is much easier:

1. Activate the "Edit diashow bitmaps" mode with the button.
2. Click the "Graphics"/"Insert" menu items and select a graphic file with individual bitmaps. Confirm with "OK".
3. The editor loads the graphic and displays it. The size of the bitmap is first based on the default settings. Double-click the diashow bitmap to adjust the settings.

That's it. Now, the graphic must be moved to the desired position:

3.15.3 Move diashow bitmap on the page

A diashow bitmap can be moved in the "Static bitmap" mode.

1. Activate the "Edit static bitmaps" mode with the  button.
2. Click the desired graphic with the mouse (left mouse key) keep the mouse key pressed. Drag it (together with the position indicator) to the desired position.
3. Release the mouse key and the editor places the graphic together with the position indicator at this position.


3.15.4 Editing individual bitmap files

In order to edit the individual bitmaps of a diashow bitmap, you must have set one of the graphic modes "Static bitmaps", "Edit bar graphs" or "Edit XY-graphics".

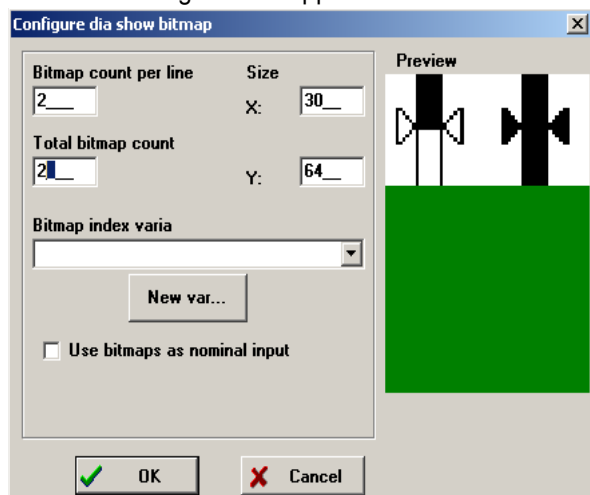
1. Click the left mouse key once onto the graphic and select "Graphics"/"Edit" from the menu or click the right mouse key onto the graphic.
2. The editor now loads the graphic into the image-processing program.
3. Edit the graphic and save it.
4. Exit the image-processing program.

3.15.5 Configuring diashow bitmaps

How do I tell the graphic which individual bitmap is to be displayed?

1. Switch to the "Edit diashow bitmaps" mode by pressing the  button.
2. Double-click the diashow bitmap to be configured.

The following window appears:



3. Carry out the desired settings and confirm with "OK".

3.15.5.1 Bitmap count per line

Indicate how many individual bitmaps are horizontally arranged in the bitmap.

3.15.5.2 Total bitmap count

Enter the total number of individual bitmaps in this field.

3.15.5.3 Size X

Enter the width of an individual bitmap in pixels.

3.15.5.4 Size Y

Enter the height of an individual bitmap in pixels.

3.15.5.5 Index variable

In the "Index variable" field, you can specify the variable from which the operating panel should take the number of the individual bitmap. The "New var" button serves to create a new variable.

3.15.5.6 Preview

Here you see the entire area of the original bitmap. If no bitmap is displayed, one of the parameters "Bitmaps count per line", "Total bitmap count", "Size X" or "Size Y" has been set too high. As a consequence, more bitmap area is required than the original bitmap provides for.

3.15.5.7 Modifying attributes

Apart from the runtime, the diashow bitmap can modify its attributes "blinking" and "reverse". This can be carried out by the following steps:

A maximum of 64 bitmaps (0-63) is admitted for one diashow bitmap. However, 8 bits are used as variable value. This means that the bits 0-5 are required as bitmap numbers. The bit 6 is now used as

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blinking attribute and the bit 7 as reverse attribute.
As a consequence:

Values 0 - 63	graphic normal
Values 64-127	graphic blinking
Values 128-191	graphic reverse
Values 192-255	graphic blinks reversely.

3.15.5.8 Diashow bitmap as nominal values

Graphics as nominal value? What for?

Think of the above example with the valve. Would it not be nice if your user could see the graphics (here: the open and closed valve) instead of the figures during selection, as it is the case with the step value setting? This is exactly what can be realised with the help of individual bitmaps.

If you tick the "Use bitmaps as nominal input" option in the "Configure diashow bitmap" mask, you have already activated this function. You then receive the index of the selected bitmap in your control as nominal value.

The diashow bitmap as nominal value is parameterised the same way as the diashow bitmap. However, the "Use bitmaps as nominal input" is activated additionally. Within the bitmap, this entry acts as a "Nominal value with step-value processing" and is displayed reversely upon activation like any other nominal value.

The operating panel uses zero and the number of bitmaps as limit values, the step value is fixed to 1. If you use this nominal value entry, the "Priority" field shows up in the parameterisation mask.

3.15.5.9 Priority

If you work with priority releases, you can assign the priority level for the nominal value entry in this field. (Refer to Chapter 7, Variable I_Priority)

3.15.6 Deleting diashow bitmaps

In order to delete a diashow bitmap, you must have activated one of the graphic modes.

Proceed as follows to delete a diashow bitmap:

1. Click once the diashow bitmap to be deleted.
2. Select the "Graphics"/"Delete" menu items.
The selected graphic is deleted.

3.16 Attribute bitmaps


The so-called attribute bitmap is another example for "controllable" graphics. What can be controlled in this context?

The bitmap can be set to reverse and/or blinking. The bitmaps described in the Chapter "Static bitmaps" are just static, i.e. not modifiable. There is not possibility to select individual states. With static bitmaps, you can also indicate "reverse" or "blinking", but then the graphic remains in this state - and with some applications a continuously

blinking graphic is inappropriate.

With an attribute bitmap, you may control the attributes (therefore the name) "blinking" and "reverse" via a variable.


3.16.1 Activating the "Attribute bitmaps" mode

Change to the "Edit attribute bitmaps" mode by pressing the  button.


3.16.2 Creating new graphics

As with all other graphics, attribute graphics are only acceptable in the bitmap format (*.BMP).

It takes several steps to create a new attribute bitmap:

1. Activate the "Static bitmaps" mode.
2. Use the mouse to drag a window in the size of the desired graphic.
3. Determine the file name for the graphic.
4. Edit the graphic with the image-processing program.
5. Save the graphic in the image-processing program (very important !!!)
6. Exit the image-processing program in order to return to the editor.
7. The graphic is displayed on the page. A page refresh must be carried out if required. For this purpose, press the  button.

Example of an attribute bitmap

1. Start the editor (or select "File"/"New") to create a new project. The editor now switches to its basic state and displays the page 0.
2. Press the  button to activate the "Attribute bitmaps" mode. Now, drag a window with the mouse (for this purpose, position the mouse cursor on the top-left corner of the graphic area).
3. Press the left mouse key and drag the pointer to the bottom-right corner with the mouse key pressed:
4. As soon as you have dragged the window and released the mouse key, the editor asks for a file name under which this graphic is to be saved.
5. Enter any name and confirm with OK. The editor now starts the image-processing program and has informed it already about the size of the graphic. A black frame was attached to the graphic before it was loaded.
6. Create a graphic the way you like, but observe to only use the colours black and white for projects with monochrome panels.


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7. Draw e.g.the following graphic:



8. Save the file and exit the image-processing program to return to the editor. The editor loads the graphic created by you and displays it.

3.16.3 Inserting existing graphics into an attribute bitmap

Press the  button to make sure that the "Attribute bitmaps" mode is active.

Via the "Graphics"/"Insert" menu items, a selection window shows up in which you can enter the file name of the graphic to be inserted. Select a file and press "OK".

The editor loads the graphic into the page on position (0,0) (top-left) and displays the graphic.

3.16.4 Moving attribute bitmaps

Click the left mouse key on the graphic and keep the key pressed. If you move the mouse now, a rectangle in the size of the graphic is attached to the mouse. If you release the key, the graphic is positioned at the current position.

Observe that the editor continuously displays the position of the top-left corner underneath the display window. This is very useful for a precise positioning.

3.16.5 Deleting attribute bitmaps

Click the left (or right) mouse key once on the graphic to be deleted. Select "Graphics"/"Delete" from the menu. The graphic is now deleted from the page.

3.16.6 Editing existing bitmaps

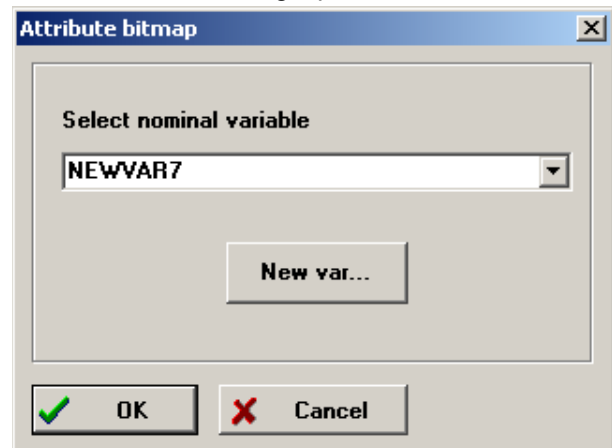
1. Click the left mouse key once on the graphic and select "Graphics"/"Edit" from the menu or click the right mouse key on the graphic.
2. The editor now loads the graphic into the image-processing program. Edit the graphic.
3. Save the graphic via the "File"/"Save" menu items and exit the image-processing program.

3.16.7 Configuring attribute bitmaps

How can a variable be assigned to an attribute bitmap ?

If you double-click an attribute bitmap in the "Attribute bitmaps" mode, you can select the desired

variable in the following input window:



The lowest-order bit (bit 0) of the variable indicates whether the graphic is to be displayed normally or reversely. The following bit (bit 1), however, switches the blinking option on and off. The following table applies:

Reaction of the bitmap?


- | | |
|---|-----------------------------------|
| 0 | normal representation. |
| 1 | graphic is represented reversely. |
| 2 | graphic is blinking. |
| 3 | graphic is blinking reversely. |

You can cover the entire attribute spectrum with these variable values.

3.17 Parameterising pages

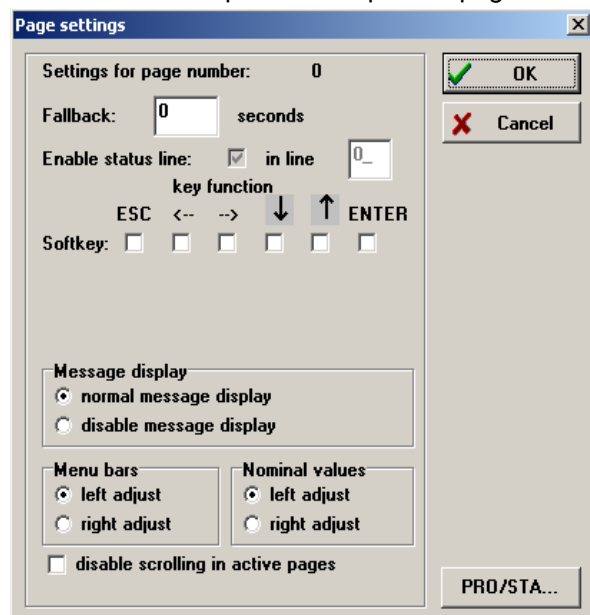
The operating panel offers various setting options for pages. These options range from key release to statistics.

To parameterise a page, you first have to scroll to the desired page.

Via the  button or the Specials>Configure image/message menu items the parameterisation

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window is called up for the respective page.



3.17.1 Fallback time

What does "fallback time" stand for? The fallback time is an adjustable time on the basis of which the operating panel carries out a shift-in of operating functions (e.g. scrolling) into the system function.

Example:

Three pages were called up by the PLC, which are alternately displayed. Now the operator comes and scrolls into a menu to call up information on the device state.

Right in the middle of his operating work he is interrupted and must leave the room. What happens now?

Should the operating panel remain at the current step? Or should it return to the "normal" page display?

This problem can be solved with the "Fallback time" setting. For each page, you may select the one or the other option:

1. Fallback time = 0:

The operating panel remains in the page selected by the operator. There is, however, one exception: If a so-called "Priority page call-up" is executed.

2. Fallback time <> 0:

With every operating step, the operating panel starts a timer with the duration of the fallback time. If this timer reaches 0, it is switched back to "normal" operation ("Global abortion"). The operating panel then acts as if no operator is working at the panel.

We want to provide you with the following tips on this topic:

- Select fallback time 0 only for pages which must urgently remain on the display during operating steps.
- Select the fallback time for the operator in a way as to ensure that he has enough time to read the display information and to decide on a new operating action. If the selected time is too short, the operating panel returns to the normal operating display before the operator has detected everything, which is not very comfortable. The minimum time requirements suggested for the detection of page information amounts to approx. 20 seconds for a qualified operator and to approximately 40 seconds for a beginner.

3.17.2 Key functions

For many pages no menu keys are used for the operator guidance or they are to be deactivated. The operating panel allows you to blank out the keys for individual pages.

Provided you have not locked a key in the parameterisation main menu for the menu editing (menu: "Device"/"Parametrize", "Common" index card, under "Use marked as softkeys") you may use these keys as "soft keys" on the page. This means that this key is no longer used for menu operation in the operating panel. Instead you can use this key as "control key" for a machine function.

All the keys you tick will then be used as "function keys".

Attention! Keys which have been selected as "soft keys" are no longer available in the control program either!

3.17.3 Message display

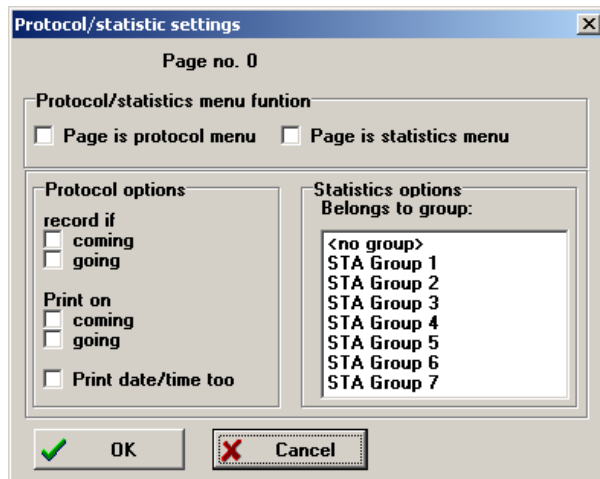
You can determine on the page whether messages are to be displayed or not. The line where messages appear cannot be determined on the page. The message line is either determined globally or appears in the line in which it was created.

Further information are available in the Chapter "Creating and editing messages" as well as in the Chapter "Calling-up pages and messages".

3.17.4 Protocol and statistics

A further configuration window can be reached via the PRO/STA switch. Within this window, you can determine the protocol and statistic features of the page:

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The protocol and statistic functions of the operating panel are very comprehensive and comfortable to parameterise.

Protocol and statistic settings can be specified for each page individually. A detailed overview of the functions is available in the Chapter "Protocol and statistics". This section contains only a brief description of the setting options.

3.17.4.1 Protocol/statistics menu function

Protocols and statistics are useless if the recorded data cannot be viewed.

This is why we have thought about solutions for this problem. The operating panel offers the possibility to display the protocol/statistic data on any kind of page. Therefore, you have the possibility to develop your own menu structure within which you display the data.

3.17.4.2 Page as protocol menu

If you tick "Page as protocol menu", the operating panel shows the protocol data on the page at fixed positions. ITE also displays this (of course without data). To get an impression of this function, have a look at the following table (an empty page has been used and "Page as protocol menu" has been activated):


Gruppe	Nr.	Idx.	Datum	Stat.	Zeit	Druckstatus

The editor shows the data entries, which have the following meanings:

Entry	Meaning
Idx	Consecutive number of the entry in the protocol memory.
Stat	Entry status, e.g. "coming" if a page/message has been called-up.
Group	Here, the name of the statistic group of the page/message from the protocol is displayed.
No:	Number of the page/message
Date	Date of the entry
Time	Time of the entry
Numbers	Number of the entries in the protocol memory
Print status	Indicates whether this protocol entry has already been printed before: *P* not yet printed -P- already printed

As every application requires a different description of these data, the operating panel only shows raw data. You yourself can now describe the entries with text. It is, however, not possible to show other variables on the protocol page. The protocol page has to look like this:

Gruppe	Nr.	Idx.	Datum	Stat.	Zeit	Druckstatus

This page has the file name „Default.pro“ and is supplied with the ITE. You can load it into the editor via the  button.

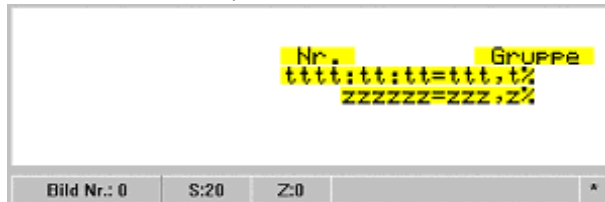
The graphics displayed on the bottom of the page are to symbolise the menu functions of the keys. The respective bitmap is also included in the scope of delivery.

Further information on this topic is available in the Chapter "Protocols and statistics".

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3.17.4.3 Page as statistic menu

If you tick "Page as statistic menu", the operating panel shows the statistical data at fixed positions of the page. ITE indicates this as well (of course without data). To get an impression of this function, have a look at the following table (an empty page has been used and "Page as statistic menu" has been activated):

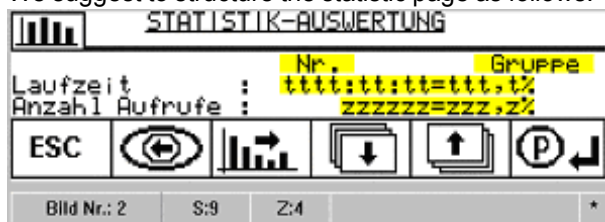



The editor shows the data entries, which have the following meanings:

Entry	Meaning
No:	Number of the page/message
Group	Here, the name of the statistic group of the page/message from the protocol is displayed.
tttt:tt:tt=ttt,t%	Runtime (cumulated) and related the group in percent.
zzzzzz=zzz,z%	Total number of call-ups which this page has received. Related to the group in percentage.

As every application requires a different description of these data, the operating panel only shows raw data. You yourself can now describe the entries with text. It is, however, not possible to show other variables on the statistic page.

We suggest to structure the statistic page as follows:



This page is supplied under the file name "default.sta" with the ITE. You can load it into the editor via the  button.

The graphics displayed on the bottom of the page are to symbolise the menu functions of the keys. The respective bitmap is included in the scope of delivery as well.

Further information on this topic is available in the Chapter "Protocols and statistics".

3.17.4.4 Protocol options

For each page, you can select whether

- the page is recorded upon activation,
- the page is recorded upon deactivation,
- the page is printed upon activation,
- the page is printed upon deactivation,
- date and time are to be printed additionally with the print-out.

A more detailed description of these options is available in the Chapter "Protocol and statistics".

3.17.4.5 Statistic options

Here you can only select the statistic group to which the page is to be assigned. Select the group from the list window.

The operating panel provides a total of 7 statistic groups which may be named by yourself (refer to the Chapter "Protocols and statistics").



3.17.5 Creating publicity pages

The operating panel offers you the possibility to present your corporate profile when the operating panel is switched on. The device displays an "initialising page" for approx. 4 seconds when it is switched on. This initialising page, which is also called publicity page, can be individually designed by you.

You still have to observe that some lines of the display are taboo for you. This refers to lines containing information on the integrated firmware, loaded PLC drivers and also project data. This information has a fixed format. For operating panels with a display size of 64*240 pixels, the lines 7-8 are reserved for panel information, for operating panels with display sizes 128*240 the lines 9-16.


Your project can be provided with a name, which appears in these two lines. For this purpose, open the menu "Device"/"Parametrize", click on the "Firmware/char set" tab, and enter the name in the "Project-Version name". This information need therefore not be entered in the upper 6 lines.

Several steps are required to create/edit a publicity text:

1. Create a new page without content (via the  button).
2. Load the publicity text into the page; either via the  button (integrates the current publicity page on the page) or via the menu item "Specials"/"Load publicity page".
3. Edit the publicity page like a normal page. Please observe the following instructions for the edit process:
 - Leave line 7-8 or 9-16 free.
 - Only use static text and static

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graphics.

4. Save the publicity text via the  button to enter the publicity text into the project or via the menu option "Specials"/"Save publicity page" to make the publicity text accessible for other projects.
5. Delete the page with the publicity text you have just edited (this text has been saved separately).
6. Save the project via "File"/"Save". By means of these tools, it is possible for you to create your own publicity text and use it for all projects. Of course you can create several different publicity texts, e.g. if you use the operating panel in different machines. However, only one publicity page is allowed for each project.

4 Creating and editing messages

The operating panel differentiates between pages and messages. What for?

This differentiation was performed as a result of the experience made with other GRAF SYTECO display systems. The following problems appear in many applications:

The operator is entering data into the system. He is being distracted and leaves the system without completing the entry.

A fault occurs while he is not at the system. However, this fault cannot reach the display since the entry has not yet been finished.

The operator returns. As he has no information on the fault, he finishes his entry - and initiates a process which is not permissible due to the fault.

Here, the differentiation between pages and messages comes up. Messages are always displayed, no matter which page the operator has entered, unless the message display has been switched off (refer to "Parameterise pages"). Since entries are only permissible in pages, it does not matter what the operator is doing. The message display cannot be skipped by operating steps at the panel. As a consequence, important messages always reach the operator.

In this respect, the operating panel has two display levels which can be designed individually under observation of the fact that they are both output on the same display.


What differentiates pages from messages?

- *Messages only consist of static text and actual values.*
- *Messages are always single-line (may, however, also use large fonts to become noticeable)*
- *Contrary to a page, a project does not always need to include a message.*

The line in which a message is displayed can either be adjusted globally (in the menu "Device"/"Parametrize", "Messages and pages" index card) or the message appears in the line where it has been created in the editor! This setting is then equally valid for all pages.

The editor is equipped with a separate mode in which you can create and edit messages. In this mode, some functions/switches which are inadmissible for message editing (graphics, nominal values and menu options) are blanked out.

The "Edit messages" mode can be activated via

the  button. This button remains active and indicates the message mode.

Within this mode, you have to carry out all operating steps that are specified in this section.

What does a message consist of ?

- *Message number*
- *Fixed text*
- *Actual values*
- *Text lists*


Although many operating steps are identical with the steps for creating/editing pages, we demonstrate these steps again in the following section. Observe the creation of pages. This exercise concentrates on texts.

4.1 Message number

Upon creation of the message, you already have to determine a message number for the message. The editor requests this information via an input dialog. This number is also used for the message call-up. It is not possible to assign a message number double, as otherwise the editor outputs a fault message.

The message numbers need not be consecutively, therefore certain numbers can be skipped. All numbers must lie in the range between 1 and 9999.

4.2 Adding new messages




Press the  "Add new message" button.

Enter the desired page number (1 - 9999) upon the following request. You then receive a new message with the indicated number. The fixed text "New message" is already inserted by the interface.

Note: If you switch over from the "Page mode" to the "Message mode" and no message has yet been created, the editor automatically adds and displays message 1.


4.3 Scrolling through messages

In order to scroll through messages, the 3 buttons

above the display are here also available:  (scroll forward),  (scroll backward) and  (jump directly to message number xy).

These functions are self-explanatory.

4.4 Deleting messages

Scroll to the message you want to delete. Press the  button. The page is deleted after an acknowledgment request has been made and

the previous message is displayed. If the last existing message is deleted, the editor automatically switches back to page 0.

4.5 Fixed message text

Usually, messages always require fixed texts. Fixed text can be displayed in 3 different sizes with normal, reverse, blinking and/or underlined characters. Within the table of page contents, all fixed texts characterised by "T" appear in the left column.

4.5.1 Inserting text in the message

Move the mouse cursor to the desired position on the display and press the left mouse key. "New text" appears at this position. Now enter the desired text. The text first appears in the "Text input..." field and - slightly delayed - also on the display.

- *As a message always consists of only one line, the editor automatically places all text parts in the same line.*
- *All texts receive the same size*
- *If the message line has been specified. ("Device"/"Parametrize", "Pages and messages" index card), all texts are transferred to this line.*

4.5.2 Editing existing texts

Click the text on the display. The text is displayed in the "Text input" window. The entire text is now selected. If you move the cursor to the respective position using the cursor keys, you may modify the text the way you are used to it from the input fields.

4.5.3 Moving existing texts

Position the mouse cursor on the text. Press the left mouse key and keep it pressed. Now, move the mouse. A rectangle in the size of the text is "attached" to the mouse cursor. Move this rectangle to the position where you would like to insert the text. If you release the mouse key, the text moves to the new position.

- *As a message always consists of only one line, the editor automatically places all text parts in this line.*
- *If the message line has been specified ("Device"/"Parametrize", "Pages and messages" index card), all texts are transferred to this line and cannot be moved to any other line.*

4.5.4 Deleting texts

Click with the mouse on the text in the display and press the "Delete" button in the "Text input" window.

4.5.5 Setting text attributes

Double-click the mouse on the desired text in the display. A mask is opened by means of which you can set the desired text attributes. (Mask in Chapter 3, Text in pages)


A message cannot contain different font sizes. A modification of the font size therefore affects all elements of the message.

4.5.6 Other fonts

The display of the operating panel supports only one font. In messages, you can only use the installed font in the sizes 8, 16 and 32 pixels. Additionally you can define your own font. For this topic, please refer to the Annex "Using customised character sets" .

4.5.7 Inserting actual values

Actual values can be taken over from the variables which you have created in the table of variables. In order to transfer a variable to the message, proceed as follows:

1. Select the variable in the table of variables by clicking the "Format" field of the variable. A grey frame appears.
2. Press the  button in the "Table of variables" window. The variable is taken over as actual value (green) into the message.

The display is taken over from the format field of the variable.

If you want to modify the display format, proceed as described under "Variables, nominal and actual values". You should, however, consider that the display of the actual/nominal value may then be faulty (e.g. displaced decimal point). A more detailed description of this topic is available in the Chapter "Nominal and actual values, variables".

4.5.8 Editing format of actual values

Click the actual value on the display. The entire text is now selected in the "Text input" window. If you move the cursor to the respective position by means of the cursor keys, you may modify the text the way you are used to it from the input fields. Use the "@" sign for numerical digits and the full stop as decimal point. For time entries you can also use the colon.

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4.5.9 Moving existing actual values

Move the mouse cursor to the value. Press the left mouse key and keep it pressed. Now, drag the mouse. A rectangle in the size of the value is "attached" to the mouse cursor. Drag this rectangle to the position where you would like to insert the value. If you release the mouse key, the text moves from its initial place to the new position.

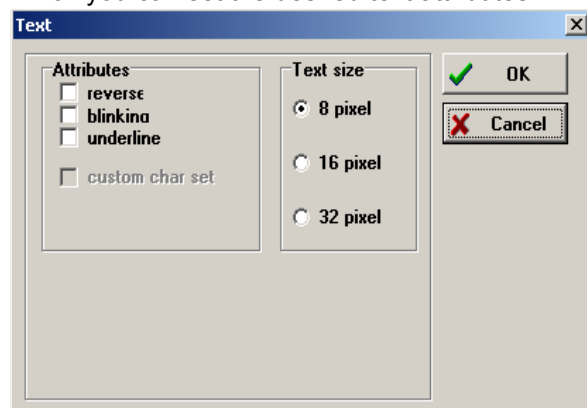
Actual values as well are automatically placed into the message line.

4.5.10 Deleting actual values

Click the mouse on the text in the display and press the "Delete" button in the "Text input" window.

4.5.11 Displaying attributes for actual values

Double-click the mouse on the desired actual value on the display. A mask appears by means of which you can set the desired text attributes:



Do not get confused by the "Text" heading. For actual values the same display attributes can be selected as for texts, with the exception of "reverse" and "blinking". Experience has proved that these options cause confusion, as nominal and actual values may be mixed up at the operating panel etc. Therefore, it is not possible for you to select this option.

4.5.12 Inserting text lists

Text lists can also be used for messages. A description on the meaning of text lists is available in Chapter 3 "Editing pages". Remember: A text list is a listing of single character chains (e.g.: red, yellow, green etc.). From this listing, the text to be displayed can be selected via an index (the variable). Text lists are equally inserted into the message as actual values:

1. Select the variable which indicates the index from the variable table.
2. Take the variable over into the page.
3. With the "--> List" button you can change the


actual value variable into a text list variable.

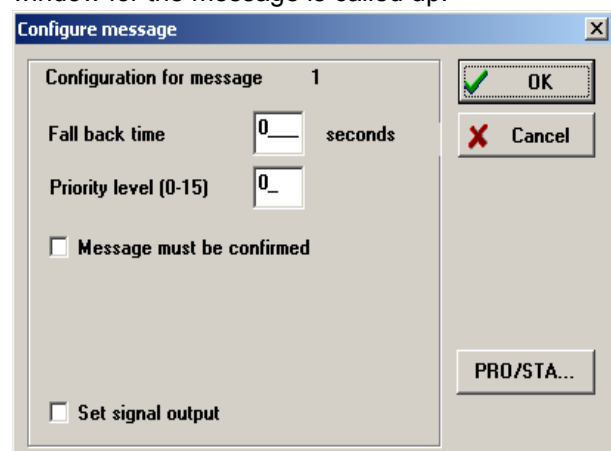
4. Indicate the file from which the text list is to be read in the parameterisation mask.
5. Position the variable in the message.

As messages do not accept nominal values, you do not have the possibility, as it is the case with pages, to create selection fields.

4.6 Configuring messages

The operating panel features several setting options for messages. In order to parameterise a message, you must first scroll to the required message.

By pressing the  button, the parameterisation window for the message is called up:



4.6.1 Fallback time

If several messages are active, the operator has the possibility to scroll through the messages. To ensure that the operator does not forget to scroll back to the message to be displayed, a fallback time has been installed. After the time has expired (measured from the time of the last key-press), the operating panel returns to the normal message display. Thus, the device determines which message would have to be displayed and displays it again.

4.6.2 Priority level

A priority level can be assigned to each message. The operating panel then always displays the last called-up message with the highest priority. If the alternating function has been activated ("Device"/"Parametrize", "Pages and messages" index card, "Message alternation time" unequal 0), all messages of the highest priority level are displayed alternately in the indicated cycle. The operating panel is able to carry out this action independently of any programs.

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4.6.3 Confirmation

If the "Message must be confirmed" field is ticked, the confirmation may provoke 2 reactions:

1. The message remains on the display in the original size. This option is worth considering for important messages with large fonts.
2. The message is reduced to 8 pixels (if the font has been set to larger than 8 pixels).

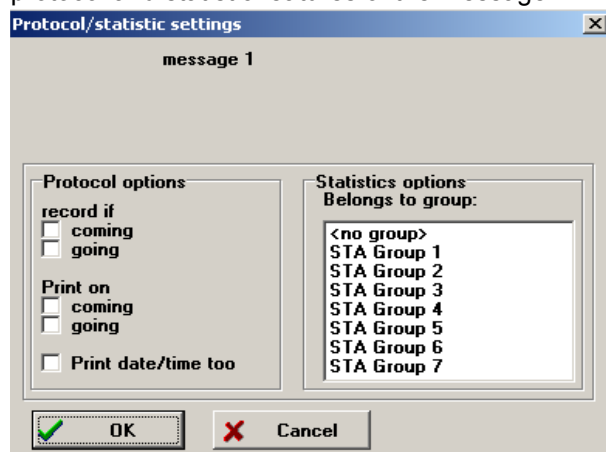
4.6.4 Signal output

A message can be set as a signal output. This output is integrated into the operating panel (24 V DC, 75 mA, short-circuit proof). It can be used, for example, to switch on a signal lamp or similar devices. For the control of higher currents, you should use a relay which works with a 75 mA induction current.

4.6.5 Protocol and statistics

For the protocol and statistics, the same settings can be made as with pages.

The configuration window for protocol and statistics can be activated by pressing the PRO/STA switch. Within this window, you can determine the protocol and statistic features of the message:



Each message may have individual settings for protocol and statistics. A detailed listing of the functions is available in the Chapter "Protocol and statistics". This section only contains a brief description of the setting options.

4.6.5.1 Protocol options

For each message you can select whether

- *it is recorded upon activation*
- *it is recorded upon deactivation*
- *it is printed out upon activation*
- *it is printed out upon deactivation*
- *date and time are to be printed additionally with the print-out.*

A more detailed description of these options is available in the Chapter "Protocol and statistics".

4.6.5.2 Statistics options

Here you can only select the statistic group to which the page is to be assigned. Select the group from the list window. You can assign the group names in the menu "Device"/ "Parametrize", "Statistics" index card by yourself. The operating panel provides a total of 7 statistic groups.

5 Calling up messages and pages

"PLC calls operating panel, show page No. 3!"

If the above sentence is technically translated into a command, it becomes clear that it cannot be so wrong. And if you have a look on the CAN telegram for the page call-up, you will recognise this sentence. Prior to presenting the page/message call-up, we would like to provide you with some explanations on the page and message management in the operating panel.

5.1 Page stack

Stack - a nice term for the technology that stands behind it.

Imagine several events occur simultaneously in the machine, e.g. "pallet is full", "feed-magazine 1 is empty", "new nominal quantity must be entered". For the PLC, these events are basically only indicators which report that the respective status has been achieved.

And here comes the problem: Which of these statuses should I display ? Or has an operator currently immersed himself in his menu in the display ???

If, additionally to the - usually difficult - control program, you had to add all these functions to the PLC, you would not only require more memory capacity, but also more cycle time. Let alone the fact that the program becomes even more complex... It is not possible to completely do without program components. But the operating panel considerably relieves both the PLC and consequently you as the project planner.

- *It runs a kind of list (page stack) which contains all pages called up by the PLC.*
- *It determines which page should be displayed.*
- *It manages the interaction with the operator without burdening the PLC.*

For you, the programmer, actually only two commands are required:

- *Enter page into the page stack.*
- *Take page out of page stack.*

5.1.1 Procedure for calling up a page

The following procedure is executed in the operating panel if the PLC wants to enter a page into the page stack ("Calling up a page", "Activating a page")

5.1.1.1 Via interface

The following steps are executed if a page is called up via an interface:

1. First, it is checked whether the page has already been entered into the stack. If this is the case, the page is removed from the stack.
2. The called-up page is placed on top of the stack.
3. If the device is in its idle state (refer to Chapter 6), it displays the page which is on top of the page stack.
4. If the page stack is empty, page 0 is displayed.

5.1.1.2 Via internal control program

The call-up via the internal control program is carried out differently:

1. If the page is not included in the stack, it is placed on top.
2. If the page is already included in the stack, it remains at the current stack position.
3. If the device is in its idle state, it displays the page which is on top of the page stack.
4. If the page stack is empty, page 0 is displayed

5.1.2 Procedure for removing a page

The operating panel proceeds as follows if the PLC or the internal control program wants to remove a page from the page stack:

1. First, it is checked whether the page has already been entered into the stack. If this is the case, it is removed from the stack.
2. If the device is in its idle state, it displays the page which is on top of the page stack.
3. If the page stack is empty, page 0 is displayed.

This type of page management is also called "Display of the last called-up page".

Some information on the scope of the stack. The stack is of course limited and may contain up to a maximum of 32 pages.

If you activate more than 32 pages, the bottom pages drop out of the stack. Anyway, if so many pages appear simultaneously, something is wrong with the machine and the operator is busy ...

5.1.3 Help, urgent case of emergency!!!

Do you remember? The operator can enter a menu, scroll, check actual values, adjust nominal values - the operating panel is working to capacity. Suddenly a pressure hose bursts, something must be done, the operator must be informed but he is scrolling through the pages...

Well, we have a solution for this problem as well: the so-called "priority page call-up".

This priority function interrupts all processes. The operating panel is first switched to its idle state (nominal value entries may be cancelled!), then the page is placed on top of the stack and - as the panel is in its idle state! - immediately displayed.

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Now, the operator knows what is going on and can solve the problem.

5.1.4 Alternating pages

If several pages have been entered into the page stack, you can instruct the operating panel to display the pages alternately. For this purpose, you do not need to write a single line of program. Parameterise an alternating time of 0 for the "Messages and pages" index card in the "Device"/"Parametrize" menu.<> The operating panel then displays all pages from the stack alternately. The alternating time determines the time in seconds during which an individual page is visible on the display before the next page is called up.

When the operating panel has reached the end of the stack, it starts again with the top page.

5.2 Message stack

The message stack works likewise as the page stack but has some further features:

- *It can comprise up to 100 messages.*
- *It manages messages of different priority levels.*
- *It enables message confirmations.*

What distinguishes a message from pages?

Roughly said, a message is always single-line and can contain a maximum of two actual values. It can, however, appear on the display no matter which page is being displayed.

Thus, a second level is available for the information display which works independently of the first level - the pages.

No matter what the operator is doing: he will definitely receive the message. If required, he even has to confirm these messages. But there is no rule without an exception: You can also parameterise pages with the message display deactivated - if you absolutely do not want messages to appear on this page. Refer to the "Configure page" window.

5.2.1 Procedure for calling up a message

If a message is called up, the operating panel proceeds as follows:

5.2.1.1 Call-up via interface

The operating panel automatically executes the following steps:

1. If the message has already been entered into the message stack, it is removed from the stack.
2. The message is sorted into the stack according to its priority. This means, it positioned above the first message of an identical or


lower priority.

3. The message on top of the message stack is displayed.
4. If the called-up message has been assigned the "confirm" attribute, the confirmation is requested the moment when the message is displayed for the first time.

5.2.1.2 Call-up via internal control program

The steps to be executed for the call-up via the internal control program are slightly different:

1. If the message has not yet been entered into the stack, it is sorted into the stack according to its priority. This means, it positioned above the first message of an identical or lower priority.
2. If the message has already been entered into the stack, it remains at its current stack position.
3. The message on top of the message stack is displayed.
4. If the called-up message is assigned the "confirm" attribute, the confirmation is requested the moment when the message is displayed for the first time. In clear, a message with the "confirm" attribute is deferred as long as messages with a higher priority level are present.

If the message to be confirmed is directly displayed because it can be placed on top of the stack, the confirmation is requested directly. The message is confirmed by pressing the  button. Afterwards, the message is marked as confirmed, it remains, however, in the message stack until it is removed.

5.2.2 Removing message

An active message remains in the message stack until it is removed from the stack. Both via the interface and the internal control program, the operating panel proceeds as follows:



1. If the message has already been entered into the message stack, it is removed from the stack.
2. The message on top of the message stack is displayed.
3. If the message on top has been assigned the "Confirm" attribute and if it has not been displayed yet, the confirmation is requested now.

5.2.3 Confirm messages

Purpose: It must be ensured that the operator gets aware of a message. If he is scrolling or navigating within a menu structure, he may easily overlook a message.

If, however, he receives a message to be confirmed, he cannot continue with his current opera-

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tion as the confirmation locks all operating actions - he first needs to find out what is going on. Logically: he checks the display for a reason why he cannot continue, he reads the message and then consciously (!) presses the  button to continue. How can a "Message to be confirmed" be created? No problem: Scroll to the message in the editor, press the  "Configure message" button and tick the "Message must be confirmed" field. In the following "Reaction to confirmation" field you can adjust the reaction of the operating panel to the confirmation:

1. "Message remains original": Select this field if the message is to maintain the size with which it was created. For messages which were created in a font with more than 8 pixels height.
2. "Message decreased to 8 pixels": Select this option if you want to change a message to the normal font size with 8 pixels after confirmation. This way, you may maximise a message on the display, and as soon as the operator has confirmed it, it will not disturb any longer - it is still there but only in a small line.
3. Feedback signal to the PLC. Upon request, the number of the currently displayed page, the number of the currently displayed message as well as the key status can be transferred to the control. This function, however, considerably depends on the PLC driver. Please refer to the Chapter "Driver interface". Key word: "Device state".

5.3 Print protocol

This section applies both to pages and messages. The print protocol function can be individually set for each message via the "Configure page/message" menu and the "PRO/STA" button.

Ensure that a printer has been connected - either to the operating panel itself (RS232) or externally to a CAN module. Instead of a printer, you may also connect the operating panel to a PC which stores the incoming data on a data carrier.

You can select the time when the print-out is to be initiated for each individual page or message:

"Print on coming" means that the message is always printed at the time it is inserted into the message stack (the same applies to pages).

"Print on going" means that the message is printed when it is removed. It does not matter whether it was in the stack or not.

What data are printed?

If you activate the "Print date/time", a line with the status information is printed first. Status information are: Page/message number, date, time, status (incoming or outgoing).

Below this line, the message text or page text fol-

lows.

Graphics in pages are not printed, as the print processing would involve high expenditures, also as regards the data transfer to the printer.

The font size is not considered either. With the 16 pixels font size, the operating panel inserts a blank between the individual text characters, with 32 pixels 3 blank characters. Therefore, at least the position of the individual characters remains unchanged.

Depending on the type, variables are printed as follows:

1. **Internal variables:** the value which is currently available in the memory is printed.
2. **External variables:** the value 0 is printed. The operating panel cannot request the variable values for print out.

Depending on the PLC driver, the value of external variables may also be printed. Please check whether your driver supports this feature.

5.4 Generation of protocols

For the generation of protocols, basically the same information are valid as for the print protocol. However, the status information is principally included in the protocol in this case.

5.5 Statistic functions

Basically, the following information apply to both messages and pages.

Via the "Configure page/message" function and the "PRO/STA" button, you can determine for each page individually whether it is to be statistically recorded or not. As soon as you assign it to a statistic group, the operating panel automatically integrates a counter which is automatically increased with the page call-up. Additionally, an hour counter is configured which starts to run whenever the page is entered into the page stack. Furthermore, the counters of the statistics group to which the page belongs are also active.

All these options are valid for messages as well.

6 Menu functions

What does the term "menu" imply? Generally spoken: the project planner of a machine or system must provide operating functions for the user (worker) and he has three options to do this:

1. He puts on a key or switch for every operating function. This may be practicable up to a certain system size, but will soon result in a wire entanglement and high wiring costs. Furthermore, troubleshooting in case of a broken cables gets highly problematic.
2. He integrates a kind of "intelligent" operation and continuously assigns different functions to only a few keys. The currently valid key functions are represented on a display. With this option, he must provide keys which allow for a function re-assignment for the other keys.
3. As a third option, all keys have permanent functions. One key is always responsible for the release a function, another key for the abortion and the remaining keys for the "navigation" within the function variety. The actual function which is released is not directly released by a key. The required function is marked via the "navigation keys" and the function is released via the "release key".

As you probably know already, the operating panel is able to realise all these functions. Method 1, however, does not imply the disadvantages ("wire entanglement"). The operating panel can be equipped with up to 56 keys - and is still connected to the control via an only 2- or 3-wire line.

There are even two variants possible with method 1. With the first variant, a key is directly mapped to a control as a flag and the control then releases the required function. With variant two, the control program LD of the ITE is required (version D or higher). In this case, the control functions of the operating panel can be directly switched to the outputs.

Within the scope of method 2, a control must realise the menu functions via page call-ups. The operating panel only assigns the keys to flags in the control, which in turn has to respond to the key activation. On the one hand, this method is very flexible, on the other hand it results in increased expenditures within the control program. The operating panel is intended for method 3. Here, it can realise all its benefits and offer operator control without an additional control program.

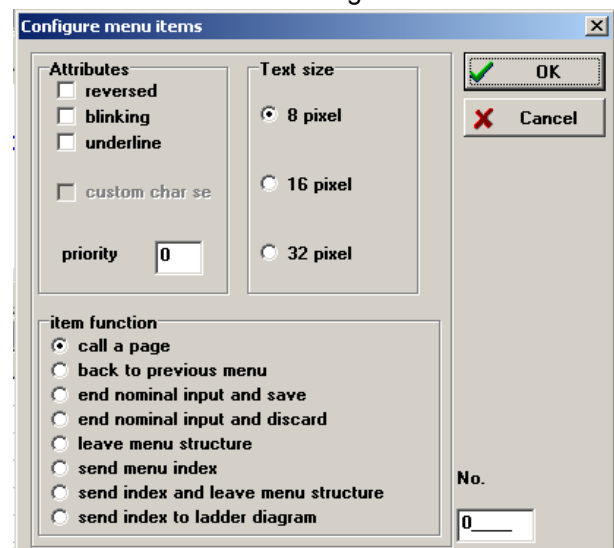
Basically, the editing of menu items and fixed texts is identical. First of all, the text which is to appear as a menu item at a later stage, is entered like fixed text (and is modified and deleted in the same manner). Afterwards, the text is converted into a menu item by pressing a button and its function is parameterised.

The operating panel allows for a very flexible menu structure. A menu structure may include up to 16 levels and a maximum of up to 18 menu entries can be inserted into a page.

6.1 Configuring menu functions

Fixed texts can be integrated in a page which are then configured as so-called menu items in the editor.

Different actions can be assigned to a menu item:



6.1.1 Page call-up

This menu item allows you to jump to a different page. In the "Page no." input field you determine which page is activated next.

This function serves to create menu trees. This way, a menu may appear in the called-up page (bypass) or/and nominal value inputs may be made.

6.1.2 Going back in the menu

This function calls up the page which was active prior to the current page. It allows for a free navigation within a menu structure - and if this function is integrated in a menu, the user can only exit the sub-menus by pressing the Escape key.

If this menu item has been selected and a "Nominal value input with saving" menu item is available on the page, modifications to nominal value inputs are cancelled.

By means of this function it is possible to return to the upper junctions of a menu tree.

6.1.3 Nominal value input with saving

This function can be compared with the Windows - "OK"-switch: If this menu item has been activated, all modifications in the input fields are accepted and the page is exited. Then, the page which you have entered for the menu item in the configuration mask is called up.

If a nominal value input has been parameterised in a page, the user can be given the possibility to initially modify the nominal values in the operating panel and to transfer all nominal values together, i.e. "at the press of a button", to the control. This function is realised by this version. Within the scope of nominal value inputs, the operating panel differentiates the following cases:

1. There is no "Nominal value input with saving" menu item available. If the <Enter> key has been pressed, the entered nominal value is checked for its limits. If a limit is exceeded/underrun, the limit value is entered. The nominal value input is not exited at this stage. If the value lies within the limits, the value is saved or transmitted to a control.
2. Exactly one nominal value and the "Nominal value input with saving" menu item are available. The nominal value is first checked for the limits. If it is OK, the nominal value input is exited and the "Nominal value input with saving" menu item is directly selected (but not yet executed!). Upon pressing the <Enter> key again, the value is saved.
3. Several nominal values and the "Nominal value input with saving" menu item are available. In this case, the operating panel stops at the currently terminated nominal value. Using the cursor keys, the operator must specifically move to the "... save" menu item and confirm his selection with <Enter> to save his entries.

6.1.4 Nominal value input without saving

This function allows the user to cancel all entries (nominal values) which he has carried out in the active page.

It can only be applied in combination with a "Nominal value input with saving" menu item. Ensure that you use a "Save" menu item if you intend to use this option.

This function can be compared with the Windows "Exit" switch: If it is activated, all modifications in the input fields are cancelled and the page is exited. Afterwards, the page which you have entered in the configuration mask for the menu item is called up.

6.1.5 Global abortion

This function is similar to the "Exit nominal value input without saving" function, but in this case the menu system is completely exited. The page which was called up last by the control logic (bus or PLC) is displayed.

6.1.6 Menu index output

This function serves to inform a PLC which menu item of a project has been selected by the operator. For this purpose, the number you enter for this function is transferred by means of a CAN telegram (refer to Chapter "CAN driver") to the PLC. The PLC then decides what to do. The operating panel does not respond to this function.

6.1.7 Menu index output with global abortion

This is a combination of the "Menu index output" and the "Global abortion" functions. You have suspected it: The menu index ("number" field) is output to the PLC and a "global abortion" is released.

6.1.8 Transfer menu index to LD

This function reports the menu ID ("number" field) to the ladder diagram (LD) of the operating panel. It is comparable with the "Menu index output" function, the index, however, is transferred to the LD and not to the PLC.

Thanks to these functions, you can create your menu trees in a way as to meet all your individual requirements.

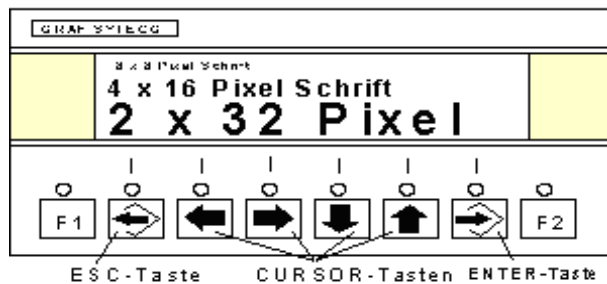
6.1.9 "Priority" field

An access hierarchy can be created via this field. The internal I_Priority variable is used within this context.

6.2 Operation of menus

The operation of menus is always executed via 6 function keys (with ITS/AT 62 / ITS/AT 72) or via the number pad (with ITS/AT 61/71). The numeric field has a fixed printed labelling/pre-defined symbols, while the function keys at the ITS/AT 62 can be freely designed.

In order to create a common basis, we take the following symbols:



6.2.1 Activating menu

If menu items or nominal values are integrated in a page, the menu system / nominal value input can be activated via the key.

The first menu item (or nominal value) is now displayed reversely on the page (black bar).

The LD allows to automatically activate the menu. For this purpose, either the "Menu page call-up" function or a relay with the "Execute CAN function" function is used. The value "2907" must be entered in the DATA field. This simulates the ENTER key.

6.2.2 Selecting menu items

With the , , , arrow keys, the black bar can be moved to other menu items/nominal values.

With the ITS/AT 71, a nominal value is automatically activated, you do not need to additionally press the button.

6.2.3 Executing menu item function

In order to confirm the function of a menu item, the key must be pressed. With a menu item, the programmed function is executed. With a nominal value, the nominal value edit function is activated if this has not been carried out yet.

6.2.4 Proceeding in the menu

This function must be realised as a menu item with page call-up. If this menu item then is selected, the new page is displayed, which may be provided with a menu structure. The menu editing function remains active, therefore, the first menu item has not to be re-activated with the key. This menu item is already pre-selected by the operating panel.

6.2.5 Going back in the menu

There are two ways to implement this function:

1. A menu entry with the "Going back in the menu" function is provided for.
2. You can go back in the menu by pressing the key.

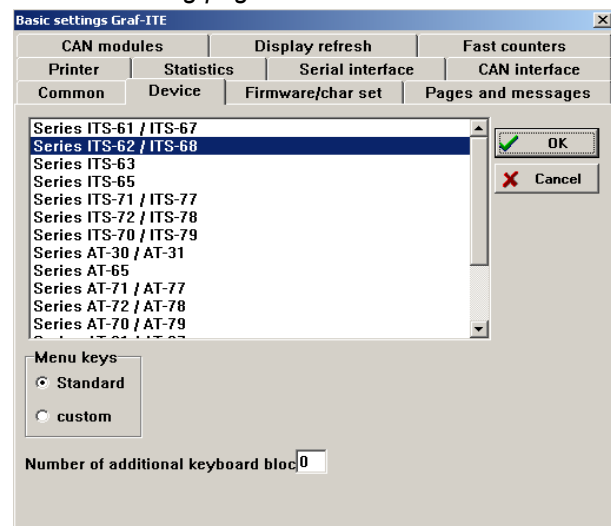
Both options can be freely used in your application. If you use the key globally or as a soft key in the page and thus switch off the menu function, you should go for option 1.

The global switch-off function for the key is specified in the "Device"/"Parametrize", "Common" index card, "Use marked keys as softkeys" category. If you only want to switch off the key in the page, go to the "Edit pages" mode, "Configure", "Key function" category.

6.3 Freely assigning menu keys

With the ITS/AT 61 / ITS/AT 71, no free assignment of menu keys is possible, as the menu functions are always taken over from the number pad. However, with the ITS/AT 62 / ITS/AT 72 you can freely assign the menu key functions to the function keys. And this works as follows:

- Select "Device"/"Parametrize", "Device" index card. Set "ITS62/ITS72" in the device series.
- Select "Menu keys"/"custom" and you receive the following page:



In the "Custom key configuration" you are now required to enter the number of the function key which should receive the desired menu function. The standard assignment of the ITS/AT 62 / ITS/AT 72 is shown in the above example.

In this case, the mask contains the following information: "ESC" function on key 2, "ENTER" function on key 7 etc.

7 Operating functions of the device

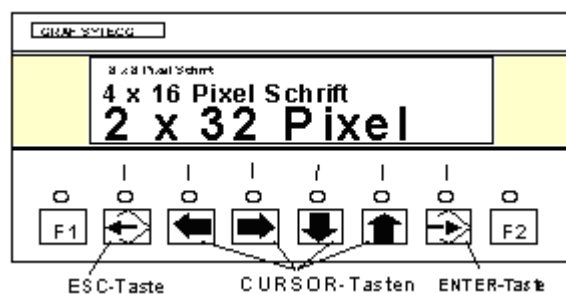
This chapter describes fundamental operating functions and is not applicable if the device keys have been redefined. With devices with touch-screen, i.e. without keys, the user himself must provide for the operating functionality via the internal control program.

Furthermore, the operator has the possibility to call up data which are currently not provided by the PLC control program. What kind of data may occur?

- *Several pages can be active at the same time. The operator may want to scroll through these active pages.*
- *Several messages can be active.*
- *The operator wants information texts to be displayed for trouble-shooting.*
- *The operator wants to call up protocol and statistical information.*
- *The operator wants to specify new nominal values.*
- *The operator wants to view actual values which are currently not indicated on the display.*

As you can see, there is a variety of requirements. In order to meet these requirements, the device is equipped with a user interface which on the one hand functions very consistently and on the other hand can be easily understood.

But keep in mind: Depending on the currently called-up information, the keys are assigned different functions - that cannot be avoided. We have, however, observed that all key functions are as logical as possible and easy to remember. In the following section, the key symbols always refer to the following page:



Before we concentrate on the key functions, we have to introduce a new term, the "device state". This term determines the current operating step of the operating panel.

7.1 Device states

What is the operating panel doing? This question defines the term "device state" very well.

The most important, since elementary, state is the

7.1.1 Idle state

Idle state does not mean that the device is not working at all (resting), but that it is in its basic state. We specify the basic state as follows.

- *The device has been switched on.*
- *The control has activated one or more pages and/or messages.*
- *The operator has not executed any operating steps. The fallback time for both pages and messages has expired. The display either shows page 0 (page stack is empty) or the last called-up page (top page on the stack).*

7.1.1.1 Key functions in the idle state

Provided the keys were not adjusted as soft keys (refer to "Device"/"Parametrize", "Device" index card or "Configure page") and depending on the device, the keys have the following functions:



ITS/AT 6: The device is switched to the "Scroll pages" state (if this function has been activated; refer to "Device"/"Parametrize", "Common" index card). In this state, the operator is able to scroll through the active pages. For a description, see further below.

ITS/AT 7: No function



ITS/AT 6: If more than one message is active, the device is switched to the "Scroll active messages" state and the next message of the message stack is immediately displayed. The operator is now able to scroll through the active messages. For a description, see further below.

ITS/AT 7: No function



ITS/AT 6: If more than one page has been activated by the control, the device is switched to the "scroll active pages" state and the next page of the page stack is immediately displayed.

ITS/AT 7: No function



If this key is pressed in the idle state, the following cases are distinguished:

1. There are no nominal values or menu items on the page: The key has no function, the device remains in the idle state.
2. Exactly one nominal value is available: The operating panel directly switches to the "Edit nominal value" state. For a description, see below.
3. Several nominal values/menu items are available on the page. The first entry found is a nominal value: The device is switched to the "Select nominal value" state. For a description, see further below.
4. Several nominal values/menu items are available on the page. The first entry found is a menu item. The device is switched to the "Select menu items" state.

7.1.2 "Scroll pages" state (only ITS6)

Within this state, the operator can scroll through all pages which have been created in the project. If the "Scroll pages" function has been locked (menu item "Device"/"Parametrize", "Pages and messages" index card), the operator cannot get to this state.

This function enables the operator to call up pages into the display which have not been called up by the PLC. For some applications, this may be advantageous, e.g. if help texts for trouble-shooting or working instructions are to be stored in the operating panel.

If one page does not provide sufficient space, the information has to be split to two or more successive pages and the operator can then easily scroll forward or backward.

7.1.2.1 Key functions

If "Scroll pages" has been activated, the keys have the following meaning:



The device is switched to the idle state (on page 46.).



These keys have no function now.



The next page is displayed (following number). If the numerical sequence is inconsistent (e.g. 1, 2, 3, 10, 11, 12, 13, 17, 24), the operating panel scrolls through the pages in this specified sequence.



The previous page is displayed (foregoing number). In this case as well, numerical gaps are skipped.



This key has exactly the same function as in the idle state:

7.1.3 Scroll active pages (only ITS6)

Here, the operator can scroll through the pages activated by the PLC. This function cannot be locked. At all times, the operator has the possibility to scroll through PLC pages - except you define the menu keys as soft keys by means of which the operator can get to the "Scroll active pages" state. This function allows the operator to get an impression of the machine state. Usually, the cycle set for alternating the pages ("Device"/"Parametrize", "Messages and pages" index card) is sufficient for all applications. If an operator needs particular information, he may want to have the option to scroll by himself - and here this option is offered to him.

7.1.3.1 Key functions

The key functions are similar to the key functions in the idle state. Here as well, the operator can change directly the state and get to the "Scroll messages" state. As a result, the desired information can be easily found and the operation is standardised. The key functions in detail:



The device is switched to the idle state (on page 46.).



If more than one message is active, the device is switched to the "Scroll active messages" state and the next message of the message stack is immediately displayed. The operator can then scroll through the active messages. For a description, see further below.



The next page of the page stack is displayed (following number).



The previous page of the page stack is displayed (foregoing number).



This key has exactly the same function as in the idle state:

7.1.4 Scroll through active messages (only ITS6)

In contrast to pages, only active messages can be scrolled through. It is not possible for the operator to scroll through the created, but non-active messages. This would not make any sense - these messages are meant to inform the operator on unusual processes to ensure that the operator is able to quickly respond. If he was able to scroll through the messages, he would not receive any useful information.

In this state, the operator can instruct the device to display active messages that have been called up by the PLC. You, as the project planner, may also specify an alternating cycle for the operator, on the basis of which the operating panel alternately displays the messages of the highest priority level (adjustable in "Device"/"Parametrize", /"Pages and messages" index card). If this cycle is too fast for the operator (or too slow), he can scroll through the messages by himself and also view messages of a lower priority.

7.1.4.1 Key functions

The key functions are similar to the key functions in the idle state. Here as well, the operator can directly change the state and get to the "Scroll active pages" state. The following table lists the respective key functions:



The device is switched to the idle state (on page 46.).



The next message of the page stack is displayed independently of its priority.



The foregoing message of the page stack is displayed independently of its priority.



If more than one page has been activated by the control, the device is switched to the "Scroll active pages" state and the next page of the page stack is displayed immediately.



If more than one page has been activated by the control, the device is switched to the "Scroll active pages" state and the foregoing page of the page stack is displayed immediately (foregoing number).




This key has the same function as in the idle state:

7.1.5 Select menu item

A menu item can be selected if the following requirements are met:

The operator has scrolled to a page (via "Scroll pages" or "Scroll active pages") or the currently displayed page has several menu items and nominal values. The first entry is a menu item (the operating panel starts to search at the top left corner of the page).

The operator automatically activates the "Select menu item" state when pressing the  key.

This device state is automatically active if the operator works within a menu structure and a menu item is reversely displayed.

In this device state, the operator can "navigate" within a menu structure, i.e. he quickly receives information with the help of project settings. The menu configuration possibilities are unlimited - get the best out of your application and help the operator to quickly find the required information.

If the operator got to this state, the menu entry is displayed reversely. Thus, the operator can easily recognise which entry he is able to activate at this moment.

7.1.5.1 Key mapping

In this device state, the keys have a clearly different function. The "Select nominal value" device state, which is described in the next section, is closely connected with the "Select menu entry" device state. Depending on where the operator navigates (to a nominal value or a menu entry), the operating panel automatically changes its device state. The following table contains the key mapping for the "Select menu entry" state :



The device is switched to its previous state. This means: The operator goes to the next higher level, i.e. backwards. If he reaches the top menu page, the operating panel switches back to the state from which the operator has accessed the menu structure (it "remembers" this state).

In connection with nominal value entries it has to be observed that all modifications to nominal values are cancelled if an "Exit with storing" menu item is available on the page. If this menu item does not exist, the nominal values are stored when leaving the nominal value edit mode.



The operating panel searches on the left of the reversely displayed entry for a nominal value or a menu item. It may also move upwards or downwards. The entry found is then represented reversely and, depending on the entry, the "Select menu entry" or "Select nominal value" state is activated.



The operating panel searches on the right of the reversely displayed entry for a nominal value or a menu item. It may also move upwards or downwards. The entry found is then represented reversely and, depending on the entry, the "Select menu entry" or "Select nominal value" state is activated.



The device searches for a nominal value or a menu item below the reversely displayed entry. It may also move to the left or right. The entry found is reversely displayed and, depending on the entry, the "Select menu entry" or "Select nominal value" state is activated.




The operating panel searches for a nominal value or a menu item above the reversely displayed entry. It may also move to the left or right. The entry found is reversely displayed and, depending on the entry, the "Select menu entry" or "Select nominal value" state is activated.




The function of the currently selected menu item is executed. If it is a page call-up (new menu level), the device automatically searches the new page for a menu entry/nominal value and the first entry found is activated. Depending upon whether a nominal value or a menu item has been found, the "Select menu item" or "Select nominal value" state becomes active.

7.1.6 "Select nominal value" state

The "Select nominal value" state is reached when the menu interface is activated and a nominal value is pending for selection, i.e. is displayed reversely.

This state is similar to the "Select menu entry" state. The key functions are almost identical - with the exception of the  key.

Nominal values and menu items have the same characteristic as long as they have not been activated - they are displayed reversely if the operator works with the cursor keys in the menu mode and are activated when the operator presses  - a standardised operation is therefore ensured.

Four different types of nominal values may occur. One of them has a number entry; the other three are considered as "nominal values with step-value processing":

- *Nominal values with number entry.*
- *Nominal values with step-value processing.*
- *Diashow bitmap as nominal value (step).*
- *Text list as nominal value (step).*

7.1.6.1 Key mapping

Here, we refer with a clear conscience to the select menu item section. The key functions are identical. Except for:



ITS/AT 71: This device requires a special treatment. The nominal value entry is activated immediately without the key having to be pressed. This is possible, as the cursor keys are separated from the numerical keys.

ITS/AT 6/72: The edit mode for nominal values is activated. There are two types of nominal value entries:

1. Editing numbers: The operator can edit each number individually. He is able to identify this edit mode by the blinking of single numbers.
2. Step-value editing: The operator can modify the nominal value only within the specified (configured) steps. He identifies this edit mode by the blinking of the entire nominal value. Diashow bitmaps as nominal value and text lists as nominal value are to be edited this way.

The operating panel automatically activates the appropriate state for the nominal value.

7.1.7 Edit nominal value with number editing

Two types of edit modes can be specified for nominal values. The first mode is the number entry, in which the operator can freely enter his values. The second mode provides for step values, where the operator can modify the nominal value only within specified steps.

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In this state, the operator can enter a nominal value directly via the number entry. At this point, the ITS/AT 61/71 and ITS/AT 62/72 device series differ from each other: With the ITS/AT x1, the operator can enter the numbers directly via number keys as with a pocket calculator, while with the ITS/AT x2 he has to use the cursor keys to modify the value of a number. The entry or modification of the nominal value takes place in the operating panel, an intervention of the PLC is not required. The device calls up limit values and/or, if required, step values and a modified nominal value is checked by the operating panel and converted into a proper format. **This, of course, considerably relieves the PLC program.**

ITS61/71 key mapping

The entry of numbers is carried out as with a pocket calculator. If a number key is pressed, the entire value is deleted and the number appears as a single figure. Subsequently entered numbers cause the numbers entered before to be moved to the left and the new number appears at the very right - as with a pocket calculator.

How can I delete a wrong entry? This is quite easy: by means of the decimal point! If you press the decimal point, the entry changes from the decimal place to the left of the comma to the decimal place to the right of the comma and vice versa - and you can enter new numbers.

If no decimal point has been intended for the nominal value, the decimal point has the same effect as the "CE" key of the pocket calculator - the entered value is cancelled and you can start with a new entry. In detail:



The entered number is cancelled. The device switches back to its previous state and the old, unmodified nominal value is displayed again.



to



Entry of numbers as with the pocket calculator.




Decimal point: Switching over between decimal places to the left and the right of the comma. This way, the selected places can be entered again. If no decimal places to the right of the comma are available, the decimal places to the left of the comma can be entered anew after pressing "."



The "+" sign changes to the "-" sign and vice versa.



If an "Exit with storing" menu item is available on the page, only the edit mode is exited and the new value is cached. The value is not checked and output until the "Exit with storing" menu item is activated.

If this menu item is not available, the operating panel checks the value for its limits (if limits have been specified). For this purpose, the panel differentiates between the so-called "internal" and "external" nominal values (refer to Chapter "Variables"). With internal nominal values, it automatically sets the value to a limit value, if this limit value was exceeded or underrun during the entry. With external nominal values, the panel cancels the entry as if the  key would have been pressed.



Only ITS/AT 71: Save value and proceed to the next/previous menu entry / nominal value.

7.1.7.1 ITS/AT 62/72 key mapping

With the ITS/AT 62/72, the modification of nominal values is equally easy. The keys have a logical function:



The entry is cancelled. The device switches back to its previous state (the operating panel "remembers" this state) and the old, unmodified nominal value is displayed again.



Shift cursor 1 digit to the left: The cursor moves 1 position to the left and the respective figure can be edited.



Shift cursor 1 digit to the right: The cursor moves 1 position to the right and the respective figure can be edited.




The blinking figure is reduced by 1. At the very front digit, the minus sign is displayed after the 0, which allows you to also enter the required + or - sign.



The blinking figure is increased by 1.



If the "Exit with storing" menu entry is available, only the edit mode is exited and the new value is cached. The value is not checked and output until the "Exit with storing" menu item is activated.

If this menu item is not available, the operating panel checks the value for its limits (if limits have been specified). For this purpose, the panel differentiates between the so-called "internal" and "external" nominal values (refer to Chapter "Variables"). With internal nominal values, the device automatically sets the value to a limit value, if this limit value was exceeded or underrun during the entry. With external nominal values, the device cancels the entry as if the  key would have been pressed.

7.1.8 Editing nominal values in the step-edit mode

This is the second type of nominal value entry: A value can only be modified in steps.

Within the scope of this nominal value entry, the operator can only modify the nominal value within a predefined step range, which has been specified by the system project planner (i.e. you). The operator cannot exceed or underrun the specified limits. He identifies the step-value edit mode by the blinking of the entire nominal value.

With diashow bitmaps and text lists, the specified step range is always 1. Zero and "Number of individual bitmaps" or "Number of list entries" are defined as limits.


7.1.8.1 Key mapping

The keys have a similar function as with the number entry into the ITS/AT 62/72:



The entry is cancelled. The device switches back to its previous state and the old, unmodified nominal value is displayed again.



If in the "Exit with storing" menu entry is available on the page, only the edit mode is exited and the new value is cached. The value is not checked and output until the "Exit with storing" menu item is activated. If this menu item is not available, the operating panel checks the value for its limits (if limits have been specified). For this purpose, the device differentiates between the so-called "internal" and "external" nominal values (refer to Chapter "Variables"). With internal nominal values, the device automatically sets the value to a limit value, if this limit value was exceeded or underrun during the entry. With external nominal values, the device cancels the entry as if the  key would have been pressed.



ITS/AT 71: Go to the next menu item/nominal value. The nominal value is stored.



ITS/AT 6/72: These keys do not have any function here.



ITS/AT 71: Go to the next menu item/nominal value. The nominal value is stored.

ITS/AT 6/72: The blinking nominal value is reduced by the step value. If it has reached the lower limit, nothing happens anymore.



ITS/AT 71: Go to the next menu item/nominal value. The nominal value is stored.

ITS/AT 6/72: The blinking nominal value is increased by the step value. If it has reached the upper limit, nothing happens anymore.

7.1.9 "Confirmation of message" state

If a message with the "Message must be confirmed" setting ("Configure message" mask) is activated by the PLC, the device interrupts the operator. It remembers its current state and changes to the confirmation state.

What is the purpose behind it?

There are situations when the attention of the operator must be drawn to a particular occurrence, no matter what he is doing. If a confirmation message comes in, the operating panel "freezes" and the operator must consciously press a key - this way, he is already confronted with an action which

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attracts his attention and he will certainly check the cause for this interruption...

In the confirmation state, the operator must first "confirm" a newly received message before he can initiate another operating step. This means, he must confirm that he has read the message by pressing a key.

If you use this type of message, please observe that you do not use the key as a soft key - otherwise the operator cannot confirm the message and the ITS6 freezes in this state.

Trick: If you assign a key to the ENTER key via the "Device"/"Parametrize"/"Device" menu items which does not exist (e.g. key no. 20), you can reproduce the function of the ENTER key via the LD using the "Execute CAN function", DATA=2907.

7.1.9.1 Key mapping

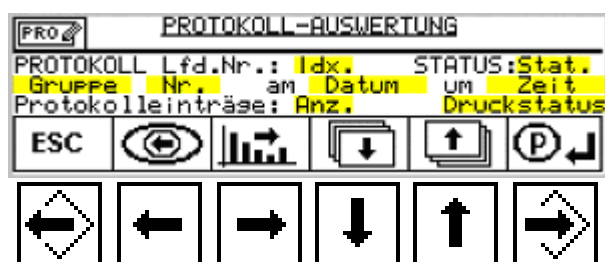
In this state, only the  key has a function. All other keys are ignored:

The message is confirmed, the ITS/AT returns to the operating state which was active prior to the message call-up.

7.1.10 "Call up protocol" state

This device state is only available if the panel is provided with protocol and statistic functions (device designation ITS/AT xx2x) and a protocol page has been created (for more details, refer to Chapter 3).

In the "Call up protocol" state, the keys have a completely new meaning. The standard protocol page provided by us indicates the key functions as symbols. We have illustrated the key mapping below, to show which symbol is assigned to which key:



If the operator has scrolled to the protocol menu, he can trace back processes which have been recorded by the device. For this purpose, a completely different functionality must be available - for this reason, the key functions are completely different.

The operator can now call up the processes in the protocol memory. He can even look up the variable values with which a page was stored.




If a printer has been connected, the operator may

print out the protocol.



Back to the last state. If the protocol print-out is still in process, this key interrupts the printing process. The "Call up protocol" state is then maintained.



This key initiates the output of the protocol to a printer. It is possible to print all protocol entries or select individual entries which are related to the current entry (e.g. all entries of this page). After this key has first been pressed, the "sel"/"all" message starts to blink. Now, the print-out of all entries can be initiated by pressing the  key. The  starts the selective print-out. A print-out in process can be interrupted by activating the  key.



In the "Call up protocol" mode, this key must be kept pressed to view the information.

Depending on the selected protocol entry, the following information is displayed with this key:

- a) page content
- b) message content
- c) value of a recorded variable

State messages (device on/off etc.) cannot be viewed in detail. The key then has no function.



This key must be also be kept pressed to see the information. It visualises the statistical data on the page/message of the current protocol entry. Variables or state messages have no statistic; the key has no function with these entries.



These keys allow the operator to scroll within the protocol memory; based on the date/time and the consecutive number, the position can be read from the protocol memory.



7.1.11 "Call up statistic" state

This device state is only available if the panel is provided with protocol and statistic functions and a statistic page has been created (for more details, refer to Chapter 3). In the "Call up statistic" state, the keys have a completely different meaning. The standard statistic page provided by us indicates the key functions as symbols. We have illustrated

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the key mapping below, to show which symbol is assigned to which key:




If the operator has scrolled into the statistic menu, he can call up statistics which have been recorded by the device. For this purpose, a completely different functionality must be available - for this reason, also the key functions are completely different.




The operator can now call up the statistical data of pages and messages, which have been parameterised for the statistics (refer to "Configure page" in Chapter 3 or "Configure message" in Chapter 4). Here, he can read, for example, how frequently a message has been called and how long it was active.


If a printer has been connected, the operator may also print out the statistic.


7.1.11.1 Key function

In the statistic call-up, the keys are assigned the following functions:



 Back to the last state. If the statistic print-out is still in process, this key interrupts the printing process. The "Call up statistic" state is then maintained.

 This key initiates the output of the statistic to a printer. Statistics are always print out completely, as the statistical data of individual messages are not meaningful. Prior to the printing process, the blinking "Start print" message is displayed. For this purpose, the  key must be pressed again. Then, the printer starts the print-out of the statistic. A print-out in process can be interrupted by activating the  key.

 This key must be kept pressed in the statistic call-up mode, otherwise the information cannot be displayed. Either the page content or the message content for the statistic entry is displayed.

 This key must also be kept pressed, otherwise the information is not provided for.

Via this key, statistical data relating to the group to which the message/ the page belongs can be displayed.

  These keys allow the operator to scroll within the pages/messages and the desired page/message from which the statistical data are to be called up can be selected.

7.2 Contrast and brightness adjustment





Independently of the device type, contrast and brightness are adjusted via the ESC key and the cursor keys. This description therefore applies for all device ranges.

These keys must not be defined as "soft key" keys. If you need the soft key function, you have to add a "service page", in which the soft key function is deactivated. Then, you can adjust the contrast and brightness at least for this page. Or you use the LD which also offers access to contrast and brightness.

Proceed as follows to modify the settings:

1. Press the ESC key and keep it pressed during the following steps.
2. Wait for approx. 2 seconds.
3. Adjust (with the ESC key pressed) brightness and contrast via the cursor keys.

The key mapping is as follows:

-  Reduce brightness
-  Increase brightness
-  Reduce contrast
-  Increase contrast

Please observe:

If you are in the experimental phase and frequently download projects, you should switch off the device after the contrast and brightness adjustment and restart it. This affects a long-term storage of the data.

If you change contrast and brightness without switching off, the device returns to its initial settings after the next project download.

8 Actual values, nominal values, variables

Three terms, the same basic principle.

These terms cover everything that cannot be displayed as fixed text or fixed graphic on a page.

8.1 Term "variable"

We will focus on this term first, as both nominal and actual values are related to variables.

"Variables" are parameters which originate from a measuring or counting process as well as values which are to be modified as default settings of a machine.

As opposed to fixed texts, these values cannot be saved as text on a page, because they "vary", as the name already implies. Basically, everything that is variable and must be displayed, is a variable.

8.2 Term "actual value"

An "actual value" is a parameter which is produced in a system and which must be displayed. Actual values are, for example, a temperature measuring value, a counted piece number or a pressure measuring value. A product name or product number which is read via a bar code can also be defined as an actual value.

Thus, an actual value is a parameter which is transferred from the system to the operating panel.

8.3 Term "nominal value"

A "nominal value" is a parameter which is used as a default setting in the system. This parameter is transferred as an actual value but in reverse direction - from the operating panel into the system. In this context, a nominal value can well be displayed as an actual value. Think, for example, of an operator who wants to check the current default setting (e.g. nominal quantity). In this case, the nominal and actual quantity could be displayed side-by-side on one page. On this page, the operating panel then considers both parameters ("variables") as actual values.

8.4 Display forms

For this topic, we have to make a short excursion to the field of data technology.

Each kind of data is represented as binary information "On"/"Off" in a data system. Every PLC programmer knows this: an input or a flag has exactly these two states. This information is also called 1 bit.

How is it then possible to display, for example, a quantity?

As a rule: Several bits are combined and assigned

different priorities. The various bit combinations are then interpreted as values. Usually, you start with 8 bits (=1 byte). These 8 bits allow for the generation of 256 combinations and the representation of the values 0-255. If the number of bits combined is increased, higher values can be represented accordingly. Generally, 1 bit is then used as +/- sign.

Why do we start on this low level? Because the interpretation of the bit combination already starts to differ on this level!

Think of the so-called "BCD" format. In the BCD format, always 4 bits are combined to a figure 0-9. 4 bits, however, allow for a generation of 16 combinations; i.e. there are 6 invalid bit combinations! In addition to this, modern micro-processors work in units of 8 bits, thus have to process 2 figures at the same time. Each figure then contains 6 invalid combinations... attention must be paid in this case. Consequently, in the BCD format only the values 0 - 99 are represented with 3 bits contrary to the "real" byte with 256 values.

The next steps range from 16 bits (=1 word) and 32 bits (double-word) to floating point values which are again represented completely different and could have up to 128 bits. Real floating point values are not available in these operating panels; decimal places are realised in a different way.

These binary represented information must now be displayed in some way. Generally, the so-called ASCII coding is used for displays. A particular 8-bit coding is assigned to each sign. Theoretically, 256 output signs, practically approximately 200 output signs are then available. All other signs are used as control instructions for displays, printers, etc.

If you want to use a variable, you must know the display format of this variable. Pass on the respective display type to the operating panel, which then converts these binary information automatically into ASCII signs for the display. Nominal values, however, are re-converted by the operating panel from the display information into the correct binary representation. As a consequence, you do not even have to write a single program line for this conversion; the indication of the binary format is sufficient. In the following, this is also designated as variable type.

8.5 Variable types

By means of the variable type you define the binary format of your variables for the operating panel. It "knows" the following display types:

8.5.1 "Binary" variable type

Binary variables are values interpreted by the bit. Instead of the bit combination, the bits are observed individually in this case. Bit variables may have up to sixteen digits (bits), each digit indicates a bit.

The value range per bit is 0 and 1.

8.5.2 "Integer" variable type

An integer variable is a binary 16-bit number representation within the scope of which 1 bit (the highest order bit) is used as +/- sign and 15 bits serve as numerical value. With negative representations, the so-called double complement is used. The value range of an integer variable covers the figures -32768 to +32767 and you have a maximum of 6 digits available for this variable type (numerical value plus +/- sign).

This variable type can be used for the representation of temperatures, pressure, etc., for which this value range is sufficient.

A temperature can also be provided with a decimal point. If you can measure to the second decimal place in the control, the variable value 100 would exactly correspond to the temperature 1.00°C. In the operating panel you would now indicate "integer" as variable type and "@@@.@" as variable format (more details later on). You could then represent the temperatures from -99.99 to 327.67, which sufficiently covers the value range of the integer number.

8.5.3 "Long-Int" variable type

Long Integer - long whole number - is the correct designation for this variable type. It uses 32 bits for the representation of figures, whereby the highest-order bit provides the +/- sign - as with the integer variable type. Consequently, 31 bits are responsible for the value and realise a value range for whole numbers from -2,147,483,648 to 2,147,483,647.

The Long Int variable is typically applied in the field of quantity counting. An integer variable would not be sufficient here as it only covers a value range up to approx. 32,000. As with integer values, a decimal point can be "inserted" via the format.

You can use a maximum of 12 digits for the format.

8.5.4 "Longword" variable type

This variable type corresponds to the Long-Int variable type, covers 32 bits but has no +/- sign. The "+/- sign bit" is added to the value, so that the value range lies between 0 and 4,294,967,295.

You can use a maximum of 11 digits for the variable value.

8.5.5 "ASCII" variable type

In this case, 32 bits are split up into 4 bytes of 8 bits each and each individual byte is regarded as an ASCII-coded sign. In this respect, ASCII is the "easiest" variable type for the operating panel, as no conversion is required.

You have up to 4 bytes, each byte occupies one digit. For each digit, you can select exactly one character from the operating panel's character set. ASCII variables are typically applied in the fields of display and recording of operator names, product names or similar information.

But I need more than 4 digits!

Simply add one (or several) ASCII variables and line them side-by-side on the display. You can create variables of an unlimited "length".

Or: Enter as many positions as you need for the variable format. The editor then generates as many ASCII variables with successive handle as required for the number of digits. Just take this single variable into a page and the editor settles the rest.

8.5.6 "TimeSec" variable type

"Time in seconds format" would be the exact designation for this type. The TimeSec variable is based on a 32-bit variable without a +/- bit (as Long-Word), which is graded into seconds. (1 = 1 second, 2 = 2 seconds, etc.) The respective value range lies between 0 seconds and 4,294,967,295 seconds, which corresponds to 136 years, 70 days, 6 hours, 28 minutes and 15 seconds. A machine with such an operating time must have been perfectly constructed...

You have exactly 8 digits in the HH:MM:SS format available for the display of the value (exactly: @@: @@: @@).

There is no chance to display the 136 years, at least not with this format.

This variable type is intended to record and display the runtime of processes in the minute range. Examples are, for example, downtimes, production duration of a product or similar times.

8.5.7 "TimeMin" variable type

This variable type is called "Time in minute format". It is simply another display form of the "TimeSec" variable type, works with the same grading - seconds -, but displays only hours and minutes: The format is HHHH:MM (@@@@: @@). This corresponds to a display range from 0 to 99999 hours, which corresponds to approx. 11.5 years.

With this variable type, e.g., total runtimes of machines can be displayed for statistical purposes. (The operating panel uses for its internal statistics counter also 32-bit operating hour counters with a

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second grading.)

8.5.8 "Time" variable type

This variable type is normally used for the display of time. The time must be available in the BCD format in 3 bytes and is then displayed in the HH:MM:SS format. The value range therefore lies between 00:00:00 and 23:59:59.

Please observe that the operating panel always displays the colons with this format.

8.5.9 "Date" variable type

This variable type allows for the date display. The date must be available in the BCD format (3 byte) as with the "Time" variable and is displayed in the TT.MM.JJ format (@@.@@.@@). Apart from the date display, we have not (yet) discovered any other application area for this format.

8.5.10 "Passcode" variable type

Caution - secret code.

Frequently, machine configuration works must only be carried out by specially trained personnel. In such cases, the entry of certain nominal values is only accepted after a respective identification code has been entered. If, however, the entered code is visualised on the display, somebody standing next to the machine gets to know the code...

To solve this problem, we have developed an entry possibility which accepts numbers but only displays little stars on the display - as with cash dispensers.

The underlying basis of the "Passcode" variable is the "LongWord" variable with 32 bits. Consequently, you can allow for an 11-digit code. Please observe: you have to remember this code! Therefore, 4-6 digits are recommendable. This variable type is useless with an ITS/AT 62/72 device. You cannot see the nominal values you adjust with the cursor keys on the display. An ITS/AT 61/71 operating panel enables you to enter the figures directly, which is a prerequisite for entering codes. The value range as well as the format correspond to the "LongWord" variable type.

8.6 Where do variables come from ?

This is a good question. Of course, you are now expecting a good answer.

Variables can occur inside or outside the operating panel. Therefore, the so-called "internal" and "external" variables are distinguished.

8.6.1 "Internal" variables

Internal variables are managed by the device itself. An example for such a variable is time, which is recorded and displayed by the panel itself - at

least with panels featuring date and time functions. You can influence internal variables using the PLC (i.e. loading with a value). In this case, you are responsible for the point of time when you modify the values.

Internal variables have one advantage: with page/message call-ups, the value which is currently saved in the variable is taken over into the protocol unlike external variables. Furthermore, only internal variables can be processed by the internal control program. For addressing internal variables via the PLC, please refer to the driver description.

8.6.2 "External" variables

External variables are managed, for example, in a PLC.

If a page or message is to be displayed (not printed or recorded for the protocol) and the operating panel detects an external variable within a page, it automatically asks the PLC for the current variable value (for further details, please refer to the driver description). As soon as the ITS has received all values, it represents the values in the correct form on the display.

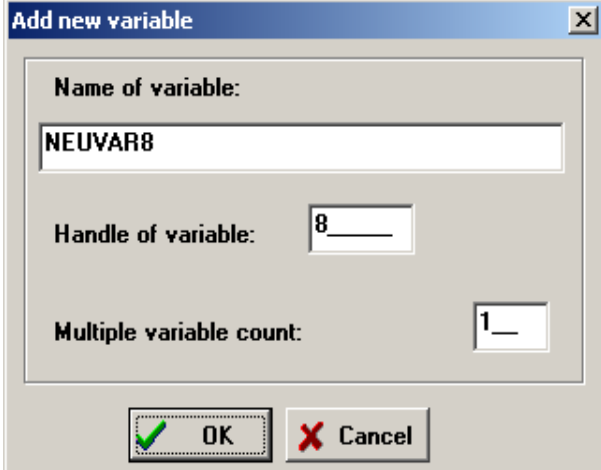
Additionally, you have the option to determine the up-date interval for variable values. The operating panel then ensures that the variable values are requested from the control within this interval and up-dated on the display.

This interval, however, strongly depends on the PLC driver. For this reason, please carefully read the driver description.

Observe: external variables cannot be addressed by the internal control program.

8.6.3 Creating variables

This is very easy. Click on the "New Var." switch below the variable table. The following window appears:



Assign the variable you are generating a respective name. This makes the maintenance of your project considerably easier for you. Indicate as

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name e.g. "quantity" or "tempnom". The name must be clear and may not contain any umlauts or special characters except "_". Besides, the first character of the variable name must be a letter. The editor does not allow you to place a variable name which is already used with another variable. But he draws your attention to it.

The "Handle" field assigns a number to the variable, with whose help the operating panel and the PLC identify this variable.

If you want to generate several similar variables, you can indicate this in the field "How many variables are to be set up?". The editor then generates variables with successive handle and adds "2", "3" etc to each variable name. The new variables are added to the end of the variable table. The following window contains settings for the

8.6.4 parameterisation of variables

The window looks like this:

The 'Variable' window is a dialog box for configuring a variable. It includes the following fields and controls:

- name:** Text field containing 'NEUVAR8'.
- Handle:** Text field containing '8'.
- Format:** Text field containing '#####'.
- Variable location:** Radio buttons for 'Internal' (selected) and 'External'.
- Type of variable:** A list box with options: 'word binary', 'integer (16 bit, range -32.768 to +32.767)', 'Longint (32 bit, range +/- 2.147.483.647)', 'Long (32 bit, range 0 to 4.294.967.295)', and 'ASCII (4 chars)'. 'integer' is currently selected.
- Lower limit:** Text field.
- Upper limit:** Text field.
- Step value:** Text field.
- Comment:** Text area.
- Buttons:** 'OK' (with a green checkmark icon) and 'Cancel' (with a red X icon).

Why must variables be parameterised?

If you want to display several values, the operating panel must know how to inform the control which variable is required.

A variable is identified by its so-called "handle". Handle is a term from the programming language and roughly means "identification number". The meaning of the handle varies depending on the PLC driver. The handle with S5 controls is, for example, the number of the data word from a data module. The number of the data module is, in turn, adjusted in the PLC driver. For further information, refer to the PLC driver description.

Of course, parameterisation also includes the number of digits on the display, upper and lower limits of nominal values, variable type etc.. You may also deposit a description on the variable in order to explain its function. This only serves documentation purposes and has no meaning for the operating panel.

If you have created several variables at the same time, all fields of this mask are taken over into the new variable. Except, of course, the name and

handle, which are generated.

loc	name	format	handle	type	low limit
I	NEUVAR8	#####	8	1	

Below the table are buttons: 'New var' and 'Delete var.' with a red arrow pointing to the selected row.

You can generate a new variable via the "New var." button; via "Delete var." the currently selected variable is deleted.

How can I parameterise a variable?

Quite simply: Scroll into the table of variables until you come across the desired variable. Double-click the line with the variable - and the above illustrated parameterisation window shows up.

Here, you can make all settings.

You reach this window both from the "small" and the "large" table of variables.

It is very difficult to find the variables. Is it possible to sort the table?

Of course it is. For this purpose, click onto the respective heading in the table. With large tables, this process may take approx. 2 seconds.

The sorting option is available both for the small and the large display of the table of variables.

8.6.4.1 Handle

In the "Handle" field, you have to assign a number to the variable. Internal variables such as date, time, etc., have already fixed numbers. The number has 16 bits, consequently, the value range lies between 0 and 65500. Some handles are reserved for internal variables and must not be assigned double!

8.6.4.2 Format

The "format" field is used as a text entry when inserting variables into a page and can even be modified there, carefully of course! (You should, for example, not change the position of the decimal point).

8.6.4.3 Upper and lower limit, step value

Some additional information on the lower limit, upper limit and step value fields: If you enter the name of a variable here (observe the use of small and capital letters!), the operating panel also calls up the values of the upper and lower limit from the PLC (if these are external). With this function, upper and lower limits can be set for a machine without having to modify the visualisation project in the device. This is a great thing! Please observe to correctly indicate the variable names, i.e. ensure the correct use of small or capital letters. Of

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course, you can also use "combinations"; e.g. the lower limit is permanently adjusted, the upper limit is variable, etc..

The "lower limit", "upper limit" and "step value" settings are not used until you use the variable as nominal value on a page. If you have filled in the "step value" field, the nominal value automatically becomes a "nominal value with step processing".

8.6.4.4 Comments

The "Comment" field serves for variable-related descriptions. The content of this field has, however, no meaning for the operating panel.

8.6.5 Special variables

In the operating system of the operating panel, a series of variable handles has been permanently reserved for internal variables.

Handle	Variable	Variable name
65535	Invalid	
65534	Date	I_Date
65533	Time	I_time
65532	Weekday	I_weekday
65531	Runtime	I_runtime
65530	Language	I_language
65529	Selecan address	-
65528	Priority	I_priority
65527	Device temperature	-
65526	Keyboard layout	-

Some of these variables are automatically created by the editor and provided with the identification "S" for "System". These variables cannot be modified. The variables I_date, I_time and I_weekday are only useful for panels with real-time clock. You can identify these devices by a "2" on the third digit of the device type. The ITS6220 is, for example, equipped with a clock, the ITS6200 is not.

8.6.5.1 I_Date variable

This variable displays the date of the real-time clock and, like the time, can also be used and adjusted as nominal value.

8.6.5.2 I_Time variable

This variable displays the time of the real-time clock and can be used as an actual value or nominal value. This means, you can set the time via the keyboard if you provide the variable as a nominal value on a page; This variable is automatically entered into the real-time clock.

8.6.5.3 I_Weekday variable

This variable cannot be used as a nominal value; the real-time clock computes the weekday on the basis of the date. The values are

0=Sunday, 1=Monday, etc. up to 6=Saturday.

If you use a text list whose weekdays have been entered in accordance with this sequence, you may even display the tag as a string by simply converting the weekday variable into a text list.

8.6.5.4 I_Run-time variable

This variable is can also only be used as an actual value. It indicates the total operating time of the device. The time is counted in seconds; "TimeMin" is a recommendable display format.

8.6.5.5 I_Priority variable

This variable has a special function for menu items and nominal values. The purpose of this variable is to establish several levels for the access authorisation. This way, depending on the priority, certain nominal values and/or menu items can be locked on a page. A single page can be designed in a way as to grant the system engineer access to all setting options, the machine foreman to certain setting options and the machine operator to only the minimum required setting options. This considerably spares programming work.

For this purpose, enter priority 0 for menu items or nominal values, which should be operable independently of the settings in I_Priority. If you now assign priority 4 to a nominal value, this value is only operable if the value of the I_Priority variable is smaller or equal 4. If I_Priority is 5, this nominal value is no longer operable.

8.6.5.6 I_Language variable

This variable allows for a comfortable language changeover of the operator guidance. What does this mean?

Assumed you have created approx. 30 pages for your operator guidance. If you translate these pages into another language, you need to save the pages under a new number and observe the language to be displayed when calling up pages as well as compute a new language-related page number.

All these procedures are completely in the field of responsibility of the operating panel; you have to configure only two or three things. This can best be documented by an example: You want to realise the operator guidance in German and English. You have to display 30 pages, the pages 0-29. Save the German operating texts under these page numbers. The English operating texts are to be saved under the numbers 100 to 129. Now, set

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100 in the "Page offset per language" field under the menu "Device"/"Parametrize"/"Pages and messages".

Effect: If you call up a page, the respective page is administered with the number of the call-up in the internal stacks. The display, however, shows the page which is calculated as follows:

Display page=Call-up page+I_Language*Page-Offset

If the calculated page is not available, the actually called up page is displayed.

This means for you: You just have to set the variable I_Language with the desired language number (for our example 0=German, 1=English), configure the offset and - that's it. For the PLC program the code remains unchanged for the page call-up.

If you now enter the I_Language variable as a nominal value via a text list, you have realised a very comfortable changeover.

The same applies of course to messages (messages are provided with an own offset). And the LD benefits as well from this technology. Requests whether page 3 is active (or on the display) are also processed as the real page number has been recorded internally.

8.6.5.7 SELECAN device address

Currently, another handle is available on the basis of which a variable can be created and the device address (SELECAN) can be individually adjusted via the display.

This handle has the number 65529. If you assign this handle to a variable, you can provide the device address (SELECAN) as a nominal value entry. This is useful for applications where several operating panels with an identical configuration are used at different system positions. In such cases, the device address can be set directly at the installation site via, for example, a service page.

8.6.5.8 Internal device temperature

The operating panel is equipped with an internal temperature sensor which measures the internal device temperature. Normally it is used to carry out a temperature compensation for brightness and contrast. But it can also be read: if you draw up a variable with the handle 65527, you receive the internal device temperature in degrees Celsius. The resolution is not very accurate (approx. 3°), but if this is sufficient for your purposes, you can use the variable.

8.6.5.9 Keyboard layout

As the devices of the AT series are used worldwide and can be equipped with a standard interface for PS/2 keyboards, it was necessary to create a possibility to support various country-specific keyboard layouts. Currently, the devices support 12 different layouts.

Layout No.	Description
0	(US-) American mapping
1	German mapping
2	French mapping
3	English mapping
4	Italian mapping
5	Spanish mapping
6	Swedish / Finnish mapping
7	Belgian mapping
8	Danish mapping
9	Norwegian mapping
10	Swiss mapping (German and French)
11	Portuguese mapping

If a variable with handle 65526 is created in the project, this variable maintains the currently adjusted layout.

The changeover takes place via a CAN telegram (refer to the Communication manual) or via a variable modification. The changeover becomes immediately active without the device having to be re-started.

If the variable is modified via the usual telegrams or also via the nominal value input, the keyboard layout is automatically changed. If the keyboard layout is changed via the above mentioned telegram, the new value is also passed on to the variable. A layout number larger than 11 is ignored. The layout setting is permanently saved in the EEPROM. This means, the setting is restored when the device is switched on and filed in the variable if the project is provided with this variable. As a consequence, the layout setting which was active when the device was switched off is automatically reactivated after the device has been switched on. Therefore, you do not have to restore the old setting when the device is switched on again. The EEPROM is automatically updated if the layout per variable or telegram is modified.

8.6.5.10 Text list variables

The so-called text list variable is a special type of variable. In this case, a list of entries is assigned to a variable. The variable itself then only serves as an index in this list.

Application: e.g. the display of a colour. Imagine

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you want to display a colour in a system. Normally, you have not saved the words "yellow", "green", "red", etc. in the PLC, but a colour number. This is where the text list variable comes in. You simply write one colour after another into a file. If you write the colours as above, "yellow" is displayed with variable=0, "green" with variable =1, "red" with variable=2, etc..

As a result, you can spare the user the plain number values of the colours and display the facts.

8.6.5.11 Text list as nominal value = selection

You can also use the text list variable as nominal value: The operator does not have to enter the colour number (hard to know them by heart). Instead, he can use the arrow keys to scroll to the requested colour just as with a nominal value with step-processing. And the correct number is sent to the PLC.

8.6.6 LD variables

All variables such as @MB0, SYS(MenuIndex), etc. are described in the operating panel manual, section 2 "Controlling with a ladder diagram".

These variables cannot be displayed directly. If you want to display an LD variable, you have to transfer this variable via a relay into an internal variable.

9 Device settings

You will repeatedly require the settings described in this chapter. They are very versatile and complex at the same time.

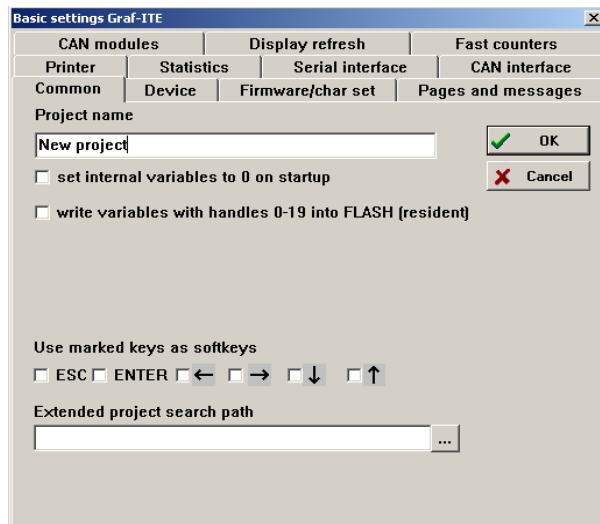
The device settings can be accessed via Device>Parametrize in the editor menu. The following section describes the respective index card dialogue.

Each index card offers a variety of setting options. The indexes are thematically structured.

Some index cards only contain parameters which can be set to specify other settings.

In order to select an index card, click the "tab" with the name of the index card. The respective index card then appears in the foreground.

9.1 "Common" index card



This card contains the basic project settings which influence the general behaviour of the device:

9.1.1 Project name

The project name only serves for an easier identification of the project and can be specified arbitrarily. This name is only required for your own documentation purposes; it appears as headline when the project data are printed out.

9.1.2 Set internal variables to zero

By ticking the "Set internal variables to 0 on start-up" field, the operating panel is instructed to set all internal variables to 0 when the panel is switched on.

Important! If this option has not been activated and the operating panel is not equipped with a clock/battery, the variables show coincidental values at program start.

9.1.3 Variables into FLASH

Not all operating panels are equipped with a bat-

tery. As a consequence, the values of the internal variables get lost in case of a power failure and when the panel is switched off.

This switch enables you to instruct the operating panel in case of a power loss to write the variables with the "handles" 0 - 19 into the FLASH and to re-write these values into the variables when the voltage returns. Therefore, important parameters can be also saved in panels without battery. This setting has priority over the "Set internal variables to 0 on startup". This means, if you activate both settings, the variables with handle ≥ 20 are set to 0 and the variables 0 to 19 are preoccupied with data from the Flash memory.

9.1.4 Soft keys

The "soft key" function is normally only required for panels without a number pad.

The setting "Use marked keys as soft keys" is used to decouple the standard menu keys of the operating panel from the device-internal menu functions and to make the keys available for the PLC.

This setting is globally applicable for all pages. You may also enable menu keys in individual pages ("Configure page"), but if you want to permanently enable a key, you can do this via this function and do not have to tick each page.

The transfer of these soft keys to the PLC is driver-dependent, but is equally executed as the transfer of other keys.

IMPORTANT! If a key is used as a soft key, it is not transferred to the internal control program. If you want to switch off the menu function of a key although the internal control program should respond to the key, assign the menu key function to a non-existing key (in the "Device" index card, e.g. ESC menu function to key 20). This way, the internal menu function is cut off and key 2 (which is normally ESC) is processed as "normal" key without menu function. In this case, it is not necessary to adjust a soft key function.

9.1.5 Extended project search path

The "Extended project search path" also allows you to call up files from another index than the project index. In this context you should know that the editor searches project-related files exclusively in the project index.

To ensure that different projects can be located in different indexes and share files (e.g. bitmaps, text lists), this project-related setting has been generated. The editor first searches the project index for files. If the search is not successful, it continues in the "Extended project search path". If the editor does not find the files there either, it accesses the "Extended editor file search path".

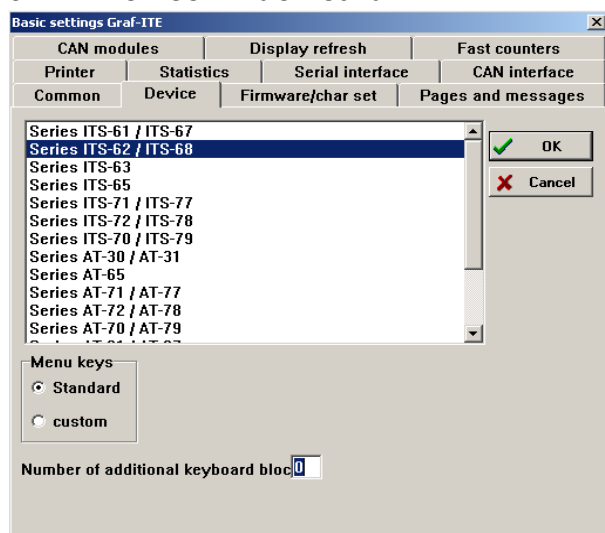
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The search index can be indicated absolutely (e.g. C:\Programs\GRAF_ITE\LIB) or relatively (e.g. LIB). Difference: Supposing your project is stored in C:\Programs\GRAF_ITE\Projects\. If you now use the absolute index mentioned in the example, the editor first searches C:\Programs\GRAF_ITE\Projects, then C:\Programs\GRAF_ITE\LIB. With the relative LIB index it would first search C:\Programs\GRAF_ITE\Projects, then C:\Programs\GRAF_ITE\Projects\LIB for the files. It thus combines the indexes.

The same applies to the extended editor search index which is searched in the third place.

Recommendation: Where possible, only specify relative paths to the project index. It is then easier for you to copy or to move the project to another hard disk or into another index structure.

9.2 "Device" index card



9.2.1 Device series

Enter the device-specific settings in this card. As different device series feature a large variety of functions and not every panel supports all features, the correct setting of the device type is absolutely necessary. The features of the different devices are listed in the respective data sheets.

9.2.2 Keyboard extensions

All device series can be delivered with keyboard extensions in steps of eight; refer to the order code for these extensions.

In the "Number of additional keyboard blocks" you have to indicate how many key blocks are added to the basic device.

You can use these key blocks to realise additional operating functions within your system.

9.2.3 Menu keys

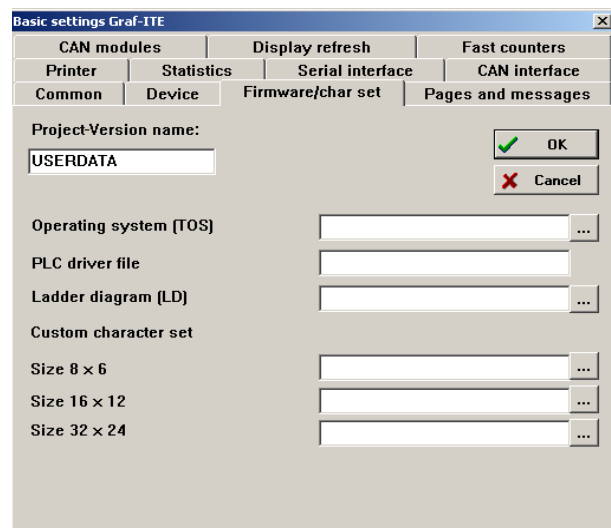
This option is offered by all devices without a

number pad. If you select the "standard" option, all keys have the functions described in Chapter 7.

With the "custom" option, you can assign the menu keys to different function keys. The numbering of the keys starts on the top left and goes from the left to the right, to the next line and again from the left to the right.

If you adjust the values for the standard assignment, the "custom key configuration" window disappears as if you would have selected "standard". If you no longer want to use a key as menu key but only for the internal control program, specify a key for the respective menu function which is not available in your device. For example key 20 if the device has only 8 keys. Then, the original key is free from menu functions and is reported only to the internal control program.

9.3 "Firmware/char set" index card



In this index card, you have to specify additional project-related files and the project name.

9.3.1 Project-version name

When the operating panel is switched on, this field displays the first 8 characters in the so-called publicity text. This enables you to immediately identify the project loaded in the device.

Information on how you create or edit a publicity page are available in Chapter 3.

This information can also be called up via a CAN telegram to allow the PLC to identify the version running in the operating terminal.

9.3.2 PLC driver file

The editor displays which PLC driver is loaded into the project. PLC drivers are not automatically integrated in the operating system, but are supplied with the editor as loadable drivers.

These drivers can be loaded into the operating panel together with the project. On the basis of the "Operating system (TOS)" field and the "Serial in-

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terface" setting, the editor determines the required driver file (".drv"-file).

The file name of the driver contains two letters for the PLC type for which it is determined as well as the operating system version (TOS) of the operating panel with which it works together.

Example: S5044S00.DRV (S5-driver for operating system IO044S00.HEX). The driver version is always identical with the version of the operating system (in this case 044).

In the publicity page, you can see whether a PLC driver has been loaded into the panel. This field always displays the first two letters of each driver:

DRV: FX (for Mitsubishi FX-controls) or

DRV: S5 (for Siemens S5-controls) or

DRV: AS (ASCII Request/Response driver)

DRV: TG (ASCII Telegram driver)

DRV: VT (VT-100 Terminal emulation)

If the driver code (FX, S5, AS, TG, VT) starts to blink, a wrong driver version has been loaded, i.e. driver and operating system are not compatible.

If DRV does not appear: no driver has been loaded.

CAN drivers are always integrated in the operating system, therefore they are always loaded.

9.3.3 Operating system (TOS)

The operating panel operating system has a modular design. It consists of a BIOS (Basic Input Output System, basic functions for input and output) and a TOS (Terminal Operating System, user surface).

The ITE editor is supplied with the latest TOS version. The TOS operating system is transferred to the device if "Operating system and project" have been specified during loading.

Enter the file name of the operating system, e.g. IO056S00.HEX, in this field.

Via the "..." button. Behind the input field, you receive a list of all operating systems available in the path ...\\GRAF_ITE\\TOS. The editor automatically copies the TOS to be used into the project path.

9.3.4 Ladder diagram (LD)

Enter the file name of your generated control program in this field. This program is then called up by the TOS of the device.

For operating panels of the ITS series, the control program is generated in the form of a ladder diagram. Devices of the AT series also offer the high-level language "C". For both types, a programming interface is available (LD, GCE).

The control program is interpreted as part of the project; i.e. it is loaded into the devices like pages and messages etc.

Normally, the control program receives the same name as the project.

During translation, LD and GCE create a file with

the .HEX or ATX identification, which contains the executable control program. If, for example, your project is named "PLANT.ITE", you will find the control program under "PLANT.HEX" or "PLANT.ATX". The respective source files are called "PLANT.LD" or "PLANT.C"

The control program is optional and is not required to be loaded.

A detailed description of the "Controlling with ITS/AT" topic is available in the Operating panel manual - Part 2.

9.3.5 Custom character sets

You can load an individually designed character set into the operating panel and use it. For this purpose, enter a bitmap graphic file which contains the character set in the appropriate pixel size into each of the "size 8 x 6", "size 16 x 12" and "size 32 x 24" fields. These three files correspond to the different font sizes.

You can use the "C8X6.BMP", "C16X12.BMP" as well as "C32X24.BMP" files as sample character sets.

DO NOT CHANGE THESE ORIGINAL FILES, BUT COPY THEM UNDER ANOTHER NAME.

If you have generated character sets and entered them here, an additional "custom char set" field shows up in the mask for text parameterisation (can be accessed via a double-click on the text). If you activate this field, your individually generated character set is used for this text instead of the standard character set. The editor even displays this character set, which allows you to get an impression of the effect on the display.

You can click the mouse directly on the self-defined signs via the "ASCII-table".

9.4 "Pages and messages" index card

Basic settings Graf-ITE

CAN modules		Display refresh	Fast counters
Printer	Statistics	Serial interface	CAN interface

Common Device Firmware/char set Pages and messages

☒ Permitted to scroll active pages

Message display in pages

☐ Messages always in line

☒ Messages as designed

Page alternation time: 0 s [0=don't alternate]

Message alternation time: 0 s [0=don't alternate]

Language settings

Page offset per language: 100

Message offset per language: 100

OK Cancel

This mask contains settings which refer to the rep-

resentation of messages and pages on the display.

9.4.1 Scroll pages

You can allow the operator to scroll through all pages which are saved within the project. It is always possible to scroll through pages which are part of the page stack (refer to Chapter 8).

If you tick the option "Permitted to scroll active pages", the operator may scroll without restrictions ... except with ITS/AT 7x. This operating function does not exist for this device.

9.4.2 Message line

Of course, the two display levels pages and messages cannot be completely independent as they even use the same display.

The "Message line" setting determines how the "message" level is embedded into the "page" level.

9.4.2.1 Fixed message line

If you select the "Message always in line X" setting, all messages always appear in the specified line. The line number ranges from 0 to 7 (or 15).

9.4.2.2 Variable message line

Messages can be also freely created on the display. If you select the "Messages as designed" option, the messages appear in the line where they were created in the editor. In this case, messages can be displayed freely and independently of the currently active page.

9.4.3 Page alternation time

If several pages have been entered into the page stack, normally the page on top of the stack appears.

You can, however, instruct the operating panel to display all pages of the stack consecutively. Just enter the time in seconds during which a page should be active on the display before the editor calls up the next page of the stack. If you set this value to 0, the alternating function is switched off.

9.4.4 Message alternation time

As with pages, the operator may also activate an alternating function for messages. In this case, however, it must be observed that messages are treated according to their different priority levels. The alternating function only refers to messages of the currently highest priority level.

As with pages, enter the time in seconds during which a message should be active on the display before the next message arrives on the display. If 0 is entered, the pages are not alternated. The last message with the highest priority is displayed.

9.4.5 Language settings

The operating panel offers a high-capacity language management. You (or your PLC) do not need to bother which language has been set. For this purpose, the operating panel provides the "I_language" variable into which you can enter a number. On the basis of this number, the calculation of the actual message number is initiated during the display.

As a result, you can easily create multilingual projects. First create the pages in language 0. If you have succeeded doing so, create the second language by copying pages with the same offset into a new page. Enter this offset into the "Page offset per language" field.

Example:

You have created your project and you use the pages 0 to 56.

Provide for a page into which you can enter the "I_language" variable as nominal value. This is particularly easy by means of a text list, in which you can call the language by the name. It is also possible to use the national flag as nominal value via a diashow bitmap!

Ensure, however, that the lower limit value is set to 0 and the upper limit value to the number of the languages - 1 you have created or want to create. Enter 100 in the "Page offset per language" field. Copy page 0 into page 100, 1 in 101, 2 in 102 etc. Only translate the texts into the additional language and leave everything else unchanged. Start the third language at page 200 etc.

If you call up a page now, the called-up page is managed in the stacks. The operating panel calculates for the display of the page:

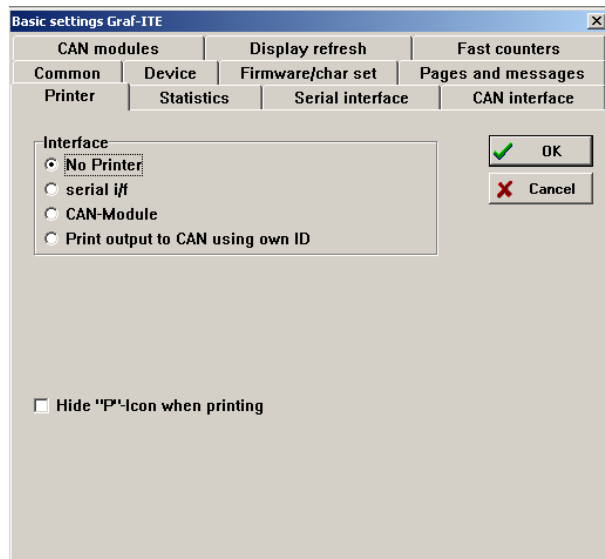
$$\text{pageno} = (\text{I_language} * \text{pageoffset}) + \text{callupnumber}$$

This calculation takes place with all call-ups from the control program, PLC, CAN, menu options etc. You therefore do not need to further edit pages in which you have parameterised menu options. This is all done by the operating panel.

This of course also applies to messages. Messages even have their own "Message offset per language".

9.5 "Printer" index card

The ITS/AT is able to directly print out incoming messages on a serial printer. In this card, you can select your printer connection:



The printer can also be connected to a CAN printer module, which is integrated in a CAN bus network. The "Printer on CAN" only appears if the "CAN-module" has been selected as printer connection.

9.5.1 Interface

Here, you have to indicate, whether you use a printer and if yes, which type of printer.

9.5.1.1 No printer

If you do not connect a printer, please select "No printer". The operating panel then ignores the printer-related settings of pages and messages and deactivates the printer functions of protocol and statistics.

9.5.1.2 Serial printer

If you connect a printer to the serial interface of the ITS, please select the "Serial i/f" option. The baud rate setting must then be made in the "Serial interface" index card, where you have to choose the "No driver" option.

9.5.2 Printer to CAN-module

Select this setting if you connect the printer to a CAN module with SELECAN protocol which can serve as a printer interface.

If you select this setting, you are required to enter the node/module address of the CAN printer module in the "Printer on CAN" field that shows up now.

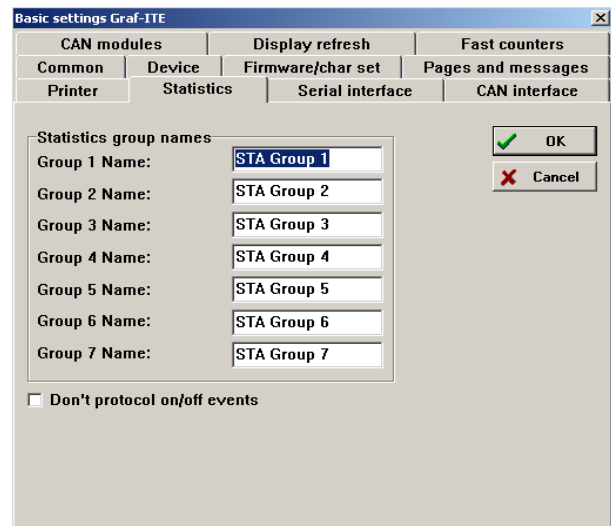
9.5.2.1 Print output to CAN using own ID

If you select this setting, the operating panel transfers the print data to the CAN bus by means of the transmit selected in the "CAN interface" index card. This option is necessary in some systems.

9.5.3 Hiding "P"-icons

During the print-out process, the operating panel displays a blinking "P" symbol. This symbol can be hidden by ticking this field.

9.6 "Statistics" index card



One version of the operating panel features both protocol and statistic functions (refer to the order documents). You can set up seven statistic groups and enter a name for these groups here.

The names are restricted to 8 characters!

These names appear on the display whenever you call up a statistic page and read these statistics.

9.6.1 Do not protocol on/off events

The panel no longer protocols the "Device switched off" or "Device switched on" events if you activate this field.

9.7 "Serial interface" index card

In this field, you have to parameterise the serial interface. The serial interface can either be directly used in the control program or as a PLC-interface. If a PLC is serially connected, the setting options of the PLC-driver are displayed in the lower section. The index card changes its content depending to the selected PLC-driver.

9.7.1 No PLC-driver

Please select this setting if the serial interface remains free or a printer is serially connected. Adjust the respective values for your application in the "Setup of serial interface" field.

These settings can, for example, be adjusted for the connection of a serial printer.

Basic settings Graf-ITE

CAN modules		Display refresh	Fast counters
Common	Device	Firmware/char set	Pages and messages
Printer	Statistics	Serial interface	CAN interface

PLC driver (RS232)

☐ No driver
☐ SIEMENS S5 (AS511)
☐ Mitsubishi FX
☐ ASCII (Request/Response)

☐ ASCII (like Telegrams)
☐ VT100
☐ Custom driver

OK Cancel

Setup of serial interface

Baudrate

☒ 9600 ☐ 1200
☐ 4800 ☐ 600
☐ 2400 ☐ 300

Parity

☒ none
☐ odd
☐ even

Data bits

☐ 7
☒ 8

Stopbits

☐ 1
☒ 2

9.7.2 Siemens S5 (AS511)

With Siemens S5-controls, the operating panel can be directly coupled to the PG interface. The data exchange is carried out as with a programming unit, though it is automatically controlled by the operating panel.

You have to determine which data areas (flag words and data modules) you want to access.

Basic settings Graf-ITE

CAN modules		Display refresh	Fast counters
Common	Device	Firmware/char set	Pages and messages
Printer	Statistics	Serial interface	CAN interface

PLC driver (RS232)

☐ No driver
☒ SIEMENS S5 (AS511)
☐ Mitsubishi FX
☐ ASCII (Request/Response)

☐ ASCII (like Telegrams)
☐ VT100
☐ Custom driver

OK Cancel

Please setup PLC driver file in card "programs" too !

Data block (DB)/Flag-bytes (MB) for

Actual val.: 0 Nominals: 0 pages 8 x8 messages 16 x8

status: 0 lower limits: 0 prio pages: 8 x8

Page/mess: 0 upper limits: 0 LEDs 1 x8 keys 1 x8

Keys: 0 step values: 0

The meaning of the individual fields is explained in the Chapter "PLC-driver", in the section "Siemens S5" of the "Communication" manual. Please look up the details in this manual.

Do not forget to check whether the appropriate driver-file has been entered in the "Firmware" card.

9.7.3 Mitsubishi FX

If you select this option, the lower part of the index card changes:

Basic settings Graf-ITE

CAN modules		Display refresh	Fast counters
Common	Device	Firmware/char set	Pages and messages
Printer	Statistics	Serial interface	CAN interface

PLC driver (RS232)

☐ No driver
☐ SIEMENS S5 (AS511)
☒ Mitsubishi FX
☐ ASCII (Request/Response)

☐ ASCII (like Telegrams)
☐ VT100
☐ Custom driver

OK Cancel

Please setup PLC driver file in card "programs" too !

Data register/Flags for

Actual val.: 0 Nominals: 0 pages 8 x8 messages 16 x8

status: 0 lower limits: 0 prio pages: 8 x8

Page/mess: 0 upper limits: 0 LEDs 1 x8 keys 1 x8

Keys: 0 step values: 0

The setting of the serial interface (9600 baud, 7 data bits, 1 stop bit, even parity) is determined here.

You can carry out the settings for the data areas which are used in the PLC for the data exchange with the operating panel.

The meanings of the settings are described in the Chapter "PLC-driver" of the "Communication" manual. Do not forget to check whether the appropriate driver-file has been entered in the "Firmware" card!

9.7.4 Free (Request/Response)

The free ASCII protocol in the Request/Response mode enables you to realise a simple control of the operating panel: It calls up the required data and you only have to answer the questions. Details on this topic are available in the Chapter "PLC-drivers", in the "Communication" manual.

This index card offers you to make settings with regard to the request behaviour and adapt the inter-

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face parameters to your demands:

Basic settings Graf-ITE

CAN modules | Display refresh | Fast counters

Common | Device | Firmware/char set | Pages and messages

Printer | Statistics | Serial interface | CAN interface

PLC driver (RS232)

☐ No driver ☐ ASCII (like Telegrams) ☒ OK

☐ SIEMENS S5 (AS511) ☐ VT100 ☒ Cancel

☐ Mitsubishi FX ☐ Custom driver

☒ ASCII (Request/Response)

Please setup PLC driver file in card "programs" too !

Absolute request addresses for

Actual val.: 0 Nominals: 0 pages messages

status: 0 lower limits: 0 prio pages: 8 x8 16 x8

Page/mess: 0 upper limits: 0 LEDs keys

Keys: 0 step values: 0 1 x8 1 x8

Setup of serial interface

Baudrate

☒ 9600 ☐ 1200

☐ 4800 ☐ 600

☐ 2400 ☐ 300

Parity

☒ none

☐ odd

☐ even

Data bits

☐ 7

☒ 8

Stopbits

☐ 1

☒ 2

9.7.5 Free (telegram communication)

This driver works similarly as the driver of the CAN-bus interface. Telegrams are exchanged in the same format as with the CAN-bus.

In this field, you can only adjust the interface parameters, the telegrams have already been determined and do not require parameterisation:

Basic settings Graf-ITE

CAN modules | Display refresh | Fast counters

Common | Device | Firmware/char set | Pages and messages

Printer | Statistics | Serial interface | CAN interface

PLC driver (RS232)

☐ No driver ☒ ASCII (like Telegrams) ☒ OK

☐ SIEMENS S5 (AS511) ☐ VT100 ☒ Cancel

☐ Mitsubishi FX ☐ Custom driver

☐ ASCII (Request/Response)

Please setup PLC driver file in card "programs" too !

Setup of serial interface

Baudrate

☒ 9600 ☐ 1200

☐ 4800 ☐ 600

☐ 2400 ☐ 300

Parity

☒ none

☐ odd

☐ even

Data bits

☐ 7

☒ 8

Stopbits

☐ 1

☒ 2

9.7.6 VT-100

You may also use the operating panel as a mere VT-100 terminal. It understands most of the VT100 control sequences. The chapter "PLC-driver" in the "Communication" manual contains a list of control sequences.

The following setting options are available on the

index card:

Basic settings Graf-ITE

CAN modules | Display refresh | Fast counters

Common | Device | Firmware/char set | Pages and messages

Printer | Statistics | Serial interface | CAN interface

PLC driver (RS232)

☐ No driver ☐ ASCII (like Telegrams) ☒ OK

☐ SIEMENS S5 (AS511) ☒ VT100 ☒ Cancel

☐ Mitsubishi FX ☐ Custom driver

☐ ASCII (Request/Response)

Please setup PLC driver file in card "programs" too !

VT100 options

Driver option: 0 0 = VT100/VT101 standard

1 = additional codes: ESC =

Setup of serial interface

Baudrate

☒ 9600 ☐ 1200

☐ 4800 ☐ 600

☐ 2400 ☐ 300

Parity

☒ none

☐ odd

☐ even

Data bits

☐ 7

☒ 8

Stopbits

☐ 1

☒ 2

9.7.7 Custom drivers

For future developments, a possibility has been established to integrate universally applicable drivers. Only the first two letters of the driver name are entered, the driver settles the rest.

Details on the new drivers can be obtained directly from our Customer Support.

Basic settings Graf-ITE

CAN modules | Display refresh | Fast counters

Common | Device | Firmware/char set | Pages and messages

Printer | Statistics | Serial interface | CAN interface

PLC driver (RS232)

☐ No driver ☐ ASCII (like Telegrams) ☒ OK

☐ SIEMENS S5 (AS511) ☐ VT100 ☒ Cancel

☐ Mitsubishi FX ☒ Custom driver

☐ ASCII (Request/Response)

Please setup PLC driver file in card "programs" too !

Driver settings

P1 0 P5 0 S1 8 S2 16

P2 0 P6 0 S3 8

P3 0 P7 0 S4 1

P4 0 P8 0 S5 1

Setup of serial interface

Baudrate

☒ 9600 ☐ 1200

☐ 4800 ☐ 600

☐ 2400 ☐ 300

Parity

☒ none

☐ odd

☐ even

Data bits

☐ 7

☒ 8

Stopbits

☐ 1

☒ 2

9.8 “CAN interface” index card

Basic settings Graf-ITE

CAN modules Display refresh Fast counters

Common Device Firmware/char set Pages and messages

Printer Statistics Serial interface CAN interface

☐ SELECAN protocol

☒ custom CAN-protocol

☐ CAN-open protocol

custom CAN-protocol

transmit ID 220_

receive ID 221_

☐ MultiMaster

☐ activate filter

Busrate

☐ 10 kBit/s

☐ 20 kBit/s

☐ 50 kBit/s

☐ 100 kBit/s

☒ 125 kBit/s

☐ 250 kBit/s

☐ 500 kBit/s

☐ 1 MBit/s

Update time for actuals/nominals: 10_ *10ms

Minimum wait between CAN-telegrams: 0_ *10ms

OK

Cancel

This index contains the settings for the CAN interface which is installed in every operating panel. As CAN has been largely standardised (at least as far as the hardware and the telegram structure are concerned) the settings are not very comprehensive. Nevertheless, you have to enter settings as the bus rate, protocol type and identifier (this is a kind of transmitter/receiver identification).

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9.8.1 Protocol

The operating panel is able to create company-specific protocols, free CAN protocols and CAN-open. Depending on the protocol you use, you have to make a respective selection. The input fields vary depending on the selected protocol.

9.8.1.1 SELECAN protocol

The SELECAN protocol is a proprietary protocol which was originally intended for de-centralised extensions for PLC systems.

The protocol has been integrated in the operating panel as the CAN-modules of the GRAF-SYTECO GCM series use this protocol.

Basic settings Graf-ITE

CAN modules		Display refresh	Fast counters
Common	Device	Firmware/char set	Pages and messages
Printer	Statistics	Serial interface	CAN interface

☒ SELECAN protocol
☐ custom CAN-protocol
☐ CAN-open protocol

SELECAN protocol
device no.

CAN master/slave
☐ Terminal is slave
☒ Terminal is master

Busrate
☐ 10 kBit/s
☐ 20 kBit/s
☐ 50 kBit/s
☒ 100 kBit/s
☐ 125 kBit/s
☐ 250 kBit/s
☐ 500 kBit/s
☐ 1 MBit/s

Update time for actuals/nominals: *10ms
Minimum wait between CAN-telegrams: *10ms

OK Cancel

Device number

With the SELECAN protocol, each device in the bus receives a node number which is entered into the CAN-identifier. This number which must lie within the range of 0 and 31, identifies the protocol in the bus. A maximum of 32 stations can be connected within one bus segment.

A master should always be assigned 0. If you want to use a slave, take a number other than 0.

ITS CAN configuration

Set "master" under "ITS CAN configuration" if the operating panel is operated with modules of the GCM series and is required to carry out a bus monitoring.

Bus rate

As the CAN bus has no automatic baud rate detection, please adjust the transfer speed in this field. All bus devices must have the same transfer speed.

9.8.1.2 Free CAN protocol

With this protocol, the device receives two identifiers.

:

Basic settings Graf-ITE

CAN modules		Display refresh	Fast counters
Common	Device	Firmware/char set	Pages and messages
Printer	Statistics	Serial interface	CAN interface

☐ SELECAN protocol
☒ custom CAN-protocol
☐ CAN-open protocol

custom CAN-protocol
transmit ID
receive ID channels..

☒ MultiMaster
☐ activate filter

Busrate
☐ 10 kBit/s
☐ 20 kBit/s
☐ 50 kBit/s
☐ 100 kBit/s
☒ 125 kBit/s
☐ 250 kBit/s
☐ 500 kBit/s
☐ 1 MBit/s

Update time for actuals/nominals: *10ms
Minimum wait between CAN-telegrams: *10ms

OK Cancel

Transmit ID

Enter the device identifier the operating panel should use for transmission into the "Transmit ID" field.

Receiver ID

The "Receiver ID" field contains the identifier which is used for the message reception of the operating panel.

MultiMaster

If you tick "MultiMaster", you may activate further receiver IDs for the operating panel via the "Channels" switch. This option becomes necessary if you have more than one PLC in a bus segment which should all access the same operating panel. If these PLCs simultaneously had to transmit on the same receiver channel, telegrams would collide and bus errors would occur.

Multiple master configuration

Master channel	copy to LD
Master channel 1	<input type="checkbox"/> copy to LD MB0-MB7
Master channel 2	<input type="checkbox"/> copy to LD MB8-MB15
Master channel 3	<input type="checkbox"/> copy to LD MB16-MB23
Master channel 4	<input type="checkbox"/> copy to LD MB24-MB31
Master channel 5	<input type="checkbox"/> copy to LD MB32-MB39
Master channel 6	<input type="checkbox"/> copy to LD MB40-MB47
Master channel 7	<input type="checkbox"/> copy to LD MB48-MB55

OK Cancel

How can the operating panel deliberately address a control?

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It cannot. It transmits by means of the identifier which has been specified in the "Transmit ID" field. With the CAN-Bus, all stations are always switched over to "receive". If a PLC receives a CAN message from the operating panel, the PLC program decides in the PLC whether to respond or not.

Evaluating telegrams in the internal control program

The internal control program offers the possibility to evaluate telegrams with any identifier and content. This becomes necessary if you integrate the operating panel in an existing system and want to call up the telegrams pending in the bus. The identifiers/telegrams stated in the MultiMaster can be transferred to the internal flag area.

If you require this function, tick "copy to" behind the respective channel.

If a telegram is received with the indicated identifier, the data bytes of the telegram are written into the internal flag bytes, where they are then evaluated. The TOS is no longer involved in the telegram evaluation, if the "bypass" to the internal control program has been activated.

Bus rate

There is no automatic detection of the data transmission rate on the CAN bus. Please enter the desired transmission rate here.

With filter function

With high bus transmission rates and a high bus utilisation, system errors may occur in the panel if the operating panel considers all telegrams. With the filter function, it only considers telegrams marked by identifiers, which lie between the smallest and the largest of the indicated identifiers (MultiMaster!). By means of a clever division of identifiers, all telegrams which are not determined for the device can be neglected.

Update time for variables

The operating panel has internal and external variables. If external variables are contained in a page, the panel must request these variables from the PLC and update them continuously.

On the basis of this setting, you can determine the update frequency for variables.

Minimum wait between CAN telegrams

This setting should be set to 0. There is only one exception: If the control which receives the CAN messages requires a break between the messages. This is e.g. the case if the CAN interface has no buffer and only one message per cycle can be read. If the time between incoming messages is too short for such a system, the messages may be overwritten and get lost.

This setting is only rarely required as messages on the CAN bus are usually processed quickly enough. If you enter any values in these fields, observe that under no circumstances the "interval time" is shorter than the minimum waiting time! Otherwise, the operating panel faces a tricky situation....

9.8.1.3 CANopen protocol

Here you can parameterise the ITS for a CANopen environment. A detailed description of the setting of the individual parameters is available in the Chapter CANopen, in the Chapter PLC-driver of the "Communication" manual and in the "Controlling with ladder diagram" manual:

Basic settings Graf-ITE

CAN modules		Display refresh	Fast counters
Common	Device	Firmware/char set	Pages and messages
Printer	Statistics	Serial interface	CAN interface

☐ SELECAN protocol
☐ custom CAN-protocol
☒ CAN-open protocol

☐ CAN master/slave
☐ Terminal is slave
☒ Terminal is master

CAN-open protocol
Knotennummer: 1 Additional PDO's...

Guard time: 0 x 100 ms

Life time: 1 x Guard time

Download-ID's
Send 385
Receive 513

Busrate
☐ 10 kBit/s
☐ 20 kBit/s
☐ 50 kBit/s
☐ 100 kBit/s
☒ 125 kBit/s
☐ 250 kBit/s
☐ 500 kBit/s
☐ 1 MBit/s

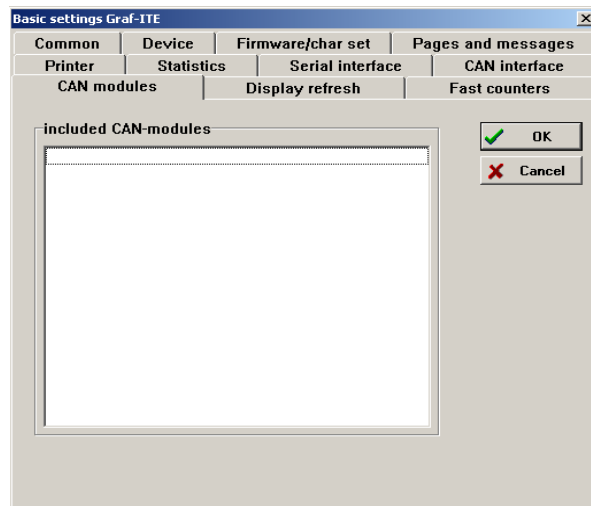
Update time for actuals/nominals: 10 *10ms

Minimum wait between CAN-telegrams: 0 *10ms

OK Cancel

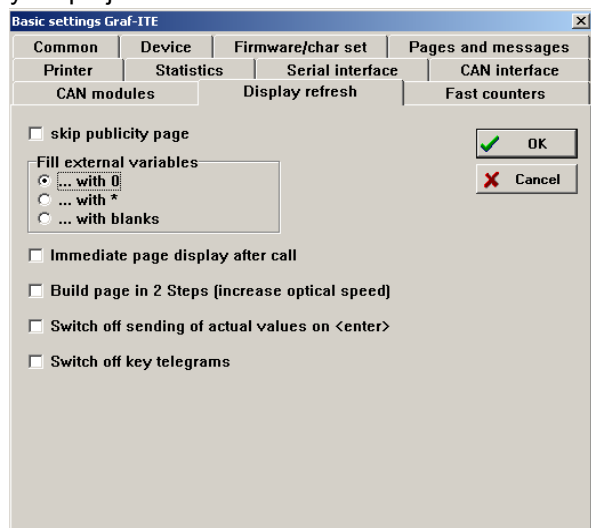
9.9 "CAN modules" index card

This index cards displays the configured CAN modules of the GCM series. For CAN module configuration, start the appropriate program via the menu items Programs>Configure CAN modules. Configured modules communicate with the operating panel via the SELECAN protocol. This protocol has to be used if GCM modules have been configured. See "SELECAN protocol" o69n page .



9.10 “Display refresh” index card

Within this index card, you may execute settings which positively influence the display speed in your project:



9.10.1 Skip publicity page

If you do not want some publicity for your company, you can skip the publicity page ... In this case, the operating panel displays immediately the first page when it is switched on.

9.10.2 External variables

This setting is of interest if you use pages with external variables. If such a page is called up, the current variable values must first be requested from the PLC. And what does the operating panel display during this time?

You may already guess it: the settings you enter here...

9.10.3 Immediate page display

The operating panel waits another 200 msec after

a call-up before displaying a page. Thus, the PLC has the chance to transfer variables before they are displayed. External variables as well are already called up during this time.

9.10.4 Build page in 2 steps

If you use a very large number of variables and/or graphics in pages, the operating panel requires a lot of time to edit the dynamical values (variables) for the display.

You can, however, instruct the operating panel to display all static page parts first (this happens very quickly) and to show the variables in a second step. This is much more comfortable for the operator than if he does not immediately realise a response after pressing a key.

9.10.5 Switch off sending of nominal values

If nominal values are entered, they are automatically transferred to the control. This is not desirable in all cases. In this field, you can switch off this function.

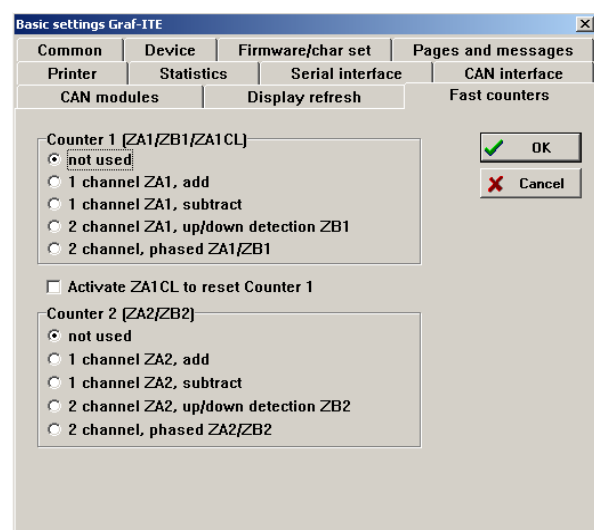
9.10.6 Switch off key telegrams

Sometimes the operating panel can turn into a disruptive factor if it outputs a telegram upon the press of every single key in order to record which key has been pressed or released. You can switch off this function by ticking the respective box.

9.11 “Fast counters” index card

Operating panels with integrated I/O offer up to 5 inputs as inputs for quick counting functions. There are two counters with a maximum frequency (counting frequency) of 10 kHz, whereby an up/down or left/right detection is adjustable for each counter. One of the counters can even be quickly reset via a reset-input.

This function is not available with panels of the AT series !



9.11.1 Counter 1

Inputs ZA1 (counter input/phase 1), ZB1 (up-down detection/phase 2) as well as ZA1CL (counter reset) are responsible for this counter. The different operating modes of counters are described in the "Ladder diagram" manual. This parameterisation mask allows you to determine the operating mode of the counter. The control functions of the counter are programmed in the LD.

9.11.2 Counter 2

This counter has generally the same functions as counter 1, but no reset-input. There are only ZA2 (counting input/phase 1) and ZB2 (up-down detection/phase 2). Counter 2 is completely independent of counter 1. The control functions can also be programmed in the LD.

10 Protocol and statistics

The operating panels are equipped with a protocol and statistics memory, which offers you the possibility to generate protocols even if your device is not connected to a printer. This protocol can be displayed by means of the menu keys or read out by a connected device (PLC, PC, etc.).

10.1 Protocol

The protocol memory is applied as a dynamic ring buffer, i.e. if the memory is full, the oldest entries are overwritten. It is able to record variable values, page and message call-ups (incoming/outgoing), status messages (such as On-/Off-switching of the device) and error messages (such as CAN bus error, GCM IO module error, etc.). All entries are provided with date and time.

The page and message recording also includes all internal variable values of the page or message.

In the ITE, different protocol attributes can be configured and specified variables and device states can be linked with a protocol function.


The recording of the On/Off events can be deactivated. The respective setting field is available under "Device"/"Parametrize" on the "Statistics" index card.

10.1.1 Protocol attributes

- *Recording of a page/message call-up ("incoming")*
- *Recording of a page/message output ("outgoing")*
- *Print-out with "incoming" and/or "outgoing".*
- *Function: Switching on/off print-out with date and time.*

Instructions on how to set these attributes are available in Chapter 3 under "Configuring page" or in Chapter 4 under "Configuring message". Usually attributes are set in the menu entry "Configure" in the respective page/message. The "PRO/STA" button in the displayed input mask leads to the protocol attributes.

10.1.2 Create protocol page

Protocol pages can be quickly created via the  button. Press it and specify the page in which the protocol call-up is to be integrated. Then, you are asked which page you want to use as a sample. Indicate "default.pro" for devices of the ITS/AT 6 series and "def_7.pro" for devices of the ITS/AT 7 series. If you have already created your own pages (via "Specials"/"Save as protocol page"), you may of course select one of them.

10.1.3 Edit protocol page

A protocol page is edited the same way as a "normal" page. Exception: the yellow data fields which are permanently positioned; You can only determine supplementing attributes.

10.1.4 Save as protocol page

If you would like to edit several projects which should all have the same protocol interface, simply save the protocol page of a project (as .pro file) and use your own file for "Save as protocol page".

10.1.5 Protocol functions

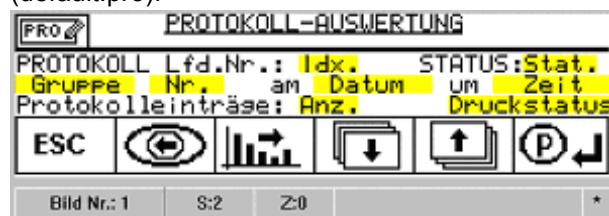
- *View protocol*
- *Read out protocol (request) via the interfaces (serial, CAN)*
- *Delete protocol memory*
- *Print protocol*

10.1.6 View protocol

The display of protocol entries is made possible via a permanently defined protocol page. The protocol page is treated like any other page, i.e. it can be called up via the menu function or interface commands.

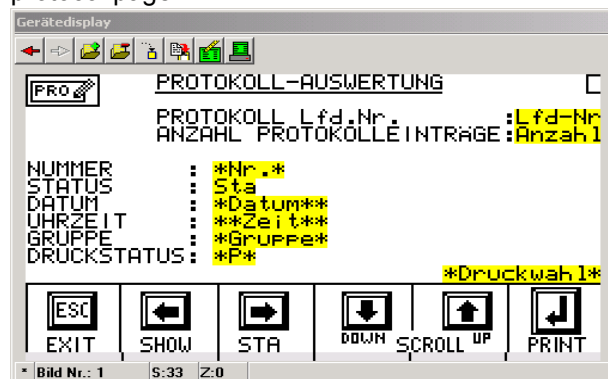
Chapter 6 contains a detailed description on the call-up of protocol information via menu keys.

For the ITS/AT 6, the protocol page, which is supplied with the ITE as a standard, looks as follows (default.pro):



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For the ITS7 (def_7.pro), we suggest the following protocol page:



Graphics and text can be modified in the ITE6 Windows editor, whereby the variable fields (highlighted in yellow, e.g. date, time, page no. etc.) are permanently positioned. Refer to chapter 3 for more information on this topic.

10.1.6.1 Serial no.. (Idx.)

is the serial number of the entry in the protocol memory, whereby entry number 1 is the latest entry. A maximum of 1000 entries can be managed.

10.1.6.2 Protocol entries (no.)

is the total number of protocol entries.

10.1.6.3 Date and time (date, time)

of the entry are also displayed.

10.1.6.4 Status (Stat.)

indicates the status of an entry:

- ON Power ON
- OFF Power Off
- +++ Incoming message/page
- --- Outgoing message/page

10.1.6.5 Page/message/variable numbers (no.)

are displayed separately.

- V xxxx Variable entry
- B xxxx Entry of a page call-up
- M xxxx Entry of a message call-up

10.1.6.6 Statistic group (group)

is only displayed with page and message entries.

10.1.6.7 Print status

indicates whether the entry is already printed out.

- *P* Entry has not yet been printed.
- -P- Entry has already been printed.

10.1.7 Print protocol

The printing of the protocol can be initiated manually (refer to Chapter 6, Menu key function in the protocol page) or via interface commands.

The print-out is transferred to the interface adjusted in the editor (RS-232 or CAN-address). Refer to the "Printer" index card under "Device"/"Parametrize" for these settings.

The protocol is printed in the ASCII format and contains a single-line headline and the following page, message or variable text. The individual entries are separated from each other by space lines.

Examples of the print-out format:

Status print-out (header)

ON	07:00:00	21.08.02
OFF	18:02:34	21.08.02
ON	07:01:57	22.08.02

Variable print-out (header + variable value)

V 0030:	12:13:45	22.08.02
103.56		
V 0030:	12:15:10	22.08.02
102.06		
V 0030:	12:17:55	22.08.02
113.12		

Page print-out (header + 8 lines page text)

B +++ : 0023 17:20:56 23.06.96
This is page 23

Actual value1: 104.45

Nominal value1: 250.00

[Go to page 24]
[Abort]

Message print-out (header + 1 line message text)

M ---: 0001 08:03:12 14.11.96
VALVE IS CLOSED

Make sure that the printed pages / messages are not deleted from the protocol memory. They are only marked with the -P- comment to document that they have already been printed.

10.1.8 Delete protocol

The protocol can be deleted via interface commands (see PLC driver) or a special function of the internal control program. This way, the protocol memory is completely deleted and contains no more entries.

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10.2 Statistics

The operating panel is provided with a very comfortable statistic function, thanks to which system weak points can be easily identified. By means of an assessment in percentage with group organisation you can quickly detect which errors occur frequently or result in long downtimes.

10.2.1 Statistic attributes

The statistic memory reserves for each message and each page a cumulative counter for the number of call-ups and an hour counter for the total operating time. Each page and each message can be assigned to a statistic group in the editor (e.g. for the differentiation of message groups like ok, faults or maintenance groups, messages, etc.).

10.2.1.1 Statistic groups


You can specify the names of the statistic groups in the "Device"/"Parametrize"/"Statistics" index card.

10.2.1.2 Group assignment

By opening the "Configure" menu item in the respective page/message you get access to a window with the "PRO/STA" button. This button leads you to the input mask with the statistic attributes. If you assign a page/message to a group, the statistic counter is automatically activated.

Messages and pages of the statistic group 0 (setting "no group") are not evaluated statistically.

10.2.2 Create statistic page

Statistic pages can be quickly created via the  button. Press it and specify the page in which the statistics request is to be integrated. Then, you are asked which page you want to use as a sample. Indicate "default.pro" for devices of the ITS/AT 6 series or "def_7.pro" for devices of the ITS/AT 7 series. If you have already created your own pages (via "Specials"/"Save as protocol page"), you may of course select one of them.

10.2.3 Edit statistic page

A statistic page is edited the same way as a "normal" page. Exception: the yellow data fields, which are permanently positioned. You can only determine supplementing attributes.

10.2.4 Save as statistic page

If you would like to edit several projects which should all have the same statistics interface, simply save the statistics page of a project (as .pro file) and use your own file for "Save as statistics page".

10.2.5 Statistic functions

- View statistics (for each page/message, cumulative counter of operating time for each statistic group, absolute and in percentage).
- Read out statistics (request) via the interfaces (serial, CAN).
- Delete statistic memory
- Print statistics

10.2.6 View statistics

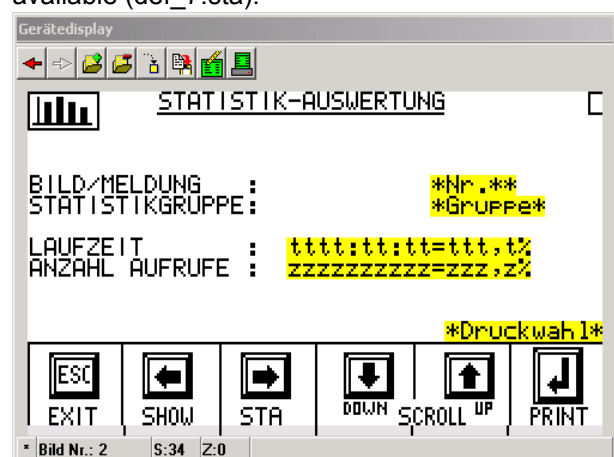
The display of the statistics is enabled via a permanently defined statistic page. The statistic page is treated like any other page, i.e. it can be called up via the menu function or interface commands (page call-up).

The operation of the statistic call-up is described in detail in Chapter 6.

The following statistic page for the ITS/AT 6 is delivered together with the ITE (default.sta):



and for the ITS7 a respective statistic page is also available (def_7.sta):



Graphics and text can be modified in the ITE, whereby the variable fields (highlighted in yellow, e.g. counter, time values, etc.) are permanently positioned. Refer to Chapter 3 for more information on this topic.

Meaning of the data contained in the statistic page:

Runtime (tttt:tt:tt=ttt,t%)

is the "active time" of the selected page/message. The time is displayed in hours/minutes/seconds.

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The runtime assessment in percentage of a page/message refers to the entire runtime of the statistics group to which the page/message belongs.

Number of call-ups (zzzzzz=zzz,z%)

indicates how often the page/message has been called up. The assessment in percentage again refers to the total number of call-ups of the respective statistics group.

No.

is the number of the currently displayed page/message.

Group

is the statistic group name of the displayed page/message.

10.2.7 View group statistics

As described in Chapter 6, the group statistic can be viewed by pressing the "cursor right" key.

This group overview represents the group runtime and its assessment in percentage related to the total runtime of the operating panel as well as the number of call-ups per group and their assessment in percentage related to the total number of page/message call-ups.

Besides, the start time of the statistic evaluation (the start time is set by deleting the statistic) is displayed.

Representation of the group statistic:

Statistik Start:	08:03:07	14.02.96	
STÖRUNG:	1278:34:56 = 12,1%	123 = 95,8%	
WARTUNG:	67:12:22 = 4,6%	5 = 4,2%	
Gruppe 3 :	0:00:00 = 0,0%	0 = 0,0%	
Gruppe 4 :	0:00:00 = 0,0%	0 = 0,0%	
Gruppe 5 :	0:00:00 = 0,0%	0 = 0,0%	
Gruppe 6 :	0:00:00 = 0,0%	0 = 0,0%	
Gruppe 7 :	0:00:00 = 0,0%	0 = 0,0%	

10.2.8 Print statistics

The printing of the statistic can be initiated manually (refer to Chapter 6, Menu key function in the statistic page) or via interface commands.

The print-out is transferred to the interface adjusted in the editor (RS-232 or CAN-address).

The statistic is printed in the ASCII format and looks as follows:

STA START: 22.08.02 08:00:57
STA PRINT: 29.08.02 17:30:22

M0001: 0:05:13 = 0.5 % 1 = 0.1 %
B0000: 5:12:03 = 12.3 % 45 = 20.4 %
B0001: 39:00:45 = 87.2 % 186 = 79.5 %

FAULT: 44:18:01 = 22.8 % 232 = 100.0 %

B0002: 0:00:00 = 0.0 % 0 = 0.0 %

MAINTEN.: 0:00:00 = 0.0 % 0 = 0.0 %

Group 3: 0:00:00 = 0.0 % 0 = 0.0 %

Group 4: 0:00:00 = 0.0 % 0 = 0.0 %

Group 5: 0:00:00 = 0.0 % 0 = 0.0 %

Group 6: 0:00:00 = 0.0 % 0 = 0.0 %

Group 7: 0:00:00 = 0.0 % 0 = 0.0 %

10.2.9 Delete statistics

The statistic can be deleted via interface commands or a special function of the control program. It is restarted simultaneously. All statistic counters are set to 0 when the statistic is deleted.

10.2.10 Calculation of the statistical data

The statistical calculation comprises two stages. In order to get an insight into the calculation, you should know some facts.

10.2.11 Recording of the total statistical data

The statistic has an aggregate counter for page/message call-ups and an aggregate runtime counter.

- The aggregate counter for page/message call-ups is increased by 1 if a statistically recorded page/message is called up.
- The aggregate runtime counter always operates as long as the panel is switched on.

10.2.12 Recording of the group data

Each group has a group aggregate counter for page/message call-ups and a group aggregate runtime counter.

- The group aggregate counter for pages/messages is increased by 1 if a page/message of this group is called up.
- The group aggregate time counter operates as long as a page/message of this group is active (in the stack).

10.2.13 Recording of individual data

Each page/message to be statistically recorded has a call-up counter and a runtime counter.

- The call-up counter is increased by 1 if the page/message is called up (or is re-written into the stack).
- The runtime counter operates as long as the page/message is active (in the stack).

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10.2.14 Calculation of the group data in percentage

The group aggregate counter (GAC) is set in relation to the statistics aggregate counter (SAC):

$$\text{Group in percentage} = \text{GAC} \times 100 / \text{SAC}$$

This calculation is applicable for the call-up counter and the time counter.

10.2.15 Calculation of the individual data in percentage

The individual counter (IC) is set in relation to the group aggregate counter (GAC):

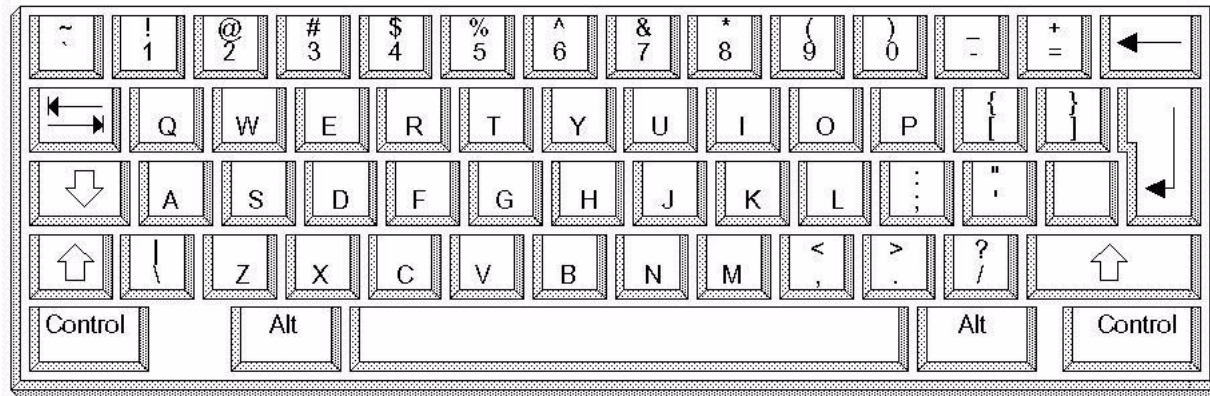
$$\text{Message/page in percentage} = \text{IC} \times 100 / \text{GAC}$$

This calculation is applicable for the call-up counter and the time counter.

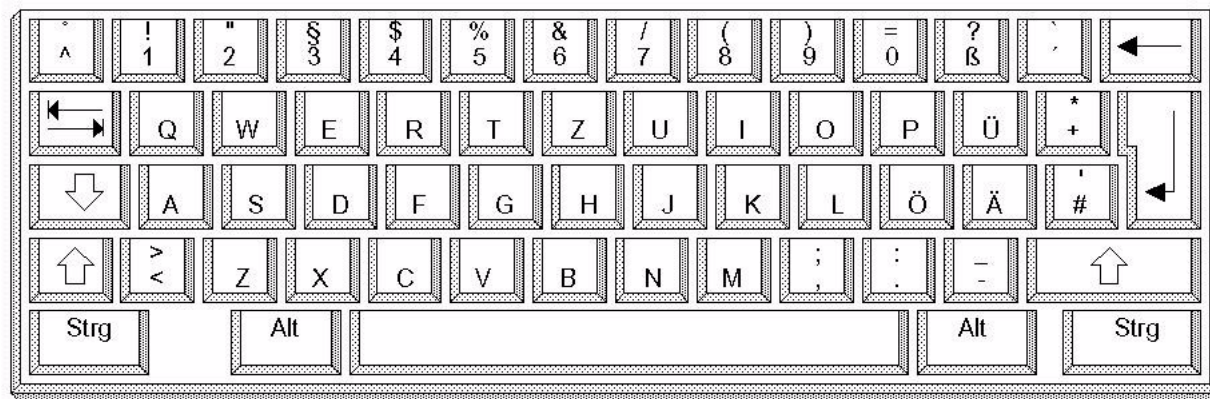
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11 Annex: Keyboard layouts

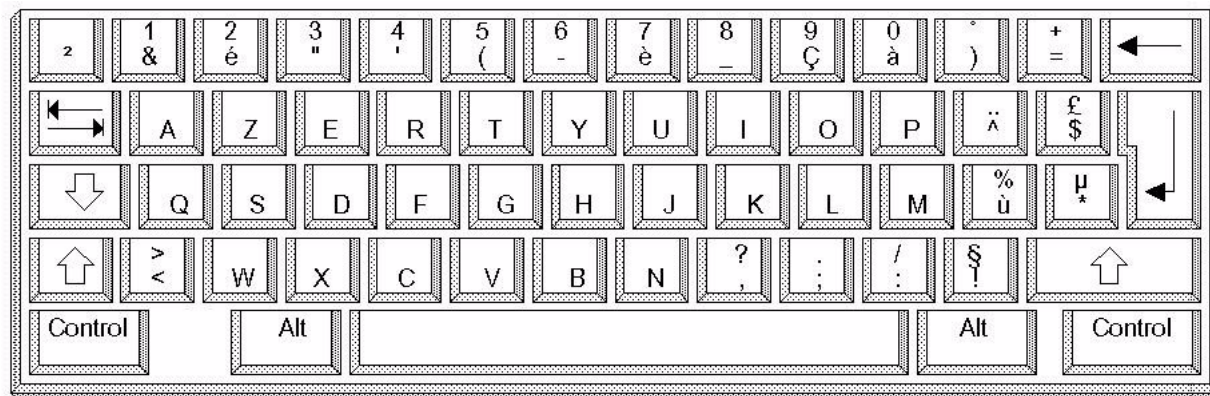
11.1 American mapping



11.2 German mapping

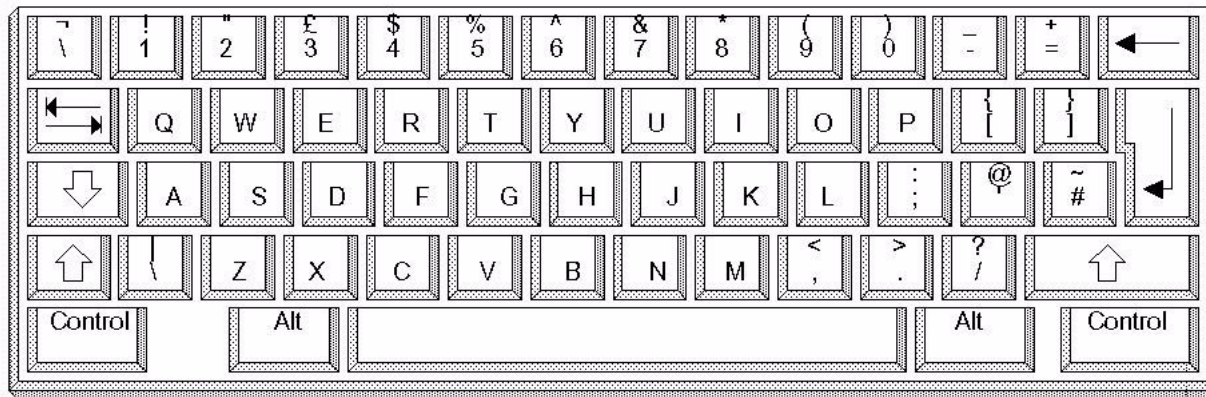


11.3 French mapping

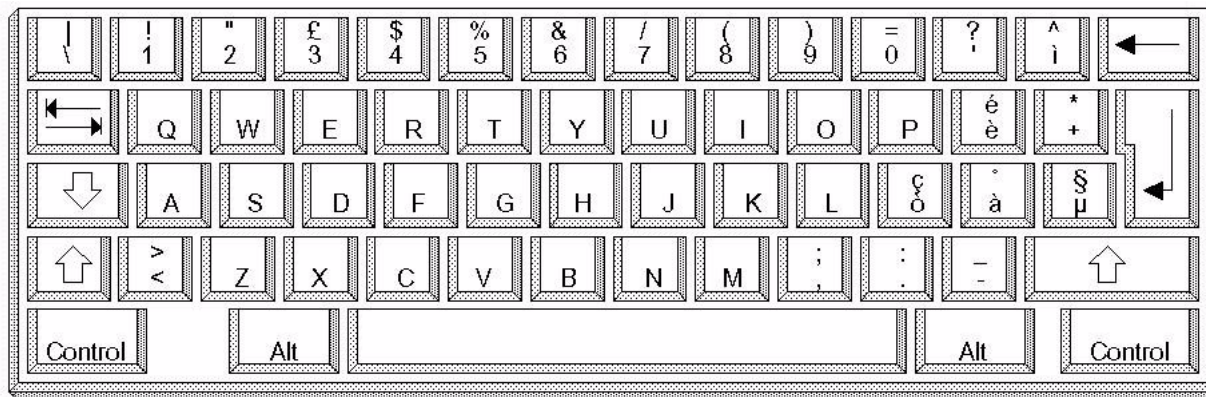


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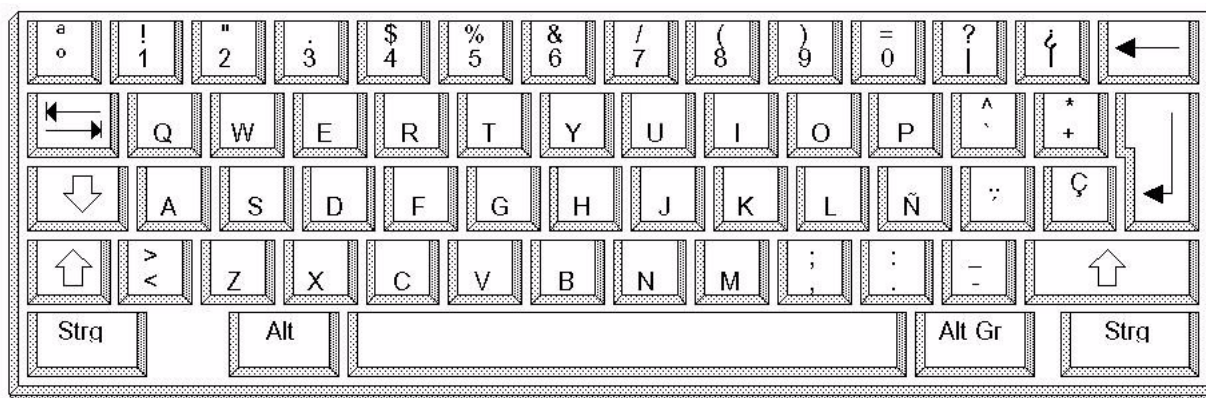
11.4 US-English mapping



11.5 Italian mapping

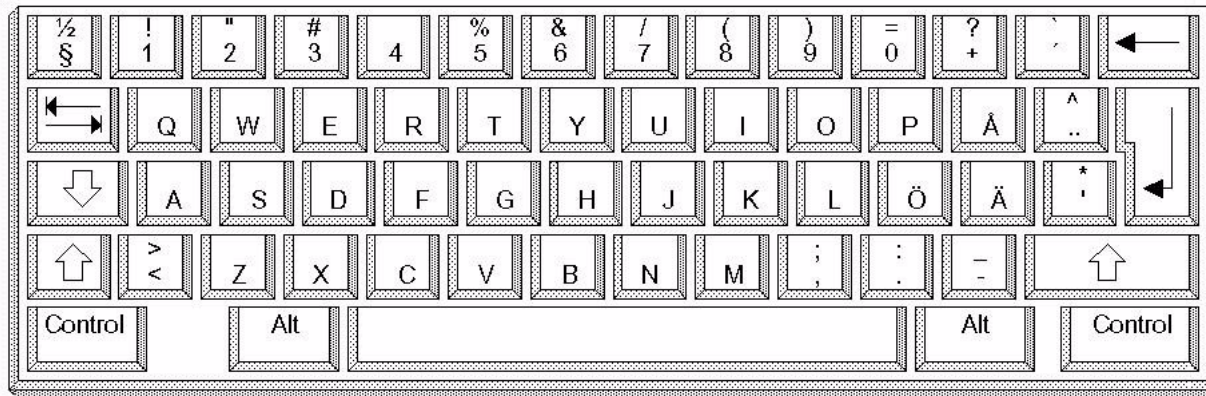


11.6 Spanish mapping

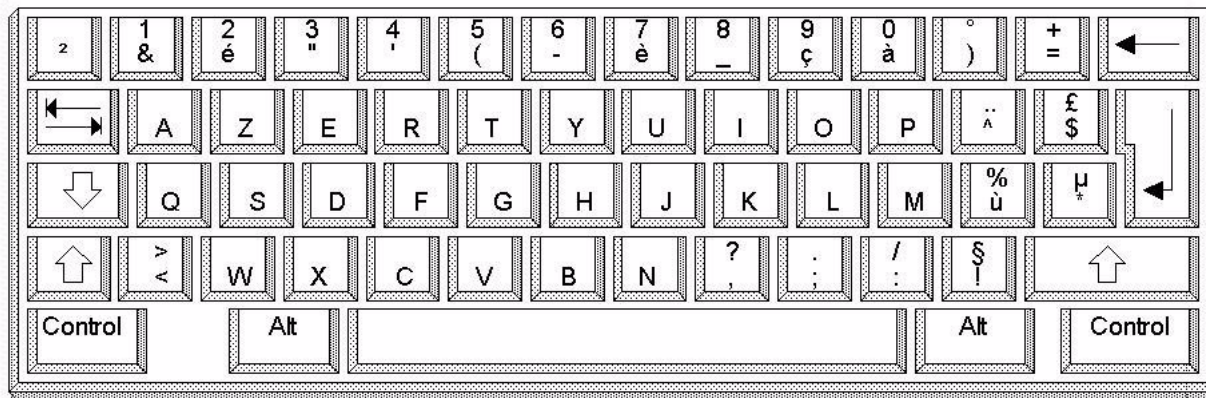


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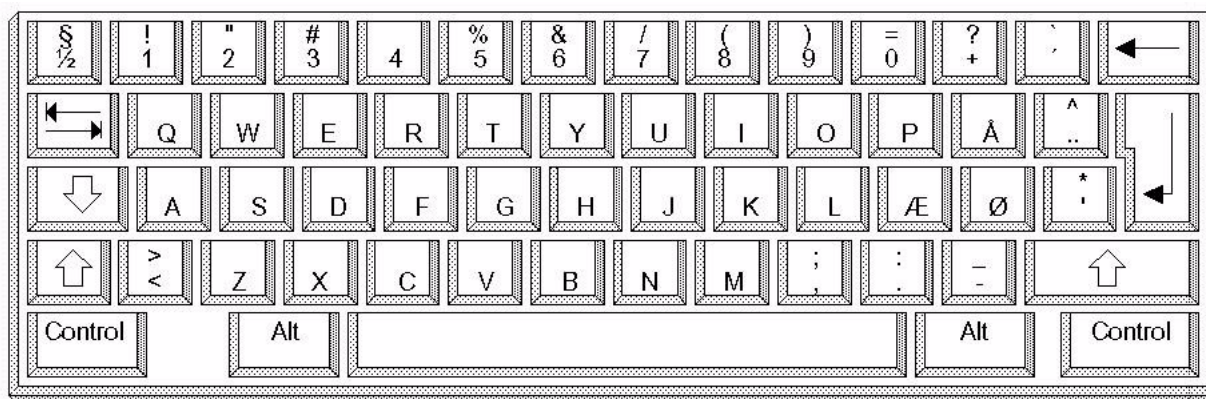
11.7 Swedish / Finnish mapping



11.8 Belgian mapping

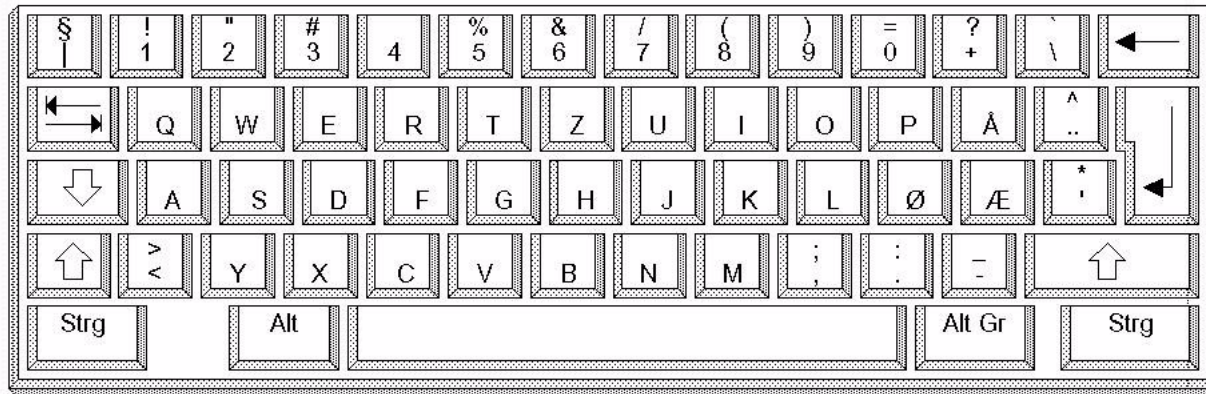


11.9 Danish mapping

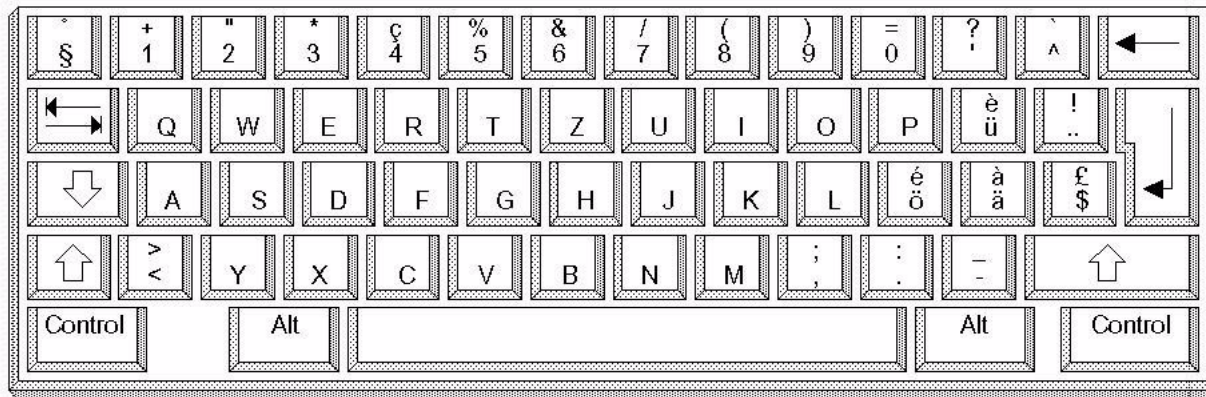


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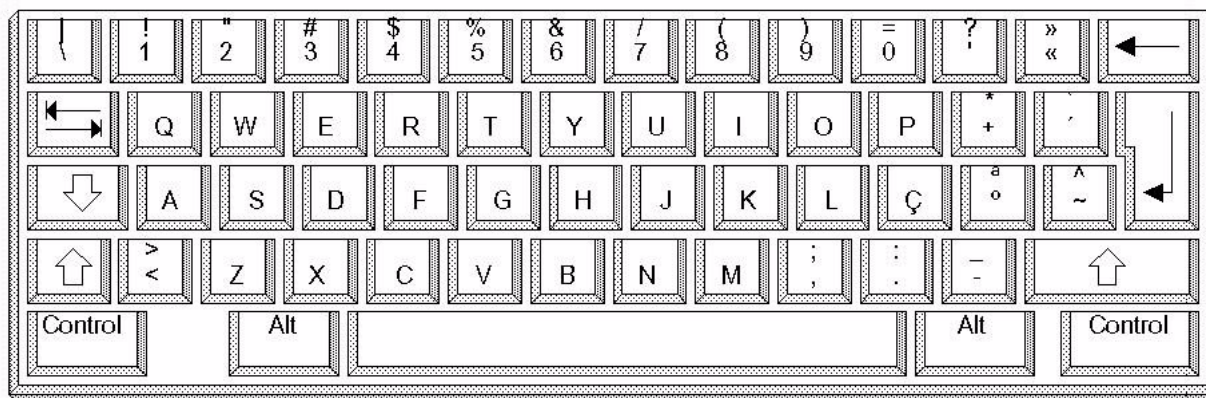
11.10 Norwegian mapping



11.11 Swiss mapping (G and F)



11.12 Portuguese mapping



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11.13 Cyrillic mapping

