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VARIABLE SPEED DRIVES

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PS Operator Terminal
AB 202 L (PROLINE)
Manual

AMK

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1 Safety Information

Please observe the safety information both for your own safety and for the safety of others. The safety information points out possible dangers to you and tells you how to avoid dangerous situations.

The following pictograms are used in this manual:

! *Caution, indicates dangers and sources of error*

 *Provides information*

 *Danger, general or specific*

 *Danger of an **electric shock***

1.1 General information

The ProLine 90/95/900 Operator Terminal is used only as part of a complete system.

! *The operator of a machine installation is responsible for observing the safety and accident prevention regulations for his specific application.*

 *Please observe the application-specific safety and accident prevention regulations during configuration.*

 *Emergency stop equipment conforming to EN 60204 / IEC 204 must remain active in all modes of the machine installation. An undefined restart of the installation must not be possible.*

 *Faults occurring in the machine installation that can cause damage to material or injury ot people must be prevented from taking effect by the use of additional external equipment. This equipment must ensure that a safe state is achieved even in the event of a fault. This equipment might comprise electromechanical safety switches, mechanical interlocks etc. (see pr EN 954-1, risk estimation).*

Safety-relevant functions must never be executed or initiated from the operator terminal.

Uncontrolled restarts must be ruled out by the software.

1.2 User notes

This manual is intended for configurers, users and installers of the ProLine 90/95/900 Operator Terminal.

It is intended to serve the configurers as a programming manual and reference work. It shows the user how to operate the Operator Terminal and explains signaling functions. It provides the installation technicians with all the data they require for installation.

The Operator Terminal is mainly used in conjunction with a complete system. For this reason, configurers, users and installation technicians must observe the valid standards and the safety and accident prevention regulations for the application in question. The operator of the automation system is responsible for the observance of such regulations.

1.3 Use for the intended purpose only

The ProLine 90/95/900 Operator Terminals must only be used as described in the manual, as a communication and signaling system.

1.4 Never use for other purposes!

Safety-relevant functions must not be controlled exclusively by the operator terminal. Uncontrolled restarts must be prevented by the software.

1.5 Installation and mounting

The operator terminal must be installed as stipulated in VDE 0100 IEC 364.

Before beginning installation work, disconnect all system components from the power supply.

Danger of electric shock!

Observe the application-specific safety and accident prevention regulations during installation.

2 System Overview

2.1 Applications

The ProLine Operator Terminal is used as a man-machine interface in open-loop and closed-loop control systems.

Any multiple line texts can be displayed. Variables can be defined within these texts. These variables are assigned the current values from the programmable controller when the text is displayed or printed. The values on the display are continually refreshed. Changes in values can be seen immediately.

Message texts can also be printed out. ProLine has a serial printer interface. A text to be printed does not have to be displayed on the screen. If the printer fails, the texts to be printed are stored. They are printed later on when the printer is ready again.

It also possible to enter values which are then transferred to the programmable controller via the operator terminal. During input, ProLine can check for range limits. An illegal value cannot be entered.

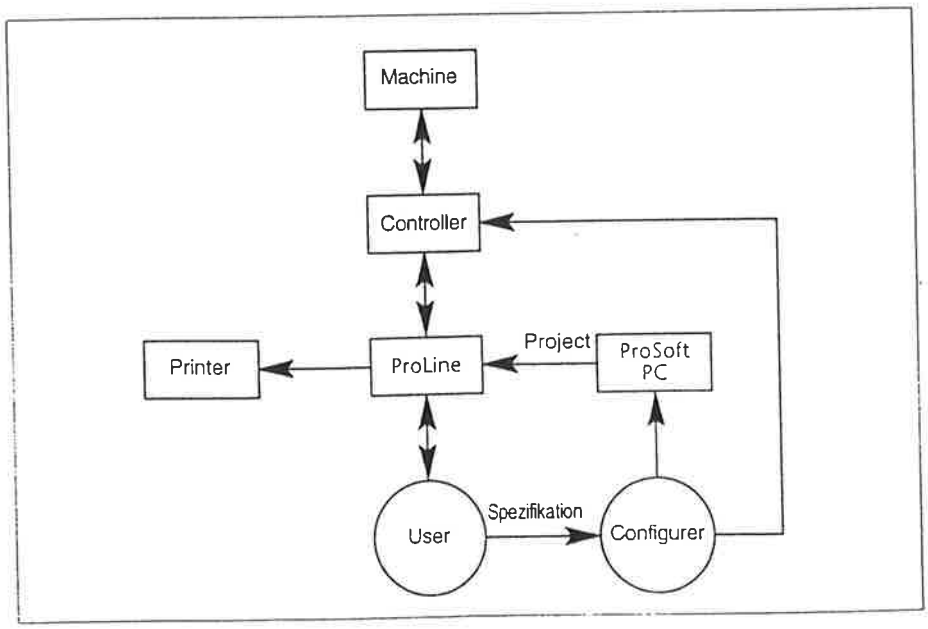
The connection between ProLine and the programmable controller is made via a serial interface.

2.2 Configuring ProLine

The ProLine Operator Terminal is configured using the ProSoft Configuration Software. This software runs on any PC with a 286 processor or better under DOS 3.2 or higher. The projects configured are transferred to the Operator Terminal via the serial interface of the PC where they are permanently stored.

The project is interpreted and executed by the operating system of the operator terminal.

Fig. 2.3.1 System overview



2.3 Device family

The ProLine Operator Terminal is available in four variations:

- ProLine 90 (no printer port)
- ProLine 90D (ProLine 90, with printer port)
- ProLine 95
- ProLine 900

The principle of project configuration is the same for all variations.

This manual gives the data for the ProLine 900. The data for the ProLine 90 and 95 are subsets of this. For more detailed information see the "Technical Data" section.

2.4 Scope of supply

- ProLine Operator Terminal
- Set of fixing elements
- Screw terminal, 3-pole, plug-in

2.5 Accessories

- ProSoft Configuration Software including all standard drivers and data handling blocks,

German	800-900-0AA11
English	800-900-0AA12

• ProLine Manual, German	900-900-0BT11
• ProLine Manual, English	900-900-0BT12

- Interface modules for linking ProLine to S5 115U to S5 155U via a high-speed protocol and linking further I/O devices to S5 115U-155U via an ASCII protocol:

SAS 523-1 interface module	700-523-3UA11
SAS 523-2 interface module	700-523-3UA12
SAS 523-3 interface module	700-523-3UA13

- Interface modules for linking ProLine to S5 115U to S5 155U via a high-speed protocol and linking further I/O devices to S5 115U-155U via 3964(R) with the RK512 or ASCII protocol:

SAS 525-1 interface module	700-525-3UA11
SAS 525-2 interface module	700-525-3UA12
SAS 525-3 interface module	700-525-3UA13

- S5 data handling blocks for SAS 523, ASCII protocol

S5 115	802-523-0AA11
S5 135	802-523-0AA21
S5 150	802-523-0AA31
S5 155	802-523-0AA41

- S5 data handling blocks for SAS 525, ASCII and 3964 protocol

S5 115	802-525-0AA11
S5 135	802-525-0AA21
S5 150	802-525-0AA31
S5 155	802-525-0AA41

- Interface modules

TTY	700-523-1UA11
RS232	700-523-1UA21
RS485 not isolated	700-523-1UA41
RS485 isolated	700-523-1UA51

- Connecting cables (length: 3 meters):

ProLine - PC 9-way (programming cable)	700-750-2VK13
ProLine - PC 25-way (programming cable)	700-750-2VK14
ProLine - SIMATIC® programmer interface	700-750-2VK21
ProLine - SAS 523/525 TTY	700-750-2VK31
ProLine - SAS 523/525 RS232	700-750-2VK41
ProLine - SAS 523/525 RS485	700-750-2VK51
ProLine - SIMATIC-TI	700-750-2VK61

Other cable lengths are available on request.

3 Function Description

3.1 Text functions

The Operator Terminals of the ProLine series can store up to 1536 four-line (ProLine 900) texts in the project memory. These texts are subdivided into three different groups:

- Status texts
- Message texts
- Help texts

Status texts and message texts can be called via data bytes of the PLC. A text can contain up to 16 variables (numeric values or variable texts).

Help texts are called by the user with the <Help> key.

It is possible to link status texts with complete input/output menus (255 menus for ProLine 900). Message texts can be subdivided into eight different priority levels. Status texts and menus have their own priority level. All text types can be assigned various parameters (blinking, print, LED, priority, ...).

3.2 Variables

Values from the PLC can be displayed in status or message texts. Variables can be entered on the keyboard if they are defined as input variables. Input mode can be protected by a password. A minimum/maximum, leading zero suppression, decimal places and conversion factors can be defined for variables. The variables are continually refreshed by ProLine. Semigraphic representation such as barcharts and scales are also supported.

3.3 Function keys and LEDs

If a function key is pressed this is signalled to the PLC as a set data bit. This set bit can be used in the PLC to trigger a function. By using combinations with the <Shift> or <Alt> or <Shift and Alt> keys, the number of function keys available as data bits can be quadrupled. Because the <Alt> key is missing on the ProLine 90, this only has double the number of data bits. The LEDs of the function keys and the cursor keys can be controlled via data bits in the communication area. The possible states of the function key LEDs are:

- off
- green on
- red on
- green blinking
- red blinking
- red / green alternating

The info LED is permanently assigned to the status texts and the error LED is permanently assigned to the message texts.

The possible states of the green info LED and the red error LED are:

- off
- on
- blinking

The green input LED lights up when input mode is activated.

3.4 Softkey functions

Using softkey functions the user of a ProLine can execute actions by pressing a function key that would otherwise have to be programmed in the PLC . In this way it is also possible to change values in the variable data block. The function can be explained to the user in a short text. Softkey functions can be assigned to each of the function keys in a row underneath the display. The function keys in this row will be referred to collectively as a softkey bar from now on. For more detailed information about programming, see Section 5, Softkey bars.

3.5 Multilingual projects

Two (in ProLine 900 three) different projects can be stored in a ProLine. Only one project can be active at a time. Which project is activated is defined in a data word in the data handling block of the PLC. A softkey function can be used to enable the user to switch to another project, e.g. another language. In this way, the user can select the language in which he wants to interact with ProLine. For example, there could be one project for the user and one project for service functions for the service technicians. Multilingual projects are developed as separate projects which are then transferred to the ProLine together.

3.6 Printing

The message texts can be output via the serial printer interface. Output of a message can also be logged with:

- Date
- Time of day
- Print counter
- Message number
- Message status (raised, cleared, acknowledged)

The following can be defined as an event for message printing:

- Print, if message raised
- Print, if message cleared
- Print, if message acknowledged

All message texts to be printed are placed in a 24 Kbyte printer buffer. The entries in this printer buffer are retained even after a power failure. In this way, no print jobs are lost if the printer has a fault for short time. If the printer buffer is full, a bit is set in the PLC. If more messages arrive the oldest messages can be overwritten and therefore no longer printed.

Printing is not possible with the ProLine 90.

!

Buffering of message texts only functions satisfactorily if the printer has no buffer or does not use it. Otherwise, the ProLine cannot detect which outputs have already been made in the event of a power failure.

3.7 Communication

All functions can be controlled in a predefined memory area in the PLC (a data block in SIMATIC S5). Here, it is also possible to read the current state of the device. A second memory area of up to 256 words contains the variables. Moreover, special data (timers and counters for SIMATIC S5) are supported independently of the PLC. Various drivers, modules and software are available for communication with the PLC.

Our manual "ProLine Kopplung" (ProLine Link), Order No. 900-900-1BT12 contains a description of the communication software.

3.8 Configuration of the ProLine

The easy-to-use, menu-guided programming software ProSoft (MS-DOS) is available for configuring the ProLine. With it, all functions can be defined in the simplest possible way. A virtual display is shown on the PC screen for checking purposes. This makes configuration of the texts possible without an Operator Terminal. Extensive copying functions facilitate fast creation of texts, menus and variables. A simulation mode permits testing of the project on the ProLine without a PLC.

3.9 Display overflow

It is possible that variables might not be displayed because they violate the permitted value range or the field length has not been defined as long enough. In this case, the variable fields are filled with rectangles in the ProLine 90/95. The ProLine 900 outputs characters with three horizontal lines. Incorrect interpretation is thus ruled out.

3.10 External input units

It is possible to connect serial input devices such as barcode readers, card readers, PC keyboards. In some cases, an adapter or special driver might be required.

4 Starting Up ProLine / ProSoft

This Section describes the initial installation of the ProLine in conjunction with a PLC and the ProSoft Configuration Software.

4.1 Installation of ProLine

After the power supply has been connected, the ProLine is ready to use. All further settings on the unit are made via the software.

The print text memory is backed up by a built-in battery. This battery is not charged when ProLine is delivered. Internal back-up of the print text memory is only ensured after the unit has been in operation for 20 hours.

4.2 Installation of ProSoft

Install the ProSoft programming software on your PC.
To do this proceed as follows:

Insert the ProSoft diskette supplied in drive A.
Change to drive A with the command:

```
A:↵
```

Start the installation program by entering:

```
A:INSTALL_C:↵
```

This installs the ProSoft programming software on drive C, in the directory C:\PROSOFT.35\.

Now change to directory PROSOFT.35 by entering:

```
C:↵
CD_\PROSOFT.35↵
```

and start the programming software with:

```
P.BAT↵
```

This batchfile starts the software with the following options:

- Programming via COM1
- Siemens PLC
- VGA monitor

5 ProSoft Configuration Software

5.1 Starting the ProSoft Configuration Software

The program is started with the command:

```
prosoft_[[parameter] ...]
```

The parameters can be used for preliminary configuration of the program. The following parameters can be set:

All the call parameters can by changed afterwards when the program is running!

-?	Display this list of parameters
-Cn	Serial port COM1 or COM2 for transfer of the project to the Operator Terminal, n=[1, 2], default: n = 1
-l	Laptop monitor (VGA monochrome)
-m	Monochrome monitor (Hercules)
-S5	Adaptation to SIMATIC PLCs
-TI	Adaptation to Texas Instruments PLCs
-p_<filename>	Printer driver
-0_n	Printing via LPT1 - LPT3, n=[1, 2, 3], default n=1
-f_<path\file>	Project file for direct loading
-b_n	Selection of the baud rate for transfer of the project, n=[19200, 38400], default: n=38400

Example:

```
prosoft_-S5_-l_-C1_-p_hpl4↵
```

Program started for SIMATIC PLCs using a laptop monitor. The project is transferred via COM1 with 38400 baud. Project documentation to be printed on an HP Laserjet IV printer.

If the ProSoft Configuration Software is called without parameters, the program asks for which ProLine type the project is to be created.

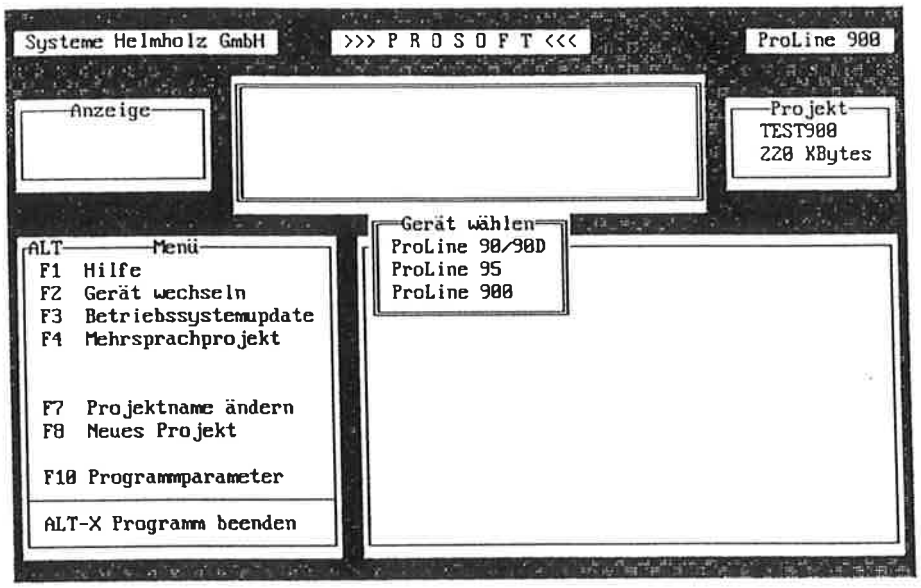


Fig. 5.1.1 Select ProLine type for project

The main screen is then displayed. The ProLine type can be changed even after a project has been created. The project is then adapted for the type. If an existing project is loaded, the correct ProLine type is set automatically.

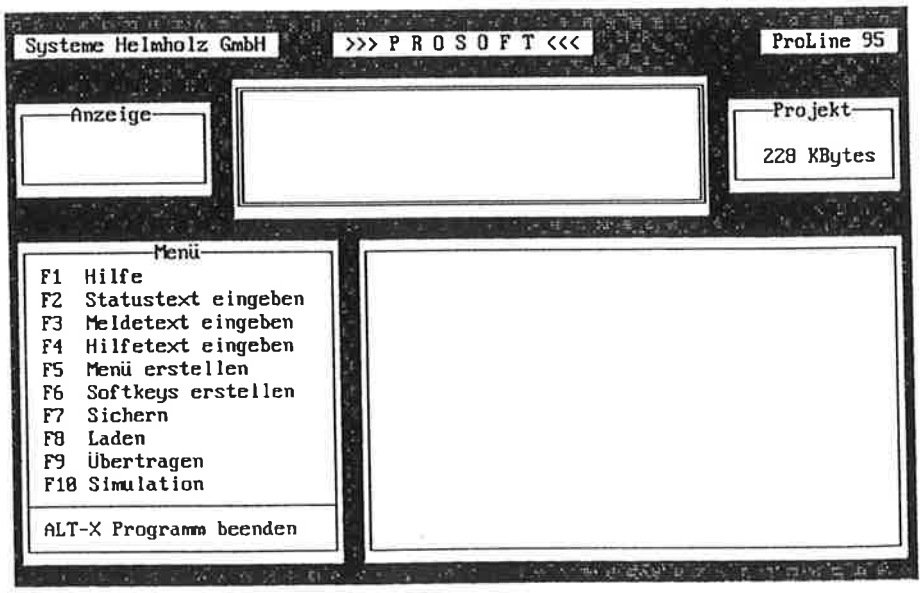


Fig. 5.1.2 Main screen

5.2 On-line help

ProSoft has an integrated help system that can be called up at any time with the function key <F1> and then displays a topic-specific help text. If you press the function key <F1> again when already in help, the help index is displayed.

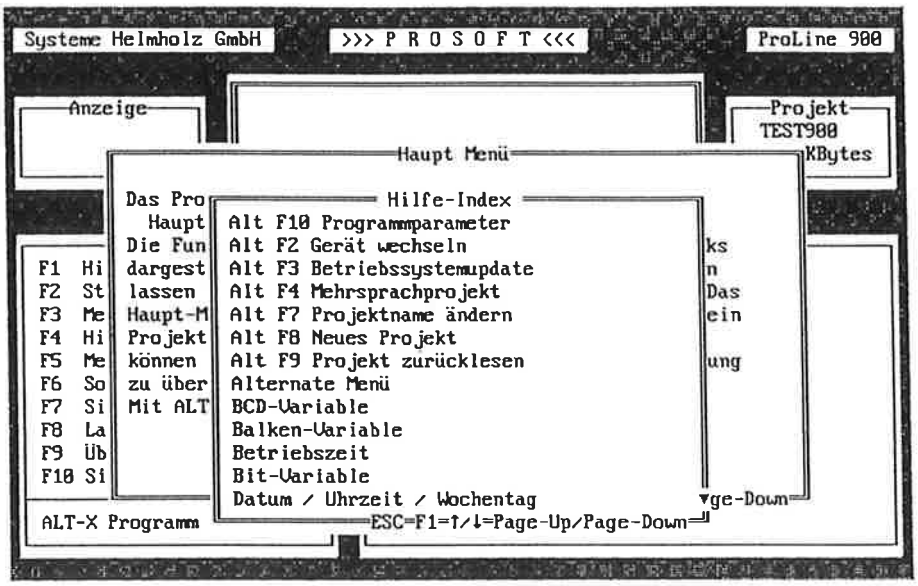


Fig. 5.2.1 Help index

The help index contains an alphabetical overview of all available help topics.

5.3 Editor functions

The editor functions are displayed in the menu window if you press the <Ctrl> key.

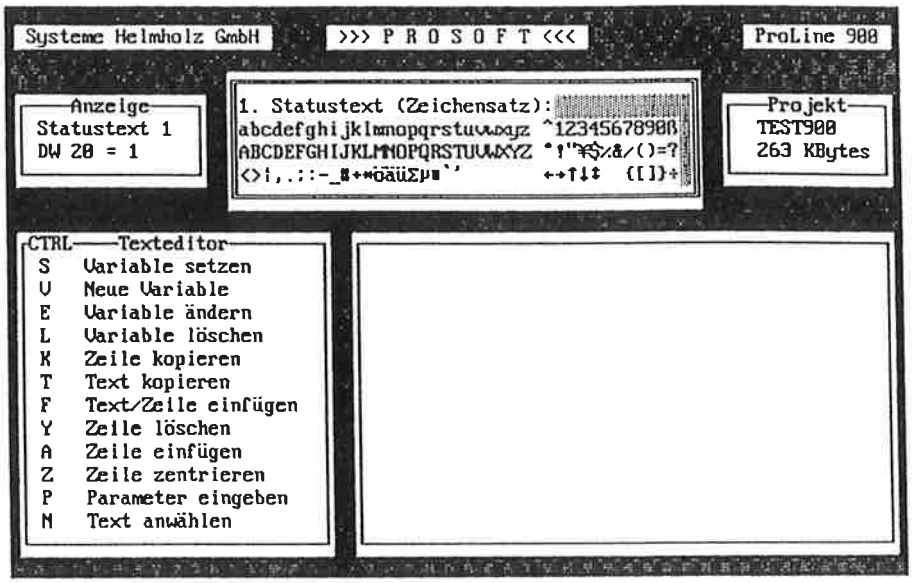


Fig. 5.3.1 Ctrl menu, editor functions

The commands of the editor are available the whole time you are editing text (defining message texts, status texts, help texts). Variables can be set, redefined, changed and deleted. Whole texts and single lines can be copied, inserted, centered and deleted just like in any other text processing system.

Editor functions

<HOME>	Cursor to beginning of line
<END>	Cursor to end of line
<BACKSPACE>	Delete previous character
<INSERT>	Switch between insert and overwrite mode.
<TAB>	Set tabulator. Up to 5 blanks are inserted.
<DEL>	Delete current character
<Ctrl-K>	Copy current line. The line is copied to the clipboard. If there is a line in the clipboard, this is indicated by the character + in the display window.
<Ctrl-T>	Copy all lines of the current text. The text is copied to the clipboard. Copy text. If there is a copied text in the clipboard, this is indicated by the character * in the display window.
<Ctrl-F>	Insert a previously copied line or text from the clipboard
<Ctrl-Y>	Delete current line

<Ctrl-A>	Insert a line at the current cursor position
<Ctrl-Z>	Center the current line
<Ctrl-N>	Select a text. The current position jumps to the text number entered. If you press <TAB> when the program asks for a text number, a selection box is displayed. You can select a text with the <cursor keys> and <PAGEUP>, <PAGEDOWN>. With the <↵> key, the selected text number is accepted.
<Ctrl-V>	Create new variable. From the following selection window, you can select the type of the new variable. With the option "Copy variable", you can accept the settings of an existing variable. Note that a new variable can only be defined and set if the cursor is not positioned on another variable.
<Ctrl-E>	Change variable. If the cursor is on a variable, you can change its definition. If this function is activated when the cursor is not on a variable, the variable to be changed can be selected from a table.
<Ctrl-S>	Set variable. A variable can be selected from a list of the existing variables and placed at the current cursor position.
<Ctrl-L>	The variable on which the cursor is located is deleted. If the variable is no longer required in the project, it can be removed altogether or retained in the system for subsequent use. If this function is activated when the cursor is not on a variable, a list of all variables that are no longer used is displayed. If a variable is now selected, it is removed from the system altogether.
<Ctrl-Q>	Display the cross-reference list of a variable. If the cursor is on a variable, the cross-reference list of this variable is displayed. If this function is activated when the cursor is not on a variable, the variable to be displayed can be selected from a table.
<Ctrl-D>	Insert text file. With this function, you can read in ASCII texts from a file. They are inserted beginning with the current status, message or help texts. Variables cannot be read in in this way. Lines of up to 40 characters of text followed by CR/LF or only CR are expected. Texts with more than 40 characters are cut off and a CR/LF is inserted. If you press <TAB> when the program asks for a file name, a file selection box is displayed. Enter the maximum number of texts to be filled under 'Number of texts'. If non-empty status, message or help texts are detected on insertion, they are skipped and not overwritten.

<Ctrl-→>	Move cursor to the next variable in the text
<Ctrl-←>	Move cursor to the previous variable in the text
<Ctrl-P>	Enter parameter for status or message text
<Alt-K>	Generates the character →
<Alt-J>	Generates the character ←
<Alt-H>	Generates the character ↑
<Alt-L>	Generates the character ↓
<Alt-G>	Generates the character ↕
<PAGE UP>	The previous text is displayed
<PAGE DOWN>	The next text is displayed

In input fields:

<Ctrl-↵>	Accept all parameters and exit the window.
<ESC>	Cancel entries and do not accept the values entered.
<↵>	Confirm an entry. If the key in the last entry field is pressed, all inputs are accepted and the window is exited.

All ASCII characters from 32_d to 191_d and 224_d to 255_d can be entered with **<Ctrl><Alt><number>**.

5.4 Variables

Input mode can be password-protected separately for each variable!

In status texts and message texts up to 16 variables can be linked per text. In total, 600 different variables are possible. They can be displayed, entered and changed on the Operator Terminal. If you want to enter or change a variable, it must be defined as an input variable by ProSoft and input mode (HDB DW24 bit 0 is logical 1) must be activated in the PLC.

Numeric values or strings assigned to the PLC values (up to 40 characters long) are possible as variables as is the semi-graphic representation of the value .

The names of the variables can be up to 30 characters long.

It is possible that variables might not be able to be displayed because they violate the permitted value range or the field length has not been defined long enough. In this case, the variable fields are filled with rectangles. The ProLine 900 outputs characters with three horizontal lines instead. This prevents values from being interpreted incorrectly.

Parameters for variable INTEGER

Display or entry of a numeric value in integer format up to 40 places long from a PLC data word, decimal point, scaling, input limits.

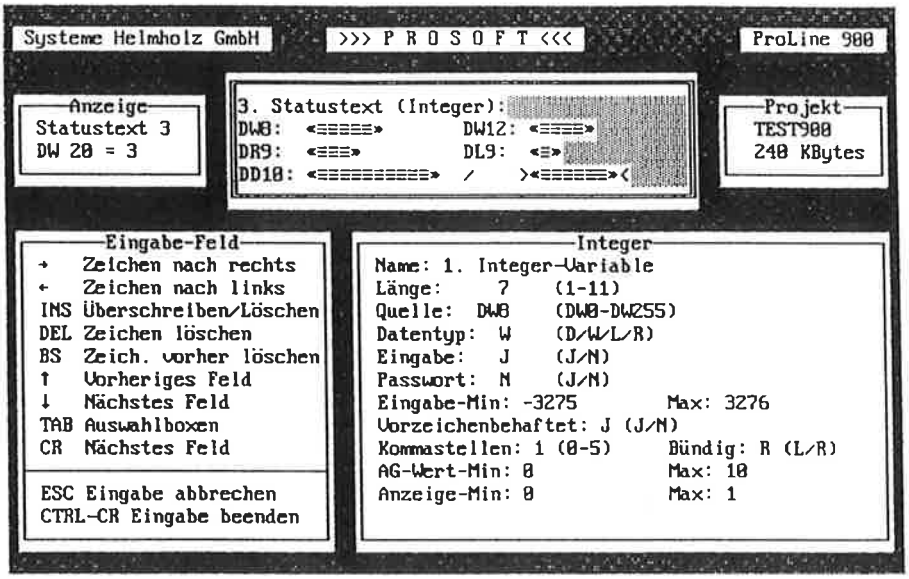


Fig. 5.4.1 Definition of a variable of type INTEGER

Name: Variable identifier, up to 30 characters long

Length: Max. number of places of the variable (1...11, including the decimal point)

Source: Number of the data word assigned (DW 0...DW 255).

Data type: R: right byte
L: left byte
W: word (2 bytes beginning with DW number)
D: double word (4 bytes beginning with DW number)

Input: Y: In input mode, it is possible to edit this variable (input variable).
Please pay attention to the parameter password!
N: This variable is only displayed. It cannot be changed in input mode.

Password: Y: The input for this variable is only activated if the correct input password has been entered first.
N: The input for this variable is activated without any conditions having been fulfilled.

Input min: The minimum value that is accepted as input. Only integer values are accepted as input. Decimal places are not possible.

The parameter data word is replaced by the data register designation of the control if ProSoft is called for other PLCs. For example: Texas Instruments "Register: (V7200 - V7577)"

If no input limits are selected (input min and max = 0), the value range limits are automatically used as input limits.

Input max: The maximum value that is accepted as input. Only integer values are accepted as input. Decimal places are not possible.

Signed Y: The first bit of a value is treated as a sign. A data word (16 bit) can therefore have a value in the range -32768...32767.
N: The first bit is not treated as a sign. A data word can therefore have a value in the range 0...65535. This range is reduced if scaled values are to be displayed.

Decimal places: The number of decimal places is only used for the output of scaled values. Up to five decimal places is reasonable because of the internal calculation precision.

Justification: L: output left-justified
R: output right-justified

Scaling:

PLC value min
PLC value max *(The value range limits of the must be observed!)*

Display min
Display max
These values are used to scale the PLC value. They are not output limits but only limits for the scaling function. If the values in the PLC are outside PLC value min and PLC value max the display value in the display is still shown correctly scaled.

Scaled output is only possible with signed variables in a value range of ±8388607 and a precision of approximately seven decimal places!

Example of the use of scaling:

An incremental rotary encoder is connected to a counter input of a PLC. The rotary encoder supplies 4096 pulses per revolution. However, the display of the Operator Terminal must display a value in degrees indicating the position of the rotary encoder axis.

PLC value min:	+ 0
PLC value max:	+ 4096
Display min:	+ 0
Display max:	+ 360
Decimal places:	1

The value range in the PLC is now scaled in accordance with the display range. The Operator Terminal displays degrees with one decimal place.

Parameters for variable BCD

Display or entry a numeric value in BCD format of up to eight places from a PLC data word. Negative BCD numbers are not supported.

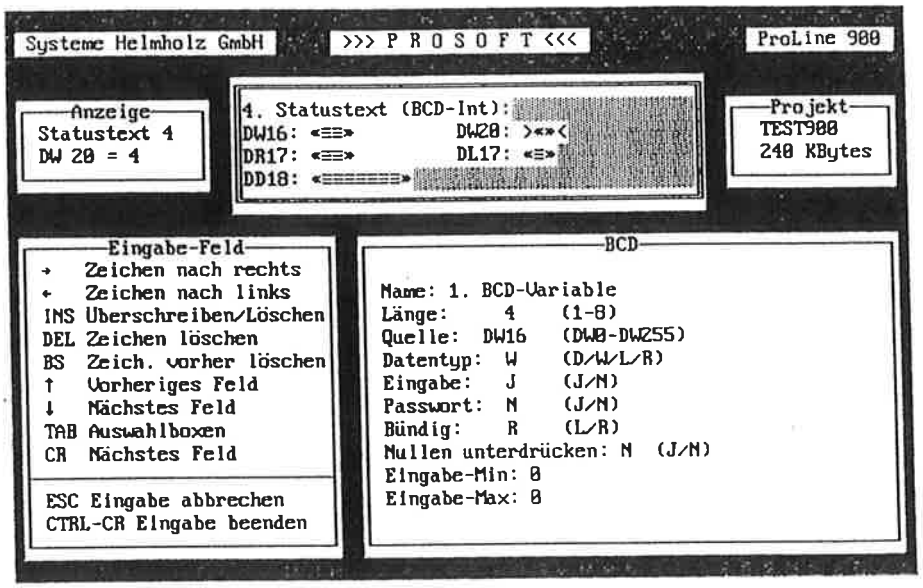


Fig. 5.4.2 Definition of a variable of type BCD

If bytes from the PLC cannot be represented as BCD, a rectangle is output on the ProLine 90/95. The ProLine 900 outputs a character with three horizontal lines instead.

Name:	Variable identifier, up to 30 characters long
Length:	Max. number of places of the variable (1...8)
Source:	Number of the data word assigned (DW 0...DW 255)
Data type:	R: right byte L: left byte W: word (2 bytes beginning with DW number) D: double word (4 bytes beginning with DW number)
Input:	Y: In input mode, it is possible to edit this variable (input variable). N: This variable is only displayed. It cannot be changed in input mode.
Password:	Y: The input for this variable is only activated if the correct input password has been entered first. N: The input for this variable is activated without any conditions having been fulfilled.
Justification:	L: display left-justified R: display right-justified
Suppress leading zeroes:	Y: Leading zeroes are not output N: The variable is output with leading zeroes
Input min:	Minimum value that is accepted as input.

Input max: Maximum value that is accepted as input.

Parameters for variable HEX

Representation of a numeric value in hexadecimal format with up to eight places from a PLC data word.

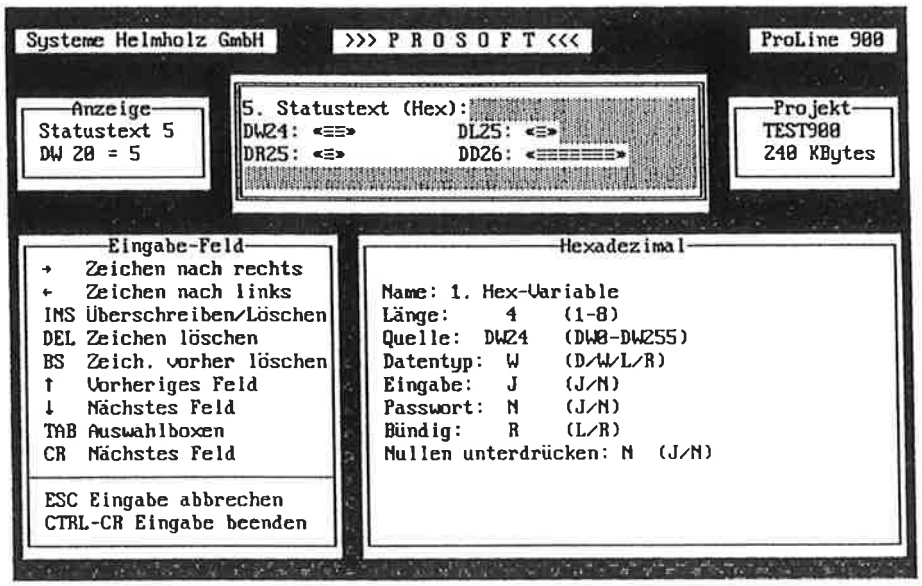


Fig. 5.4.3 Definition of a variable of type HEX

Name:	Variable identifier, up to 30 characters long
Length:	Max. number of places of the variable (1...8)
Source:	Number of the data word assigned (DW 0...DW 255)
Data type:	R: right byte L: left byte W: word (2 bytes beginning with DW number) D: double word (4 bytes beginning with DW number)
Input:	Y: In input mode, it is possible to edit this variable (input variable) N: This variable is only displayed. It cannot be changed in input mode
Password:	Y: The input for this variable is only activated if the correct input password has been entered first. N: The input for this variable is activated without any conditions having been fulfilled.
Justification:	L: display left-justified R: display right-justified

Suppress leading zeroes:	Y: Leading zeroes are not output N: The variable is output with leading zeroes

Parameters for variable BINARY

Representation of a numeric value in binary format. Any character can be chosen to represent bit states 0 and 1.

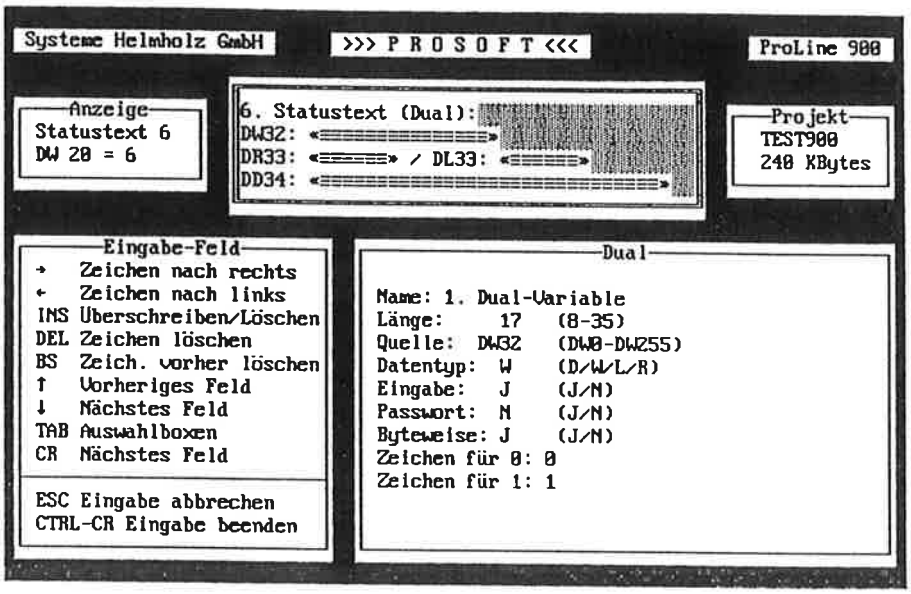


Fig. 5.4.4 Definition of a variable of type BINARY

Name:	Variable identifier, up to 30 characters long
Length:	Max. number of places of the variable (8...35)
Source:	Number of the data word assigned (DW 0...DW 255)
Data type:	R: right byte L: left byte W: word (2 bytes beginning with DW number) D: double word (4 bytes beginning with DW number)
Input:	Y: In input mode, it is possible to edit this variable (input variable) N: This variable is only displayed. It cannot be changed in input mode
Password:	Y: The input for this variable is only activated if the correct input password has been entered first. N: The input for this variable is activated without any conditions having been fulfilled.

In bytes:	Y: An additional blank is output after each byte N: The bits are output contiguously without any formatting
Character for 0:	ASCII character for bit state 0 in the range 32_d...191_d and 224_d...255_d
Character for 1:	ASCII character for bit state 1 in the range 32_d...191_d and 224_d...255_d

Parameters for variable TEXT

Display or entry of variable texts that are assigned to the values of a PLC data byte.

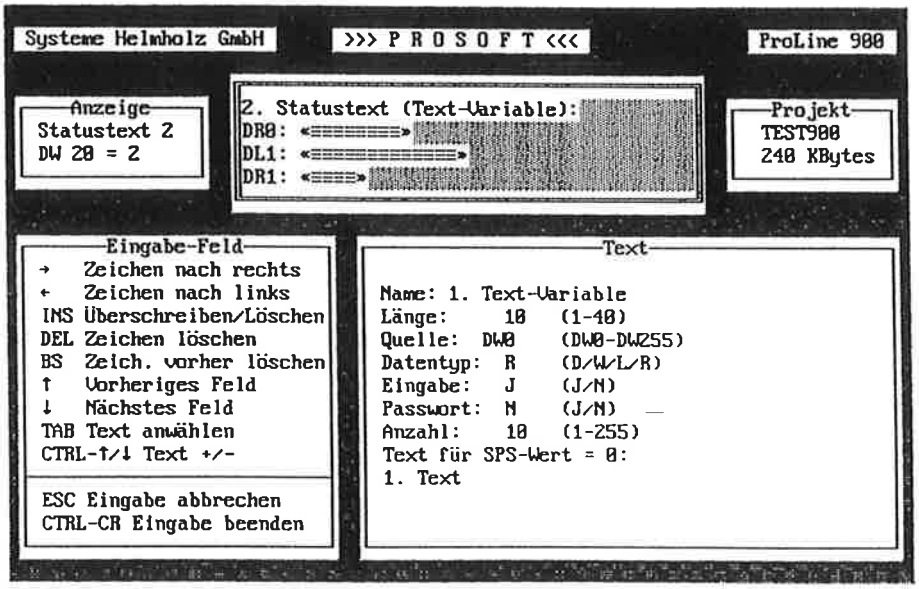


Fig. 5.4.5 Definition of a variable of type TEXT

If a text no. is requested by the PLC that exceeds the number of texts, rectangles are output over the entire text length. The ProLine 900 outputs characters with three horizontal lines.

Name:	Variable identifier, up to 30 characters long
Length:	Max. number of places of the variable (1...40)
Source:	Data word assigned (DW 0...DW 255)
Data type:	R: right byte L: left byte W: word (2 bytes beginning with DW number) D: double word (4 bytes beginning with DW number)
Input:	Y: In input mode, it is possible to edit this variable (input variable) N: This variable is only displayed. It cannot be changed in input mode

Password:	Y: The input for this variable is only activated if the correct input password has been entered first. N: The input for this variable is activated without any conditions having been fulfilled.
Number of texts:	1...255 texts

The one-line, variable texts are numbered starting at zero.

If the variable has been defined as an input variable and input mode is activated, it is possible to select the texts assigned to this variable with the <+> and <-> keys on the Operator Terminal.

In the input field for the texts to be displayed, additional editor functions are available:

<Ctrl-UP>	Next text
<Ctrl-DOWN>	Previous text
<Ctrl-TAB>	Accept a text from a list of all texts of all text variables of the entire project
<TAB>	Go to a text from the list of all texts of this variable

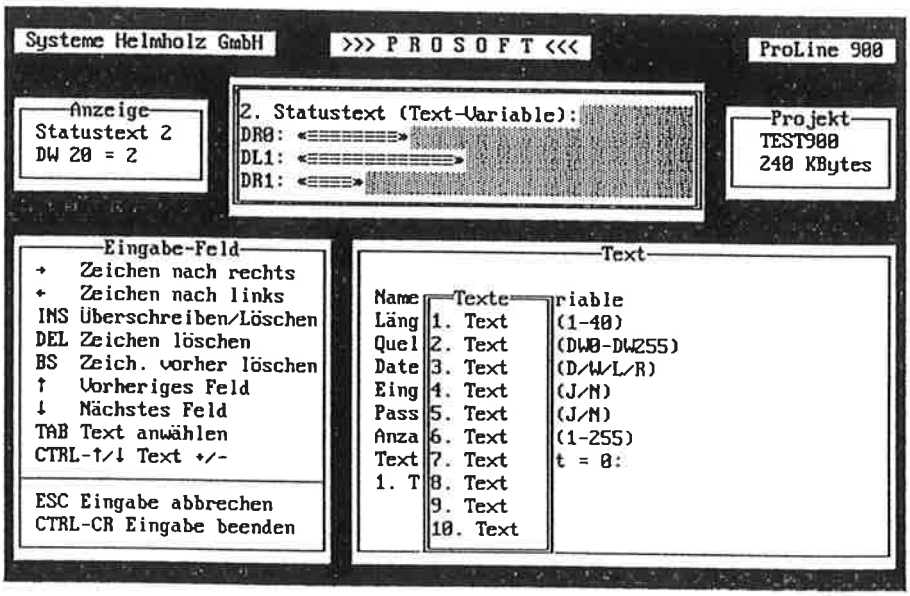


Fig. 5.4.5b Selection of a text with TAB

Parameters for variable BIT

Display or entry of two variable texts that are assigned to the bit states 0 and 1 of a PLC data bit.

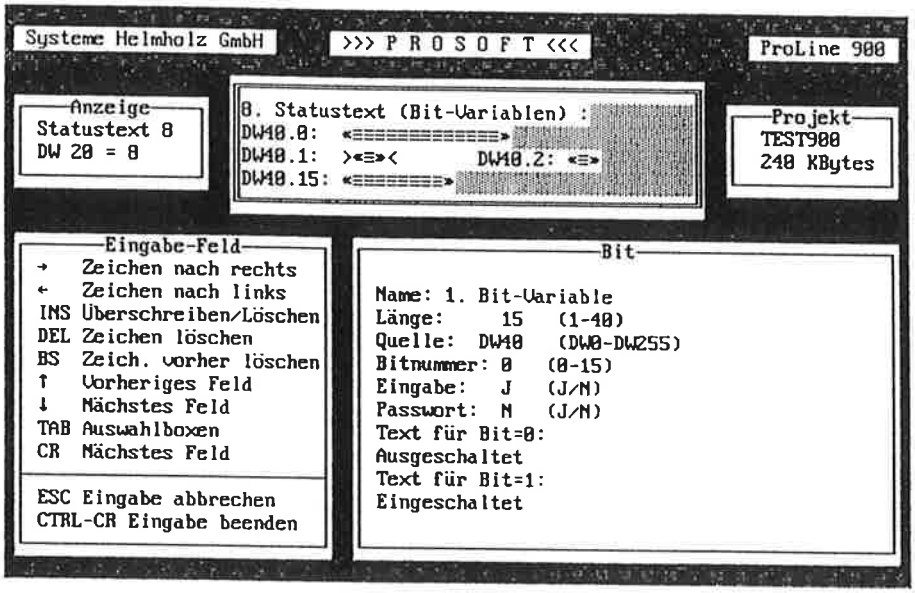


Fig. 5.4.6 Definition of a variable of type BIT

Name: Variable identifier, up to 30 characters long

Length: Max. number of places of the variable (1...40)

Source: Number of the data word assigned (DW 0...DW 255)

Bit number: The data bit assigned to the two texts (0...15)

Input: Y: In input mode, it is possible to edit this variable (input variable).
N: This variable is only displayed. It cannot be changed in input mode.

Password: Y: The input for this variable is only activated if the correct input password has been entered first.
N: The input for this variable is activated without any conditions having been fulfilled.

Text bit = 0: Text (up to 40 characters) which is displayed if the assigned data bit has logical state 0.

Text bit = 1: Text (up to 40 characters) which is displayed if the assigned data bit has logical state 1.

If the variable has been defined as an input variable and input mode has been activated, it is possible to select texts on the Operator Terminal with the <+> and <-> keys. <+> sets the corresponding bit to logical state 1, and <-> sets the bit to 0.

Parameters for variable DATE

Display or entry of the current date.

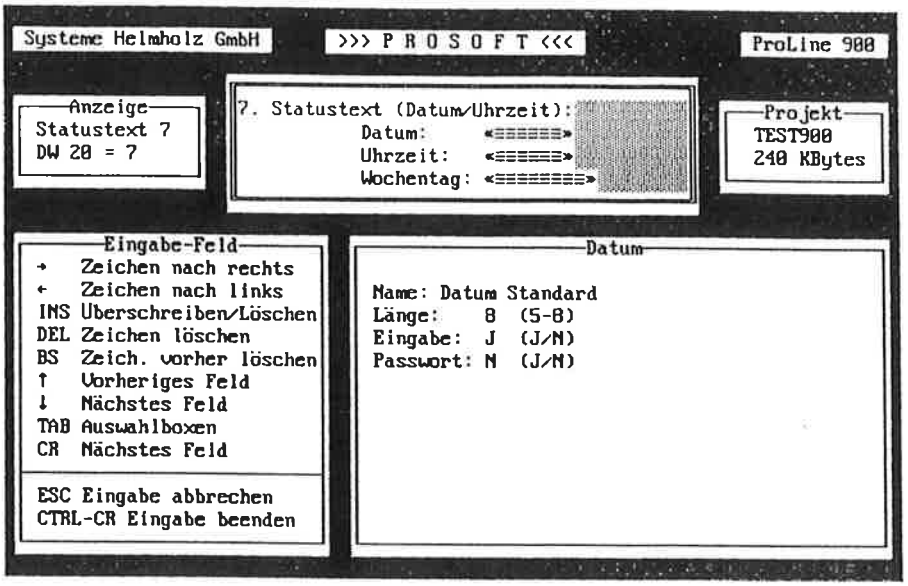


Fig. 5.4.7 Definition of a variable of type DATE

Name: Variable identifier, up to 30 characters long

Length: Max. number of places of the variable (5...8, including the decimal point)

Input: Y: In input mode, it is possible to edit this variable (input variable).
N: This variable is only displayed. It cannot be changed in input mode.

Password: Y: The input for this variable is only activated if the correct input password has been entered first.
N: The input for this variable is activated without any conditions having been fulfilled.

If a value less than 90 is specified for the year, the date is assumed to be in the 21st century.

Parameters for variable TIME

Display or entry of the current time of day.

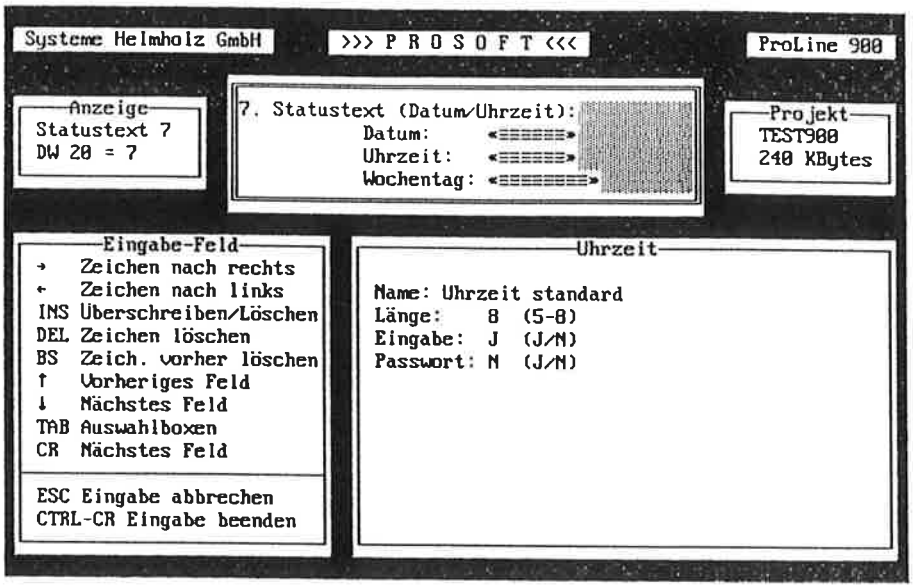


Fig. 5.4.8 Definition of a variable of type TIME

Name: Variable identifier, up to 30 characters long

Length: Max. number of places of the variable (5...8, including colons)

Input: Y: In input mode, it is possible to edit this variable (input variable).
N: This variable is only displayed. It cannot be changed in input mode.

Password: Y: The input for this variable is only activated if the correct input password has been entered first.
N: The input for this variable is activated without any conditions having been fulfilled.

!

When entering the time on the Operator Terminal, use a period instead of the colon.

Parameters for variable DAY OF WEEK

Display or entry of the current day of the week.

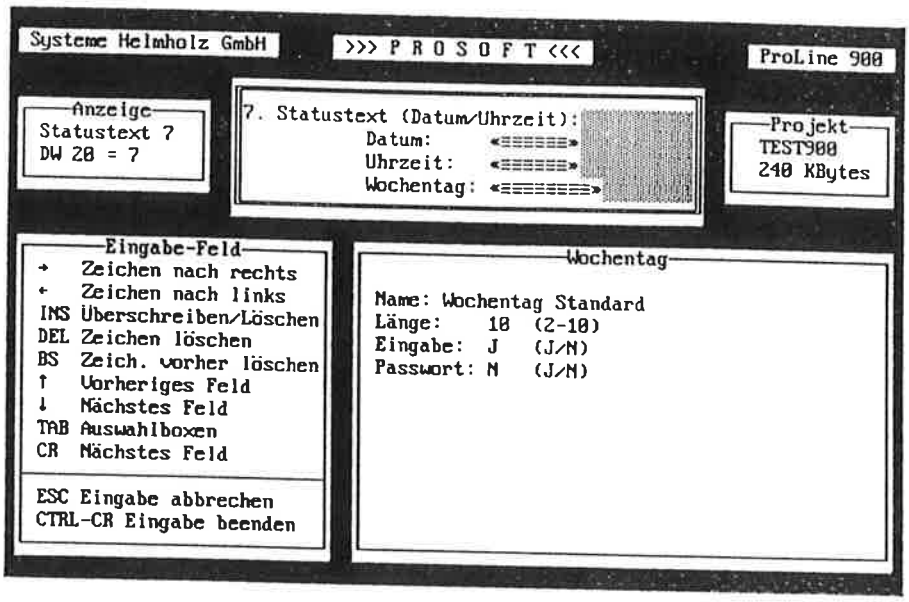


Fig. 5.4.9 Definition of a variable of type DAY OF WEEK

Name: Variable identifier, up to 30 characters long

Length: Max. number of places of the variable (2...10)

Input: Y: In input mode, it is possible to edit this variable (input variable).
N: This variable is only displayed. It cannot be changed in input mode.

Password: Y: The input for this variable is only activated if the correct input password has been entered first.
N: The input for this variable is activated without any conditions having been fulfilled.

If the variable has been defined as an input variable and input mode has been activated, it is possible to select the day of the week on the Operator Terminal using the <+> and <-> keys.

Parameters for variable PRINT NUMBER

Display or entry of the serial print number.

!

The variable PRINT NUMBER is reset to zero after a project has been transferred.

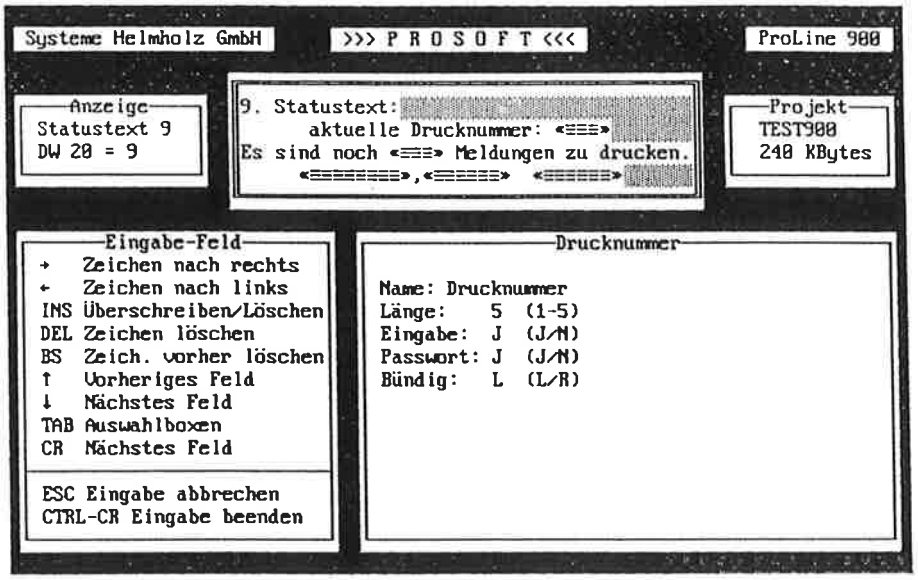


Fig. 5.4.10 Definition of a variable of type PRINT NUMBER

Name:	Variable identifier, up to 30 characters long
Length:	Max. number of places of the variable (1...5)
Input:	Y: In input mode, it is possible to edit this variable (input variable). N: This variable is only displayed. It cannot be changed in input mode.
Password:	Y: The input for this variable is only activated if the correct input password has been entered first. N: The input for this variable is activated without any conditions having been fulfilled.
Justification:	L: display left-justified R: display right-justified

The serial print number counts up to 65535. After this the count restarts as zero.

Parameters for variable PRINT COUNT

Display of the messages still to be printed.

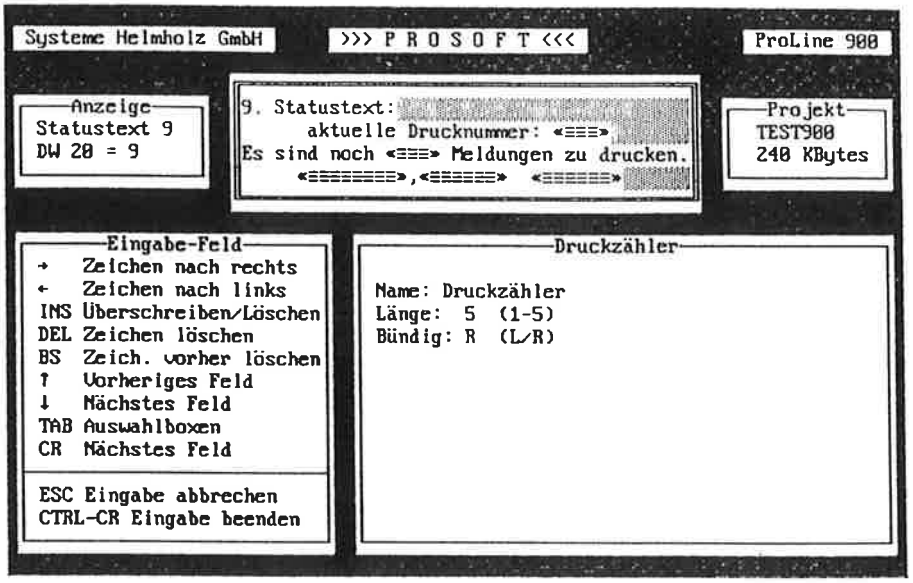


Fig. 5.4.10b Definition of a variable of type PRINT COUNT

Name:	Variable identifier, up to 30 characters long
Length:	Max. number of places of the variable (1...5)
Justification:	L: display left-justified R: display right-justified

Parameters for variable OPERATING TIME

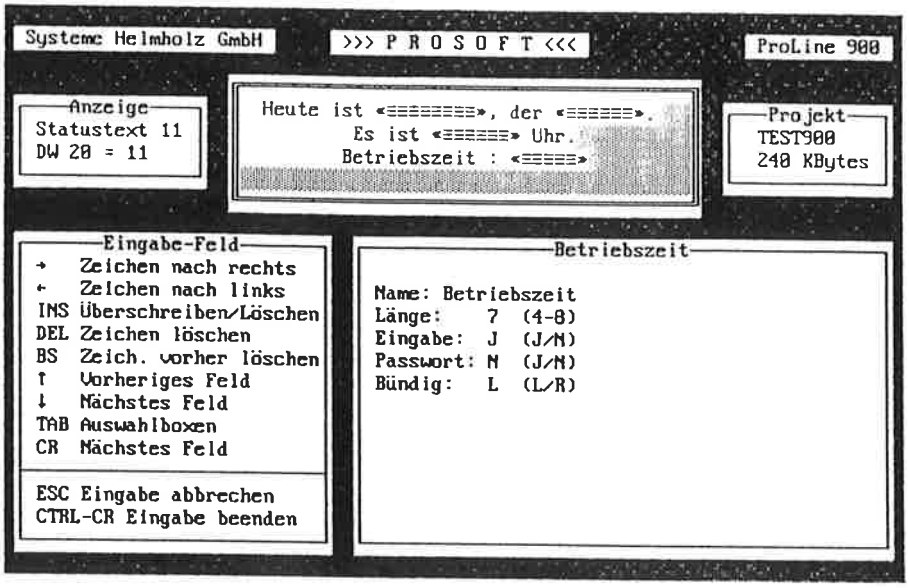


Fig. 5.4.11 Definition of a variable of type OPERATING TIME

Name: Variable identifier, up to 30 characters long

Length: Max. number of places of the variable (4...8)

Input: Y: In input mode, it is possible to edit this variable (input variable).
N: This variable is only displayed. It cannot be changed in input mode.

Password: Y: The input for this variable is only activated if the correct input password has been entered first.
N: The input for this variable is activated without any conditions having been fulfilled.

Justification: L: display left-justified
R: display right-justified

The operating time is output in hours and minutes. Hours and minutes are separated by a colon. While the operating time is running, the colon blinks at one-second intervals.

It is possible to start, stop and initialize the operating time counter by command bits or softkey functions.

Parameters for variable BAR

Display of a barchart in the display depending on the value of a data word. The value to be displayed is always interpreted as a signed value.

!

On ProLine 90/95 four bar or scale variables can be displayed simultaneously for each text. On ProLine 900 three bar or scale variables can be displayed simultaneously for each text.

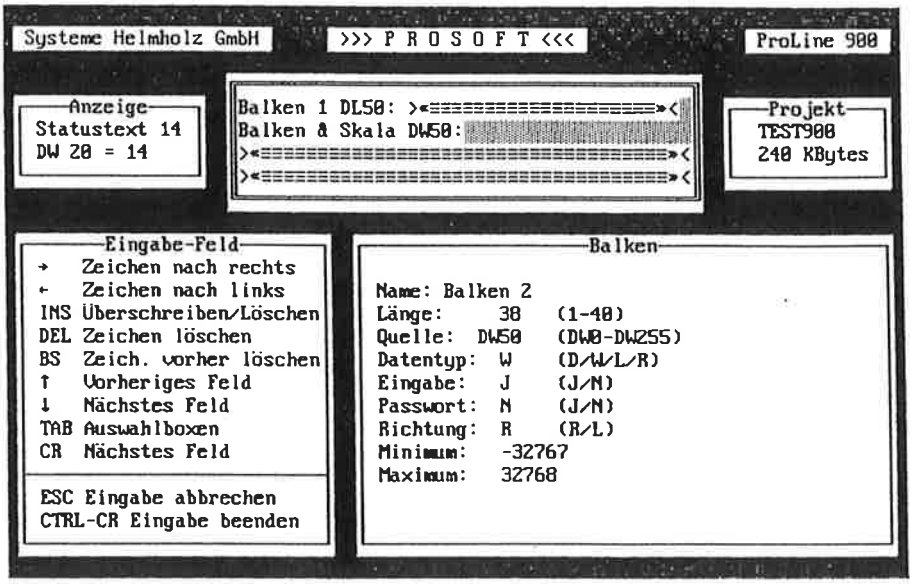


Fig. 5.4.12 Definition of a variable of type BAR

Name:	Variable identifier, up to 30 characters long
Length:	Max. number of places of the variable (1...40)
Source:	Number of the data word assigned (DW 0...DW 255).
Data type:	R: right byte L: left byte W: word (2 bytes beginning with DW number) D: double word (4 bytes beginning with DW number)
Input:	Y: In input mode, it is possible to edit this variable (input variable). N: This variable is only displayed. It cannot be changed in input mode.
Password:	Y: The input for this variable is only activated if the correct input password has been entered first. N: The input for this variable is activated without any conditions having been fulfilled.
Direction:	L: The bar becomes longer toward the left as the value becomes larger. R: The bar becomes longer toward the right as the value becomes larger.

Minimum: Minimum value. No bar is visible. This value is also the input limit. If the in the PLC is lower than the minimum value, no bar is displayed.

Maximum: Maximum value. The complete bar is displayed. This value is also the input limit. If the value in the PLC is above the maximum value, the complete bar is displayed.

If the variable has been defined as an input variable and input mode has been activated, it is possible to change the length of the bar with the <+> and <-> keys.

Parameters for variable SCALE

Display of an indicator in the display depending on the value of a data word. The value to be displayed is always interpreted as a signed value.

!

On ProLine 90/95 four bar or scale variables can be displayed at once per text.
On ProLine 900 three bar or scale variables can be displayed at once per text.

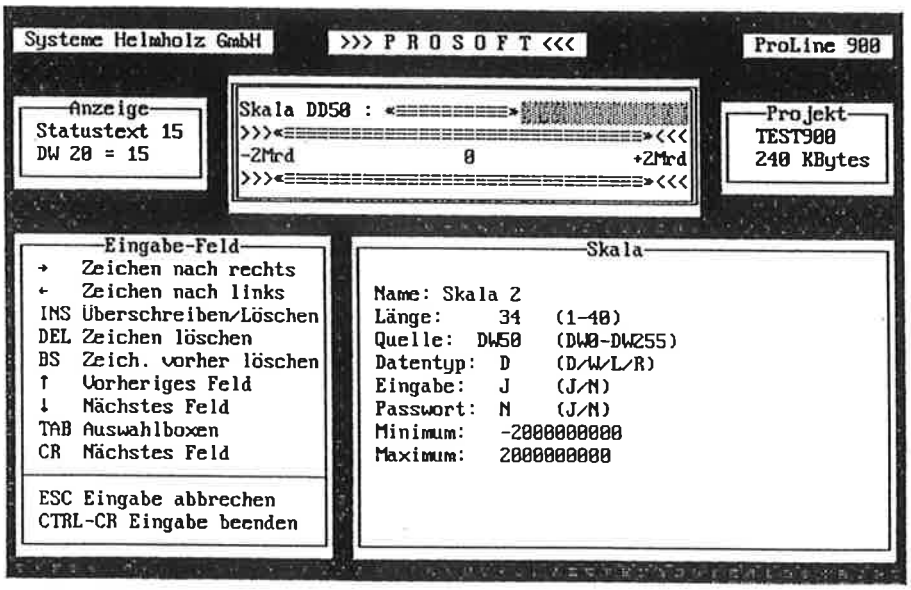


Fig. 5.4.13 Definition of a variable of type SCALE

Name: Variable identifier, up to 30 characters long

Length: Max. number of places of the variable (1...40)

Source: Number of the data word assigned (DW 0...DW 255)

Data type: R: right byte
L: left byte
W: word (2 bytes beginning with DW number)
D: double word (4 bytes beginning with DW number)

Input: Y: In input mode, it is possible to edit this variable (input variable).
N: This variable is only displayed. It cannot be changed in input mode.

Password: Y: The input for this variable is only activated if the correct input password has been entered first.
N: The input for this variable is activated without any conditions having been fulfilled.

Minimum: Minimum value. Indicator at minimum. Also input limit. The input is only an integer value, no decimal places are possible. If the value in the PLC is lower than the minimum, the indicator is at minimum.

Maximum: Maximum value. Indicator at maximum. Also input limit. The input is only an integer value, no decimal places are possible. If the value in the PLC is lower than the maximum, the indicator is at maximum.

If the variable has been defined as an input variable and input mode has been activated, it is possible to change the length of the scale indicator with the <+> and <-> keys.

Parameters for variable COUNTER

Display of a counter with input option. Counters are PLC-specific variables. Access to the values is performed directly by the data handling. At present only counters in SIMATIC S5 format are supported. Implementation for other PLC types is also possible on request.

Because of the special treatment in the data handling, the refresh rate for counters is somewhat slower than for normal variables.

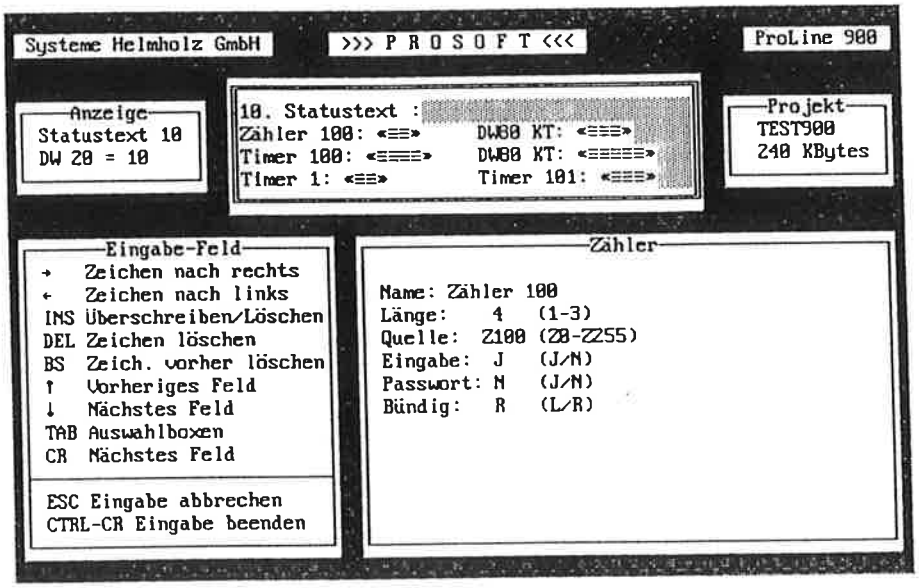


Fig. 5.4.14 Definition of a variable of type COUNTER

Name:	Variable identifier, up to 30 characters long
Length:	Max. number of places of the variable (1...3)
Source:	Number of the counter (0...255)
Input:	Y: In input mode, it is possible to edit this variable (input variable). If a counter has been edited, it is switched to valid in the PLC. N: This variable is only displayed. It cannot be changed in input mode.
Password:	Y: The input for this variable is only activated if the correct input password has been entered first. N: The input for this variable is activated without any conditions having been fulfilled.
Justification:	L: display left-justified R: display right-justified

Parameters for variable TIMER

Display of a timer in SIMATIC S5 format with an input option. TIMER variables are PLC-specific variables. Access to the values is performed directly by the data handling. At present only TIMER variables in SIMATIC S5 format are supported. Implementation for other PLC types is also possible on request.

Because of the special treatment in the data handling, the refresh rate for timers is somewhat slower than for normal variables.

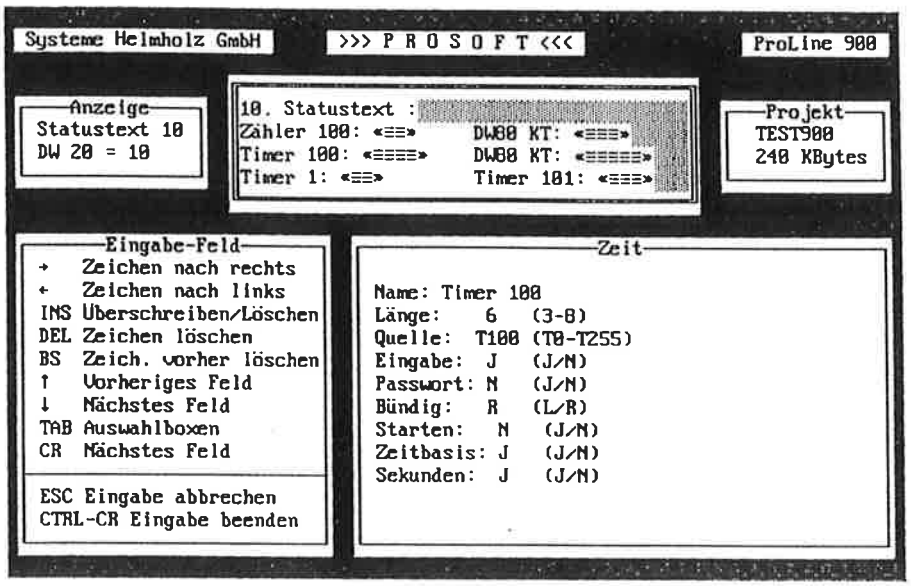


Fig. 5.4.15 Definition of a variable of type TIMER

Name:	Variable identifier, up to 30 characters long
Length:	Max. number of places of the variable (3...8)
Source:	Timer number (0...255)
Input:	Y: In input mode, it is possible to edit this variable (input variable). If a timer has been entered, it is switched to valid in the PLC. N: This variable is only displayed. It cannot be changed in input mode.
Password:	Y: The input for this variable is only activated if the correct input password has been entered first. N: The input for this variable is activated without any conditions having been fulfilled.
Justification:	L: display left-justified R: display right-justified
Start:	Y: After a timer value has been entered, the timer in the PLC is started N: Only the timer value in the PLC is set. The timer is not started.
Timebase:	Y: The timebase in SIMATIC S5 format is displayed in addition to the timer value.

Seconds: Y: The timer value is represented in seconds depending on the timebase. An "s" is automatically appended to the value. The optimum timebase is selected on entry and set in the PLC.

Parameters for variable KT format

Display of a timer in SIMATIC S5 KT format. The value of this variable is stored in a PLC data word in KT format.

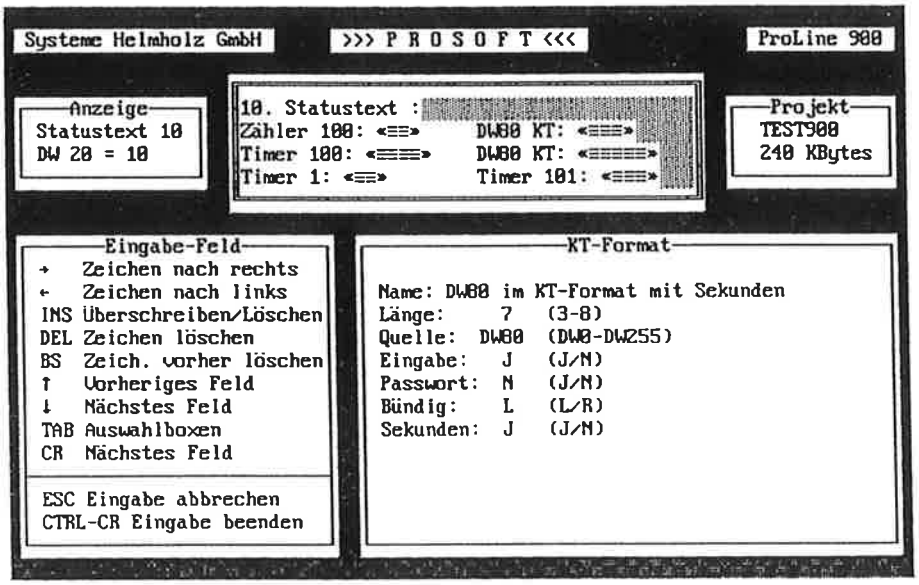


Fig. 5.4.15b Definition of a variable of type KT format

If the value from the PLC cannot be displayed in KT format, a rectangle is output at the corresponding position in the display value on the ProLine 90/95. The ProLine 900 outputs a characer with three horizontal lines instead.

Name: Variable identifier, up to 30 characters long

Length: Max. number of places of the variable (3...8)

Source: Number of the data word assigned (DW 0...DW 255)

Input: Y: In input mode, it is possible to edit this variable (input variable)
N: This variable is only displayed. It cannot be changed in input mode

Password: Y: The input for this variable is only activated if the correct input password has been entered first.
N: The input for this variable is activated without any conditions having been fulfilled.

Justification: L: display left-justified
R: display right-justified

Seconds: Y: The timer value is represented in seconds depending on the timebase. An "s" is automatically appended to the value. The optimum timebase is selected on entry and entered in the PLC dataword.

Parameters for variable CHARACTER

Display or entry of up to four ASCII characters from PLC data bytes.

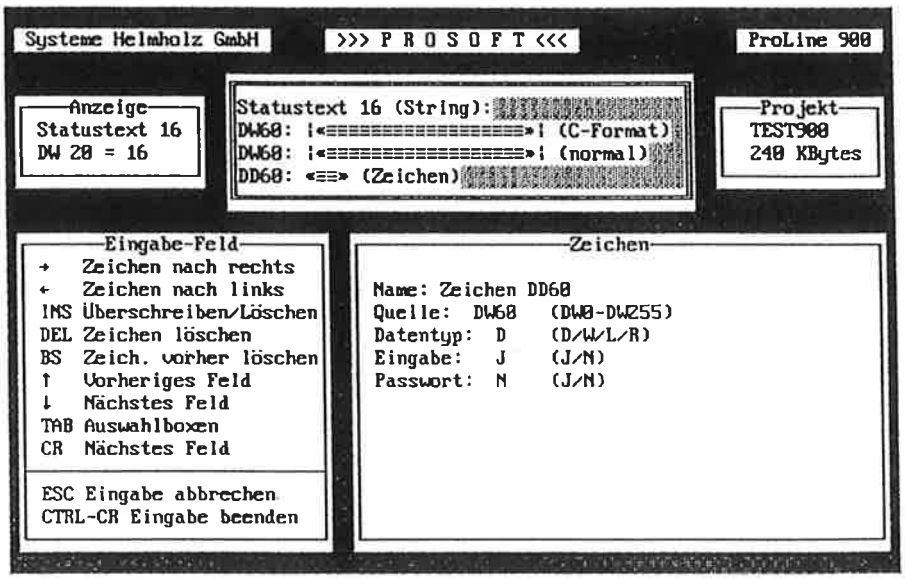


Fig. 5.4.16 Definition of a variable of type CHARACTER

If bytes from the PLC cannot be displayed as ASCII characters, a rectangle is output on the ProLine 90/95. The ProLine 900 outputs a character with three horizontal lines instead.

Name: Variable identifier, up to 30 characters long

Source: Number of the data word assigned (DW 0...DW 255)

Data type: R: right byte
L: left byte
W: word (2 bytes beginning with DW number)
D: double word (4 bytes beginning with DW number)

Input: Y: In input mode, it is possible to edit this variable (input variable).
N: This variable is only displayed. It cannot be changed in input mode.

Password: Y: The input for this variable is only activated if the correct input password has been entered first.
N: The input for this variable is activated without any conditions having been fulfilled.

If the variable has been defined as an input variable and input mode has been activated, it is possible to change individual text characters on the Operator Terminal with the <+>, <-> keys or the **numeric keypad**. For a detailed description of the edit functions of the ProLine, see Section "Keys in input mode".

The data type defines the number of characters that can be displayed and entered!

Parameters for variable STRING

Display or entry of an ASCII strings from PLC data bytes.

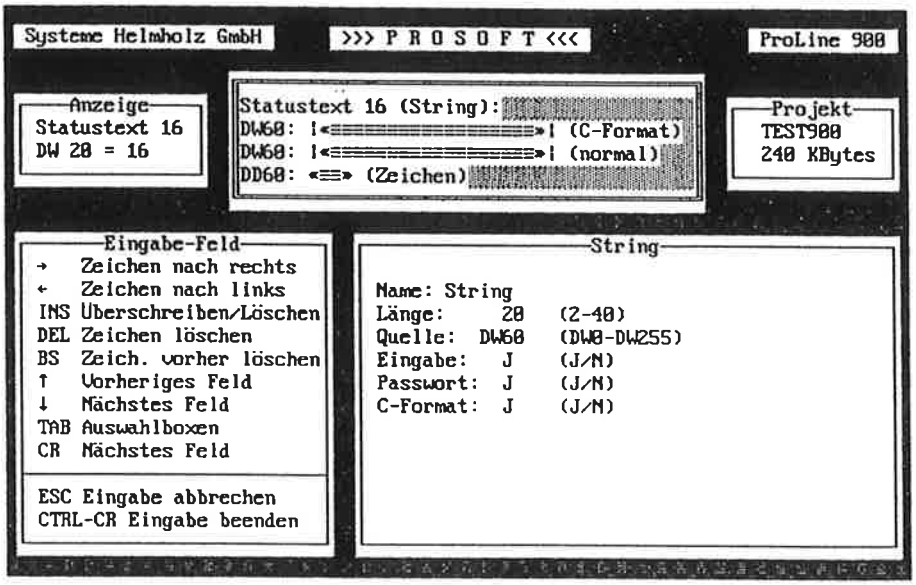


Fig. 5.4.17 Definition of a varible of type STRING

If bytes from the PLC cannot be displayed as ASCII characters, a rectangle is output on the ProLine 90/95. The ProLine 900 outputs a character with three horizontal lines instead.

Name:	Variable identifier, up to 30 characters long
Length:	Number of places of the variable (2...40), only even-numbered lengths are permitted
Source:	Number of the data word assigned (DW 0...DW 255)
Input:	Y: In input mode, it is possible to edit this variable (input variable). N: This variable is only displayed. It cannot be changed in input mode.
Password:	Y: The input for this variable is only activated if the correct input password has been entered first. N: The input for this variable is activated without any conditions having been fulfilled.

C **Format:** Y: Text output on the ProLine is canceled with the character 00_{Hex} and the remainder is filled with blanks.
N: The full number of places is always interpreted as an ASCII string.

If the variable has been defined as an input variable and input mode has been activated, it is possible to change individual text characters on the Operator Terminal with the <+>, <-> keys or the **numeric keypad**. For a detailed description of the edit functions of the ProLine, see Section "Keys in input mode".

5.5 Main screen

When the program is started the main screen is displayed first.

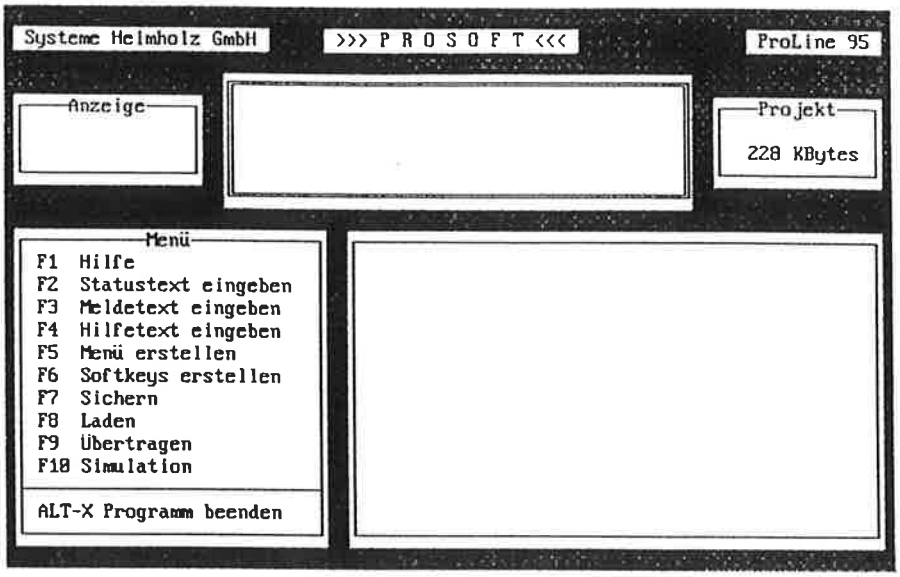


Fig. 5.5.1 ProSoft development environment

An image of the ProLine display is shown in the middle of the upper part of the screen. Texts can be entered and variables positioned in this display.

The small window to the left shows the type and number of the text being edited and, if necessary, the associated data word or data bit.

In the right-hand, small window, the name of the current project and the free memory capacity are shown.

The large window bottom left shows all the functions that can be executed. If you press **<Shift>**, **<Alt>** or **<Ctrl>** here, another menu level is shown with further functions.

The large window to the bottom right displays help screens, current statuses and input fields. Together with the display window it is the "Working field".

You can return to the previous level from all functions by pressing <ESC>.

5.6 Projects

5.6.1 New project

A new project to be created. It includes texts, variables and parameters and must be assigned a name. The directory in which the project is to be stored can be specified here.

If you press the key combination <Alt-F8>, the program asks you for a name for the new project. If you press <TAB>, a file selection box is displayed, with which you can change the current project path. With "Accept" or <↵> the selected project path is accepted as the current project path. Now enter a name (up to 8 characters) for the current project.

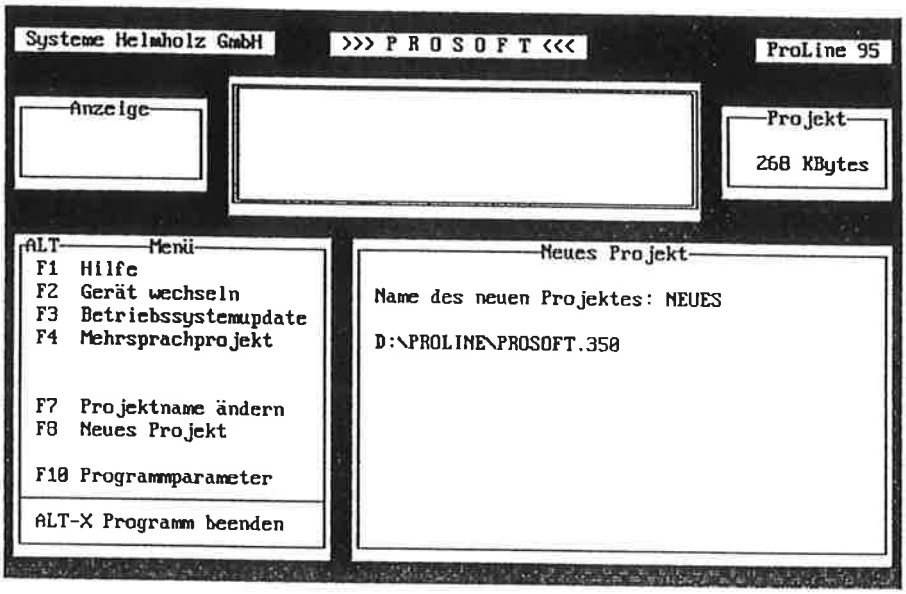


Fig. 5.6.1 New project

In the windows that now appear, you are prompted for settings that apply globally to the whole project. The first window asks for the project parameters. Other windows ask for the communication drivers and the printer interface of ProLine.

5.6.2 Project parameters

By creating a new project or pressing the key combination <Shift-F9> you can enter the project parameters.

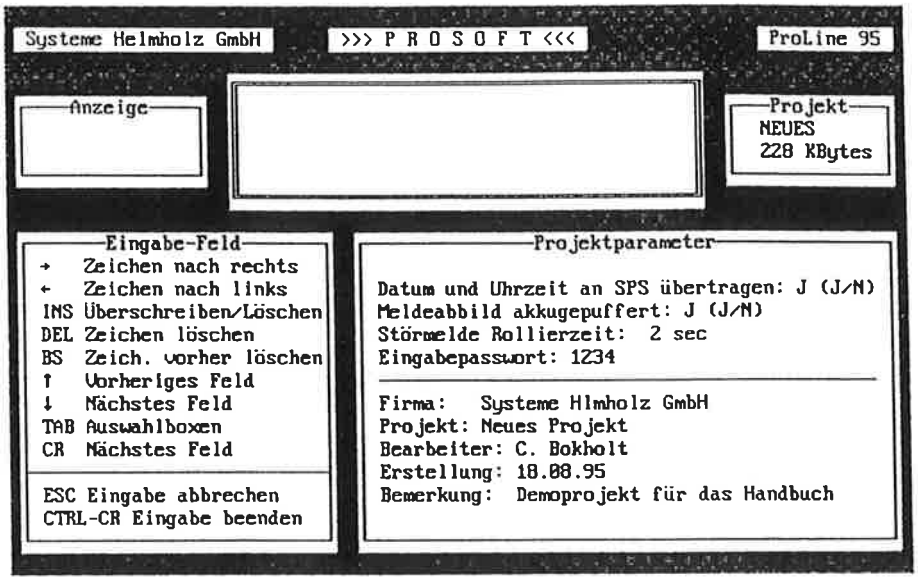


Fig. 5.6.2 Entering the project parameters

Transfer date and time to PLC:

Y: The ProLine transfers the internal time and date to the PLC cyclically.

N: To achieve faster communication between the PLC and ProLine you can block the transfer of the date and time.

Message image battery-backed:

Y: After a power failure of the ProLine only those printable fault messages are printed that changed during the power failure.

N: After a power failure of the ProLine all printable fault messages are printed again.

Fault message rolling time:

If several fault messages with equal priority are active and the alternating display (rolling) of these messages is activated, this parameter can be used to enter the delay between the messages.

Input password:

Enter input password for the Operator Terminal (4 figures).

Company / project / developer / creation / comment:

Company-specific data can be entered in the lower fields. This information appears on the project print-outs.

5.6.3 Communication drivers

By creating a new project or by pressing the key combination <Shift-F6> it is possible to select the communication driver for communication between the Operator Terminal and the PLC. Only one driver can be selected.

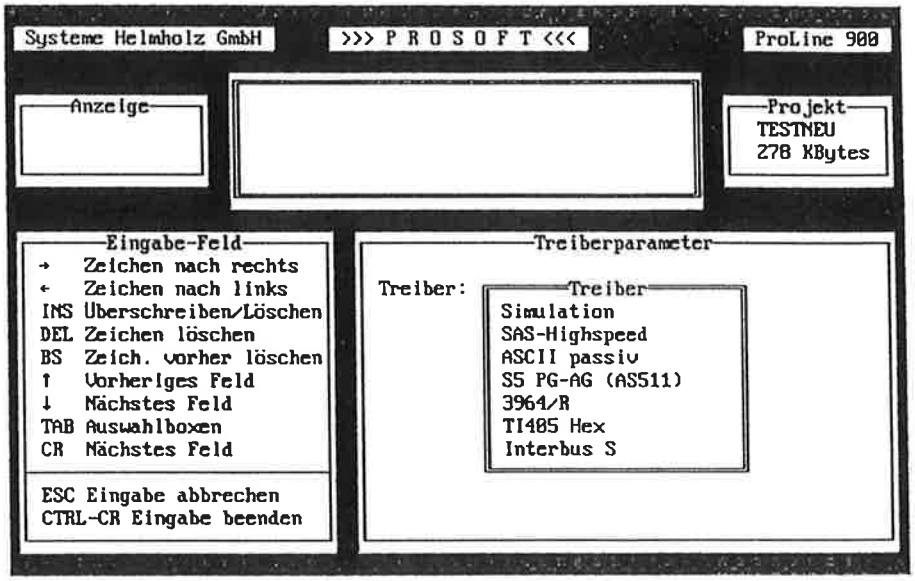


Fig. 5.6.3 Selecting a communication driver

Here it is possible to set the necessary driver parameters for the driver selected.

3964 with BCC	Y: 3964R N: 3964
Baud rate	Baud rate for transfer via the communication interface.
Data width	Width of the data channel for INTERBUS-S
ON delay	Period (seconds) after POWER-ON during which no transmission errors are displayed on the display of the Operator Terminal.
Data handling DB	Number of the data handling block
Master ID	Master ID for TI405
Interface	V: V.24 (RS232) interface T: TTY interface
Slave ID	Slave ID for TI405
Variable DB	Number of the variable data block

For further information on the communication driver see our Manual "ProLine Kopplung" (ProLine Link), order number 900-900-1BT12.

5.6.4 Printer parameters (Log printer)

By creating a new project or by pressing the key combination <Shift-F7> you can set the printer parameters of the Operator Terminal.

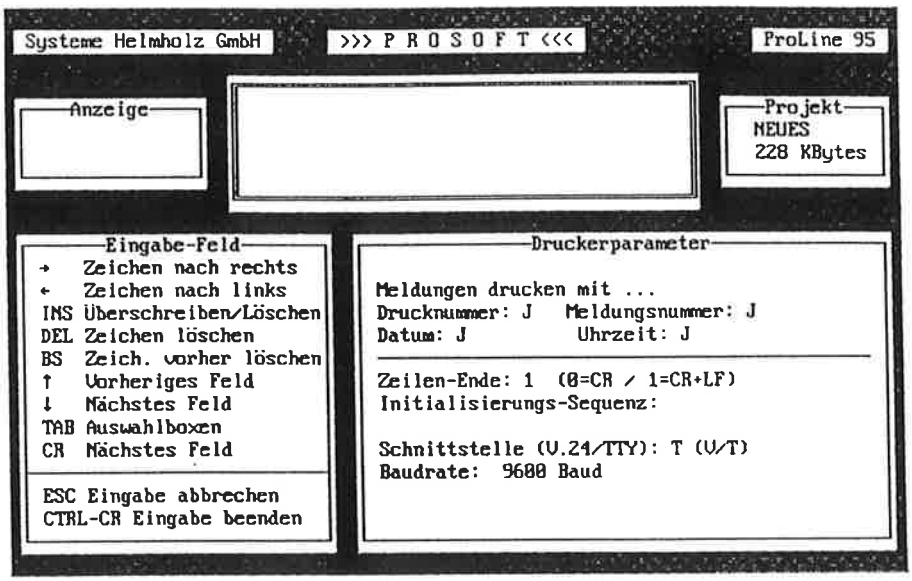


Fig. 5.6.4 Setting the printer parameters of the Operator Terminal

The serial print number is incremented even if printing of the serial print number is deactivated!

Every message to be printed can be assigned a header. In this header you can output the following system internal variables:

- Serial print number
- Message number with status information
- Date
- Time

It is also possible to set whether CR only or CR+LF is to be printed at the end of a line. The initialization sequence is sent to the connected printer in the following cases:

- When ProLine is started after project transfer
- On POWER-ON
- When message printing is enabled (bit 24.4 reset)
- After message printing reset (bit 24.8 reset)

The codes of the sequence must entered in decimal code separated by a comma.

The last settings concern the transmission mode and the speed of the printer interface. For more detailed information about further physical parameters of the printer interface, see the Section "Printing messages".

Please refer to your printer manual for information about these settings!

Example of a print-out:

```
>Print number: 12345
>Message 512 acknowledged
>on 11.25.94 at 16:11:03
 CAUTION!
 Heat accumulation in switchroom
 Replace filter mats
 Test HVAC system
```

5.6.5 Loading a project

To load an existing project, use the function key <F8>. You can then enter the name of the project or press <TAB> to select a file name via a file selection box. In this selection box you can change the current project path and the drive.

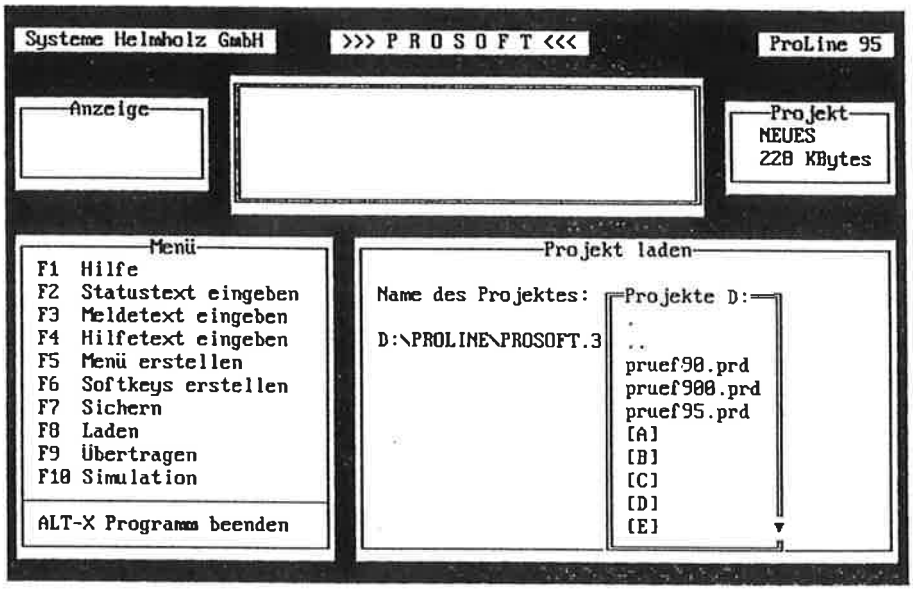


Fig. 5.6.5 Loading a project

When loading an existing project the correct ProLine type is set automatically and the project parameters are read in from this file.

5.6.6 Change project name

With the key combination <Alt-F7> an existing project is duplicated and further processed under another name. The previous state of the project is retained on the hard disk with its old name.

5.6.7 Transferring a project

!

To transfer a multilingual project to the Operator Terminal, please use the <Alt-F4> function!

With the function key <F9>, the current project is converted to a special binary format and stored in the current project path in a file with the extension .BIN. This binary format contains all the parameters required for the ProLine, the communication drivers and texts in a compressed form. After conversion, the binary file created is transferred to the ProLine.

! *Before starting transmission, the ProLine must be in project transfer mode!*

To activate project transfer mode press the keys <Shift> and <Help> simultaneously on the ProLine. The following query is displayed:

```
Do you want to load a new project?
     Yes = <Clear> / No = <Enter>
```

After confirmation with <Clear>, project transfer mode is active.

```
Start project transfer
on your development computer ...
```

Now start transmission of the project on your PC pressing <F9> as described above.

When the following text is displayed, the old project is deleted in the ProLine and the new project is transmitted:

```
Project data are being read:  Base _
Total size:       _ _ _ _ _ Bytes
Received:         _ _ _ _ _ Bytes
Programmed:       _ _ _ _ _ Bytes
```

⚠ ***After successful project transfer, the ProLine attempts to re-establish communication with the PLC by restarting the driver interface.***

The interface for project transmission is preset to COM1. The baud rate on operating system version 1.50 and higher (of the ProLine) is 38400 baud. Older operating system versions require 19200 baud for project transmission. These settings can be changed in the program parameter menu <Alt-F10>.

The success of project transfer is displayed on your development computer along with the current operating system version of the Operator Terminal. The memory allocation of the converted project file and the free memory remaining in the Operator Terminal are displayed in bytes.

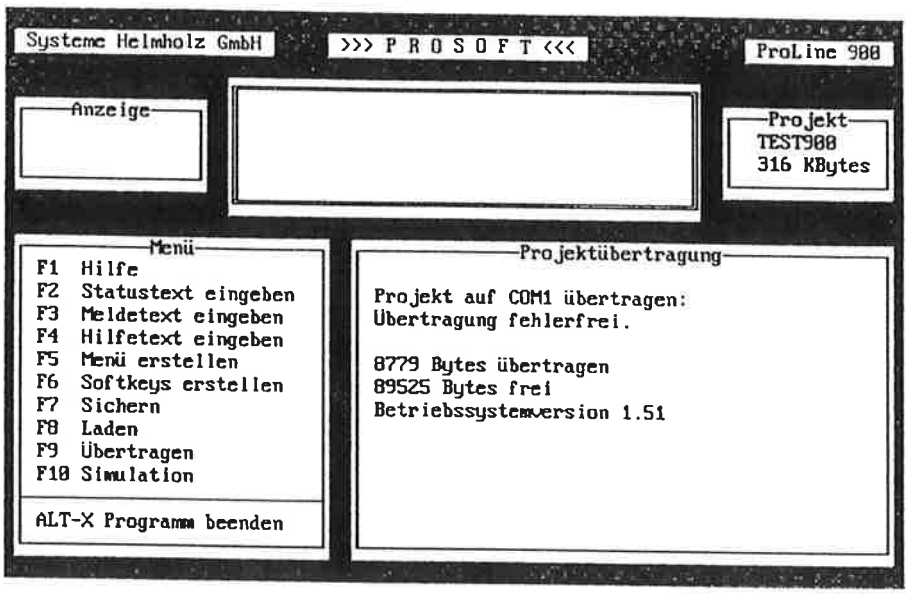


Fig. 5.6.7 Project transfer

5.6.8 Printing out a project

With the key combination <Shift-F8>, it is possible to print individual parts or the entire project.

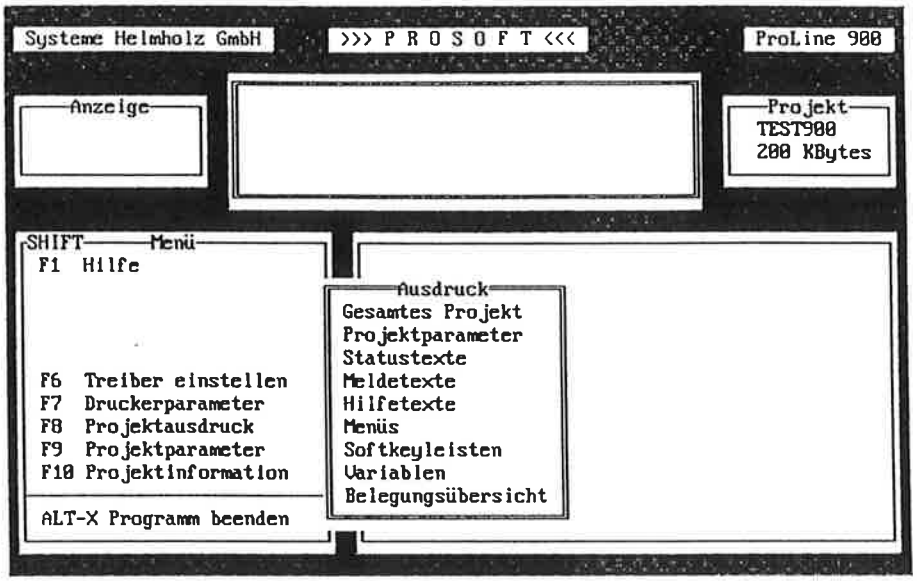


Fig. 5.6.8 Print menu

With print-out "Variables", you obtain information about their parameter settings and the texts in which they are used.

With the print-out "Assignment overview" you obtain precise information about the assignment of the variable data block. *This shows you which areas are unassigned or doubly assigned!*

5.7 Entering a status text

On the ProLine 900 up to 512 four-line status texts are possible. These are shown on the display via a certain data word or register in the connected PLC. The number of the text to be displayed must be written as a value in the data word for status texts. If this value is 0 a system text is displayed which also contains the project name and the current operating system version. Only one status text can be active at any one time. Using status texts it is possible to display the status of an installation for example. Several status texts can be linked to form menus (see Section "Creating a menu").

Each status text can contain up to 16 variables (see Section "Variables").

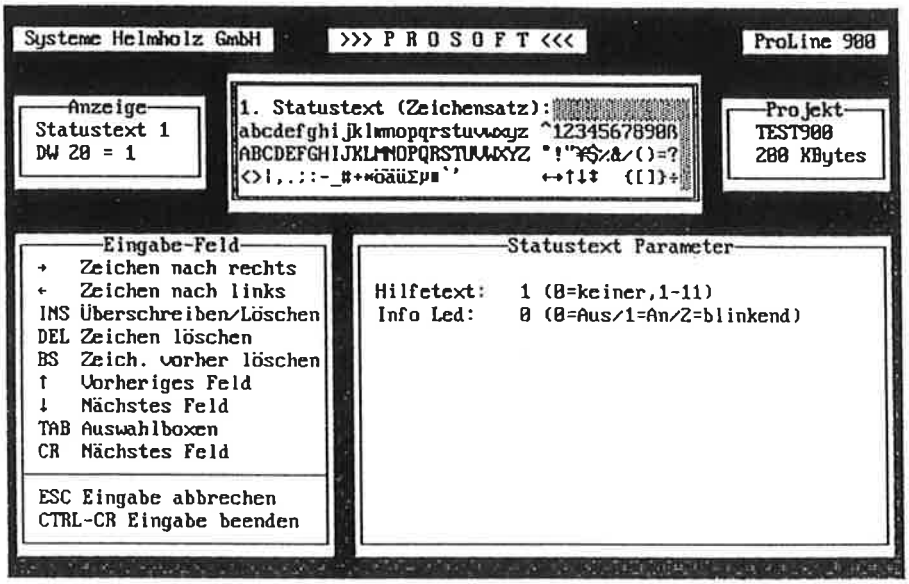


Fig. 5.7.1 Entering status texts

It is only possible to program status texts if a project has already been loaded or a new project created.

Press function key <F2> to edit status texts. The first status text is displayed in the text window and the cursor blinks in the display window. The text can now be created and edited just like in any text processing system.

With the <PAGE DOWN> key you can page down in the status texts and with the <PAGE UP> key you can page up.

Parameters can be assigned to a status text. To do this press the <Ctrl> and <P> keys simultaneously.

Every status text has the following parameters:

Help text: The number of an existing (already created) help text can be specified. This help text is displayed when the status text is displayed on the Operator Terminal, as long as the **<Help>** key is pressed. If zero is entered here, the key on the Terminal has no effect. If status texts are linked with menus, the menu help text is displayed in the menus instead of this help text.

Info LED: Status of the info LED when the status text is displayed.

0 = off
1 = on
2 = blink

5.8 Entering a message text

With the ProLine 900, up to 512 four-line message texts are possible. Each message text can be activated via a data bit in the PLC. Several messages can be set and active at the same time.

Using message texts, it is possible to display fault messages, alarms, information or warnings.

Message texts can be printed with the date, time, serial print number and status information (message raised, cleared or acknowledged).

The priority of message texts is higher than that of status texts. An active message text covers up a status text active at the same time. One of eight priorities can be assigned to each message text (see Section Overall Priority)

Each message text can contain up to 16 variables (see Section Variables).

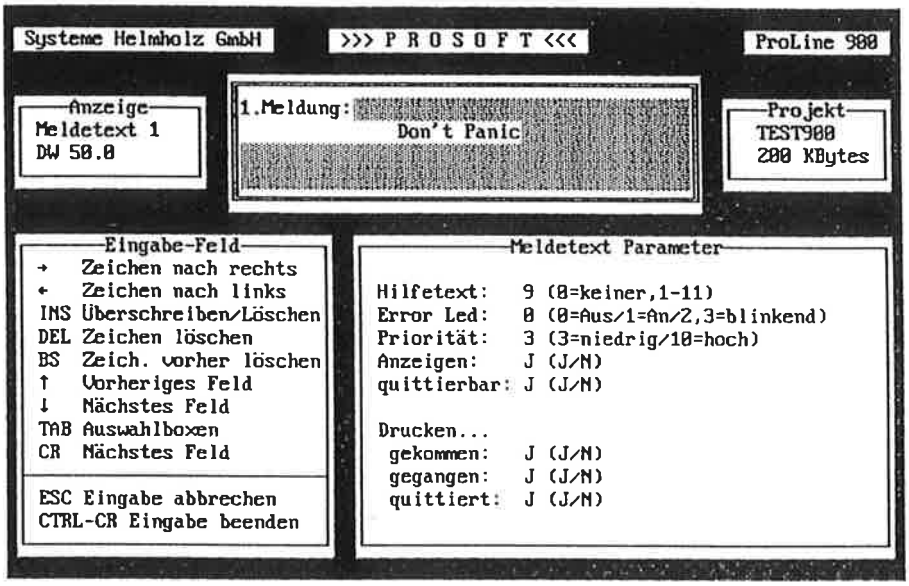


Fig. 5.8.1 Entering message texts

It is only possible to program message texts if a project has already been loaded or a new project created.

Press the function key <F3> to edit message texts. The first message text appears and the cursor blinks in the text window. The text can now be created and edited just like in any text processing system.

The <PAGE DOWN> key can be used to page down in the message texts and the <PAGE UP> key to page up.

Parameters can be assigned to a message text. To do this, press the <Ctrl> and <P> keys simultaneously.

Every message text has the following parameters:

Help text: The number of an existing (already created) help text can be specified. This help text is displayed when the message text is displayed on the Operator Terminal, as long as the <Help> key is pressed. If zero is entered here, the key on the Terminal has no effect.

Priority: A priority level from 3 to 10 can be set. It controls the display priority when several messages are active at the same time.

Error LED: Status of the error LED when a message text is displayed.
0 = off
1 = on
2 = error LED blinking
3 = text and error LED blinking

Displays: Y: If the corresponding bit in the communication area is set, the text appears on the display.
N: The text is not shown on the display. This is useful if a message text is to be printed only.

Acknowledged: Y: With the <Clear> key you can acknowledge the message text currently being displayed. The corresponding bit is automatically reset in the programmable controller. Messages that are not displayed because of a priority limitation cannot be acknowledged.
N: The message cannot be acknowledged from the ProLine. The bit in the communication area must be reset by the PLC.

Printing is not possible with ProLine 90!

Print when raised: Y: Print the message text when the corresponding data bit is set. (Bit is set to 1)

Print when cleared: Y: Print the message text when the corresponding data bit is reset. (Bit is set to 0)

Print when acknowledged: Y: Print the message text when the text is acknowledged. For this the message text must be defined as acknowledgeable.

5.9 Entering a help text

Each help text can be assigned to any status text, message text or menu node. A help text is displayed if the associated status text, message text or menu node is displayed and the <Help> key is pressed on the Operator Terminal. Several assignments are possible.

A help text covers up all other types of text because it has a higher priority.

Help texts cannot contain variables!

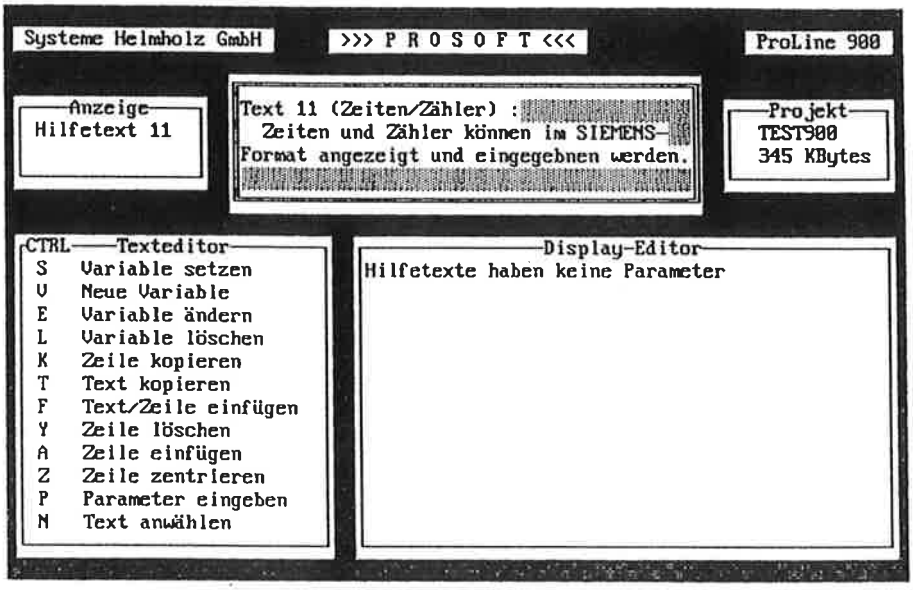


Fig. 5.9.1 Defining help texts

Press the function key <F4> to edit a help text. The help text is displayed in the text window and the cursor blinks in the display window. The text can now be created and edited just like in any text processing system.

The <PAGE DOWN> key can be used to page down in the help texts and the <PAGE UP> key to page up.

The help text has no parameters. A help text is assigned to menu nodes, status or message texts via the parameters of the corresponding texts or menu nodes.

5.10 Creating a menu

A menu links several status texts to form a structure in which you can branch on the Operator Terminal using the cursor keys. The operator can switch between these status texts using the cursor keys of the Operator Terminal. When defining a menu, you can choose with which cursor key you can branch to which status text. All four directions are possible in each node. You do not always have to use all four directions.

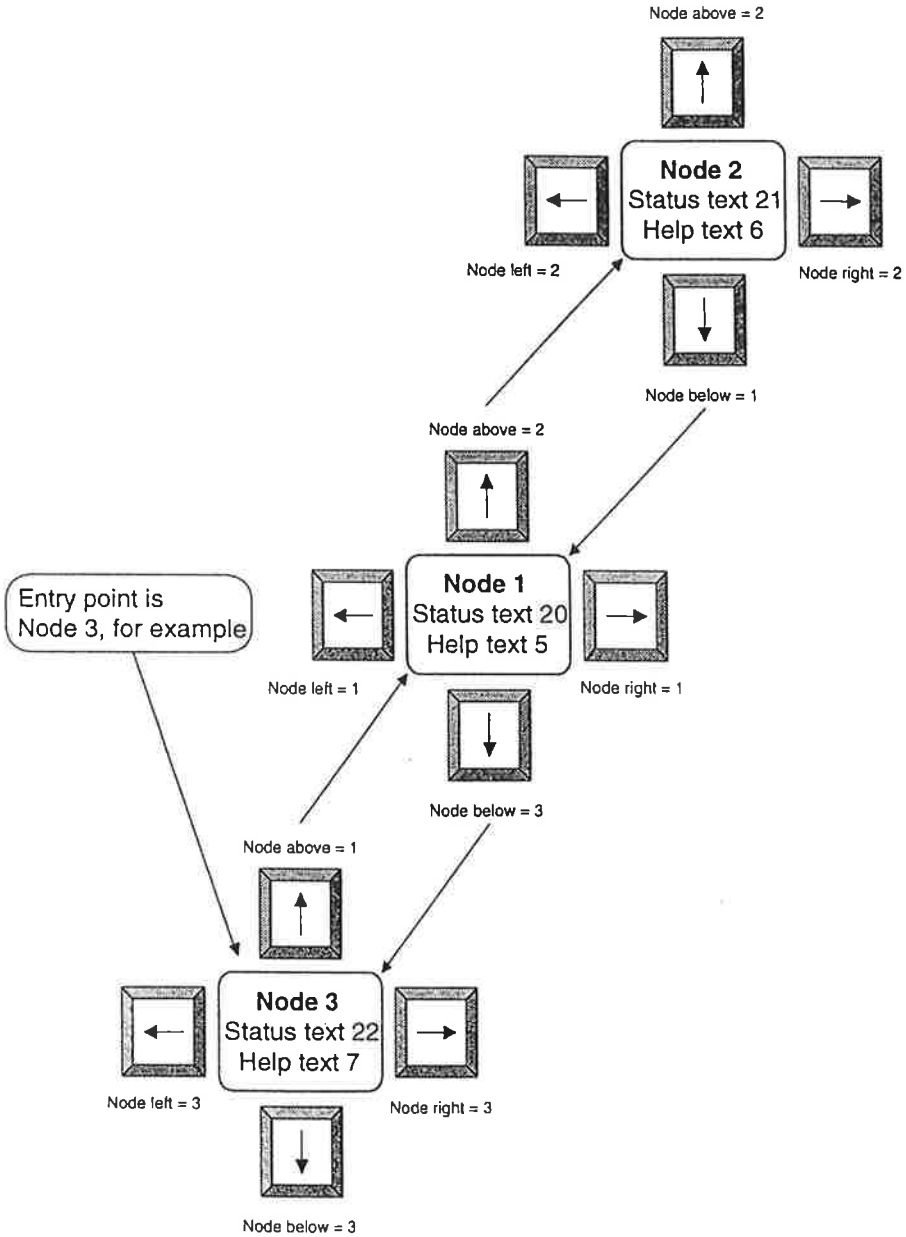


Fig. 5.10.1 Example of a menu consisting of three menu nodes

Create new menu:

Select the <F5> key in the main menu of ProSoft for "Create menu". The dialog window "Create menu" is displayed. Enter <0> to create a new menu. The menus are numbered automatically. If no other menu has been created yet, the first menu will be menu 1.

Change existing menu:

Select the <F5> key in the main menu of ProSoft for "Create menu". The dialog window "Create menu" is displayed. Enter the number of the existing menu.

If a menu is called in the Operator Terminal (DL 21 in the communication area), the normal method (DR 21 = 0) is to begin at the starting node that is specified in the parameter settings of ProSoft. However, if a special starting node (DR21 > 0) is specified by the PLC in the communication area (DR 21) then this is the starting node that applies.

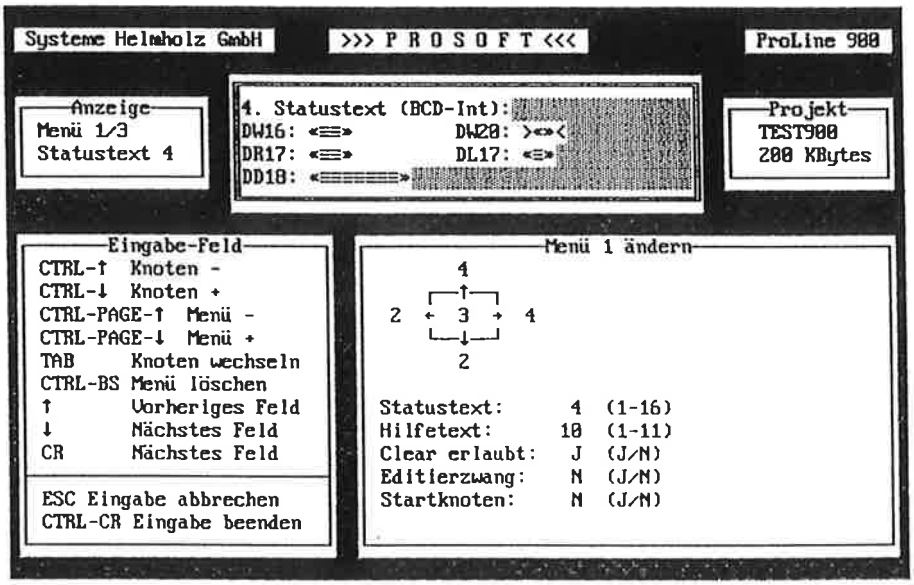


Fig. 5.10.2 Entering the menu you have created

Editor functions:

<Ctrl-UP>	pages in the created nodes
<Ctrl-DOWN>	pages in the created nodes
<Ctrl-PAGEUP>	pages in the created menus
<Ctrl-PAGEDOWN>	pages in the created menus
<Ctrl-BACKSPACE>	deletes a complete menu
<Ctrl-↵>	accept values and exit menu input

Description of the menu structure parameters:

Branching information:

- The node specified in the center of the frame is the current menu node.
- The nodes specified outside the frame show the destination reached when this cursor key is pressed.

If you do not want a cursor key to have any function, enter its own node number or <->. When the ProLine is in on-line mode, only those cursor LEDs are lit that are not assigned to the same node (ProLine 90 does not have cursor LEDs).

Status text:

This status text is displayed if the menu node is active. The info LED lights up in accordance with the parameter definition of the status text. The help text assigned to the status text is not evaluated in menus. If you want a help text to be displayed in menus too, this can be defined with the following parameters (help text).

Help text:

The help text is displayed as long as the <Help> key is pressed on the Operator Terminal. It is possible to assign a separate help text to each node.

Function of the <Clear> key:

With this key, an operator can exit the menu. This function can be disabled in each node.
Y: If this function is enabled, the menu structure is exited as soon as the key is pressed. If ProLine is in input mode, input mode is terminated before the menu structure is exited.
N: It is not possible to exit the menu structure at this menu node.

If editing compulsion exists for the node and ProLine is also in input mode, this is a special case in which the <Clear> key only has a function once all the variables have been edited.

Editing compulsion:

Y: If ProLine is in input mode, all input variables must first be edited. Only after that are the functions of the cursor key enabled again so that it is possible to switch to another menu node. If no input variables have been defined in a status text, the parameter editing compulsion has no function.
N: In input mode, you do not have to edit any variables before you can enter another menu node.

Starting node:

Y: The node specified in the center of the frame becomes the starting node for the entire menu structure. A previous starting node definition of another menu node is then no longer valid.
Please note that a starting node specified in the PLC (DR21 > 0) has priority over the parameterized starting node at this point!
N: This menu node is not to be the starting node for the entire menu structure.

Help with parameter input:

Status text:

If the cursor is in the editing field status text number, you can press the <TAB> key to obtain a list of all the status texts already defined. You can then select one with the cursor keys. <↵> accepts this value and shows you it in the virtual display.

Help text:

If the cursor is in the editing field help text number, you can press the <TAB> key to obtain a list of all the help texts already defined. You can then select one with the cursor keys. <↵> accepts this value and shows you it in the virtual display.

Node right:
Node left:
Node above:
Node below:

Node number reached in each direction on changing the menu node. If the cursor is in this editing field you can go to the corresponding node by pressing the <TAB> key. The status text reached with the cursor movement is then displayed in the virtual display.

Menu movements within a menu (using the cursor keys), can be disabled temporarily with the command bit 5 DW 24.

The menu status text currently displayed can be seen from data handling block DW13. The menu currently displayed is in DR12 and the current menu node is in DL12.

5.11 Softkey bars

5.11.1 How softkey bars work

The softkey functions enable the operator of a ProLine to trigger actions by pressing a function key which would otherwise have to be programmed in the PLC. All softkey functions change the corresponding data words in the data handling block as if they had been modified by the PLC program. The function is then executed on the next data handling block information reading cycle.

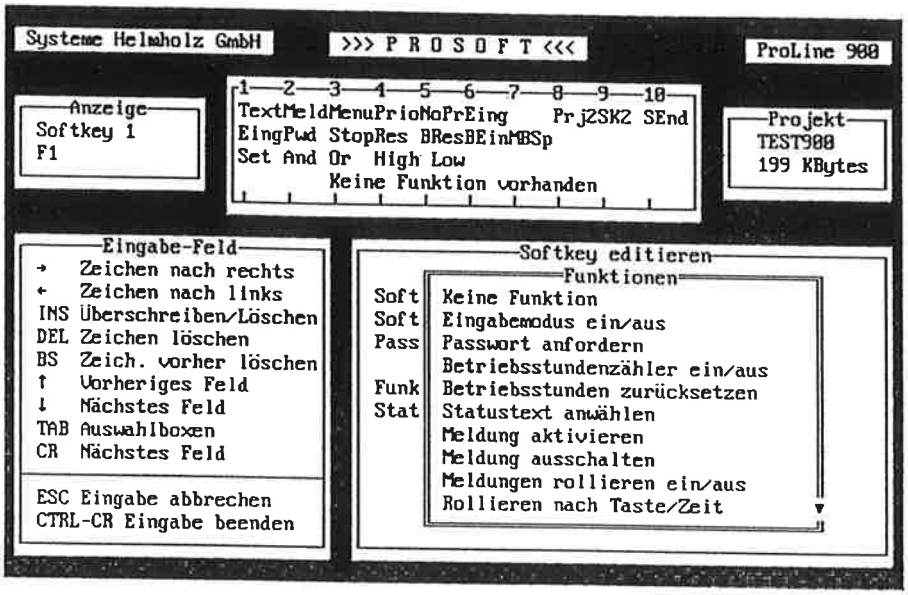


Fig. 5.11.1 Selecting a function from a softkey bar

On the ProLine 90 there are only two function key combinations <FT> and <Shift+FT>, because there is no <ALT> key!

Softkey functions can be assigned to each of the function keys in row underneath the display. All function keys of this row are collectively designated the softkey bar. By combining the function key with <Shift> or <Alt> or <Shift+Alt>, four different special functions can be assigned to each function key within a softkey bar. If a softkey is activated, a five-character-wide short text is displayed on the bottom display line for each function key. With this short text, you can describe the softkey functions. The text on the Operator Terminal automatically changes when the <Shift> or the <Alt> key is pressed.

On the ProLine 90/95 the maximum number of characters for the short text is five. On the ProLine 900 it is only four characters for design reasons!

After converting a project from ProLine 90/95 to ProLine 900 only four characters of the short texts are displayed and not five.

5.11.2 Editing the softkeys

If you press the <F6> key you enter the softkey bar editor. The number of the softkey bar to be edited is displayed in the top left-hand display field. In the line underneath you can see which function key is being edited within this softkey bar.

The virtual display in the top center display is subdivided into max. four rows for specifying short texts. These correspond to the four possible function key combinations (FK only, Shift+FK, Alt+FK, Shift+Alt+FK). These short texts are displayed in the bottom display line of the Operator Terminal when the softkey bar is activated.

5.11.3 Editing the softkey parameters

To change the parameters for each function key, you require the following functions:

<Ctrl-E>	Edit parameters. First select the function key combination with the cursor in the virtual display.
<Ctrl-N>	Select softkey bar. Go to the specified softkey bar.
<Ctrl-L>	Delete softkey. Only the parameters of the currently selected function key combination (e.g. <Shift-FT3>) are deleted.
<Ctrl-K>	Copy softkey. Only the parameters of the currently selected function key combination (e.g. <Shift-FT3>) are copied to the clipboard.
<Ctrl-T>	Copy softkey bar. All parameters from FK1 to FK10 are copied to the clipboard.
<Ctrl-F>	Insert softkey (bar). Previously copied parameters of single function keys or entire softkey bars are inserted from the clipboard.
<Ctrl-Y>	Delete softkey bar. All parameters from FK1 to FK10 are deleted.
<Ctrl-→>	Select the next function key in the virtual display.
<Ctrl-←>	Select the previous function key in the virtual display.
<PAGEDOWN>	Select the softkey bar.
<PAGEUP>	Select the previous softkey bar.

5.11.4 Softkey parameters

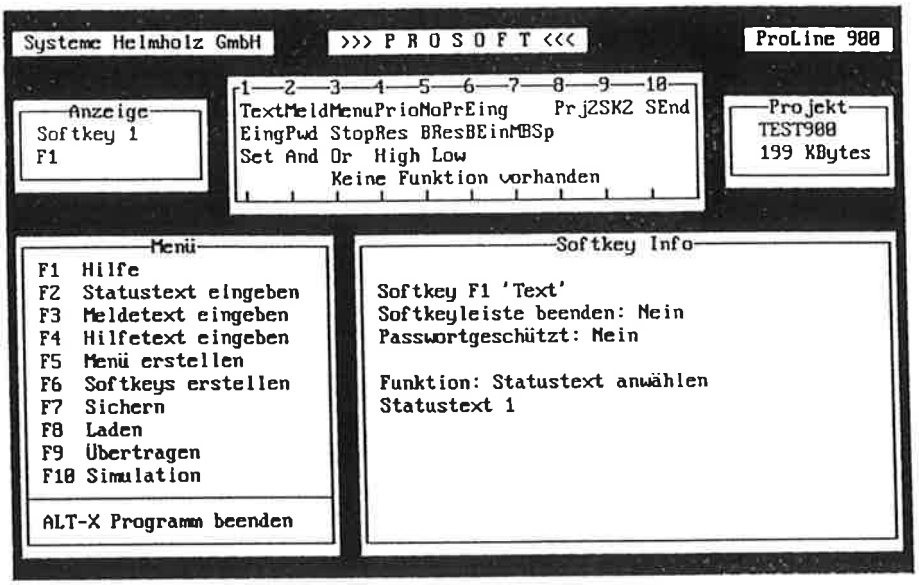


Fig. 5.11.4 Softkey parameters

Softkey F _ '_____'	Short text of the function key. The short text can be changed in the virtual display.
Deactivate softkey bar:	Y: If you press the function key on the Operator Terminal, the entire softkey bar is deactivated. N: If you press the function key on the Operator Terminal, the entire softkey bar remains active.
Password-protected:	Y: The function key only has a softkey function if the message bit "Password entered correctly" (Bit 9 in DW15) is 1. If this bit is 0, the short text in the display of the Operator Terminal is not displayed. N: The function key always has the parameterized softkey function.
Function:	With the <TAB> key you can select one of the many softkey functions. Some functions might require further parameters. These are explained in the following function description.

5.11.5 Softkey functions

Input mode on/off:
When you press the function key bit 0 in HDB DW24 changes its logical state. If this bit is logical 1 (= on) the alternative short text is displayed.

Request password:
When you press the function key bit 1 in HDB DW24 changes its logical state. If this bit is logical 1 (= on) the alternative short text is displayed.

Operating hours counter on/off:
When you press the function key bit 6 in HDB DW24 changes its logical state. If this bit is logical 1 (= on) the alternative short text is displayed.

Reset operating hours counter:
When you press the function key bit 7 in HDB DW24 is set to logical 1.

Select status text:
When you press the function key the value from the input field **Status text:** is entered in HDB DW20.

Activate message:
When you press the function key the corresponding message bit in HDB from DW50 is set to logical 1.

Deactivate message:
When you press the function key the corresponding message bit in HDB from DW50 is set to logical 0.

Message rolling on/off:
When you press the function key bit 2 in HDB DW24 changes its logical state. If this bit is logical 1 (= on) the alternative short text is displayed.

Message rolling by keystroke/time:
When you press the function key bit 3 in HDB DW24 changes its logical state. If this bit is logical 1 (= key) the alternative short text is displayed.

Disable/enable message printing:
When you press the function key bit 4 in HDB DW24 changes its logical state. If this bit is logical 1 (disabled) the alternative short text is displayed.

Message buffer reset:
When you press the function key bit 8 in HDB DW24 is set to logical 1.

Activate menu:
When you press the function key the value from the input field **Menu:** is entered in HDB DL21. The value from input field **Starting node:** is also entered in HDB DR21.

Disable/enable menu movement:
When you press the function key bit 5 HDB DW24 changes its logical state. If this bit is logical 1 (disabled) the alternative short text is displayed.

Select softkey bar:

When you press the function key the value from the input field **Softkey bar:** is entered in HDB DR23. With this function it is possible to jump from one softkey bar to another.

Set priority limitation:

When you press the function key the value from the input field **Priority level:** is entered in HDB DR22.

Select project base:

When you press the function key the value from the input field **Project base:** is entered in HDB DL22.

Write word to VDB:

When you press the function key the **value** is entered in VDB DW **(target VDB DW:)**.

AND word in VDB:

When you press the function key the **value** is logically ANDed with the previous value and entered in VDB DW **(target VDB DW:)**.

OR word in VDB:

When you press the function key the **value** is logically ORed with the previous value and entered in VDB DW **(target VDB DW:)**.

Write high byte to VDB:

When you press the function key the **value** is entered in VDB DL **(target VDB DL:)**.

Write low byte to VDB:

When you press the function key the **value** is entered in VDB DR **(target VDB DR:)**.

5.12 Multilingual projects

After power-on, project 1 is always active on the ProLine.

In a ProLine, two different projects can be stored (in the ProLine 900 three) simultaneously. Only one of these can be active at any one time. Which project is active is defined in a data word in the data handling block of the PLC. The user can switch to another project, e.g. in another language, by pressing a softkey function. In this way, the user can select the language in which he would like to interact with the ProLine. It would also be possible to implement one project for the user and one project for the service technician for service functions.

Multilingual projects CANNOT be transferred to the Proline with function <F9>!

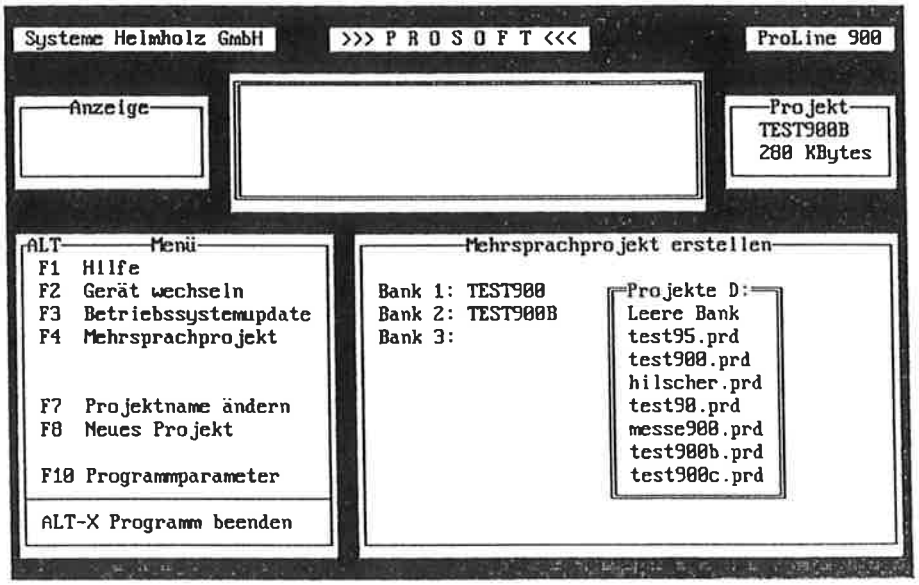


Fig. 5.12.1 Defining a multilingual project

With multilingual projects, the project files must not be larger than 32 Kbytes after translation!

Multilingual projects are developed as separate projects with different filenames. They are then selected with the function multilingual projects **<Alt-F4>** and transferred to the ProLine together. To deactivate individual bases from the multilingual project, you can use the entry "Empty base" in the file selection list. The individual project files remain separate projects even after development of a multilingual project and can be edited as such.

With a multilingual project, only the configuration of base 1 is used as the communication driver. The settings of bases 2 and 3 are ignored.

5.13 Program parameters

The function is called with <Alt-F10>.

The settings of the program parameters only affect the behavior and the working of ProSoft. With the transmission interface, the current project or operating system update is transferred to the Operator Terminal. ProSoft can simulate a PLC using the simulation interface. The parameters for the printer define the printing behavior of ProSoft. With the video mode, ProSoft can also be adapted to LCD or monochrome monitors. The project path indicates the current project path.

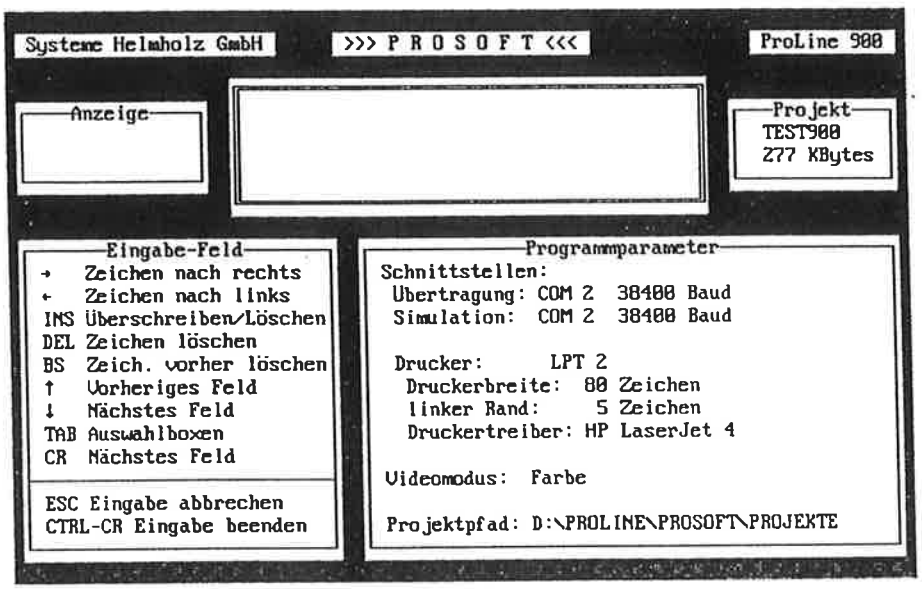


Fig. 5.13.1 Program parameters

Transfer COM: COM interface for transfer of the projects and the operating system updates. With **<TAB>** you obtain a selection list of the available interfaces.

Transfer baud: Baud rate for transmission of the projects and the operating system updates. On operating system version 1.50 and higher, the value 38400 baud is used in the Operator Terminal for transmission. Older operating system versions use 19200 baud. With **<TAB>** you obtain a selection list of the available baud rates.

Simulation COM: COM interface for simulation of a PLC. The communication driver "Simulation" **<Shift-F6>** must be set for the Operator Terminal. With <TAB> you obtain a selection list of the available interfaces.

Simulation baud:	Baud rate of the simulation interface. The same value must be set as for communication driver <Shift-F6>. With <TAB> you obtain a selection list of the available baud rates.
Printer LPT:	Printer interface of ProSoft. All project print-outs are output via this interface <Shift-F8>.
Printer width:	Maximum number of characters in the line.
Left margin:	Number of characters that must remain free as a filing margin.
Printer driver:	Current printer driver. With <TAB> you obtain a selection list of the available printer drivers. With an ASCII editor the ProSoft can be adapted to any printer by changing the *.PDF files.
Video mode:	Video mode of the Prosoft. With <TAB> you obtain a selection list of the modes you can select.
Project path:	Current project path. All projects are loaded from and saved to this project path. With <TAB> you obtain a file and drive selection list. With the list entry "Accept" the set path is accepted as the new current project path.

5.14 Project information

The function is called with <Shift-F10>.

In this information screen you can read the system reserves for the project file in the Operator Terminal. It shows how many texts, menus, softkeys and variables are defined in the current path and how many can still be defined. You can also read the set communication driver with its version number and the current project path.

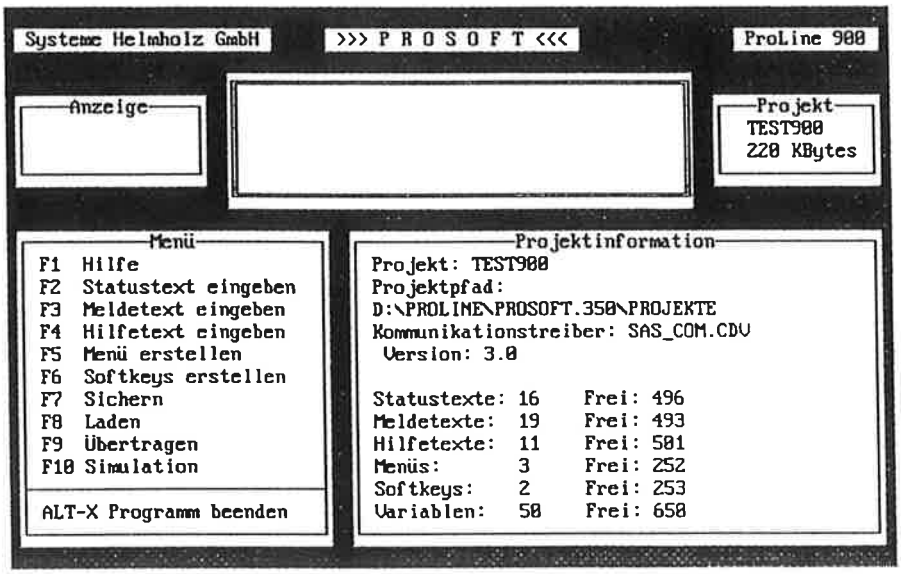


Fig. 5.14.1 Project information

After project transfer to the ProLine with <F9> you obtain further project information. The memory allocation of the converted project file and the remaining free memory capacity is output in bytes.

5.15 Changing the target device

The function is called with <Alt-F3>.

CAUTION, data loss possible!

An existing project can be used for all types in the ProLine range. Conversion for larger terminals is possible without loss of data. Conversion for smaller terminals is also possible . CAUTION! In this case, unnecessary data (e.g. for ProLine 90: line three and four of all status, message and help texts) or excessive data (e.g. number of status, message and help texts) are irretrievably lost!

Section "Technical Data" gives information about the maximum number of status, message and help texts.

5.16 Transferring the operating system

The memory with the messages still to be printed and the serial print number is erased when the operating system is transferred.

The operating system of the ProLine can be updated without interfering with the unit.

Disconnect the ProLine Operator Terminal from the power supply.

Connect the programming interface of the Operator Terminal with the development computer.

Press the **<Shift>** and **<Clear>** keys simultaneously while the ProLine is switched off.

A message such as the following appears on the display of the ProLine:

```
>>> Operating system V.1.51 update <<<
        Start communication
    on your development computer...
```

Now start the ProSoft Configuration Software.

Start transfer of the operating system with **<Alt-F3>** in the main menu. A selection box appears with the possible operating system versions.

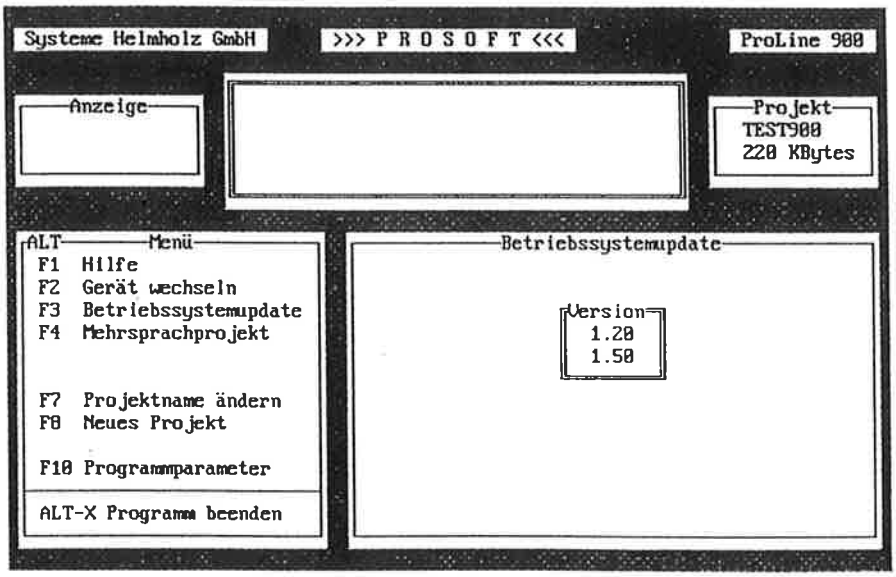


Fig. 5.16.1 Operating system update

Please compare the version number on the display of the Operator Terminal with the latest version of the selection box. Make sure there are no other versions **between** these two versions, because you **must** always update from one version to the next.

If the power supply is disconnected while the operating system is being blown, the unit must be returned to the factory for service

During transmission, the LEDs of the function keys on the Operator Terminal represent the transmission counter and the following text is shown on the display:

```
>>> Operating system update <<<
Operating system being read...
```

The Operator Terminal must not be switched off now.

Storage of the new operating system takes up to 10 seconds. After the operating system has been stored on the FLASH-EPROM, the ProLine is restarted automatically. A previously loaded project is retained if it is compatible with the new operating system.

The interface used is preset as COM1. The baud rate on operating system version 1.50 and higher (of the ProLine) is 38400 baud. Older versions require 19200 baud for operating system transfer. These settings can be changed in the menu Program parameters **<Alt-F10>**.

6 Hardware and Operating System

6.1 Control of data areas of the programmable controller

Communication with ProLine is performed via two data areas. The first data area is responsible for defined device functions. The first part of this area (DW0...19) is for status information. You only have read access to this area. The second part (DW20...82) is used as a command interface with the ProLine. The second area contains freely defined variables. This area is up to 256 data words long.

Appendix A contains a summary of the communication area. Here, you will find additional information.

These values can only be read!

DW 0 **Live counter**
This counter indicates whether communication is being performed correctly by continually counting up at one-second intervals.

DW 1...4 **Date and time**
The data and time are stored in BCD format and can be evaluated by the PLC. Years below 90 are treated as 20xx.
Definition of the day of the week (DL 3):

0 = Sunday	1 = Monday
2 = Tuesday	3 = Wednesday
4 = Thursday	5 = Friday
6 = Saturday	

DW 5...9 **Function keys**
If you press a function key, the associated data bit (DW 5 / bit 0 = **<F1>**; DW 5 / bit 1 = **<F2>**, ...) is set. The bit is reset when the key is released.

If **<Shift>** is pressed simultaneously with a function key, the corresponding data bit in DW 6 or DW 7 is set, and the same thing applies if **<Alt>** or **<Alt>** **<Shift>** is pressed simultaneously with a function key. This means that 80 functions can be triggered directly.

Only up to two function key bits can be set at the same time, even if more keys have been pressed.

DW 10 **Active status text**
Number of the currently active status text. The current status text within a menu is in DW13. The active priority level (DR15) indicates whether this text is currently being shown on the display.

0	No status text.
1...512	Text 1...512

DW 11 **Active message text**
Information about the currently active message text. The active priority level (DR15) indicates whether this text is currently being shown on the display.

0	No message text on the display
1...512	Message text 1...512

DL 12 **Active menu node**
Information about the currently active menu node. The active priority level (DR15) indicates whether this node is currently being shown on the display with its status text (DW13).

0	No menu node active
1...255	Menu node 1...255 on the display

DR 12 **Active menu**
Information about the currently active menu. The active priority level (DR15) indicates whether this menu is currently being shown on the display with its status text.

0	No menu active
1...254	Current menu 1...254

DW 13 **Active menu status text**
Number of the status text assigned to the active menu node. The current status text outside a menu is in DW10. The active priority level (DR15) indicates whether this text is currently being shown on the display.

0	No status text.
1...512	Text 1...512

DW 14 **Number of messages still to be printed**
Number of messages that are still in the message print spooler but have not yet been printed.

DL 15 **Status bits**

D 15.8: Input mode activated
If this bit is set, input mode is active.

D 15.9: Input password is valid
If this bit is set, the input password has been entered correctly. The bit remains set until the bit "Query input password" (D 24.1) is reset.

These values can only be read!

D 15.10: Message text printing buffer overflow
This bit is set by the ProLine, if at least one message has been overwritten in the message print spooler. It is only possible to reset this bit with a message buffer reset (D 24.8).
The reasons for this are:
- No printer connected
- Printer off-line
- Message text printing disabled (D 24.4 and D 15.11)
- Too many messages occurred that the message text printer could not output.

D 15.11: Message text printing disabled
This bit is set by the ProLine if a message occurs and cannot be output because message printing (D 24.4) is disabled.

DR 15 **Active priority level**
Value of the currently active priority. This value indicates the current display status of the Operator Terminal. (For a detailed description, see Section "Overall priority").

DL 16 **Active project base**
This value specifies which project base is currently active in multilingual projects.

0	No multilingual project
1	Project 1 active
2	Project 2 active
3	Project 3 active

DR 16 **Active softkey bar**
This value specifies which softkey bar is currently being displayed.

0	No softkey bar active
1...255	Softkey bar 1...255

DL 17 **Cursor column on input**
In input mode the current column position of the cursor is entered here.

DR 17 **Cursor line on input**
In input mode the current line position of the cursor is entered here.

DL 18 **Device identification**
Indicates which terminal is connected.
Bit 0: ProLine 90 Bit 1: ProLine 90D
Bit 2: ProLine 95 Bit 3: ProLine 900

DR 18 **Key code**
Indicates the key code of the key last pressed. See the table in **Appendix B.**

DW 19 **Operating hours counter**
Number of operating hours since the last counter reset. This value is not defined when the unit is supplied and must be initialized with a RESET.

DW 20 **Status text**

Number of the status text to be displayed. Menu status texts **cannot** be selected in this way because they are defined by the menu node in the project.

0	Normal text
1...512	Status text 1...512

DL 21 **Menu**

Menus can be activated here.

0	No menu
1...255	Menu 1...255

If you press **<Clear>** the current menu is deactivated and this value is set to zero. (Precondition: Clear must be permitted in the active menu node).

DR 21 **Special starting node**

0	Starting node of the project is used
1...255	Special starting node (starting node of the project is not used)

The next time a menu is called this specification is used. If an undefined node is specified, the Operator Terminal ignores this value.

DL 22 **Select project**

1...3	Select project 1...3 from the multilingual project

After the power-on of the ProLine project 1 is always active.

DR 22 **Priority limitation**

The priority limitation for the display can be set here.

0	No limitation
1...10	Limitation to the corresponding priority level (levels 11 to 20 are displayed anyway)
11...255	No effect

DR 23 **Softkey bar**

Number of the softkey bar to be displayed

0	Do not display softkey bar
1...255	Display softkey bar 1...255

DW 24 **Command bits**

D 24.0: Activate input mode:

Setting this bit switches to input mode. In input mode, updating the current input variable is disabled. It is not possible to change the display text while input mode is activated. Exceptions to this are movements inside menus and display of help texts. If there are no input variables, input mode is not activated.

D 24.1: Query input password:
Setting this bit queries the input password. It is only possible to query the password when the input mode (D 15.8) is not active.

D 24.2: Roll messages:
1 = If there are several messages with the same priority level, they are displayed alternately
0 = If there are several messages with the same priority level, only the message with the highest priority (lowest number) is displayed

D 24.3: Rolling mode:
0 = Rolling of messages with the same priority level in set time interval
1 = Rolling of messages with the same priority level using cursor keys

D 24.4: Disable message text printing:
If this bit is set, no message text is printed out on the printer connected to the Operator Terminal. Incoming messages are stored in the internal message print spooler. Printing of messages already being printed is completed.

D 24.5: Disable menu movements:
After this bit has been set, all menu movements (cursor keys and **<Clear>**) are disabled.

D 24.6: Activate operating hours counter:
After this bit has been set, the operating hour counter starts running.

D 24.7: Reset operating hours counter:
If this bit set, the operating hour counter is zeroed. The data handling software resets the bit automatically.

D 24.8: Clear message print spooler:
Setting this bit causes the message print spooler to be cleared. Messages being printed are printed out completely. The data handling software resets the bit automatically.

DW 25 *reserved for future use*

DW 26 LED 1...16 green
Setting the bit causes the green LEDs 1...16 to be switched on.

DL 27 LED cursor keys (ProLine 95/900 only)
Setting the bit causes the cursor LEDs to be switched on.

DR 27 LED 17...20 green
Setting the bit causes the green LEDs 17...20 to be switched on.

⚠ *DW 34 to 49 must not be written.*

DW 28 **LED 1...16 green blinking**
Setting the bit causes the green LEDs 1...16 to blink.

DL 29 **LED cursor keys (ProLine 95/900 only)**
Setting the bit causes the cursor LEDs to blink.

DW 29 **LED 17...20 green blinking**
Setting the bit causes the green LEDs 17...20 to blink.

DW 30 **LED 1...16 red**
Setting the bit causes the red LEDs 1...16 to be switched on.

DW 31 **LED 17...20 red**
Setting the bit causes the red LEDs 17...20 to be switched on.

DW 32 **LED 1...16 red blinking**
Setting the bit causes the red LEDs 1...16 to blink.

DW 33 **LED 17...20 red blinking**
Setting the bit causes the red LEDs 17...20 to blink.

DW 34...35 *reserved for future use*

DW 36...42 **Used internally**
These data words are used internally for data handling. <u>They must not be written</u>.

DW 43...49 *reserved for future use*

DW 50...82 **Message bits 1 to 512**
One bit in this area is assigned to each message text. If the bit is set, the corresponding message is activated. Any number of bits can be set at the same time.

A message is deactivated by resetting its data bit.

When a message text is created, the message can be defined as "acknowledgeable". In this case, the corresponding message bit is reset on the Operator Terminal with the <Clear> key.

6.2 Message management

Messages can be activated via the communication area of the programmable controller. This is done by setting the corresponding bit (HDB from DW50).

If several messages with the same priority level are active, rolling mode is important for display. Rolling mode can be set in DW 24.

If several messages of different priority levels are active, the message with the highest priority is always displayed.

While input mode is active (D 24.0 is set), it is not possible to change the message texts.

6.2.1 Rolling mode

If several messages are active, the message with the highest priority and the lowest number is displayed. To display messages with one priority level simultaneously, rolling mode must be activated. The messages with the highest priority can be rolled at set intervals or by pressing the cursor keys. While input mode is active (D 24.0 is set) it is not possible to roll the message texts.

Bit 2 in DW 24 activates rolling mode.

Bit 3 switches from timed rolling to keyed rolling.

6.2.2 Message priority

Messages can be subdivided into priority levels 3...10. Subdivision into three classes NOTE, WARNING and FAULT is useful.

6.2.3 Overall priority

Different priority levels are managed in the ProLine to control the display.
The general rule is: A higher priority covers up a lower priority.

The priority can be limited in DR 22 to keep the display clear for text types with a lower priority. This is required for displaying menus (priority 2) while messages (priority 3...10) are active. Limitation to priority 2, for example, permits display of a menu while message texts are active.

Priority levels

0	No text / system basic text	
1	Status text is displayed	(can be disabled)
2	Menu active	(can be disabled)
3	Message text level 3 is displayed	(can be disabled)
4	Message text level 4 is displayed	(can be disabled)
5	Message text level 5 is displayed	(can be disabled)
6	Message text level 6 is displayed	(can be disabled)
7	Message text level 7 is displayed	(can be disabled)
8	Message text level 8 is displayed	(can be disabled)
9	Message text level 9 is displayed	(can be disabled)
10	Message text level 10 is displayed	(can be disabled)
11	Help text is displayed	
12	Input password is queried	
19	Internal error. Please contact our customer service.	
20	Communication error (is evaluated by the data handling software)	

Priority limitation (disablement)

0	No limitation. The text with the highest priority is displayed.
1...10	Limitation to a priority level. With a limitation to 5, for example, only texts with a priority of 0 through 5 are displayed. Because texts with a priority of 11 to 20 cannot be disabled, they are also displayed.
11...255	No effect

6.2.4 Priorities of the LEDs

The bits for green, red or blinking LEDs can be set simultaneously. The following priority applies to the management of these bits:

- A red LED has priority over a green LED.
- A blinking LED has priority over a continuous LED.
- Red and green alternate.

6.2.5 Printing messages

When a message is set, reset and / or acknowledged, it can automatically be printed. This is done by selecting "Printing raised", "Printing cleared" and/or "Printing acknowledged" in the parameters of the message text.

If the printer is switched offline or no printer is connected, the messages are stored internally until the printer is ready. The message text spooler for this has a length of 24 Kbytes.

Buffering of the message texts only works satisfactorily, if the printer does not have a print buffer or does not use it. Otherwise the ProLine cannot detect which messages have already been output after a power failure.

For adaptation to the printer, you can select the interface (V=V.24 (RS232) / T=TTY) via the ProSoft printer parameters <Shift-F7> and enter an initialization sequence for the printer. The interface standard V.24 is also known as RS232.

The pin assignment of the printer interface is given in Appendix E.

Any printer with a serial interface (RS232 or TTY) can be used for message printing.

The printer interface is permanently set to

- 8 data bits,
- No parity and
- 2 stop bits.

The baud rate can be set in ProSoft under printer parameters <Shift-F7>.

The standard printer driver is designed for 42 characters per line and RTS/CTS handshake. Other printer drivers are also available on request (e.g. XON/XOFF protocol).

6.3 Input mode

Input mode is an operating mode of the Operator Terminal in which entries can made on the keyboard which are then transferred to the PLC after a plausibility check. This mode is activated and deactivated by setting a bit (D 24.0) in the communication area or via a softkey function.

While input mode is active, it is not possible to change display texts!

It is not possible to change the display text while input mode is active. Changing between menu nodes and calling up a help text are exceptions to this.

6.3.1 Entering variables

To permit input of a variable on the Operator Terminal, input must have been enabled in the definition of the variable (definition as an input variable).

If the bit for input mode is set (DW 24, bit 0) during text display, the cursor appears on the first input variable. As confirmation, bit 8 is set in DW 15 and the current cursor column and cursor line is entered in DW 17.

After the operator has changed the value and accepted the data with the **<Enter>** key, the value is accepted and transferred to the PLC, if it is within the permitted range. The cursor jumps to the next input variable. After the last variable the cursor jumps back to the first input variable in the text.

Input mode can be terminated at any time by resetting bit 0 DW 24 without accepting the value currently being edited.

If there is no input variable in the text, input mode is only activated after switching to a text which contains an input variable.

If the input field is empty (An input field can be cleared by pressing the **<Shift>** and **<Clear>** keys simultaneously), the old value is retained after **<Enter>** has been pressed.

6.3.2 Keys in input mode

<→> **Inside menus before a character has been edited:**
Switch to next menu node to the right.

Inside menus after a character has been edited:
Cursor movement in the field to the right

Outside menus :
Cursor movement in the field to the right

<←> **Inside menus before a character has been edited:**
Switch to next menu node to the left.

Inside menus after a character has been edited:
Cursor movement in the field to the left

Outside menus :
Cursor movement in the field to the left

<Shift-→>	Cursor movement in the field to the right
<Shift-←>	Cursor movement in the field to the left
<↵> or	
<Shift-↓>	Accept value and continue to next field
<Shift-↑>	Accept value and go to previous field
<Clear> or	
<Shift><Clear>	Delete field
<Shift><↵>	Accept value, continue to the next field and exit the input mode
<+> / <->	• Sign for INTEGER variables • Page in TEXT variables • Select day of week • Select a text with BIT variables • Change BAR or SCALE • Change a character in STRING or CHARACTER variables (next or previous character in character set. See Appendix F).
<0> ... <9>	**All variables except STRING and CHARACTER:** Input values 0...9 **in STRING and CHARACTER variables:** Three letters and one special character are assigned to each numeric key. The characters are input be pressing the key several times: <0>: 0 . , : ; ( ) ? <1>: 1 a A b B c C ! <2>: 2 d D e E f F " <3>: 3 g G h H i I * <4>: 4 j J k K l L $ <5>: 5 m M n N o O % <6>: 6 p P q Q r R & <7>: 7 s S t T u U / <8>: 8 v V w W x X ß <9>: 9 y Y z Z + - =
<Shift-1> to	
<Shift-6>	"A" to "F" for hexadecimal inputs
<.>	Decimal point (is also a separator for date and time)

6.3.3 Entering a password

Via bit 1 in DW 24 and via a softkey function, it is possible to activate a password query in the ProLine. A four-figure numeric password is expected. The password can be set with ProSoft under <Shift-F9> project parameters. It is always transferred to the Operator Terminal together with the project and remains **permanently** stored there.

After a correct password has been entered, bit 9 in DW 15 is set.

After an incorrect password has been entered, bit 1 in DW 24 is reset. Automatic resetting of the bit can be counted in the PLC program to prevent frequent attempts (e.g. only three consecutive attempts).

The password query is only possible if input mode (D 15.8) is **not** activated, because the password query activates input mode itself. During the password query it is not possible to change the display text.

6.4 Operating hours counter

The operating hours counter is not initialized when the unit is supplied!

The operating hours counter keeps a record of the current number of operating hours of the ProLine. The operating hours counter is activated with bit 6 DW 24. The operating hours counter is zeroed with bit 7 DW 24.

The number of operating hours is stored in DW 19. The value is given in whole hours.

Via the variable OPERATING TIME, it is possible to display and change the current operating hours. The display shows hours and minutes separated by a colon. If the operating hours counter is active, the colon blinks at one-second intervals.

6.5 Switching operating system languages

The language of the operating system always refers to the system texts stored in the Operator Terminal and does not affect the projects!

Two operating system languages are available as standard in the ProLine. To switch to the other language proceed as follows:

- Disconnect the ProLine from the power supply
- Press the following combination for the language required:

  <Shift-0> GERMAN

  <Shift-1> ENGLISH

- Switch on the power supply

7 Simulation

A complete simulation system is integrated into the development environment of ProSoft. With this system you can test your project immediately under authentic conditions. The PC simulates a PLC interacting with the Operator Terminal.

In the top right-hand corner of the screen, the communication status displayed. The letter "E" indicates a transmission error. The causes of an error might be:

- Incorrect cabling
- Incorrect communication driver - the ASCII driver must be loaded.
- Incorrect baud rate

7.1 Simulation: HDB numerical

Display of the simulated data handling block as it is displayed on the programmer with "FORCE VARIABLES". On this side you can only change those values for which a change is permitted.

Depending on the cursor position, the meaning of the current value is displayed in the top right-hand corner of the screen.

```
HDB                                  Eingabemodus 1=Ein 0=Aus
DW 0 KF  +93                         DW17 KY  0,0
DW 1 KH  1995                        DL18 KM  00001000
DW 2 KH  0818                        DR18 KY  0
DW 3 KH  0516                        DW19 KF  +9
DW 4 KH  0189
                                     DW20 KF  +1
Funktionstasten                      DW21 KY  0,0
DW 5 KM  00000000 00000000           DW22 KY  0,0
DW 6 KM  00000000 00000000           DW23 KY  0,1
DW 7 KM  00000000 00000000           DW24 KY  00000000 01000000
DW 8 KM  00000000 00000000           DW25 KF  +0
DW 9 KM  00000000 00000000
                                     LEDs
DW10 KF  +1                          DW26 KM  10101010 10101010
DW11 KF  +0                          DW27 KM  00000000 00000000
DW12 KY  0,0                         DW28 KM  01010101 01010101
DW13 KM  00000000 00000000           DW29 KM  00000000 00000000
DW14 KF  +0                          DW30 KM  00000000 00000000
DL15 KM  00000000                    DW31 KM  00000000 00000000
DR15 KY  1                           DW32 KM  00000000 00000000
DW16 KY  0,1                         DW33 KM  00000000 00000000

F1:Hilfe F5:HDB numerisch  F6:HDB Text  F7:Meldungsübersicht  F8:Variablen-DB
```

Fig. 7.1.1 Simulation HDB in numerical output

Editor functions on page "HDB numerical":

<Space>	Toggle a bit if the cursor is on a KM field (If the bit is set, it is reset - if it is not set, it is set)
<0>	Reset a bit if the cursor is on a KM field
<1>	Set a bit if the cursor is on a KM field
<HOME>	Cursor to the beginning of the line
<END>	Cursor to the end of the line
<PAGE UP>	Switch to page "Variable DB"
<PAGE DOWN>	Switch to page "HDB Text"

7.2 Simulation: HDB text

On this page, the simulated data handling block is output in plain text. Here it is not possible to change values. Use the window simulation HDB numerical for changes.

```
HDB                                  Eingabemodus 1=Ein 0=Aus
DW 0 KF  +93                         DW17 KY  0,0
DW 1 KH  1995                        DL18 KM  00001000
DW 2 KH  0818                        DR18 KY  0
DW 3 KH  0516                        DW19 KF  +9
DW 4 KH  0109
                                     DW20 KF  +1
Funktionstasten                      DW21 KY  0,0
DW 5 KM  00000000 00000000           DW22 KY  0,0
DW 6 KM  00000000 00000000           DW23 KY  0,1
DW 7 KM  00000000 00000000           DW24 KY  00000000 01000000
DW 8 KM  00000000 00000000           DW25 KF  +0
DW 9 KM  00000000 00000000
                                     LEDs
DW10 KF  +1                          DW26 KM  10101010 10101010
DW11 KF  +0                          DW27 KM  00000000 00000000
DW12 KY  0,0                         DW28 KM  01010101 01010101
DW13 KM  00000000 00000000           DW29 KM  00000000 00000000
DW14 KF  +0                          DW30 KM  00000000 00000000
DL15 KM  00000000                    DW31 KM  00000000 00000000
DR15 KY  1                           DW32 KM  00000000 00000000
DW16 KY  0,1                         DW33 KM  00000000 00000000

F1:Hilfe F5:HDB numerisch  F6:HDB Text  F7:Meldungsübersicht  F8:Variablen-DB
```

Fig. 7.2.1 Simulation HDB in text output

Editor functions on page "HDB text":

<PAGE UP>	Switch to page "HDB numerical"
<PAGE DOWN>	Switch to page "Message overview"

7.3 Simulation: Message overview

On this page all message bits are displayed that are possible with the Operator Terminal currently connected. The message bits are part of the data handling block and are located in the data words starting at DW50.

The numbers of the set message bits are displayed in numeric order at the bottom edge of the screen. If more messages are active than can be displayed, this output line ends with three dots.

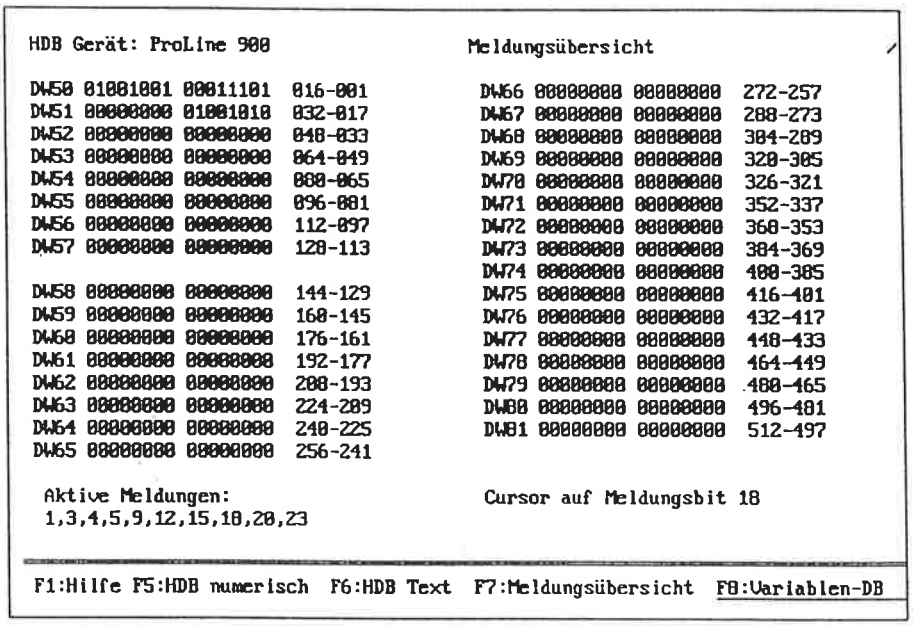


Fig. 7.3.1 Simulation Message overview

Editor functions in the message overview:

<Space>	Toggle a bit (If the bit is set, it is reset - if it is not set, it is set)
<0>	Reset a bit
<1>	Set a bit
<HOME>	Cursor to the beginning of the line
<END>	Cursor to the end of the line
<PAGE UP>	Switch to page "HDB text"
<PAGE DOWN>	Switch to page "variable DB"

7.4 Simulation: VDB

The variable data block has a maximum length of 256 data words. Data formats KC, KM, KY, KH and KF are available to represent these words. The data formats are preset from the project data. A BCD variable assigned to DW6 causes the DW6 to be represented in KH format.

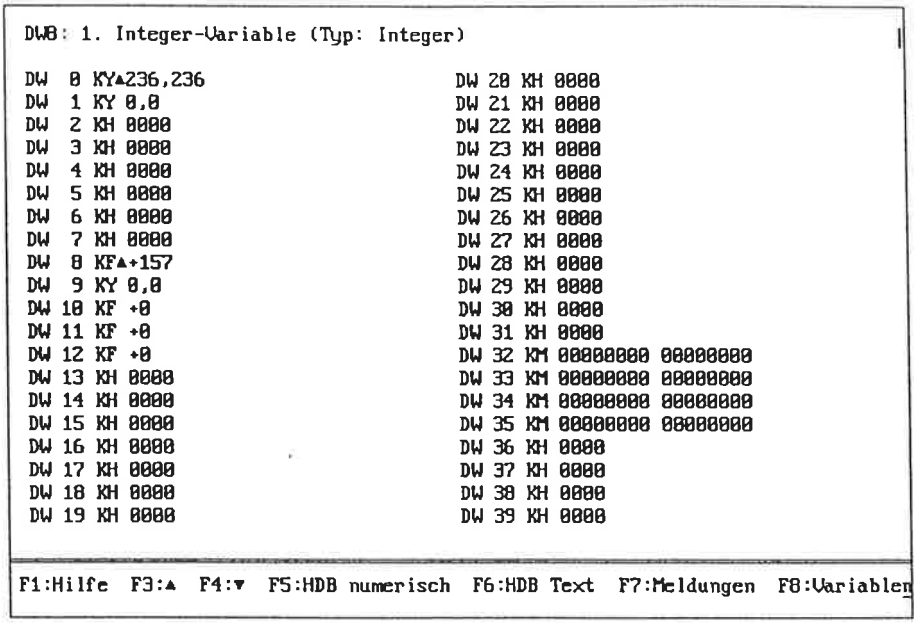


Fig. 7.4.1 Simulation VDB

Editor functions on page "Variable DB":

<C>	Switchover to data format KC, if the cursor is on data format
<M>	Switchover to data format KM, if the cursor is on data format
<Y>	Switchover to data format KY, if the cursor is on data format
<H>	Switchover to data format KH, if the cursor is on data format
<F>	Switchover to data format KF, if the cursor is on data format
<Space>	Toggle a bit if the cursor is on a KM field (If the bit is set, it is reset - if it is not set, it is set)
<0>	Reset a bit, if the cursor is on a KM field
<1>	Set a bit, if the cursor is on a KM field
<CR>	Edit a value
<TAB>	One page to the right
<CTRL-TAB>	One page to the left

<Ctrl-→>	One column to the right
<Ctrl-←>	One column to the left
<F3>	Automatic incrementing (+1) of a variable
<F4>	Automatic decrementing (-1) of a variable
<HOME>	Cursor to the beginning of the line
<END>	Cursor to the end of the line
<PAGE UP>	Switch to page "Message overview"
<PAGE DOWN>	Switch to page "HDB numerical"

8 Technical Data

Display:

ProLine 90 / 90D	LCD, Supertwist technology 152 x 16 mm 2 lines by 40 characters Character size 5.55 mm x 3.2 mm Character matrix 8 x 5 dots
ProLine 95	LCD, Supertwist technology 147 mm x 29 mm 4 lines by 40 characters Character size 4.89 mm x 2.78 mm Character matrix 8 x 5 dots
ProLine 900	Vacuum fluorescence, 170 mm x 30 mm 4 lines by 40 characters Character size 5 mm x 3 mm Character matrix 7 x 5 dots
Interfaces:	Programming interface RS232 Communication interface TTY, RS232 Printer interface (not ProLine 90) TTY, RS232 Further interface configurations such as • RS485 • Interbus • CAN bus • Profibus • Barcode reader • Card reader • PC keyboard are available on request.
FLASH-EPROM memory:	128 Kbytes (standard) 256 Kbytes (on request)
Message text spooler:	24 Kbytes battery-backed RAM (not ProLine 90)

Project memory:

ProLine 90 / 90D	32 Kbyte FLASH-EPROM (2 project bases)
ProLine 95	64 Kbyte FLASH-EPROM (2 project bases)
ProLine 900	96 Kbyte FLASH-EPROM (3 project bases)

Status texts, message texts, help texts:

ProLine 90/90D	128 each
ProLine 95	256 each
ProLine 900	512 each

Menus / nodes per menu:

ProLine 90/90D	64 / 255
ProLine 95	128 / 255
ProLine 900	255 / 255

Softkey bars:

ProLine 90/90D	64
ProLine 95	128
ProLine 900	255

Number of variables per status or message text: 16

Total number: 600 (expandable)

Communication area: 256 data words

Variable types:

- INTEGER (scalable)
- BCD
- HEX
- BINARY
- TEXT
- BIT
- TIME
- DAY OF WEEK
- DATE
- PRINT NUMBER (not ProLine 90)
- PRINT COUNT (not ProLine 90)
- OPERATING TIME
- BAR
- SCALE
- TIMER
- COUNTER
- TIMER IN KT FORMAT
- CHARACTER
- STRING

Protocols:

- SIMATIC S5 PG interface (AS511)
- High-speed protocol for SAS 523/
- SAS 525 (SIMATIC S5 115U - 155U)
- Siemens 3964R procedure (RK512)
- Texas Instruments TI 435
- Interbus-S
- Open ASCII driver (protocol description supplied on request)
- Further protocols on request

Operating voltage: 24 V DC (18 to 30 V DC)

Current consumption (without additional bus modules):

ProLine 90:	< 300 mA at 24 V
ProLine 95:	< 500 mA at 24 V
ProLine 900:	< 900 mA at 24 V

Keyboard:

ProLine 90 / 90D	Membrane keyboard
ProLine 95 / 900	Mechanical short-stroke keys under high-resistance membrane

Terminals:	• 3-way screw terminal, plug-in, for power supply • 25-way subminiature D socket for PC (programming) / printer • 25-way subminiature D socket for communication link
Degree of protection:	IP65 (front panel)
Ambient conditions:	Operating temperature 0 to 50 °C Storage temperature -20 to 70 °C Relative humidity <85% (no condensation)

Dimensions / weight:

ProLine 90 / 90D	Front panel 216 mm x 168 mm Mounting depth without connectors 40 mm approx. 1.0 kg
ProLine 95	Front panel 288 mm x 192 mm Mounting depth without connectors 45 mm approx. 1.7 kg
ProLine 900	Front panel 336 mm x 192 mm Mounting depth without connectors 60 mm approx. 2.0 kg

A Communication Area

The user must only read this area!

DW	Type	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
DW 0	Integer	Live counter															
DW 1	BCD	Century								Decade							
DW 2	BCD	Month								Day							
DW 3	BCD	Day of week (see table below)								Hour							
DW 4	BCD	Minute								Second							
		Function keys F1...20 = Function key only SF1...SF20 = <SHIFT>+function key AF1...AF20 = <ALT>+function key SAF1...SAF20 = <SHIFT>+<ALT>+function key															
DW 5	Binary	F 16	F 15	F 14	F 13	F 12	F 11	F 10	F 9	F 8	F 7	F 6	F 5	F 4	F 3	F 2	F 1
DW 6	Binary	SF 12	SF 11	SF 10	SF 9	SF 8	SF 7	SF 6	SF 5	SF 4	SF 3	SF 2	SF 1	F 20	F 19	F 18	F 17
DW 7	Binary	AF 8	AF 7	AF 6	AF 5	AF 4	AF 3	AF 2	AF 1	SF 20	SF 19	SF 18	SF 17	SF 16	SF 15	SF 14	SF 13
DW 8	Binary	SAF 4	SAF 3	SAF 2	SAF 1	AF 20	AF 19	AF 18	AF 17	AF 16	AF 15	AF 14	AF 13	AF 12	AF 11	AF 10	AF 9
DW 9	Binary	SAF 20	SAF 19	SAF 18	SAF 17	SAF 16	SAF 15	SAF 14	SAF 13	SAF 12	SAF 11	SAF 10	SAF 9	SAF 8	SAF 7	SAF 6	SAF 5
DW 10	Integer	Active status text															
DW 11	Integer	Active message text															
DW 12	Byte	Active menu node								Active menu							
DW 13	Byte	Active menu status text															
DW 14	Integer	Number of messages still to be printed															
DW 15	Byte	Reserved				Fault message print disabled	Message text spooler overflo	Password is valid	Input mode activated	Active priority level (see table below)							
DW 16	Byte	Active project base								Active softkey bar							
DW 17	Byte	Cursor column during input								Cursor line during input							
DW 18	Byte	Device identification								Key code (see Appendix B)							
		Reserved				ProLine 900	ProLine 95	ProLine 90D	ProLine 90								
DW 19	Word	Operating hours counter															

Priority levels

0 No text / system basic text
1 Status text is displayed (can be disabled)
2 Menu active (can be disabled)
3 Message text level 3 is displayed (can be disabled)
4 Message text level 4 is displayed (can be disabled)
5 Message text level 5 is displayed (can be disabled)
6 Message text level 6 is displayed (can be disabled)
7 Message text level 7 is displayed (can be disabled)
8 Message text level 8 is displayed (can be disabled)
9 Message text level 9 is displayed (can be disabled)
10 Message text level 10 is displayed (can be disabled)
11 Help text is displayed
12 Input password is queried
19 Internal error. Please contact our customer service.
20 Communication error (is evaluated by the data handling software)

Days of the week

0 Sunday
1 Monday
2 Tuesday
3 Wednesday
4 Thursday
5 Friday
6 Saturday

The user can read and write in this area!

DW	Type	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
DW 20	Integer	Status text															
DW 21	Byte	Menu								Special menu starting node							
DW 22	Byte	Project base								Priority limitation							
DW 23	Byte	Reserved								Softkey bar							
DW 24	Binary	Reserved							Clear message test spooler	Operating hours counter: Reset	Operating hours counter: 1=on 0=off	Disable menu movement	Disable message text printing	Rolling: 0=time 1=key	Rolling: 1=on 0=off	Query password	Input mode 1=on 0=off
DW 25	-	Reserved															
DW 26	Binary	LED 16...1 green															
		LED 16	LED 15	LED 14	LED 13	LED 12	LED 11	LED 10	LED 9	LED 8	LED 7	LED 6	LED 5	LED 4	LED 3	LED 2	LED 1
DW 27	Binary	Cursor LED on ↓	Cursor LED on →	Cursor LED on ←	Cursor LED on ↑	Reserved								LED 20...17 green			
														LED 20	LED 19	LED 18	LED 17
DW 28	Binary	LED 16...1 green blinking															
		LED 16	LED 15	LED 14	LED 13	LED 12	LED 11	LED 10	LED 9	LED 8	LED 7	LED 6	LED 5	LED 4	LED 3	LED 2	LED 1
DW 29	Binary	Cursor LED blinking ↓	Cursor LED blinking →	Cursor LED blinking ←	Cursor LED blinking ↑	Reserved								LED 20...17 green blinking			
														LED 20	LED 19	LED 18	LED 17
DW 30	Binary	LED 16...1 red															
		LED 16	LED 15	LED 14	LED 13	LED 12	LED 11	LED 10	LED 9	LED 8	LED 7	LED 6	LED 5	LED 4	LED 3	LED 2	LED 1
DW 31	Binary	Reserved												LED 20...17 red			
														LED 20	LED 19	LED 18	LED 17
DW 32	Binary	LED 16...1 red blinking															
		LED 16	LED 15	LED 14	LED 13	LED 12	LED 11	LED 10	LED 9	LED 8	LED 7	LED 6	LED 5	LED 4	LED 3	LED 2	LED 1
DW 33	Binary	Reserved												LED 20...17 red blinking			
														LED 20	LED 19	LED 18	LED 17
DW 34	-	Reserved															
DW 35...49	-	Used internally, this area must not be written															
DW 50...81	Binary	Message bits 1...512 (see next page)															

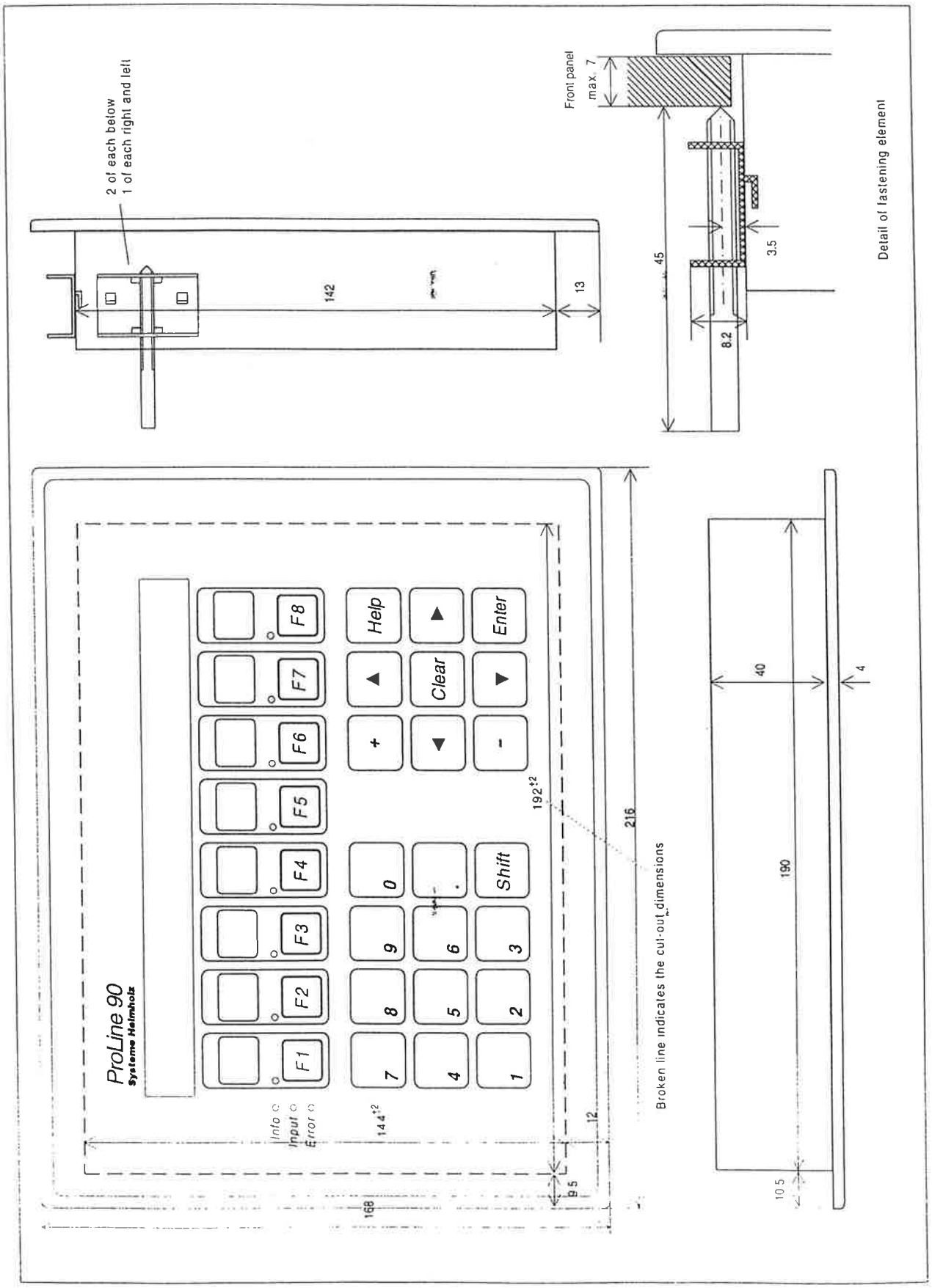
Assignment of bits to the message texts:

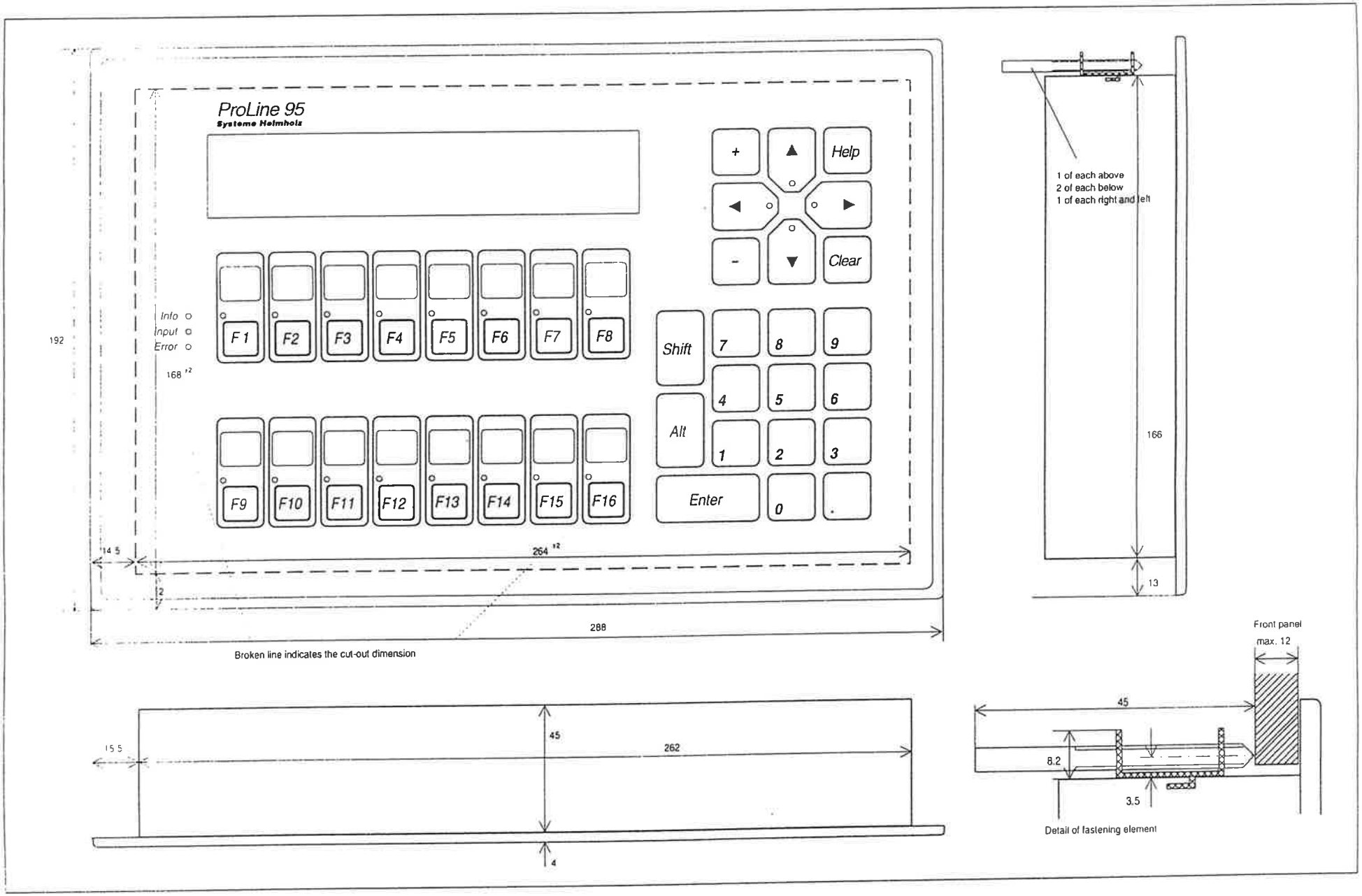
DW		Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
DW 50		16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
DW 51		32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
DW 52		48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
DW 53	ProLine 90/90D 95 900	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
DW 54		80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
DW 55		96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
DW 56		112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
DW 57		128	127	126	125	134	123	122	121	120	119	118	117	116	115	114	113
DW 58		144	143	142	141	140	139	138	137	136	135	134	133	132	131	130	129
DW 59		160	159	158	157	156	155	154	153	152	151	150	149	148	147	146	145
DW 60		176	175	174	173	172	171	170	169	168	167	166	165	164	163	162	161
DW 61	ProLine 95 900	192	191	190	189	188	187	186	185	184	183	182	181	180	179	178	177
DW 62		208	207	206	205	204	203	202	201	200	199	198	197	196	195	194	193
DW 63		224	223	222	221	220	219	218	217	216	215	214	213	212	211	210	209
DW 64		240	239	238	237	236	235	234	233	232	231	230	229	228	227	226	225
DW 65		256	255	254	253	252	251	250	249	248	247	246	245	244	243	242	241
DW 66		272	271	270	269	268	267	266	265	264	263	262	261	260	259	258	257
DW 67		288	287	286	285	284	283	282	281	280	279	278	277	276	275	274	273
DW 68		304	303	302	301	300	299	298	297	296	295	294	293	292	291	290	289
DW 69		320	319	318	317	316	315	314	313	312	311	310	309	308	307	306	305
DW 70		336	335	334	333	332	331	330	329	328	327	326	325	324	323	322	321
DW 71		352	351	350	349	348	347	346	345	344	343	342	341	340	339	338	337
DW 72		368	367	366	365	364	363	362	361	360	359	358	357	356	355	354	353
DW 73	ProLine 900	384	383	382	381	380	379	378	377	376	375	374	373	372	371	370	369
DW 74		400	399	398	397	396	395	394	393	392	391	390	389	388	387	386	385
DW 75		416	415	414	413	412	411	410	409	408	407	406	405	404	403	402	401
DW 76		432	431	430	429	428	427	426	425	424	423	422	421	420	418	418	417
DW 77		448	447	446	445	444	443	442	441	440	439	438	437	436	435	434	433
DW 78		464	463	462	461	460	459	458	457	456	455	454	453	452	451	450	449
DW 79		480	479	478	477	476	475	474	473	472	471	470	469	468	467	466	465
DW 80		496	495	494	493	492	491	490	489	488	487	486	485	484	483	482	481
DW 81		512	511	510	509	508	507	506	505	504	503	502	501	500	499	498	497

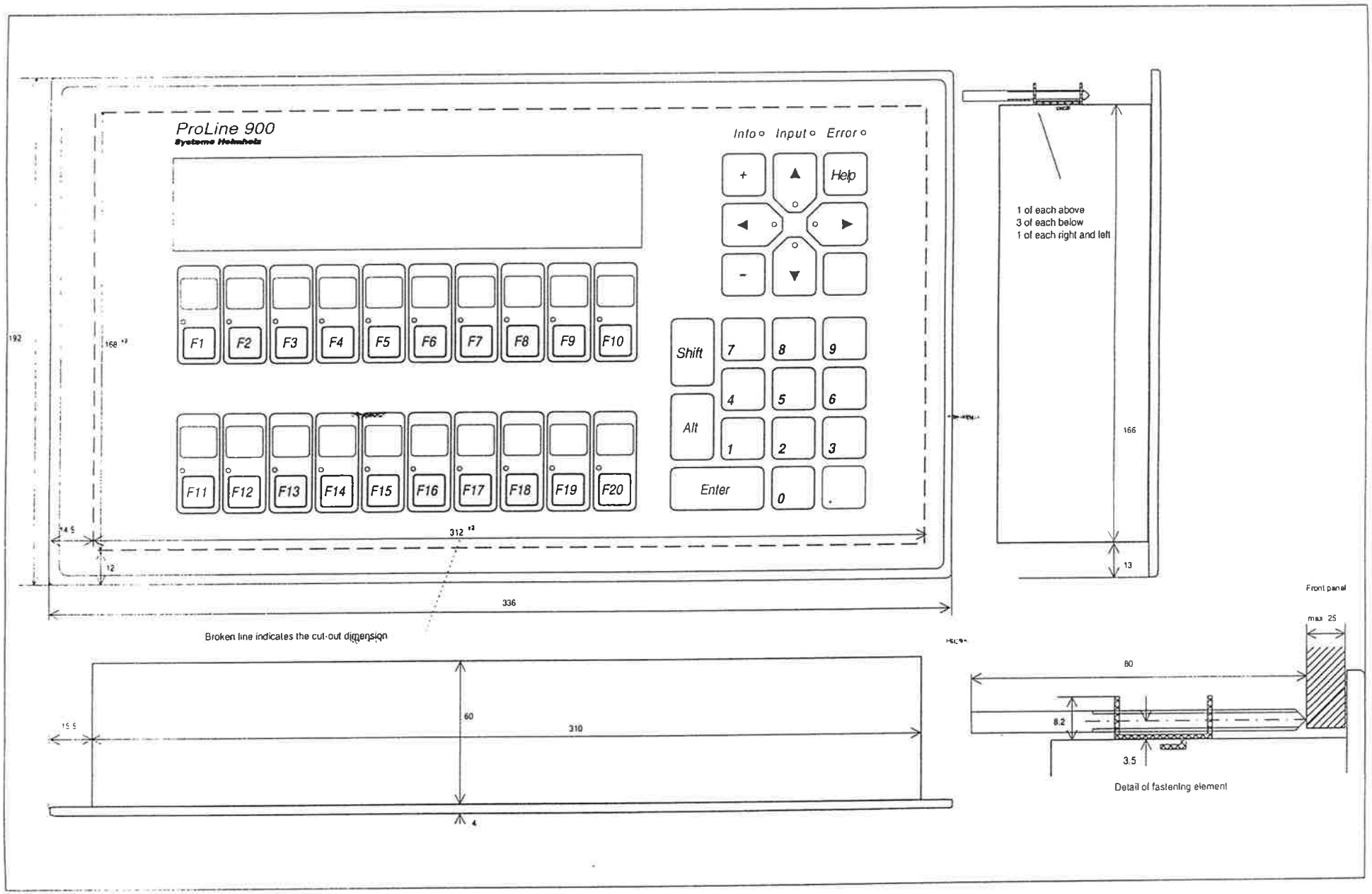
B Key Codes

	Key codes in communication area DR18							
	Key only		Shift + key		Alt + key		Shift+Alt+key	
0	30h	48	70h	112	B0h	176	F0h	240
1	31h	49	71h	113	B1h	177	F1h	241
2	32h	50	72h	114	B2h	178	F2h	242
3	33h	51	73h	115	B3h	179	F3h	243
4	34h	52	74h	116	B4h	180	F4h	244
5	35h	53	75h	117	B5h	181	F5h	245
6	36h	54	76h	118	B6h	182	F6h	246
7	37h	55	77h	119	B7h	183	F7h	247
8	38h	56	78h	120	B8h	184	F8h	248
9	39h	57	79h	121	B9h	185	F9h	249
.	2Eh	46	6Eh	110	AEh	174	EEh	238
-	2Dh	45	6Dh	109	ADh	173	EDh	237
+	2Bh	43	6Bh	107	ABh	171	EBh	235
Enter	0Dh	13	4Dh	77	8Dh	141	CDh	205
Clear	1Bh	27	5Bh	91	9Bh	155	DBh	219
Cursor left	08h	8	48h	72	88h	136	C8h	200
Cursor right	09h	9	49h	73	89h	137	C9h	201
Cursor down	0Ah	10	4Ah	74	8Ah	138	CAh	202
Cursor up	0Ch	12	4Ch	76	8Ch	140	CCh	204

C Dimension Drawings




ProLine 95
Systeme Helmholz
Info
Input
Error
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
F11
F12
F13
F14
F15
F16
+
Help
Clear
-
Shift
Alt
Enter
7
8
9
4
5
6
1
2
3
0
.
192
168 +2
14.5
264 +2
2
288
Broken line indicates the cut-out dimension
1 of each above
2 of each below
1 of each right and left
166
13
15.5
45
262
4
Front panel
max. 12
45
8.2
3.5
Detail of fastening element


ProLine 900
Systeme Helmholz
Info
Input
Error
Help
Shift
Alt
Enter
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
F11
F12
F13
F14
F15
F16
F17
F18
F19
F20
192
168
14.5
12
312
336
Broken line indicates the cut-out dimension
1 of each above
3 of each below
1 of each right and left
166
13
Front panel
max. 25
80
8.2
3.5
Detail of fastening element
15.5
60
310
4

D Mounting Instructions

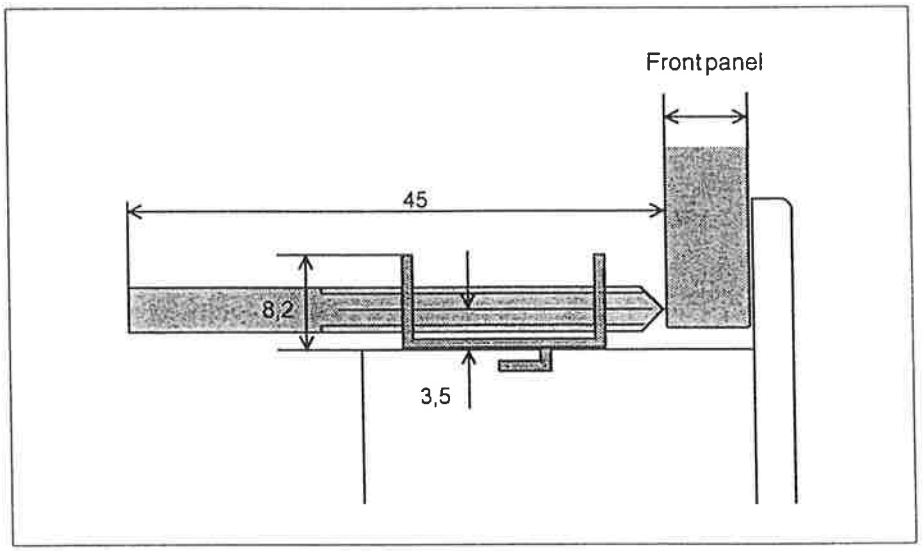
During mounting, the application-specific safety and accident prevention regulations must be observed. Before beginning installation work, all system components must be disconnected from the power supply.

Procedure:

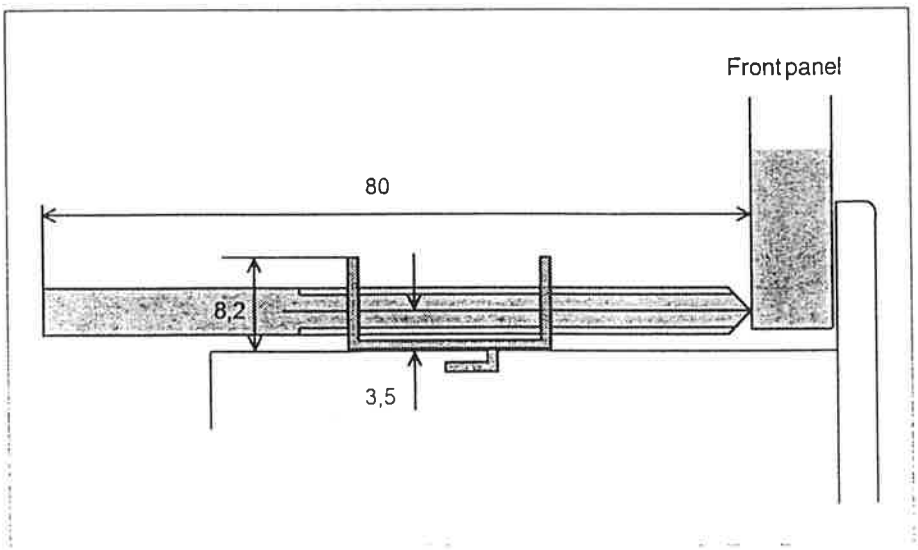
- Make front panel cut-out as shown in the dimension drawing.
- Observe maximum front panel thickness (see dimension drawings)
- Insert Operator Terminal from the front through the front panel cut-out.
- Hook fixing hooks into the ProLine housing.
- Tighten the stud bolts of the fixing hooks slightly and align the Operator Terminal horizontally.
- Tighten the stud bolts.

The Operator Terminal must be installed as stipulated in VDE 0100 / IEC 364.

Fixing hook ProLine 90 / 90D / 95

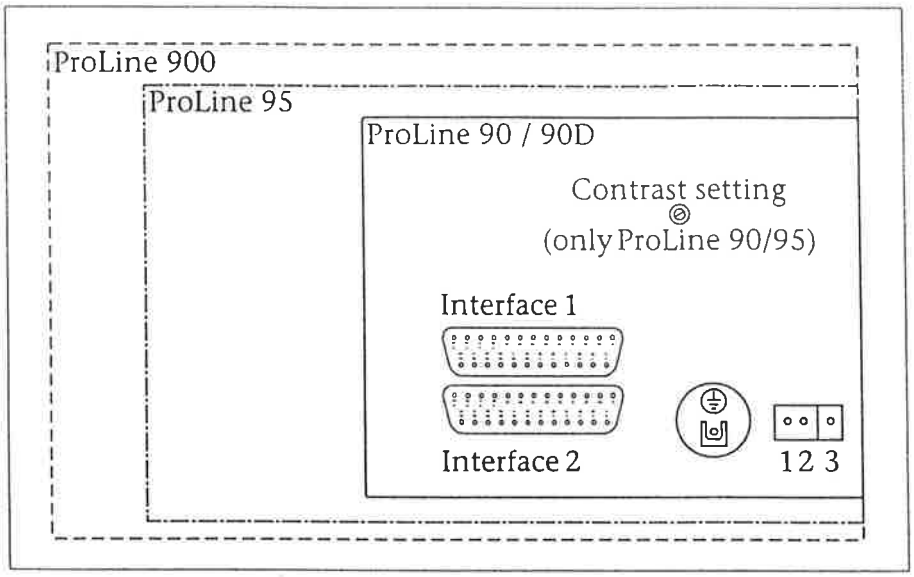


Fixing hook ProLine 900



E Pin Assignments

Rear view of ProLine 900 ProLine 90 / 90D / 95



Interface 1: Communication interface with the PLC (V.24 (RS232) / TTY), or with the simulation interface on the PC (V.24 (RS232) / TTY) 25-way subminiature D socket

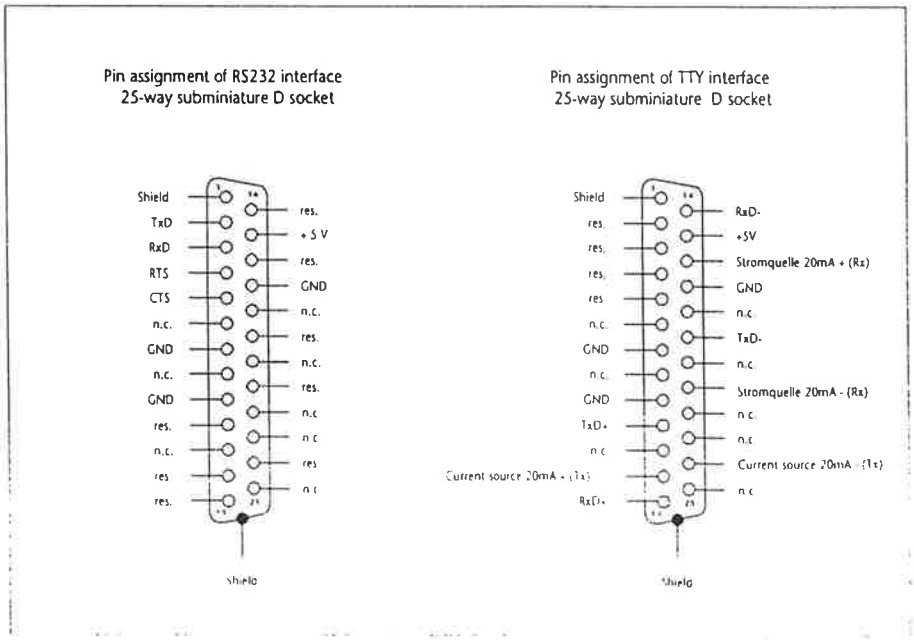
Interface 2: Programming interface with the PC (V.24 (RS232)) or printer interface (not ProLine 90D) (V.24 (RS232) / TTY) 25-way subminiature D socket

Power supply:
Pin 1: 0 V
Pin 2: + 24 V DC
Pin 3: shield

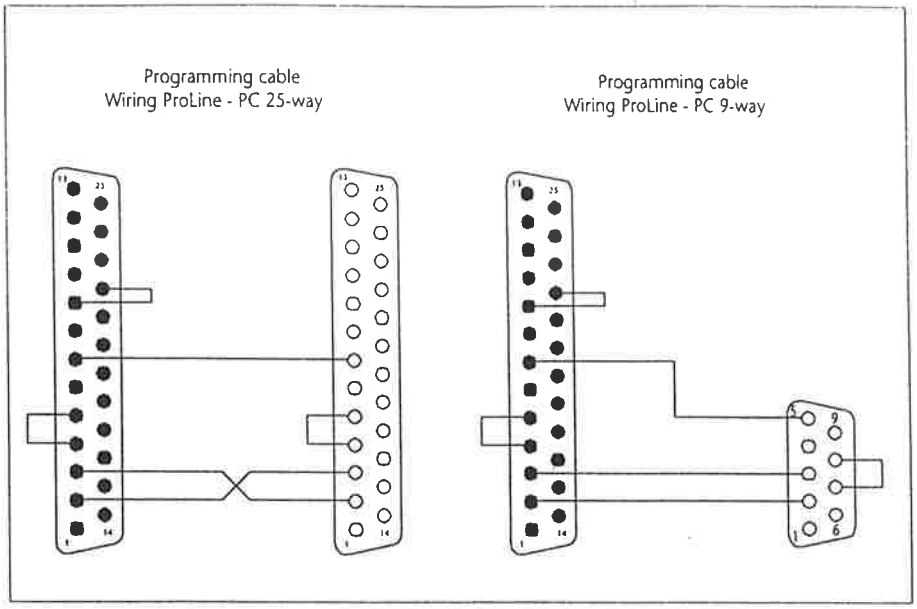
Pin assignment

Interfaces 1 and 2 can be used as V.24 (RS232) or TTY.

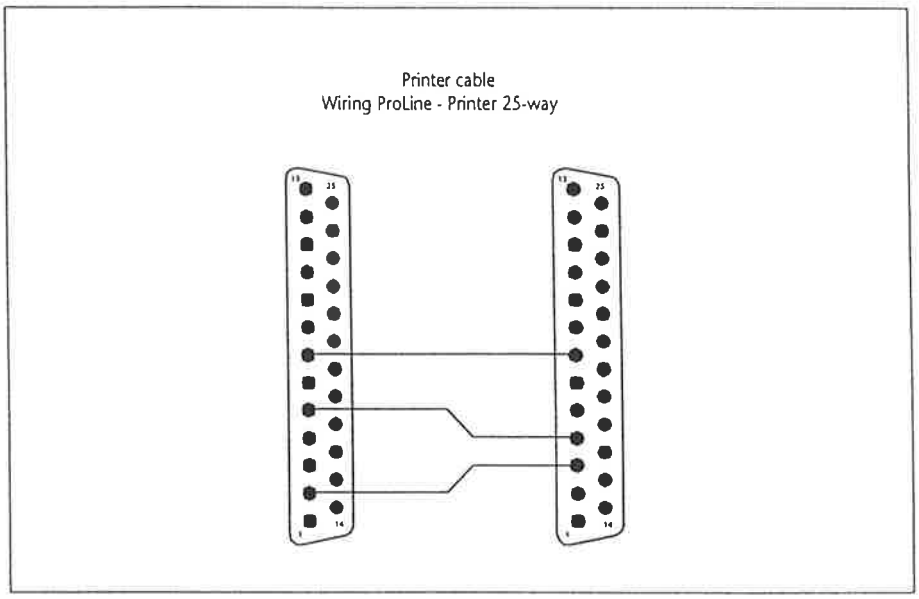
Pin assignment of interfaces 1 and 2



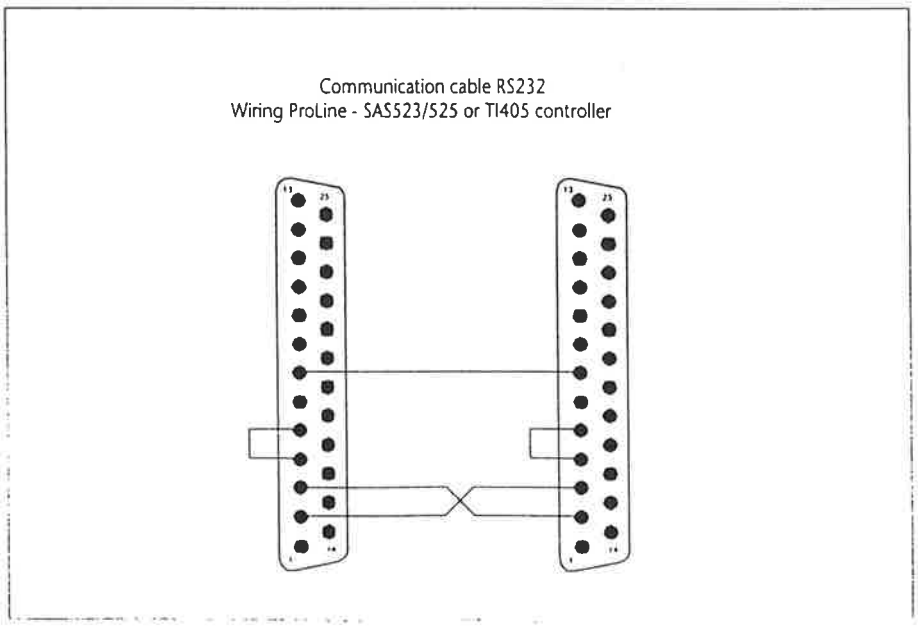
Wiring programming cable



Wiring printer cable

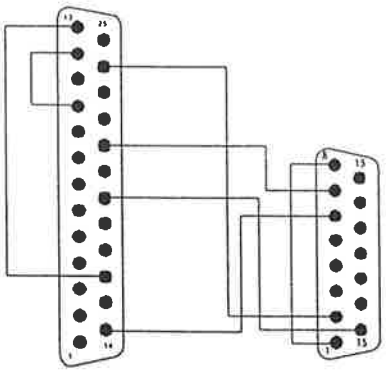


Wiring communication cable RS232

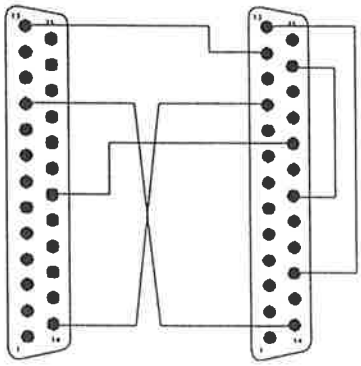


Wiring communication cable TTY

Communication cable TTY
Wiring ProLine - SIMATIC PG interface



Communication cable TTY
Wiring ProLine - SAS523/525



F Character Sets

ProLine 90 / 90D / 95

These characters can be displayed on the LCD display. They are called with key combination **<AltGr>+<decimal number>**.

Dec.	Hex.	ASCII	Dec.	Hex.	ASCII	Dec.	Hex.	ASCII	Dec.	Hex.	ASCII	Dec.	Hex.	ASCII	Dec.	Hex.	ASCII
001	01		044	2C	,	087	57	W	130	82		173	AD		216	D8	
002	02		045	2D	-	088	58	X	131	83		174	AE		217	D9	
003	03		046	2E	.	089	59	Y	132	84	ä	175	AF		218	DA	
004	04		047	2F	/	090	5A	Z	133	85		176	B0		219	DB	
005	05		048	30	0	091	5B	[	134	86		177	B1		220	DC	
006	06		049	31	1	092	5C	\	135	87		178	B2		221	DD	
007	07		050	32	2	093	5D	]	136	88		179	B3		222	DE	
008	08		051	33	3	094	5E	^	137	89		180	B4		223	DF	
009	09		052	34	4	095	5F	_	138	8A		181	B5		224	E0	α
010	0A		053	35	5	096	60	`	139	8B		182	B6		225	E1	β
011	0B		054	36	6	097	61	a	140	8C		183	B7		226	E2	
012	0C		055	37	7	098	62	b	141	8D		184	B8		227	E3	
013	0D	CR	056	38	8	099	63	c	142	8E		185	B9		228	E4	∑
014	0E		057	39	9	100	64	d	143	8F	Ä	186	BA		229	E5	σ
015	0F		058	3A	:	101	65	e	144	90		187	BB		230	E6	µ
016	10		059	3B	;	102	66	f	145	91		188	BC		231	E7	
017	11		060	3C	<	103	67	g	146	92		189	BD		232	E8	
018	12	↕	061	3D	=	104	68	h	147	93		190	BE		233	E9	
019	13		062	3E	>	105	69	i	148	94	ö	191	BF		234	EA	
020	14		063	3F	?	106	6A	j	149	95		192	C0		235	EB	
021	15	§	064	40	@	107	6B	k	150	96		193	C1		236	EC	∞
022	16		065	41	A	108	6C	l	151	97		194	C2		237	ED	
023	17		066	42	B	109	6D	m	152	98		195	C3		238	EE	∈
024	18	↑	067	43	C	110	6E	n	153	99	Ö	196	C4		239	EF	
025	19	↓	068	44	D	111	6F	o	154	9A	Ü	197	C5		240	F0	≡
026	1A	→	069	45	E	112	70	p	155	9B		198	C6		241	F1	
027	1B	←	070	46	F	113	71	q	156	9C		199	C7		242	F2	
028	1C		071	47	G	114	72	r	157	9D	¥	200	C8		243	F3	
029	1D		072	48	H	115	73	s	158	9E		201	C9		244	F4	
030	1E		073	49	I	116	74	t	159	9F		202	CA		245	F5	
031	1F		074	4A	J	117	75	u	160	A0		203	CB		246	F6	÷
032	20	SP	075	4B	K	118	76	v	161	A1		204	CC		247	F7	
033	21	!	076	4C	L	119	77	w	162	A2		205	CD		248	F8	°
034	22	"	077	4D	M	120	78	x	163	A3		206	CE		249	F9	
035	23	#	078	4E	N	121	79	y	164	A4		207	CF		250	FA	
036	24	$	079	4F	O	122	7A	z	165	A5		208	D0		251	FB	√
037	25	%	080	50	P	123	7B	{	166	A6		209	D1		252	FC	
038	26	&	081	51	Q	124	7C	|	167	A7		210	D2		253	FD	
039	27	'	082	52	R	125	7D	}	168	A8		211	D3		254	FE	
040	28	(	083	53	S	126	7E	~	169	A9		212	D4		255	FF	
041	29	)	084	54	T	127	7F	▮	170	AA		213	D5				
042	2A	*	085	55	U	128	80		171	AB		214	D6				
043	2B	+	086	56	V	129	81	ü	172	AC		215	D7				

These characters can be displayed on the VF display. They are called with key combination **<AltGr>+<decimal number>**.

Dec.	Hex.	ASCII	Dec.	Hex.	ASCII	Dec.	Hex.	ASCII	Dec.	Hex.	ASCII	Dec.	Hex.	ASCII	Dec.	Hex.	ASCII
001	01		044	2C	,	087	57	W	130	82	é	173	AD	¡	216	D8	
002	02		045	2D	-	088	58	X	131	83	â	174	AE	≫	217	D9	
003	03		046	2E	.	089	59	Y	132	84	ä	175	AF	≪	218	DA	
004	04		047	2F	/	090	5A	Z	133	85	à	176	B0		219	DB	
005	05		048	30	0	091	5B	[	134	86	å	177	B1		220	DC	
006	06		049	31	1	092	5C	\	135	87	ç	178	B2		221	DD	
007	07		050	32	2	093	5D	]	136	88	ê	179	B3		222	DE	
008	08		051	33	3	094	5E	^	137	89	ë	180	B4		223	DF	
009	09		052	34	4	095	5F	_	138	8A	è	181	B5		224	E0	α
010	0A		053	35	5	096	60	`	139	8B	ï	182	B6		225	E1	β
011	0B		054	36	6	097	61	a	140	8C	î	183	B7		226	E2	Γ
012	0C		055	37	7	098	62	b	141	8D	ì	184	B8		227	E3	π
013	0D	CR	056	38	8	099	63	c	142	8E	Ä	185	B9		228	E4	Σ
014	0E		057	39	9	100	64	d	143	8F	Å	186	BA	‖	229	E5	
015	0F		058	3A	:	101	65	e	144	90	É	187	BB		230	E6	μ
016	10		059	3B	;	102	66	f	145	91	æ	188	BC		231	E7	τ
017	11		060	3C	<	103	67	g	146	92	Æ	189	BD		232	E8	ϕ
018	12	↕	061	3D	=	104	68	h	147	93	ô	190	BE		233	E9	Θ
019	13		062	3E	>	105	69	i	148	94	ö	191	BF		234	EA	Ω
020	14		063	3F	?	106	6A	j	149	95	ò	192	C0		235	EB	δ
021	15		064	40	@	107	6B	k	150	96	û	193	C1		236	EC	∞
022	16		065	41	A	108	6C	l	151	97	ù	194	C2		237	ED	∅
023	17		066	42	B	109	6D	m	152	98	ÿ	195	C3		238	EE	∈
024	18		067	43	C	110	6E	n	153	99	Ö	196	C4		239	EF	∩
025	19		068	44	D	111	6F	o	154	9A	Ü	197	C5		240	F0	≡
026	1A	→	069	45	E	112	70	p	155	9B	¢	198	C6		241	F1	±
027	1B	←	070	46	F	113	71	q	156	9C	£	199	C7		242	F2	≥
028	1C		071	47	G	114	72	r	157	9D	¥	200	C8		243	F3	≤
029	1D		072	48	H	115	73	s	158	9E	Pt	201	C9		244	F4	
030	1E		073	49	I	116	74	t	159	9F	*f*	202	CA		245	F5	
031	1F		074	4A	J	117	75	u	160	A0	á	203	CB		246	F6	
032	20	SP	075	4B	K	118	76	v	161	A1	í	204	CC		247	F7	
033	21	!	076	4C	L	119	77	w	162	A2	ó	205	CD		248	F8	°
034	22	"	077	4D	M	120	78	x	163	A3	ú	206	CE		249	F9	
035	23	#	078	4E	N	121	79	y	164	A4	ñ	207	CF		250	FA	
036	24	$	079	4F	O	122	7A	z	165	A5	Ñ	208	D0		251	FB	
037	25	%	080	50	P	123	7B	{	166	A6	ª	209	D1		252	FC	η
038	26	&	081	51	Q	124	7C	|	167	A7	º	210	D2		253	FD	²
039	27	'	082	52	R	125	7D	}	168	A8	¿	211	D3		254	FE	
040	28	(	083	53	S	126	7E	~	169	A9		212	D4		255	FF	
041	29	)	084	54	T	127	7F	▮	170	AA	¬	213	D5				
042	2A	*	085	55	U	128	80	Ç	171	AB	½	214	D6				
043	2B	+	086	56	V	129	81	ü	172	AC	¼	215	D7				