Dolog AKF125 → A120/A250
Type: AKF125EN
Version: 7.10
Configuration A250 (Vo. 2)
User Instruction

DOK–707695.35–1096

Translation of the German Description
DOK–702653.35–0196

Accompanying software package E-No. 424-275182

Documents in the software package

Kit 1

Documentation	Area of application
Installation User Instruction DOK-702082	Explains the usage and installation of the diskette s included.
How do you proceed? User Instruction DOK-702084	Serves as a ”red thread” through the documentation of the software packet and should be gone over before the start.

Kit 2

Documentation	Area of application
AKF125 for Beginners User Instruction DOK-702083	Serves to introduce new customers to AKF125. The user learns how to use the software in samll steps.
Short Form Guide A120 User Instruction DOK-702087	Tables for validity ranges and symstem markers, SFB-Formal operands for quick use onsite.
Sort Form Guide A250 User Instruction DOK-702088	Tables for validity ranges and symstem markers, SFB-Formal operands for quick use onsite.
Configuration A120 User Instruction DOK-702085	Contains the new features of the current version and explains th efunctions of th individual software menus for the configurer.

Kit 3

Documentation	Area of application
Configuration A250 (Vo1) User Instruction DOK-702086	Contains the new features of the current version and explains th efunctions of th individual software menus for the configurer.
Configuration A250 (Vo2) User Instruction DOK-707695	The explanation of the individual software menus will continued.
Masterindex User Instruction DOK-702089	Index of all documentation.

Notes

Application Note

Caution The relevant regulations must be observed for control applications involving safety requirements.
For reasons of safety and to ensure compliance with documented system data, repairs to components should be performed only by the manufacturer.

Training
Schneider Automation GmbH offers suitable training that provides further information concerning the system (see addresses).

Data, Illustrations, Alterations
Data and illustration are not binding. We reserve the right to alter our products in line with our policy of continuous product development. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us by using the form on the last page of this publication.

Addresses
The addresses are given at the end of this publication.

Terminology

Note This symbol emphasizes very important facts.

Caution This symbol refers to frequently appearing error sources.

Warning This symbol points to sources of danger that may cause financial and health damages or may have other aggravating consequences.

Expert This symbol is used when a more detailed information is given, which is intended exclusively for experts (special training required). Skipping this information does not interfere with understanding the publication and does not restrict standard application of the product.

Path This symbol identifies the use of paths in software menus.

Figures are given in the spelling corresponding to international practice and approved by SI (Système International d‘ Unités).
I.e. a space between the thousands and the usage of a decimal point
(e.g.: 12 345.67).

Abbreviatons

ABS	absolute Adressing
Adr.	Adresse (signal adresse)
AE	Block for one time actions
AZ	Block for cyclicel actions
AKF	Instructionlist, Contaktplan, Functionlist
ALD	Sequentiel Flow Chart with Diagnostics
ALS	Sequentiel Flow Chart
AWL	Instructionlist
AWP	User programm
BGT	Subrack
BSS	Serviceconnection for PC ore VS210
DAE	Diagnostics Block for one time actions (AE)
DAZ	Diagnostics Block for cyclicel actions (AZ)
DIB	Diagnostics Block for Block independent Diagnostics
DB0....9	SYM/KOM-Datablock for A120
DPB	Diagnostics Block for Programm Blocks (PB)
DSB	Diagnostics Structure Block
DW	Double word
I/O	Input– / Output signales (e.g. from a Module)
FB	Function block
FUP	Function list
FW	Floatingpoint
HW	Hardware (z.B. PLC)
IB	Initial value block
KB	Sequentiel block
KF	Sequentiel errorbit
KFW	Sequentiel errorword
KOP	Kontaktplan
KS	Kettenstatus für Simultankette
LZS	Run Time System
MW	Markerword
OB	Organisations Block
PB	Program Block
PaDT	Programming- and Diagnostics testequipment
RK	Controlloop
SFB	Standard-Function Block
SK	Step marker

SM	Systemmarker
SSP	Signal memory
SW	Software
SYM	symbolic Adressing
SYM/COM	Symbol und Comment
SZ	Step Counter
TB	Transitionsblock
TN	Teilnehmer
VBGT	Virtuelle Subrack (InterBus-S, Modnet 1/IS))
ZVT	Time organiasationtable (Controlle)
ZZ	Time Counter
<Return>	Applay the key Return
<Esc>	Applay the key Esc
<Ctrl>+<Alt>+<Del>	Applay in the same time the keys Ctrl, Alt und Del (beginning with Ctrl.and finnishing with Del)

Objectives

The functions of the software for configuring PLC stations are described. The documentation is set up like a reference document. Frequent consultation of the index is recommended.

Arrangement of this guide

Chapter 3 contains new features and a broad overview of the software structure.

Related Documents

A250
User Manual A250
804 BHB 000 00

A250
User Manual A250
Regeln mit Dolog AKF
804 BHB 001 00

A250
User Manual A250
Prozessperipherie Frontanschlusstechnik
899 BHB 000 00

A250
User Manual A250
Cable
899 BHB 001 00

A250
Blockbibliothek Standard Funktionblocks A250
Vol. 1 (AKF125 V4.x, ALD25 V4.1)
804 BSB 001 00

A250
Blockbibliothek Standard Funktionblocks A250
Vol. 2 (AKF125 V4.x, ALD25 V4.1)
804 BSB 002 00

Validity Note

These User Instructions apply to the AKF125 software, version 7.1, on the DOS operating system.

The current intention is for **remote control data** only to be edited with the **AKF125** configuration software and **not** with ALD25. Therefore, within systems U250 and UZ250, remote control modules **KOS140**, **KOS141** and **DEZ161** should **not** be used as REAL–TIME variants.
Correspondingly, the **KOS 20x** modules of the U120, Z120 and UZ120 systems are **not** to be used.

Table of Contents

3.3.5 Title Block

 - ”Edit”, ”Title Block”

This editor allows you to specify the title block for all station documentation lists to either be printed or displayed on the screen. The title block editor uses special keys and graphics characters.

In the ”Title Block” pulldown menu, the following functions are available:

Input is made with a title block editor.

Start Entry

 - ”Edit”, ”Title Block”, ”Start Entry”

After determining the name, width and height of the title block and pressing <Return>, you can start the input. This title block can then be used for all print operations. Output is always made at the end of a page of print. If the Title Block File does not exist, it is created automatically with the parameters (name, width, height) determined in the Pulldown menu.

Title Block Editor

 - ”Edit”, ”Title Block”, ”Start Entry”, <Return>

With this editor you enter the title block for the station documentation lists for output to a printer, file, or screen.

You can edit any text in the displayed frame using the following special keys and the typewriter keyboard.

Special keys:

<Del>	Delete character under cursor
<backspace>, <⇐>	Delete character to the left
< ←>, < →>, < ↑>, < ↓>	Move cursor
<Return>	Cursor to the start of the next line
tab	Cursor 8 Columns to the right
backtab	Cursor 8 Columns to the left
<PgUp>	Move image to the left
<PgDn>	Move image to the right
<Ins>	Insert / Overwrite
<Ctrl>+<B>	Save + End Editing

Graphics characters:
You can also use graphics characters when drawing a new title block. This is created using the Keyboard with the <Alt> key and the keys of the right–hand Numerical keypad:

Press the <Alt> key and keep it pressed. Use the keys of the right–hand numerical keypad to enter a three–figure number and then release the <Alt> key again. The corresponding graphics character appears on the screen at the current cursor position.

The following graphics characters are available (on the left, the 3 digit number, on the right, the corresponding character)

179	180	181	182	183
184	185	186	187	188
189	190	191	192	193
194	195	196	197	198
199	200	201	202	203
204	205	206	207	208
209	210	211	212	213
214	215	216	217	218

Figure 10 Available graphics characters

Instead of creating your own title block, you can also use a standard title block file, in which you only need to enter the current details.

This is what the standard title block looks like:

Title Block Name

 - ”Edit”, ”Title Block”, ”Title Block Name”

Enter here the name of the Title Block file which you would like to process.

The standard Title Block File is called ”HEAD.DOC”. Normally, the extension ”.DOC” is given to Title Block filenames.

Title Block Width

 - ”Edit”, ”Title Block”, ”Title Block Width”

Enter the desired width of the title block here. Once files have already been created, it is no longer possible to change them.

64 to 132 characters are permitted.

Title Block Height

 - ”Edit”, ”Title Block”, ”Title Block Height”

Enter the desired number of lines for your title block (permitted values 1 to 12). Once files have already been created, it is no longer possible to change them.

3.3.6 Replace Signals

- ”Edit”, ”Replace Signals”

Use this function to replace signal addresses by others. This is done in ranges by specifying signal lists; replacement can thus also be carried out by module.

A block list must be entered for this purpose; a ”*” has the effect of replacing all the blocks in the current station. The SYM/COM block is adapted automatically. This means that the symbol names and comments of the contacts to be replaced are assigned to the new addresses and deleted for the contacts to be replaced.

In this pulldown menu you can select and call the following functions:

The SYM/COM block is modified when you enter ”SYMCOM1” in the block list

If you want to exchange two contacts, A and B, proceed as follows:

Step 1 ”Old Signal” → A, ”New Signal” → Auxiliary Contact, Start Replace

Step 2 ”Old Signal” → B, ”New Signal” → A, Start Replace

Step 3 ”Old Signal” → Auxiliary Contact, ”New Signal” → B, Start Replace

The auxiliary contact is only needed for this exchange, and must be of the same type as contacts A and B. This procedure is necessary to prevent information loss, because if you were to replace contact A with contact B and then replace contact B with contact A, contact A would be lost at the first use of the Replace function.

Start Replace

 - ”Edit”, ”Replace Signals”, ”Start Replace”

After entering all the required data (see the following pulldown menu lines) replacement is started, following a safety check. This check involves a test to see whether the new signal addresses in the SYM/COM block already contain symbols and comments, which would be overwritten by the replace procedure. If this is so, then the user is given an opportunity to revise his decision.

Old or new signal

 - ”Edit”, ”Replace Signals”, ”Old or New Signal”

Enter the desired hardware address here (I, Q, M, MW, MD, MG etc.). The old and new signals must have the same signal type. If you enter a range, you can replace several signals simultaneously, e.g:

Old Signal	E8.1–8.16
New Signal	E8.17–8.32

The following conditions must be met:

- The signal lists must be equally long.
- The signal lists cannot be identical.
- The old signals and the corresponding new ones must have the same validity state in the equipment list.
- If a range is entered, the first address must be smaller than the second.
- The start and end signals must be entered in the equipment list.

It is permitted to have the signal lists overlap.

Block list

- ”Edit”, ”Replace Signals”, ”Block List”
- ”Load”, ”Read–out PLC”, ”Block List”
- ”Load”, ”Compare”, ”Blocks with PLC”, ”Block List”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Block List”
- ”Print”: ”Program Protocol”; ”Cross–Reference List”; Signal Allocation List”

Enter here a list of all the blocks to be processed.
The list can comprise a maximum of 200 characters.

Authorized entries:

*	→	Processing of all the blocks under the station. ”*” is the preset.
Space + <Return>	→	a selection window of all blocks appears
OB, PB, FB	→	e.g. OB1, PB1, FB55, ...
PBxxx-yyy	→	e.g. PB8-19
FB10	→	FB10 only

With a list of entries, the items must be separated by commas: e.g. PB1-19, PB23-24, FB5-8, FB13-28

You can overwrite existing entries or use <Shift>+<F2> to delete them and then replace them. Enter <Blank> and <Return> to reveal a window containing all the existing blocks in the station databank. You can then use the Arrow keys and <Return> to select and mark the desired blocks. Then use the key combination <Ctrl>+<B> to enter them in the Block list. This list can be given a name and saved, using ”Save Block List” and then be reloaded when and where you wish.

Load block list

- ”Edit”, ”Replace Signals”, ”Load Block List”
- ”Load”, ”Read Out PLC”, ”Load Block List”
- ”Load”, ”Compare”, ”Blocks with PLC”, ”Load Block List”
- ”Print”: ”Program Protocol”; ”SFC Protocol”;”Cross–Reference List”; ”Diagnostics Protocol”, ”Signal Allocation List”

The list which is programmed under ”Block list” and saved under ”Save Block Lists” can be reloaded using this function, if required.

If desired, an overview of all block lists stored in the selected station can be displayed by entering a space and pressing <Return>. You can then use the Arrow keys and <Return> to select a block list.

Save block list

- ”Edit”, ”Replace Signals”, ”Save Block List”
- ”Load”, ”Read Out PLC”, ”Save Block List”
- ”Load”, ”Compare”, ”Blocks with PLC”, ”Save Block List”
- ”Print”: ”Program Protocol”; ”SFC Protocol”;”Cross–Reference List”; ”Diagnostics Protocol”, ”Signal Allocation List”

The list entered under ”Block List” can be stored under a name chosen by the user.
The block list name should not contain a period.
If required, it can be called again using ”Load Block List”.

If desired, an overview of all block lists stored in the selected station can be displayed by entering a space and pressing <Return>. You can then use the Arrow keys and <Return> to select a Block list.

3.3.7 Compile (blocks)

- ”Edit”, ”Compile (Blocks)”

This function is used to adapt other AKF programs to the present software. These programs can be AKF programs from other programmable controllers or ALD25 programs of an older version (for later use).

The following functions are available here:

General information on converting other or old ALD/AKF programs

If one or more ”foreign blocks” (not AKF125 or old AKF125 version) are to be found in the station currently set, an attempt will be made to convert them to the current ALD. Before you start this function you should generate an equipment list which reflects the equipment list of the foreign/old system, as accurately as possible. If an old block is successfully converted, it will be deleted from the current station and then placed in the databank used by AKF125 to manage the blocks.

Caution During compiliation the (”old”) blocks to be compiled are always deleted.

Even if conversion is successful, it is possible that the behavior of some blocks may differ from what it was in the foreign ALD.

This is because various system markers in ALD25 have different meanings. The system marker SM12 from AKF12 (flashing rate 1Hz), for example, is called SM167 inALD25.

You can solve such problems by editing the block; however, it is better to use a system and/or user assignment file during conversion. The system assignment file tells the compiler how the meanings of the system markers have shifted, so that the old system markers can be replaced by the new ones during conversion. Subsequent editing then becomes unnecessary.

Basic procedures for converting old blocks or for re–assignment in the current ALD / AKF :

Adaptation of a foreign/old ALD/AKF station:

Step 1 Define a station under ALD25 / AKF125.

Step 2 Export the foreign blocks to the ALD25 / AKF125 station.

Step 3 Import the foreign blocks to the ALD25 / AKF125 station.

Step 4 Configure the Equipment List of the current ALD / AKF so that differences between it and the foreign configuration are minimal (identical slot references, nodes or module types).

Step 5 Compile once
without User Assignment (this way you gain an overview of any operands which are stil faulty)
or
with User Assignment (see below)

Response The old blocks are converted and adopted into the databank, or at least, provided no major errors have been found (the original blocks are deleted automatically.)

Step 6 In the current station, create a user–A file (see below) with the mandatory extension ".ARD", to carry out additional or on–board assignments.

You must then use the block editor to edit blocks in which bit string parameters or node numbers are used.

Assignment in AKF125 ("Rewire", "Reconfigure")

In AKF 125, you can modify blocks with the help of a user assignment. This procedure is similiar to that of replacing signals. Proceed as follows:

Ähnlich wie beim Ersetzen von Signalen können Sie im AKF125 mit Hilfe einer Anwender-Rangierung Ihre Bausteine verändern. Dafür gehen Sie in folgender Reihenfolge vor:

Step 1 Create user–A file (see below)

Step 2 Change equipment list, if necessary

Step 3 Start Compiling (user–A file, User Assignment ”on”, System Assignment ”off”)

Für die Umsetzung anderer (nicht AKF125 bzw. alt AKF125) ALD-Programme sind zwei Verfahren möglich:

❒ System Assignment

System assignment is used in the conversion of foreign/old blocks, to replace signals which have a meaning in the foreign/old ALD/AKF which is different to that in the current AKF, with the corresponding signals of the current AKF125 which have the same meaning. The system assignment file supplied with AKF125, currently only contains directions for the assignment of system markers. So that the compiler knows which assignments he should make, toggle with <Return> in the ”System Assignment” menu item to select the name of the system to be converted (e.g. A350). Set A250, if old AKF versions (for A250) are to be converted.

The system assignment file is located in the AKF125 program directory and should not be modified. You can, however, look at the system assignment instructions in the system assignment file. In addition you can use any given editor or the TYPE command from MS–DOS.

The name of the file is ”SRAN25_1.SRD”.

❒ User Assignment (user–A file)

This functions like system assignment except that the user creates his own user–A file in which he can enter any assignment instructions.

Unlike system assignment, a user assignment makes sense even for blocks from ALD25 or AKF125, to achieve signal ”re–wiring”. In addition, user assignment is used in conversion to replace the instructions found in the system assignment file (only carry out user assignment), or to complement them (carry out user and system assignment).

To carry out a user assignment, you must toggle with <Return> in the ”User Assignment” menu line, to select ”on”. You must also use a window to select an assignment file from the current station in the ”User Assignment File” menu line.

Procedure for creating the user assignment file (user–A file)

You can create a user assignment file in the current station with any text editor. Diese wird im AKF125 interpretiert und als Steuerdatei für das Rangieren und ”Umverdrahten” von Kontakten benutzt.

You are free to choose the filename. Only the extension ”.ARD” is mandatory so that the files can later be found by AKF125.

The file comprises the old signal, the number of signals of the same type that should be assigned, and the new signal:

Old signal, Number > New signal;

Old signal and new signal are obligatory entries. If the number is 1, this entry can be left out, as only one contact or operand needs to be assigned. The following entries are also valid

- , (Comma) separates the old signal and the number; this entry in only necessary if the number is greater than 1, e.g. MW100, 7 > M666
- > separates the number and the new signal, this entry is always necessary (means ”assign to”)
- ; (semicolon) ends the assignment line and is always necessary, lines consisting only of a semicolon are not permitted. A text can be entered after this point as a comment.
- Tabulators/ Spaces are allowed (for signals, only between the name and the instance)
- Spaces are permitted
- Comments can be entered as you wish, after the semicolon
- Line breaks are not permitted in the assignment line

The following types of signal (old / new signals) are valid:

E, EB, EW, ED, EG, (EWA)
AB, AW, AD, AG, (AWA)
M, MB, MW, MD, MG
SM, SMB, SMW, SMD, SMG
T, TIW, TSW, Z, ZIW, ZSW
PB, SFB

☞ **Note** Types EWA and AWA can only be identified in the conversion from AKF13. Otherwise, they are automatically converted to EW and AW with the same copy number.

Data strcutures cannot be converted.

When the original operand is entered, the notation of the original ALD/AKF should always be used, e.g. for AKF13 M 0.1500 or SM 9.2 and M 9.64 for the DEA marker. The target operands in the assignment file must satisfy the ALD25 checks.

Example for ”User.ARD”

```
E1.1,16   > E2.1; A complete module is assigned
E1.17,16  > E3.1;
A2.1,16   > A4.1;
A2.17,16  > A5.1;
A3.1,16   > A6.1;
A3.17,16  > A7.1;
M7        > M22; Only one marker is assigned
E9.8,16   > E 15.1;
A9.1,16   > A 18.1;
A10.1,16  > A 17.1;
```

Start compiling

 - ”Edit”, ”Compile (Blocks)”, ”Start Compiling”

After setting up the other menu lines, start compiling with this function.

System assignment

 - ”Edit”, ”Compile (Blocks)”, ”System Assignment”

In this function, toggle to set the programmable controller from which you want to convert. Each programmable controller has its own system assignment file.

User assignment

 - ”Edit”, ”Compile (Blocks)”, ”User Assignment”

Here you can choose whether you want to carry out your own user assignment (setting ”on”) or not (setting ”off”).

user–A file

 - ”Edit”, ”Compile (Blocks)”, ”user–A file”

If you have created a user assignment file, you can select it here. If no such file exists in the current station, an error message appears.

3.3.8 Data structures

- ”Edit”, ”Structure Editor”

General
Data structures are tables in which memory cells can be reserved. Data structures have a function similar to that of the FBs. Once they have been created, they can be used repeatedly. With data structures, however, the number of times that they can be used should be defined at the time of their creation. This number is called ”Instances”. Memory cells (bit, byte, word, etc.), are reserved in the instances. These memory cells are called ”Elements”. The elements can be used in FBs as auxiliary markers (e.g. for intermediate results, timer and counter setpoint values, etc.). When calling up the FB, you only need to specify the desired instance of the data structure. All the auxiliary markers in the FB will thus be assigned data structure elements. This means that it is not necessary to assign actual operands to the auxiliary markers when calling the FB. This assignment is made automatically when entering the data structure instance.

In the SYM/COM editor symbols, initial values and comments can be specified for data structure instances and elements.

There are two types of data structure

- ❒ data structures specified by Schneider Automation, which cannot be modified (for more information, see the ”A250 Pocket Guide” user instructions)
- ❒ new data structures created by the user (for more information, please refer to the ”AKF125 for Beginners” user instructions)

This Editor is used to view the Schneider Automation data structures and to create and change the user–defined data structures.

Once this function has been chosen, the ”data structure name” line appears. You can use spaces and <Return> to display a selection window containing all the existing data structures. Use <Return> to choose the desired name.

Note The functions described below are used to create and change user–defined data structures.

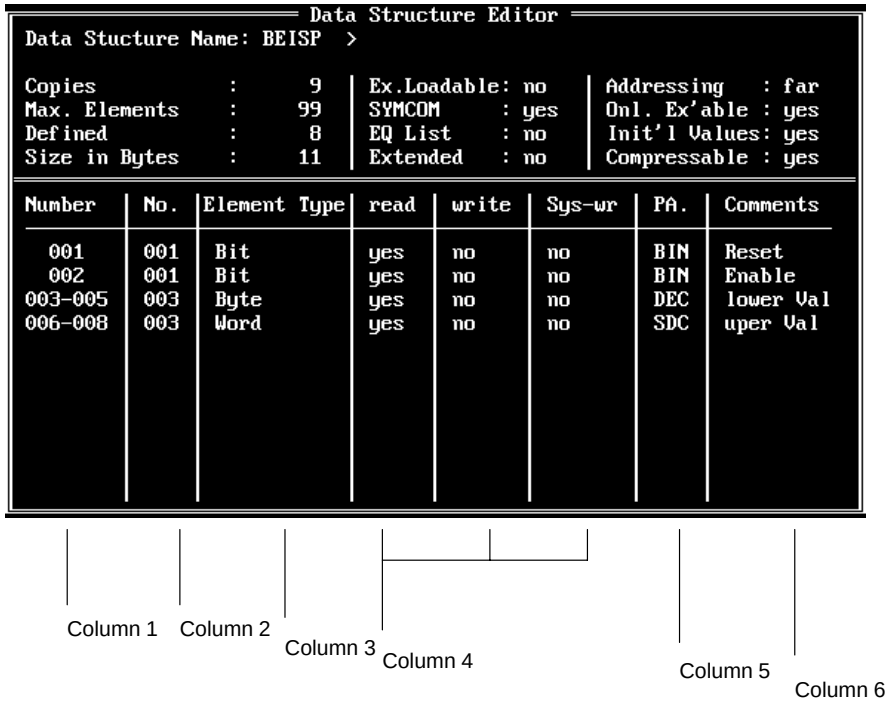
Association Name length, Number of instances/Elements

There are associations between possible name lengths, the possible number of instances and the maximum number of elements that can result. The names consist of 2 – 6 (see Note) characters and may contain neither special characters nor numbers.

☞ **Note** From Version 7, it will be possible to define as many as 4096 elements (bit, byte, word, DWORD, GWORD) for a data structure. This has been made possible by the fact that the data structure name can now consist of only 2 characters, whereas previously it was 4. However, you must ensure that this indicates a corresponding memory pre–assignment in the PaDT, which , if it is not used, will be lost for other structures.

To generate a new data structure, enter a new name in the ”Data Structure Name” line after you have selected the function. If you enter a name comprising less than 4 characters, a corresponding message will be issued.

You will then be asked for the number of instances. ”Instance” indicates the number of times a data structure may be used in a station.


Data Structure Editor
Data Stucture Name: BEISP >
Copies : 9
Max. Elements : 99
Defined : 8
Size in Bytes : 11
Ex.Loadable: no
SYMCOM : yes
EQ List : no
Extended : no
Addressing : far
Onl. Ex'able : yes
Init'l Values: yes
Compressable : yes
Number
No.
Element Type
read
write
Sys-wr
PA.
Comments
001 001 Bit yes no no BIN Reset
002 001 Bit yes no no BIN Enable
003-005 003 Byte yes no no DEC lower Val
006-008 003 Word yes no no SDC uper Val
Column 1
Column 2
Column 3
Column 4
Column 5
Column 6

Editor header
Information relating to the entire data structure is displayed in the top 5 lines of the window:

- Data structure name specified by AEG or the user
- Instances — the total number of times the data structure can be used for parameterization
- Elements max. — number of elements which can be defined in the data structure
- defined — number of elements defined in the data structure
- Size in bytes — memory requirement for the elements defined in the data structure
- Attributes — the following attributes are valid for the entire data structure
  - Externally loadable — used internally by AEG, used here only for display
  - SYMCOM — assign for user–defined data structures (whether selectable in the SYM/COM editor)
  - EQ list — used internally by AEG, used here only for display
  - Extended — reserved for later use, currently only for service
  - Addressing — if the data structure is stored in the signal memory (Near) or in the user memory (Far)
  - Onl. exchang. — specify for user–defined data structures (if exchangeable online)
  - Initial values — specify for user–defined data structures (if ”yes”, then SYM/COM ”no” is invalid)
  - Compressible — procedure for Exchange Online
    ”yes”: only the described elements of the data structure
    are exchanged online, loading into the PLC is speeded up;
    ”no”: all elements are exchanged.

First comes the column description, followed by explanations for the editor functions.

Column 1 (Run No.

Indicates the element number (is generated automatically).

Column 2 (Number)

The number of related variables of the same type is determined in this column. These variables then occupy consecutive lines in the SYM/COM block and consecutive addresses in the PLC. The total of the numbers in ”Number” is limited by ”maximum variables” in the Editor header.

Use <Return> to activate the column (cursor jumps to the left) or to accept the entered number.

☞ **Note** Once the data structure in a block is linked, you may no longer change the number of elements. It is therefore necessary to designate a reserve of elements when the data structure is created.

Use <Ctrl>+<Return> to call the Editor functions.

Column 3 (Element Type)

A structure consists of several different elements of a fixed element type. These element types are predetermined and fixed. Data structures can consist of any mixtures from bits to floating point words.

Press <Return> to select or accept the following element types in the second column:

Size	Value
1 bit	0/1, binary
1 byte	0 to 255, (–128 to +127)
2 bytes	0 to 65 535, -32 768 to 32 762
4 bytes	-2 147 483 648 to +2 147483 647
4 bytes	-3.4E+38 ... +3.4E+38
4 bytes	-2 147 483 648 bis +2 147 483 647 -3.4E+38 ... +3.4E+38

Use <Ctrl>+<Return> to call the Editor functions.

Column 4 (Attributes)

The elements can be assigned attributes.

Use <Return> to toggle between ”yes” and ”no” in the ”write” and ”read” columns.

This column is divided into three parts:

- ❒ read = ”yes” Element contents can be read by the user e.g. in IL with ”L”, comparable with constants)
- ❒ write = ”yes” Element contents can be written by the user (e.g. in IL given the assignment ”=”)
- ❒ Sys-wr = ”yes” ”System write”, used only for display; the data structure is stored in RAM (additionally, in case the user program is saved in EPROM)

The combinations

”write” = ”yes”,	”read” = ”no”	(the contents of the element can only be written in the user program)
”write” = ”no”,	”read” = ”no”	(the contents of the element can be neither written nor read) do not produce a meaningful application.

☞ **Note** When ”write” or ”sys-write” is set to ”yes” for an element, the entire data structure is stored in RAM

Use <Ctrl>+<Return> to call the Editor functions.

Column 5 (Presentation Attribute)

The Presentation attribute is selected using the Arrow keys in the pulldown menu and confirmed usng <Return>, or selected using the reference character.

Please note that storage of the initial values for the presentation type character (CHR) is not rotated in Intel format.

Example:

Word in the type of presentation:	HEX	CHR
Initial value input in symbol and comment editor:	4142	AB
Storage in the memory:	4241	4142

The following presentation attributes are made available for the creation and processing of data structure elements.

Pres. type	Shortform (display)	Used for element type
character	CHR	byte, word, double word
bit string	BIN	byte, word (double word for online functions)
decimal	DEZ	byte, word, double word
+ decimal	SDZ	byte, word, double word
octal	OKT	byte, word, double word
hexadecimal	HEX	pointer, stream
floating point	GLP	floating point word
string	STR	address (pointer)

Use <Return> to call a selection menu. Here you will find the possible types of presentation for the element types in question.

Use <Ctrl>+<Return> to call the Editor functions.

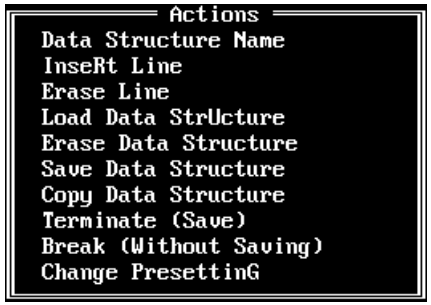
Column 6 (Comment)

In this column you can assign the variable group as many as 9 characters of comment.

Use <Ctrl>+<Return> to call the Editor functions.

Editor functions

Use <Ctrl>+<Return> to call the following pulldown menu:



Data structure name

- ”Edit”, ”Structure Editor”, ”Data Structure Name”

With the data structure name option, you can change the name of the data structure. The new data structure must then be loaded, if necessary.

Exit the menu with ”Enter” to save the changes.

Use <Esc> to abort the Editor and the changes will not then be adopted.

Insert line

 - ”Edit”, ”Structure Editor”, ”Insert Line”

This function inserts a new line in the data structure at the current cursor position. The line is given a standard value.

Delete line

 - ”Edit”, ”Structure Editor”, ”Delete Line”

Deletes the line at the current cursor position within the data structure.

Load data structure

 - ”Edit”, ”Structure Editor”, ”Load Data Structure”

The existing, stored data structure with the name from the Editor header is loaded from the databank to the editor (corresponds to the initial state).

If a new data structure has been created and not yet stored, then the data entered in the action window is deleted by this function.

Use <Esc> to abort Editor input and the changes will not then be adopted.

Delete data structure

 - ”Edit”, ”Structure Editor”, ”Delete Data Structure”

The existing, stored data structure with the data structure name from the Editor header is deleted in the databank. The action window, with already entered basic settings (data structure name/instance), is retained. The deletion is carried out when the ”Exit (Save)” function is called.

Use <Esc> to abort Editor input and the changes will not then be adopted.

Save data structure

- ”Edit”, ”Data Structure”, ”Save Data Structure”

The data structure specified by data structure name and instance is stored in the databank. If another data structure exists with the same name, it will be overwritten.

Use <Esc> to abort Editor input and the changes will not then be adopted.

Copy data structure

- ”Edit”, ”Data Structure”, ”Copy Data Structure”

The identical data structure to that in the editor is stored, with a newly entered data structure name. Otherwise, executing the function accepts the data structure name.

Select the data structure with the following menu:

Use <Esc> to abort Editor input and the changes will not then be adopted.

Exit (save)

- ”Edit”, ”Data Structure Editor”, ”Exit (save)”

Exit the Editor to store the processed data structure in the databank.

Abort

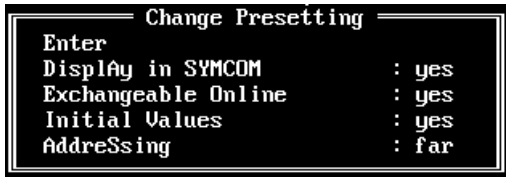
- ”Edit”, ”Data Structure Editor”, ”Abort”

The data structure in the editor is not stored if Abort is used. As with <Esc>, you exit the Editor.

Change presetting

- ”Edit”, ”Data Structure Editor”, ”Change Presetting”

You can use this function to allocate certain attributes to your user data structure. You can toggle between ”yes” and ”no” in the following menu .:



yes/no
yes/no
yes/no
near/far

You can enter:
Data structure with display in the SYM/COM editor
Data structure is exchangeable online.
Data structure can be allocated initial values in the SYM/COM editor. (also refer to Volume 1)
Near or Far addressing

The display appears in the top left portion of the data structure editor.

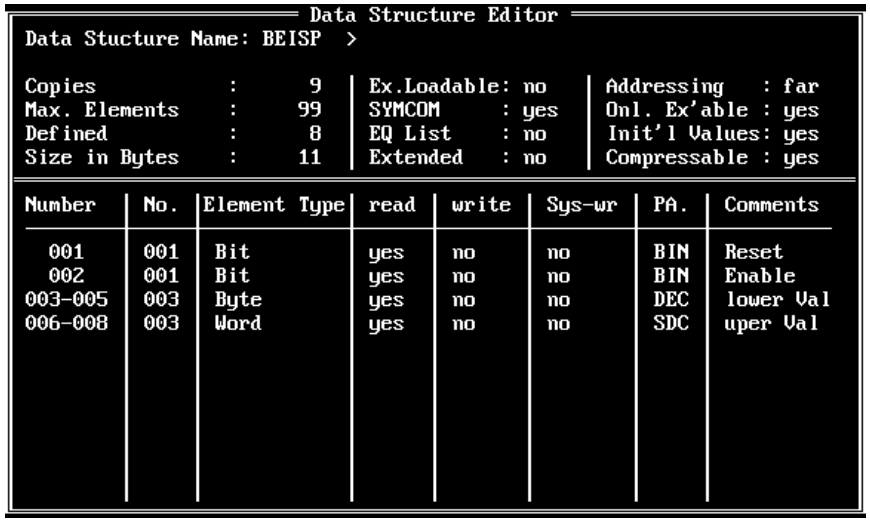
Note AEG data structures can not be modified. With an imported data structure (via an ASCII file, see under ”Special”, ”Import”, ”Data structures”) you can allocate additional attributes.

3.3.8.1 Example of a data structure

The following example shows the application option for a data structure and its integration into an FB.

Creating the data structure

The Data Structure Editor (also refer to Volume 1) is used to define the construction of the data structure (name, instances, elements, etc.).

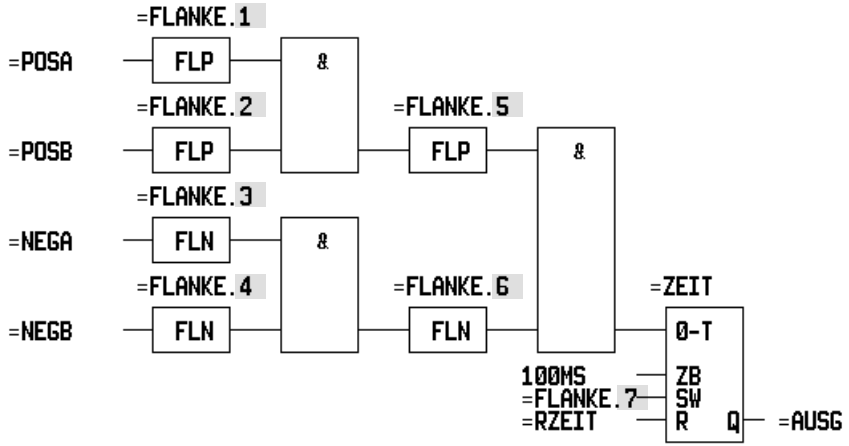


Creating the FB

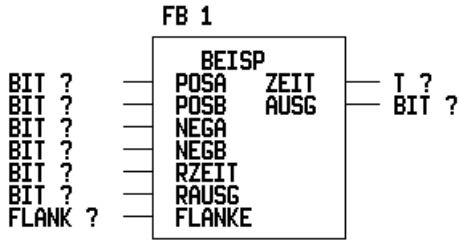
In the Declaration part of the FB, the data structure is assigned a formal operand name (see FBs).

```
NAME   :BEISP
       <Bezeichner  Solltyp   Attribut>
BEZ    :POSA        BIT       I
BEZ    :POSB        BIT       I
BEZ    :NEGA        BIT       I
BEZ    :NEGB        BIT       I
BEZ    :RZEIT       BIT       I
BEZ    :RAUSG       BIT       I
BEZ    :FLANKE      FLANK     I F
BEZ    :ZEIT        T         O
BEZ    :AUSG        BIT       O
       :***
```

In the Instruction part of the FB, the data structure elements are linked logically. The number after the formal operand refers to the element number (see FBs).

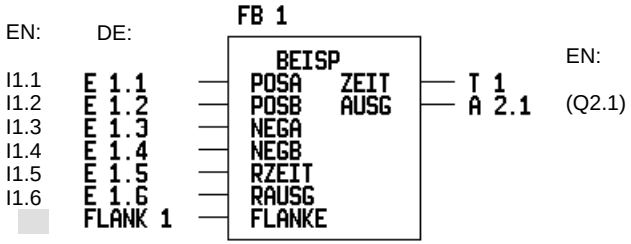


Calling the FB



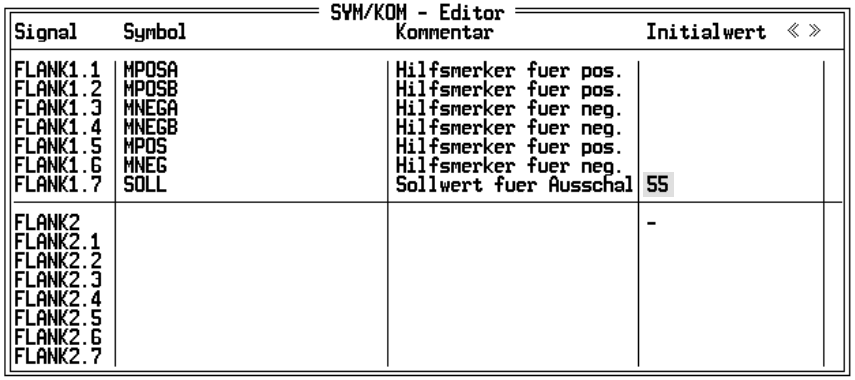
Entering the actual operands

Now the actual operands are assigned to the formal operands (see FBs). The number of the instance is assigned to the data structure.



SYM/COM Editor

In the SYM/COM editor, symbols and comments can be assigned to the data structure elements and instances. Initial values for the data structure elements are also assigned here (see SYM/COM Editor).



3.3.9 Run–Time System (RTS)

- ”Edit”, ”Run–Time System”

Note For general information on Controls technology with the ALD25 (run–time system etc.), please refer to the publication ”A250, Closed loop control with Dolog AKF”

Control functions generally exhibit dynamic behavior and are usually described by differential equations. The digital realization of control functions generally requires the differential equations to be approximated by difference equations, assuming equidistant sampling.

A run–time system (RTS) ensures that for the various control functions (which both here and in the text which follows, also include functions of measured–value processing with dynamic behavior, e.g. filter algorithms), the corresponding control algorithms are processed with constant sampling steps. It is possible that parts of the control algorithm will need to be scanned in longer periods of time than others. The run–time system ensures that the various control loops are processed with different scan times.

The entire closed–loop control can be configured in a maximum of 5 operating system tasks. Usually, however, only one control task is used. This is configured in an organization block (e.g. OB2, abbreviated below to OB REG). SFB O_REG, which must always be called up in the OB1 organization block, is responsible for setting up and checking the control task(s). SFB O_REG works together with the time organization table (ZVT). Using the basic sampling time found in the ZVT, t0, the OB-REG linked to the O_REG block will be called in interrupt–controlled fashion.

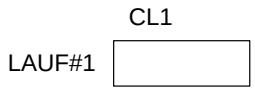
If several control tasks are used, each control task is generally a separate, closed program, configured in its own OB. For each control task, a call of the SFB O_REG (SFB390) in OB1 must be configured. The parameters OB, ZVT and MELD are each to be used only once. This means, for example, that ZVT1 cannot be used the second time SFB O_REG is called.

Control loops are generally characterized by sampling times which differ from the basic sampling time. For better utilization of computer capacity, it is possible to

call up the individual control loops out of phase. A maximum of 64 different control loops is possible, each one separately parameterized and enabled or disabled. The parameterization of the basic sampling time as well as the reductions and the phase states of the control loops, takes place in the time organization table (ZVT).

The control loops are configured as PBs, which must be called up from within OB–REG, using the markers LAUF#xx as conditions.

Example: Network 1 in OB-REG



CL1 is the symbolic name for PB1, for example
LAUF#1 is the call marker for control loop 1 from the ZVT

Each element of ZVT1 (symbolic name ZVT) has standard symbol names, standard comments and standard initial values. If a ZVT other than ZVT1 is to be used (e.g. in the case of several control tasks), standard symbol names and standard initial values will not be available here initially.
To create standard symbol names, the ZVT in question must be edited in the ”Edit”; ”Run–Time System” menu. It is important that the number of the control loops to be processed be set to the desired number. Saving will then store the edited values. In addition, standard names will be generated for all ZVT global data and the ZVT local data specified in ”Number”. Standard symbol names only differ from the standard names of ZVT1 in that they are preceded by Zx_, with x standing for the number of the ZVT (x = 2 ... 5).

Example:
The basic sampling time of ZVT3 is given the symbol name Z3_T0_CLC. The call marker for the fourth control loop of ZVT2 is given the symbol name Z2_LAUF#4.

☞ **Note** All dynamic control blocks have a status word (STAT) by which they are linked to the respective control loop. Connecting the status words with the associated status word in the ZVT (STAT#xx) allows all the dynamic blocks within the control loop to run a start–up phase within the control loop, when the transition is made from disabled to enabled control loop status. The start–up phase creates internal old values, so that the dynamic blocks can be set to the current status.

⚠ **Caution If the status signals are not connected to the control loop status word in the ZVT, the user himself must control the status.**

Closed loop control configuration procedure:

- ❒ Edit control run–time system
- ❒ Set up task closed loop control using the O_REG control block
- ❒ Form subfunctions as control loops
- ❒ Configure control loops using control blocks in PBs
- ❒ thus linking the control block status words to the status word of each respective control loop in the ZVT (STAT#xx)
- ❒ Call PBs, using ZVT call markers in OB–REG, LAUF#xx as conditions

Error conditions will be intercepted by the blocks and reported in WAF.

Call markers

Before OB_REG is called, however, the ZVT will be processed in such a way that three markers will be processed in the ZVT, in accordance with reduction and phase state as well as enable input and reset input.

These three markers are:

- START#xx one–time run before continuous processing of the control loop
  The START#xx marker is used to initialize control loop xx for the first time. This is where the user can define what should happen before the continuous processing of control loop xx begins.

- LAUF#xx continuous processing of the control loop
  The LAUF#xx marker is designated for ongoing processing of control loop xx. It is set whenever the sampling time configured for the control loop has elapsed (e.g. once every second).

- HALT#xx one–time run after continuous processing of the control loop
  The HALT#xx marker can be used to finalize processing if control loop xx is no longer to be processed.

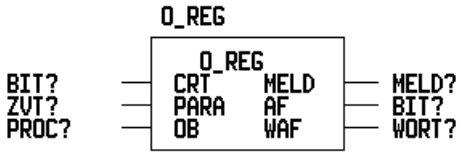
In addition to the call markers for the individual control loops, there are two call markers for the entire run–time system:

- STARTCLC one–time run before continuous processing of all control loops
  The STARTCLC marker can be used for the first initialization of complete closed loop control. It is set once, before any control loop can be called with the LAUF#xx marker.

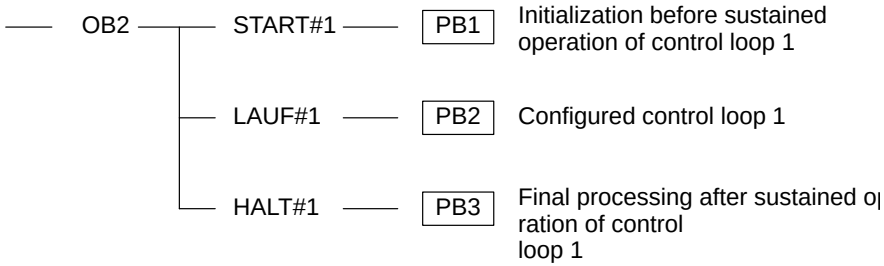
- HALTCLC one–time run after all control loops have been continuously processed. The HALTCLC marker can be used to finalize processing (initialization) after all control loops have been run. It is set once, after all control loops have been processed, if the run–time system is disabled.

Example: Setting up closed loop control

Network xx in OB1:



Example: Use of the call marker



Status markers
In addition to the call markers, the run–time system has status markers for the run–time system itself, as well as for each control loop, available in the ZVT. The control loop status markers (STAT#xx) are important not only for the synchronization of the control blocks used, but also for the start–up behavior of the blocks.

The run–time system recognizes the following states:
- ”Reset” (STAT = -1)
- ”Start–Up” (STAT = 0)
- ”Running” (STAT = 1)
- ”Halt” (STAT = -2)

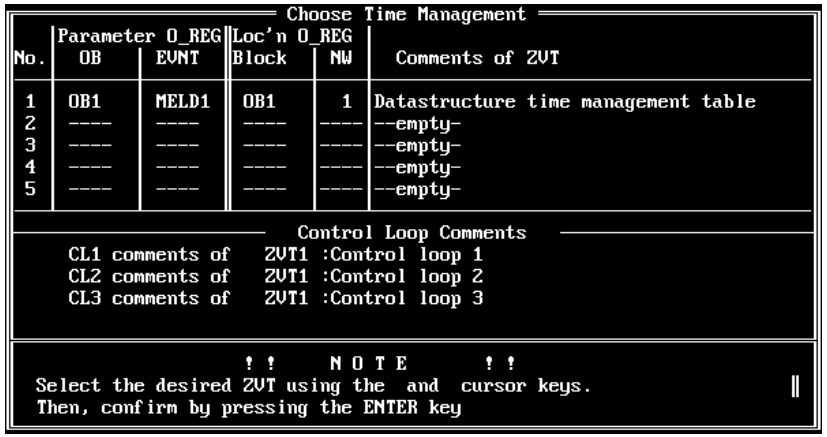
The status signals ”Reset” and ”Halt” are evaluated by the run–time system. The control blocks do nothing if they are called with this status. The status signals ”Start–up” and ”Running” are processed by the control blocks. If control loop status is set to ”Start–up”, the internal values are generally standardized for all the control blocks of the control loop concerned and the requisite old values for processing are created, so that as a rule, the control block can set up smoothly on the existing process status. If the control loop status is ”Running”, all the control blocks of the control loop concerned will be processed according to their algorithms and modes of operation.

Caution All control blocks should be called ”unconditionally” within their control loops (PBxx), so that the old information about the process can always be passed on. It is possible to stop all control blocks using special markers, so that they no longer change their output. By taking advantage of this possiblity, you can ensure that the old information of the control blocks about the process is valid, and the blocks can be smoothly set to the current values.
There is an exception: in the case of two control SFBs with different sampling times in a control loop, the PB representing the control loop will be called unconditionally, the SFBs, however, will be called conditionally with LAUF#xx.

Select time organization table (global)

- ”Edit”, ”Run–Time System”
- ”Edit”, ”Run–Time System”, <Return>, <Ctrl>+<Return>, ”Select ZVT”
- ”Online”, ”Run–Time System”
- ”Online”, ”Run–Time System”, <Return>, <Ctrl>+<Return>, ”Select ZVT”

After the function ”Run–Time System” has been chosen, a window will appear in which to select the time organization table (ZVT) to be processed. Further information about the control task will be shown. This is the associated OB and the associated data block MELD. These particulars are determined by calling SFB O_REG. If no SFB O_REG (SFB390) call has been determined for a ZVT, this is represented by ----. The ZVT in question can still be edited.



Once the time organization table to be processed has been selected and confirmation is given by pressing <Return>, a window containing the time organization table data appears. The ZVT contains global data which refers to every control loop and local data which refers to each individual control loop.

OFF-Line RTM

G l o b a l data of ZVT1

Basic scan time 0.10 sec Priority: 5 global mode : active
Phase state : 1 Task No. : 1 No. of ctrl. loops: 10

L o c a l data of ZVT1

CL NO	stepdown	phase	mode	status	scan time
1	2	1	active		0.20 sec
2	3	1	active		0.30 sec
3	3	2	active		0.30 sec
4	3	1	p a s s i v e		0.30 sec
5	10	1	p a s s i v e		1.00 sec
6	10	1	p a s s i v e		1.00 sec
7	10	1	p a s s i v e		1.00 sec
8	15	3	p a s s i v e		1.50 sec
9	10	1	p a s s i v e		1.00 sec

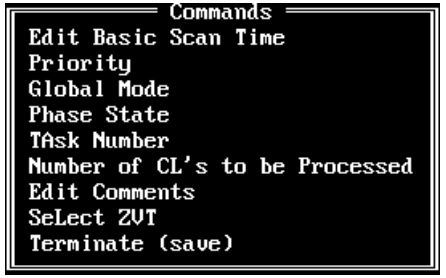
Comments : Control loop 1

Change global and local data

- ”Online”, ”Run–Time System”, Select ZVT, <Return>
- ”Edit”, ”Run–Time System”, Select ZVT, <Return>

Use <Ctrl>+<Return> to call up a further menu. It will allow you to modify global and local parameters.

In the following text, the information in brackets after the call specifies whether it is a global or local parameter.



An explanation follows of the individual items in the run–time system menu

Edit basic sampling time (global)

- ”Edit”, ”Run–Time System”, Select ZVT, <Return>, <Ctrl>+<Return>, ”Global Mode”, ”Edit Basic Sampling Time”
- ”Online”, ”Run–Time System”, Select ZVT, <Return>, <Ctrl>+<Return>, ”Global Mode”, ”Edit Basic Sampling Time”

This is where the basic sampling time can be edited. The basic sampling time (ZVT?.2) is the time with which the task ”Closed Loop Control” can be called. The sampling times of each control loop derive from this basic sampling time, in conjunction with the reduction parameterized to the respective control loop.

The value range for this parameter in the ZVT goes from 1 to 1000. This corresponds to a basic sampling time of 10ms to 10.00 secs. Entries in the menus, however, are made in floating point format, as values in seconds (0.01 – 10.00). The digits after the decimal point must be specified.

The basic sampling time should be selected so that it corresponds to approx. 1/10 of the smallest process time constant to be recorded.

Online modification of the basic sampling time is only permitted if parameter CRT (Create Task) at SFB O_REG (SFB390) is ZERO. The reason for this is that modified values for the basic sampling time are only adopted when the ”Closed Loop Control” task is reactivated.

When modifying the basic sampling time

- closed loop control must be stopped: parameter CRT at block O_REG must be set to ZERO (e.g. with ”Online”, ”Control List”).
- a new value must be specified for the basic sampling time (e.g. using ”Online”, ”Run–Time System”, <Ctrl>+<Return>, ”Edit Basic Sampling Time” or by Exchange Online in the data structure ZVT)
- closed loop control must be activated: the parameter CRT on block O_REG is set to ONE

Priority (global)

- ”Edit”, ”Run–Time System”, Select ZVT, <Return>, <Ctrl>+<Return>, ”Priority”
- ”Online”, ”Run–Time System”, Select ZVT, <Return>, <Ctrl>+<Return>, ”Priority”

The priority parameter gives a relative priority to the time and control tasks, compared to the cyclical task (OB1). The parameter can be set to a value between 1 and 5. The task with the higher priority will interrupt the task with the lower priority.

Note This parameter can only be modified in online operation if the parameter CRT at SFB O_REG is ZERO. In order to modifiy this parameter, the task must be made passive. A new value can then be entered. Following this, the task should be reactivated (CRT from ZERO to ONE).

Global Mode (global)

- ”Edit”, ”Run–Time System”, Select ZVT, <Return>, <Ctrl>+<Return>, ”Global Mode”,
- ”Online”, Run–Time System”, Select ZVT, <Return> <Ctrl>+<Return>, ”Global Mode”,
- ”Online”, ”Run–Time System”, Select ZVT, <Return> <Ctrl>+<Return>, ”Global Mode”, ”Activate” or ”Make Passive” or ”Standardize”

There are three possible states for Global mode, which can be changed through a menu or by using <Ctrl>+<reference character>:

- Active: the individual control loops are being processed
- Passive: the individual control loops are not being processed
- Standardize: the individual control loops are being standardized

The global modes ”make passive” and ”standardize” dominate the local modes of the individual control loops. These are then also made passive, or standardized.

In the ”Activate” global mode, control loops are processed according to their local modes.

Activate (global/local)

- ”Edit”, ”Run–Time System”, Select ZVT, <Return>, <Ctrl>+<Return>, ”Global Mode”, ”Activate”
- ”Online”, ”Run–Time System”, Select ZVT, <Return>, <Ctrl>+<Return>, ”Global Mode”, ”Activate”

Activate the individual control loop or the entire run–time system.

Activating a control loop means changing the selected control loop xx from the inactive state (passive or standardizing) to the active state. The marker EF_RKxx (from the ZVT) will be changed to ONE and ER_RKxx to ZERO. The PBs or FBs called up ”conditionally” using marker LAUF#xx are called according to the time condition.

Activating the global mode of the run–time system means that first the individual control loops will be processed according to their local modes. The status STATCLC of the entire run–time system changes from ”Start Up” to ”Running”.

If Global mode is activated and the mode associated with control loop xx is activated, in this state marker LAUF#xx is set and the PBs or FBs called up conditionally using this marker are called in accordance with the time specified in the ”Sampling Time” field.

Make passive (global/local)

- ”Edit”, ”Run–Time System”, Select ZVT, <Return>, <Ctrl>+<Return>, ”Global Mode”, ”Make Passive”
- ”Online”, ”Run–Time System”, Select ZVT, <Return>, <Ctrl>+<Return>, ”Global Mode”, ”Make Passive”

Make the individual control loop passive, or the entire run–time system.

Making a control loop passive means changing the selected control loop xx from the active state to the inactive state. The marker EF_RKxx (from the ZVT) will be set to ZERO and ER_RKxx to ZERO. The PBs or FBs called ”conditionally” using the LAUF#xx marker are no longer called. (Marker LAUF#xx is no longer set in accordance with the time condition).

Making the run–time system passive means that all control loops will be changed from the active state to the inactive state. As a result, the control loops will no longer be called. The marker HALTCLC is only set once. A terminating initialization of the entire closed loop control is possible with this marker. The status of all control loops as well as the status of the entire run–time system (RTS), switches to Halt.

If the global mode is set to ”passive”, marker Laufxx will no longer be set, whatever the local mode of each control loop. This means that the PBs or FBs conditionally called up with this marker are no longer called.

Standardize (global/local)

- ”Edit”, ”Run–Time System”, Select ZVT, <Return>, <Ctrl>+<Return>, ”Global Mode”, ”Standardize”
- ”Online”, ”Run–Time System”, Select ZVT, <Return>, <Ctrl>+<Return>, ”Global Mode”, ”Standardize”

Standardize the individual control loop or the entire run–time system.

Standardizing a control loop means changing the selected control loop xx from its present status to one in which it is possible to standardize using marker START#xx. The marker EF_RKxx (from the ZVT) will be changed to ONE and ER_RKxx to ZERO. The marker Lauf#xx will no longer be set. This means that PBs or FBs (control loop) called up conditionally with this marker are no longer called. Control loop status switches to ”Reset”.

Standardizing the run–time system means that all control loops are changed from the active state to the inactive state. The status of the STAT#xx control loops and the status of the entire run–time system (RTS) STATCLC, switch to ”Reset”. Before the next ”Activate CLC” command, marker STARTCLC is set to ONE. An initialization before the actual start of the control loop is possible via this procedure.

If the global mode is set to ”Standardize”, the marker Lauf#xx will no longer be set, whatever the local mode of each control loop. This means that PBs or FBs called up ”conditionally” with this marker, are no longer called.

The modes ”passive” and ”standardize” will automatically be passed on to all control loops, whatever their local modes.

In ”active” mode, the individual local control loop modes are valid.

Phase state (global)

- ”Edit”, ”Run–Time System”, Select ZVT, <Return>, <Ctrl>+<Return>, ”Phase State”

The phase state defines a Wait time until the first initiation of the task, in 10ms units. The phase state can ensure that tasks are not called in the same time interval, but are called out of phase. The correct choice of phase state can achieve optimum utilization of computer capacity.

Note This parameter can only be modified in online operation if parameter CRT at SFB O_REG is ZERO. In order to modifiy this parameter, the task must be made passive. A new value can then be entered. Following this, the task should be reactivated (CRT from ZERO to ONE).

Task number (global)

- ”Edit”, ”Run–Time System”, Select ZVT, <Return>, <Ctrl>+<Return>, ”Task Number”
- ”Online”, ”Run–Time System”, Select ZVT, <Return>, <Ctrl>+<Return>, ”Task Number”

Each time task is given its own number. The system marker range is where information about the task is stored. This parameter will be used as an index. For more detailed information on this topic, please refer to the ”A250 Pocket Guide”. Two time tasks must not be given the same task no. This leads to an error message in the block.

Note This parameter can only be modified in online operation if the parameter CRT at SFB O_REG is ZERO. In order to modifiy this parameter, the task must be made passive. A new value can then be entered. Following this, the task should be reactivated (CRT from ZERO to ONE).

Number of tasks to be processed (global)

- ”Edit”, ”Run–Time System”, Select ZVT, <Return>, <Ctrl>+<Return>, ”Number of tasks to be processed”
- ”Online”, ”Run–Time System”, Select ZVT, <Return>, <Ctrl>+<Return>, ”Number of tasks to be processed”

This function allows you to enter the number of control loops to be processed. The value of this parameter can lie between 1 and 64. The smaller the selected value, the smaller the base load of the control task, as then only the call marker and the status word from 1 to this number are processed.

Edit Comment (local)

- ”Edit”, ”Run–Time System”, Select ZVT, <Return>, <Ctrl>+<Return>, ”Edit Comment”
- ”Online”, ”Run–Time System”, Select ZVT, <Return> <Ctrl>+<Return>, ”Edit Comment”

This is where a comment describing the control loop can be entered. This comment will be linked to the enable marker EF_RKxx (in the ZVT) of control loop xx.

Use the Arrow keys to select the desired control loop. Then open the menu with <Ctrl>+<Return>, or edit the comment directly with <Ctrl>+<K>.

Exit (global)

- ”Edit”, ”Run–Time System”, Select ZVT, <Return>, <Ctrl>+<Return>, ”Exit”
- ”Online”, ”Run–Time System”, Select ZVT, <Return>, <Ctrl>+<Return>, ”Exit”

This exits the function and the modified values from the time organization table can be adopted as initial values.

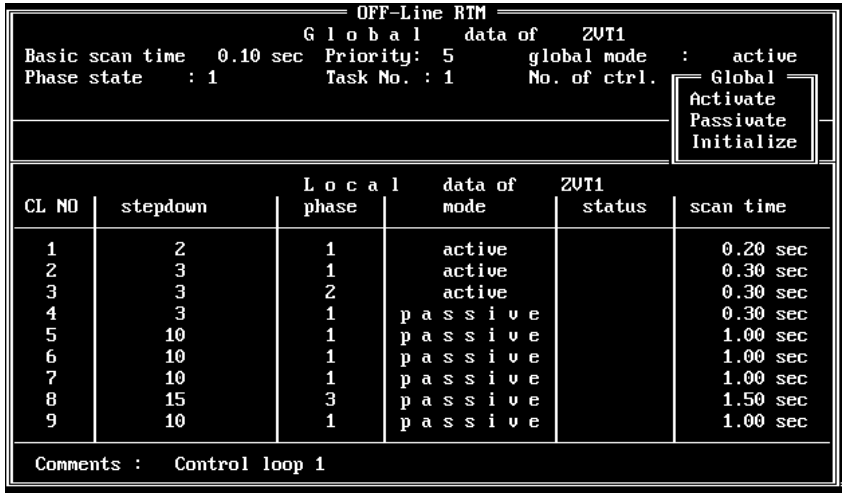
In addition to this, standard names will be generated for all global ZVT data and the local ZVT data specified in ”Number”. This normally only holds true for ZVT2 – ZVT5, as ZVT1 contains standard symbol names, standard initial values and standard comments as soon as a new station is generated.

Standard symbol names only differ from the standard names of the ZVT1 in that they are preceded by Zx_, with the x standing for the number of the ZVT (x = 2 – 5).

Additional local data

- ”Edit”, ”Run–Time System”, Select ZVT, <Return>, Select Column, <Return>
- ”Online”, ”Run–Time System”, Select ZVT, <Return>, Select Column, <Return>

Additional local data can be changed by selecting the columns with the Arrow keys. <Return> can then be used for the change (cursor moves to the left). Use <Return> again to adopt the change.



CL No. (local)

The CL number is the number of the control loop that is to be shown. During ALD configuration, you can organize the sequence as you wish. After each new ALD call, however, the series is sorted in ascending order.

Reduction (local)

Reduction is the factor with which basic sampling time t0 from the ZVT must be multiplied, to arrive at the actual sampling time for the control loop.

The effective sampling time should be selected so that it corresponds to approx. 1/10 of the smallest process time constant to be recorded.

Phase (local)

The phase state can allow control loops with the same reduction not to be called in the same call of O_REG (OB in which the closed loop control is configured), but to be called out of phase. The correct choice of phase states will achieve optimum utilization of computer capacity.

To provide the control loops with a common reference for their phase state, they must all be started at the same time. They can be started using the CRT marker at the standard function block O_REG or using the global mode of the run–time system. If a particular control loop is started at a later point, there is no way of fixing its phase state with respect to the other control loops.

Mode (local)

Each control loop has its own mode.

Status (local, read-only)

The status is only shown in the ”Online, ”Run–Time System” menu.

Sampling time (local, read–only)

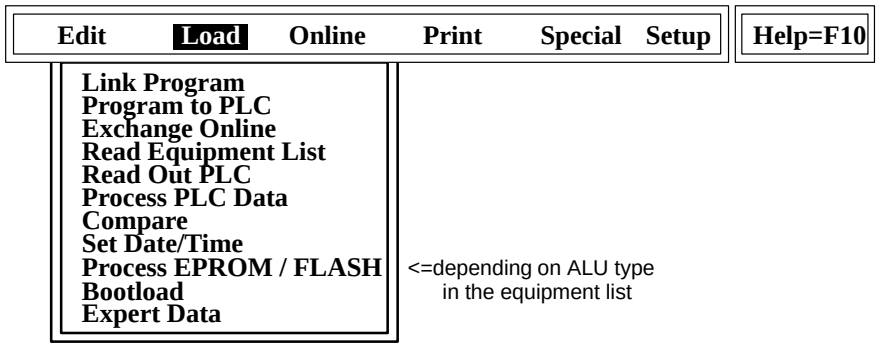
The sampling time is obtained from the basic sampling time and the reduction of the control loop in question.

3.4 Load

The load functions are used to communicate with the PLC and to process the user program in the PLC.

☞ **Note** Please note that all functions except ”Link Program” are only possible with a properly connected PLC.
Connection options for the ”A250” PLC are either
local
via the PaDt serial V24 interface COMx or
remote
via a bus interface from Modnet 1 or Modnet 3.

The following load functions are available under this pulldown menu:



3.4.1 Link Program

- ”Load”, ”Link Program”

When this function is selected, the PLC program is generated .
The OB and all blocks called from the OB, are linked to make a program which can be run for the PLC.
This complete program is filed in the directory under ”CODE25.PLC” and can be transferred to the PLC with the ”Program to PLC” function.
The link is made according to the presets given in ”Setup”, ”PLC station” (Link mode, type of networking, diagnostics)

If OB3 is called in a block, then all sequence (KB)and AZ blocks will automatically be linked, otherwise the sequence and AZ blocks will not get into the linked object.

The maximum number of blocks that can be linked is equal to the number of blocks set in ”Setup”, ”PLC station”.

Note Exchange Online is only possible if the program has first been loaded into the PLC and is no longer linked on the PaDT after loading.

3.4.2 Program to PLC

- ”Load”, ”Program to PLC”

This function loads the linked program, the equipment list, the firmware and the linking tables (if available) to the PLC. During the Load procedure, the amount of memory available in the ALU is continuously checked. If there is not sufficient memory available, the Load procedure is terminated following an inquiry.

Note This function is only possible if the PLC is stopped.

3.4.3 Exchange Online

- ”Load”, ”Exchange Online”
- ”Edit”, ”Blocks”, ”Start Entry”, existing block, <Return>, ”Exchange Online”
- ”Edit”, ”Overview”, select block, <Return>, ”Edit Block”,..

This function allows you to load a new block (OB, PB, FB, IB, AZ, AE, KB (contains the TBs)), an internal or an external data structure into the program while the PLC is running or stopped.
It is also possible to exchange an existing block within the program with a modified one,or a modified external data structure in the program, while the PLC is either running or stopped. The IB initial value block allows new or modified initial values to be loaded into the PLC.

In addition to a newly configured block (e.g. PBx), the **next higher ranking** block should always be exchanged. If PBx has been integrated into an OB1, the OB1 must therefore also be exchanged.

An entry can only ever be made in one of the three menu lines (block, internal/ external data structure). The remaining two lines are automatically set to ”-----”, i.e. a blank entry.

When approaching the limit of available memory, an Exchange Online may no longer be possible. In such a case, try to transfer the whole program to the PLC after relinking.

☞ **Note** OBs, that are called by a time/control task of the O_TIME and O_CON SFBs or OBs that call an OB with a time and control task, may only be exchanged online if the corresponding task has been made passive (RCT = 0).

It is not permitted to exchange O_INTR parameters online.

The following entries are available in this menu:

Start Exchange

- ”Load”, ”Exchange Online”, ”Start Exchange”
- ”Edit”, ”Blocks”, ”Start Entry”, existing block, <Return>, ”Exchange Online”, ”Start Exchange”
- ”Edit”, ”Overview”, select block, <Return>, ”Edit Block”,..

After determining the block to be exchanged (type and number), the exchange commences.

Small windows show you the point you have reached in processing.

☞ **Note** An Exchange Online is only possible if the program has first been loaded into the PLC and is no longer linked on the PaDT after loading.

Internal data structure

- ”Load”, ”Exchange Online”, ”Internal Data Structure”

The name and copy number of the internal data structure to be exchanged is entered here. A list of all internal data structures can be called with <Blank> and <Return>. A data struture can be selected from the list with <Return>. The copy number should then be updated.

External data structure

- ”Load”, ”Exchange Online”, ”External Data Structure”

The name and copy number of the external data structure to be exchanged is entered here. A list of all external data structures can be called with <Blank> and <Return>. A data structure can be selected from the list with <Return>. The copy number should then be updated.

For example, this function allows Viewstar images to replace the directory blocks (VRG). This is necessary, for example, if images have been modified in Viewstar.

If a directory block is to be exchanged, then all the external data structures referred to in it, are checked with regard to the dates they were created. The reference is the date in the block header of the corresponding block in the PLC and on the PLC. If the dates do not match, the block is then exchanged. A block that is not yet available in the PLC is also loaded into the PLC.

3.4.4 Read equipment list

- ”Load”, ”Read Equipment List”

This functions allows an equipment list to be read out from the PLC.

There are two possible options:

Before the reading process begins, a backup copy of the equipment list (of the PaDT) is made, as the current PLC equipment list is overwritten during the reading process. The copy is saved under the file name ”BES25DAT.BAK in the current station. The copy can be loaded at any time using the ”Special”, ”Import” and ”Equipment List” function. However, it must first be renamed xxx.ABL.

Hardware equipment list

- ”Load”, ”Read Equipment List”, ”Hardware Equipment List”

The hardware EQ list contains the equipment actually available in the PLC. It can be read out from the PLC immediately after the bootload.The ”Disconnection Characteristics”, ”Node Number”, ”Scan”, ”Phase”, ”Timeout” and ”Module Comments” parameters are given the standard preset. You can then modify these further in the equipment list editor, as required.

The subrack types cannot be read out, as none of their functions are process–related. For all subracks, therefore, the system uses the type with the mostslots.

The hardware EQ list can only be read when the PLC is stopped.

Caution The actual equipment of the PLC is only updated during bootloading and when loading a program to the PLC. I.e. at all other times, there may be discrepancies between the hardware EQ list and the actual equipment.

user equipment list

- ”Load”, ”Read Equipment List”, ”User Equipment List”

The user EQ list is equipment that you have edited and loaded into the PLC using ”Load” and ”Program to PLC”. It may not relate to the actually existing hardware configuration.

This menu item allows you to read out the equipment list in which, for example, you have entered modules that are wanted for later use, but are currently not yet available in your PLC. These would not be taken into consideration when reading out the hardware equipment list.

The ”Disconnection Characteristics”, ”Node Number”, ”Scan”, ”Phase”, ”Timeout” and ”Module Comments” parameters are also read out (unlike the hardware EQ list).

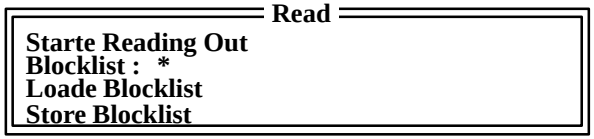
3.4.5 Read out PLC

- ”Load”, ”Read out PLC”

This function allows all blocks (OBs, PBs, FBs, AZs, AEs, KBs, IBs, data structures and SYM/COM block) as well as the equipment list to be read out of the PLC.

Caution This function should always be carried out in an empty station (without a user program, equipment list, etc.) in order to avoid overwriting.

The following pulldown menu is available for retranslating, once you have given confirmation:



Initial value blocks and data structures are always read out. They cannot be declared in the block list .

Start Readout

- ”Load”, ”Read out PLC”, ”Start readout”

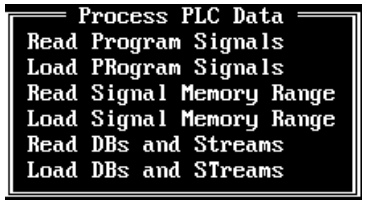
The blocks named in the block list will be reproduced.

3.4.6 Process PLC data

- ”Load”, ”Process PLC Data”

Signals, data structure elements, entire data structures und streams can be read out here from the PLC and read–out data can be transferred back to the PLC.

The following functions are available:



The values read are saved in a file and can then be reloaded, printed or processed further.

There are two conditions to be met before these functions can be selected, otherwise the function will be terminated:

- Networking must be connected <ONLINE>.
- The equipment lists on the PLC and on the PaDT must be the same, i.e. have the same creation date. If necessary, the PLC equipment list can be transferred to the PaDT using the ”Read Equipment List”, ”User Equipment List” function. (This does not apply to the reading and loading of DBs and streams)

All files created in connection with reading out data from the PLC, are saved in a separate sub–directory.

This directory is called ”SPSABZUG”

read program signals

 - ”Load”, ”Process PLC Data”, ”Read Prg. Signals”

Here you can read the contents of the signal memory and data structure elements out of the PLC.The signals to be read out are declared in the signal list. Only those signals referred to in your AKF program are read out. A file with the extension ”.PSG” is created.

The following functions are available:

The function should only be used if the PLC is stopped or is in a defined state. When the PLC is running, the reading process is always carried out at the end of a scan. Thus, a maximum of 72 signals per scan can be read. If you want to read out more than 72 signals, you must take appropriate measures yourself to ensure that your signals are consistent.

Start function

- ”Load”, ”Process PLC Data”, ”Read Prg. Signals”; ”Start Function”
- ”Load”, ”Process PLC Data”, ”Read Sig. Mem. Range”; ”Start Function”
- ”Load”, ”Process PLC Data”, ”Read DBs and Streams”; ”Start Function”

The readout of signals or data structures from the PLC commences. You should first check that menu parameters have been entered correctly.

File name

- ”Load”, ”Process PLC Data”, ”Read Prg Signals”, ”File Name”
- ”Load”, ”Process PLC Data”, ”Load Prg. Signals”, ”File Name”
- ”Load”, ”Process PLC Data”, ”Read Sig. Mem. Range”, ”File Name”
- ”Load”, ”Process PLC Data”, ”Load Sig. Mem. Range”, ”File Name”
- ”Load”, ”Process PLC Data”, ”Read DBs and Streams”, ”File Name”
- ”Load”, ”Process PLC Data”, ”Load DBs and Streams”, ”File Name”

Enter here the name of the file in which the data contents from the PLC are saved or from which they should be loaded.

The files have the following extensions, which cannot be changed:

Program signals	.PSG
Signal memory range	.SSB
DB's and Streams	.DSB

Load program signals

- ”Load”, ”Process PLC Data”, ”Load Prg. Signals”

Signal memory contents and data structure elements can be transferred into the PLC here, from a file. This will mean that only the signals found in your AKF program are transferred. Data structures which have since had their declaration modified, will not be included for safety reasons. A corresponding note is made.

The following functions are available:

The function should only be used if the PLC is stopped or is in a defined state. When the PLC is running, the loading process always occurs at the end of a scan. Thus a maximum of 72 signals per scan can be loaded. If you want to load more than 72 signals, then you must take appropriate measures yourself, to ensure the consistency of your signals.

Caution If the PLC is stopped, it is not possible to load the signals in ”NEWSTART” mode, as the values of the PLC would be overwritten when starting.

Start function

- ”Load”; ”Process PLC Data”, ”Load Prg. Signals”
- ”Load”; ”Process PLC Data”, ”Load Sig. Mem. Range”
- ”Load”; ”Process PLC Data”, ”Load DBs and Streams”

Signals or data structures start to be loaded into the PLC. You should first check that the menu parameters have been entered correctly.

Read Sig. mem. range

- ”Load”; ”Process PLC Data”; ”Read Sig. mem. range”

Signal memory contents can be read out from the PLC here. This is a physical read which does not take into account whether the signals in your AKF program are used. This function allows large areas to be taken from the PLC in a relatively short period of time.

The following functions are available:

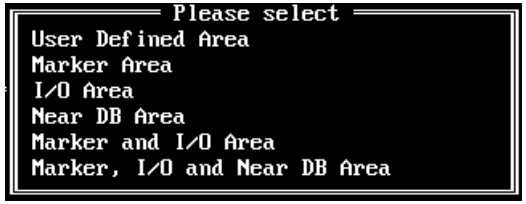
The function should only be used if the PLC is stopped or is in a defined state. When the PLC is running, the readout occurs independently of the program scans. You must therefore take appropriate measures youself, to ensure that your signals are consistent.

Sig. mem. section

- ”Load”; Process PLC data”; ”Read Sig. mem. range”; ”Sig. mem. section”, <Return>

Here you can choose which area of the signal memory is to be read out.

The following options are available:



The ”User Defined Area” allows you to enter any two signals located in the signal memory. All signals located between these key points are read.

The requirements are as follows:

- Both signals must be present, according to the equipment list.
- The first signal must come before the second.

Examples:
M1.1 - M10.10
Q2.1 - Q3.7

In addition to the ”User Defined Area”, a series of predefined areas are available, from which you can choose, as required.

Structure of the signal memory
The following signals are lined up in the signal memory

- Header:	no access	
- Special markers:	SM, SMB, SMW, SMD, SMG	
- User markers:	M, MB, MW, MD, MG, P, T, Z	
- Module signals:	mod. slot	1: Status, I/O or Exp.Sig.
	” ”	2: Status, I/O or Exp.Sig.
:	” ”	n: Status, I/O or Exp.Sig. (only actually equipped slots)
- Sequence parameter sets :	SZ ,ZZ, KS, KF, KFW in accordance with the defined sequence number (refer to equipment list).	
- Near–data structures:	User defined structures	

Load sig. mem. range

- ”Load”, ”Process PLC Data”, ”Load Sig. mem. range”

Here you can transfer signal memory contents from a file into the PLC. This is a physical write which does not take into account whether the signals are used in your AKF program.

The following functions are available:

The function should only be used when the PLC is stopped or is in a defined state. When the PLC is running, the load process occurs independently of the program scans. You must therefore take appropriate measures yourself, to ensure the consistency of your signals.

Caution When the PLC is stopped, it is not possible to load the signal memory contents in ”NEWSTART” mode, as the values would be overwritten when the PLC was started.

Read data structures and streams

- ”Load”, ”Process PLC Data”; Read DBs and Streams”

Here you can read out the contents of data structures from the PLC. The data structures that are to be read, are found in the data structure list. Only those data structures which are present in the PLC can be read, i.e. those referred to in the user program. Near data blocks are not taken into account here. A file with the extension ”.DSB” is created.

The following functions are available:

The function should only be used when the PLC is stopped or is in a defined state. When the PLC is running, the readout occurs independently of the program scans. You must therefore take appropriate measures yourself, to ensure the consistency of your data structures.

Data structure list

- ”Load”, ”Process PLC Data”, ”Read DBs and Streams”; ”DB List”

This function allows you to enter a list of data structures.

The following conditions must be observed:

- The data structures must be known to the system.
- Only single copies can be processed.
- The copy number must be located in a valid area, otherwise a warning message will appear.

Example: DBAA1, DBAA2, DBAB1

Load DBs and streams

- ”Load”, ”Process PLC Data”; ”Load DBs and Streams”

Here you can transfer the contents of data structures from a file into the PLC. In doing this, it tests to see whether the structure of the data blocks has been modified. If this is the case, the affected data structures are rejected.

The following functions are available:

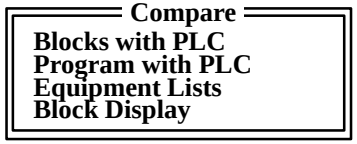
The function should only be used when the PLC is stopped or is in a defined state. If the PLC is running, the load process occurs independently of the program scans. You must therefore take the appropriate measures yourself, to ensure the consistency of your signals.

3.4.7 Compare

- ”Load”, ”Compare”

These functions compare data from the AKF station in the PaDT with that in the PLC.

The following compare functions are available:



3.4.7.1 Compare blocks with PLC

- ”Load”, ”Compare”, ”Blocks with PLC”

This function allows you to compare the blocks found in the block list. Unequal blocks are entered in a list for display.

The source block in the station databank is compared with the linked block on the PaDT and the loaded block in the PLC. The result of the comparison is determined using a block CRC, which is formed from the source block when a block is filed in the station databank and is passed on to the linked or loaded block on the PaDT, or to the PLC, when linking or loading.

If a block CRC equals 0000, then this is an old block.
In such a case, the comparison is carried out using a different process. The MCode CRC of a block from the linked object on the PaDT is compared with that in the PLC. The result of the comparison will depend on the settings in Setup (link mode and diagnostics). If the block CRC exists in part, it is used in the comparison as well.

For text blocks, the MCode-CRC of the linked block on the PaDT is always compared to that of the loaded block in the PLC. Here, too, the result of the comparison depends on the settings (link mode and diagnostics) in Setup.

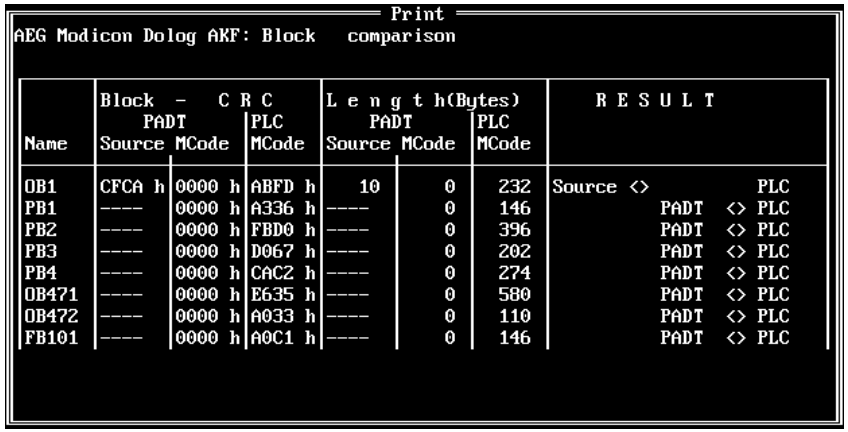
The following functions are available:

Start printing

- ”Load”, ”Compare”, ”Blocks with PLC”, ”Start Printing”

The blocks named in the block list are compared between the PaDT and PLC, in accordance with the specified mode.

The following example shows a successful block comparison.



Print

AEG Modicon Dolog AKF: Block comparison

Name	Block - CRC PADT Source	Block - CRC PADT MCode	Block - CRC PLC MCode	Length(Bytes) PADT Source	Length(Bytes) PADT MCode	Length(Bytes) PLC MCode	RESULT
OB1	CFCA h	0000 h	ABFD h	10	0	232	Source <> PLC
PB1	----	0000 h	A336 h	----	0	146	PADT <> PLC
PB2	----	0000 h	FBD0 h	----	0	396	PADT <> PLC
PB3	----	0000 h	D067 h	----	0	202	PADT <> PLC
PB4	----	0000 h	CAC2 h	----	0	274	PADT <> PLC
OB471	----	0000 h	E635 h	----	0	580	PADT <> PLC
OB472	----	0000 h	A033 h	----	0	110	PADT <> PLC
FB101	----	0000 h	A0C1 h	----	0	146	PADT <> PLC

Comparison Mode

”Load”, ”Compare”, ”Blocks with PLC”, ”Comparison Mode”

You can choose between the following by toggling:

Byte comparison:	The blocks are compared byte by byte (highest level of certainty)
Quick comparison:	Only one test polynomial per block is compared

Title Block

- ”Load”, ”Compare”, ”Blocks with PLC”, ”Title Block”
- ”Load”, ”Compare”, ”Program with PLC”, ”Title Block”
- ”Online”, ”PLC Status”, ”Title Block”
- ”Online”, network monitoring”, display messages & modify Inh. bits”, ”Title Block
- ”Print”: ”Overview”; ”Program Protocol”; ”SFC Protocol”; ”Symbols and Comments ”; ”Cross–Reference List”; ”Signal Allocation List”; ”Equipment List”; ”Entire Documentation”; ”Data Structures”; ”DiagNostics Protocol” ”Title Block”
- Print”, ”PLC Data”, ”Prg. Signals”, ”Title Block”
- Print”, ”PLC Data”, ”Data Structure”, ”Title Block”
- ”Special”, ”Table of Contents”, ”AKF Blocks”, ”Title Block”
- ”Special”, ”Table of Contents”, ”DOS Files”, ”Title Block”
- ”Special”, ”System Information”, ”Title Block”

You have the option of also displaying the title block you have created in the ”Edit”, ”Title Block” menu item or the one which is available as standard under the name ”HEAD.DOC” and which has been copied under the station.

You can toggle between ”on” and ”off”.

The entry ”on” means that the title block, whose file name is listed under the ”Title Block File” menu item, appears on the printout. If the entry ”on” is made and the desired title block is not under the station, then output is rejected with an error message.

Title block file

- ”Load”, ”Compare”, ”Blocks with PLC”, ”Title Block File”
- ”Load”, ”Compare”, ”Program with PLC”, ”Title Block File”
- ”Online”, ”PLC status”, ”Title Block File”
- ”Online”, network monitoring”, display messages & modify Inh. bits”, ”Title Block File”
- ”Print”: ”Overview”; ”Program Protcol”; ”SFC Protocol”; ”Symbols and Comments”; ”Cross–Reference List”; ”Signal Allocation List”; ”Equipment List”; ”Entire Documentation”; ”Data Structures”; ”DiagNostics Protocol, ”Title Block File”
- Print”, ”PLC Data”, ”Prg. Signals”, ”Title Block File”
- Print”, ”PLC Data”, ”Data Structure”, ”Title Block File”
- ”Special”, ”Table of Contents”, ”AKF Blocks”, ”Title Block File”
- ”Special”, ”Table of Contents”, ”DOS Files”, ”Title Block File”
- ”Special”, ”System Information”, ”Title Block File”

Here you should enter the name of a title block file which is available under the station, if you have selected the entry ”on” in the ”Title Block” menu item. Otherwise, when the printing process starts, you will be given the message, ”Title block file not found”. Press any key.”

Then you must either enter the name of an alternative title block file available under the station or copy an appropriate title block file that has already been created to the station in the ”Special”, ”File Copy”, ”Files” menu items. You can use the line editor to enter the filename.

Output unit

- ”Load”, ”Compare”, ”Blocks with PLC”, ”Output Unit”
- ”Load”, ”Compare”, ”Program with PLC”, ”Output Unit”
- ”Online”, ”PLC Status”, ”Output Unit”
- ”Online”, network monitoring”, display messages & modify Inh. bits”, ”Output Unit”
- Print”, ”PLC Data”, ”Prg. Signals”, ”Output Unit”
- Print”, ”PLC Data”, ”Data Structure ”, ”Output Unit”
- ”Print”: ”Overview”; ”Program Protocol”; ”SFC Protocol”; ”Symbols and Comments”; ”Cross–Reference List”; ”Signal Allocation List”; ”Equipment List”; ”Entire Documentation”; ”Data Structures”; ”DiagNostics Protocol”, ”Output Unit”
- ”Special”, ”Table of Contents”, ”AKF Blocks”, ”Output Unit”
- ”Special”, ”Contents Directory”, ”DOS Files”, ”Output Unit”
  ”Special”, ”System Information”, ”Output Unit”

A menu appears, from which you can select:

Screen	-	output appears page by page on the screen.
Printer	-	output is made at the printer selected under ”Setup”.
File	-	output is made to the MS–DOS file determined by the complete path. If a file already exists with the same name, then a message appears asking if this file should be overwritten.

3.4.7.2 Compare program with PLC

- ”Load”, ”Compare”, ”Program with PLC”

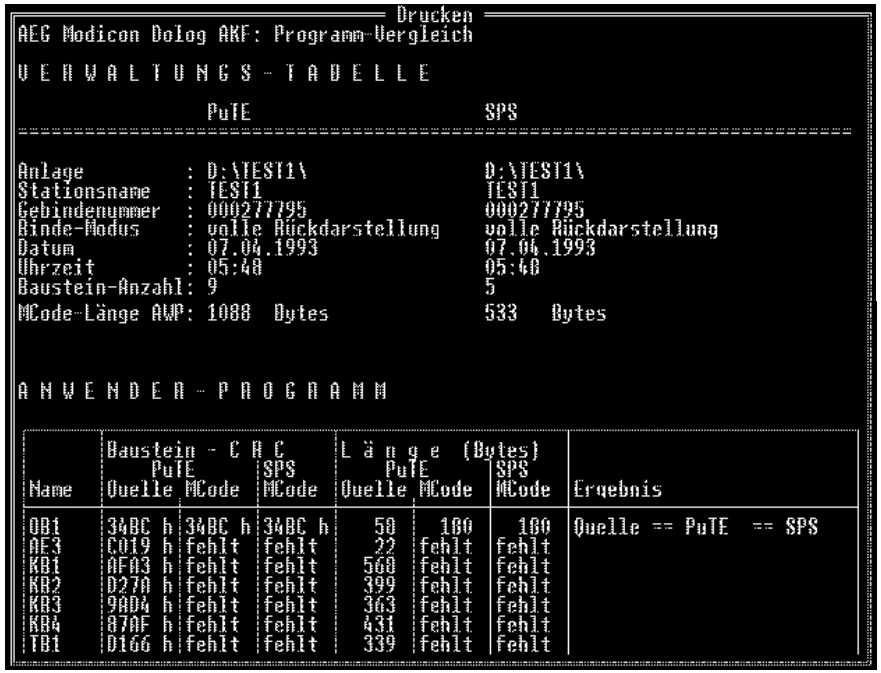
The source block in the station databank is compared with the linked block on the PaDT and the loaded block in the PLC.
The result of the comparison is determined using a block CRC, formed using the source block when filing a block in the station databank and passed on to the linked or loaded block on the PaDT or into the PLC, when linking or loading.

If a block CRC equals 0000, this is an old block.
In such a case, the comparison is carried out using a different process. The MCode CRC of a block from a linked object on the PaDT is compared to the one in the PLC. The result of the comparison depends on the settings in Setup (link mode and diagnostics). If the block CRC exists in part, it is used in the comparison as well.

For text blocks, the MCode-CRC of the linked block on the PaDT is always compared to that of the loaded block in the PLC. Here, too, the result of the comparison is dependent on the settings in Setup (link mode and diagnostics).

The following fnctions are available:

The following example shows a successful program comparison (first page).



Drucken

AEG Modicon Dolog AKF: Programm-Vergleich

V E R W A L T U N G S - T A B E L L E

	PuTE	SPS
Anlage	: D:\TEST1\	D:\TEST1\
Stationsname	: TEST1	TEST1
Gebindenummer	: 000277795	000277795
Binde-Modus	: volle Rückdarstellung	volle Rückdarstellung
Datum	: 07.04.1993	07.04.1993
Uhrzeit	: 05:48	05:48
Baustein-Anzahl	: 9	5
MCode-Länge AWP	: 1088 Bytes	533 Bytes

A N W E N D E R - P R O G R A M M

	Baustein - C R C			Länge (Bytes)			
	PuTE		SPS	PuTE		SPS	
Name	Quelle	MCode	MCode	Quelle	MCode	MCode	Ergebnis
OB1	34BC h	34BC h	34BC h	50	100	100	Quelle == PuTE == SPS
AE3	C019 h	fehlt	fehlt	22	fehlt	fehlt	
KB1	AFA3 h	fehlt	fehlt	560	fehlt	fehlt	
KB2	D27A h	fehlt	fehlt	399	fehlt	fehlt	
KB3	9AD4 h	fehlt	fehlt	363	fehlt	fehlt	
KB4	87AF h	fehlt	fehlt	431	fehlt	fehlt	
TB1	D166 h	fehlt	fehlt	339	fehlt	fehlt	

3.4.7.3 Compare equipment lists

- ”Load”, ”Compare”, ”Equipment Lists”

After you have selected this function, you are shown the actual hardware in the SPS compared with the equipment list on the PaDT, on your selected output unit. The comparison can be shown immediately after bootloading.In addition, the revision index for the integrated software is displayed (only actual equipment) for modules that have different variants.

The following functions are available:

It is only possible to compare PaDT and PLC equipment lists when the PLC is stopped.

Caution The actual equipment of the PLC is updated only when bootloading and loading a program to the PLC. This means that at all other times, there may be discrepancies between the hardware equipment list and the actual equipment.

The DEA modules are neither shown nor compared, as they have no function in the process to be controlled.

3.4.7.4 Block display

- ”Load”, ”Compare”, ”Block Display”

The function compares a specified block in the PaDT with the corresponding PLC block, displayed in separate windows. The comparison is made at IL level. It is a requirement

- for the program to have been linked with the Setup setting ”Complete Representation” or ”Without Comments” (Setup / PLC station / Link Mode...). If the block has been linked ”without comments”, then neither will comments be displayed for the PaDT blocks.
- for networking to have been set up (Setup / Networking....)

The user then has **two** different modes available to him:

- Comparison mode
- Editing mode

You can alternate between the modes using the Function keys.

Note The keys have different meanings in each mode.

Comparison mde

Use Comparison Mode to display a previously selected block in two separate windows. The block is compared at IL level and the comparison is made line by line. The block located on the PaDT is entered in the top / left window and the block located in the ALU is entered in the bottom / right window.Use the <+> and <–> function keys to search for and highlight unequal IL lines.

Key assignment in **Comparison mode**

<Right cursor>	=Move contents of both windows to the left (by 3 columns)
<Left cursor>	=Move contents of both windows to the right (by 3 columns)
<F2>	Toggle between side–by–side and stacked representation.
<F3>	Alternate between Comparison and Editing mode (left or top window)
<F4>	=Alternate between Comparison and Editing mode (right or bottom window)
<+>	=Forward comparison of IL lines from the same initial cursor position in both windows
<–>	=Backward comparison of IL lines from the same initial cursor position in both windows
<Esc>	=Abort
<Home>	=Scroll up cursor in window 1 (top / left)
<End>	=Scroll down cursor in window 1
<Ctrl.>+<Home>	=Page back IL in window 1
<Ctrl.>+<End>	=Page forward IL in window 1
<PgUp>	=Scroll cursor in window 2 (bottom / right) up
<PgDn>	=Scroll down cursor in window 2
<Ctrl.>+<PgUp>	=Page backward IL in window 2
<Ctrl.>+<PgDn>	=Page forward IL in window 2
<Cursor up>	=Scroll up IL in windows 1 + 2
<Cursor down	=Scroll down IL in windows 1 + 2

Editing mode

With Editing mode, both the PLC block and the PaDT block can be filed as an **Export file** in the PaDT station directory. This means that after modification, the block must be **imported**, if the changes are to be shown on the screen.

☞ **Note** Exit Editing mode after saving by switching to Comparison mode.

The block is stored in the sub–directory:
LW:\SYSTEM\STATION\COMPR\
for a modified block in the **ALU**
depending on the block type, under the name:
OBxxxALU.IL
PBxxxALU.IL
FBxxxALU.IL
or for a modified block in the **PaDT**
depending on block type, under the name:
OBxxxAPU.IL
PBxxxAPU.IL
FBxxxAPU.IL

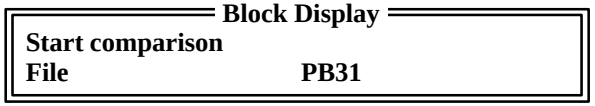
Key assignment in **Editing mode**

<Cursor keys>	=Cursor moves in the window in accordance with the cursor direction
<Ctrl>+<O> +”n”	=Copy ”n” number of lines (1...9) from the alternative window in each case, from the marked position (incl.), behind the currently flashing cursor. (Enter ”O” when the Ctrl. key is pressed and then enter a number)
<Ctrl>+<K>+”S”	=Save the file as an export file under the above name and directory

☞ **Note** After the above command, the PLC block or PaDT block in the PLC or PaDT is not updated. The update is made when the saved file is imported.

<Esc>	Abort
<F2>	Toggle between side–by–side and stacked representation.
<F3>	Alternate between Comparison and Editing mode (left or top window)
<F4>	=Alternate between Comparison and Editing mode (right or bottom window)
<Home>,<End>	=Jump to the start or end of the line
<PgUp>,<PgDn>	=Page the screen up or down, a page at a time
<Ctrl.>+<F>	=Move the cursor to the right, a word at a time
<Ctrl.>+<A>	=Move the cursor to the left, a word at a time
<Ctrl.>+<PgUp>	=Position the cursor at the start of the IL
<Ctrl.>+<PgDn>	=Position the cursor at the end of the IL
<Insert>	=Alternate between Insert and Overwrite mode
<BkSp>	=Delete character to the left of the cursor
<Del>	=Delete character under the cursor

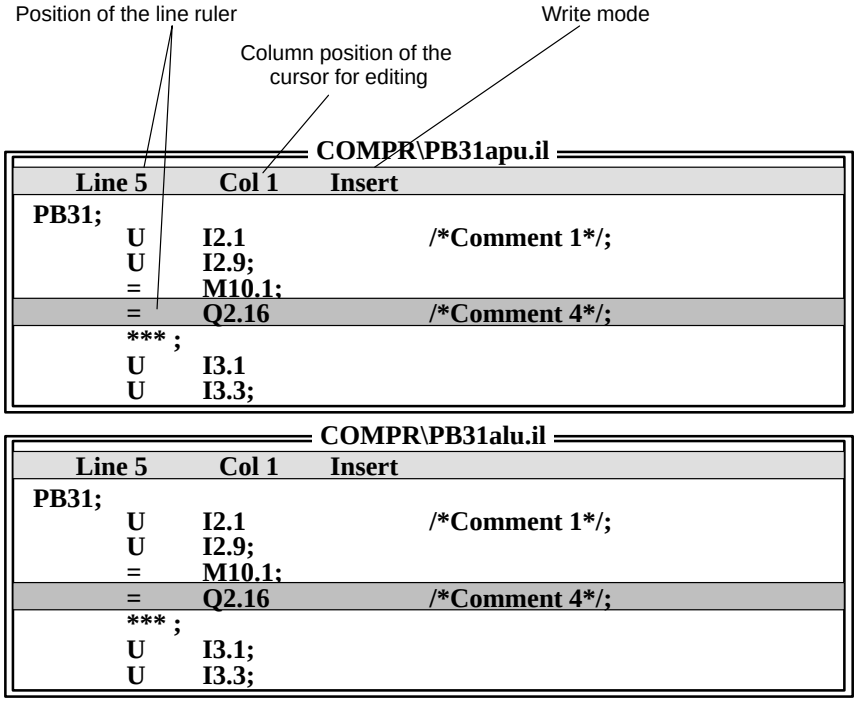
The following functions are available once Block Display has been selected:



Start comparison

- ”Load”, ”Compare”, ”Block Display”, ”Start Comparison”

Once this function is called, the comparison starts for the block entered under ”File”. Two windows are inserted. The PaDT block is inserted in the left or top window and the ALU block in the right / bottom window, in IL representation.



The top window contains the PaDT block.
The bottom window contains the PLC block.

The call with <+> compares the IL of the two windows with each other from the set ruler positions, moving **down line by line**. The next time **inequality** is detected, the ruler stops.

The call with <–> compares the IL of the two windows with each other, from the set ruler positions, moving **up line by line**. The next time **inequality** is detected, the ruler stops.

☞ **Note** The initial positions of the two rulers can be **unequal**.

The display mode for the two windows can be changed, in accordance with the Function keys described above. <F2> is used to convert horizontal representation to vertical representation. Although then, comments are not inserted.

Entry to Editing mode (<F3> / <F4>) is made through Comparison mode. Follow the reverse sequence to **exit** . Once the changes have been saved to an export file, you exit Editing mode by calling Comparison mode (<F3> / <F4>).

☞ **Note** An exit using <Esc> is **not** possible.

3.4.8 Set date/time

- ”Load”, ”Set Date/Time”

This menu is used to set the date and time for the PaDT as well as for the PLC.

When the function ”Set PLC” is selected, the date and time are transferred to the PLC. This brings the system marker bytes SMB1 to SMB9 up to date.

The following functions are available:

Note The time in the PLC cannot be set by the user program, communication or Viewstar (AKF function ”Time” is the time master).

3.4.8.1 Set date

- ”Load”, ”Set Date/Time”, ”Date”

In the first line you will see the date currently set on your PaDT.
This date can correspond to today’s date, if you have set the date and time when starting up the system, or if your PaDT has an integrated multi–function card. If this is the case, use <Esc> to exit the editor.

A new date is entered in the second line.
Input must be repeated until a valid date has been entered or you have exited the editor.

Note Your PaDT’s date will be overwritten by the entered date.
Examples of valid input: (day,month,year)
12.3.1991 12 3 1991 12/3/1991 12,3,1991 12-3-1991 12:3:1991

3.4.8.2 Set time

- ”Load”, ”Set Date/Time”, ”Time”

In the first line, you will see the time currently set on your PaDT.
This time can correspond to the current time, if you have set the date and time when starting up the system, or your PaDT has an integrated multi–function card. If this is the case, use <Esc> to exit the editor.
A new time is entered in the second line. Input must be repeated until a valid time has been entered or you have used <Esc> to exit the editor.

Note Your PaDT’s time will be overwritten by the entered time.
Examples of valid input: (hour,minute,second)
12.13.19 12 13 19 12/13/19 12,13,19 12-13-19 12:13:19

3.4.8.3 PLC setup

- ”Load”, ”Set Date/Time”, ”PLC Setup”

If you have just entered the new time and date, these will be transferred to the PLC.Otherwise, the system date and time will be transferred to the PLC. Then the system markers SMB1 to SMB9 in the PLC are brought up to date.

The system’s date and time can also be set on the PaDT with the operating system functions ’Date’ and ’Time’ after it has been switched on (or after a warm restart, for example).

3.4.9 Process EPROM / FLASH

When using **ALU154** or **ALU154-1** , you can choose to load the FW and the user data into the ALU RAM or into the **Flash-Card**.

For all other ALUs, the **choice** is between loading the data into the ALU RAM or EPROM.

Depending on the type of ALU entered in the EQ List, you will obtain the sequential menu for EPROM or Flash processing.

3.4.9.1 EPROM ALU in the equipment list:

- ”Load”, ”EPROM / Process FLASH”

An EPROM file is created under ”Program Link”. The contents of this EPROM file can be burned into the EPROM or compared with the EPROM’s contents, using the ”EPS 2000” programming station.

In this menu, the following functions are available:

The EPROM programming device ”EPS 2000” is to be connected to either one of the PaDT’s serial interfaces, COM1 or COM2 (if available), using cable YDL 36.1!

Note Make sure that no PLC link–up is active for the selected interface.

Mode of operation
Before starting, the program is loaded from the EPROM into RAM.

Extensive hardware checks are carried out before the program is started. This takes approximately one minute.

If data has been lost in RAM, the process of loading the user program from the EPROM to the RAM can be accessed by setting DIP switches B0 ... B2 to the left and resetting the system.

Test if empty

- ”Load”, ”Process EPROM”, ”Empty Test”

With this function, all the memory cells of the EPROM are checked for blanks i.e. hexadecimal ’FF’. This test is carried out again automatically before the burning of EPROMs.

Program EPROM

- ”Load”, ”Process EPROM”, ”Program EPROM”

This function allows the burning process of EPROMs to be carried out. However, you must first have either linked to the updated station (see Chapter 3.4.1), or have read out the contents of already burned EPROMs with ”Read PLC” (see below) with ”Read PLC”. Either the current station or the read–out data is burned, depending on what you carried out last.

EPROM’s that have a capacity of 1 Mbit or 4 Mbit can be used. You will discover how many EPROMs of the selected type are required after you have activated the function.

☞ **Note** If you burn data from read–out EPROMs, the EPROMs used must have the same capacity as the read–out EPROMs.

If you want to transfer a new program, start with step 1.
If you want to transfer a program that has been read out from the PLC, start with Step 3.

Step 1 Link the program under ”Load”, ”Link Program”, continue with Step 2.

Step 2 Mount the empty EPROM in the EPS 2000.

Step 3 Start the ”Load”, ”Process EPROM”, ”Program EPROM” function.

Compare EPROM

- ”Load”, ”Process EPROM”, ”Compare EPROM”

This function enables a comparison to be made in order to be sure that the contents of burned EPROMs correspond to the data of the updated station. The EPROMs are placed next to one another in the EPS 2000 programming device and the function is started.

While the comparison is running, you will be given detailed information on the EPROM located in the programming device. The following information is shown: the name of the burned station, the time of burning, the total number of EPROMs in the set, an ID. number and the ALU slot for which the EPROM has been created.

EPROM status of the PLC

- ”Load”, ”Process EPROM”, ”EPROM Status of the PLC”

This function carries out tests on the EPROMs located on the ALU to determine whether they are correctly positioned. To do this, it tests if the EPROM’s belong to the same burning set and if they have been plugged into the correct socket.

If there is inconsistency, then you will be asked to check the EPROMs in certain slots.

EPROM Read PLC

- ”Load”, ”Process EPROM”, ”Read PLC”

First connect the PLC to the PaDT via the serial interface (COM1/COM2) and activate the PLC link–up.

This function reads out data from the EPROMs, which are located in the predetermined slots on the ALU, and saves this in a file on the PaDT.

If the function ”Burn EPROM” is activated after the readout, an EPROM set is created which has the same content as the EPROMs on the ALU. It is then possible to duplicate EPROMs.

Note If you want to burn the data of the set station instead of the data from the read–out EPROMs, then you must carry out the ”Link Program” function before burning.

3.4.9.2 Flash ALU in the equipment list:

HW configuration:

This requires the **exclusive** use of an external flash drive, which is connected to the printer interface of the PC (LPTx) by the enclosed cable. The data carrier to be processed is of the "**Flash Memory Card**" type. There are **4MByte** (MEF004) and **1MByte** (MEF001) cards available for use in **ALU154** and **ALU154–1**. When shipped, these cards are given an **identifier**, which **guarantees** their **operation** in the respective ALU type. Like any diskette, this Flash Card has **write protection.** In this case, it take the form of a slide switch integrated into the narrow side of the card, without a socket connector.

Once the data has been written to the Flash Card, the card can be removed from the drive and mounted in the card slot of the ALU, by applying gentle pressure.

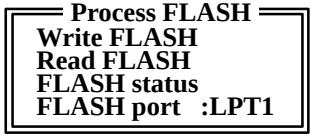
The **transfer** of data from the Flash to the RAM is triggered by **powering up** the PLC or by inserting and withdrawing the **Disable pin** on the DNP / BIK. It is a **requirement** for switch **B2 = ON** to be set on the ALU front panel. The positions of the remaining switches are unimportant.

Menu description:

"Load", "EPROM / Process FLASH"

The data present on the PaDT (FW) and the generated user data is written to a Flash Card via a Flash Card write / read station. Written Flash Cards can be read out, or their status can be determined.

The menu shown below contains the menu items to be processed.



☞ **Note** This menu is only offered if the corresponding ALU has been entered in the EQ List.

Write FLASH

”Load”, ”EPROM / Process FLASH”, ”Write FLASH”

Selecting this function activates the writing of the Flash Card. Current memory capacities are 1Mbyte (MEF001) and 4Mbyte (MEF004).

HW requirements:

- The LPT1 (or LPT2,3,4) Flash drive connection is established
- The Flash drive is enabled and ready for operation
- Flash Card is inserted into the Flash drive

SW requirement:
Either:

- the current station is linked (see Chapter 3.4.1)

or

- the data from a Flash Card has been read out. Then, in the subsequent write call, it is **not** the linked **Station data** that is written, but the data from the **re–read** Flash Card (Copy function).

☞ **Note** After a **link run** has taken place, it is once again the data from the **linked** station that is automatically **written**.

Read FLASH

 ”Load”, ”EPROM / Process FLASH”, ”Read FLASH”

Selecting this function activates the reading of the FLASH Card. The read–out data is saved in the FLASH.IMG file of the set station directory.

HW requirements:

- ❒ The LPT1 (or LPT2,3,4) – Flash drive connection is established
- ❒ The Flash drive is enabled and ready for operation
- ❒ The Flash Card is inserted in the Flash drive

SW requirement:

- ❒ The corresponding FLASH ALU is entered in the equipment list

☞ **Note** The data of a Flash Card (FLASH.IMG) which has already been read out, will be overwritten.

FLASH Status

 ”Load”, ”EPROM / Process FLASH”, ”FLASH Status”

The function is not currently active.

Flash Port

 ”Load”, ”EPROM / Process FLASH”, ”FLASH Port”

Select this function and you can then modify the preset printer interface LPT1, through which the Flash drive should be addressed (1...4).

3.4.10 Bootload

- ”Load”, ”Bootload”

This function allows the basic software to be transferred from the programming device to the ALU. There are no requirements for the user program. Boot mode must be activated under the following exceptional conditions:

- The PLC station is started up for the first time.
- Configuration change Master <–> Slave.
- New programming SW has been installed.
- Enter or change bus type
- ALU change ALU 1xx <–> 2xx.

The following steps are necessary for first–time operation (brand–new PLC):

Step 1 Insert the desired modules into the subrack and connect to the power supply. Place the RAM backup battery into the ALU.

Response The yellow ALU LED flashes, the green one glows.

Step 2 Flip DIP switch B3 on the ALU to ”ON” = Bootload (DIP switches B0 ... B2 to ”OFF”)

Step 3 Carry out a RESET (power supply Off/On **or** insert and withdraw the Disable pin e.g. on the BIK116) to assume the new switch position.

Response The yellow ALU LED flashes, the green one glows.

Step 4 If you have not yet entered the ALU: call ALD25 on the PaDT and set your ALU under ”Edit”, ”Equipment List”.

Step 5 Plug in the connection cable PaDT ↔ ALU (YDL52)

Step 6 Set the link–up in ALD25 with ”Setup”, ”Link–up”, ”Local”

Step 7 Select the ”Load”, ”Bootload” function

Response A window appears, indicating how much of the basic software is being transferred.
At the **end** of the bootloading process, a small message window appears, which you must confirm with **<Esc>**. The yellow ALU LED goes out, the green one glows.

Step 8 Flip DIP switch B3 on the ALU to ”OFF” = user program operation and switches B0 and B1 in accordance with the requirements of the technology (cold restart / warm restart and manual / automatic start)

The bootloading process is now completed. You may now begin with the program configuration or link the already edited program and transfer it to the PLC.

Note The yellow ALU LED flashes until the bootloading process is completed, or if there is an error. After correct bootloading, the LED goes out. After loading and starting the user program, the LED stays on.

Caution The green ALU LED should not flash during bootloading nor after its completion. If this does occur, bootloading must be repeated.

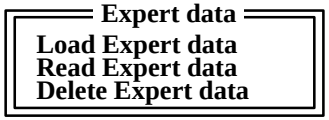
Caution You must wait at least 3 minutes after bootloading is complete, before carrying out a RESET (DNP, BIK) or switching the PLC off and then on again.

3.4.11 Processing A250 Expert data

-”Load”, ”Expert Data”

The user data generated by the Expert system software (e.g. ZAE10S), can be edited with the menu items in the window shown below. I.e. user data is loaded into the Expert system and can be read in the Expert system.

Note The **Delete** function **cannot** be activated.

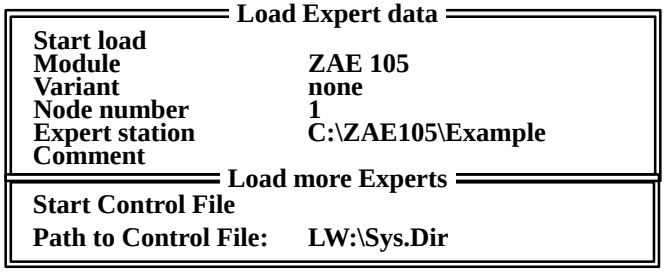


<= The ”Delete” line is not currently in force.

Select any of these menu items to call up the window shown below, which will only show a corresponding difference in the **first line**: the choice is between ”**Load**” or ”**Read**”.

3.4.11.1 Handling A250 Expert data

-”Load”, ”Expert Data”, ” **Load** Expert Data”



<= **line can only be read**

<= **currently no control file created by AKF/ALD.**

-”Load”, ”Expert Data”, ” **Read** Expert Data”

Read Expert data

Start load	
Module	**ZAE 105**
Variant	**none**
Node number	**1**
Expert station	**C:\ZAE105\Example**
Comment	

<= **line can only be read**

HW requirements:

- Establish PaDT – PLC connection
  either:
  - via COM1/2 and V24 interface of the ALU using cable YDL52
    or:
  - via BIK003 and Modnet 1/SFB interface (ALU, BIK or DEA) at any point in the network using cable YDL103.

☞ **Note** Experts can be mounted either in the master or in the expansion subrack.

SW requirement:

- The corresponding Expert must be entered in the Equipment List.
- Networking is activated.
- The user program has been stopped

Start load

-”Load”, ”Expert Data”, ”Load Expert Data”, ”Start Load”

Start read

-”Load”, ”Expert Data”, ”Load Expert Data”, ”Start Read”

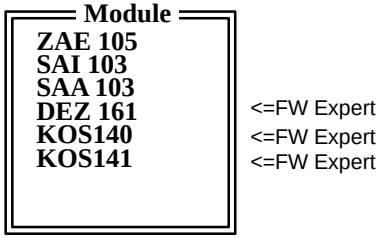
Select one of these menu items to start the processing operation in accordance with the entries in the subsequent menu items. User data (parameters) generated using the respective configuration software (e.g. ZAE10S), is processed.

Subsequent explanations for the ”Load Expert data” example.

Module

-”Load”, ”Expert Data”, ”Load Expert Data”, ”Module”

Select this menu line by pressing <Return> to reveal a corresponding window, in which possible Experts are displayed for selection. Die Leistungen für die Fernwirk-Experten werden im Kapitel 3.4.12, Seite 49 behandelt.



<=FW Expert
<=FW Expert
<=FW Expert

Variant

-”Load”, ”Expert Data”, ”Load Expert Data”, ”Variant”

There are currently no A250 Expert variants.

Node number

-”Load”, ”Expert Data”, ”Load Expert Data”, ”Node Number”

You must enter the node number associated with the Expert in the offered menu line. The permitted number range runs from 1 to 999.

☞ **Note** The selected Node number must match the Equipment List entry in the ”Node No.” column.

Expert station

-”Load”, ”Expert Data”, ”Load Expert Data”, ”Expert Station”

The station**path** which the user has assigned for the station configuration in the Expert system software, must be entered in this menu line. The Expert station must match the Station name in the Expert system software setup.

Comment

-”Load”, ”Expert Data”, ”Load Expert Data”, ”Comment”

A comment edited with the Expert system software is displayed in this menu line. It it used for information and **cannot** be edited.

Start Control File

-”Load”, ”Expert Data”, ”Load Expert Data”, ”Start Control File”

This starts the Control File, which has been made available under ”Path to group file”. (Currently not enabled)

Path to Control File

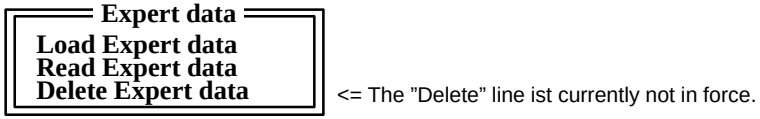
-”Load”, ”Expert Data”, ”Load Expert Data”, ”Path to Group File”

⚠ **Caution The system currently does not generate the Control File necessary for the common loading of A250 Experts.**

3.4.12 Processing remote control Expert data

-”Load”, ”Expert Data”

User data generated using the PRO FWT Expert system software, can be processed using the menu items in the window shown below. I.e. the user data is loaded into the Expert and can be read in the Expert.

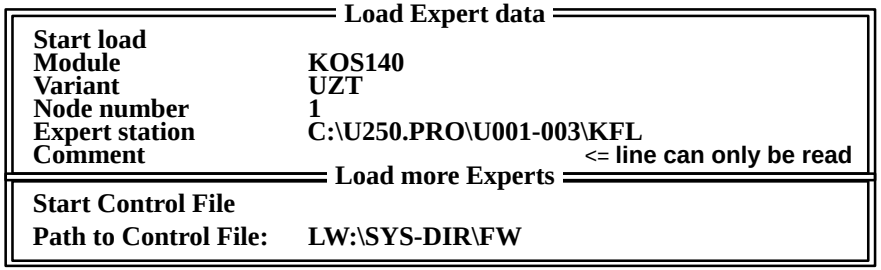


<= The ”Delete” line ist currently not in force.

Select any of these menu items to call up the window shown below, which will only show a corresponding difference in the first line: The choice is between ”**Load**” or ”**Read**”.

3.4.12.1 Remote control Expert data handling

-”Load”, ”Expert Data”, ” **Load** Expert Data”



-”Load”, ”Expert Data”, ” **Read** Expert Data”

Read Expert data

Start load	
Module	**KOS140**
Variant	**UZT**
Node number	**1**
Expert station	**C:\U250.PRO\U001-003\KFL**
Comment	**<= line can only be read**

HW requirements:

- Establish PaDT – PLC connection using
  - COM1/2 and V24 interface of the ALU using cable YDL52

Note The KOS Experts (140 and 141) can be mounted in the master subrack and the DEZ161 can be mounted either in the master or the expansion subrack.

SW requirements:

- The corresponding Expert must be entered in the Equipment list.
- Networking is activated.
- The user program has been stopped

Start Load

-”Load”, ”Expert Data”, ”Load Expert Data”, ”Start Load”

Start read

-”Load”, ”Expert Data”, ”Load Expert Data”, ”Start Read”

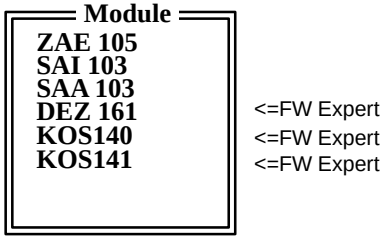
Select one of these menu items to start the processing operation in accordance with the entries in the menu items shown below. User data (parameters) generated using the configuration tool PRO-FWT, is processed.

Subsequent explanations for the ”Load Expert data” example.

Module

-”Load”, ”Expert Data”, ”Load Expert Data”, ”Module”

Select this menu line by pressing <Return> to reveal a corresponding window, in which the Experts are displayed for selection.



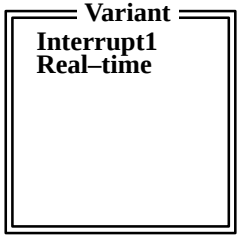
Note Modules DEZ and KOS are remote control Experts. The user data is created with the configuration tool PRO-FWT and the configuration tool AKF125 or ALD25 is made aware of the management path for the Control File.

Variant

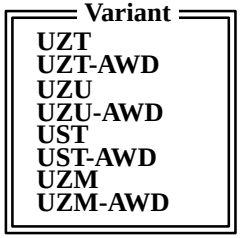
-”Load”, ”Expert Data”, ”Load Expert Data”, ”Variant”

Select this menu line by pressing <Return> to reveal a corresponding window, in which the permitted variants are displayed for selection. The selected variant must match the EQ List entry.

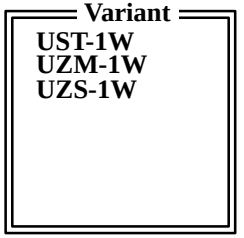
Example for DEZ161



Example for KOS140



Example for KOS141



Node number

-”Load”, ”Expert Data”, ”Load Expert Data”, ”Node Number”

You must now enter the node number associated with the Expert into the offered menu lineThe permitted number range goes from 1 to 999.

Note The selected **Node Number** must match the Equipment List entry in the ”**Node No.” column**.

Expert station

-”Load”, ”Expert Data”, ”Load Expert Data”, ”Expert Station”

The MS–DOS path in which the user data generated by the configuration tool PRO–FWT can be found, must be entered in this menu line.

Comment

-”Load”, ”Expert Data”, ”Load Expert Data”, ”Comment”

This menu line is **not** used by remote control Experts.

Start Control File

-”Load”, ”Expert Data”, ”Load Expert Data”, ”Start Control File”

Trigger this function to load all FW-KOS nodes.

Path to Control File

-”Load”, ”Expert Data”, ”Load Expert Data”, ”Path to Control File”

You must enter the path here which contains the Control File for common loading.

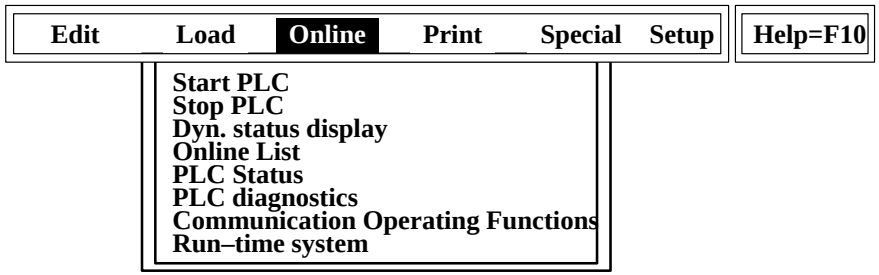
In the top window, ”LW:\SYS-DIR\FW” stands for the path in which the system can find the requisite Control File. The Control File of the Station currently set in SETUP is evaluated.

3.5 Online

The Online functions are used to test the program in the PLC.

☞ **Note** You can only carry out these functions if the PLC is properly connected (PaDT ↔ PLC cable connected, local networking, Boot-load, Link Program and Program to PLC functions already carried out).

You can select from the following functions:



3.5.1 Start PLC

- ”Online”, ”Start PLC”

This function is used to start the program in the PLC.

Before the PLC program is started, confirmation is required.

3.5.2 Stop PLC

- ”Online”, ”Stop PLC”

This function is used to stop the program in the PLC and to update the status display of the PLC.

Confirmation is required to stop the PLC.

3.5.3 Dynamic status display

- ”Online”, ”Dyn. Status Display”

You can use this function to carry out the dynamic behavior of a program in the PLC in various ways.

After you have selected this menu line, the following functions appear:

3.5.3.1 Dyn. status display (current display), General information

From Version 7,.1, the dyn. status display will contain a real–time status display in IL representation. The intermediate signal states (markers, I/O, data structures, etc.), assigned to a block / network can thus be shown in real–time, so that the signals can be recorded at the time the associated IL line is processed.

☞ **Note** This real–time representation holds for the ”current display”. It comprises the representation of operand contents, as well as any associated register contents.

☞ **Note** Both the triggered status display and the Online list will be processed as before at the end of a scan.

Additional constraints:
The real–time status display (EZS) does not necessarily always follow, however. Depending on the block type, instruction type and on the number and type of representation, the switch is made automatically to the network status display (NE) or to the scan end status (OB1-BE (block end)). The current display mode is indicated in the top right–hand corner of the screen.

Representation is either hexadecimal or decimal, in accordance with the processing type (logic (without sign) or arithmetic (with sign)).

With bit string commands, hexadecimal representation is used for the register contents and in addition to this, two–line binary representation is used for the bit string signals (depending on the number of bits).

Values are only displayed after Jump commands, if the corresponding lines really would cross.

☞ **Note** The addition of 2 Nops (2 bytes) per network extends the PLC scan time and the program length accordingly.

⚠ **Caution If an FB is called up** several times **in a user program, the contents of the first FB call (within the program processing sequence) are displayed on the screen. The** address and contents **of the actual operands are displayed.**

Mode features:

- Real–time status display (EZS): The **operand and register data** is read line by line after each **IL instruction** and written to the status buffer. This display occurs for:

  - OBs, PBs, FBs and AZs .

Possible **limits** are exceeded with:

- more than 156 IL lines (incl. comment and NOPs) or e.g.
- with approx. 120 direct logical commands or
- with approx. 60 indirect instructions such as ”U P1->word”

If limits are exceeded, the switch to NE mode is automatic (internal limit : 4Kbyte).

- Network status display (NE): **Operand values** are read after the **network** is processed and written to the status buffer. (**Extent of recording** as in the previous ”old” status display). This dislay occurs for:

  - LD and FBD data (also for compressed representation).
  - more than 156 IL lines with EZS mode (incl. comment and NOPs).

If the limit for NE mode is exceeded, the switch is automatically made to OB1 BE mode (internal limit :4Kbyte).

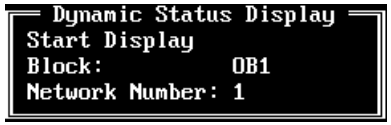
- Scan End Status (OB1-BE): The **operand values** are read at the program **end of scan** and are written to the status buffer. (”old” status display). This display occurs for:

  - TBs and AEs and
  - all networks containing BEB or IDT instructions.

3.5.3.2 Current display

- ”Online”, ”Dyn. Status Display”, ”Current Display”

This display works with ongoing updates for signal changes. You can select from the following functions:



Start Display

- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”

Once block type and network number have been selected, the display is started with this line.

Example of a dynamic display in IL mode

Dynamic Status Display				EZS
:U	clock pulse_6	1	1	
:U	I2.1	1	1	
:=	Q2.1	1	1	
	Signal states in:	Accumulator	/	Sig. mem.
SM169 clock pulse_6 1.0 Hz flashing frequency				
Block: OB1 NETWORK: 1				

Dynamic display

- ”Online”, ”Dynamic Status Display”, ”Current Display”, ”Start Display”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”
- ”Edit”, ”Blocks”, ”Start Entry”, <Return>, ”Dyn. Status Display”

You are in dynamic display mode.

Note If the user program is in an endless loop, the runtime is exceeded or Pointercheck cuts in (the **program end**block has not been reached), this is highlighted by the flashing message in the screen header:
”**!!! Network not being processed !!!**”.
Error localization is effected by ”PLC diagnostics”. The faulty network is localized and displayed.

Note If, within a user program, a block is not processed because of a missing condition, or if the block is terminated by a conditional block end (before the network to be displayed), this is highlighted by the following flashing message, when the Dyn. Display is called for this block:
”**!!! Network not being processed !!!**”, in the screen header.

Note If the PLC block differs from the PaDT block, after an appropriate inquiry, this can be shown in its PLC form in the dyn. display. The PaDT block is not destroyed.

Press <Ctrl>+<Return> and you will then be able to select the following functions in the pulldown menu:

Outside the pulldown menu, you can call the functions using <Ctrl>+<reference character>. The following special keys are also available:

< ↑>, < ↓>, < ←>, < →>	Move cursor
<PgDn>	Page to the next network
<PgUp>	Page to the previous network
<Esc>	Abort the dynamic display

Dyn. status display Page Up / Page Down

- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, ”Page Up”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Page Up”
  ”Recording”, ”Block/List Display”, <Ctrl>+<Return>,
- ”Edit”, ”Blocks”, ”Start Entry”, <Ctrl>+<Return>, ”Dyn. Status Display”, <Ctrl>+<Return>, ”Page Up”
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”, ...

This function is used for paging up and down, network by network, within the selected block. If a network cannot be displayed in the selected depiction mode (LD, FBD), then IL is automatically used.

Abort dyn. status display

- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Abort”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Abort”
- ”Edit”, ”Blocks”, ”Start Entry”, <Ctrl>+<Return>, ”Dyn. Status Display”, <Ctrl>+<Return>, ”Abort”
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”..

After selecting this function the dynamic display is terminated.

Use <Esc> to close the window again.

Dyn. status display Signal search

- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Signal Search”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Signal Search”
- ”Edit”, ”Blocks”, ”Start Entry”, <Ctrl>+<Return>, ”Dyn. Status Display”, <Ctrl>+<Return>, ”Signal Search”
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”..

Use the search function to look for signals within the block. The signals names can be either absolute or symbolic.

By prefixing one of the optional characters (”+”,”-”), the search direction can be specified as forward or backward. The default direction is forward. The search begins at or before the currently selected network.

The following entries are possible:

- ❒ Absolute addresses
- ❒ Symbol names

Dyn. status display Network search

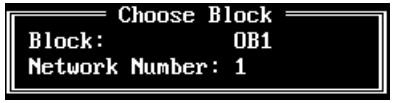
- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Network Search”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Network Search”
- ”Edit”, ”Blocks”, ”Start Entry”, <Ctrl>+<Return>, ”Dyn. Status Display”, <Ctrl>+<Return>, ”Network Search”
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”..

You can search for networks within the block using this search function.
Enter the network number and press <Return> to confirm, or enter ”0” and confirm with <Return>, to display a list of all the block networks (network number und header).

Choose block

- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Choose Block”

Use this function to select any block you like. The following menu is displayed



Dyn. status display MW mode

- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”MW Mode”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”MW Mode”
- ”Edit”, ”Blocks”, ”Start Entry”, <Ctrl>+<Return>, ”Dyn. Status Display”, <Ctrl>+<Return>, ”MW Mode”
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”..

Use this function to toggle presentation mode.

In LD/FDB:

a) Signal symbols or addresses are displayed in the network and signal address, symbol and comment are displayed in the status line.
b) Signal contents (byte, word, DWORD) are displayed in the network and signal address, symbol and signal contents are displayed in the status line in DEC/BIN/HEX representation.

In IL:

a) Line comments are displayed in the network and signal address, symbol and comment are displayed in the status line.
b) Signal contents are displayed in the network in BIN representation and signal address, symbol and comment are displayed in the status line.

Online list

- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Online List”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Online List”
- ”Edit”, ”Blocks”, ”Start Entry”, <Ctrl>+<Return>, ”Dyn. Status Display”, <Ctrl>+<Return>, ”Online List”
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”..

Use this function to proces the online list within the dynamic status display. For a description, see under ”Online List” (refer to Chapter 3.5.4, page 141)

Data structure zoom

- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Data Structure Zoom”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Data Structure Zoom”
- ”Edit”, ”Blocks”, ”Start Entry”, <Ctrl>+<Return>, ”Dyn. Status Display”, <Ctrl>+<Return>, ”Data Structure Zoom”
- ”Edit”, ”Overview”, Edit Block, <Return>, ”Edit Block”..

If you position the curser on a data structure in the dynamic status display, this function allows you to view all the data elements of the respective instance. The display takes the form of a list in which you can page.

Start PLC

- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Start PLC”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Start PLC”
- ”Edit”, ”Blocks”, ”Start Entry”, <Ctrl>+<Return>, ”Dyn. Status Display”, <Ctrl>+<Return>, ”Start PLC”
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”..

This function makes it possible to start the user program in the PLC during the dynamic status display.

Stop PLC

- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Stop PLC”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Stop PLC”
- ”Edit”, ”Blocks”, ”Start Entry”, <Ctrl>+<Return>, ”Dyn. Status Display”, <Ctrl>+<Return>, ”Stop PLC”
- ”Edit”, ”Overview”, Selkect Block, <Return>, ”Edit Block”..

This function is used to stop the user program in the PLC during the dynamic status display.

Display NW comment

- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Display NW Comment”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Display NW Comment”
- ”Edit”, ”Blocks”, ”Start Entry”, <Ctrl>+<Return>, ”Dyn. Status Display”, <Ctrl>+<Return>, ”Display NW Comment”
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”..

The network comment generated in a window under ”Edit”, can be retrieved at this point.

Press any key to return to the dyn. status display.

Dyn. status display preset

- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Preset”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Preset”
- ”Edit”, ”Blocks”, ”Start Entry”, <Ctrl>+<Return>, ”Dyn. Status Display”, <Ctrl>+<Return>, ”Preset”
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”..

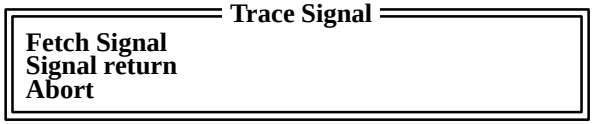
You can select the following functions at this point:

Dyn. status display Signal tracing

- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Signal Tracing”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Signal Tracing”
- ”Edit”, ”Blocks”, ”Start Entry”, <Ctrl>+<Return>, ”Dyn. Status Display”, <Ctrl>+<Return>, ”Signal Tracing”
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”..

After identifying the signal by the cursor position, the controlling network is connected.

The following pulldown menu is available:

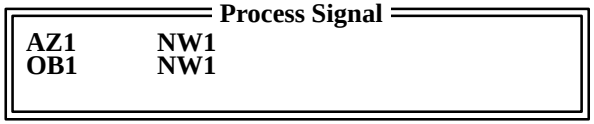


Note If the PLC block and the PaDT block are not equal, you are given an error message containing an appropriate notice, instead of the above menu. Signal tracing is then **not** possible.

Dyn. status display Fetch signal

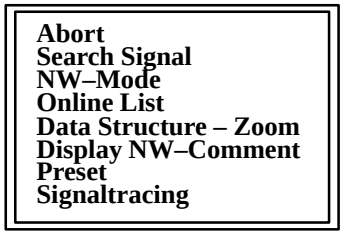
- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Signal Tracing”, ”Fetch Signal”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Signal Tracing”, ”Fetch Signal”
- ”Edit”, ”Blocks”, ”Start Entry”, <Ctrl>+<Return>, ”Dyn. Status Display”, <Ctrl>+<Return>, ”Signal Tracing”, ”Fetch Signal”
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”..

A list of blocks and networks which control the signal is displayed.



You can use the cursor keys and <Return> to select the block with the network to be connected.

In the connected network, you can use <Ctrl>+<Return> to call up the following pulldown menu:



Dyn. status display Signal return

- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Signal Tracing”, ”Signal Return”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Signal Tracing”, ”Signal Return”
- ”Edit”, ”Blocks”, ”Start Entry”, <Ctrl>+<Return>, ”Dyn. Status Display”, <Ctrl>+<Return>, ”Signal Tracing”, ”Signal Return”
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”..

Use this function to return to the network from which signal tracing was started.

Dyn. Status Display Abort

- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Signal Tracing”, ”Abort”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Signal Tracing” ”Abort”
- ”Edit”, ”Blocks”, ”Start Entry”, <Ctrl>+<Return>, ”Dyn. Status Display”, <Ctrl>+<Return>, ”Signal Tracing” ”Abort”
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”..

Use this function to move to the network where the signal tracing started.

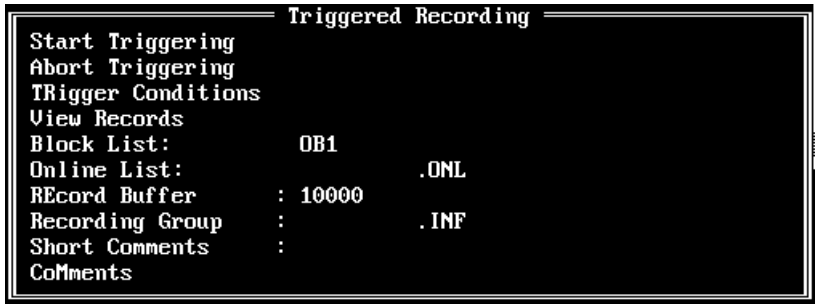
3.5.3.3 Triggered recording

- ”Online”, ”Dynamic Status Display”, ”Triggered Recording”

With triggered recording, you can start and end recording specifically, when conditions are met. You can then view these recordings.

Caution This function requires the PLC to be in scan.

The following functions are executable in the pulldown menu:



The triggered recording serves as a startup aid.

If you carry out the triggered recording, the states of various signals are recorded in the PLC. After you have stopped the recording, you can view the data. The data from the PLC is transferred to the PaDT and then the data is displayed on the screen. The type of representation corresponds to that of the ”Current Display” or the ”Online List”.

How to proceed
First, you have to specify the ”recording group”. The recordings which follow are then assigned to this group. To understand what this means, replace the word ”group” with the word ”problem”. This will associate all the recordings in a group with a certain problem, e.g. tracking down a programming error in a particular block. If a new problem occurs, a new group can be opened forit. A maximum of 999 recording can be stored on the hard disk for a single group.

If you have entered a group name, you must enter the blocks to be recorded in the block list and/or select an online list. You must also set the size of the recording buffer and the trigger conditions.

Now you can start triggered recording using the ”Start Triggering” menu item. Once you have done this, a block is created that contains all the signals from the blocks in the block list and the Online list. Signals can be from the signal memory or they can be pointers or data structure elements.

Then the block is loaded into the PLC, where it is always run at the end of a PLC scan and the signal states are recorded, if required.

Whether data is recorded or not, depends on the conditions for starting, recording and stopping, which are preset in the trigger conditions menu. The data is recorded only if the starting condition has been fulfilled in any previous or in the current scan. Now, whenever the recording condition is fulfilled, the signal states are entered into a special buffer provided for this purpose, the so–called recording buffer. If the stop condition is fulfilled, exactly as many more cycles will be recorded as there are run–ons set. In this case, the recording condition is not taken into account. If this happens, triggered recording is stopped.

There are two other possible ways to stop a triggered recording. It can be either stopped using the menu command ”Abort Triggering” or it can be stopped automatically if you have chosen ”Yes” for ”Stop when PLC buffer full” in the trigger conditions and the PLC buffer is completely filled with data.

In all these cases, you can view the data recorded up to the point the process was stopped. The data is always saved!

You can view the data using the ”Recordings”, ”Block/List Display” menu item. For this purpose, they are called from the PLC to the PaDT, stored in a file and displayed on the screen.

The ”Recordings” menu contains the menu item ”Recording Number”.
It can also be used to select and view older recordings.

☞ **Note** As already mentioned above, the data is always recorded at the end of a PLC scan. If the statesof some signals have changed several times within the space of one scan, this is not recognized in the triggered recording!
Only those signal states which are currently in the signal memory at the end of a scan are stored.

Start triggering

- ”Online”, ”Dynamic Status Display”, ”Triggered Recording”, ”Start Triggering”

This function generates a block which contains the signals to be recorded and the trigger conditions. It loads the block into the PLC and starts it.

While the block is being created, the status of the trigger process is displayed in a window.

Abort triggering

- ”Online”, ”Dynamic Status Display”, ”Triggered Recording”, ”Abort Triggering”

This function aborts triggering on the PLC.

This is useful if, for example, you have set a start or stop condition which never occurs.

Trigger conditions

- ”Online”, ”Dynamic Status Display”, ”Triggered Recording”, ”Trigger Conditions”

For triggering to be carried out, various conditions must be established in the ”Trigger Conditions” menu:

- the condition under which recordings should be made
- the condition for starting recording (Start condition)
- the condition for stopping recording (Stop condition)
- the number of recordings after the stop condition (run–on)
- Type of PLC Buffer

The following pulldown menu is available:

Possible entries for the Record, Start and Stop conditions
For each of the Record, Start and Stop conditions, select one of the following functions from the right–hand window and use <Return> to transfer it to the left–hand window.

Unconditional	Condition always applies
Status 0	Condition applies if signal status is 0 (low)
Status 1	Condition applies if signal status is 1 (high)
Transition 0 → 1	Condition applies for status transition 0 to 1 (positive edge)
Transition 1 → 0	Condition applies for status transition 1 to 0 (negative edge)

Any transition condition applies for each status transition

<= Trigger level	Condition applies if signal (byte, word, double word or floating point word) is less than or equal to the entered trigger level
>= Trigger level	Condition applies if signal (byte, word, double word or floating point word) is greater than or equal to the entered trigger level

Bytes, words, double words and floating point words are acceptable trigger levels. Floating point words are characterized by ”e” or ”E”.
The following entries are authorized: e.g. 1.57E3; 1.88e-2; 1.76; 0.005e2

Recording condition
The condition for recording is defined
here. If the condition is fulfilled, the signal states are recorded.

If a different condition has been chosen as ”unconditional”, it is mandatory to enter the recording signal.

☞ **Note** The recording condition only comes into force if the Start condition has been fulfilled in an earlier scan (of the PLC) or in the current one.

Recording signal
The signal specified here is the trigger for the recording condition.

Start condition
The condition for starting triggering is defined here. This condition must be fulfilled before the signal states can be recorded. Triggering is now active.

If a different condition has been chosen as ”unconditional”, it is mandatory to enter the Start signal.

Start signal
The signal specified here is the trigger for the Start condition.

Stop condition
If the condition defined here occurs, triggering is stopped Triggering becomes inactive.

If a different condition has been chosen as ”unconditional”, it is mandatory to enter the Stop signal.

Stop signal
The signal specified here is the trigger for the Stop condition.

Number of run–ons
In addition to this, also enter the number of run–ons (0 – N) which should be recorded after the Stop condition has occured. In this case, the recording condition is no longer taken into account. The number of run–ons corresponds to the number of cycles on the PLC which follow the occurrence of the Stop condition.

Stop when PLC buffer full
Here you can choose between having the recording buffer filled with data only once, or having it function as a ring buffer.

Enter ” yes” and the buffer will be filled with data only once. You will always see the beginning of a triggering.

Enter ”no” and the buffer will be filled more than once (ring buffer). You will always be given the end of your triggering.

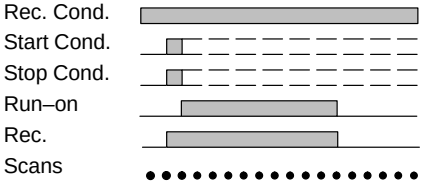
If all entries are correct, use <Esc> to accept the menu.

Triggered status display examples

☞ **Note** The diagrams of the time characteristics of the various conditions do **not** show the value of the signal (0 or 1), but the ”fulfilment” of the specified condition (yes or no).

a) Triggering on status ”1”, with run–ons

Timing diagram



Trigger conditions

Recording condition	unconditional
Recording signal	
Start condition	Status 1
Start signal	M4.4
Stop condition	Status 1
Stop signal	M4.4
Number of run–ons	10

b) Pre-triggering on positive edge

Timing diagram

Trigger conditions

Recording condition	unconditional
Recording signal	
Start condition	unconditional
Start signal	
Stop condition	Transition 0-1
Stop signal	M4.5
Number of run–ons	0

c) Mid-triggering on positive edge, run–ons

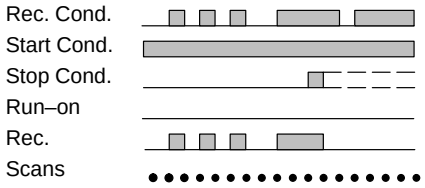
Timing diagram

Trigger conditions

Recording condition	unconditional
Recording signal	
Start Condition	unconditional
Start signal	
Stop condition	Transition 0-1
Stop signal	M4.6
Number of run–ons	5

d) Recording of all the changes to marker M4.7 until marker M4.8 assumes status ”1”. If the available memory is insufficient for saving all the recordings, at least the events can be counted.

Timing diagram



Trigger conditions

Recording condition	any Trans.
Recording Signal	M4.7
Start condition	unconditional
Start Signal	
Stop condition	Status 1
Stop Signal	M4.8
Number of run–ons	0

Recordings

- ”Online”, ”Dynamic Status Display”, ”Triggered Recording”, ”Recordings”, <Return>

Use this function to view recordings and delete recordings.

Block/List display

- ”Online”, ”Dynamic Status Display”, ”Triggered Recording”, ”Recordings”, ”Block/List Display”

Use this function to display the recorded data.
If you have recorded a block, then the recordings will be shown in network form.
If you have recorded an online list, then the recordings will be shown in list form.

Press <Ctrl>+<Return to reveal a window containing following functions:

The functions can be called up outside the pulldown menu with <Ctrl>+<reference character>. The following special keys are also available:

< ↑>, < ↓>, < →>, < ←>	Move cursor
<PgDn>	Page to next network
<PgUp>	Page to previous network
<Esc>	Abort dynamic display
<F4>	Choose recording
<F5>	Previous recording
<F6>	Next recording

Choose Block

- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Choose Block”

Use this function to select a block from the block list.

Next recording

- ”Online”, ”Dynamic Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display” <Ctrl>+<Return>, ”Next Recording”

Use this function to select the next recordings. The recording number can be found in the top left of the screen footer.

You can also call up this function with <F6>.

Previous recording

- ”Online”, ”Dynamic Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Previous Recording”

Use this function to select previous recordings. The recording number can be found in the top left of the screen footer.

You can also call up this function with <F5>.

Choose recording

- ”Online”, ”Dynamic Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Choose Recording”

This function is used to display the recording of your choice. The recording number can be found in the bottom right of the screen footer. You can make your choice in the following menu:

Total number of recordings incl. run–ons.
Start number of run–ons
Number of run–on displayed

Run–on ”0” means: The recording displayed is not a run–on
Run–on ”n” means: The recording displayed is the n–th run–on

You can also call up this function with <F4>.

Record number

- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Recording Number”

Here you can select a particular trigger process (recording) that you would like to view.

Recording comment

- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Recording Comment”

Enter a comment.
This comment refers directly to the trigger process (recording).

Delete recording group

- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Delete Recording Group”

At this point, you can delete a group of recordings.

Enter <Return> or <Blank>+<Return> to open a selection window.

Online list

- ”Online”, ”Dynamic Status Display”, ”Triggered Recording”, ”Online List”

If you enter a name in the online list under ”Triggered Recording”, the signals in the list will also be recorded. Thus an extended program investigation is possible.

Recording buffer

- ”Online”, ”Dynamic Status Display”, ”Triggered Recording”, ”Recording Buffer”

Here you can set the size of the recording buffer on the PLC. The higher the value, the more memory you have for your recordings.

The size of the recording buffer depends on the size of the ALU memory. Therefore, it is not possible to enter the maximum value for the recording buffer for every single ALU.

Values for the recording buffer can range between 1000 and 65 500 bytes.

If you have entered too large a value for the buffer, a message flashes during recording informing you that the PLC memory is insufficient. In this case, you must enter a lower value or use the buffer as a ring buffer.

Recording group

- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording group”

You must enter a group name here (max. 8 chars.).

Example:
Recording Group: LOOP_21.INF

All the following recordings will then be assigned to the group LOOP_21.INF.

You must enter a name, as all recordings that are displayed will also be saved on the hard disk.

Short comment

- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Short comment”

Here you can enter a short comment.
The comment refers directly to the recording group.

Example:
Recording group: LOOP_21.INF
Short Comment: Test of control loop 21

Here you can see immediately the reason you made these recordings.

Comment

- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Comment”

An input window is displayed where you can enter a comment consisting of 15 lines.
The comment refers directly to the recording group. It may, for example, contain all the important information on one group of recordings.

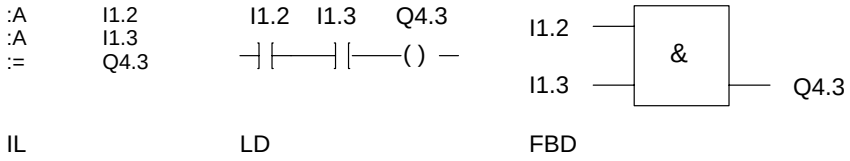
Press <Ctrl>+<Return> to reveal the following pulldown menu:

3.5.3.4 Output mode

- ”Online”, ”Dyn. Status Display”, ”Output Mode”
- ”Print”, ”Program Protocol”, ”Output Mode”

In this menu line, you can choose the mode of output for your program protocol. You can choose between instruction list (IL), ladder diagram (LD) and function block diagram (FBD).
Select by toggling between the modes.

The following example shows the same program in three display formats:



3.5.4 Online list

- ”Online”, ”Online List”
- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Online List”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Online List”
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”,..

This list is used to test check and monitor the user program in the PLC. It accesses the signal memory of the PLC directly.

You may edit several lists per station. Each list may include status, control and forcing instructions.

Select this function to reveal the following window:

3.5.4.1 Load online list

- ”Online”, ”Online List”, ”Load Online List”
- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Online List”, ”Load Online List”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Online List”, ”Load Online List”
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”,..

This function is used to load and to call up the online lists. Several lists can be created for each station. The lists are station-specific.

Select the function and a menu line appears in which you can enter a name. If lists already exist, the last list to be edited is displayed. This name can be confirmed with <Return> or changed using the line editor. In addition to this, enter a space and press <Return> to reveal a window in which you can use the cursor keys to select an already existing list.

Now the window appears in which you can edit and run the online list.

Edit online list

- ”Online”, ”Online List”, ”Load Online List”, Name, <Return>
- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Online List”, ”Load Online List”, Name, <Return>
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Online List”, ”Load Online List”, Name, <Return>
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”,..

A table is displayed containing five columns.

Signals can be displayed (status), controlled, and forced.

Once the list has been entered, you can use the function key <Ctrl>+<Return> to process (execute) the list through a pulldown menu.

Column 1 (ID)
To set individual signals without having to discard the entire list, you can use the following identifiers (ID).

ID	brings about
F	Signal set on forcing, not active
FO	Forcing on; current signal will be forced with ”Update Forcing”
C	Markers set on control, not active
CO	Control on, current signal will be controlled with ”Enable Control”
”Space”	Status display active

Column 2 (G)
In this column, a ”G” identifies which signal is to be recorded graphically. A maximum of 7 signals can be identified. With analog signals, you must also enter the display limits (Edit scaling ”menu).

Column 3 (signal)
The following signal types are available for the individual parts of the list (see. ”Pocket Guide”).

Operand	Status	Control	Force
I	possible	possible	possible
IB	possible	possible	possible
IW	possible	possible	possible
ID	possible	possible	possible
IG	possible	possible	possible
Q	possible	possible	possible
QB	possible	possible	possible
QW	possible	possible	possible
QD	possible	possible	possible
QG	possible	possible	possible
VFx	possible	not possible	not possible
VFWx	possible	not possible	not possible
KSx.1	possible	not possible	not possible
KSx.2	possible	not possible	not possible
M	possible	possible	possible
MB	possible	possible	possible
MW	possible	possible	possible
MD	possible	possible	possible
MG	possible	possible	possible
P	possible	possible	possible
SM (bit)	possible	not possible	not possible
SMB	possible	not possible	not possible
SMW	possible	not possible	not possible
SMD	possible	not possible	not possible
SMG	possible	possible	possible
SKx.y	possible	not possible	not possible
SZx	possible	not possible	not possible
T	possible	not possible	not possible
TIW	possible	not possible	not possible
TSW	possible	possible	possible
C	possible	not possible	not possible
CIW	possible	possible	possible
CSW	possible	possible	possible
ZZx	possible	not possible	not possible
Near data structures	possible	possible	possible

☞ **Note** If you want to enter 16 inputs of one module in slot reference 6 into the list, you have to type: E6.1–16. E6.1 to E6.16 are then entered automatically into the list.

Column 4 (FRM)
In this column, the format of the signal value from column 5/6 will be entered. The following formats are possible:

FRM	Format	Example signal value
ASC	ASCII	Otto
BIN	Binary	11011001
DEC	Decimal	1234567890
GLP	Floating point	1.234e+4
HEX	Hexadecimal	9AFF
PTR	Pointer	MD 1

Column 5 (Force/Status/Control Value)

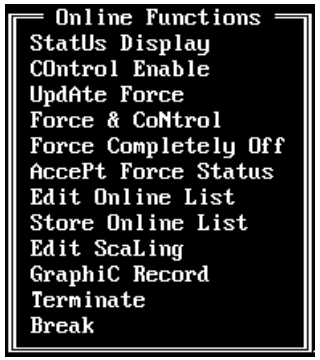
Force/Status/Control Value
In this column the signal content is displayed in the format selected under ”FRM” (also refer to column 4).also Column 4).

Edit
A new list can be edited immediately (see list header).

The functions can be called up from outside the pulldown menu using <Ctrl>+<reference character>. The following special keys are also available:

<←>, <→>, <↑ >, <↓>	Move cursor
<Esc>	In ”Edit” mode: Abort
	In ”Active” mode: switch to ”Edit” mode
<tab>	Cursor to the next Input field of a line
<Shift>+<tab>	Cursor to the previous Input field of a line
<PgUp>	Page the list back one page
<PgDn>	Page the list forward one page
<backspace>	Delete character to the left of the cursor
<Del>	Delete the character above the cursor
<Alt>+<F1>	Delete the entire list
<Ins>	Switch to Insert mode
<Ctrl>+<D>	Delete the line at the cursor position
<Ctrl>+<G>	Insert a blank line after the cursor
<F1>	Status Display
<F2>	Enable Control
<F3>	Update Force
<F4>	Force and Control

Once the list has been entered you can use the function key <Ctrl>+<Return> to process (execute) the list using an online menu.



Status display

- ”Online”, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Status Display”
- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Online List”, ”Status Display”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Online List”, ”Status Display”
- ”Edit”, ”Overview”, Select Block <Return>, ”Edit Block”,..

After selecting this function, the entire online list switches to the ”active” state (display in the header) and cannot be edited. In this mode, the current actual values of all signals entered in the list are cyclically read–in by the PLC and displayed in the column for the signal value. You can display them in the numerical system determined in the ”Format” column.

The keys <PgUp>, <PgDn>,<↑> and <↓> retain their functions even if the list is active. The functions of the online menu are also available, except for the functions ”Status Display” (already active) and ”Adopt Force Status”.

To get back to ”Edit” mode from the active list, press <Esc> or use the ”Edit Online List” function (Online menu). The status display simultaneously becomes inactive and any signal values that have been overwritten return automatically.

Enable Control

- ”Online”, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Enable Control”
- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Online List”, ”Load On–line List”, Name, <Return>, <Ctrl>+<Return>, ”Enable Control”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Enable Control”
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”,..

All signals available in the list with the identifier ”CO” (Control On) are controlled to the corresponding signal value, after this function has been selected. Control is only effective for the duration of a PLC program cycle. The status of the signals controlled remains until the signals are overwritten with new values by the program in the PLC or by functions of the online list (force, control).

Signals with the identifier ”C” are not controlled! The identifier ”S” is merely a signal classification and is required for editing.

Update Force

- ”Online”, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Update Force”
- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Update Force”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Update Force”
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”,..

Signals in the online list with the identifier ”FO” (Force On) are forced to the corresponding signal value, once this function is triggered. Forcing remains active until it is explicitly disabled. Use the function ”Force Completely Off” (online menu) to disable forcing. It can also be disabled by changing the Identifier of the signals concerned from ”FO” to ”F” and then triggering the ”Update Force” function. A forced signal is recognizable by the color change.

Constant forcing is possible for inputs and for outputs that are not used in the user program. Forcing can only influence user logic at the end of a scan.

For M, MW, MD, MG, direct inputs/outputs (IN/OUT) and interlocked outputs see mode of operation described below.

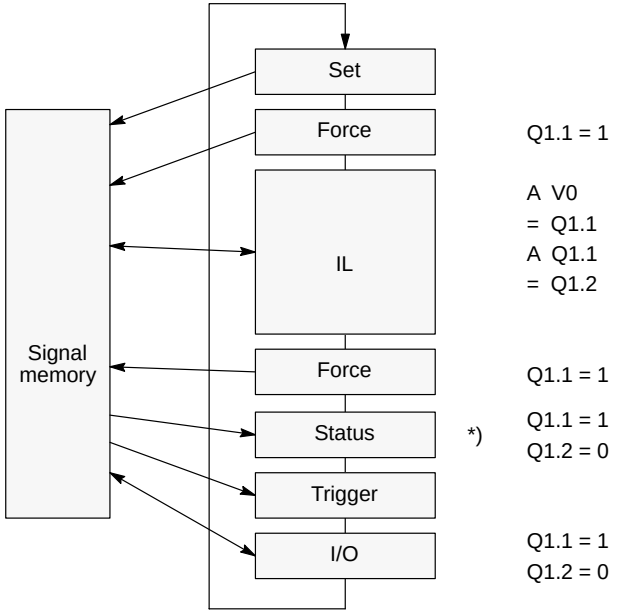
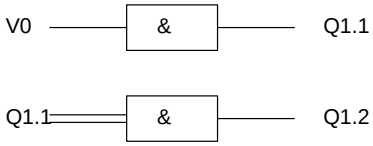


Figure 11 Force mode of operation

The operands mentioned above are forced at the beginning and at the end of a scan. During the runtime they may momentarily assume other values (see example Q1.1). However, the Force values are displayed in the Online List und Triggered Recording functions. To see what this means, look at the following presentation.



Force & Control

- ”Online”, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Force & Control”
- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Force & Control”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Force & Control”
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”,..

This function combines the two functions ”Control On” and ”Update Force”. The signal is both forced and controlled at the same time.

Force completely off

- ”Online”, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Force Completely Off”
- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Force Completely Off”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Force Completely Off”
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”,..

Forcing is inactive for all signals currently being forced. The respective identifiers remain unchanged.

Accept Force Status

- ”Online”, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Force Completely Off”
- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Force Completely Off”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Force Completely Off”
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”,..

If some signals in the PLC are to be forced, which are not entered in the online list selected, then this function can be used to adapt the list to the status of the PLC.
Missing entries are always inserted after the last list entry. If a Force signal is in the Liste, but is forced with a different signal value to that in the PLC, the signal is given the value from the PLC. Excess forcing signals in the online list are not affected by this function.

Edit Online List

- ”Online”, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Edit Online List”
- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Edit Online List”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Edit Online List”
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”,..

Use this function to switch an active online list (with the entry ”active” in the first line) to be ”Edit” status. You can only make changes to the list in ”Edit” status.

The same function is available if you press <Esc>.

Store online list

- ”Online”, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Store Online List”
- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Store Online List”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ” Store Online List”
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”,..

Using this function, the list is stored again in the current station. Select the new file name as desired. Enter a space and <Return> to reveal a window containing all the currently available lists. The list is stored under the name selected. This does not exit the list editor.

Exit (online list)

- ”Online”, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Exit”
- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Exit”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Exit”
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”,..

Use this function to terminate list editing and save the list.

Abort (online list)

- ”Online”, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Abort”
- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Abort”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Online List”, ”Load Online List”, Name, <Return>, <Ctrl>+<Return>, ”Abort
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”,..

With this function you exit the list without storing it.

3.5.4.2 Delete Online List

- ”Online”, ”Online List”, ”Delete Online List”
- ”Online”, ”Dyn. Status Display”, ”Current Display”, ”Start Display”, <Ctrl>+<Return>, ”Online List”, ”Load Online List Delete”
- ”Online”, ”Dyn. Status Display”, ”Triggered Recording”, ”Recording”, ”Block/List Display”, <Ctrl>+<Return>, ”Online List”, ”Load On–line List Delete”
- ”Edit”, ”Overview”, Select Block, <Return>, ”Edit Block”,..

After selecting this function, a window is displayed containing all the stored online lists of the station. Select one list using the Arrow keys. This function erases the list selected from the station directory.

3.5.5 PLC status

- ”Online”, ”PLC Status”

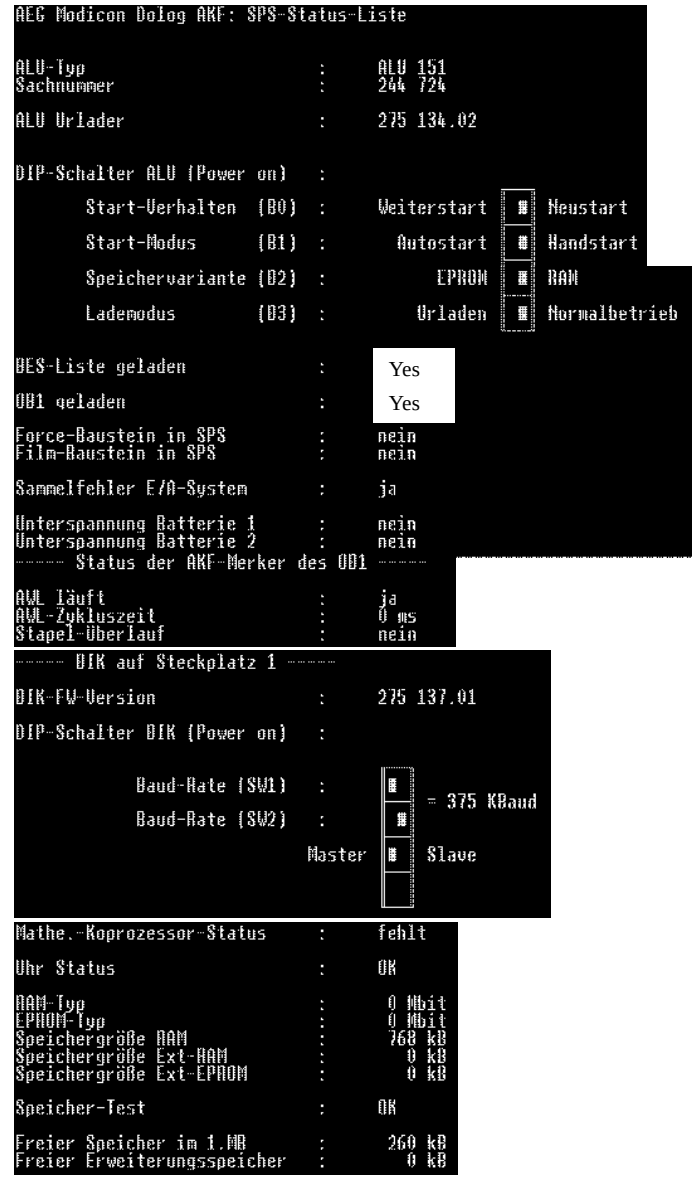
You can display the following list on the screen, print it at the printer stated in ”Setup”, or print it to a file.

This online function displays various PLC parameters and system markers. For example, the available RAM on the ALU is displayed here. The display is made in KBytes, separated according to memory in 1mByte and ext. memory.

Furthermore, memory which is still **available** to the user is shown, divided into a range **less than** the first MByte and **more than** the first MByte, i.e. in the add–on memory.

To put it simply, this means that **the signal memory, GSW stacks and data structures are stored in the firstMByte**. The conventional blocks such as **PBs ad FBs** are stored in the **add–on memory**, while there is still room available. **If not**, this data is also stored i**n the first MByte**.

The following diagram shows an example of such a list.



3.5.6 PLC diagnostics

3.5.6.1 PLC diagnostics, General

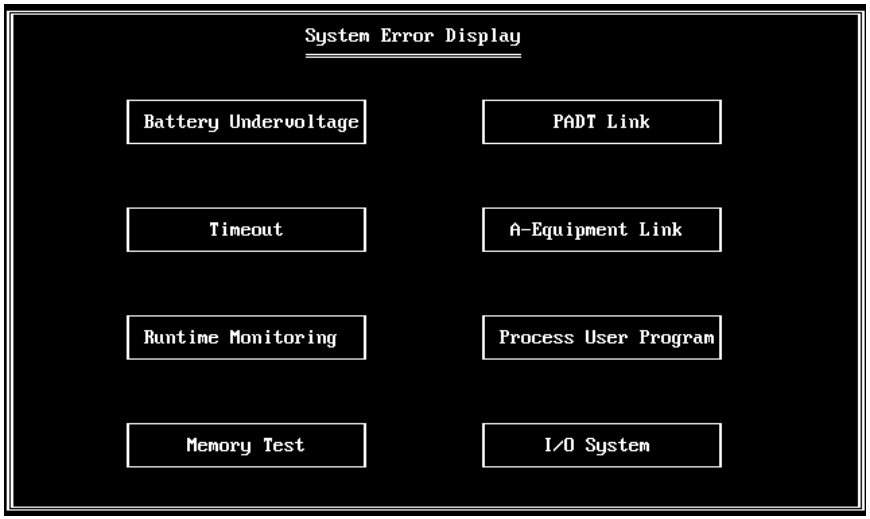
Error localization, triggered by

endless loops,
limit violations when using pointers,
stack overflow through exceeding the permitted block call depth and
task runtime overflow
etc.

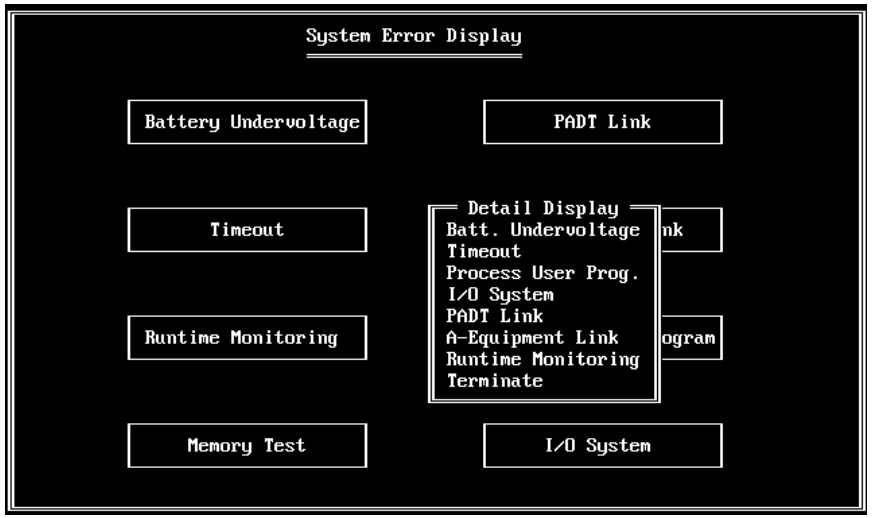
has been realized, starting from Version 7.1. The faulty IL line is highlighted by the cursor position.

- ”Online”, ”PLC diagnostics”

PLC diagnostics provide an overview of the various runtime errors on the PLC. Starting with an overview diagram, which allows you to monitor all the error ranges at the same time, you can swith to further diagrams, giving detailed information on the error ranges. If an error occurrs, the corresponding field on the screen is highlighted in red (with a color monitor) or inverted (for a monochrome monitor).



Press <Ctrl>+<Return> to call the following pulldown menu:



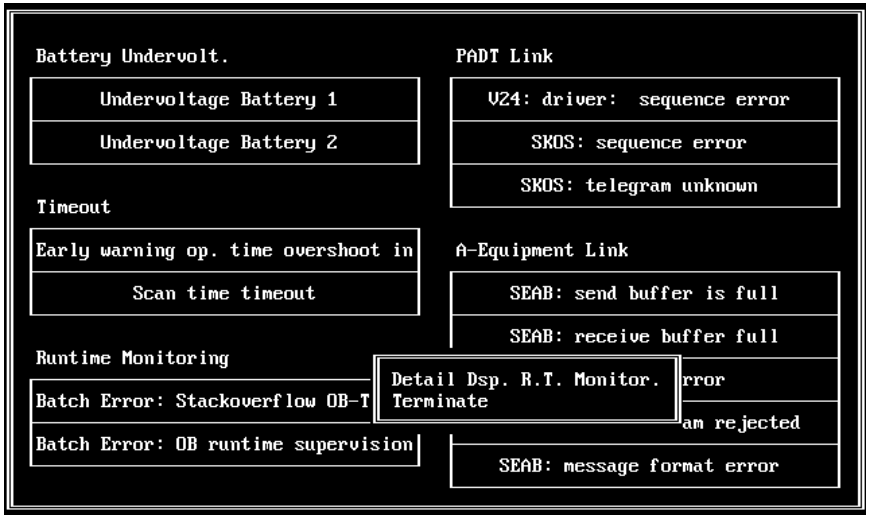
Use this menu to call up detailed information for the individual error ranges.

☞ **Note** There is no detailed information on the ”Memory test” range. This error is activated when defective memory is discovered in the initialization cycle. In this case, the only solution is to get the ALU repaired.

3.5.6.2 Undervoltage battery, Timeout, Run–time monitoring, PaDT link–up, A–equipt. link–up

- ”Online”, ”PLC–Diagnostics”, <Ctrl>+<Return>, ”Undervoltage Battery”/ ”Timeout”/”Run–Time Monitoring”/”PaDT Link–Up”/”A–Equipt. Link–Up”

Detailed information on these ranges is combined into a single detailed display.



The detailed diagram gives you concrete error information.
If you take the error ”Undervoltage Battery”, this means that the defective battery of the ALU is displayed.

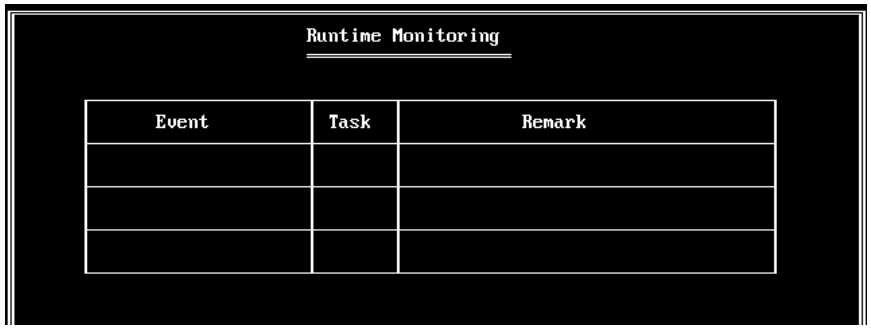
Press <Ctrl>+<Return> to call the following pulldown menu.

Detail dsp. R.T. monitor.

- ”Online”, ”PLC Diagnostics”, <Ctrl>+<Return>, **”**Undervoltage Battery”/ ”Timeout”/”Run–Time Monitoring”/”PaDT link–up”/”A–Equipt. Link–Up”, <Ctrl>+<Return>, ”Detail Dsp. R.T. Monitor.”

Run–time monitoring takes effect when endless loops or recursive block calls have been configured within a user program. In earlier AKF/ALD versions such program processes invariably resulted in the HW watchdog responding, causing PLC boot mode to be activated.

Now, these program processes are recognized through run–time monitoring and the user is informed by the ”Run–Time Monitoring” detailed diagram. If such an error occurs, the PLC is automatically stopped (STOP state) instead of going into boot mode.



The following information can be found in the detailed diagram of run–time monitoring:

- The event itself again (plus task interrupt)
- The task that called the defective block (”Task” column)
- In the ”Comments” column, an exact description of what led to the event (naming the blocks between which there is recursion; specifying the blocks which contain endless loops)

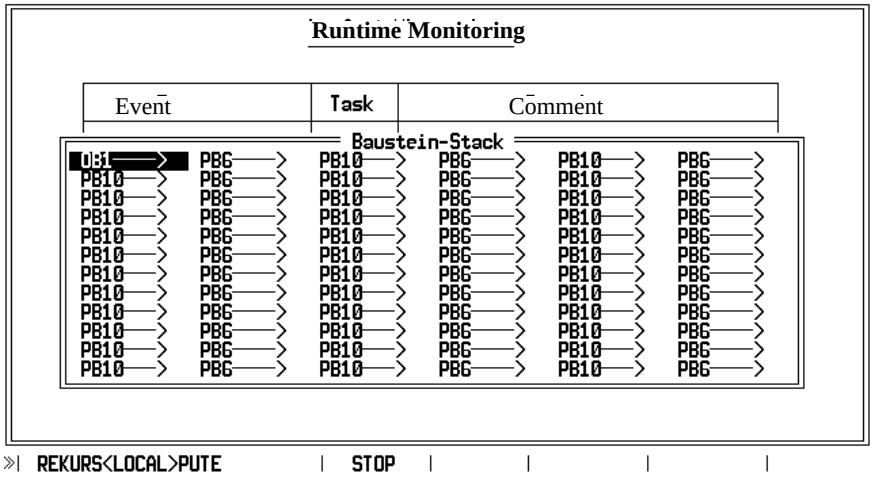
The ”Task Interrupt” event presents a special case and can only occur in conjunction with a time overflow.

From this detailed diagram, you can also call a further menu by pressing <Ctrl>+<Return>.

Display Stack

- ”Online”, ”PLC Diagnostics”, <Ctrl>+<Return>, ”Undervoltage Battery”/ ”Timeout”/”Run–Time Monitoring”/”PaDT Link–Up”/”A–Equipt. Link–Up”, <Ctrl>+<Return>, ”Detail Dsp. R.T. Monitor.”, <Ctrl>+<Return>, ”Display Stack”

An image of the PLC block stack during the activation of run–time monitoring can be displayed. The display should be read from the left to the right and from top to bottom.



Starting from the organization block, you can easily reconstruct the sequence in which the blocks called each other. In the case of a recursion, you can recognize a repeated presentation of a block sequence. The last block which is displayed is a block with a configured endless loop, because this block cannot call up any other blocks.

Localize error

- ”Online”, ”PLC Diagnostics”, <Ctrl>+<Return>, **”**Undervoltage Battery”/ ”Timeout”/”Run–Time Monitoring”/”PaDT Link–Up”/”A–Equipt. Link–Up”, <Ctrl>+<Return>, ”Localize Error”

Example for the localization of an endless loop:

Block Editor

```
        :”       ––––endless loop––––––––––
        :
LL1     :A       E6.4
        :SPB     =LL1
```

The cursor position identifies the faulty IL loop.

Exit

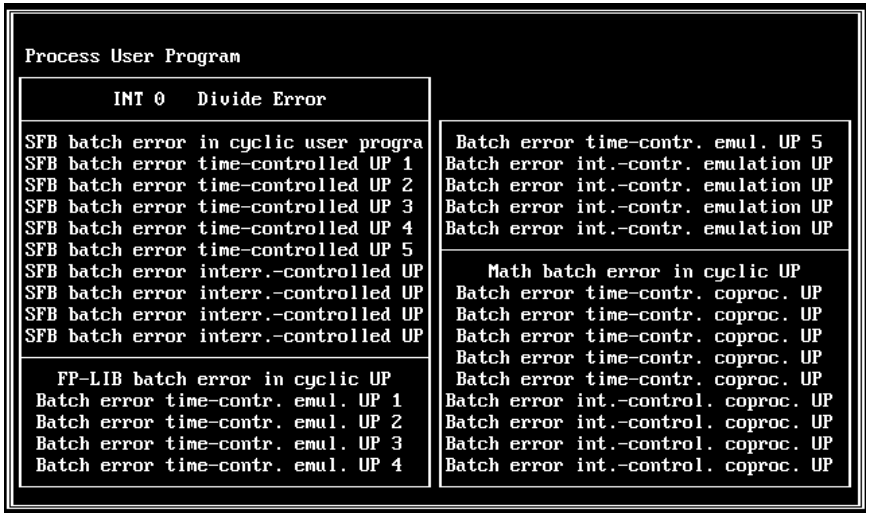
- ”Online”, ”PLC Diagnostics”, <Ctrl>+<Return>, **”**Undervoltage Battery”/ ”Timeout”/”Run–Time Monitoring”/”PaDT Link–Up”/”A–Equipt. Link–Up”, <Ctrl>+<Return>, ”Exit”

This exits the detailed presentation.

3.5.6.3 UP processing

- ”Online”, ”PLC Diagnostics”, <Ctrl>+<Return>, ”UP Processing”

The detailed diagram for user program processing covers the potential errors of cyclical program processing.
These include ”Division by zero” error, SFB batch error
for each OB task, floating point library batch error (math processor emulation) for each OB task and math batch error for each OB task as well.



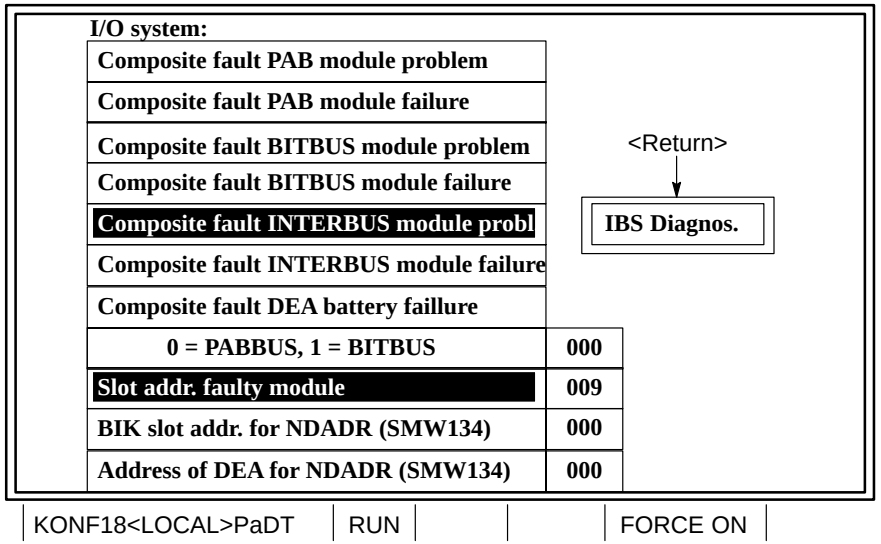
Use <Esc> to exit the detailed diagram.

3.5.6.4 I/O system

- ”Online”, ”PLC Diagnostics”, <Ctrl>+<Return>, ”I/O System”

The detailed diagram of the I/O system provides you with additional information on PAB nodes and Bitbus nodes.

The last four columns of the table allow you to localize the faulty node precisely. If several nodes contain errors, this data refers to the node with the highest slot address.



If there is an error on the InterBus, use <Return> to switch to the ”IBS Diagnos.” field. Press <Return> again to switch to the IBS Diagnostics window for the BKF102 at the lowest slot address.

IBS Diagnostics

- ”Online”, ”PLC Diagnostics”, <Ctrl>+<Return>, ”I/O System”, <Return>, <Return>

IBS Diagnostics

No.	Group disabled (X)*)	No.	Module error (X)
000	X. XXXXXXXXXX	001	X.....
016	XXXXXXXXXXXXXXXX	033	. .....
032	XXXXXXXXXXXXXXXX	065	. .....
048	XXXXXXXXXXXXXXXX	097	. .....
064	XXXXXXXXXXXXXXXX	129	. .....
080	XXXXXXXXXXXXXXXX	161	. .....
096	XXXXXXXXXXXXXXXX	193	. .....
112	XXXXXXXXXXXXXXXX	225	. .....
128	XXXXXXXXXXXXXXXX	257	. .....
144	XXXXXXXXXXXXXXXX	289	. .....
160	XXXXXXXXXXXXXXXX	321	. .....
176	XXXXXXXXXXXXXXXX	353	. .....
192	XXXXXXXXXXXXXXXX	385	. .....
208	XXXXXXXXXXXXXXXX	417	. .....
224	XXXXXXXXXXXXXXXX	449	. .....
240	XXXXXXXXXXXXXXXX	481	. .....

BKF 2

BKF failure: no
BKF fault: yes
BKF status: 0040
BKF SMW1: 5000
BKF SMW2: 0000
Slot: 0540
IBS status: 00A1
IBS diagn.: 0000

Relat. module: 1
Slot: 540
Node 540
SM 540.1: ok
SM540.2:fault
SMW540.1: H

KONF18<LOCAL>PaDT	RUN			FORCE ON

*)=Group is disabled or not defined.

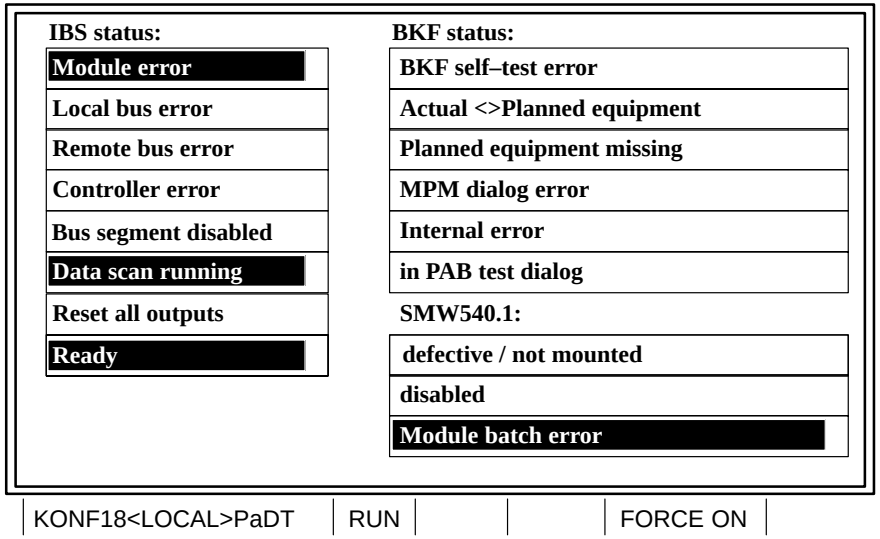
The status of all 256 possible **groups** (Equipment List) on the InterBus is displayed: Period (.) =Group is enabled; (X)=Group is disabled or has not been defined.
The module status of as many as 512 **modules (modules;** incl. peripheral bus**)** at the InterBus can be displayed: Period (.) =Module running error–free at the bus or has not been entered; (X)=Module is defective or has an error.
In the third large column, the contents of the node–specific system markers for the selected BKF 102 (**<PgUp> or <PgDn>**) and a selectable (**<Cursor> key**) module are displayed.
The status display for the BKF102 represents the contents of the first 8 system markers (BKFSMx.y).
The relative position of the selected (Cursor) module after the BKF102, is specified by the ”relative module” line. The contents of the corresponding node–specific system markers, as well as of the slot (for DEA 202, of the virtual slot) and the node number, are also represented. This also applies to the node in the DTA20x subrack.

Analysis (BKF, IBS and node status)

The system marker analysis is made visible by using function key **<F1>** to call a further window.

- ”Online”, ”PLC Diagnostics”, <Ctrl>+<Return>, **”**I/O System”, <Return>, <Return>**<F1>**

Status interpretation



Exit the detailed diagram by pressing <Esc>.

Exit

- ”Online”, ”PLC Diagnostics”, <Ctrl>+<Return>, **”**Exit”

The ”PLC Diagnostics” function is terminated.

3.5.7 Communication operating functions

- ”Online”, ”Communication Operating Functions”

These functions are used for networking

- two automation devices via Modnet
- an automation device and a PaDT via Modnet

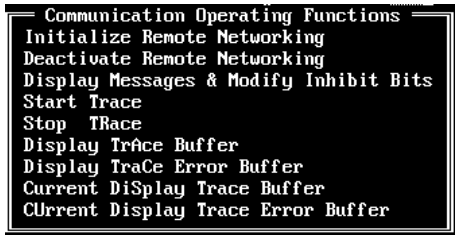
Every device must be set up separately via the RS 232C interface.

The initialization and deactivation of a remote link is only possible via the local link.

Note The prerequisites for these functions are as follows:

- Communications tables configured in COMAKF
- AKF program linked with the ”SetUp”, ”PLC Station”, ”Bus Operation” preset: ”Yes”
- Linked devices (PLC already loaded with basic software and AKF data)
- RS 232 C connection PaDT ↔ PLC and type of networking ”Local”

The following functions are available to control communication.



3.5.7.1 Initialize remote linking

- ”Online”, ”Communication Operating Functions”, ”Initialize Remote Linking”

When the above requirements are met, you can use this function to start initializing Modnet communication

☞ **Note** If the error buffer of the ”Display Trace Error Buffer” function is empty after initialization, then the communications processor works error-free.

3.5.7.2 Deactivate remote linking

- ”Online”, ”Communication Operating Functions”, ”Deactivate Remote Linking”

After confirmation, use this function to terminate Modnet communication.

After this, Modnet communication is only possible after remote linking has been reinitiated.

3.5.7.3 Display messages & modify inhibit bits

- ”Online”, ”Communication Operating Functions”, ”Display Message & Modify Inhibit Bits

The logical message numbers (LMN) of the station are displayed. For this purpose, a previous initialization of remote linking is required.

When this function is first called up, the EQ list is automatically read out and saved in a file. At every further call, this file is used. If you exit the ”Communication Operating Functions” function and restart it, the EQ list is read out again.

The following pulldown menu is available:

Start printing

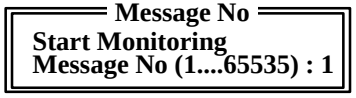
- ”Online”, ”Communication Operating Functions”, ”Display Message & Modify Inhibit Bits”, ”Start Printing”

When this function is first called up, PLC status is automatically read out of the PLC and stored in a file.

For each subsequent call, you are asked whether PLC status should be read out again or not. Answer ”yes” or ”no”.

- Yes: PLC status is read out from the PLC
- No: the existing file in the PaDT is used.

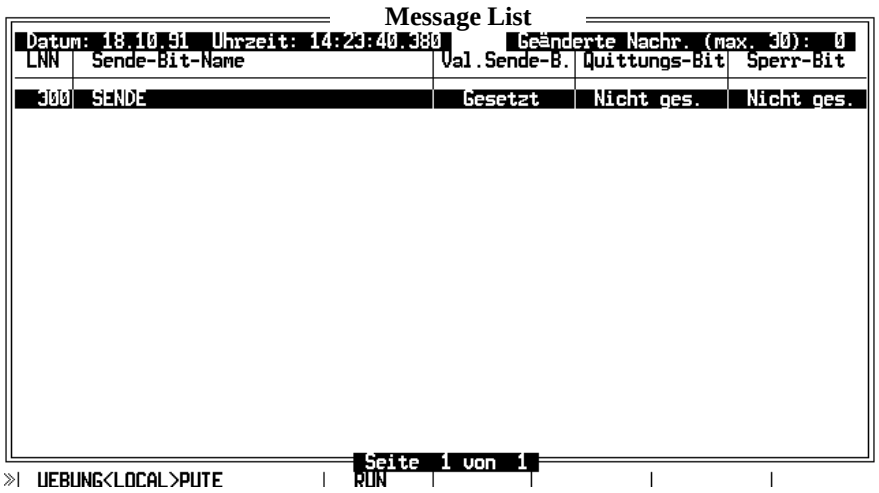
Once you have given your answer, a further pulldown menu appears.The following functions are available:



Start display

- ”Online”, ”Communication Operating Functions”, ”Display Message and Modify Inhibit Bits”, ”Start Printing”, ”Start Display”

The LMN’s or logical message numbers configured for the station are displayed in a table on the screen. The table contains the following elements:



The display in the send bit name column will be either logical or symbolic. This depends on the AKF addressing mode selected (absolute/symbolic). Except for the system messages, all inhibit bits can be changed. Once a line is selected, use <Return> to set (”1”, no output) or release (”0”, output) the inhibit bit. Up to 30 inhibit bits may be modified at one time. Once you have pressed <Esc> to complete the function and confirmed the message with ”Yes”, the changes are sent to the station.

Message number

- ”Online”, ”Communication Operating Functions”, ”Display Message and Modify Inhibit Bits”, ”Start Printing”, ”Message No.”

With this function, you enter the message number with which the list is to begin.

After the function has been selected, an LMN between 1 and 65535 is expected. It must be an LMN valid for the station.

Then, use the function ”Start Display” to display the table.

3.5.7.4 Start trace

- ”Online”, ”Communication Operating Functions”, ”Start Trace”

Note Tracing is only possible with initialized linking. In order to display the trace buffer, tracing must first be stopped.

Use ”Trace” to record the communication volume of the current station, without actively interfering in it. After the display, the recording is deleted.

Use this function to start recording. The message TRACE ON in the status line shows that the trace function is switched on.

During the trace function, the messages that are transferred to or from this station via the bus, are stored in the trace ring buffer. This process goes on for as long as the PaDT is linked up to the station.

You can only display the trace buffer if the trace function has been switched off again (stop trace).

3.5.7.5 Stop trace

- ”Online”, ”Communication Operating Functions”, ”Stop Trace”

This function stops the recording (trace). The message TRACE ON in the status line is deleted.

3.5.7.6 Display trace buffer

- ”Online”, ”Communication Operating Functions”, ”Display Trace Buffer”

Use this function to send the contents of the trace buffer to the selected output unit.

The trace buffer can only be selected in ”Local” or ”Remote” linking modes. The last entries are always the ones to be displayed.

The following pulldown menu is available:

Start printing

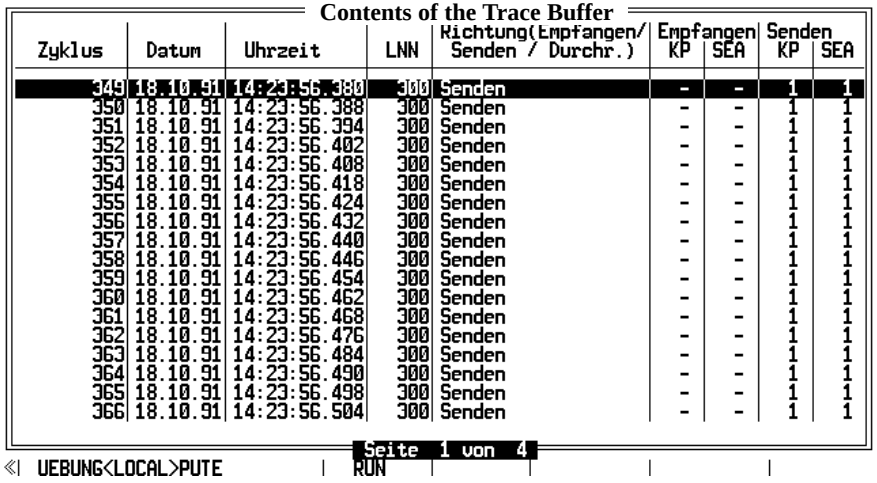
- ”Online”, ”Communication Operating Functions”, ”Display Trace Buffer”, ”Start Printing”
- ”Online”, ”Communication Operating Function”, ”Display Trace Error Buffer”, ”Start Printing”

When this function is first called up, the messages are automatically read out of the PLC and saved in a file.

At every further call of the function the user is asked to state whether or not the messages are to be read out again. Answer ”yes” or ”no”.

- ❒ Yes: the messages are read out of the PLC
- ❒ No: the existing file in the PaDT is used.

The following buffer elements are displayed:



The contents of the trace buffer can only be displayed if the ”Stop Trace” function has previously been executed.

The following functions are available:
<Esc> Exit display

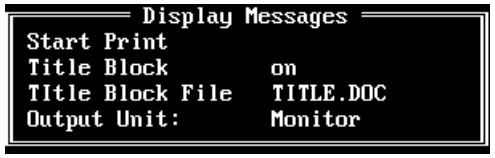
3.5.7.7 Display trace error buffer

- ”Online”, ”Communication Operating Functions”, ”Display Trace Error Buffer”

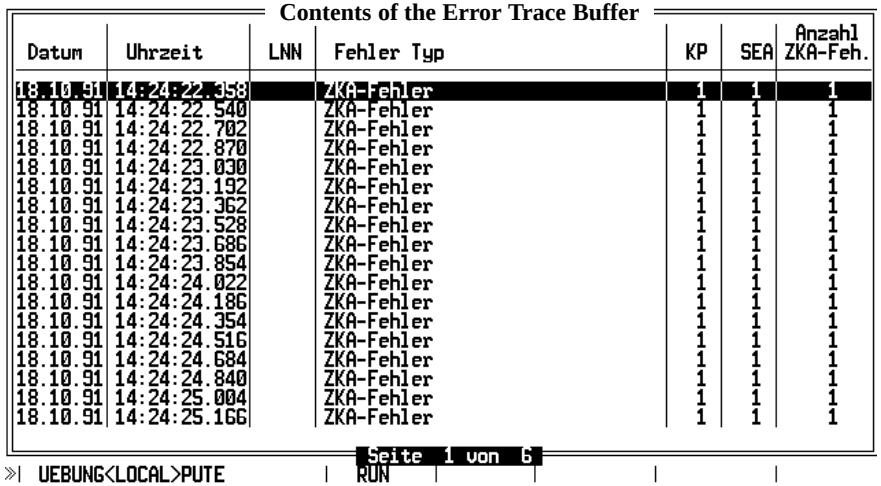
Use this function to send the contents of the trace error buffer to the selected output unit.

The trace error buffer can only be selected in ”Local” or ”Remote” linking mode. The last entries are always output.

The following pulldown menu is available:



After starting the function, the following buffer elements are displayed:



The following functions are available:
<Return> Display defective stations
<Esc> Exit display

With the error message ”ZKA Error” (ZKA =Short Scan Poll), press <Return> to specify the stations, which have not yet responded to the ZKA.

The following errors can occur

- Local message number errors:
  Format error - Receive
  Format error - Send
  Unknown Message Number
  Telegram too long

- SEA errors:
  Receive Buffer Overflow
  Send Buffer Overflow
  Horizontal Parity Error
  Vertical Parity Error
  Endlabel MTA List
  Framing Error
  SSP Error

- Line Error:
  BUS time monitoring expired
  Line error

3.5.7.8 Display Current Trace Buffer

- ”Online”, ”Communication Operating Functions”, ”Display Current Trace Buffer”

Use this function to continuously send the updated contents of the trace buffer to the screen.

The trace buffer can only be selected in ”Local” or ”Remote” linking mode. The last entries are always the ones to be displayed.

The following functions are available:

<S>	Stop Current Display
<W>	Restart Current Display
<Esc>	Exit Current Display

The screen layout is the same as that for the ”Display Trace Buffer” function. In addition, the note ”Current display” and the number of messages read out, is displayed.

3.5.7.9 Current Trace Error Buffer display

- ”Online”, ”Communication Operating Functions”, ”Display Current Trace Error Buffer”

Use this function to continuously send the updated contents of the trace error buffer to the screen.

The trace error buffer can only be selected in ”Local” or ”Remote” linking mode. The last entries are always the ones to be displayed.

The following functions are available:

<S>	Stop Current Display
<W>	Restart Current Display
<Esc>	Exit Current Display

Screen layout and possible errors are the same as for the ”Display Trace Error Buffer” function. In addition, the note ”Current Display” and the number of messages read out, are displayed.

3.5.8 Run–Time System

- ”Online”, ”Run–Time System”

Note In the main, the functions of this menu are identical to the functions in chapter 3.3.11 ”Edit, Run–Time system” and are therefore not explained in detail here.

Note This function is only possible, if the user program in the PLC contains the standard function block O_REG, with the time organization table (ZVT) and networking has been activated.

After selecting ”Run-Time System”, a window appears in which the time organization table (ZVT) to be processed can be selected.

Select the time organization table to be processed and confirm with <Return>, to reveal a window, containing the data of the time organization table. The ZVT contains global data applicable to all control loops.

OFF-Line RTM

G l o b a l data of ZVT1

Basic scan time 0.10 sec Priority: 5 global mode : active
Phase state : 1 Task No. : 1 No. of ctrl. loops: 10

L o c a l data of ZVT1

CL NO	stepdown	phase	mode	status	scan time
1	2	1	active		0.20 sec
2	3	1	active		0.30 sec
3	3	2	active		0.30 sec
4	3	1	p a s s i v e		0.30 sec
5	10	1	p a s s i v e		1.00 sec
6	10	1	p a s s i v e		1.00 sec
7	10	1	p a s s i v e		1.00 sec
8	15	3	p a s s i v e		1.50 sec
9	10	1	p a s s i v e		1.00 sec

Comments : Control loop 1

Runtime overflows (global, read–only)

If the current processing time for the individual control loops exceeds the parameterized basic sampling time t0, the run time will be exceeded, as it will not be possible to call the ”Control” task again while it is still active. The number of such run–time overflows is added up by the marker CRT in the block O_REG (CRT from ZERO to ONE) when the ”Control” task begins to be activated, and displayed with this marker.

maximum RVL run–time (global, read–only)

The maximum run–time of the control loops (maximum OB run–time for the OB in which the control is configured), measured since the start of the ”Control” task, is displayed on the screen here.

In addition, the current number of control loops with the states

- running control loops (read-only)
- halted control loops (read-only)
- control loops to be standardized (read-only)

is displayed. This information is related to the number of control loops to be processed.

Status (local, read–only)

Each control loop has a status. All control blocks associated with a particular control loop should be connected by this status. The status tells the control blocks whether they are in the initial or currently executing state (in initial, old values must be initialized). The status can take on one of four possible states:

❒ Reset
The Reset state means that control loop xx can be initialized using call marker START#xx prior to the next startup.

❒ Initial
The initial state sets the call marker LAUFxx once. Blocks that are called and have this state, initialize their old values.

❒ In progress
In this state, the control loops are periodically called up using the call marker LAUFxx.

❒ Halt
The Halt state means that a terminal initialization has been carried out for control loop xx with call marker HALT#xx (if it has been configured).

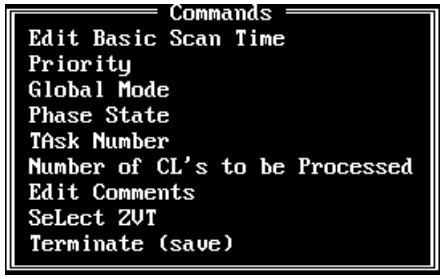
If the value shown in the ”Mode” field does not agree with the corresponding current status of the ZVT, then the field is highlighted to draw attention to this fact.

Change global and local data

- ”Online”, ”Run–Time System”, Select ZVT, <Return>, <Ctrl>+<Return>

Use <Ctrl>+<Return> to call a further menu. In it, you can modify the parameters.

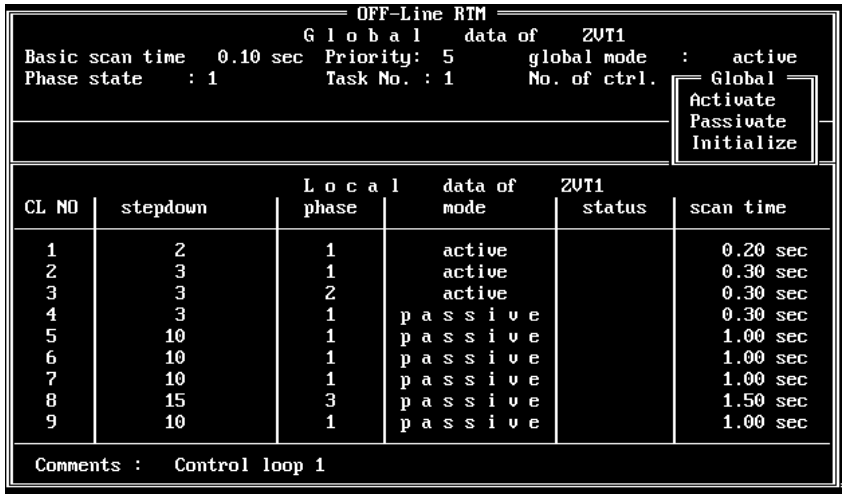
☞ **Note** For a description of the individual items, see page 33ff.



Other local data

- "Online", "Run–Time System", Select ZVT, <Return>, Select Column, <Return>

You can change local data by selecting the column using the arrow keys. You can then use <Return> to make the change (cursor moves to the left). Press <Return> again to adopt the change.



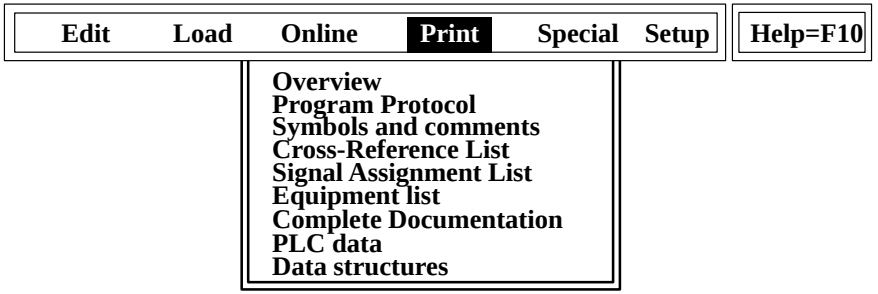
Note For a description of the individual items, see the Run–times chapter.

3.6 Print

You can choose to have a printout of the program overview, program protocols, symbols and comments, cross–reference lists, signal assignment lists, the equipment list, the complete documentation or the data structures, or have them displayed on the screen or printed to a file.

Select the reference letters to select the corresponding menu line directly.

You can also get into the submenu by moving the cursor to the corresponding menu line and pressing <Return>.

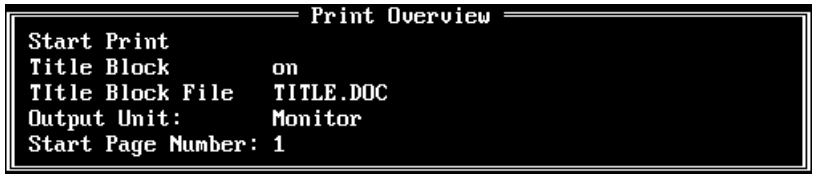


3.6.1 Overview

- ”Print”, ”Print Overview”

Here, you can print out the program overview graphic that is available under ”Edit”, ”Overview”.

After you have made your selection, the following pulldown menu becomes available:



3.6.1.1 Start printing

- ”Print”, ”Overview”, ”Start Printing”
- ”Print”, ”Program Protocol”, ”Start Printing”
- ”Print”, ”SFC Protocol”, ”Presetting”, ”Start Printing”
- ”Print”, ”Symbols and Comments”, ”Start Printing”
- ”Print”, ”Cross–Reference List”; ”Start Printing
- ”Print”, ”Signal Assignment list”, ”Start Printing”
- ”Print”, ”Equipment List”, ”Start Printing”
- ”Print”, ”Complete Documentation”, ”Start Printing”
- ”Print”, ”Data Structures”, ”Start Printing”
- ”Print”, ”Diagnostics Protocol”, ”Start Printing”
- ”Online”, ”PLC Status”, ”Start Printing”

In accordance with the remaining entries in the pulldown menu, you may now start printing.

3.6.1.2 Start Page number

- ”Print”, ”Overview”, ”Start Page Number”
- ”Print”, ”Program Protocol”, ”Start Page Number”
- ”Print”, ”SFC Protocol”, ”Start Page Number”
- ”Print”, ”Symbols and Comments”, ”Start Page Number”
- ”Print”, ”Cross–Reference List”, ”Start Page Number”
- ”Print”, ”Signal Assignment List”, ”Start Page Number”
- ”Print”, ”Equipment List”, ”Start Page Number”
- ”Print”, ”Complete Documentation”, ”Start Page Number”
- ”Print”, ”Data Structures”, ”Start Page Number”
- ”Print”; ”PLC Data”, ”Program Signals”, ”Start Page Number”
- ”Print”; ”PLC Data”, ”Data Structure”, ”Start Page Number”
- ”Print”, ”Diagnostics Protocol”, ”Start Page Number”

With this function, you can enter the page number (1 to 9999) for the first page of the printout.

For block–by–block page mode, you start again for each block or each list. The printout is numbered consecutively if the page mode is continuous.

3.6.2 Program protocol

- ”Print”, ”Program Protocol”

Use this function to make a printout of your user program (OB, PB, FB, TB, AZ, AE, KB), which you created using ”Edit”, ”Blocks”, in IL, LD or FBD, or print it to a file or screen. In KBs, sequencer presentation is selected automatically.

In this pulldown menu, you can select and call the following functions:

Print Program Protocol

Start Printing	
Output Mode	**IL**
Symbols and Comments	**on**
Cross-Reference List	**on**
Cross–Reference Mode	**Local (block by block)**
Title Block	**on**
Title Block File	**HEAD.DOC**
Output Unit	**Screen**
Block List	**PB**
Load Component List	
Save Component List	
Page Mode	**Block by Block**
Start Page Number	**1**

3.6.2.1 Output mode

- ”Print”, ”Program Protocol”, ”Output Mode”
- ”Print”, ”SFC Protocol”, ”Output Mode”
- ”Online”, ”Dyn. Status Display”, ”

With this menu command, you can select the mode of output for your program protocol. You can choose between Instruction list (IL), ladder diagram (LD) Aund function block diagram (FBD). Make the changeover by toggling. (<Return>)

3.6.2.2 Symbols and comments

- ”Print”, ”Program Protocol”, ”Symbols and Comment”
- ”Print”, ”SFC Protocol”, ”Symbols and Comments”
- ”Print”, ”Cross–Reference List”, ”Symbols and Comments”

You can toggle between ”on” and ”off”.

The entry ”on” means that the symbolic names and initial values you have assigned to the individual signals (inputs, outputs, markers, data structures, etc.), appear next to the signals when the list is printed.
After each network, a list is printed of all the signals which occur in the network, with symbol, comment and extended comments.

The ”Off” entry prevents these symbolic names, initial values, comments and extended comments from being printed out.

3.6.2.3 Cross–reference list

- ”Print”, ”Program Protocol”, ”Cross–Reference List”
- ”Print”, ”SFC Protocol”, ”Cross–Reference List”

The blocks from the block list make up the output when using this function. After each network, the inputs, outputs, markers, etc., you have used, are listed. It is also indicated in which networks of other blocks these addresses occur. The signals are displayed together with their symbols, initial values, comments and extended comments (if available in SYM/COM block).

You can toggle between ”on” and ”off”.

The entry ”on” means that the cross-reference list appears in the program protocol. For each block, it will then be stated on the printout in which network the signals also occur.

IL/LD/FBDe.g. Entry ”:PB1 1 (I)” or ” FB3 5 (O)”.

I.e. the requested signal appears in network 1 of PB1 as
an input $\triangleq$ Input $\triangleq$ I or in network 5 of FB3 as an output $\triangleq$ Output $\triangleq$ O.

3.6.2.4 Cross–reference mode

- ”Print”, ”Program Protocol”, ”Cross–Reference Mode”
- ”Print”, ”Cross–Reference List”, ”Cross–Reference Mode”
- ”Print”, ”Diagnostics Protocol”, ”Cross–Reference Mode”

You have to decide whether you want an output of the global, i.e. across all blocks, or the local, i.e. block by block cross–reference list. You can toggle between ”global” and ”local”.

local: the cross-reference list refers only to the specified block,
e.g. I2.1 5(I)

global: the cross–reference list refers to the specified block and
to all blocks called up from OB1.
e.g. I2.1 FB1 5(I)

In the ”Block list”, you must decide from which blocks the cross–reference lists should be created. An ”I” or an ”O” appears after the number of the network, in which the corresponding signal occurs as an output.

3.6.2.5 Page mode

- ”Print”, ”Program Protocol”, ”Page Mode”
- ”Print”, ”SFC Protocol”, ”Page Mode”
- ”Print”, ”Cross–Reference List”, ”Page Mode”
- ”Print”, ”Signal Assignment List”, ”Page Mode”
- ”Print”, ”Complete Documentation”, ”Page Mode”

Using this function, you can determine how the page numbering should be carried out by toggling:

continuously numbering: the start page number is only determined at the beginning, is continuous across the various blocks in the list

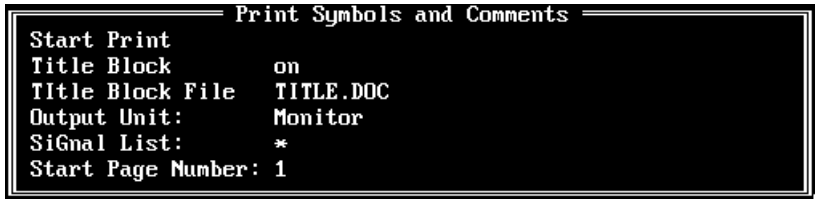
block by block: numbering starts again for each new block / each new list (at Start Page Number). Using this method allows you to insert a new block/a new list into an existing printout without adapting the numbering.

3.6.3 Symbols and comments

- ”Print”, ”Symbols and Comments”

You have the option of printing out the signals (inputs, outputs, markers, data structures, etc.), to which you have assigned symbolic names and comments in the menu item ”Edit”; ”Symbols and Comments”.

The following functions are available under this menu:



3.6.3.1 Signal list

- ”Print”, ”Symbols and Comments”, ”Signal List”
- ”Print”, ”Cross–Reference List”, ”Signal List”
- ”Print”, ”Signal Asignment List”, ”Signal List”

With this function, you enter signal ranges by which you are able to limit the output. The entries are valid for:

❒ * or clear	All the signals and data structures of a particular station will be considered (I, Q, M, MW, PB, FB, OB, VVZ ...)
❒ I, Q, VVZ ...	All the signals of a given type will beconsidered
❒ Ia.b-x.z	All signals of a given type from a.b to x.z will be considered
❒ In.m	Only the signal In.m will be considered

Use commas to separate the individual entries from each other.

3.6.4 Cross–Reference List

- ”Print”, ”Cross–Reference List”

All the inputs, outputs, markers, etc., which you have used in the cross–reference list are listed and the parts of the program in which they appear, are also specified.
You can either print out the global cross–reference list, i.e. across all blocks, or the local cross–reference list, i.e. block by block.

The following functions are available under this pulldown menu:

Print Cross Reference List

Start Printing	
Symbols and Comments	**on**
Title Block	**on**
Title Block File	**HEAD.DOC**
Output Unit	**Screen**
Cross–Reference Mode	**Local (block by block)**
Signal List	*****
Block List	**OB1**
Load Component List	
Save Component List	
Page Mode	**Block by Block**
Start Page Number	**1**

3.6.5 Signal assignment list

- ”Print”, ”Signal Assignment List”

The signal assignment list contains a list of all the inputs, outputs, markers, etc., you used, which are assigned in the blocks of the block list you created.

An ”X” in the corresponding position of the signal table means that this signal occurs in the blocks which are entered in the ”Block List”.

You can either print out the global signal assigment list, i.e. across all blocks, or the local signal assignment list, i.e. block by block.

The following functions are available in this pulldown menu:

Print Signal Assignment List

Start Printing	
Title Block	**on**
Title Block File	**HEAD.DOC**
Output Unit	**Screen**
Allocation Mode	**Local (block by block)**
Signal List	*****
Block List	**OB1**
Load Component List	
Save Component List	
Page Mode	**block by block**
Start Page Number	**1**

3.6.5.1 Allocation mode

- ”Print”, ”Signal Assignment List”, ”Allocation Mode”

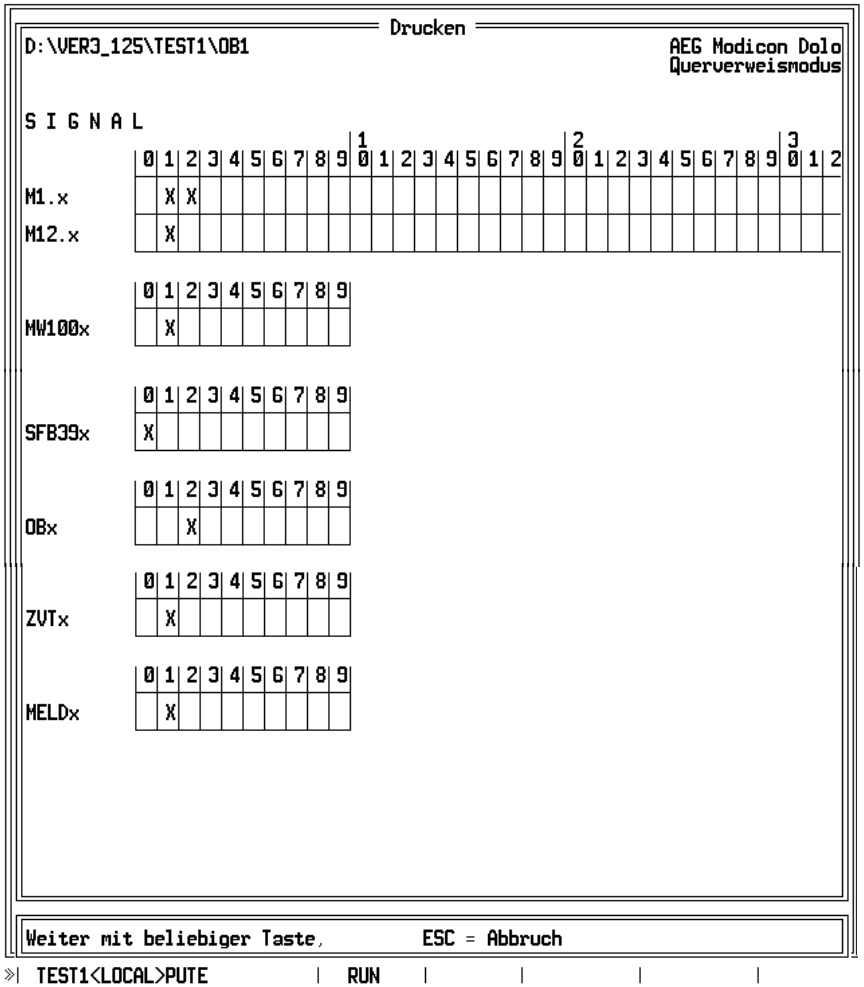
You have to decide here whether you want to print the global signal assignment list, i.e. across all blocks, or the local signal assignment list, i.e. block by block. You can toggle between ”global” and ”local”.

local: the assignment list relates only to the specified block
global: the assignment list refers to the specified block and to all blocks which are called up from that block

In the local signal assignment list, a list is made of all the signals which occur in a block and are entered in the signal list.

In the global signal assignment list, not only the local list, but also the blocks called from a block, are considered.

The following diagram gives an example of the signal assignment list on the screen.

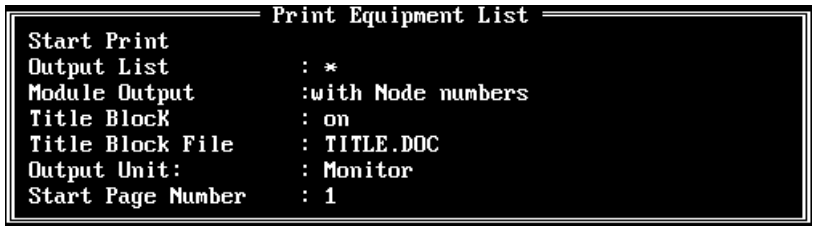

Drucken
D:\VER3_125\TEST1\OB1
AEG Modicon Dolo
Querverweismodus
S I G N A L
0 1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 20 1 2 3 4 5 6 7 8 9 30 1 2
M1.x X X
M12.x X
0 1 2 3 4 5 6 7 8 9
MW100x X
0 1 2 3 4 5 6 7 8 9
SFB39x X
0 1 2 3 4 5 6 7 8 9
OBx X
0 1 2 3 4 5 6 7 8 9
ZVTx X
0 1 2 3 4 5 6 7 8 9
MELDx X
Weiter mit beliebiger Taste, ESC = Abbruch
TEST1<LOCAL>PUTE | RUN

3.6.6 assignment list

– ”Print”, ”Equipment List”

With this function, you can have your station equipment list printed out. The slot reference, the equipment list, the BIK number, the structure types, the number, the directory block and the comments will be printed out. The file will only be printed out to the last assigned element.

The folowing functions are available under this pulldown menu:



3.6.6.1 Output list

- ”Print”, Equipment List”, ”Output List”

With this list you select which parts of the equipment list you want to print. The following settings, and therefore distinctions, are possible:

- ❒ M — All subracks
- ❒ Mx, ❒ Mx-y — x = 0: Slot 0 ... 9 (16), x = 1: Slot 20 ... 29 (36) ... etc.
- ❒ U — the modules in the subrack as a tree structure
- ❒ Z — the segmentation of signal memory (”Parameterize Central Controller”)
- ❒ * — U, Z and M

The individual items of information in a list must be separated by commas.

3.6.6.2 Module output

- ”Print”, ”Equipment List”, ”Module Output”

This function only takes effect if the output mode ”M”, ”Mx”, ”MX-y” or ”*” is set for ”Output List”.

For module output (output unit: ”Screen”, ”File” or ”Printer”) the following is usually printed:

- Slot reference, Module, Variant, Access procedure and Switch–off mode

In the available menu lines, select which additional options you wish to have.

You can toggle between:

❒ with comments	Module comments will be displayed as well (screen)
❒ with node numbers	Data type(s), node numbers will be displayed as well (screen)
❒ with job elements	Data type(s), scan and phase will be displayed as well

The outputs ”with comments” and ”with instance numbers” function only on the screen. In the printout, the output for ”with comments” and ”with instance numbers” is the same.

3.6.7 Complete Documentation

- ”Print”, ”Complete Documentation”

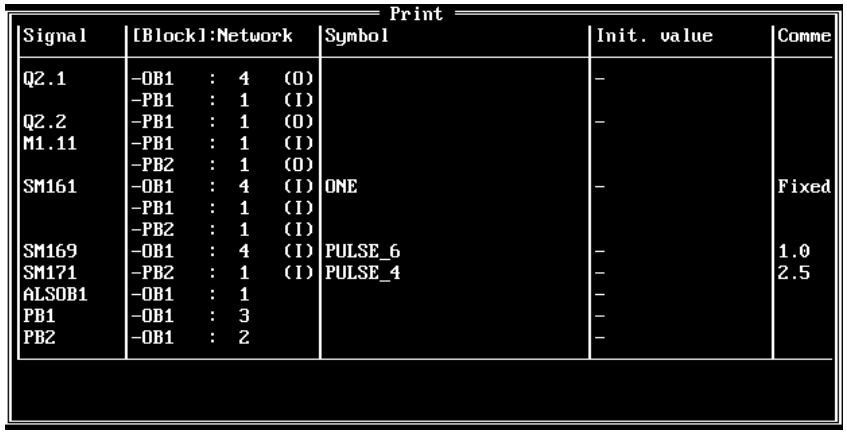
With this function, a summary of the following lists will be printed (chronologically):

- Equipment List
- Signal Assignment List
- Cross-Reference List
- Symbols and Comments
- Overview
- Program Protocol
- Data Structures
- Table of Contents

Only the elements which have been used in the program will be printed out.

In the printout of the lists, the settings of the various single menus will be taken into account. The following presets are available for the complete documentation:

In the following diagram, you can see an example of a section from a complete documentation printout.



Print

Signal	[Block]:Network	Symbol	Init. value	Comme
Q2.1	-OB1 : 4 (O)		-	
	-PB1 : 1 (I)			
Q2.2	-PB1 : 1 (O)		-	
M1.11	-PB1 : 1 (I)			
	-PB2 : 1 (O)			
SM161	-OB1 : 4 (I)	ONE	-	Fixed
	-PB1 : 1 (I)			
	-PB2 : 1 (I)			
SM169	-OB1 : 4 (I)	PULSE_6	-	1.0
SM171	-PB2 : 1 (I)	PULSE_4	-	2.5
ALSOB1	-OB1 : 1		-	
PB1	-OB1 : 3		-	
PB2	-OB1 : 2		-	

3.6.8 PLC data

- ”Print”; ”PLC Data”

Here, the contents of signals, data structure elements or complete data structures can be printed out. The data must have previously been read out from the PLC and saved in a file (see ”Process PLC data”).

The following functions are available:

All files created in connection with the data readout from the PLC, are saved in a separate subdirectory.

This directory is called ”SPSABZUG”.

3.6.8.1 Program signals

- ”Print”; ”PLC Data”, ”Program Signals”

Here you can print out program signals that have been extracted from the PLC using ”Read Program Signals”.

The following functions are available:

Start printing

- ”Print”; ”PLC Data”, ”Program Signals”, ”Start Printing”

The output of program signals is started. You should first check the correct setting of the menu parameters.

File name

- ”Print”; ”PLC Data”, ”Program Signals”, ”File Name”

Here you enter the name of the file with program signals, whose contents are to be printed out. The file must first have been created under ”Read Prog. Signals”.

A space followed by <Return> will reveal a selection window containing the available files.

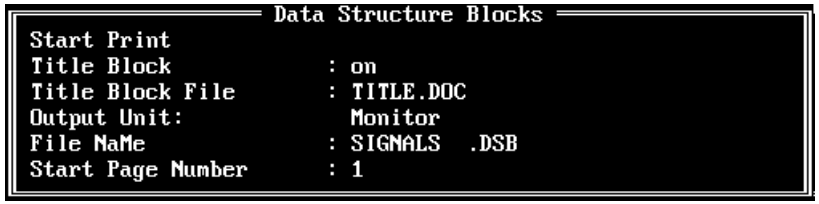
Note You cannot print out signal memory files with the extension ”.SSB” .

3.6.8.2 Data structureblocks

- ”Print”; ”PLC Data”, ”Data Structure Blocks”

Here you can print out data structures which have been extracted from the PLC using ”Read DBs and Streams”.

The following functions are available:



Note You cannot print out the contents of stream data structures.

Start printing

- ”Print”; ”PLC Data”, ”Data Structure”, ”Start Printing”

Data structure output commences. You should first check the correct setting of the menu parameters.

File name

- ”Print”; ”PLC Data”, ”Data Structure”, ”File Name”

Enter the name of the file with data structures, whose contents are to be printed out. The file should first have been created under ”Read DBs and Streams”.

A space followed by <Return> will reveal a selection window containing the available files.

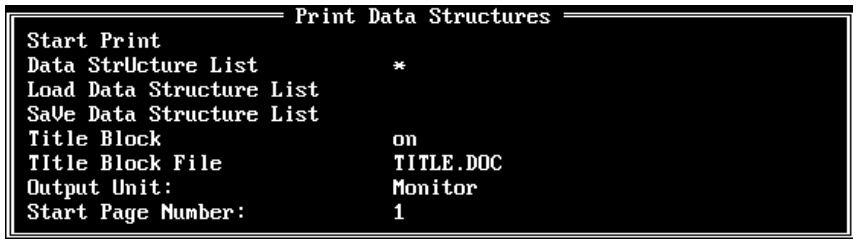
Note You cannot print out signal memory files with the extension ”.SSB” .

3.6.9 Data structures

- ”Print”, ”Data Structures”

Here you can have the data structures printed which appear in the data structure editor under ”Edit” (preset by AEG and user–defined data structures).

You can select and call the following functions in this pulldown menu:



3.6.9.1 Data structure list

- ”Print”, ”Data Structures”, ”Data Structure List”

Enter a list of all data structures that are to be processed. The list can comprise a maximum of 200 characters.

Valid input:

*	process all the data structures available under this station
BESLIS,NOKBF,...	process BESLIS, NOKBF, ...

The individual data structure entries should be separated by a comma.

You can overwrite existing entries or delete them with <Shift>+<F2> and then replace them.

Enter a space and press <Return> to reveal a window containing all the data structures from the station. You can move around in this window with the Arrow keys. Use <Return> to select the data structure on which the cursor is positioned. In this way, you can combine a number of data structures to form a list. Use <Ctrl>+<B> to terminate selection. The selected data structures will then be transferred to the menu line.

The list of data structures created in this way can now be given a name and stored, so that it can be reloaded at any time.

If you wish to have all the data structures printed, enter ”* ” (Presetting).

3.6.9.2 Load data structure list

- ”Print”, ”Data Structures”, ”Load Data Structure List”

The list created under ”Data Structure List” and stored under ”Save Data Structure List” is loaded by giving its name. Enter a space and press <Return> to reveal a selection window containing all the existing lists.

3.6.9.3 Save data structure list

- ”Print”, ”Data Structures”, ”Save Data Structure List”

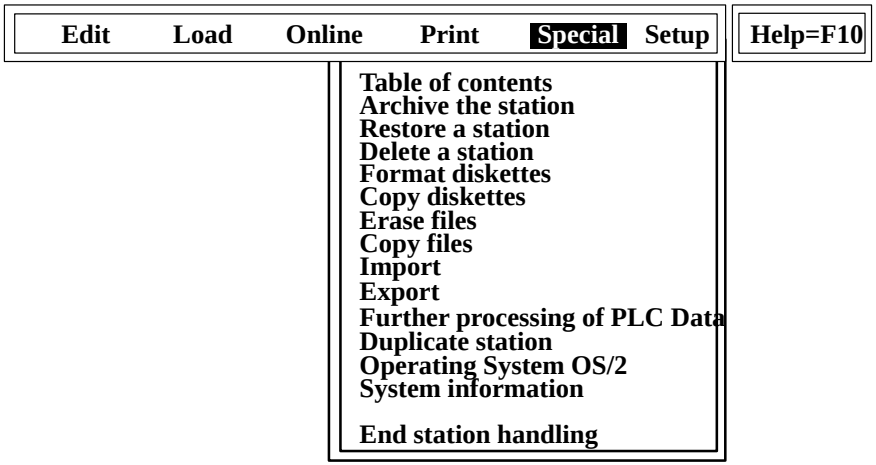
Use this function to save the list edited in ”Data Structure List” under any name desired. It can subsequently be loaded under this name in ”Load Data Structure List”. Enter a space and press <Return> to reveal a selection window containing all the existing lists.

The name of the data structure list should not contain a period.

3.7 Special

This menu contains the functions related to the programming units.

The following system functions are available:



3.7.1 Table of contents

- ”Special”, ”Table of Contents”

Use this function display the table of contents of your current station. You are then provided with an overview of the AKF blocks or DOS files located there.

Table of contents AKF blocks

- ”Special”, ”Table of Contents”, ”AKF Blocks”

This function allows you to view a table of contents with all the blocks from the station databank.

A pulldown menu appears containing the following functions (with sample entry):

Start printing

- ”Special”, ”Table of Contents”, ”AKF Blocks”, ”Start Printing”
- ”Special”, ”Table of Contents”, ”DOS Files”, ”Start Printing”

Once the remaining parameters have been established, you can start printing to the printer, a file or the screen.

Search key(s) (Mask) AKF Blocks

- ”Special”, ”Table of Contents”, ”AKF Blocks”, ”Search key(s) (Mask)”

Use the line editor to enter a mask for the files to be shown:

e.g.:	*	all blocks will be shown
	FB	display all function blocks
	PB2,FB	display PB2, then all FBs

Use a space and <Return> to reveal a window containing all the blocks available in the station databank. You can use the Arrow keys and <Return> to select and

mark the blocks in the list to be displayed. Use <Ctrl>+<B> to terminate selection. The selected blocks will then be transferred into the menu lines.

Type of output AKF blocks

 - ”Special”, ”Table of Contents”, ”AKF Blocks”, ”Type of Output”

This function allows you to specify how the output of the table of contents should look.
You can toggle between:
Long Form / Short Form.

Long form means: all the data from the blocks will be displayed (length, date etc.). Blocks will be arranged according to block type.

Short form means: only the block names will be displayed.

Table of contents DOS files

- ”Special”, ”Table of Contents”, ”DOS Files”

This function allows you to display a table of contents with all the files of the given station.

A pulldown menu appears containing the following functions (with sample entry):

Search key(s (Mask) DOS files

- ”Special”, ”Table of Contents”, ”DOS Files”, ”Search Key(s) (Mask)”

Use the line editor to enter a mask for the files to be shown:

e.g. *.* display all the files in the set station
*.ONL display all the files with the extension ONL

Type of output DOS files

 - ”Special”, ”Table of Contents”, ”DOS Files”, ”Output Type”

This function allows you to specify how the output of the table of contents should look.

You can toggle between:
Sorted Long Form / Unsorted Long Form
Sorted Short Form / Unsorted Short Form.

Long form means: all the data from the files will be shown (length, date, etc.). ”Sorted” means the files will be arranged alphabetically.
Short form means: only the file names will be displayed. Sorted means the files will be arranged alphabetically.

3.7.2 Backup a station or system

- ”Special”, ”Archive the Station”

Select this menu item to open a further window. Zur Auswahl wird das **Archivieren** (DOS-Backup) und ein **komprimiertes** Archivieren angeboten.

Backup / Compression

Backup
Compression

Use these functions to backup / save all the data of a **set** station or **system** to **any** drive.

Caution

- For external storage of data on diskette (DR A: or DR B:): All ”old” files on the diskette can be deleted following consultation.
- For external storage of data on disk drives: Already existing Bakkup files can be deleted folowing consultation.
- Restore / Decompression is only possible under the same station path (if necessary see Backup file CONTROL.001 or Filename.ZOO)
- Backup und Restore should
only be carried out in the same operating system version (see Operating system manual under ”Backup/Restore)

Note Only compression and decompression are possible independently of the operating system.

❒ Backup a station or system

The following functions are to be processed (with sample entry):

Backup

Start backup		
From station:	**F:\ANL_NAME\STA_NAME*.***	
To station	**A:**	(Preset)
Parameter	**/S**	(Preset)

Start backup

 - ”Special”, ”Backup Station”, ”Start Backup”

Once you have entered the station to be backed up and the target system, the backup commences.

From this point on, please follow the directions on the screen.

It is only possible to interrupt the backup by pressing <Ctrl>+<C> simultaneously.

After the backup, you are immediately returned to the menu.

Specify source station

- ”Special”, ”Backup Station”, ”From Station”

This is where the station or parts of the station to be backed up can be entered using the keyboard (line editor):

=>e.g.: **F:\ANL_NAME\STA_NAME*.***

Step 1 <Return> (initiate Edit)

Step 2 Enter Station Name

Step 3 Complete with <Return>

Note If **no** station is entered, the entire **system** is backed up. The entry then would be
=>e.g.: **F:\ANL_NAME*.***.

Specify target address

 - ”Special”, ”Backup Station”, ”To station”

This is where the target drive is entered using the keyboard (line editor).

=>e.g.: **A:**

This is where the entries ”A:” and ”B:” are useful for **external** storage of data. For **rapid** re–use, **diskette drives** can also be used.

Step 1 <Return> (initiate Edit)

Step 2 Enter target drive

Step 3 Complete with <Return>

Note We recommend that when formatting diskettes, you assign the station name to the data carrier, so that it can be identified at a later date.
If necessary, the **station path** and also the first lines can be taken from the backup file **CONTROL.001**.

Specify parameters for data transfer

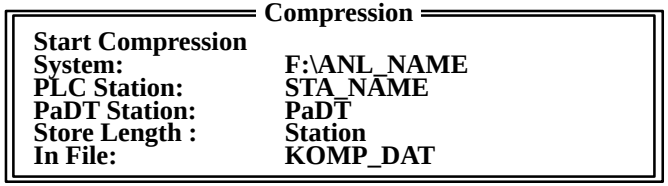
 - ”Special”, ”Backup station”, ”**Parameters**”

Parameter ”S” is **preset** for the backup **including** the sub–directory. Further parameters can be found in the Help texts.

=>e.g.: **/S**

❒ **Compressed backup of station or system**

The following functions are to be processed (with sample entry):



(Preset)

Start compression

- ”Special”, ”Backup Station”, ”**Start Compression**”

Press <Return> to transfer and in accordance with the entry of the parameters shown below, the compressed backup commences.

Follow any messages / instructions on the screen.

It is only possible to interrupt during the backup by pressing <Ctrl>+<Pause> simultaneously.

After the backup, you are immediately returned to the menu.

Note It must be possible for compression to be carried out **without** changing the data carrier.

Enter system path

 - ”Special”, ”Backup Station”, ”**System**”

Enter here the **system path** of the station to be backed up (drive + system name):

=>e.g.: **F:\ANL_NAME**

Select station name

 - ”Special”, ”Backup Station”, ”**PLC Station**”

You can select the **Station Name** from a list in a window. Enter a space and press <Return> to open a corresponding window and press <Return> to transfer the desired station name:

=>e.g.: **STA_NAME**

Select PaDT station

 - ”Special”, ”Backup Station”, ”**PaDT station**”

Any of the PaDT stations contained in the system can be accepted here for bakkup, by pressing <Return> and <Ctrl+B>. The preset is the V24 PaDT.

=>e.g.: **PaDT1,PaDT2,PaDT3,PaDT**

Select store length

 - ”Special”, ”Backup Station”, ”**Store Length**”

Toggle to choose between **Entire System**, a **Station with** its various PaDTs and a **Station without** PaDTs.

=>e.g.: **Station+PaDT**

Specify target file (In File)

- ”Special”, ”Backup Station”, ”**In File**”

After selection with <Return>, there are two target file default options:

- Default of file name with **Storage** under the **system name** indicated in Setup.

=>e.g.: **KOMP_DAT** => see Note

- Default of a **complete** storage path such as :

=>e.g.: **H:\KOMP\KOMP_DAT** => see Note

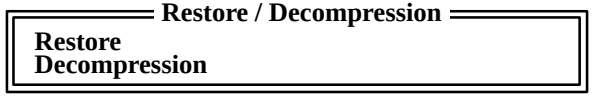
The maximum length for the **file**name under which storage is to be made, is 8 characters. The backup you generate is stored under this name. The system assigns the extension (.ZOO) automatically and this is not displayed. The **Directory**name (e.g: KOMP) must have previously been defined by the user.

Note If **no** extension is specified, the system provides you with **.ZOO**. However, you can also specify your **own** extension. This enables you, for example, to save or backup different configuration levels.

3.7.3 Restore a station or system

- ”Special”, ”Restore a Station”

Select this menu item to open a further window. The choice is between **Restore** (Dos-Restore) and a **decompression restore**.



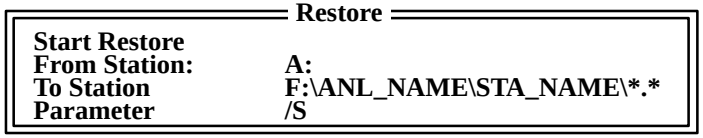
Use these functions to restore all the data of a **backed–up station or system** under the **same path name** , from any drive.

Caution **Files which already exist will be overwritten** without comment**.**

Note **Only compression and decompression are possible** independently **of the operating system.**

❒ **Restore a station or system**

The following functions are to be processed (with sample entry):



(Preset)

(Preset)

Start Restore

 - ”Special”, ”Restore a Station”, ”Start Restore”

Call this menu item to start Restore in accordance with the set defaults.

From this point on, please follow the directions on the screen.

It is only possible to interupt during Restore by pressing <Ctrl>+<C> simultaneously.

After Restore, you are immediately returned to the menu.

Specify source drive

- ”Special”, ”Restore a Station”, ”From Station”

This is where the source drive is entered using the keyboard (line editor).

=>e.g.: **A:**

The entries ”A:” and ”B:” for **external** storage of data are useful here. However, you can also use the **disk drives** in the same way.

Step 1 <Return> (initiate Edit)

Step 2 Enter source drive

Step 3 Complete with <Return>

Specify Target Station

- ”Special”, ”Restore a Station”, ”To Station”

Use the keyboard (line editor) to enter the **path** of the Target station, including the drive:

=>e.g.: **F:\ANL_NAME\STA_NAME*.***

The path name must **match** the backup name.

Warning **Existing files with the same name will be overwritten!**

Step 1 <Return> (initiate Edit)

Step 2 Enter station name

Step 3 Complete with <Return>

Specify data transfer parameter

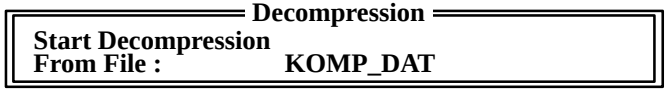
- ”Special”, ”Restore a Station”, ”Parameter”

Parameter ”S” is **preset** for Restore **including** the sub–directories. Additional parameters can be found in the Help texts.

=>e.g.: **/S**

❒ **Decompression Restore of a station or system**

The following functions are to be processed:



Start decompression

- ”Special”, ”Restore a Station”, ”**Start Decompression**”

Transfer with <Return> to start the decompression restore in accordance with the subsequent parameters.

Follow any messages / instructions on the screen.

Caution Files which already exist will be overwritten.

It is only possible to interrupt decompression by pressing <Ctrl>+<C> simultaneously.

After decompression, you are immediately returned to the menu.

Specify source file (From File)

- ”Special”, ”Restore a Station”, ”**From File**”

Once selection is made with <Return>, there are two source file default options:

- Default of only the file name, if the backup was made without a default path and the currently set station corresponds to the Setup at the time the backup was made :

=>e.g.: **KOMP_DAT**

- Default of the complete storage path such as :

=>e.g.: **H:\KOMP\KOMP_DAT**

Note The station path currently given in **Setup** is normally **without** significance. However, if decompression of a set station occurs immediately after compression, ALD25 must be called again beforehand.

If the station path does **not** exist on the PC, it is **created** during **decompression**.

3.7.4 Erase a station

- ”Special”, ”Erase a Station”

The given station will be irrevocably erased after confirmation has been given. Enter a space and <Return> to display a selection window.

Note This function requires you to specify the complete station name, e.g. ”F:\ALD25\EXAMPLE” and the station to be erased must not match the current station.

3.7.5 Format diskettes

- ”Special”, ”Format Diskettes”

New diskettes must first be formatted, before they can be used as data carriers. Formatting prepares the diskette so that the operating system can read it and save data on it.

Caution Formatting destroys all data stored on the diskette (it can thus be used to completely erase a diskette).

The following functions are available under this pulldown menu:

Start formatting

 - ”Special”, ”Format Diskettes”, ”Start Formatting”

Specify the drive and if applicable the parameters, to start formatting.

After you have chosen this function, please follow the directions that appear on the screen.

Formatting cannot be aborted.

drive

 - ”Special”, ”Format Diskettes”, ”Drive”

By toggling, you can specify the data carrier to be formatted.
A: means that the diskette in drive A: will be formatted.

Parameter

 - ”Special”, ”Format”, ”Parameter”

This is where you can use the line editor to enter additional parameters to be edited (for additional information, please see the Operating System manual).

Examples for parameters (these are valid for portable AEG programming units; different manufacturers may use different parameters; please check your operating system manual):

/4 The diskette will be formatted with 40 tracks per side. This parameter is used to format a 5 $^{1}/_{4}$ inch diskette with 360 KB in a 1.2 MB drive. This allows you to use 360 KB diskettes in a high density drive. It is not guaranteed, however, that you will be able to read these diskettes in a 2D or DD drive as well.

/V Enables you to assign a name to the data carrier (max. 11 characters including spaces). When you are backing up a station, we recommend that you specify the station name, as otherwise it will only be possible to identify the diskette again when it is restored.

3.7.6 Copy diskettes

- ”Special”, ”Copy Diskettes”

This function is used to copy the entire contents of one diskette onto another diskette of the same capacity. Any data stored on the target diskette will be destroyed, as the target diskette will be formatted for copying.

The following functions are available in this pulldown menu:

Start copying diskette

- ”Special”, ”Copy Diskettes”, ”Start Copying Diskettes”

After the source and target drives have been entered, copying will begin.

After this function has been chosen, please follow the directions that appear on the screen.

Once this function has started, it is possible to abort by pressing <Ctrl>+<C>.

Source drive or target drive

- ”Special”, ”Copy Diskettes”, ”Source Drive” or ”Target Drive”

Using the line editor, you can enter the same drive twice or different drives.

Ex.1, one drive:	Ex.2, two drives:
Source drive: A:	Source drive: A:
Target drive: A:	Target drive: B:
	- or B to A.

3.7.7 Erase Files

- ”Special”, ”Erase Files”

This function can be used to delete any number of AKF blocks in the current station or DOS OS/2)files.

Delete AKF blocks

 - ”Special”, ”Delete Files”, ”AKF Blocks”

Using the line editor, you can enter a mask for the block(s) to be deleted. Enter a space and <Return> to display a selection window. You can then use the Arrow keys and <Return> to select and mark the blocks to be deleted in the list. Press <Ctrl>+<Return> to acept these as a mask in the list.

In the case of AKF blocks, this function is only valid for the current station.

e.g.	*	Delete all blocks
	FB	Delete all FBs
	FB10	Delete FB10

It is only possible to interrupt the deletion by pressing <Ctrl>+<C> simultaneously.

Erase DOS files

 - ”Special”, ”Erase Files”, ”DOS Files”

The line editor is used to enter a mask for the files to be erased. Enter a space and <Return> to display a selection window.

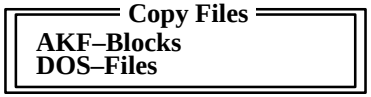
e.g.	***.*** =>	Erase **all** files of the current station
	F:\ANL_NAME\STA_NAME*.TXT	on the hard disk in the station ”**STA_NAME**” erases all files with the extension **.TXT**

It is only possible to interrupt the deletion by pressing <Ctrl>+<C> simultaneously.

3.7.8 Copy files

- ”Special”, ”Copy Files”

Use this command to copy AKF blocks within the station (e.g. FB1 to FB2) or DOS files between any two directories.



Copy AKF blocks

- ”Special”, ”Copy Files”, ”AKF Blocks”

The following functions are available under this pulldown menu:

This function allows you to store a block under a **different** name (i.e. copy).

Caution If you copy OB1, the ALSOB1 call is deleted.

Caution If you copy any block to OB1, the ALSOB1 call is transferred to Network 1.

Start copying

- ”Special”, ”Copy Files”, ”AKF Blocks”,”Start Copying”
- ”Special”, ”Copy Files”, ”DOS Files”, ”Start Copying”

After source and target have been specified, copying will begin.

source

- ”Special”, ”Copy Files”, ”AKF Blocks”,”Source”

Using the line editor, enter under source the block to be copied. Enter a space followed by <Return> to display a selection window. Use the Arrow keys and <Return> to select a block from the list.

AKF blocks can only be copied within the current station.

target

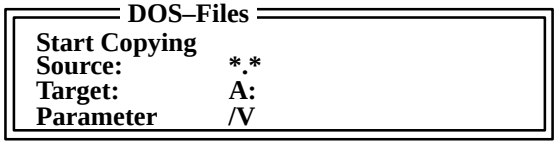
- ”Special”, ”Copy”, ”AKF Blocks”, ”Target”

This is where the target block is entered (block name under which the copied block will be stored). Enter a space followed by <Return> to display a selection window. Use the Arrow keys and <Return> to select a block from the list.

Copy DOS files

- ”Special”, ”Copy files”, ”DOS files”

The following functions are available under this pulldown menu:



You can use the Replace character (”Wildcards”) ”?” and ”*” in the source and target names.

When using replace characters, please always ensure that you will not unknowingly overwrite important files.

☞ **Note** External data structures (e.g. VVzn, VRGxy) may not be copied into other stations, as this could lead to naming conflicts; they must always be created for the particular station by using the specific configuration sofware (e.g. VS200).

☞ **Note** AKF blocks (Stations) may not be copied into ALD stations. You should use the Export or Import function.

source

 - ”Special”, ”Copy Files”, ”DOS Files”, ”Source”

Using the line editor, enter under source the file to be copied along with the entire path.

e.g.: **F:\ANL_NAME\STA_NAME\BES25.DAT:** File **BES25.DAT** of station ”**STA_NAME**” in directory ”**ANL_NAME**” on drive F:of the hard disk will be copied to the ”target”.

F:\ANL_NAME\STA_NAME\CODE.SPS*.*: **All** files from directory will be copied.

If a file name rather than a path is entered, the file of the current station will be copied.

target

 - ”Special”, ”Copy”, ”DOS Files, ”Target”

This is where the target directory for the files under ”Target” is entered using the line editor.

Parameters

 - ”Special”, ”Copy”, ”DOS Files”, ”Parameters”

Specify additional parameters here for copying with the line editor (additional information can be found in the OS/2 manual).

Parameters:
/V: Checks the copy
/A: The file will be treated as a text file.
Source: The file will be copied up to, but not including, the EOF character.
Target: The file is terminated with the EOF character.
/B: Source: The entire file will be copied.
Target: The file will not be terminated with an EOF character.

3.7.9 Import

- ”Special”, ”Import”

This function is used to import data from ASCII files (i.e. inserted into the current station). In order to be able to import with this function, you must either previously have carried out an export in another station or have used an editor to create an ASCII import file.

Importing stream DBs to the second MByte
From Version 7.1, stream DBs can also be loaded by importing into the second Mbyte. Previously, this had only been possible by definition using the Data Structure Editor in the currently set station (Extended=Yes).

Carry out the individual functions in the order in which they occur in the Import menu. Import ”Equipment List” **before** ”Symbols and Comments” and ”Blocks”. Otherwise it can cause errors in the SYM/COM file and in the blocks (unknown operands)

The following functions are available:

.

Example of Possible Errors
You can produce an error by attempting the following:

For example, there are 3 stations called ”A”, ”B” and ”C”. Various files are to be taken from them, to create a station called ”D”.
It is possible in ALD / AKF125 to define user–specific data structures that are only valid in one station, i.e. it is possible to define date structures with the same name in all stations, but they will have different structures in each.

The data structures are exported from station A, which has data structure ABCD. The symbol and comment files as well as the equipment list are exported from station B, which also has data structure ABCD but this is different to that of station A. The AWP blocks are exported from station C, which also has data structure ABCD, but this has nothing in common with the data structures of stations A and B.

All the ASCII files are imported one after the other in the correct order, into station D. When importing, the Import program cannot recognize that, for example, the signals in the symbol and comment files from data structure ABCD (from station B), do not refer to the previously imported data structure ABCD (from station A). Neither does it recognize that the references to data structure ABCD (from Station C) are no longer valid, it is just that there is a data structure with the same name. Even though it is unlikely that such a mixture could be compiled and linked, the inconsistencies in the new station D will be very hard to find.

Note If, in the hope of saving yourself some work, you are planning to take parts from different stations that are only imperfectly suited and then somehow adapt these to new tasks, you should first check whether problems might arise as a result of name conflicts, particularly for the user data structures.

3.7.9.1 Total import

- ”Special”, ”Import”, ”Total Import”

This function represents a combination of the functions ”Data Structures”, ”Blocks”, ”Symbols and Comments”, ”Equipment List” and ”External Data Structure”.

The system handles each of these in turn, until an error occurs or until an Abort command is received from the user. The Import files will be expected in the path ”**Source Directory\G_EXPIMP**”. The result will be stored in the **current** station directory, if **no** alternative source directory is specified.

Before the function is executed, you will be asked to decide whether or not the function should be directly terminated if an error occurs.

If ”Y” (Yes) is entered, an error will cause the individual function to be ended and an error message to be displayed. The total import will be aborted. This will be accompanied by a separate message.

If ”N” (No) is entered, the error messages of the individual functions will be collected and then displayed when the total import is finished. The function total import will not be aborted.

The following pulldown menu is available (the entry is merely an example):

Total import

Start
Source directory: **F:\ANL_NAME\STA_NAME**

Start Importing

- ”Special”, ”Import”, ”Total Import”, ”Start”
- ”Special”, ”Import”, ”Data Structures”, ”Start”
- ”Special”, ”Import”, ”Equipment List”, ”Start”
- ”Special”, ”Import”, ”Blocks”, ”Start”
- ”Special”, ”Import”, ”Symbols and Comments”, ”Start”
- ”Special”, ”Import”, ”External Data Structures”, ”Start”

The data to be imported from the selected import file will be moved to the specified station.

Import Source Directory

- ”Special”, ”Import”, ”Total Import”, ”Source Directory”
- ”Special”, ”Import”, ”Data Structures”, ”Source Directory”
- ”Special”, ”Import”, ”Equipment List”, ”Source Directory”
- ”Special”, ”Import”, ”Blocks”, ”Source Directory”
- ”Special”, ”Import”, ”Symbols and Comments”, ”Source Directory”
- ”Special”, ”Import”, ”External Data Structures”, ”Source Directory”

This is where the complete path is entered from which the data is to be imported.

If a path is not given, the data to be imported will be expected in the current station directory.

3.7.9.2 Import data structures

- ”Special”, ”Import”, ”Data Structures”

This is where the external data structures from the selected import file can be read. The data structures are subject to the same conditions as in the data structure editor and will be integrated into the selected station.

Note If **no** Source Directory is entered, the data to be imported is expected in the current **station directory**.

The following functions are available (with sample entry):

Import

Start
Source directory: **F:\ANL_NAME\STA_NAME\DST_EX**
Import file name:

If, upon reading, an error occurs, an error file with the name of the import file along with the extension ’.FST’ will be stored in the station directory currently set. This file can be corrected with an ASCII editor and then loaded again.

Note Data structures already present in the system such as standard AEG data structures can no longer be imported. The existing data structure of the same name will not be overwritten. An entry will be made in the error file.

Import Import file name

- ”Special”, ”Import”, ”Data Structures”, ”Import File Name”
- ”Special”, ”Import”, ”Equipment List”, ”Import File Name”
- ”Special”, ”Import”, ”Symbols und Comments”, ”Import Data Name”

This is where the name of the file that you wish to have imported is entered. The file extension refers to the contents of the file.

Data Structures	AST / FST / DST
Blocks	IL
Symbols and Comments	ASD / FSD / DSD
Equipment List	ABL

If no entry is made, a list will be generated of all the import files in the source directory which come into consideration for the chosen function. An import file can be selected from this list.

3.7.9.3 Import Equipment List

- ”Special”, ”Import”, ”Equipment List”

This is where the equipment lists from the entered import files can be read in and integrated into the specified station.

The following functions are available (with sample entry):

Import

Start
Source directory: **F:\ANL_NAME\STA_NAME\BESLI_EX**
Import file name:

If, upon reading the file, an error occurs, you will be asked if an error list is to be shown. If you so wish, a list of all the errors which have occurred, will be displayed. This list includes the line number in which an error is to be found, as well as its position within the line, separated by commas. Only ASCII Equipment Lists that are without error can be integrated; otherwise the Equipment List remains unchanged.

Errors can occur when an equipment list is modified via ”Edit”, ”Equipment List” after it has been imported and before symbols / comments and blocks have been imported. If, for example, a module is removed which is referred to within the symbol and comment data or in the blocks of the user program, error messages will be generated upon importing these files and stored in the corresponding error files.

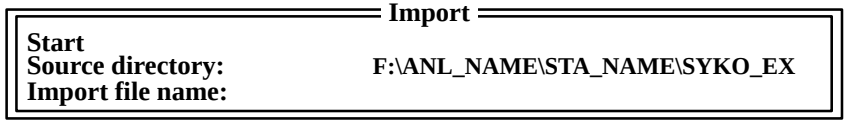
Incompatibility of Equipment Lists
The integration of new or modified modules has led to incompatibilities in the Equipment Lists of different ALD versions, or when changing from AKF to ALD.

3.7.9.4 Import Symbols and Comments

- ”Special”, ”Import”, ”Symbols and Comments”

This is where symbols, comments and initial values can be read in from an import file.

The following functions are available (with sample entry):



The symbols and initial values are subject to the same conditions as in the symbol and comment editors and will be integrated in the system.

If, upon reading, an error occurs, an error file named after the import file but with the extension ’.FSD’ will be stored in the source directory. These files can be corrected with an ASCII editor and read in again later.

3.7.9.5 Import blocks

”Special”, ”Import”, ”Blocks”

This is where blocks can be read in from ASCII files.

When importing an ASCII IL, the conversion process is logged in a log file. It will contain a list of the ASCII files processed and the AKF blocks generated.
In addition, the following errors are listed:

- Errors identified by the converter, with the line number of the ASCII file.
- Errors of the AKF compiler which lead to an Abort command, with the network number and the instruction number, in accordance with AKF notation.

The log file is always called ”**PROT.PRT**” in the current station.

The following functions are available (with sample entry):

Import

Start	
Source directory:	**F:\ANL_NAME\STA_NAME\BAUST_EX**
Block list:	*****

Import blocks Block list

 - ”Special”, ”Import”, ”Blocks”, ”Block List”

Specify the blocks here which you wish to have imported with the import file.

File identifiers should be entered here without an extension, as the defined extension ”.IL” is a requirement. The default is *; this means all ASCII files with the extension ”*.IL”. You may only enter the name of o n e ASCII file to be converted.

A list with a maximum of 200 characters consisting of ASCII file names without the extension ”.IL” can be entered. Entries are to be separated by commas. The standard wildcards ”?” and "*” are valid.

Example: FB*,PB1?,PB222,HUGO,SFBG_11

If no entry is made, a window opens containing all the files with the extension ”.IL” which can be found in the specified source directory. Files can then be selected from here and combined to make a list by moving the cursor and selecting with <Return>.

3.7.9.6 Import external data structures

- ”Special”, ”Import”, ”External Data Structures”

This is where external data structures can be imported from the source directory to the current station directory. The file extension ”.EDB” attatched during exporting, will be removed.

The following functions are available:

Import

Start	
Source directory:	**F:\ANL_NAME\STA_NAME\EXDSR_EX**
Structure list:	*****

Import external data structures / structure list

- ”Special”, ”Import”, ”External Data Structures”,”Structure List”

A list of external data structures can be entered. This list can contain a maximum of 200 characters. The entries are to be separated by commas (e.g. VRG1,VVZ1,etc.).

Enter an empty field to generate a list of all the external data structures which can be imported. You can use <Return> to mark individual data structures, which can then be combined to make a list.

3.7.10 Exporting station–specific data

 - ”Special”, ”Export”

Use this function to export data from the set station in ASCII files (i.e. swapped from the current station). There is a free choice of relocation target.

The menu shown below contains the Export function options.

Export

Total export
Data structures
Equipment list
Symbols and comments
Blocks
External data structures

3.7.10.1 Total export of current station

- ”Special”, ”Export”, ”Total Export”

This function is a combination of the functions ”Data Structures”, ”Blocks”, ”Symbols and Comments”, ”Equipment List” and ”External Data Structures”.

The system handles each of these functions in turn until an error occurs or an Abort command is received from the user.

☞ **Note** The result is stored in **Target directory\G_EXPIMP**”.

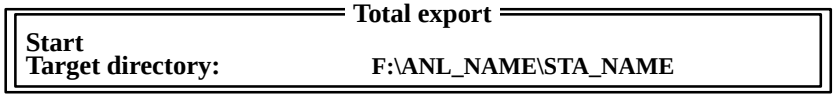
Before the function is executed, you will be asked to decide whether or not the function should be directly terminated if an error occurs.

If ”Y” (Yes), when an error occurs, the individual function will be terminated with an error message and the Total export will be aborted. This will be accompanied by a separate message.

If you enter ”N” (No), the error messages of the individual functions will be collected and then displayed at the end of the total export. The total export function will not be aborted.

☞ **Note** Importing at a later date can lead to changes in the sequencer presentation (**only for ALD application**) and this may mean that some of the step numbers could be allocated differently. For reasons of clarity, we therefore recommend that you export with symbolic addressing.

The following functions are available:



Start Export

- ”Special”, ”Export”, ”Total Export”, Start”
- ”Special”, ”Export”, ”Data Structures”, ”Start”
- ”Special”, ”Export”, ”Equipment List”, ”Start”
- ”Special”, ”Export”, ”Blocks”, ”Start”
- ”Special”, ”Export”, ”Symbols and Comments”, ”Start”
- ”Special”, ”Export”, ”External Data Structures”, ”Start”

The data to be exported will be stored in the export file.

Name target directory for Export

- ”Special”, ”Export”, ”Total Export”, ”Target Directory”
- ”Special”, ”Export”, ”Data Structures”, ”Target Directory”
- ”Special”, ”Export”, ”Equipment List”, ”Target Directory”
- ”Special”, ”Export”, ”Blocks”, ”Target Directory”
- ”Special”, ”Export”, ”Symbols and Comments”, ”Target Directory”
- ”Special”, ”Export”, ”External Data Structures”, ”Target Directory”

This is where you enter the **complete path**, in which the Export file is to be stored. If this path does not exist, it will be set up when the function is started. If this is impossible, the function will be aborted.

If a target directory is not given, the data being exported will be stored in the current station directory.

The default allocation is the current station directory.

3.7.10.2 Export data structures

- ”Special”, ”Export”, ”Data Structures”

This is where data structures can be stored in an export file.

The following functions are available (with sample entry):

Determine Export file name

- ”Special”, ”Export”, ”Data Structures”, ”Export File Name”
- ”Special”, ”Export”, ”Equipment List”, ”Export File Name”
- ”Special”, ”Export”, ”Blocks”, ”Export File Name”
- ”Special”, ”Export”, ”Symbols and Comments”, ”Export File Name”

This is where the name of the file is entered in which the data is to be stored. You can choose the name. The extension will be subsequently added by the system, it will not be shown.

Data Structures	AST / FST / DST
Blocks	IL
Symbols and Comments	ASD / FSD / DSD
Equipment List	ABL

Name data structures to be exported

 - ”Special”, ”Export”, ”Data Structures”, ”Structure List

A list of data structure names can be entered. This list can contain a maximum of 200 characters. The entries are to be separated by commas.

Enter a blank field to generate a list of all the data structures from the set station, which can be exported. You can then select individual data structure names and combine them to make a list.

System and division structures can only be exported with appropriate authorization. If this is not available, the entry will be rejected with an error message.

3.7.10.3 Export equipment list

 - ”Special”, ”Export”, ”Equipment List”

This function is used to store equipment lists in an ASCII file.

The following functions are available:

Export

Start
Target directory: **F:\ANL_NAME\STA_NAME**
Export file name: **BESLI_EX**

3.7.10.4 Export symbols and comments

- ”Special”, ”Export”, ”Symbols and Comments”

This function is used to store symbols, comments and initial values in an export file.

The following functions are available (with sample entry):

Export symbols and comments / Signal list

- ”Special”, ”Export”, ”Symbols and Comments”, ”Signal List”

A list of signals can be entered. The list can consist of a maximum of 50 characters. The entries are to be separated by commas. Range specifications are possible.

Example: I1.1-1.32, M ,APOA1

In this example, the entries for signals I1.1 to I1.32, for all the markers and for the data structure APOA1 are exported.

3.7.10.5 Export blocks

- ”Special”, ”Export”, ”Blocks”

This function is used to store blocks in one or more ASCII files.

☞ **Note** **Importing** at a later date can lead to **changes in the presentation** of the sequencer and this may mean that some of the **step numbers** could be allocated **differently**. For reasons of clarity, we therefore recommend that you export with symbolic addressing.

☞ **Note** Transition blocks (TBs) when exporting **KBs**, are automatically **exported with them**.

The following functions are available (with sample entry):

Export output mode

 - ”Special”, ”Export”, ”Blocks”, ”Output Mode”

Files are always generated according to the output mode.
ASCII IL files located in the target directory will automatically be overwritten if the names are identical.

You can toggle between the following settings:

- ASCII Block Files
  An ASCII file with the block name and the extension ”.IL”, xxxxx.IL, will be generated for each AKF block xxxxx.
- ASCII Station File
  An ASCII file with the name of the station and the extension ”.IL”, yyyyy.IL, will be generated for all the AKF blocks from station yyyyy.

Export blocks / Block list

 - ”Special”, ”Export”, ”Blocks”, ”Block List”

This list allows you to specify which blocks are to be exported, e.g. PB, FB10, etc.

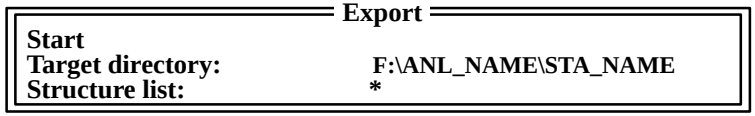
3.7.10.6 Export external data structures

- ”Special”, ”Export”, ”External Data Structures”

This function is used to export external data structures into the target directory selected.

They will be given the file extension code ”.EDB”.

The following functions are available (with sample entry):



Export external data structures / Structure list

- ”Special”, ”Export”, ”External Data Structures”,”Structure List”

A list of external data structures can be entered. This list can contain a maximum of 200 characters. The entries should be separated by commas (e.g. VRG1,VVZ1,etc.).

Enter an empty field to generate a list of all the external data structures which can be imported. You can use <Return> to mark the individual data structures which are then combined to make a list.

3.7.11 Further processing of PLC data

- ”Special”, ”Further Processing of PLC Data”

Here you can continue processing the contents of signals, data structure elements or complete data structures, i.e. take over the values into the SYM/COM databank or create an ASCII Export file. The data must previously have been read out of the PLC and be stored in a file (see also ”PLC Data” Processing).

The following functions are available:

All files created in connection with the read–out of data from the PLC, is saved in a separate subdirectory.

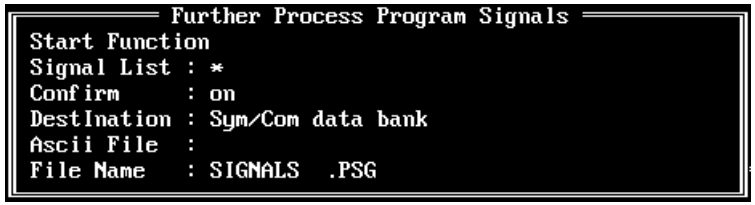
This directory is called ”**SPSABZUG**”.

3.7.11.1 Program signals

- ”Special”, ”Further Processing of PLC Data”, ”Program Signals”

Here you can continue processing the program signals which you extracted from the PLC using ”Read program signals”. **Further processing** can include **ASCII Export** or the direct transfer of data into the **symbol and comment databank**, as you wish.

The following functions are available:



Start function

- ”Special”, ”Further Processing of PLC Data”, ”Program Signals”
  ”Start Function”

This starts the further processing of a file with program signals. You should first check the correct setting of the menu parameters.

Destination

- ”Special”, ”Further Processing of PLC Data”, ”Program Signals” ”Destination”
- ”Special”, ”Further Processing of PLC Data”, ”Data Structure Blocks” ”Destination”

There are two possibilities for processing the contents of program signal files (.PSG) or data structure files (.DSB):

a. take them over into the Sym/Com databank as initial values
b. ASCII export

a. The signals you have chosen will be directly entered into Sym/Com databank as initial values.

b. The signals you have chosen will be exported in the form of an ASCII file. (Also refer to ”Special”, ”Import”, ”Symbols and Comments”)

ASCII file

- ”Special”, ”Further Processing of PLC Data”, ”Program Signals” ”ASCII Files”
- ”Special”, ”Further Processing of PLC Data”, ”Data Structure Blocks” ”ASCII Files”

Enter here the name of the ASCII file in which an ASCII export of the signal memory contents or the data structure contents is to take place.

☞ **Note** If the Destination ”Sym/Com Databank” is chosen, entry of an ASCII file is disabled.

Confirm

- ”Special”, ”Further Processing of PLC Data”, ”Program Signals” ”Confirm”
- ”Special”, ”Further Processing of PLC Data”, ”Data Structure Blocks” ”Confirm”

You can toggle between ”on” and ”off”.

If confirmation is set to ”on”, you can specify separately for each signal from the signal list, whether it is to be processed or not. An interactive question and answer session accompanies each signal.

If confirmation is set to ”off”, all the signals entered in the signal list are processed.

File name

- ”Special”, ”Further Processing of PLC Data”, ”Program Signals” ”File Name”
- ”Special”, ”Further Processing of PLC Data”, ”Data Structure Blocks” ”File Name”

This is where you enter the name of the ASCII file from which the signal memory contents or data structure contents are to be loaded and then further processed.

3.7.11.2 Data structure blocks

- ”Special”, ”Further Processing of PLC Data”, ”Data Structure Blocks”

Here you can continue processing the data structures which you extracted from the PLC using ”Read DBs and Streams”. **Further processing** can include **ASCII-Export** or the direct transfer of data into the **symbol and comment data-bank**.

The following functions are available (with sample entry):

Further processing of data structure blocks

Start function	
Confirm:	**on**
Destination:	**ASCII file**
ASCII file:	**SIGNALE.ASD**
File name:	**SIGNALE.DSB**

Note It is not possible to process streams further.

Start function

- ”Special”, ”Further Processing of PLC Data”, ”Data Structure Blocks” ”Start Function”

This starts the further processing of a file with data structures. You should first check the correct setting of the menu parameters.

3.7.12 Duplicate station

- ”Special”, ”Duplicate Stations”

This function is used to duplicate the station currently set. A system and a station must be entered in the menu as a target. The default is the current system. The specifications can be changed using the line editor. If they do not exist, the system and station will be stored after they are confirmed by the user; if they do exist, they will be overwritten.

Duplicate station

Start	
to system:	**F:\ANL_NAME**
to station :	**STA_NAME**

Note Please ensure that there is enough space on the storage medium to save the station.

3.7.13 Operating system

3.7.13.1 MS–DOS operating system

- ”Special”, ”MS–DOS operating system”

”What is an operating system ?

”What is MS-DOS ?
MS-DOS is called for Microsoft Disk Operating System ant is an ”Operating System”. An operating system controls the basic functions of the computer and connects the individual modules in such a way that user programs (word processing, spreadsheets, databanks, etc.) can easily use them. The operating system allows you to save and retrieve data in files on diskette or on the hard disk, to use the keyboard to enter data print it out again at the printer, to copy, delete, compare, rename, save and resave files from diskettes. It creates tables of contents for your data carriers and furnishes each entry with time and date. In addition, it controls the procedure of saving your data from the hard disk onto a magnetic tape drive.

You can now carry out the functions described in the Operating System Manual. By entering ”EXIT”, you return to the DOLOG AKF software.

3.7.14 System information

- ”Special”, ”System Information”

This function informs you about the hardware configuration of your PaDT, e.g about the processor, the operating system version, the interfaces and the main memeory. This information can be sent to the screen, a file or the printer. Output commences after the following menu:

Systeminformation

Start Print:	
Title Block:	**On**
Title Block File:	**Title.D01**
Output Unit:	**Monitor**

3.7.15 End station handling

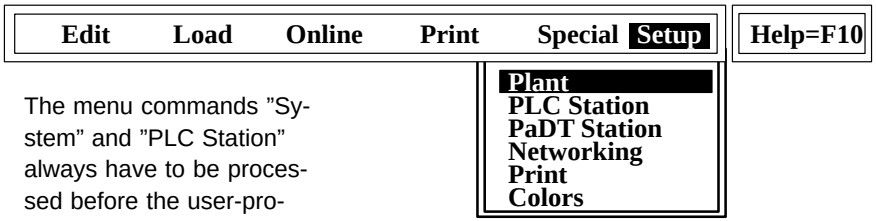
- ”Special”, ”End Station Handling”

This function allows you to end the processing of DOLOG ALD software for A250.

Caution Before exiting OS/2, always make sure you close all active programs and carry out a system shut down (right–hand mouse button, menu item ”System Shut–Down”). Data may otherwise be lost.

3.8 Setup

The Setup functions serve as a means of presetting fixed system data. They include the following settings:



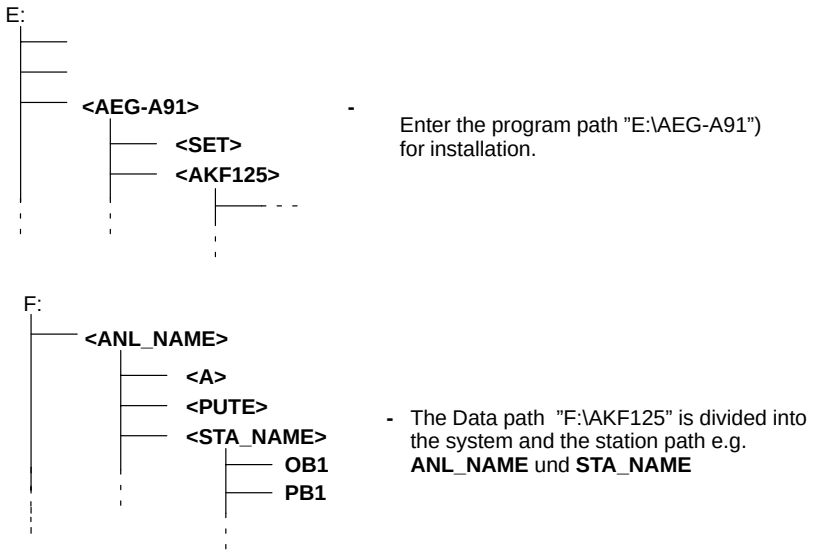
The menu commands ”System” and ”PLC Station” always have to be processed before the user-program is edited.

Directory structure on the PaDT
The configuration software is installed in two different directories on the hard disk.

- Program path:
  The system program and the ALD software data are saved in this. The **presets** for installation are as follows: C:\AEG-A91

- Data path:
  The data path is subdivided into system and station path.
  The **presets** for installation are as follows:
  System path: C:\AKF125
  Station path: Example

- Example of the division of programming SW and user data onto different drives: e.g. E and F. (recommended for reasons of clarity).



- Enter the program path ”E:\AEG-A91”) for installation.

- The Data path ”F:\AKF125” is divided into the system and the station path e.g. **ANL_NAME** und **STA_NAME**

3.8.1 Plant

- ”Setup”, ”Plant”

A system corresponds to a directory on the PaDT.
It can contain several different stations.

This function is used to set systems.
If the system entered does not yet exist, it will be created after confirmation has been requested and given. A system consists of many stations.
With existing systems, the last station worked on is automatically set up again.

Example: **F:\ANL_NAME\STA_NAME**

3.8.2 PLC station

- ”Setup”, ”PLC Station”

This function enables the user to create presets for the station :

Station Presetting

Station Name	**A250_ST1**
Addressing	**SYM**
Max. No. of Blocks	**200**
Link mode	**Full reproduction**
Bus Type	
Load procedure	**normal /packed /compressed**
SYM Start char.	**1**
Overview Mode	**MEMORY**
ALU Group	**15X; 204; 205**

3.8.2.1 Station name

- ”Setup”, ”PLC Station”, ”PLC Station Name”

e.g.: **A250_ST1**

This function allows you to select a station using the line editor (typewriter keyboard). Enter space+<Return>, to reveal a window, containing the name of the currently existing stations. From this window, use the Arrow keys and <Return> to select a station. If a **new** station is defined , it will be initially created as an **AKF** station.

This corresponds to the creation of a directory on the hard drive or on diskette. Each PLC within the system is given a station name. All the following processing functions will then be carried out in this station and the files created will be saved under this directory (see directory structure).

e.g..: **A250_ST1**

3.8.2.2 Addressing

- ”Setup”, ”PLC Station”, ”Addressing”

You have the opportunity of switching between symbolic and absolute addressing by toggling. (See Help text for additional information)

3.8.2.3 Maximum number of blocks

- ”Setup”, ”PLC Station”, ”Max. No. of Blocks”

The number of blocks that you can enter in this menu lies between 100 and 500. AKF125 or ALD25 reserves a corresponding amount of room in the PLC for linking the program.
A maximum of 500 blocks can be transferred to the PLC memory.
If the number is set too low, it is not possible to link the program. When linking for the last time, you should enter a number of blocks with an additional 10 to 20%, at this point. The number of blocks in the program will be indicated in a report after linking.

☞ **Note** If the maximum number of blocks set in the list is reached, no new block can be added on–line.

The block numbers can be selected independently of the number set here, from 1 to 999. However, the total of all blocks must **not** exceed the number set here.

☞ **Note** If a setting is modified after linking the program, the new setting will not take effect until the program has been linked and loaded again.

3.8.2.4 Link mode

- ”Setup”, ”PLC Station”, ”Link Mode”

You can specify here the amount of additional information which is to be loaded into the PLC. You can choose between:

Note If a setting is modified after linking the program, it will not take effect until the program has been linked and loaded again.

Note The ”full reproduction” or ”without comments” link modes are required for ”Load / Compare / Block Display” and ”Load / Read–out PLC”.

Link Mode / Full Reproduction

- ”Setup”, ”Station”, ”Link Mode”, ”Full Reproduction”

This setting permits unrestricted reproduction of the IL.
Comments (network and line comments; no signal comments), symbols >(parameter symbols; no signal symbols) and labels are identical to the original.
Line comments, network comments, parameter symbols and labels are reproduced.
The following is also reproduced: the initial values in the SYM/COM block, the Setup values of the PLC station and the COM tables.

Link Mode / Without Comments

- ”Setup”, ”PLC Station”, ”Link Mode”, ”Without Comments”

Comments, symbols and labels are not reproduced in this setting. Otherwise the function corresponds to ”full reproduction”.

Link Mode / Without Reproduction

- ”Setup”, ”PLC Station”, ”Link Mode”, ”Without Reproduction”

Reproduction is no longer possible with this setting..

3.8.2.5 Bus type selection

- ”Setup”, ”PLC Station”, ”Bus Type”

This call reveals the bus system currently available. The entry is made by the appropriate selection of **one** or **more** bus types and identifying it with ”Yes”.After carrying out the ”Link Program” menu item, the corresponding FW modules are loaded into the A250, together with the user program, by carrying out the ”Program to PLC” menu item.

Modnet 1/SFB

- ”Setup”, ”PLC Station””, ”Bus Type”, ”Modnet 1/SFB”

If the set PLC station is to exchange data with a different PLC station over Modnet 1/SFB (A–equipment → A–equipment communication) or this PaDT station is linked with the PLC station via REMOTE linking (P-equipment → A-equipment communication), then it must be possible to load the COM Table into the A250. The line ”Modnet 1/SFB” must be set to ”yes” in order to do this! **Once** the COM Table has been created the ALD25 / AKF125 user program must be linked again and loaded into the PLC.

TheModnet 1/SFB network requires the COM–table to be configured and created using the network configuration software ”COM->Dolog AKF” (version ≥ 4.3) and the corresponding hardware in the PLC and PaDT stations (ALU-BIK, BIK 116, BIK 002, BIK 003, etc.).

Note If the ”Yes/No” setting is changed after the linking the program, the new setting will not take effect until the program has been linked and loaded again.

Modnet 3/MMSE

- ”Setup”, ”PLC station””, ”Bus Type”, ”Modnet 3/MMSE”

Note This **menu item** should **not** be **used** when running under AKF125.

Modnet n/Profl

- ”Setup”, ”PLC Station””, ”Bus Type”, ”Modnet 1/P”

Note This **menu item** should **not** be **used** when running under AKF125.

3.8.2.6 Load procedure

- ”Setup”, ”PLC Station”, ”**Load Procedure**”

The system offers **3** different load procedures. These can be selected by toggling. They are: **normal, packed** and **compressed**.

Depending on the ALU type and the PC, the load time can be improved by up to 50%, compared with the **normal** Load. However, the ALU type only plays a subordinate role. An important contribution is made by the PC type and the PC manufacturer.
Depending on the PC, you should normally use the **compressed** or **packed** Load. (This should be established by trying both the ”packed” and ”compressed” load procedures.)
If the load operation is terminated by the system, try the **normal** Load. The cause can be an ALU RAM that is almost 100% used up, which is insufficient for the other load procedures (with an additional overhead).

Note From Version 7.1, only modified or added blocks (OBs, PBs, FBs, SFBs) and modules (GSW components) will be loaded. This load procedure does **not** apply when using the ALU 151.

3.8.2.7 Pointercheck

- "Setup", "PLC station", "**Pointercheck**"

Monitoring of the range limits for configured pointers can be switched on or off here, as desired (yes / no).
If changes are made to pointercheck, you must **re** link and load.

Note This check adds to the run–time of the program. The Read and write access extends the scan by 17µs (Near) or 19µs / 30µs (Far in the first and second MByte). If necessary, the pointercheck need only be set during an adequate commissioning phase.

An example of the Read and Write cycle is given below:

```
:LA     M1.1
:=      P1
:U      P1→Bit   (Read)
:=      M1.2
:U      M1.2
:=      P1→Bit   (Write)
:***
```

If there is **not** proper configuration with pointers, data in critical areas can be overwritten. If Pointercheck is enabled, access authorization is checked for every pointer read or write operation. If there is an error, the PLC carries out a diagnostic warm restart, which stops the PLC deliberately. Use the menu item PLC Diagnostics (under Online) to localize
the error and display the faulty IL loop. The menu sequence and informative texts when calling the menu with <Return> are as follows:

```
-ONLINE / PLC DIAGNOSTICS /RUN TIME MONITORING /
DETAIL DSP. R.T.MONITOR.      -batch error: Stack overflow in the
                              OB task
    –Display Stack or         -Stack overflow,  in task ......,
                              No recursion found
                              ( .... stands for the block, in
                               which the error occurs)
    -Localize Error           -display faulty IL-
                              Loop
```

3.8.2.8 OveRview mode

- ”Setup”, ”PLC Station”, ”OveRview Mode”

You can toggle between ”MEMORY” and ”HDD”.

With bigger stations having many inter–connected block calls, there may not be enough RAM available to produce a graphic overview. In such a case, the setting is automatically changed from ”MEMORY” to ”HDD”. This then creates the overview on the hard drive.

Creating the overview on the hard drive is a bit more time consuming than doing this in memory. The setting should therefore be on ”MEMORY” whenever possible.

3.8.2.9 A250 / A120 - switchover option

- ”Setup”, ”PLC Station”, ”ALU Group”

You can choose between ”15X; 204; 205” und ”200; 201; 202”.

3.8.3 PaDT station

- ”Setup”, ”PaDT Station”

PaDT station name

- ”Setup”, ”PaDT Station”, ”PaDT Station Name”

This function allows you to enter the name of your PaDT station, if you have configured a PaDT network over Modnet 1/SFB. The network and the name were previously configured with the COM → AKF software, Version ≥ 4.3.

The **preset** (standard, without COM networking), is ”PUTE” and is required for a **V24** link–up.

Enter a space and press <Return> to call a selection window. It contains all the stations configured with the corresponding network SW. Use the Arrow keys to select the desired station and press <Return> to call it.

3.8.4 Networking

- ”Setup”, ”Networking”

Use this function to set the connection type (link–up) between the PLC and the PaDT.

3.8.4.1 OFFLINE (no networking)

- ”Setup”, ”Networking”, ”OFFLINE”

This setting is used for Offline program generation. Establishing the connection between the PaDT and the PLC is not possible, even if you have connected a cable. Any existing link–up will be ended.

Online functions are only possible again once the link has been re–established.

3.8.4.2 LOCAL (V.24)

- ”Setup”, ”Networking”, ”LOCAL (RS232C)”

Local networking involves a link between the selected PaDT station and the target station via the serial interface (V.24/RS 232 C).

After selection of this linking mode, any previous linking is ended. The networking configuration is then checked. If it is found and if the entries are valid, then the new link is set up.

Without a networking configuration with ”COM->DOLOG AKF, a network can only be set up with the standard name ”PaDT”.

Requirement: PaDT ↔ PLC connection cable in place.

Set up networking

- ”Setup”, ”Networking”, ”LOCAL (RS232C)”, ”Set up networking”

Confirm with <Return> or select with the reference character to set up the networking, in accordance with the set networking conditions.

V24 interface

- ”Setup”, ”Networking”, ”LOCAL (V.24) ”V.24 interface”

You can toggle between ”COM1”, ”COM2” and ”COM3”.

Baud rate

- ”Setup”, ”Networking”, ”LOCAL (RS232C)”, ”Baud rate”

You can toggle between ”9600” and ”19200” baud.

3.8.4.3 REMOTE (Modnet)

- ”Setup”, ”Networking”, ”REMOTE (Modnet)”

After selection of this networking mode, any previous link–up is ended. The networking configuration is then checked. If the entries are valid, then the new connection is set up.

❒ If the following **requirements** are met, a **Modnet 1/SFB** link can be set up, for example.
- ▫ PaDT station number already determined with COM → AKF
- ▫ slave address of the PaDT (A-byte) already determined with COM → AKF

☞ **Note** The PaDT slave address should lie between 112 and 126, as this range is suppressed during the SSP (short scan poll). If the slave address lies outside this range and the PaDT is taken off the bus, an error will be reported in the SSP.

- ▫ System messages already configured with COM → AKF software
- ▫ It is only possible to load the user program using Modnet 1/SFB,
  -if the firmware has been loaded with the Setup setting ”Modnet 1/SFB: Yes”
  if, after generating the linking tables, it has already been linked and loaded on the ALD side.

- ▫ BIK 00x exists in the PaDT
- ▫ BIK1xx exists in the PLC

With this type of linking, BIK 00x in the PaDT and BIK1xx in the PLC are connected.

☞ **Note** Connection to an A120 is not possible

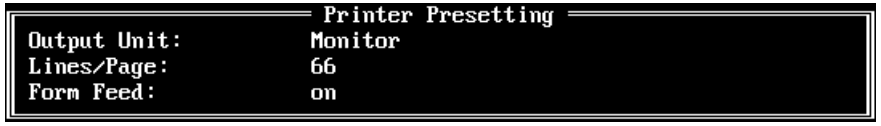
Using the Modnet 1/SFB network, you can perform the same functions as with the RS 232 C- (V.24-) link. Only the function ”Bootload” is not possible.

Caution Modifying the AKF125 program in the PLC with several PaDTs at the same time is not authorized and will cause the PLC to crash.

3.8.5 Print

”Setup”, ”Print”

The following settings are possible in the Print menu:



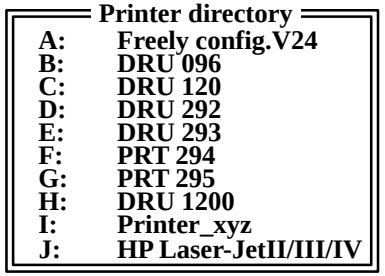
3.8.5.1 Output unit

”Setup”, ”Print”, ”Output Unit”

A menu appears in which you can make your choice:

Screen	-	output appears page by page on the screen.
Printer	-	output is made on the selected printer.
File	-	output is to the file specified by the complete path. Should a file with the indicated name exist, you will be asked if you want this to be overwritten.

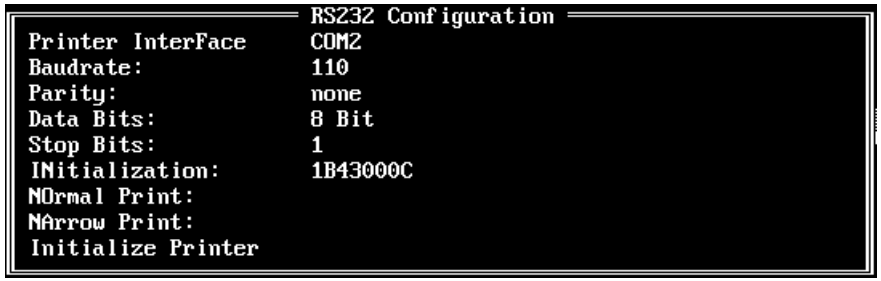
An additional window opens under the ”Printer” menu line, in which you can make your printer selection:



Freely configurable V.24 interface (serial)

- ”Setup”, ”Print”, ”Output unit”, ”Print”, ”Freely config.V24”

The following parameters must be entered for a printer with a freely configurable V.24 interface:



Printer interface

- ”Setup”, ”Print”, ”Output Unit”, ”Printer”, ”Freely Config.V24”, ”Printer Interface”

You can toggle between ”COM1” and ”COM2”.

Please make sure that the PLC is correctly connected to COM1.

Caution When using a serial interface, before you start ALD or AKF, the following setting must follow from the level of the operating system:
MODE COM1:96,,,,P or MODE COM2:96,,,,P

Baud rate

- ”Setup”, ”Print”, ”Output Unit”, ”Printer”, ”Freely Config.V24”, ”Baud Rate”

You can select one of the following baud rates:

110 Bd, 300 Bd, 600 Bd, 1200 Bd, 2400 Bd, 4800 Bd, 9600 Bd

The baud rate is set by toggling.

Please check your printer setting.

Parity

- ”Setup”, ”Print”, ”Output Unit”, ”Printer”, ”Freely Config.V24”, ”Parity”

You can toggle between ”even”, ”odd” and ”none” for parity.

270Databits

- ”Setup”, ”Print”, ”Output Unit”, ”Printer”, ”Freely Config.V24”, ”DataBits”

You can toggle between ”8 bit” and ”7 bit”.

Stop bits

- ”SeTup”, ”Print”, ”Output Unit”, ”Printer”, ”Freely Config.V24”, ”Stop Bits”

You can toggle between ”1” and ”2” stop bits.

Initialization

- ”Setup”, ”Print”, ”Output Unit”, ”Printer”, ”Freely Config.V24”, ”Initialization”

ASCII sequence for initializing the printer
z.B. character set, auto LF, etc.
or
DATEI=dddd.eee
Name of the Initialization file e.g. for a laser printer.

Normal font

- ”Setup”, ”Print”, ”Output Unit”, ”Printer”, ”Freely Config.V24”, ”Normal Font”

ASCII sequence for initializing at 80 characters / line
corresponds to 10 cpi
e.g. for DRU096 ’15’
oder
FILE=dddd.eee
Name of the Initialization file e.g. for a laser printer.

Narrow font

- ”Setup”, ”Print”, ”Output Unit”, ”Printer”, ”Freely Config.V24”, ”Narrow Font”

ASCII sequence for initializing at 143 characters / line
corresponds to 20 cpi
e.g. DRU096 '0F'
or
FILE=dddd.eee
Name of the Initialization file e.g. for a laser printer.

Initialize Printer

- ”SeTup”, ”Print”, ”Output Unit”, ”Printer”, ”Freely Config.V24”, ”Initialize Printer”

Press <Return> to adopt the set
parameters.

DRU 096

- ”SeTup”, ”Print”, ”Output Unit”, ”Printer”, ”DRU096”

The choice is made here between:

Note By dispensing with a margin, paper having a width of A4 paper can also be used.

DRU 120

- ”Setup”, ”Print”, ”Output Unit”, ”Printer”, ”DRU120”

The choice is made here between:

Note DRU 120 can print a maximum of 136 characters/line in IBM graphics configuration.

DRU 292

- ”Setup”, ”Print”, ”Output Unit”, ”Printer”, ”DRU292”

The choice is made here between:

Note To ensure a clean print–out, the following settings should be made on the DRU 292.

CHARACTER PITCH	20 CPI
PRINT MODE	UTILITY

DRU 293

- ”Setup”, ”Print”, ”Output Unit”, ”Printer”, ”DRU293”

The choice is made here between:

PRT 294

- ”Setup”, ”Print”, ”Output Unit”, ”Printer”, ”PRT 294”

The choice is made here between:

PRT 295

- ”Setup”, ”Print”, ”Output Unit”, ”Printer”, ”PRT 295”

The choice is made here between:

DRU 1200

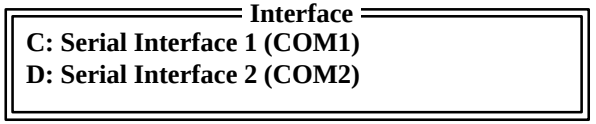
- ”Setup”, ”Print”, ”Output Unit”, ”Printer”, ”DRU1200”

The choice is made here between:

Printer_xyz

- ”Setup”, ”Print”, ”Output Unit”, ”Printer”, ”Printer_xyz”

The choice is made here between:



3.8.5.2 Lines/page

- ”Setup”, ”Printer”, ”Lines/Page”

You can use the line editor to specify the number of lines per page, to correspond to the paper format used in your printer here.

3.8.5.3 Form feed

”Setup”, ”Print”, ”Form Feed”

Printouts can occur with or without form feed, depending on the type of printer used. If the form feed is switched off, the print program outputs a number of lines to correspond to the number of blank lines.

You can toggle between ”on” and ”off”.

3.8.5.4 Upgrading the printer driver

For a new printer to be accepted by the ALD or AKF system, all you need is a simple editor, to which you can use to edit the ”DRUAKF40.DRV” file in the ”ALD25” or ”AKF125” sub–directory.

Up to 15 printers can be specified in this file. A printer description is initiated by the name ”Printer=”. The configuration software displays the name which is to follow in a pulldown menu. There then follow 3 initialization sequences, to be entered in a hexadecimal representation. Please take note of capitalization.

You will find the initialization sequences in the printer manual.

Examples:

Printer=DRU293
parallel/serial

1B3C	Initialization
12	Switch to 80 characters
0F	Switch to 132 characters

Printer=DRU096
parallel

1B3C	Initialization
12	Switch to 80 characters
0F	Switch to 132 characters

Defining the Epson Fx-80
Printer=Epson FX-80
parallel

1C1B04	Initialization
040577	Switch to 80 characters
0F444488	Switch to 132 characters

Caution When using a serial interface, before starting ALD or AKF, the following settings must follow from the level of the operating system:
MODE COM1:96,,,,P bzw. MODE COM2:96,,,,P

There are restrictions regarding:

Character set: The IBM graphics character set is required.
Cable Assignment: see printer manual and PaDT.

3.8.6 Colors

”Setup”, ”Colors”

If your PaDT is equipped with a color monitor and the corresponding card, you can set the colors yourself. You may set the colors for pulldown windows, help windows, and message windows to suit your taste.

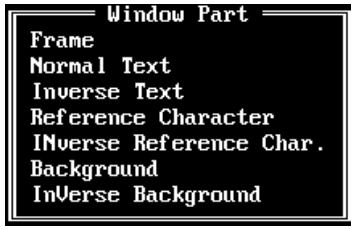
A prerequisite for the software call is the extension ”/COL”.

Furthermore, you can also set the screen parameters ”/GR” for grey scales and ”/BW” for black and white for the call.
If the software is called with these parameters, the system uses fixed settings.

Recommendation: Color monitor ”/COL”, Liquid Crystal Display”/BW”, Monochrome monitor ”/GR”.

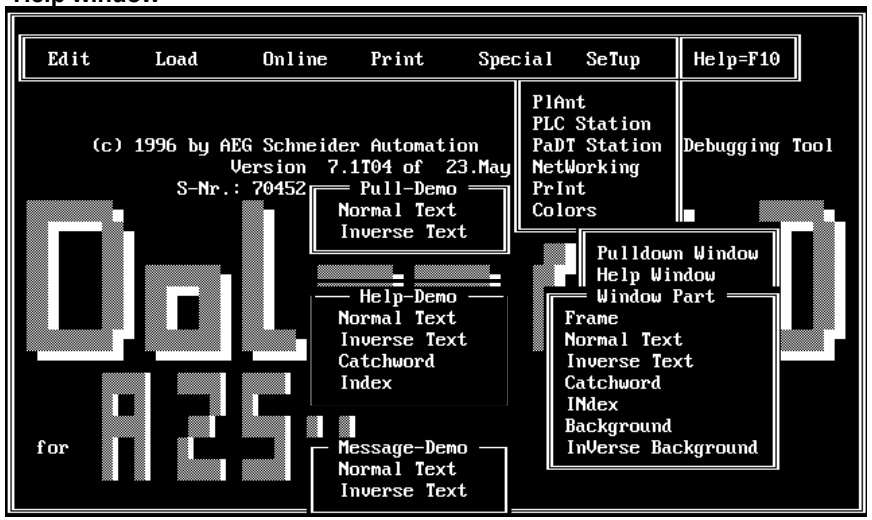
If the software is called with the /COL parameter, a further pulldown menu appears for each type of window. In this window for color setting, you can choose the following parts of a window for the color selection:

Pulldown window



Messages window

Help window



By selecting one of these menu lines, a window appears with a color palette, from which you can select a color value.
The current setting is visible in the demonstration windows.
Use <Esc> to exit the ”Colors” menu.
The new color settings appear after exiting from the Setup pulldown nenu.

Index

L

M

N

O

P

R

S

T

U

V

W

Z