Intelligent Message Displays
DAA 144-120 A/B
DAA 288-120 A/B
DAA 288-240 A/B/C

Operating Manual

GMW GOSSEN Müller & Weigert

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Preface

Congratulations on purchasing an intelligent message display from the DAA model family. There are many applications for intelligent message displays:

- in the automation field,
- in constructional engineering,
- in systems engineering

and in many other special fields where information must be quickly passed to the operating personnel.

Among other things, the intelligent message displays feature:

- easy operation by means of only 4 lockable control keys on the front,
- high reliability,
- universal triggering functionality,
- space saving standard-size panel mounting housings,
- clear reading indication due to vacuum fluorescent displays,
- water resistant (front side) to IP65, including control keys,
- 6 country-specific character sets (including Cyrillic),
- running lines up to 175 characters,
- up to 3 variables per text in any position,
- galvanically isolated inputs.

The version B and C models additionally feature:

- a memory table, all received messages are logged and can be arbitrarily retrieved or printed,
- a battery-backed real time clock,
- alarm relays,
- an integrated text editor for programming via a keyboard or a terminal,
- remote control of the control keys via the parallel interface,
- text input via a PC with simple DOS commands,

The version C devices additionally feature:

- a data logging memory for approx. 2500 events with several evaluation options,
- integrated counters and timers as internal variables,
- extended functions and features, compared with version B models.

Safety Instructions (IEC 1010-1, Class 1)

In order to preclude any danger to the operator, make sure to adhere to the following instructions:

a) If any damage or malfunction is detected, take the unit out of operation without delay.

b) Before disassembling the device, disconnect the supply voltage. When mounting the device and the connections, make sure all live components are protected from being touched directly.

c) Observe the generally accepted regulations and safety provisions for electrical, low-voltage current and power systems, in particular the local safety provisions (e.g. VDE 0100).

d) When connecting to other devices (e.g. PC's), the wiring requires particular attention. Internal connections in external devices (e.g. connection of GND to protective ground) may cause impermissible voltage potentials.

Refer to the instructions manual ! **Warning: Hazardous live voltage !**

WARNING

It cannot be avoided that there are hazardous voltages present in certain parts during the operation of electrical equipment. Non-observance of the safety instructions can result in severe personal injury or property damage. Only qualified personnel should work on this equipment. The successful and safe operation of this equipment is dependent on proper transport, storage, set-up, installation and careful operation and maintenance.

Qualified person

A "qualified person" is one who is familiar with the installation, construction and operation of the equipment and the hazards involvet. In addition, he has the following qualifications:

- # Is trained and authorized to energize, de-energize, clear, ground and tag circuits and equipment/systems in accordance with established safety standards.
- # Is trained in the proper care and use of protective equipment in accordance with established safety practices.
- # Is trained in rendering first aid.

Safety according to IEC 1010-1, EN 61010, NFC 42020, VDE 0411

Overvoltage category: see pag. 6-9

Pollution degree: 2; indoor use; altitude < 2000 m; relative humidity < 80 % up to 31 °C; temperature: 5 °C to 40 °C.

Definition of overvoltage categories according to IEC 664:

CAT I: Specialequipment or parts of electric or electronic equipment with small transient overvoltage.

CAT II: Appliances, protable equipment.

CAT III: Fixed installations regarding distribution and circuits at the input of electric maintenance of buildings.

Safety precautions: Before any measurements on electrical power sources, check whether the DAA overvoltage category is compatible with the source category.

Terms

Display	Information currently displayed on the device.
Text	Individual text in the message memory.
Message memory	Memory, in which all previously programmed display texts are stored with control characters and text number.
Message	Called text.
Memory table	Memory, in which the text numbers of called messages are stored together with the variable values valid at the time of the call.
FIFO	First In - First Out: Primary value message, the first called message is displayed; calling of the succeeding messages by paging.
Paging	Calling of the messages stored in the memory table via the control keys.
Auto-paging	Cyclic display of the messages.
Delete	Deletion of a message from the memory table or deletion of the memory table contents.
Acknowledge	Deletion of a message from the display, but not from the message memory or the memory table, reset of the alarm relay.

Contents, Overview

Each chapter is preceded by a detailed table of contents.

Page

Introduction

1 Model Overview E-2
2 The First Steps E-4
3 Interfacing Options E-4

Version B

1 Configuration B-3
2 Programming the Message Memory B-8
3 Control B-18
4 Manual operation B-28

Version C

1 Configuration C-3
2 Programming the Message Memory C-9
3 Control C-22
4 Operation C-37
5 Setting and Operation via the Serial Interface C-43

Version A

1 Configuration A-2
2 Input via the Serial Interface A-5

Connection and Installation

1 Wiring M-2
2 Installation M-11
3 Connecting Examples M-12

Page

Trouble Shooting

1 Possible Error Causes F-2
2 Error Message Table F-3

Technical Data

1 Technical Data D-2
2 Default Settings D-9
3 Mounting Dimensions D-10
4 Character Sets D-14
5 ASCII Control Characters D-17

Accessories and Options

1 Order Numbers Z-2
2 Accessories and Options Z-4

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Introduction

Contents

Page

1 Model Overview E-2

2 The First Steps E-4

3 Interfacing Options E-4

1 Model Overview

The DAA model family comprises 8 intelligent message displays in two sizes with different display and character sizes, each with or without message memory. Version C additionally provides the possibility to log and statistically evaluate processes.

Texts, the length of which exceeds the capacity of the display, can be output as running lines. Static messages can be set to flash or have flashing portions. 6 different character sets are available for the character representation.

Type/ version	No. of lines	No. of charact.	Charact. size	Message memory	**Data logging memory**
DAA 144-120 A	1	20	5 mm	–	–
DAA 288-120 A	1	20	9 mm	–	–
DAA 288-240 A	2	2x40	5 mm	–	–
DAA 144-120 B	1	20	5 mm	16 KB	–
DAA 288-120 B	1	20	9 mm	16 KB	–
DAA 288-240 B	2	2x40	5 mm	16 KB	–
DAA 288-240 C	2	2x40	5 mm	64 KB	64 KB
DAA 288-240 S	2	2x40	5 mm	64 KB	–

Table E-1: Model overview

Version A

If version A devices are used, the texts are stored in the transmitting device, e.g. in a word processing PLC. When a text is to be displayed, the transmitting device sends the complete message text to the intelligent message display via the serial interface.

Version B

The version B message displays are equipped with a message memory, in which up to 255 texts (max. 16 KB) can be stored. The messages can be triggered by binary or BCD coded input, by direct input from an individual sensor, or via the serial interface; additionally, variables can be overlaid.

For all messages, an alarm relay can be activated. Moreover, texts can be output to a printer or to an additional version A intelligent message display (master/slave). Version B devices are equipped with a battery-backed real time clock/calendar with date and time.

Version C

Compared with version B, the version C intelligent message display has extended functions and features. The device is equipped with a message memory for up to 1023 texts or 64 KB and a data logging memory which can be analyzed by various criteria. The variable overly possibilities are extended by internal timers and event counters.

In addition to the alarm relay of version B, there are two open collector outputs, so that three alarm levels can be assigned. Message texts can be assigned a destination address allowing a message to be output to another display or a printer. Many functions can also be remotely controlled via the serial interface.

Version S

The version S intelligent message display is directly connected to the PG port of the PLC. The device is "active" and requires only minimum programming of the PLC for text control and variables processing. See separate operating manual for this model.

2 The First Steps

The intelligent message displays of the DAA model family are panel mounting units. After installation, only the four function keys and the front-side serial interface can be accessed. Therefore, all connections on the rear which are required for your application must be made before the final installation (detailed information in chapter M, Connection and Installation).

- Connect your device to the specified voltage source (see M-1.1 and M-1.2).
- Connect the rear-side serial interface II, if text input, triggering, text output, variable overlay or the printed output of protocols shall be carried out via this interface. In the DAA-144... devices, the serial interface is a 9-pole Sub-D connector and a 25-pole connection in the DAA 288-... devices. The interface can also be configured as a current loop (TTY) interface (see M-1.3 and M-3.3).
- Connect the rear-side parallel interface (not for version A). Version C is equipped with two parallel interfaces (see M-1.4 and M-3.2).
- Now, make the basic settings corresponding to the version of your device by means of the menu programs (described in the version-related chapters B, C and A).
- Your device is now ready for operation. You can start programming the message memory of your version B or version C device (see B-2 and C-2 respectively).

3 Interfacing Options

Each DAA intelligent message display is addressable. This allows different information to be sent to several message display units via a single serial data line. In this case, a transmitter, e.g. a programmable logic control system or a DAA 288-240 C intelligent message display, controls several devices (RS232 C up to 4 devices, TTY up to 7 devices). Of course, it is also possible to send all messages to a single device where they are displayed. Several devices can also be assigned the same address enabling them to receive identical information.

Version B

Contents

Page

1 Configuration B-3
1.1 "Display" Menu Program Settings B-4
1.2 "Modify" Menu Program Settings B-6

2 Programming the Message Memory B-8
2.1 Message Memory B-8
2.2 Parameters B-8
2.2.1 Text Parameters B-8
2.2.2 Character Parameters (Control Codes) B-9
2.3 Text Input B-10
2.3.1 On-Line Text Input - "Edit" Mode B-11
2.3.2 Off-Line Text Input - "File" Mode B-14
2.4 Auxiliary Help Text B-16
2.5 Transmission of the Message Memory B-17
2.5.1 Transmission to a PC or a DAA Version B B-17
2.5.2 Transmission to an EPROM Programmer B-18

3 Control B-19
3.1 General B-19
3.1.1 Memory Table B-19
3.1.2 Operating Mode B-19
3.1.3 Output of Messages B-20
3.2 Triggering via the Parallel Interface B-21
3.2.1 Text Call and Variable Overlay B-22
3.2.2 Deletion of Messages B-25
3.2.3 Setting the Operating Mode B-25
3.2.4 Output of Messages with and without the Time B-26
3.2.5 Locking the Front Function Keys B-26
3.2.6 Testing the Input Lines B-27
3.3 Triggering via the Serial Interface B-28

Page

4 Manual Operation B-29
4.1 Acknowledging the Message B-29
4.1.1 Operating Mode 0 . . . . . B-29
4.1.2 Operating Modes 1, 2 and 3 . . . . . B-29
4.2 Clearing the Memory Table B-29
4.3 Acknowledging the Alarm Relay B-30
4.4 Paging B-30
4.4.1 Paging through the Message Memory B-30
4.4.2 Paging through the Memory Table B-30
4.5 Operation via the Serial Interface B-31
4.5.1 Output of the Memory Table B-31
4.5.2 Clearing the Memory Table B-32
4.5.3 Input and Output of Date and Time B-32

1 Configuration

The DAA 144/288 intelligent message displays version B are equipped with a message memory, in which up to 255 texts can be stored. Messages can be triggered by binary or BCD-coded input, by direct input, or via the serial interface; additionally variables can be overlaid. You can set for how long a message shall be displayed. Additionally, there is a real time clock/calendar with date and time. For all messages, an alarm relay can be activated and the texts can be output to a printer or an additional version A intelligent message display (master/slave).

Texts can be displayed as static messages or as running line messages. Static messages can be set to flash or have flashing portions. 6 character sets are available for the country-specific representation.

Each device has 4 red keys on the front, which are used to display or set the brightness, the interface data and the character set via menu programs.

MODE	Selection of the main function;
ENTER	Selection of the subfunction and acceptance of the selected values;
PLUS / MINUS	Selection of the offered parameters, the current value is flashing.

☞ The menu program enables the setting of the device parameters and the call of auxiliary functions in the permanent EEPROM.

1.1 "Display" Menu Program Settings

To enter the menu program, depress the MODE key for more than 3 s. In this mode the PLUS and MINUS keys have no function.

The menu program is quit manually by simultaneously depressing MODE and ENTER or automatically, if no key is actuated within 60 s.

Key	Display	Description
MODE (>3 s)	**SET UP-MENUE V 6...**	Display of the software version.
MODE	**(DISPLAY:)** **BRIGHTNESS:** e.g. **4**	Display of the currently set brightness: 1, 2, 3, 4.
MODE	**(SET TIME/DATE:)** day, month, year, hour, minute, second	Display of date and time.
MODE	**CHARACTER SET:** e.g. **ASCII**	Display of the currently set character set: ASCII, D (German), F (French), S/SF (Swedish/Finnish), DK/N (Danish/Norwegian), CYR (Cyrillic).
MODE [ENTER]	**INTERFACE: RS 232 C** e.g. **1 B2400 D8 S1 PN A00**	Display of the currently set interface data: I = front, II = rear B = baud rate: 110, 150, 300, 600, 1200, 2400 D = data format: 7 or 8 bit S = stop bit: 1 or 2 P = parity bit: E (even) O (odd) M (mark) logic 1 S (space) logic 0 N (no) no parity A = address: 00 to 31.

Table B-1: Menu program "Display", part 1

Key	Display	Description
MODE	**PRINT FORMAT:** e.g. **NORMAL**	Output format for printer or secondary display: NORMAL or STANDARD output to printer SLAVE or DAA VERSION A output to secondary display version A.
MODE	**INPUT MODE:** e.g. **SERIAL**	Text trigger modes: SINGLE direct input BINARY binary coded BCD BCD coded SERIAL input via the serial interface.
MODE	**STROBE-T MODE:** e.g. **PASSIVE**	Strobe signal (for parallel inputs): ACTIVE text call triggered by strobe signal. PASSIVE text call triggered by modified data word.
MODE	**OPERATING MODE:** e.g. **1**	Operating mode: 0 to 3 and EXT(ERNAL), see 3.1.2.
MODE	**VARIABLES:** e.g. **SERIAL**	Variable overlay: PARALLEL via parallel interface SERIAL via serial interface.
MODE	**DISPLAY TIME:** e.g. 5 **SEC**	Display time (Operating Mode 3): 0.5, 1, 2, 3, 4, 5, 10 or 30 s.
MODE ENTER	**TEST INPUT LINES**	Display of the control lines status, see 3.2.6.
MODE + ENTER	Normal operation	Exit from the menu program; if only the MODE key is actuated, the display returns to BRIGHTNESS.

Table B-2: Menu program "Display", part 2

Key names in square brackets apply only to DAA 144/288-120 B single-line message displays. On the DAA 288-240 B devices, the display is automatically continued in the second line.

1.2 "Modify" Menu Program Settings

To enter the menu program, depress the MODE key for more than 3 s. Then, depress MODE and ENTER simultaneously for more than 4 s.

In general, the MODE key is used to step through the menu, the PLUS and MINUS keys are used to change desired settings and **the ENTER key confirms the selection.** In some cases the ENTER key displays submenus.

The menu program is quit manually by simultaneously depressing MODE and ENTER or automatically, if no key is actuated within 60 s.

Key	Display	Description
MODE (>3 s)	**SET UP-MENUE V 6...**	Entry into the menu program.
MODE + ENTER (> 4 s) +, -	**(DISPLAY:)** **BRIGHTNESS:** 1 2 **3** 4	Display of the currently set brightness, the current value flashes. PLUS/MINUS key to change.
MODE ENTER +, -	**SET TIME/DATE:** second, minute, hour, year, month, day	Display of date and time. ENTER activates the parameter (flashes). PLUS/MINUS key to change.
MODE [ENTER] +, -	**CHARACTER SET:** **ASCII** D F S/SF DK/N CYR	Display of the currently set character set, the current value flashes. PLUS/MINUS key to change.
MODE [ENTER] ENTER, +, - ENTER, +, - ENTER, +, - ENTER, +, - ENTER, +, ENTER, +, -	**INTERFACE: RS 232 C** **1 B2400 D8 S1 PN A00** **INTERFACE: 1** **BAUDRATE: 2400** **DATA FORMAT: 8 BIT** **STOP BIT: 1** **PARITY: NO** **ADDRESS: 00**	Display of the currently set interface data. PLUS/MINUS key to change the individual values.
MODE +, -	**PRINT FORMAT:** **NORMAL** SLAVE	Output format for printer or secondary display, the current value flashes. PLUS/MINUS key to change.

Table B-3: Menu program "Modify", part 1

Key	Display	Description
MODE	**TEXT INPUT**	Input of texts into the message memory, see 2.3
MODE	**TEXT OUTPUT**	Transmission of the message memory, see 2.5.
MODE + -	**INPUT MODE** SINGLE **BINARY** BCD SERIAL	Text trigger mode, the current value flashes. PLUS/MINUS key to change.
MODE + -	**STROBE-T MODE:** ACTIVE **PASSIVE**	Strobe signal, the current value flashes. PLUS/MINUS key to change.
MODE + -	**OPERATING MODE:** 0 **1** 2 3 EXT	Operating mode, see 3.1.2, the current value flashes. PLUS/MINUS key to change.
MODE + -	**VARIABLES:** PARALLEL **SERIAL**	Variable overlay, the current value flashes. PLUS/MINUS key to change.
MODE + -	**DISPLAY TIME:** 0,5 1 2 3 4 **5** 10 30 **SEC**	Display time (for operating mode 3), the current value flashes. PLUS/MINUS key to change.
MODE	**TEST INPUT LINES**	Status of the control lines, see 3.2.6.
MODE + ENTER	Normal operation	Exit from the menu program; if only the MODE key is actuated, the display returns to BRIGHTNESS.

Table B-4: Menu program "Modify", part 2

Key names in square brackets apply only to the DAA 144-120 B and DAA 288-120B single-line message displays. On the DAA 288-240 B devices the display is automatically continued in the second line. The functions of the single line and double line models are identical, although the set-up of the displays is slightly different.

2 Programming the Message Memory

2.1 Message Memory

The DAA 144/288 version B intelligent message displays have a message memory, in which max. 255 texts with a total of 16,336 characters can be stored. The message memory is structured in 341 blocks with 48 characters each. If required, a text can be distributed over several blocks. In this case, only 44 characters of the first block can be used for text information.

Example: A text of 45 characters occupies two blocks. A block which is partially occupied by a text cannot be used for other texts. The storage capacity limit is, for example, reached with 85 running line messages with 175 characters each.

In the DAA 144-120 B and DAA 288-120 B displays, a static message consists of one line with max. 20 characters. The DAA 288-240 B displays allow max. two lines with 40 characters each. All the devices can display texts of max. 175 characters as running line messages. Control codes, e.g. <CTRL F>, <CTRL G>, are each counted as one character.

The texts are stored in a battery-backed CMOS-RAM. Optionally, an EPROM is available. A later conversion from RAM to EPROM is possible, see Z-2.6.

2.2 Parameters

For each text number, the corresponding parameters must be entered. The text parameters define, how a called text shall be output, as static display or running line, with or without alarm and with or without printout on a protocol printer. Control codes are required for the display of flashing text blocks and for the superimposition of variables.

2.2.1 Text Parameters

For the display of texts as static message or running line, two modes are available in single line display units and five modes in double line display units:

- Mode 1: static display (FIX), line 1 (LINE 1)
- Mode 2: static display, line 2 (only DAA 288-240 B)
- Mode 3: static display, line 1 and 2 (only DAA 288-240 B)
- Mode 4: running line (RUN), line 1

- Mode 5: running line, line 2 (only DAA 288-240 B).

There are two possibilities to output a called text to a printer or a secondary display:

- without printout: P0 or PRN OFF
- with printout: P1 or PRN ON

There also two possibilities for the activation of the alarm relay with a text call:

- without alarm: A0 or AL OFF
- with alarm: A1 or AL ON

2.2.2 Character Parameters (Control Codes)

Character parameters are set by means of control code characters during the text input.

Flashing display (not for running lines)

Complete texts or up to two blocks per line in a text can be set to flash. When entering the text, place the control character <CTRL F> at the beginning of the intended flashing block and mark the end with <CTRL G>. A flashing text block must not have more than 20 characters, for DAA 288-240 B displays it must not be longer than 40 characters in a one line text, or 80 characters total for two line texts.

Wildcards for variables

If variables will be inserted into individual texts during the operation of the display, you have to reserve the space in a so called "dynamic field". Wildcards are any spaces or characters placed between <CTRL V> (begin) and <CTRL W> (end), which will be overwritten by real variable data. For variable overlay, you can reserve up to 19 characters in up to 3 blocks per text (in DAA 288-240 B display units max. 40 characters in 3 blocks). If 3 blocks have already been marked, <CTRL V> and <CTRL W> only modify the last block.

☞ The inserted variables are always left-justified in the variable window reserved by the control characters. Make sure that the defined window is not too small.

2.3 Text Input

Texts can be input into the message memory via a programmer (e.g. Siemens PG 675/685), a terminal, or a PC. The texts are transmitted to the message memory via one of the serial interfaces.

There are two possibilities:

- On-line input of individual texts via terminal or keyboard in "Edit" mode and
- Off-line input of all texts into a file and subsequent transmission of the complete file into the message memory - "File" mode.

☞ To simplify the text input, the MWTA software for the operating systems MS-DOS and PCP/M-86 is optionally available.

☞ The interface data of the display unit must be matched to those of the text input device. The values for baud rate, data format, stop bits and parity can be set by means of the menu program "Modify" and the main function INTERFACE (see 1.2).

☞ Inputs into the message memory are possible only, if pins 1 and 6 of the 9-pole or pins 1 and 13 of the 25-pole interface are linked (see M-1.3). If the jumper is missing, the access to the message memory is disabled and the error message LOCKED or MEMORY LOCKED is displayed.

2.3.1 On-Line Text Input - "Edit" Mode

Input of new texts (example for DAA 144/288-120 B)

Menu program "Modify", main function TEXT INPUT (see 1.2).

Key	Display	Description
	TEXT INPUT	Input of texts into the message memory.
ENTER +, -	**TEXT INPUT: INT2** **TEXT INPUT: INT1**	Selection of the interface, via which the texts shall be transmitted.
ENTER	**TEXT INPUT: EDIT**	On-line "Edit" input mode.
ENTER	**TEXT NR:**	Display ready for text input.
The key designations below refer to the terminal keyboard.		
<Text-number> e.g. 15	**TEXT NR: 15**	Number of the text to be input. If an incorrect text number is entered, it flashes; re-enter the correct number.
<CR>	**FIX P1 A0** static message with printout, without alarm.	Display of the text parameters. Select the parameter to be changed using the cursor control keys, selection of the value by means of the space bar or the numeric keys.
<CR>	– cursor position	Acceptance of the parameters. The text can now be entered.
<Text>	**TEXT**	Wording for the text (with control codes).
<CR>	**TEXT NR: 16**	Completion of the text input; the next text number is displayed, which can be overwritten.

Table B-5: Text input via the menu program

The text input can be terminated at any time by ESC. If you actuate ESC again, the menu program is quit and the display returns to the selected operating mode.

Different features of the DAA 288-240 B

The text input procedure for the double line model DAA 288-240 is the same as for the single line devices. However, the representation on the display is different. The text parameter for static message or running line is extended by the specification of the line.

Example:

Display **DAA 144-120 B and DAA 288-120 B**	**Corresponding display** **DAA 288-240 B**
TEXT NR:	TEXT NUMBER: PARAMETER:
After entering the text number 15 and <CR>:	
FIX P1 A1	TEXT NUMBER: 15 PARAMETER: LINE 1 PRN ON AL ON

Table B-6: Different representation on the DAA 288-240 B

The following special case applies to text number 255 in the DAA 288-240 B units:

If text number 255 is defined with the parameters LINE 1, STATIC TEXT, MAX. 40 CHARACTERS, it is automatically displayed in the first line of the standby screen. In the second line, the date and the time are displayed. If other parameters are defined, the text 255 is treated as any other text. In this case, only the date and time are displayed in the standby screen.

Deletion of the control characters for flashing and variable overlay

The control characters <CTRL F>, <CTRL G>, <CTRL V> and <CTRL W> cannot be deleted individually. They also cannot be moved. To delete all control characters in a text enter <CTRL X>.

This function of the control character <CTRL X> applies only to text inputs in the TEXT INPUT mode under EDIT. In normal operation of the display, <CTRL X> has another function (see 4.5.2).

Editor functions:

Function	Control character	ASCII		Remark
Cursor left:	CTRL L	0C H	012	LEFT
Cursor right:	CTRL H, BS	08 H	008	BACKSPACE
Insert a blank at the cursor position:	CTRL I	09 H	009	INSERT
Delete the character at the cursor position:	CTRL D	04 H	004	DELETE
Start flashing:	CTRL F	06 H	006	FLASH
End flashing:	CTRL G	07 H	007	
Begin of variable window:	CTRL V	16 H	022	VARIABLE
End of variable window:	CTRL W	17 H	023	
Delete all control characters <CTRL F>, <CTRL G>, <CTRL V>, <CTRL W>:	CTRL X	18 H	024	EXTRACT

Table B-7:Control characters for the text input

Modification of existing texts

The modification of existing texts can be executed in the same way as the input of new texts, if you enter the control character <CTRL C> before entering the text number. Without the jumper between pins 1 and 6 of the 9-pole or pins 1 and 13 of the 25-pole interface, texts can be called by <CTRL C>, but they cannot be modified.

Key	Display	Description
<CTRL C> Text number e.g. 6	**TEXT NR: 6 CHANGE**	Number of the text to be modified
<CR>	**FIX P1 A0 CHANGE**	Display of the text parameters Changes as for the input of new texts

Table B-8: Modification of existing texts

2.3.2 Off-Line Text Input - "File" Mode

You can use an IBM-compatible PC to generate an ASCII file containing all message texts which shall be stored in the message memory and subsequently copy the complete file into the message memory of the intelligent message display. A prerequisite is, that the PC has a free serial interface.

Any ASCII editor, such as EDIT.COM (MS-DOS 5.00 or higher), EDLIN.EXE, the Norton editor or any word processing program which is able to output ASCII files can be used to generate this file. Input via the DOS command line level with COPY CON <file name> is also possible. The MWTA software is available as an option for the easy input and transmission of text files.

Structure of the text file

Each complete message text is structured as follows:

Text number	CR	Parameter	CR	Text with control characters	CR

Text number, three digits:
1 to 255

Parameter, three digits:
1st digit: Type of text and line selection
1 = static message, line 1
2 = static message, line 2 (only DAA 288-240 B)
3 = static message, lines 1 and 2 (only DAA 288-240 B)
4 = running line, line 1
5 = running line, line 2 (only DAA 288-240 B)

2nd digit: Printing option
0 = OFF, without printout
1 = ON, with printout upon text call

3rd digit: Alarm option
0 = OFF, without alarm
1 = ON, with alarm upon text call

The max. text length of a static message is 20 characters, for DAA 288-240 B units the max. length is 80 characters. Control characters do not limit the usable text length.

The individual components of the message text are separated by <CR>, a <CR> at the end of the wording indicates the end of a text. After all texts have been entered, the file must be closed with <CTRL Z>, since the DAA would otherwise not be able to recognize the end of the transmission.

Example for a message text:

3 <CR>	text number 3
110 <CR>	static text, with printout, without alarm
Text ... <CR>	Text entry and termination

The following must be observed for the input of long running line messages and for the input of double line messages:

A running line message with more than 80 characters cannot be displayed in one line on the screen of the PC. In order to get to the next editor line, you would have to enter <CR>. However, the DAA would interpret this <CR> as the end of the text. Therefore, enter the characters ^L followed by <CR> at any place before reaching the right margin. The characters ^L make the DAA ignore the following <CR> and append the succeeding text.

Example for double line text input:

4 <CR>	text number 4
400	running line message, without printout, without alarm

THIS IS A TEXT WHICH REQUIRES ^L <CR>
ONE LINE! <CR>

Transmission of the file into the message memory

The transmission of the file can be carried out by any utility program having a transmission function, but the easiest way is to use the MWTA editor. On the DOS command line level, the transmission can be carried out by copying the file to the serial interface.

Set the file transmission parameters in the main function TEXT INPUT of the menu program "Modify" (see 1.2).

Key	Display	Description
	TEXT INPUT	Input of texts into the message memory.
ENTER +, -	**TEXT INPUT: INT2** **TEXT INPUT: INT1**	Selection of the interface, through which the data shall be input.
ENTER +, -	**TEXT INPUT: EDIT** **TEXT INPUT: FILE**	On-line input mode. Off-line input mode.
ENTER	**TEXT NR:**	Display ready for text input.

Table B-9: Transmission of the message text file to the DAA

You can now start the transmission of the message text file on the PC.

Example for the file transmission via COM1 on the DOS level:

COPY <file name> COM1 <CR>

The transmission of a file into the message memory deletes all texts which have previously been stored in the message memory, i.e. also those texts, the numbers of which are not used in the new file.

Message memory full

If you try to input texts into the message memory, although it is already full, the message FULL or RAM OVERFLOW is displayed in the EDIT mode as well as in the FILE mode. In the EDIT mode, the last text number is subsequently displayed.

2.4 Auxiliary Help Text

In operating mode 0, you can assign the text number n an auxiliary help text: text number n + 128; this text is displayed after the call of text n, if the MINUS key is depressed. Actuating the MINUS key again acknowledges the display.

2.5 Transmission of the Message Memory

This function enables you to copy the contents of the message memory to a PC, another version B DAA or an EPROM programmer via the serial interface.

2.5.1 Transmission to a PC or a DAA Version B

Select the main function TEXT OUTPUT in the menu program "Modify" (see 1.2).

☞ Make sure, that the serial interfaces of the transmitting and the receiving device have matching configuration parameters.

Key	Display	Description
	TEXT OUTPUT	Transmission of the message memory.
ENTER +, -	**TEXT OUTPUT: INT2**	Selection of the serial interface. PLUS/MINUS key to change.
ENTER +, -	**TEXT OUTPUT: FILE**	Output format: if a format other than FILE is displayed, use the PLUS/MINUS key to change the setting.
ENTER	**START PRESS "ENTER"**	Device ready for the transmission. The receiving device must now be ready to receive, e.g. TEXT INPUT FILE must be set on the receiving DAA.
ENTER	**TEXT OUTPUT**	The data are being transmitted.

Table B-10: Transmission of the message memory to a PC or a DAA

2.5.2 Transmission to an EPROM Programmer

The transmission to an EPROM programmer is done in the same way as the transmission to a PC. Select the output format EP1, EP2 or EP3 instead of FILE depending on your programmer.

Format	Transmission log
EP1	ASCII HEX SPACE ETX
EP2	STX ASCII HEX SPACE ETX
EP3	STX $A0000 CR LF ASCII HEX SPACE ETX

STX = start code ASCII 02 H = CTRL B ETX = end code ASCII 03 H = CTRL C.

Table B-11: Transmission of the message memory to an EPROM programmer

3 Control

3.1 General

The output of a message can be triggered in several ways:

- via the 8 control inputs D0 to D7 of the parallel interface on the rear, arbitrarily with or without strobe signal (transfer pulse) - inputs are +24Vdc "active" high,
- via the serial interface,
- by direct input.

Texts are called by the assigned text numbers. The text numbers may be differently coded (see 3.2). Set the respective coding on your device using the menu program "Modify", main function INPUT MODE (see 1.2).

In addition to the output of a message text on the display, the called text can be output to a printer via the serial interface (see 3.1.3).

For the SIEMENS PLC S5, a function block is optionally available, which takes on the triggering of the message display (contained on the MWTA text editor diskette).

3.1.1 Memory Table

The called text numbers are stored in the memory table in the order that they were triggered together with the current variable values as well as date and time. Depending on the selected operating mode, the texts corresponding to the stored text numbers can be displayed in different order with the respective variable values (see 4.4.2).

As opposed to the message memory, the memory table is not battery-backed and is re-initialized each time the power supply is switched on.

3.1.2 Operating Mode

Four operating modes are available for the text output.

Final value message without paging-back option (operating mode 0)

In this operating mode, the last message is displayed. For each message, an assigned help text from the message memory can be additionally displayed (see 4.4.1).

When text no. 0 is called, the display is cleared.

Primary value message and final value message (operating modes 1 and 2)

Messages are stored in the order that they were triggered. The first or the last arrived message is displayed flashing. Section 4.4.2 describes how to display further messages.

Max. 127 messages can be stored. When the 128th message is received, the first message is deleted. The order is indicated in the last three positions of the display, if these are not filled with text. In case of running lines, the order is indicated in the first display position, e.g. *3*wording...* . In this case, the display is not flashing.

Sequence message (operating mode 3)

In this operating mode, the memory table is paged through automatically. The messages are displayed as follows (see 4.4.2):

- In case of direct input, all messages waiting to be served are displayed sequentially.
- In case of binary or BCD coded input, all messages triggered after the memory table was cleared are displayed.

Max. 127 messages can be stored. When the 128th message arrives, the first message is deleted.

Variables

In all the four operating modes, variable data can be overlayed (e.g. temperatures, pressures, etc.), which can be read in via the parallel or serial inputs (see 3.2.1 and 3.3).

3.1.3 Output of Messages

In addition to the output on the display, individual message texts can be output to a protocol printer e.g. IPP 144-40 or a secondary display DAA 144/288 version A via the serial interface. Only those message texts are printed or displayed on the secondary display, for which the text parameter **P1** or **PRN ON** is set (see 3.2.4).

Output to a protocol printer

For outputting the message texts to a protocol printer, set the print format (PRINT FORMAT) in the menu program "Modify" (see 1.2) to **NORMAL** or **STANDARD**. The message texts are output with date and time. If the TIME input is set high, the output of date and time is suppressed.

Output to a secondary display

For outputting the message texts to a secondary display, set the print format (PRINT FORMAT in the menu program "Modify" (see 1.2) to **SLAVE** or **DAA VERSION A**. The message texts are output without date and time.

3.2 Triggering via the Parallel Interface

In case of triggering via the selected parallel interface, the text number can be coded in different ways. Depending on the selected coding, the control lines D0 to D7 have different significances.

	Input		
Control line	Binary coded	BCD coded	Direct (single)
D0	2^0=1	2^0=1	Text 1
D1	2^1=2	2^1=2 — units pos.	Text 2
D2	2^2=4	2^2=4	Text 3
D3	2^3=8	2^3=8	Text 4
D4	2^4=16	2^0=1	Text 5
D5	2^5=32	2^1=2 — tens pos.	Text 6
D6	2^6=64	2^2=4	Text 7
D7	2^7=128	2^3=8	Text 8
max. no. of texts	255	99	8

Table B-12: Coding of the text numbers

Messages triggered by binary or BCD coded input signals can be displayed with or without the arrival of the strobe T signal (transfer pulse), depending if the STROBE is active or passive in the set-up menu. For direct input, the strobe input is without significance.

D0	D1	D2	D3	D4	D5	D6	D7
1	0	1	1	1	0	0	0
$1 \cdot 2^0$=**1**	$0 \cdot 2^1$=0	$1 \cdot 2^2$=**4**	$1 \cdot 2^3$=**8**	$1 \cdot 2^4$=**16**	$0 \cdot 2^5$=0	$0 \cdot 2^6$=0	$0 \cdot 2^7$=0
Text number = 1 + 4 + 8 + 16 = **29**							

Table B-13: Example for binary input, text no. 29

D0	D1	D2	D3	D4	D5	D6	D7
1	1	0	0	1	1	1	0
$1 \cdot 2^0$=**1**	$1 \cdot 2^1$=**2**	$0 \cdot 2^3$=0	$0 \cdot 2^0$=0	$1 \cdot 2^1$=**1**	$1 \cdot 2^2$=**2**	$1 \cdot 2^3$=**4**	$0 \cdot 2$ =0
Units position = 1 + 2 = **3**				Tens position = 1 + 2 + 4 = **7**			

Table B-14: Example for BCD input, text no. 73

D0	D1	D2	D3	D4	D5	D6	D7
0	0	0	1	0	0	0	0

Table B-15: Example for direct input, text no. 4

3.2.1 Text Call and Variable Overlay

The text call is carried out by setting the corresponding control lines to high (+24Vdc). The desired mode can be set in the menu program "Modify", main function STROBE-T MODE (see 1.2).

- ACTIVE: The text call is not carried out before the Strobe T signal is set.
- PASSIVE: The text call is carried out without Strobe-T signal. In case of a data change, a stable status on the data lines must be achieved within 3 ms maximum.

PASSIVE means, that all the functions which require a strobe signal cannot be executed, e.g. variable overlay via the parallel interface with Strobe/Plus or the deletion of a text with Strobe/Minus.

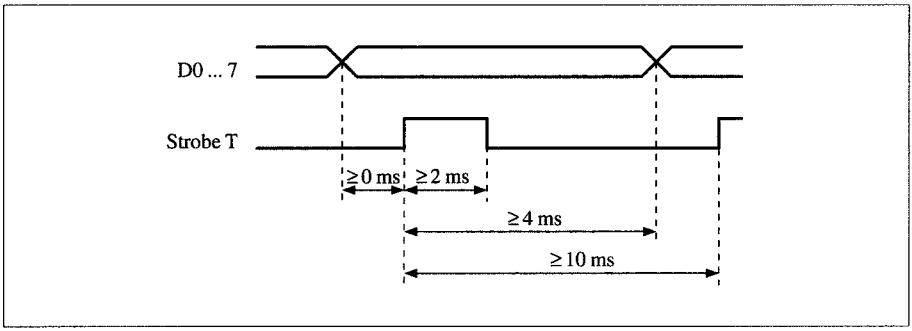

Fig. B-1: Timing with Strobe T

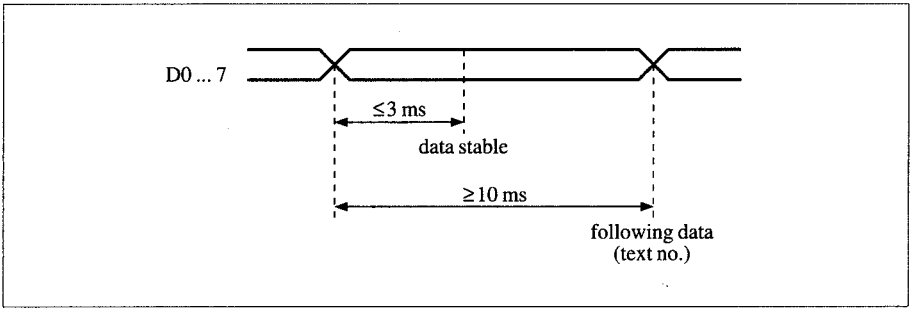

Fig. B-2: Timing without Strobe T

Text call with variables

In all called texts, it is possible to embed variables of up to 40 characters total in up to 3 blocks (DAA 288-240 B) or 19 characters in 3 blocks (DAA 144/288-120 B), which have been received through one of the interfaces at the time the text was called. A variable refresh function, without a repeat text call, is only possible in operating mode 0 and is executed only on the display.

Variable overlay via the parallel interface

The interface, via which the variable overlay shall be carried out, can be defined in the menu program "Modify" (see 1.2).

Variable overlay via the parallel interface is possible only, if the STROBE T mode is set to ACTIVE. Once the strobe signal for the text call has arrived, the first variable with strobe signal and signal to plus has to follow within 300 ms, otherwise the text

will be stored without variable. Each variable string must be closed with <CR> = 0D H (see 2.2.2).

Variable overlay via the serial interface is described under 3.3.

Input mode	Variable transmission	Character code
binary BCD	via D0 to D7 via D0 to D3	ASCII BCD*)

*) Displayable characters: see table D-11.

Table B-16: Variable formats

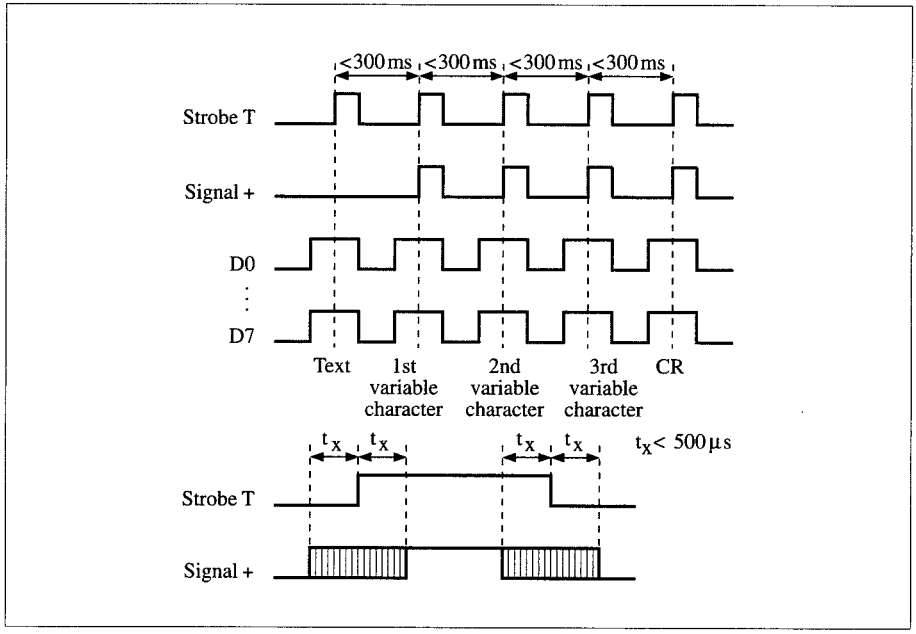

Fig. B-3: Timing for variable overlay

3.2.2 Deletion of Messages

The deletion of messages depends on the operating mode.

Operating mode 0

If text no. 0 is called, the displayed message is deleted. Messages previously generated in the storing operating modes are deleted.

A pulse at the MINUS input calls the auxiliary help text (see 2.4) and deletes the alarm. A second pulse at MINUS clears the display.

Operating modes 1, 2 and 3

Selective deletetion. A pulse at the STROBE and the MINUS input at the same time and entering the text number deletes all messages with the specified text number from the memory table, the next message is displayed.

A pulse at the MINUS input deletes the currently displayed message from the memory table, the next message is displayed.

3.2.3 Setting the Operating Mode

The operating mode can be set in the menu program "Modify", main function OPERATING MODE (see 1.2) or by means of the control signals $OM2^0$ and $OM2^1$ at the rear-side parallel interface. In the latter case, EXT or EXTERNAL must be set for OPERATING MODE in the menu program.

Operating mode	Designation	$OM2^0$	$OM2^1$
0	Final value message without paging-back option	0	0
1	Primary value message	1	0
2	Final value message	0	1
3	Sequence message (automatic paging)	1	1

Table B-17: Control signals for setting the operating mode

3.2.4 Output of Messages with and without the Time

As described under 3.1.3, each triggered message can be output to a protocol printer, if the text parameters are set accordingly. In this case, the called text is preceded by a line specifying date and time.

Format:

CR	LF	Date/time	CR	LF	Wording	CR	LF

You can suppress the output of date and time by setting the $\overline{\text{TIME}}$ control input to HIGH.

3.2.5 Locking the Front Function Keys

You can lock the front keys by means of control signals, if the operation of the keys is not desired for your application.

Locking the entry into the menu program

Set the control input ENTER of the rear-side parallel interface to HIGH. The PLUS/MINUS keys remain enabled.

Locking all front keys

Set the control inputs MODE *and* ENTER of the rear-side parallel interface to HIGH. The functions of the PLUS/MINUS keys remain available at the rear-side control intputs.

3.2.6 Testing the Input Lines

Via the function TEST INPUT LINES in the menu program, the status of all input lines of the rear-side parallel interface can be displayed.

Key	Display	Description
	TEST INPUT LINES	Main function status of the control lines
ENTER	0 0 1 1 0 0 1 0 0 1 1 1 0 0 1 1	Status, 0 = low, 1 = high
[+]	0 0 1 2 3 4 5 6 7 0 1 t M E + -	Line designation

The PLUS key toggles between status and line designation.

Table B-18: Test of the input lines, display in the menu program

Different features of the DAA 288-240 B

On the double line models, the line designation (first line) and the status (second line) are displayed together. Actuating the PLUS key is not required.

Line designations:

T	Strobe line
0 to 7	Data lines
t	TIME
M	MODE [1]
E	ENTER
+	PLUS
-	MINUS

[1] If the MODE input is triggered, this test function is terminated.

3.3 Triggering via the Serial Interface

Text call

Message texts can also be called via one of the serial interfaces. Call the menu program "Modify" and set the parameter SERIAL in the INPUT MODE function. The strobe input has no significance. Also set parameter VARIABLES to SERIAL or PARALLEL, as required.

Transmission log without addressing

Text number (max. 3 digits)	CR

Transmission log with addressing

ENQ (05 H)	Adr. 31 H to 4F H	Text number (max. 3 digits)	CR	EOT (04 H)

corresponding to

CTRL E	Device address	Text number (max. 3 digits)	CR	CTRL D

Variable overlay

Variables are stored in the memory table togehter with the text number:

Text number	CTRL V	1st variable	2nd variable	...	CR

Variable refresh in operating mode 0

The variable is updated on the display only (only possible in operating mode 0).

CTRL V	Wording	...	CR

Variable overlay for text calls via the parallel interface.

The first variable character must arrive within 300 ms maximum of the text call (<CRTL V is not required).

Wording	...	CR

4 Manual Operation

4.1 Acknowledging the Message

Acknowledging means that the text is cleared from the display and deleted from the memory table. The procedure depends on the selected operating mode and can also be carried out by means of the MINUS key or the rear-side MINUS input.

4.1.1 Operating Mode 0

In this mode - final value message without paging-back option - the last message triggered is always displayed and the DAA is ready to receive new messages. If a new message is triggered, the previous message is overwritten. Therefore, acknowledging the displayed message is not necessary. In this operating mode, the actuation of the MINUS key displays a second, assigned help text (see 4.4.1). Actuating the minus keys again clears the message.

Special feature of the DAA 288-240 B

The double line display models can show two messages simultaneously in operating mode 0, if one of the messages is defined as first line and the other as second line.

4.1.2 Operating Modes 1, 2 and 3

In the primary value, final value and sequence message mode, the display can be acknowldeged by actuating the MINUS key or by a signal at the rear-side minus control inputs.

4.2. Clearing the Memory Table

In the operating modes 1, 2 and 3, you can clear the memory table by depressing the MINUS key (or setting the rear-side minus input to HIGH) for more than 3 seconds.

4.3 Acknowledging the Alarm Relay

The alarm relay can be activated for each called text, if the corresponding parameter has been set during the text input (see 2.2.1).

The acknowlegdement of a display text by the MINUS key also resets the alarm. If you want to acknowledge the alarm only and the message shall remain on the display, depress the PLUS and the MINUS key simultaneously.

4.4 Paging

Paging means to call texts which are stored in the memory table or the message memory by means of control keys or control signals. The paging procedure depends on the selected operating mode.

4.4.1 Paging through the Message Memory

Operating mode 0, final value message without paging-back option, is a current value display mode.

For each called message, you can have displayed another text from the message memory, e.g. an operating instruction, by actuating the MINUS key. This assigned text text is stored under the following text number: **current text number + 128.**

Actuating the MINUS key again deletes the alarm. You can re-establish the original display by actuating the PLUS key.

☞ In case of direct input, always the text with the highest text number is displayed.

4.4.2 Paging through the Memory Table

In operating modes 1 and 2, primary and final value message respectively, the text numbers of the received messages are stored as a block in the memory table together with the variables, if any.
The first or the last message is displayed, the other messages can be called by actuating the PLUS key. You can re-establish the original display (primary or final value message) by depressing the PLUS key for more than three seconds.

In operating mode 3, sequence message, the memory table is paged through automatically in chronologiical order. The texts are displayed sequentially. You can select a display time between 0.5 and 30 seconds for the individual texts (menu program "Modify", section 1.2, item DISPLAY TIME). Running line messages run through once.

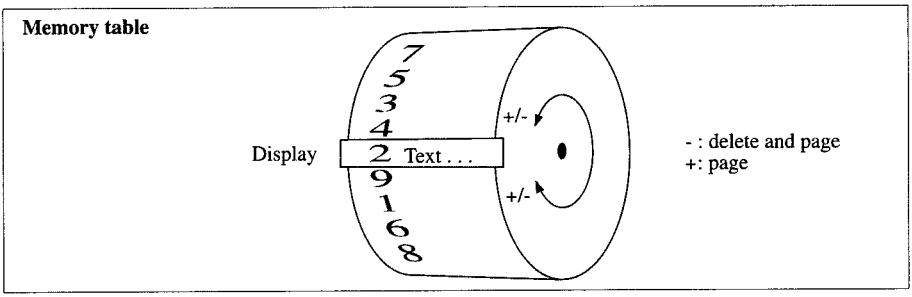

Fig. B-4: Memory table

4.5 Operation via the Serial Interface

4.5.1 Output of the Memory Table

In operating modes 1, 2 and 3, you can output all texts in the memory table to a PC or a printer. The texts are output chronologically in the order that they were called.

☞ The control character <CTRL P> effects the text output with date and time.

Format:

CTRL P	CR	LF	Date/time	CR	LF	Wording	CR	LF

4.5.2 Clearing the Memory Table

After the output to a printer or a PC by <CTRL P>, the memory table can be cleared by <CTRL X>.

☞ This function of the control character <CTRL X> is effective only after <CTRL P>.

4.5.3 Input and Output of Date and Time

By means of <CTRL S> you can set the date and the time via one of the serial interfaces.

Input format for July 16, 1992, 14:03:05:

CTRL S	160792140305	CR

Full stops, spaces, commas and colons are not entered.

By means of <CTRL T> you can request date and time via one of the serial interfaces.

Output format:

CTRL T	16. Jul. 92 14:03:05	CR	LF

Version C

Contents

Page

1 Configuration C-3
1.1 "Display" Menu Program Settings C-4
1.2 "Modify" Menu Program Settings C-6

2 Programming the Message Memory C-9
2.1 Message Memory C-9
2.2 Parameters C-9
2.2.1 Text Parameters C-10
2.2.2 Character Parameters (Control Codes) C-11
2.3 Text Input C-12
2.3.1 On-Line Text Input - "Edit" Mode C-13
2.3.2 Off-Line Text Input - "File" Mode C-15
2.4 Auxiliary Help Text C-19
2.5 Transmission of the Message Memory C-19
2.5.1 Transmission to a PC or a DAA 288-240C C-19
2.5.2 Transmission to an EPROM Programmer C-20
2.6 Message Memory Test C-20
2.6.1 Checking the Message Memory Content C-21
2.6.2 Checking the Triggered Text Numbers C-21

3 Control C-22
3.1 General C-22
3.1.1 Memory Table C-22
3.1.2 Operating Mode C-23
3.1.3 Output of Messages C-24
3.1.4 Data Logging Memory C-24
3.2 Triggering via the Parallel Interface C-25
3.2.1 Text Call C-27
3.2.2 External Variables C-28
3.2.3 Internal Variables - Timer/Counter Functions C-31
3.2.4 Deletion of Messages C-33
3.2.5 Setting the Operating Mode C-33
3.2.6 Output of Messages with and without the Time C-34
3.2.7 Locking the Front Function Keys C-34

Page

3.2.8 Testing the Input Lines C-35
3.3 Triggering via the Serial Interface C-36

4 Operation C-37
4.1 Acknowledging a Message C-37
4.1.1 Operating Mode 0 . . . . . C-37
4.1.2 Operating Modes 1, 2 and 3 . . . . . C-37
4.1.3 Resetting the Internal Variables C-37
4.2 Clearing the Memory Table C-37
4.3 Acknowledging the Alarm C-38
4.4 Paging C-38
4.4.1 Paging through the Message Memory C-38
4.4.2 Paging through the Memory Table C-39
4.5 Analysis of the Data Logging Memory C-40
4.5.1 Output of the Data Logging Memory C-40
4.5.2 Clearing the Data Logging Memory C-42

5 Setting and Operation via the Serial Interface C-43
5.1 Basic Settings C-43
5.2 Output of the Current Settings C-44
5.3 Text Input C-45
5.3.1 On-Line Text Input - "Edit" Mode C-45
5.3.2 Off-Line Text Input - "File" Mode C-45
5.4 Transmission of the Message Memory C-46
5.5 Setting the Internal Variables C-46
5.6 Operator Control during Operation C-47
5.6.1 Acknowledging the Alarm C-47
5.6.2 Output of the Memory Table C-48
5.6.3 Clearing the Memory Table C-48
5.6.4 Output of the Internal Variable Data C-48
5.6.5 Output of the Data Logging Memory C-49
5.6.6 Clearing the Data Logging Memory C-49
5.6.7 Input and Output of Date and Time C-50

1 Configuration

The DAA 288-240 C intelligent message displays are equipped with a message memory, in which up to 1023 texts can be stored. In addition, they have a memory table and a data logging memory allowing the analysis of the called messages by different criteria. Messages can be triggered by binary or BCD coded input, by direct input or via the serial interface; additionally, variables can be overlaid.

You can set for how long a message shall be displayed. Additionally there is a real time clock/calendar with date and time. For each message, three alarm levels can be activated and the texts can be output to a printer or an additional version A intelligent message display (master/slave).

Texts can be displayed as static messages or running line messages. Static messages can be set to flash or have flashing portions. 6 character sets are available for the character representation.

On DAA 288-240 C devices, the basic settings can be made by means of the front-side control keys (see 1.1 and 1.2) or via the serial interface (see 5.1).

Each device has four red keys on the front, which are used to display or set the brightness, the interface data, the character set and other parameters via a menu program.

MODE	Selection of the main function;
ENTER	Selection of the subfunction and acceptance of the selected values;
PLUS/MINUS	Selection of the offered parameters; the current value is flashing.

☞ The menu program is quit manually by simultaneously depressing MODE and ENTER, or automatically, if no key is actuated within 60 s.

☞ The menu program allows the setting of the device parameters and the call of auxiliary functions in the permanent EEPROM.

1.1 "Display" Menu Program Settings

To enter the menu program, depress the MODE key for more than 3 s. In this mode the PLUS and the MINUS key have no function.

Key	Display	Description
MODE (>3 s)	**SET UP-MENUE V. 6...**	Display of the software version.
MODE	**DISPLAY:** **BRIGHTNESS:** e.g. **4**	Display of the currently set brightness: 1, 2, 3, 4.
MODE	**SET TIME/DATE:** day, month, year, hour, minute second	Display of date and time.
MODE	**CHARACTER SET:** e.g. **ASCII**	Display of the character set: ASCII, D (German), F (French) S/SF (Swedish/Finnish), DK/N (Danish/Norwegian), CYR (Cyrillic).
MODE	**INTERFACE: RS 232 C** e.g. **INTERFACE I B2400** **D8 S1 PN A00**	Display of the currently set interface data: I = front, II = rear B = baud rate: 110, 150, 300, 600, 1200, 2400 D = data format: 7 or 8 Bit S = stop bit: 1 or 2 P = parity bit: E (even) O (odd) M (mark) S (space) N (no) no parity A = address: 00 to 31.
MODE	**PRINT FORMAT:** e.g. **STANDARD**	Output format for printer or secondary display: STANDARD: output to printer DAA VERSION A: Output to secondary display version A.

Table C-1: Menu program "Display", part 1

Key	Display	Description
MODE	**INPUT MODE:** e.g. **SERIAL**	Text trigger modes: SINGLE direct input BINARY binary coded BCD BCD coded SERIAL input via the serial interface.
MODE	**STROBE-T MODE:** e.g. **PASSIVE**	Strobe signal (for parallel inputs): ACTIVE text call triggered by strobe signal. PASSIVE text call triggered by modified data word.
MODE	**OPERATING MODE:** e.g. **1**	Operating mode: 0 to 3 and EXTERNAL, see 3.1.2.
MODE	**VARIABLE MODE INT.:** **TIMER/COUNTER** e.g. **NO**	Internal variable, counter/timer: NO internal variable not active YES internal variable active.
MODE	**VARIABLE MODE EXT.:** e.g. **0 SERIAL**	Variable overlay, definition of interface and input lines: 0 SERIAL serial 1 PARALLEL D0-D7 parallel D0-D7 2 PARALLEL E0-E7 parallel E0-E7*) 3 PARALLEL BCD BCD coded*) *) only if TIMER/COUNTER not active.
MODE	**DISPLAY TIME:** e.g. 5 SEC	Display time (operating mode 3): 0,5, 1, 2, 3, 4, 5, 10 or 30 s.
MODE + ENTER	Normal operation	Exit from the menu program; if only the MODE key is actuated, the display returns to BRIGHTNESS.

Table C-2: Menu program "Display", part 2

The menu program is quit manually by simultaneously depressing MODE and ENTER or automatically, if no key is actuated within 60 s.

1.2 "Modify" Menu Program Settings

To enter the menu program, depress the MODE key for more than 3 s. Then depress MODE and ENTER simultaneously for more than 4 s.

In general, the MODE key is used to step through the menu, the PLUS and MINUS keys are used to change desired settings and **the ENTER key confirms the selection.** In some cases the ENTER key displays submenus.

Key	Display	Description
MODE (>3 s)	**SET UP-MENUE V. 6...**	Entry into the menu program.
MODE + ENTER (> 4 s) +, -	**DISPLAY:** **BRIGHTNESS:** 1 2 **3** 4	Display of the currently set brightness, the current value flashes. PLUS/MINUS key to change.
MODE ENTER, +, -	**SET TIME/DATE:** second, minute, hour, year, month, day	Display of date and time. ENTER activates the parameter (flashes). PLUS/MINUS key to change.
MODE +, -	**CHARACTER SET:** **ASCII** D F S/SF DK/N CYR.	The currently set character set flashes. PLUS/MINUS key to change.
MODE	**INTERFACE: RS 232 C** **INTERFACE I B2400** **D8 S1 PN A00**	Display of the currently set interface data.
ENTER, +, -	**INTERFACE: 1**	PLUS/MINUS key to change the individual values.
ENTER, +, -	**BAUDRATE: 2400**	
ENTER, +, -	**DATA FORMAT: 8 BIT**	
ENTER, +, -	**STOP BIT: 1**	
ENTER, +, -	**PARITY: NO**	
ENTER, +, -	**ADDRESS: 00**	
MODE +, -	**PRINT FORMAT:** **STANDARD** DAA VERSION A	The currently set output format for printer or secondary display flashes. PLUS/MINUS key to change.

Table C-3: Menu program "Modify", part 1

Key	Display	Description
MODE	**TEXT INPUT**	Input of texts into the message memory, see 2.3.
MODE	**TEXT OUTPUT**	Transmission of the message memory, see 2.5.
MODE +, -	**INPUT MODE** SINGLE **BINARY** BCD SERIAL	Text trigger mode, the current value flashes. PLUS/MINUS key to change.
MODE +, -	**STROBE-T MODE:** ACTIVE **PASSIVE**	Strobe signal, the current value flashes. PLUS/MINUS key to change.
MODE +, -	**OPERATING MODE:** 0 **1** 2 3 EXT	Operating mode, see 3.1.2, the current value flashes. PLUS/MINUS key to change.
MODE +, -	**VARIABLE MODE INT.:** **TIMER/COUNTER** **YES** NO	Internal variable timer/counter, see 3.2.3, the current value flashes. PLUS/MINUS key to change.
MODE +, -	**VARIABLE MODE EXT.:** **0 SERIAL**	Variable overlay, see 3.2.2, the current value flashes. PLUS/MINUS key to change.
MODE +, -	**DISPLAY TIME:** 0,5 1 2 3 4 **5** 10 30 **SEC**	Display time (for operating mode 3), the current value flashes. PLUS/MINUS key to change.

Table C-4: Menu program "Modify", part 2

Key	Display	Description
MODE	**DIAGNOSIS MEMORY:**	Output of the data logging memory, see 4.5.1
MODE	**ERASE DIAGNOSIS:**	Clearing the data logging memory, see 4.5.2.
MODE	**TEST INPUT LINES**	Status of the control lines, see 3.2.8
MODE	**TEXT CONTROL MODE**	Checking the message memory content, see 2.6.1
MODE	**TEST MODE**	Checking the triggered text numbers, see 2.6.2.
MODE + ENTER	Normal operation	Exit from the menu; if only the MODE key is actuated, the display returns to BRIGHTNESS.

Table C-5: Menu program "Modify", part 3

The menu program is quit manually by simultaneously depressing MODE and ENTER or automatically, if no key is actuated within 60 s.

2 Programming the Message Memory

2.1 Message Memory

The DAA 288-240 C devices have a message memory, in which max. 1023 texts with a total of 63,470 characters can be stored. A static message consists of max. two lines with 40 characters each. Texts with a maximum of 175 characters can be displayed as running line messages. Control characters restrict the total capacity of the message memory, but not the number of characters which can be output on the display.

The texts are stored in a battery-backed CMOS-RAM. Optionally an EPROM is available. The later conversion from RAM to EPROM is possible (see Z-2.6).

The text numbers 1 to 8 enable the overlay of internal variables (counter/timer, see 3.2.5).

In operating mode 0, the message memory is divided into two parts with 511 texts each. In this case, the second part is used for storing auxiliary help texts. Each text number of the first part can be assigned an auxiliary text which is displayed, when a message is acknowledged.

Text numbers in the range 1 to 40 can be assigned a message page with 10 additional help/information texts each (see 4.4.1).

2.2 Parameters

For each text number, the corresponding parameters must be entered. The text parameters define, how a called text shall be output, as static message or running line, with or without alarm, with or without printout on a protocol printer; moreover, the priority level and the destination address must be specified. Control codes are required for the display of flashing text blocks and for variable overlay.

2.2.1 Text Parameters

Representation

For the representation of texts as static messages or running line messages, five modes are available:

- Mode 1: static display, line 1 only (LINE 1)
- Mode 2: static display, line 2 only (LINE 2)
- Mode 3: static display, line 1 and 2 (LINE 1+2)
- Mode 4: running line, line 1 (RUN L1)
- Mode 5: running line, line 2 (RUN L2).

Note: In operating mode 0 two single line messages can be displayed simultaneously if one of the messages is defined as line 1 and the other as line 2.

Printing (via the serial interface)

There are two possibilities for the output of a called text to a printer and a secondary display:

- without printout: PRN OFF
- with printout: PRN ON.

Destination address

The DAA 288-240 C can output texts to other version A displays of the DAA series or to IPP protocol printers. Therefore, it is necessary to specify a destination address with the text parameters:

- no destination address 00
- output to another device 01 ... 31.

Alarm

There are four possibilities for the activation of an alarm status with the text call:

- without alarm AL OFF
- alarm level 1 (relay, contacts 1 and 2): AL 1
- alarm level 2 (open collector 1, contacts 38 and 40): AL 2
- alarm level 3 (open collector 2, contacts 39 and 40: AL 3.

AL 2 is also set in case of a data logging memory overflow.

Statistics

The priority level specifies, whether a message call shall be logged in the data logging memory:

- output to display and data logging memory: PRIO 1
- output to the display only: PRIO 2
- output to the data logging memory only: PRIO 3.

2.2.2 Character Parameters (Control Codes)

Character parameters are set by means of control code characters during the text input.

Flashing display (not for running lines)

Complete texts or max. 2 texts blocks per line (4 blocks for two line texts) within a message can be set to be flashing. When entering the text, place the control character <CTRL F> at the beginning of the flashing block and mark the end with <CTRL G>. A flashing text block must not have more than 40 characters in a single line, or 80 characters in a two line text.

Wildcards for variables

If variables will be inserted into a text in a so-called "dynamic field", the space for the variables must be reserved. Wildcards are any characters placed between <CTRL V> (begin) and <CTRL W> (end).

Up to 3 dynamic fields can be defined. The total length of the fields must not exceed 40 characters. If 3 blocks have already been marked, <CTRL V> and <CTRL W> only modify the last block.

☞ The inserted variables are always left-justified in the variable window reserved by the control characters.
Make sure that the defined window is not too small.

2.3 Text Input

Texts can be input into the message memory via a programmer (e.g. Siemens PG 675/685), a terminal, or a PC. The texts are transmitted to the message memory through one of the serial interfaces.

There are two possibilities:

- on-line input of individual texts via terminal or keyboard and
- off-line input of all texts into a file and subsequent transmission of the complete file into the message memory.

☞ To simplify the text input, the MWTA software for the operating systems MS-DOS and PCP/M86 is optionally available.

☞ The interface data of the display unit must be matched to those of the text input device. The values for baud rate, data format, stop bits and parity can be set by means of the menu program "Modify" and the main function INTERFACE (see 1.2).

☞ Inputs into the message memory are possible only, if the pins 1 and 6 of the 9-pole interface or the pins 1 and 13 of the 25-pole interface are jumpered (see M-1.3). If the jumper is missing, the access to the message memory is disabled and the error message MEMORY LOCKED is displayed.

2.3.1 On-Line Text Input - "Edit" Mode

Input of new texts

Menu program "Modify", main function TEXT INPUT (see 1.2).

Key	Display	Description
	TEXT INPUT	Input of texts into the message memory.
ENTER +, -	**TEXT INPUT: INTERFACE II** **TEXT INPUT: INTERFACE I**	Selection of the interface, via which the texts shall be transmitted.
ENTER	**TEXT INPUT: EDIT**	On-line "Edit" input mode.
ENTER	**TEXT NUMBER:**	Display ready for text input.
The key designations below refer to the terminal keyboard.		
<Text number> e.g. 15	**TEXT NUMBER: 15** **FORMAT:**	Number of the text to be input (can be reset by <CTRL D>). If an incorrect text number is entered, it flashes; re-enter the correct number.
<CR>	**LINE 1 PRN ON *00** **AL 2 PRIO 1** Static message, line 1, with printout, no destination address, alarm level 2, output to display and data logging memory.	Display of the text parameters. Select the parameter to be changed using the cursor control keys. Selection of the value by means of the space bar or the numeric keys.

Table C-6: On-line text input via the menu program, part 1

Key	Display	Description
<CR>	– Cursor position	Acceptance of the parameters. The text can now be entered.
<Text>	**TEXT**	Wording of the text.
<CR>	**TEXT NUMBER: 16**	Completion of the text input; the next text number is displayed, which can be overwritten.

Table C-7: On-line text input via the menu program, part 2

The text input can be terminated at any time by ESC. If you actuate ESC again, the menu program is quit and the display returns to the selected operating mode.

Editor functions:

Function	Control character	ASCII		Remark
Cursor left:	CTRL L	0C H	012	**L**EFT
Cursor right:	CTRL H, BS	08 H	008	**B**ACK**S**PACE
Insert a blank at the cursor position:	CTRL I	09 H	009	**I**NSERT
Delete the character at the cursor position:	CTRL D	04 H	004	**D**ELETE
Start flashing:	CTRL F	06 H	006	**F**LASH
End flashing:	CTRL G	07 H	007	
Begin of variable window:	CTRL V	16 H	022	**V**ARIABLE
End of variable window:	CTRL W	17 H	023	
Delete all control characters <CTRL F>, <CTRL G>, <CTRL V>, <CTRL W>:	CTRL X	18 H	024	E**X**TRACT

Table C-8: Control characters for the text input

Deletion of the control characters for flashing and variable overlay

The control characters <CTRL F>, <CTRL G>, <CTRL V> and variable <CTRL W> cannot be individually deleted or moved. Enter <CTRL X> to delete all control characters in a text.

This function of the control character <CTRL X> applies only to text inputs in the TEXT INPUT mode under EDIT. In normal operation of the display, <CTRL X> has another function (see 4.5.2).

Modification of existing texts

The modification of existing texts can be executed in the same way as the input of new texts, if you enter the control character <CTRL C> before entering the text number. Without the jumper between pins 1 and 6 of the 9-pole or pins 1 and 13 of the 25-pole interface, texts can be called by <CTRL C>, but not modified.

Key	Display	Description
<CTRL C> Text number e.g. 6	**TEXT NUMBER: 6** **CHANGE TEXT**	Number of the text to be modified.
<CR>	**LINE 1 PRN ON *00** **AL 2 PRIO 1** **CHANGE TEXT**	Display of the text parameters. Changes as for the input of the new texts.

Table C-9: Modification of existing texts

2.3.2 Off-Line Text Input - "File" Mode

You can use an IBM-compatible PC to generate an ASCII file containing all message texts which shall be stored in the message memory and subsequently copy the complete file into the message memory of the intelligent message display.

Any ASCII editor, such as EDIT.COM (MS-DOS 5.00 or higher), EDLIN.EXE, the Norton editor or any word processing program which is able to output ASCII files, can be used to generate this file. Input via the DOS command line level with COPY CON

<file name> is also possible. The **MWTA** software is available as an option for the easy input and transmission of text files.

Structure of the text file

Each complete message text is structured as follows:

Text number	CR	Parameter	CR	Text with control characters	CR

Text number, four digits:

1 to 1023 (depending on coding 999 max. for BCD or serial)

Parameter, six digits:

1st digit: Type of text and line selection
- 1 = static message, line 1
- 2 = static text, line 2
- 3 = static text, lines 1 and 2
- 4 = running line, line 1
- 5 = running line, line 2

2nd digit: Printing option
- 0 = OFF, without printout
- 1 = ON, with printout upon text call

3rd and 4th digit: Destination address
- 00 = no destination address
- 01 ... 31 = destination address device 1 to 31

5th digit: Alarm option
- 0 = OFF, no alarm
- 1 = alarm level 1 (relay)
- 2 = alarm level 2 (open collector 1)
- 3 = alarm level 3 (open collector 2)

6th digit: Statistics
- 1 = output to display and data logging memory: PRIO 1
- 2 = output to the display only: PRIO 2
- 3 = output to the data logging memory only: PRIO 3.

The max. text length of a static message is 80 characters. Control characters do not limit the usable text length.

The individual components of the message text are separated by <CR> or <CR> <LF>, a <CR> at the end of the wording indicates the end of a text. After all texts have been entered, the file must be closed with <CTRL Z>, since otherwise the DAA would not be able to recognize the end of the transmission.

Example for a message text:

3 <CR>	text number 3
110021 <CR>	static text, with printout, no destination address, alarm level 2, priority 1
Text ... <CR>	text entry and termination

The following must be observed for the input of long running line messages and for the input of double line messages:

A running line message with more than 80 characters cannot be displayed in one line on the screen of the PC. In order to get to the next editor line, you would have to enter <CR>. However, the DAA would interpret this <CR> as the end of the text. Therefore, enter the characters ^L followed by <CR> at any place before reaching the right margin. The characters ^L make the DAA ignore the following <CR> and append the succeeding text.

Example for double-space text input:

4 <CR>	text number 4
400001	running line, line 1, without printout, no destination address, without alarm, priority 1

THIS IS A TEXT WHICH REQUIRES ^L <CR>
ONE LINE! <CR>

Transmission of the file into the message memory

The transmission of the file into the message memory can be carried out by any utility program having a transmission function, but the easiest way is to use the MWTA editor. On the DOS command line level, the transmission can be carried out by copying the file to the serial interface.

Transmission via the menu program

Set the file transmission parameters in the main function TEXT INPUT of the menu program "Modify" (see 1.2).

Key	Display	Description
	TEXT INPUT	Input of texts into the message memory.
ENTER +, -	**TEXT INPUT:** **INTERFACE II** **TEXT INPUT:** **INTERFACE I**	Selection of the interface, through which the data shall be input.
ENTER +, -	**TEXT INPUT: EDIT** **TEXT INPUT: FILE**	On-line input mode. Off-line input mode.
ENTER	**TEXT NUMBER:**	Display ready for text input.

Table C-10: Off-line text input via the menu program

You can now start the transmission of the message text file on the PC.

Example for the file transmission via COM1 on the DOS level:

COPY <file name> COM1 <CR>

The transmission of a file into the message memory deletes all texts which have previously been stored in the message memory, i.e. also those texts, the numbers of which are not used in the new file.

Message memory full

If you try to input texts into the message memory although it is already full, the message RAM OVERFLOW is displayed in the EDIT mode as well as in the FILE mode. In the EDIT mode, the last text number is subsequently displayed.

2.4 Auxiliary Help Text

In operating mode 0, you can assign the text number n an auxiliary help text: text number n + 512; this text is displayed after the call of text n, if the MINUS key is depressed. Actuating the MINUS key again acknowledges the display.

2.5 Transmission of the Message Memory

This function enables you to copy the contents of the message memory to a PC, another DAA 288-240 C or an EPROM programmer via the serial interface.

2.5.1 Transmission to a PC or a DAA 288-240 C

Select the main function TEXT OUTPUT in the menu program "Modify" (see 1.2).

☞ Make sure, that the serial interfaces of the transmitting and the receiving device have matching configuration parameters.

Key	Display	Description
	TEXT OUTPUT	Transmission of the message memory.
ENTER [+, -]	**TEXT OUTPUT:** **INTERFACE II**	Selection of the serial interface. PLUS/MINUS key to change.
ENTER [+, -]	**TEXT OUTPUT: FILE**	Output format: If a format other than FILE is displayed, use the PLUS or the MINUS key to change the setting.
ENTER	**START PRESS "ENTER"**	Device ready for the transmission. The receiving device must now be ready to receive.
ENTER	**TEXT OUTPUT**	The message memory is being transmitted.

Table C-11: Transmission of the message memory via the menu program

2.5.2 Transmission to an EPROM Programmer

The transmission to an EPROM programmer is done in the same way as the transmission to a PC. Select the output format EP1, EP2 or EP3 instead of FILE depending on your programmer.

Format	Transmission log
EP1	ASCII HEX SPACE ETX
EP2	STX ASCII HEX SPACE ETX
EP3	STX $A0000 CR LF ASCII HEX SPACE ETX

STX = start code ASCII 02 H = CTRL B ETX = end code ASCII 03 H = CTRL C.

Table C-12: Transmission of the message memory to an EPROM programmer

2.6 Message Memory Test

Two menu functions are available for checking the message memory: Checking the message memory content and checking the triggered text numbers.

2.6.1 Checking the Message Memory Content

Select the main function TEXT CONTROL MODE in the menu program "Modify" (see 1.2).

Key	Display	Description
	TEXT CONTROL MODE	Check of the stored texts.
ENTER +, -	**TEXT NUMBER: 1** **TEXT NUMBER: 16**	The display offers text no. 1; select the desired number using the PLUS or the MINUS key. If you keep the key depressed the numbers run through more quickly.
ENTER	Text parameters	Parameters of the selected text number.
ENTER	Text	The text is displayed; actuate ENTER to call further texts.

Table C-13: Message memory test via the menu program

The error message INVALID NUMBER indicates that the selected text number is not assigned.

2.6.2 Checking the Triggered Text Numbers

This test function can be especially useful during the commissioning of the system. The triggered text numbers are displayed instead of the text information, even if the message memory has not been programmed yet.

Select the main function TEXT MODE in the menu program "Modify" (see 1.2).

Key	Display	Description
	TEST MODE	Check of the triggered text numbers.
ENTER	**TEXT NUMBER: 1 ...**	The text numbers are displayed.

Table C-14: Check of the triggered text numbers

3 Control

3.1 General

The output of a message can be triggered in several ways:

- via the control inputs D0 to D11 of the parallel interface on the rear, with or without Strobe T signal (transfer pulse) - inputs are + 24Vdc "active" high,
- via the serial interface,
- by direct input.

The control inputs E0 to E7 and a second strobe signal (Strobe V) are used for variable overlay.

Texts are called by the assigned text numbers. The text numbers may be differently coded. Set the respective coding on your device using the menu program "Modify", main function INPUT MODE (see 1.2). The input mode can also be set via the serial interface (see 5.1).

In addition to the output of a message text on the display, the called text can be output to a printer via the serial interface (see 3.1.3). Called messages can also be stored in the data logging memory which can be analyzed by different criteria.

3.1.1 Memory Table

The called text numbers are stored in the memory table in the order that they were triggered together with the current variable values as well as date and time. Depending on the selected operating mode, the texts corresponding to the stored text numbers can be displayed in different orders with the respective variable values (see 4.4.2).

As opposed to the message memory and data logging memory, the memory table is not battery-backed and is re-initialized each time the power supply is switched on.

3.1.2 Operating Mode

Four operating modes are available for the text output.

Final value message without paging-back option (operating mode 0)

In this operating mode, the last message is displayed. For each message an assigned auxiliary help text and 10 additional texts from the message memory can be displayed (see 4.4.1).

When text no. 0 is called, the display is cleared.

Primary value message and final value message (operating modes 1 and 2)

Messages are stored in the order that they were triggered. The first or the last arrived message is displayed flashing. Section 4.4.2 describes how to display further messages.

Max. 127 messages can be stored. When the 128th message is received, the first message is deleted. The order is indicated in the three last positions of the display, if these are not filled with text. In case of running lines, the order is indicated in the first display position, e.g. 3*wording... . In this case, the display is not flashing.

Sequence message (operating mode 3)

In this operating mode, the memory table is paged through automatically. The messages are displayed as follows (see 4.4.2):

- In case of direct input, all texts waiting to be served are displayed sequentially.
- In case of binary or BCD coded input, all messages triggered after the memory table was cleared are displayed.
  Max. 127 messages can be stored. When the 128th message arrives, the first message is deleted.

Variables

In all operating modes, variable data can be overlaid (e.g. temperatures, pressures, etc.), which can be read in via the parallel or a serial interface.

3.1.3 Output of Messages

In addition to the output on the display, individual message texts can be output to a protocol printer, e.g. IPP 144-40, or to a secondary display DAA 288-240 A via the serial interface. Only those message texts are printed or displayed on the secondary display, for which the text parameter PRN ON is set (see 2.2.1).

Output to a protocol printer

For outputting the message texts to a protocol printer, set the print format (PRINT FORMAT) in the menu program "Modify" (see 1.2) to STANDARD. The message texts are output with date and time. If the TIME input is set high, the output of date and time is suppressed.

Output to a secondary display

For outputting the message texts to a secondary display, set the print format (PRINT FORMAT) in the menu program "Modify" (see 1.2) to **DAA VERSION A**. The message texts are output without date and time.

3.1.4 Data Logging Memory

The DAA 288-240 C has a battery-backed 64 KB data logging memory (diagnostic storage), in which approx. 2500 events can be stored. The texts are stored with variable data, date and time of call and reset, if the priority parameter is set to 1 or 3 (see 2.2.1).

The memory operates on the FIFO principle (first in - first out). In case of a memory overflow the older data are lost. If the memory is full (approx. 90 %), alarm AL 2 is triggered.

Different monitoring periods and statistic output formats are available for the evaluation.

The output and deletion of the data logging memory can be controlled via a menu or a serial interface (see 4.6.5 and 4.6.6). In case of menu control, the deletion of the data logging memory can be protected by a password.

3.2 Triggering via the Parallel Interface

In case of triggering via the parallel interface, the text number can be coded in different ways. Depending on the selected coding, the control lines D0 to D11 and E0 to E7 have different significances.

Control line	Input	
	Binary coded	BCD coded
D0	2^0=1	2^0=1
D1	2^1=2	2^1=2
D2	2^2=4	2^2=4
D3	2^3=8	2^3=8
D4	2^4=16	2^0=1
D5	2^5=32	2^1=2
D6	2^6=64	2^2=4
D7	2^7=128	2^3=8
D8	2^8=256	2^0=1
D9	2^9=512	2^1=2
D10		2^2=4
D11		2^3=8
Texts, max.	1023	999

D0–D3: units position; D4–D7: tens position; D8–D11: hundreds position

Table C-15: Coding of the text numbers for binary and BCD coded input

Messages triggered by binary or BCD coded input signals can be displayed with or without the arrival of the strobe T signal (transfer pulse), depending if the STROBE is set active or passive in the set-up menu.

For direct input, all 20 inputs can be used. The additional utilization of the Strobe T and Strobe V inputs allows up to 4 blocks with 20 text numbers each, i.e. up to 80 messages can be triggered by direct input.

Strobe T	Strobe V	Inputs D0 to D11, E0 to E7
0	0	Texts no. 1 to 20
1	0	Texts no. 21 to 40
0	1	Texts no. 41 to 60
1	1	Texts no. 61 to 80

Table C-16: Coding of the text numbers for direct input with strobe signal

The reference potential of the inputs Strobe T, Strobe V and D0 to D11 is galvanically isolated from that of the inputs E0 to E7. To get equal reference potentials, the inputs 3 or 4 and 37 at the rear-side control inputs must be connected.

D0 1	D1 0	D2 1	D3 1	D4 1	D5 0	D6 0	D7 0	D8 0	D9 0
$1 \cdot 2^0 = \mathbf{1}$	$0 \cdot 2^1 = 0$	$1 \cdot 2^2 = \mathbf{4}$	$1 \cdot 2^3 = \mathbf{8}$	$1 \cdot 2^4 = \mathbf{16}$	$0 \cdot 2^5 = 0$	$0 \cdot 2^6 = 0$	$0 \cdot 2^7 = 0$	$0 \cdot 2^8 = 0$	$0 \cdot 2^9 = 0$
Text number = 1 + 4 + 8 + 16 = **29**									

Table C-17: Example for binary input, text no. 29

D0 1	D1 1	D2 0	D3 0	D4 1	D5 1	D6 1	D7 0
$1 \cdot 2^0 = \mathbf{1}$	$1 \cdot 2^1 = \mathbf{2}$	$0 \cdot 2^2 = 0$	$0 \cdot 2^3 = 0$	$1 \cdot 2^0 = \mathbf{1}$	$1 \cdot 2^1 = \mathbf{2}$	$1 \cdot 2^2 = \mathbf{4}$	$0 \cdot 2^3 = 0$
Units position = 1 + 2 = **3**				Tens position = 1 + 2 + 4 = **7**			
In this case, the inputs for the hundreds position D8 to D11 are 0.							

Table C-18: Example for BCD coded input, text no. 73

Strobe T	Strobe V	D0	D1	D2	D3	D4	D5	D6	D7
1	0	0	0	0	1	0	0	0	0
In this case the inputs D8 to D11 and E0 to E7 are 0.									

Table C-19: Example for direct input, text no. 24

3.2.1 Text Call

The text call is carried out by setting the corresponding control lines to high (+24Vdc). The desired mode can be set in the menu program "Modify", main function STROBE-T MODE (see 1.2).

- ACTIVE: The text call is not carried out before the Strobe T signal is set.
- PASSIVE: The text call is carried out without Strobe-T signal. The parallel overlay of external variables is only possible via E0 to E7.

☞ PASSIVE means, that all functions requiring a strobe signal cannot be executed, e.g. variable overlay via the parallel interface with D0...D7 or the deletion of a text with strobe/minus.

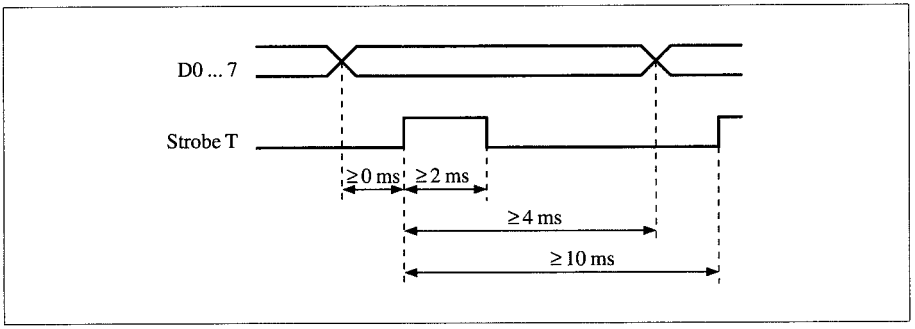

Fig. C-1: Timing with Strobe T

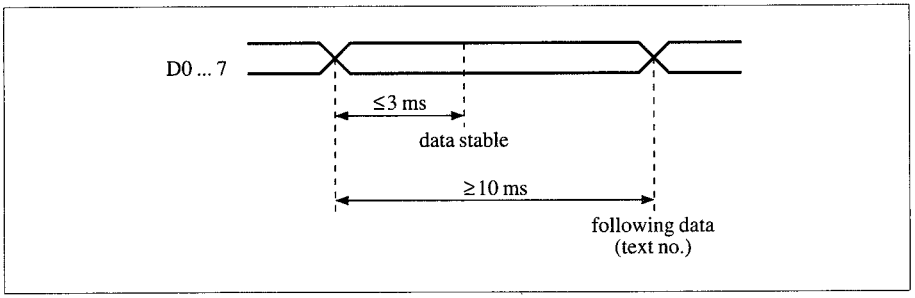

Fig. C-2: Timing without Strobe

3.2.2 External Variables

The interface, via which the variable overlay shall be carried out, can be defined in the menu program "Modify", main function VARIABLE MODE EXT. (see 1.2) or via the rear-side control inputs $OM2^2$ and $OM2^3$. Up to 40 characters total in up to 3 blocks per text can be inserted.

The following options are available:

- Serial interface (see 3.3)
- Parallel interface, inputs D0 to D7
- Parallel interface, inputs E0 to E7 (not if internal variables are used) - see 3.2.3
- Parallel interface, BCD coded, inputs D0 to D3.

BCD coded overlay is not possible in direct input mode.

Input mode	**Variable overlay**	**Character code**
binary	via D0 to D7 via E0 to E7	ASCII
BCD	via D0 to D11 and E0 to E7	BCD[1)]

[1)] Displayable characters: see Table D-11.

Table C-20: Control inputs for external variables in binary or BCD input mode

Input	Variable format serial	Parallel D0-D7 binary ASCII	Parallel D0-D7 BCD D0-D3	Parallel E0-E7 binary ASCII	Parallel E0-E7 BCD E0-E3	BCD 5 decades D0-E7
Serial	X	X	O	X	O	X
Binary Strobe active	X	X	O	X	O	X
Binary Strobe passive	X	O	O	X	O	O
BCD Strobe active	X	O	X	O	X	X
BCD Strobe passive	X	O	O	O	X	O
Direct	X	O	O	O	O	O

X possible O not possible

Table C-21: Input mode for external variables

The variable data are accepted by Strobe V. The delay between the text call and the transfer of the first variable character as well as the delay between the following characters must not exceed 300 ms. Otherwise, the text will be stored without variable. Each variable must be closed with <CR> = 0D H.

Parallel overlay via the control lines E0 to E7

Function and timing are the same as for the control lines D0 to D7.

☞ The inputs E0 to E7 are galvanically isolated from the potential of the inputs Strobe T, Strobe V and D0 to 11, i.e. the device sending the variables may have a different potential. To get equal potentials, the inputs 3 or 4 and 37 must be connected.

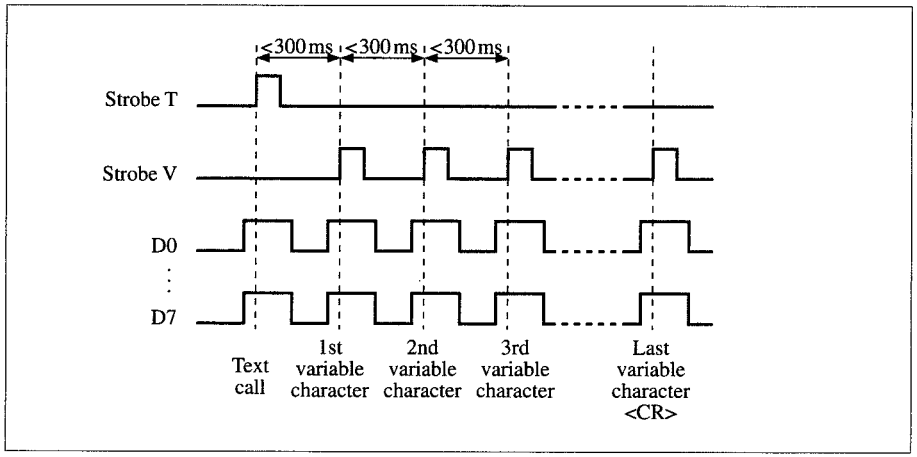

Fig. C-3: Timing

Parallel overlay in BCD format

Several digits are simultaneously read in through the inputs D0 to D11 and E0 to E7. Max. 5 decades are possible. The variable is transferred without <CR>.

D0 D1 D2 D3	D4 D5 D6 D7	D8 D9 D10 D11	E0 E1 E2 E3	E4 E5 E6 E7
1 2 4 8	1 2 4 8	1 2 4 8	1 2 4 8	1 2 4 8
10^0	10^1	10^2	10^3	10^4

Fig. C-4: Assignment of the control lines for variable overlay in BCD format

☞ The reference potential of the inputs E0 to E7 is galvanically isolated from the potential of the inputs Strobe T, Strobe V and D0 to D11. Therefore, the inputs 3 or 4 and 37 must be connected to get equal potentials.

3.2.3 Internal Variables - Timer/Counter Functions

You can use the inputs E0 to E7 to control time measurements or to count events. Set the function VARIABLE MODE INT in the menu program "Modify" (see 1.2) to TIMER/COUNTER YES. You can also make this setting via the rear-side control input OM2[4], if you have selected OPERATING MODE EXTERN (see 3.2.5). Remember to reserve a "dynamic field" to display the variable in the text!

Format:

Counter : nnnnnn (max. 6 digits)
Timer : hhhh:mm:ss

In case of an overflow, the timer/counter is reset and restarted.

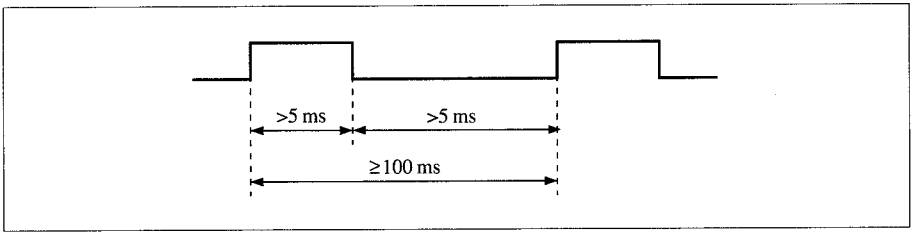

Fig. C-5: Timing diagram for counter function

The timers allow the cumulative time measurement of the high status of the respective input. That is, the timer runs when the respective input is high and stops when it is low. In the menu program "Modify" (see 1.2), you can initialize each of the input lines E0 to E7 individually as counting input (counter) or for time measurement (timer).

The counter and timer values are displayed by calling the texts 1 (for E0) to 8 (for E7). The respective measuring value is the variable in the called text. In operating mode 0 the internal variable value will be updated automatically while the message is displayed.

You can specify a limit value for each of the 8 inputs. If the limit value is reached, the corresponding text is automatically called. With the next pulse, the timer/counter is reset to 0 and restarted.

Timers or counters can be internally (see Table C22) or externally (see 4.1.3) reset.

Key	Display	Description
	VARIABLE MODE INT.: **TIMER/COUNTER YES**	Internal variable timer/counter, function activated by YES.
ENTER	**E0 E1 ... E7** **CNT CNT ... CNT**	Display of the current statusses; all internal variables are preset to Counter.
ENTER +, -	**FUNCTION MODE:** **E0 E1 ... E7**	Selection of the input to be set, the active input flashes, e.g. E1.
ENTER +, -	**FUNCTION:** **E1: TIMER COUNTER**	Select counter or timer, the active value flashes.
(ENTER)	**(E0 E1 ... E7** **CNT TIM ... CNT)**	(Return to status display, ready to select another input.)
MODE	**E0 E1 ... E7** **nlim nlim ... nlim**	Display of inputs, for which limit values have been defined; default setting: no limits.
ENTER +, -	**LIMIT MODE:** **E0 E1 ... E7**	Function for setting the limit values, the active input flashes, e.g. E1.
ENTER +, -	**LIMIT:** **E1:** NO **YES**	Select limit or no limit, the active value flashes, e.g. YES.
ENTER +, -	**LIMIT:** **E1: 0000:00:00** **E1: 0000:13:12**	Set the limit value for E1: activate the parameter with ENTER (flashes and change the value by means of the PLUS or MINUS key.
MODE	**E0 E1 ... E7** **nlim LIM ... nlim**	Return to limit status display, ready for setting further limit values.
MODE +ENTER	Standby screen	Exit from the menu program

Table C-22: Setting the internal variables via the menu program

3.2.4 Deletion of Messages

The deletion of messages depends on the operating mode.

Operating mode 0

If text no. 0 is called, the displayed message is deleted. Messages previously generated in the storing operating modes are deleted.

A pulse at the MINUS input calls the auxiliary text (see 2.4) and deletes the alarm. A second pulse at MINUS clears the display.

Operating modes 1, 2 and 3

Selective deletion: A pulse at the STROBE and the MINUS input at the same time and entering the text number deletes all messages with the specified text number from the memory table, the next message is displayed.

A pulse at the MINUS input deletes the currently displayed message from the memory table, the next message is displayed.

3.2.5 Setting the Operating Mode

The operating mode can be set in the menu program "Modify", main function OPERATING MODE (see 1.2) or by means of the control signals $OM2^0$ and $OM2^1$ at the rear-side parallel interface. In the latter case, EXTERNAL must be set for OPERATING MODE in the menu program. The additional control inputs $OM2^2$ and $OM2^3$ and $OM2^4$ control the variable transfer mode.

Oper. mode	Designation	$OM2^0$	$OM2^1$
0	Final value message without paging-back option	0	0
1	Primary value message	1	0
2	Final value message	0	1
3	Sequence message (automatic paging)	1	1

Table C-23: Control signals for setting the operating mode

Variables	$OM2^2$	$OM2^3$	$OM2^4$
serial	0	0	0
parallel through D0 to D7	1	0	0
parallel through E0 to E7	0	1	0
parallel in BCD format	1	1	0
serial, E0 to E7 = timer/counter	0	0	1
parallel through D0 to D7, E0 to E7 = timer/ counter	1	0	1
not permitted	0	1	1
	1	1	1

0 = LOW, logic 0 1 = HIGH, logic 1

Table C-24: Control signals for setting the variable overlay mode

3.2.6 Output of Messages with and without the Time

As described under 3.1.3, each triggered message can be output to a protocol printer, if the text parameters are set accordingly. In this case, the called text is preceded by a line specifying the date and the time.

Format:

CR	LF	Date/time	CR	LF	Wording	CR	LF

The output of date and time can be suppressed by setting the control input $\overline{\text{TIME}}$ to HIGH.

3.2.7 Locking the Front Function Keys

You can lock the front keys by means of control signals, if the operation of the keys is not desired for your application.

Locking the entry into the menu program

Set the control input ENTER of the rear-side parallel interface to HIGH. The PLUS/MINUS keys remain enabled.

Locking all front keys

Set the control inputs MODE and ENTER of the rear-side parallel interface to HIGH. The functions of the PLUS/MINUS keys remain available at the rear-side control inputs.

3.2.8 Testing the Input Lines

Via the function TEST INPUT LINES in the menu program, the status of all input lines of the rear-side parallel interface can be displayed.

Key	Display	Description
	TEST INPUT LINES	Main function status of the control lines
ENTER	**TV D0123456789AB B01234** **t M E + - E01234567**	Line designation Status, 0 = low, 1 = high

Table C-25: Test of the input lines, display in the menu program

Line designations:

T, V	Strobe T, Strobe V
D0 to DB	Data lines D0 to D11
E0 to E7	Data lines E0 to E7
B0 to B4	Operating mode selection $OM2^0$ to $OM2^4$
t	TIME
M	MODE[1)]
E	ENTER
+	PLUS
-	MINUS

[1)] If the MODE input is triggered, this test function is terminated.

3.3 Triggering via the Serial Interface

Text call

Message texts can also be called via one of the serial interfaces. Call the menu program "Modify" (see 1.2) and set the parameter SERIAL or SERIAL INTERFACE in the INPUT MODE function. The strobe input has no significance. Also set VARIABLES to SERIAl or PARALLEL, as required.

Transmission log without addressing

Text number (max. 3 digits)*	CR

Transmission log with addressing

ENQ (05 H)	Addr. 31 H to 4F H	Text number (max. 3 digits)*	CR	EOT (04 H)

corresponding to

CTRL E	Device address	Text number (max. 3 digits)*	CR	CTRL D

Variable overlay

Variables are stored in the memory table together with the text number:

Text number	CTRL V	1st variable	2nd variable	...	CR

Variable refresh in operating mode 0

The variable is updated on the display only (only possible in operating mode 0).

CTRL V	Wording	...	CR

Variable overlay for text calls via the parallel interface

The first variable character must arrive within 300 ms maximum of the text call (<CTRL V> is not required).

Wording	...	CR

* 999 maximum

4 Operation

4.1 Acknowledging a Message

Acknowledging means, that the displayed text is cleared from the display and deleted from the memory table. The acknowledgement procedure depends on the selected operating mode and can be carried out by means of the MINUS key or the rear-side MINUS input.

4.1.1 Operating Mode 0

In this mode - final value message without paging-back option - the last message triggered is always displayed and the DAA remains ready to receive new messages. If a new message is triggered, the previous message is overwritten. Therefore, acknowledging the displayed message is not necessary. In this operating mode, the actuation of the MINUS key displays an auxiliary help text (see 4.1.2). Actuating the MINUS key again clears the message.

4.1.2 Operating Modes 1, 2 and 3

In the primary value, final value and sequence message modes you acknowledge the display by actuating the MINUS key or by the strobe signal and a simultaneous MINUS signal at the rear-side control inputs. The second procedure is not valid, if the strobe mode in the menu program is set to PASSIVE.

4.1.3 Resetting the Internal Variables

Each timer/counter is individually reset to 0 by a simultaneous pulse to MINUS and Strobe V, while one of the text numbers 1 to 8 is displayed, or in the menu program "Modify", function FUNCTION MODE (see 3.2.3).

4.2. Clearing the Memory Table

In operating modes 1, 2 and 3 the memory table can be cleared by depressing the MINUS key (or setting the rear-side minus input to HIGH) for more than 3 seconds.

In operating mode 0, the memory table can be cleared by triggering text no. 0 (standby screen with date and time is displayed) or by acknowledging the currently triggered text.

4.3 Acknowledging the Alarm

One of three alarm levels can be activated for each called text, if the corresponding parameter has been set during the text input.

Acknowledging alarm level 1

Acknowledging a message by the MINUS key or by a HIGH pulse at the rear-side MINUS input also resets the alarm. Simultaneously depressing PLUS and MINUS resets the alarm only.

Acknowledging alarm level 2

The alarm is acknowledged only by a HIGH pulse at the rear-side MINUS input.

Acknowledging alarm level 3

The alarm is acknowledged by a pulse to the inputs Strobe-T and MINUS and the text number.

4.4 Paging

Paging means to call texts which are stored in the memory table or the message memory (auxiliary texts in operating mode 0) by means of control keys or control inputs The paging procedure depends on the selected operating mode.

4.4.1 Paging through the Message Memory

In operating mode 0: For each called message, you can display an assigned auxiliary text, e.g. an operating instruction, by actuating the MINUS key on the device. The assigned text is stored under the following text number: **current text number + 512.**

If you actuate the PLUS key, the original message is again displayed.

The ENTER key is used to call and page through up to 10 additional texts from the message memory, which are assigned to the texts 1 to 40. If ENTER is actuated again while the tenth text is displayed, the original message text is again displayed.

The text numbers of the 10 additional texts are assigned as follows:

Text number x 10 + 100 to text number x 10 + 109.

Examples:

Text 1 → Text 110 to 119
Text 2 → Text 120 to 129
Text 20 → Text 300 to 309
Text 40 → Text 500 to 509.

Key	Display
	called text number 2
ENTER	Text 120
ENTER	Text 121
.	.
.	.
.	. Text 129
ENTER	Text 2
MINUS	Text 514
PLUS	Text 2
MINUS	Text 514
ENTER	Text 120
.	.
.	.
.	.

Table C-26: Calling additional texts in operating mode 0

4.4.2 Paging through the Memory Table

In operating modes 1 and 2, primary and final value message respectively, the text numbers of the received messages are stored as a block in the memory table together with the variables, if any. The first or the last message is displayed, the other messages can be called by actuating the PLUS key. You can re-establish the original display (primary value or final value) by depressing the PLUS key for more than 3 seconds.

In operating mode 3, sequence message, the memory table is paged through automatically. The texts are sequentially displayed and you can select a display time between 0.5 and 30 seconds for static messages (menu program "Modify", see 1.2). Running line messages run through once.

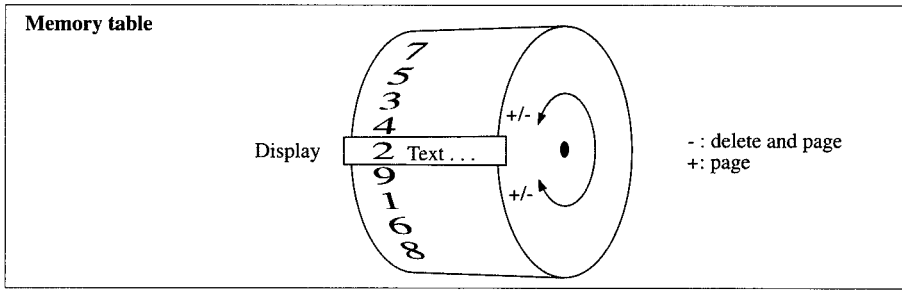

Fig. C-6: Memory table

4.5 Analysis of the Data Logging Memory

4.5.1 Output of the Data Logging Memory

The data logging memory contents can be output via the menu program "Modify" (see 1.2) or via the serial interface (see 5.6.5). For the evaluation of the data, you can specify a "**Period**" and an evaluation mode "**Analysis**".

Period:

1 TOTAL RECORD	since the data logging memory was last cleared (erase diagnosis, see 4.5.2)
2 POWER ON	since the last power-on
3 SELECT TIME INTERVAL	the evaluation period can be specified, max. 29 days, 23 hours, 59 minutes.

Evaluation mode (analysis):

1 BY TEXT NUMBERS	sorted by text numbers
2 BY EVENT RATE	sorted by frequency
3 BY TOTAL TIME	sorted by total duration
4 IN SEQUENCE	chronological in ascending sequence.

Key	Display	Description
	DIAGNOSIS MEMORY:	Main function data logging memory
ENTER +, -	**PERIOD 1 TOTAL RECORD ...** **PERIOD 3 SELECT TIME INTERVAL**	Select the evaluation period using the PLUS or the MINUS key.
ENTER +, -	(for period 3) **TIME: D20 H20 M20**	Set the time; the position is selected by ENTER, the values are changed by PLUS and MINUS.
ENTER +, -	**OUTPUT: DISPLAY INTERFACE**	Selection: Output on the display or to the serial interface.
ENTER +, -	**ANALYSIS 1 BY TEXT NUMBERS**	Use PLUS or MINUS to select the sorting sequence .
ENTER, [+]	**DIAGNOSIS MEMORY:**	The memory contents are output.

Table C-27: Setting of evaluation period and evaluation mode in the menu program

☞ The MWTA software allows the convenient handling and evaluation of the data logging memory.

If the data are output on the display, the PLUS key is used for paging and the ENTER key to display the complete message.

The useful evaluation of the data logging memory, especially in output format 3 (BY TOTAL TIME), is only possible, if a text call is also assigned a reset or acknowledgement (simultaneous pulse to Strobe T and MINUS).

Warnings :

While the data logging memory data are output on the display or to the serial interface, arriving text calls are ignored.

If the control input $\overline{\text{TIME}}$ is set high, the date and time information is also missing in the functions of the data logging memory.

4.5.2 Clearing the Data Logging Memory

To clear the data logging memory, set the function ERASE DIAGNOSIS in the menu program "Modify" (see 1.2) and depress the MINUS key for more than 4 seconds.

This function can be protected by a password.

Key	Display	Description
	ERASE DIAGNOSIS	Main function clearing the data logging memory.
ENTER [+, -]	**PASSWORD: 0000** (only if a password has been activated)	Enter the password: Use PLUS or MINUS to select the desired figure, actuate ENTER to switch to the next digit.
+ (>4 s) +, -	**PASSWORD ACTIVE** PASSIVE	Use PLUS or MINUS to set password protection yes/no..
ENTER [+, -]	**PASSWORD: 0000** (only with PASSWORD ACTIVE)	Define or change the password: Use PLUS or MINUS to select the desired figure, actuate ENTER to switch to the next digit.
ENTER [ENTER, MODE]	**ERASE DIAGNOSIS** (only with PASSWORD ACTIVE)	The password is accepted. Press ENTER to clear the data logging memory or MODE to terminate the function.
ENTER - (>4 s)	**PRESS MINUS > 4 sec**	The data in the data logging memory are deleted.

Table C-28: Activation, definition and modification of a password in the menu program and clearing the data logging memory

5 Setting and Operation via the Serial Interface

5.1 Basic Settings

The DAA 288-240 C display unit allows you to carry out the essential operating and setting functions via one of the serial interfaces, e.g. using a PC. Enter the control characters without blanks and close your entries with <CR>.

Designation	RS 232 C command	Para-meter	Description
Software version	<ESC> ?		V6600 <CR> <LF> <CTRL Z> The version number is displayed.
Character set **CHARACTER SET**	<ESC> C	A G F S D C	ASCII German French Swedish/Finnish Danish/Norwegian Cyrillic.
Output format **PRINT FORMAT**	<ESC> P	S A	Standard Output, e.g. to a printer DAA Version A Output to a secondary display
Input mode **INPUT MODE**	<ESC> I	B C E S	binary coded BCD coded direct input via serial interface.

Table C-29: Basic settings via the serial interface

If an invalid character string is received, the device sends the error message <NAK> 1; if the string is correct <ACK> 1.

5.2 Output of the Current Settings

By means of control characters, you can display the currently set parameters.

Input: <ESC> Z <CR>

Output: <1st parameter> <CR> <LF>
<2nd parameter> <CR> <LF>
....
<CTRL Z>

Designation	Parameter		Description
Input mode **INPUT MODE**	I	B C E S	binary coded BCD coded direct input serial input.
Output format **PRINT FORMAT**	P	S A	Standard DAA Version A.
Character set **CHARACTER SET**	C	A G F S D C	ASCII German French Swedish/Finnish Danish/Norwegian Cyrillic.
Internal variables and limit values.	E0 . . E7	T C L LN	timer event counter (counter) limit value (limit) specified no limit value specified.

Table C-30: Output of the current device settings

5.3 Text Input

5.3.1 On-Line Text Input - "Edit" Mode

You can control the text input via the serial interface instead of using the control keys, e.g. by means of a PC (e.g. MWTA program, function "Terminal emulation").

Format:

ESC	T	E	CR

Example:

Input:	<ESC> T E <CR>	Text Input Edit
Response:	<ACK> 1	O.K.
or	<NAK> 3	Message memory locked.

Cancel by <ESC>.

5.3.2 Off-Line Text Input - "File" Mode

You can control the data transmission via the serial interface instead of using the control keys, e.g. by means of a PC.

Example:

Input:	<ESC> T I <CR>	
Response:	<ACK> 1	O.K.
	<CTRL Z>	End of file
	<NAK> 1	Format error
	<NAK> 2	RAM overflow
	<NAK> 3	Memory locked
	<NAK> 4	Parity error.

Cancel by <ESC>.

5.4 Transmission of the Message Memory

You can control the transmission of the message memory via the serial interface instead of using the control keys, e.g. by means of a PC.

Input: <ESC> T O <CR>

Response: <ACK> 1 O.K.

Cancel by <ESC>.

5.5 Setting the Internal Variables

Input without limit value

Format:

ESC	Input	Key letter	CR

Input = E1 ... E7

Key letter:

T = Timer C = Counter

Example: Input E1, Timer

Input: <ESC> E1 T <CR> E1 defined as timer

Response: <ACK> 1 O.K.
or <NAK> 1 Error.

Input with limit value

Format:

ESC	Input	T or C	L	Limit value	CR

Input = E1 ... E7

Limit value: 6 digits for counter, HHHH:MM:SS for timer; N = no limit value; leading zeros must be entered.

Example: Input E1, timer, limit value 13 min 12 s.

Input: <ESC> E1 T L 0000:13:12 <CR>

The parameters must be entered without blanks.

Response: <ACK> 1 O.K.
or <NAK> 1 Error.

5.6 Operator Control during Operation

5.6.1 Acknowledging the Alarm

Format:

ESC	Q	ID	CR

ID (identification):

1 = only alarm 1
2 = only alarm 2
3 = only alarm 3
T1= text and alarm 1 (same as MINUS key)
T2= text and alarm 2 (same as signal to rear-side MINUS input).

Example: Acknowledgement of text and alarm 1:

Input: <ESC> Q T 1 <CR>

Response: <ACK> 1 O.K.
or <NAK> 1 Error.

Cancel by <ESC>.

5.6.2 Output of the Memory Table

In all operating modes, it is possible to output all the texts in the memory table to a PC or a printer, even those, the print parameters of which have been disabled during the text input:

☞ The control character <CTRL P> initiates the output with date and time.

Format:

CTRL P	CR	LF	Date/time	CR	LF	Wording	CR	LF

5.6.3 Clearing the Memory Table

After the memory table has been output to a printer or a PC by <CTRL P>, it can be cleared by <CTRL X>.

☞ This function of the <CTRL X> control character is effective only after <CTRL P>.

5.6.4 Output of the Internal Variable Data

Format:

ESC	H	Input	CR

Input: E0 to E7

Example: Output of the variable value of input E3:

Input: <ESC> H E3 <CR>

Response: E3: <variable value> <CR> <LF>

Cancel by <ESC> <CTRL Z>.

5.6.5 Output of the Data Logging Memory

Format:

ESC	D	I	Period	S	Evaluation mode	CR

Period I:

1 = complete memory content
2 = since last power-on
3 D29 H23 M59 = Specification of a period.

Evaluation mode S:

1 = sorted by text numbers
2 = sorted by frequency
3 = sorted by total display time
4 = chronological sequence.

Example: Output of the messages since the last power-on, sorted by the total display time.

Input: <ESC> I 2 S 3 <CR>

Response: <Text> <CTRL Z>

Cancel by <ESC>.

5.6.6 Clearing the Data Logging Memory

Input: <ESC> D E <CTRL X> <CR>

Response: <ACK> 3 after the data have been deleted

5.6.7 Input and Output of Date and Time

Input

By means of <CTRL S>, date and time can be entered via one of the serial interfaces.

Input format for July 16, 1992, 14:03:05:

CTRL S	160792140305	CR

Full stops, spaces, commas and colons are not entered.

Output

By means of <CTRL T>, you can output date and time via one of the serial interfaces.

Output format:

CTRL T	16.Jul.92 14:03:05	CR	LF

Version A

Contents

Page

1 Configuration A-2
1.1 "Display" Menu Program Settings A-3
1.2 "Modify" Menu Program Settings A-4

2 Input via the Serial Interface A-5
2.1 Text Input A-5
2.2 Addressing A-7

1 Configuration

The DAA 144/288 version A devices are plain display units without a message memory. Message texts are stored in the transmitting device, e.g. a word processing PLC. The transmitting device sends the complete message text to the display unit via the serial interface.

Messages can be displayed as static messages or running line messages. Static messages can be set to flash or have flashing portions. 6 country-specific character sets are available for the character representation.

Each device has 4 red push buttons on the front, which are used to display and set the brightness, interface data and character set via menu programs.

MODE	Selection of the main function;
ENTER	Selection of the subfunctions and acceptance of the selected values;
PLUS/MINUS	Selection of the offered parameters; the current value flashes.

The menu program allows the setting of the device parameters in the permanent EEPROM.

In the tables A-1 and A-2, key designations in square brackets apply only to the single-line displays DAA 144-120 A and DAA 288-120 A. On the DAA 288-240 A devices, the text is automatically continued in the second line. The functions of the single-line and double line devices are identical, although the set-up in the display is slightly different.

1.1 "Display" Menu Program Settings

To enter the menu program, depress the MODE key for more than 3 s. In this menu, the PLUS and the MINUS keys have no functions.

The menu program is quit manually by simultaneously actuating MODE and ENTER or automatically, if no key is actuated within 60 s.

Key	Display	Description
MODE (>3 s)	**SET UP-MENUE V 6...**	Display of the software version.
MODE	**(DISPLAY:)** **BRIGHTNESS:** e.g. **4**	Display of the currently set brightness: 1, 2, 3, 4.
MODE	**CHARACTER SET:** e.g. **ASCII**	Display of the character set: ASCII, D (German), F (French), S/SF (Swedish/Finnish), DK/N (Danish/Norwegian), CYR (Cyrillic).
MODE [ENTER]	**INTERFACE: RS 232 C** e.g. **1 B2400 D8 S1 PN A00**	Display of the currently set interface data: 1 = front 2 = rear B = baud rate: 110, 150, 300, 600, 1200, 2400 D = data format: 7 or 8 Bit S = stop bit: 1 or 2 P = parity bit: E (even), O odd), M (mark), S (space), N (no)no parity A = address: 00 to 31.
MODE + ENTER	Normal operation	Exit from the menu program; if only the MODE key is actuated, the display returns to BRIGHTNESS.

Table A-1: Menu program "Display"

1.2 "Modify" Menu Program Settings

To enter the program, depress the MODE key for more than 3 s. Then depress MODE and ENTER simultaneously for more than 4 s.

The menu program is quit manually by simultaneously actuating MODE and ENTER or automatically, if no key is actuated within 60 s.

Key	Display	Description
MODE (>3 s)	**SET UP-MENUE V 6...**	Entry into the menu program.
MODE + ENTER (> 4 s) +, -	**(DISPLAY:)** **BRIGHTNESS:** 1 2 3 **4** the current value flashes	Display of the currently set brightnesss. PLUS/MINUS key to change.
MODE [ENTER] +, -	**CHARACTER SET:** **ASCII** D F S/SF DK/N CYR. the current value flashes	Display of the currently set character set. PLUS/MINUS key to change.
MODE [ENTER] ENTER, +, - ENTER, +, - ENTER, +, - ENTER, +, - ENTER, +, - ENTER, +, -	**INTERFACE: RS 232 C** e.g. **1 B2400 D8 S1 PN A00** **INTERFACE: 1** **BAUDRATE: 2400** **DATA FORMAT: 8 BIT** **STOP BIT: 1** **PARITY: NO** **ADDRESS: 00**	Display of the current interface data. PLUS/MINUS key to change the individual parameters.
MODE + ENTER	Normal operation	Exit from the menu program; if only the MODE key is actuated, the display returns to BRIGHTNESS.

Table A-2: Menu program "Modify"

2 Input via the Serial Interface

With the DAA 144/288 version A devices, the transmission of message texts is exclusively on-line via the serial interface, e.g. by a program-controlled PLC or directly by a PC, terminal or keyboard.

A static message for the DAA 144-120 A and DAA 288-120 A devices consists of max. 20 characters. The DAA 288-240 A devices can display max. two lines with 40 characters each. All devices are able to display running line messages of max. 175 characters.

2.1 Text Input

After switching on the device (power ON) or after entering ESC, an asterisk * is displayed.

Static messages for DAA 144-120 A and DAA 288-120 A

Static message texts must be entered as follows:

<CR> Text <CR>	The line is deleted

Control characters which are entered together with the text do not limit the max. number of displayable characters.

Texts or text blocks which shall be flashing must begin with the control character <CTRL F> and end with the control characters <CTRL G>. Max. two text blocks in a static text can be displayed flashing. In the chapter "Technical Data", you can find a table of all ASCII characters and ASCII control characters.

Static messages for DAA 288-240 A

The double line display unit DAA 288-240 A allows the two lines to be input separately. Therefore, there are different ways to enter a static text.

Input into the first line, the second line remains unchanged:

Text	Input of the text including all control characters. If more than 40 characters are entered, the text is continued in the second line.
<CR>	End of text input

Input into the first line, the second line is deleted:

Text	Input of the text including all control characters. If more than 40 characters are entered, the text is continued in the second line.
<CR>	End of text input
<LF>	
<CR>	Deletion of line 2.

Input into the first and the second line:

Text 1 Text 2	Input of the two lines at the same time. If necessary, insert blanks, so that the second line starts with position 41. Alternative: Enter <LF>. In this case, the text must be preceded by FD H.
<CR>	End of text input

Input into the second line, the first line remains unchanged:

<LF>	
Text	Input of the text line 2
<CR>	End of text input

Input into the second line, the first line is deleted:

<CR>	Line 1 is deleted
<LF>	
Text	Input of the text line 2
<CR>	End of text input

Running line message

For the input of running line messages, the first character of the text must be preceded by the control character <CTRL R>. On the DAA 288-240 A devices, only one line can arbitrarily be displayed as running line, the other line has max. 40 characters.

Flashing characters in running line messages are not possible.

Control characters of the function keys

Upon actuation of the function keys, the following control characters are output via the TxD line:

Key	Control character
MODE	ESC (1B H)
ENTER	CR (0D H)
+	HT (09 H)
-	BS (08 H)

Table A-3: Control characters of the function keys

2.2 Addressing

Each intelligent message display of the DAA model family can be addressed. This allows different information to be transmitted to multiple displays via a single data line. A transmitting device, e.g. programmable logic control system or a DAA 288-240 C intelligent message display, controls several devices (RS 232 C up to 4 devices, TTY up to 7 devices). The device address is set in the menu program "Modify" under INTERFACE (see page A-4). A device without device address (00) receives all messages.

Transmission log

ENQ (05 H)	Adr. 31 H to 4F H	Text + contr. charact.	CR	EOT (04 H)

corresponding to

CTRL E	Device address	Text + contr. charact.	CR	CTRL D

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Connection and Installation

Contents

Page

1 Wiring M-2
1.1 DC Power Supply M-2
1.2 AC Power Supply M-2
1.3 Serial Interfaces I and II M-4
1.3.1 Serial Interfaces DAA 144 . . . . . M-4
1.3.2 Serial Interfaces DAA 288 . . . . . M-6
1.4 Parallel Interfaces M-8
1.4.1 Parallel Interface of Version B M-8
1.4.2 Parallel Interfaces of Version C M-9

2 Installation M-11

3 Connecting Examples M-12
3.1 Text Input M-12
3.1.1 IBM Compatible PC or Siemens Programmer M-12
3.1.2 Keyboard or Terminal M-15
3.1.3 Text Input by another DAA M-16
3.2 Triggering M-17
3.2.1 Siemens PLC S5 . . . . . M-17
3.2.2 Matsushita PLC FP3/FP5 . . . . . M-18
3.2.3 Parallel-Binary Converter ISI 64 . . . . . M-19
3.3 Message Output M-21
3.3.1 Protocol Printer IPP 144-40 . . . . . M-21
3.3.2 Output to another DAA M-23

1 Wiring

1.1 DC Power Supply

If not otherwise specified, all connection diagrams in this section show a view of the connection or solder side.

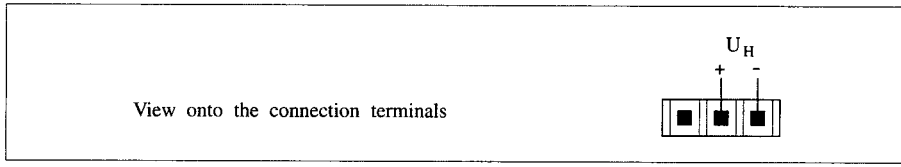

Fig. M-1: DC connection

Connect the plus and the minus cable as specified in the connection diagram UH. The diagram is located on the rear of the DAA 288 models and on the top of the DAA 144 models. The third pole of the screw terminal connector is not used for DC power supply.

Attention
The power supply connector is the same for all models; however, a 24 V device must never be connected to mains voltage.

1.2 AC Power Supply

Only the devices of the DAA 288 series are available in mains voltage versions.

The mains voltage devices are designed for 115 V or 230 V (±15 %); a mains frequency of 45 to 65 Hz is permissible.

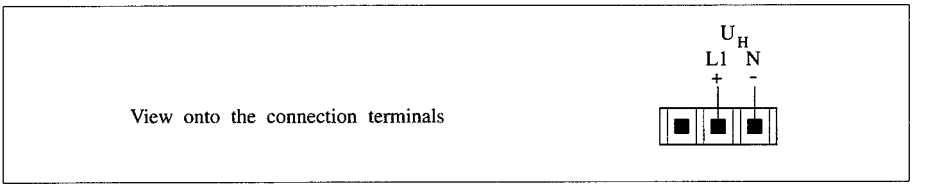

Fig. M-2: AC connection

Connect the phase and the return line to the poles marked with + and - as specified in the connection diagram UH. The third pole of the screw terminal connector is used for connecting the protective earth conductor.

☞ Observe the local regulations (e.g. VDE 0100 and VDE 0411), especially for the mains connections.

Power supply conversion 230/115 V AC

Proceed as follows:

- Loosen the eight housing screws and remove the housing from the base plate.
- Loosen the screws of the display PCB and disconnect the flat ribbon cable on one end.
- Set the desired mains voltage according to the below drawing. This is done by soldering in or removing the corresponding wire jumpers on PCB 800.
- Check the internal fuse rating is correct for the selected input voltage and change, if necessary. See Technical Data.
- Re-assemble the device in reverse order.

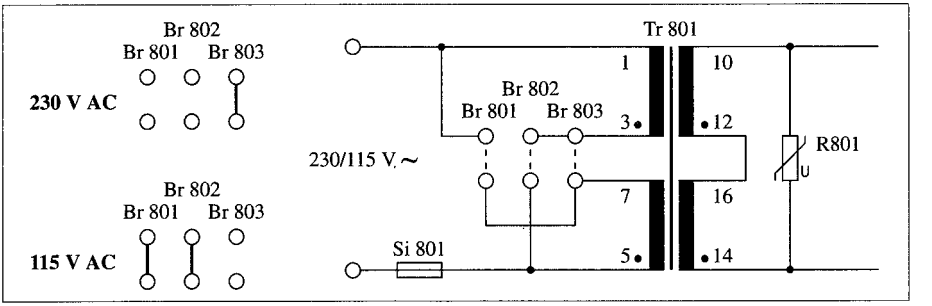

Fig. M-3: PCB 800, segment

115 V AC jumpering:

- Jumper 801 closed
- Jumper 802 closed
- Jumper 803 open.

230 V AC jumpering:

- Jumper 801 open
- Jumper 802 open
- Jumper 803 closed

1.3 Serial Interfaces I and II

The intelligent message displays of the DAA 144/288 series are equipped with two serial interfaces, one on the front and one on the rear. The interface on the front is called interface I and is accessible after installation of the unit. Accordingly the rear-side interface is called interface II.

☞ After having connected the intelligent message display to a transmitting device (e.g. a PLC), the interface data must be matched to those of the transmitting device. The settings for baud rate, data format, stop bits and parity are described in detail for each model version in chapter 1, Basic Settings.

1.3.1 Serial Interfaces DAA 144

The serial interface I of the DAA 144 family is a 3-pole socket, type Burndy MMH 3-1.

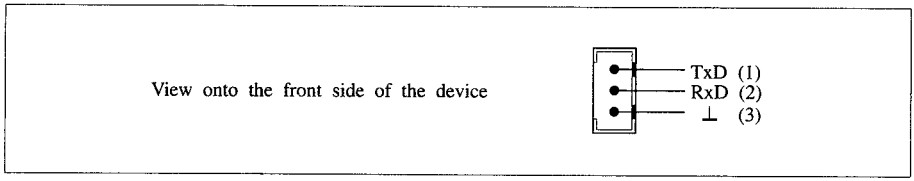

Fig. M-4: Serial interface I, DAA 144

Pin	Signal	Designation
1	TxD	Send data
2	RxD	Receive data
3	GND	Signal ground

Table M-1: Signals of serial interface I, DAA 144

The rear-side interface II is a RS 232 C interface (V.24) with 9-pole Sub-D socket.

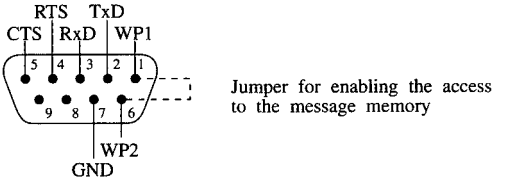

Fig. M-5: Serial interface II, DAA 144

If the pins 1 and 6 are linked, it is not possible to call the menu program on version A devices. On version B devices, the pins 1 and 6 must be linked for text input.

Pin	Signal	Designation
2	TxD	Send data
3	RxD	Receive data
4	RTS	Request to send (ready to receive at signal level HIGH)
5	CTS	Clear to send (ready to send)[1)]
7	GND	Signal ground

[1)] To be able to send data, CTS must be HIGH (+3 to +12 V). Since the input is internally pulled high (by 3 kΩ to +5V), the interface is ready to send, even if the CTS input is open-circuited

Table M-2: Signals of serial interface II, DAA 144

1.3.2 Serial Interfaces DAA 288

The serial interface I of the DAA 288 family is a RS 232 C interface (V.24) with a 9-pole Sub-D socket.

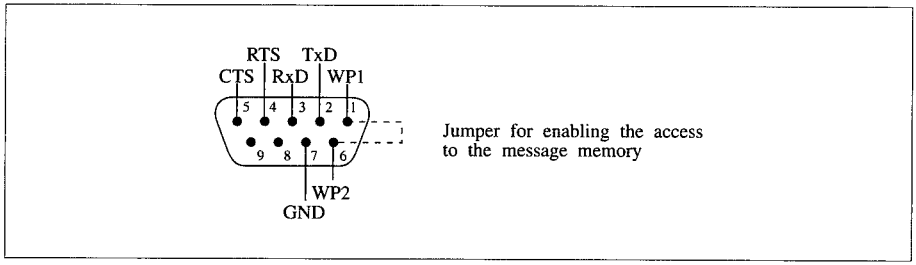

Fig. M-6: Serial interface I, DAA 288

☞ If the pins 1 and 6 are linked, it is not possible to call the menu program on version A devices. On version B and C devices, the pins 1 and 6 must be linked for text input.

Pin	Signal	Designation
2	TxD	Send data
3	RxD	Receive data
4	RTS	Request to send (ready to receive at signal level HIGH)
5	CTS	Clear to send (ready to send)[1)]
7	GND	Signal ground

[1)] To be able to send data, CTS must be HIGH (+3 to +12 V). Since the input is internally pulled high (by 3 kΩ to +5 V), the interface is ready to send, even if the CTS input is open-circuited.

Table M-3: Signals of serial interface I, DAA 288

The rear-side interface II is a combined RS 232 C (V.24)/TTY (current loop) interface with 25-pole Sub-D socket. If it is configured as RS 232 C interface, a transmitting device and max. 4 receive devices, if it is configured as TTY interface, max. 7 receive devices may be in a loop.

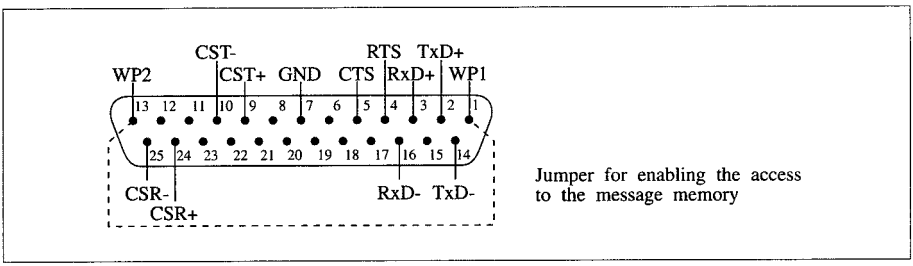

Fig. M-7: Serial interface II, DAA 288

☞ If the pins 1 and 13 are linked, it is not possible to call the menu on version A devices. On version B and C devices, the pins 1 and 13 must be linked for text input.

Pin	Signal	Designation
RS 232 C		
2	TxD	Send data
3	RxD	Receive data
4	RTS	Request to send (ready to receive at signal level HIGH)
5	CTS	Clear to send (ready to send)[1)]
7	GND	Signal ground
TTY/current loop (active)[2)]		
9	CST+	Current source transmit +20 mA
10	CST-	Current source transmit -20 mA
24	CSR+	Current source received +20 mA
25	CSR-	Current source received -20 mA

[1)] To be able to send data, CTS must be HIGH (+3 V to +12 V). Since the input is internally pulled high (by 3 kΩ to +5 V), the interface is ready to send, even if the CTS input is open-circuited.
[2)] With TTY/current loop (active), two devices with active interface cannot communicate with each other.

Table M-4: Signals of serial interface II, DAA 288

Attention
It is not permitted to connect the RS 232 C and TTY interface at the same time!

You can change the TTY interface from active to passive yourself. The active or passive setting for TxD and RxD is done by means of the jumpers on PCB 400 according to the below diagram.

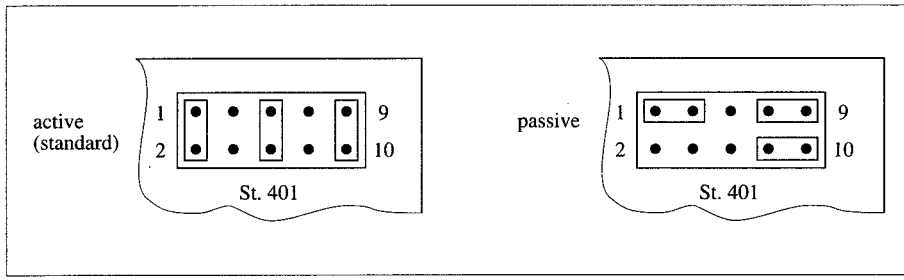

Fig. M-8: Active/passive setting of the TTY interface

1.4 Parallel Interfaces

Version B devices have one, version C devices have two parallel interfaces. Version A devices do not have a parallel interface.

1.4.1 Parallel Interface of Version B

The parallel interface is a 20-pole screw terminal strip, type Phönix MSTB 1. The diagram shows the input side of the removable terminal strip.

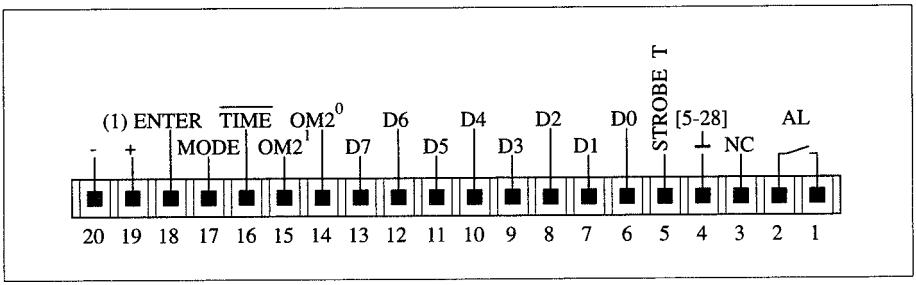

Fig. M-9: Parallel interface, version B

Input/output	Description
AL	Collective alarm = output relay
NC	not used
⊥ inputs 5-20	GND for control lines 5 to 20
Strobe T	Transfer pulse
D0 to D7	8 control lines for text selection and variable overlay
$\overline{OM2^0}$ and $OM2^1$	External control of the four operating modes
$\overline{TIME}$	No output of date and time upon a text call
MODE, ENTER, +, -(1)	Remote control of front key functions

Table M-5: Inputs/outputs of the parallel interface, version B

(1) Note: + and - are not a voltage supply! (they refer to PLUS and MINUS keys).

1.4.2 Parallel Interfaces of Version C

The DAA 288-240 C intelligent message display has two 20-pole screw terminal strips, type Phönix MSTB 1 providing additional control input lines, a strobe V input for variables and two open collector outputs for the expanded alarm function. The two interfaces of the version C devices are not pin-compatible with the interface of the version B devices. The drawing shows the input side of the removable terminal strip.

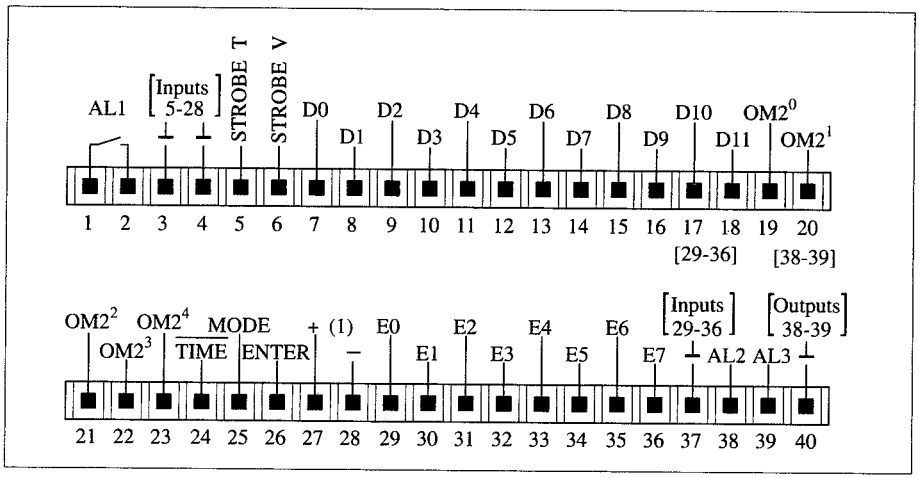

Fig. M-10: Parallel interfaces, version C

Input/output	Description
AL1	Alarm relay
⊥ inputs 5-20	GND for control lines 5 to 20
Strobe T	Transfer pulse for text call
Strobe V	Transfer pulse for variable overlay
D0 to D11	Control lines for message triggering and variable overlay
$OM2^0$ and $OM2^1$	External control of the four operating modes
$OM2^2$ and $OM2^3$	Control inputs for external variables
$\overline{OM2^4}$	Control input for internal variables
$\overline{TIME}$	No output of date and time upon text call
MODE, ENTER, +, -(1)	Remote control of front key functions
E0 to E7	Control lines for variable overlay
⊥ inputs 29-36	GND for control lines 29 to 36
AL2 and AL3	Open collector alarm outputs
⊥ outputs 38-39	GND for alarm outputs 38 and 39

Table M-6: Inputs/outputs of the parallel interfaces, version C

(1) Note: + and - are not a voltage supply! (they refer to PLUS and MINUS keys).

2 Installation

The DAA 144/288 intelligent message displays are DIN-size panel mounting devices. Insert the device into the control panel cut-out from the front and clamp it tightly to the rear of the control panel by means of the lateral clamping screws. The below drawing shows the location of the clamping screws in a DAA 144 (top view).

Designation	DAA 144	DAA 288
Control panel cut-out, width	138^{+1}mm	$282^{+1,5}$ mm
Control panel cut-out, height	$33^{+0.6}$ mm	$68^{+0.7}$ mm
Mounting depth	144.5 mm	107 mm
Max. control panel thickness	45 mm	50 mm

Table M-7: Mounting dimensions

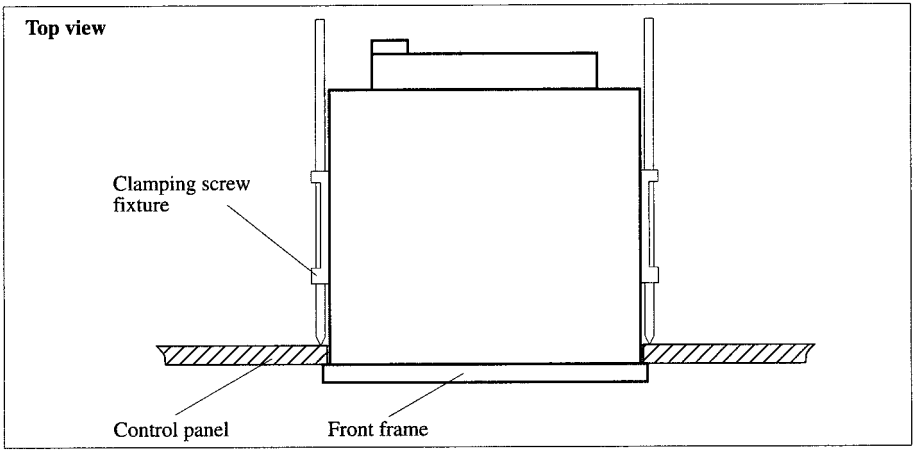

Fig. M-11: Installation by the example of the DAA 144, top view

3 Connecting Examples

3.1 Text Input

3.1.1 IBM Compatible PC or Siemens Programmer

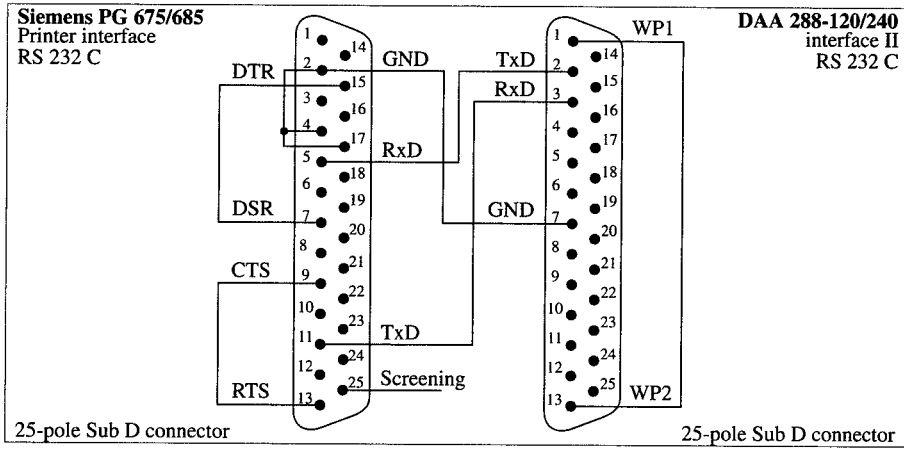

Fig. M-12: Connection of a Siemens programmer to the 25-pole serial interface

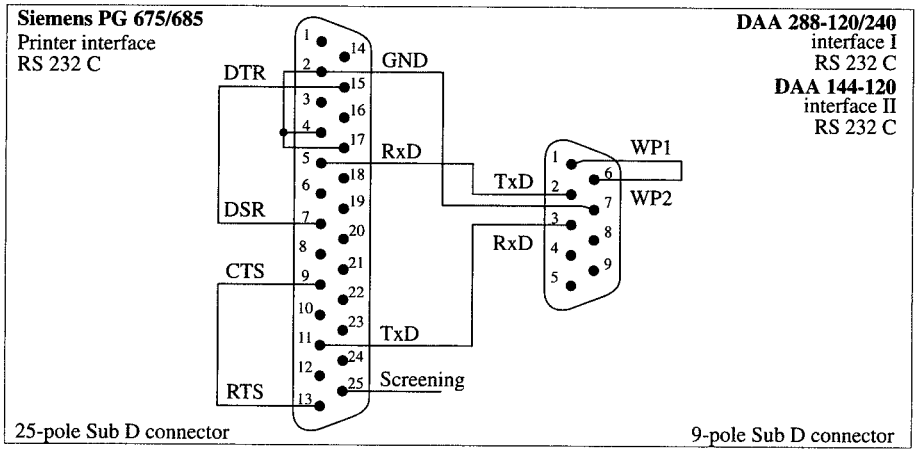

Fig. M-13: Connection of a Siemens programmer to the 9-pole serial interface

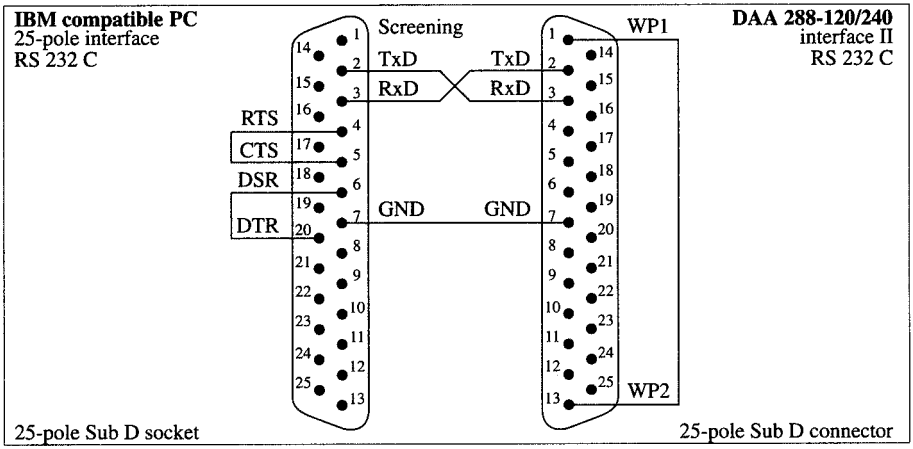

Fig. M-14: Connection of an IBM compatible PC (25-pole) to the 25-pole serial interface

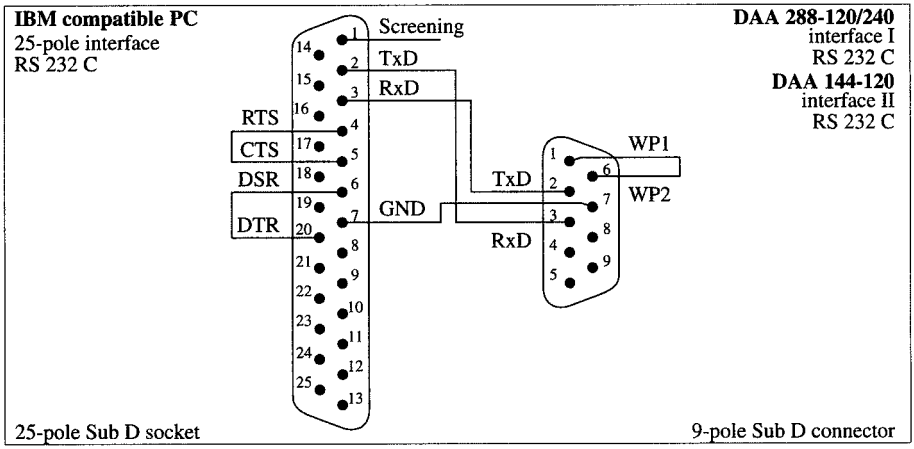

Fig. M-15: Connection of an IBM compatible PC (25-pole) to the 9-pole serial interface

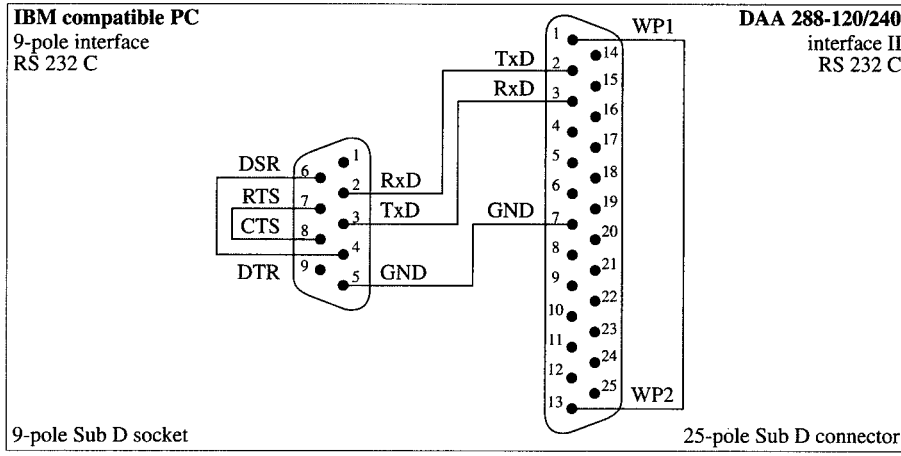

Fig. M-16: Connection of an IBM compatible PC (9-pole) to the 25-pole serial interface

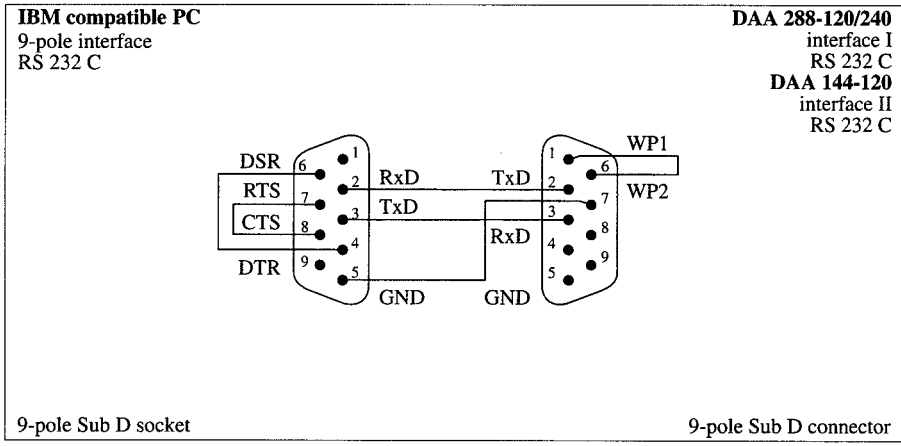

Fig. M-17: Connection of an IBM compatible PC (9-pole) to the 9-pole serial interface

3.1.2 Keyboard or Terminal

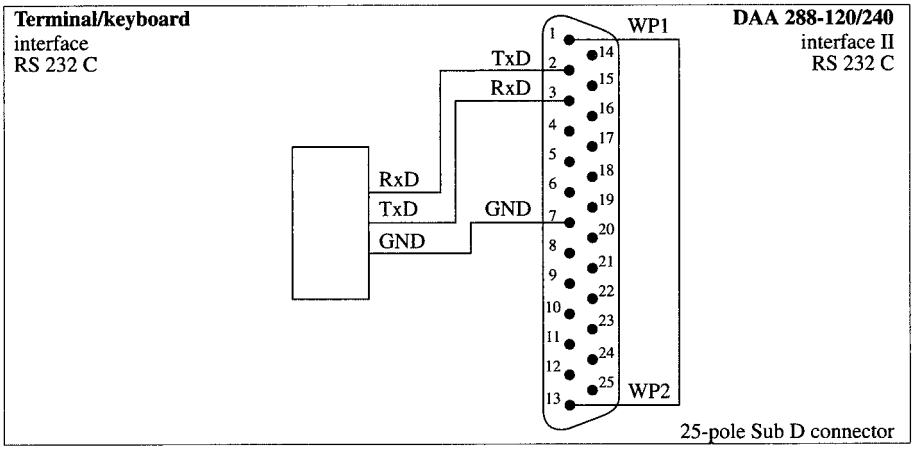

Fig. M-18: Connection of a terminal/keyboard (3-pole) to the 25-pole serial interface

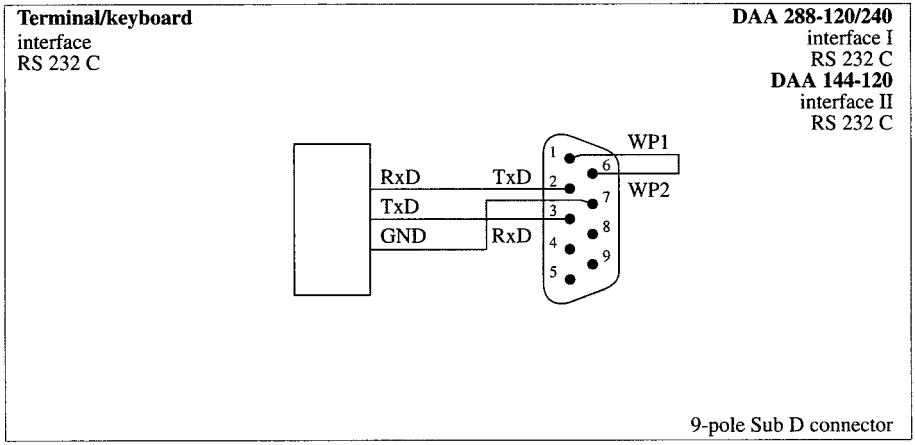

Fig. M-19: Connection of a terminal/keyboard (3-pole) to the 9-pole serial interface

Connection

3.1.3 Text Input by another DAA

Copying the message memory from a version B DAA to another version B DAA

☞ Prerequisite for copying: The receiving device must be set to TEXT INPUT FILE before the transmitting device is set to TEXT OUTPUT FILE. The version and the number of lines of the transmitting and the receiving device must be matching.

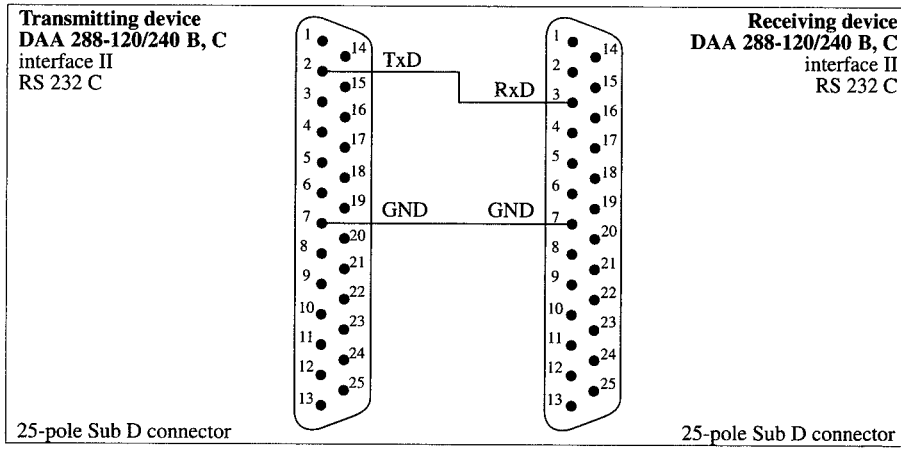

Fig. M-20: Connection for text input via the 25-pole serial interfaces

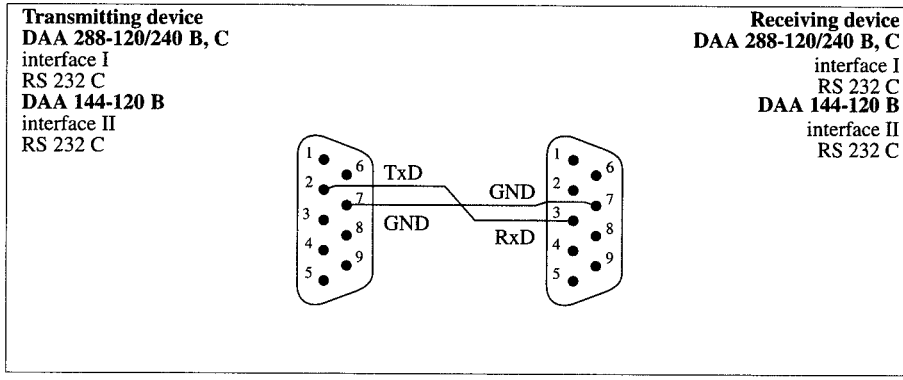

Fig. M-21: Connection for text input via the 9-pole serial interfaces

3.2 Triggering

3.2.1 Siemens PLC S5

Example: Connection of a version B DAA to a Siemens PLC S5-115 U. The PLC receives information via an input module from a machine or system and outputs the message calls to the DAA via an output module.

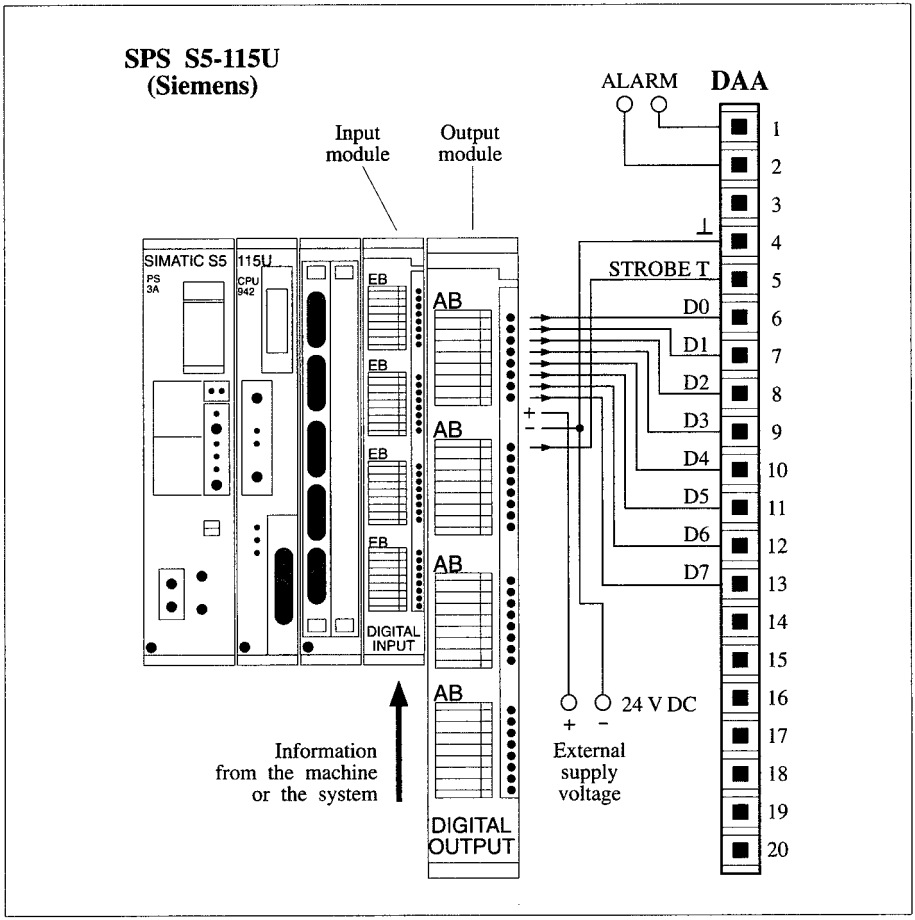

Fig. M-22: Connection of a Siemens PLC S5-115 U to a version B DAA via the parallel interface

3.2.2 Matsushita PLC FP3 / FP5

Example: Connection of a version B DAA to a PLC FP3 (Matsushita automation controls). The PLC receives information via an input module, e.g. IN 16, from a machine or a system and outputs the message calls to the DAA via an output module, e.g. OUT 16.

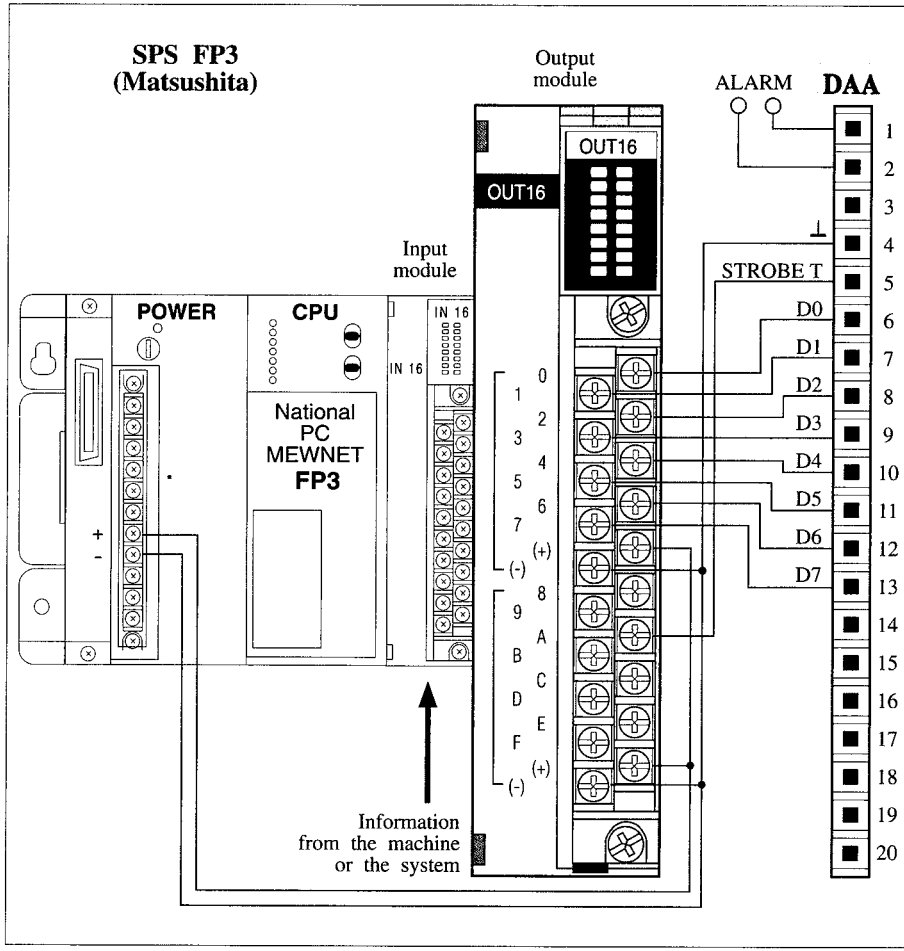

Fig. M-23: Connection of a Matsushita PLC FP3 to a version B DAA via the parallel interface

3.2.3 Parallel-Binary Converter ISI 64

The ISI parallel-binary converter is an interface for the expansion of the direct input functions of the DAA, e.g. to reduce the load of the PLC. Monitoring of max. 64 inputs. The number of inputs can be increased to max. 255 by cascading.

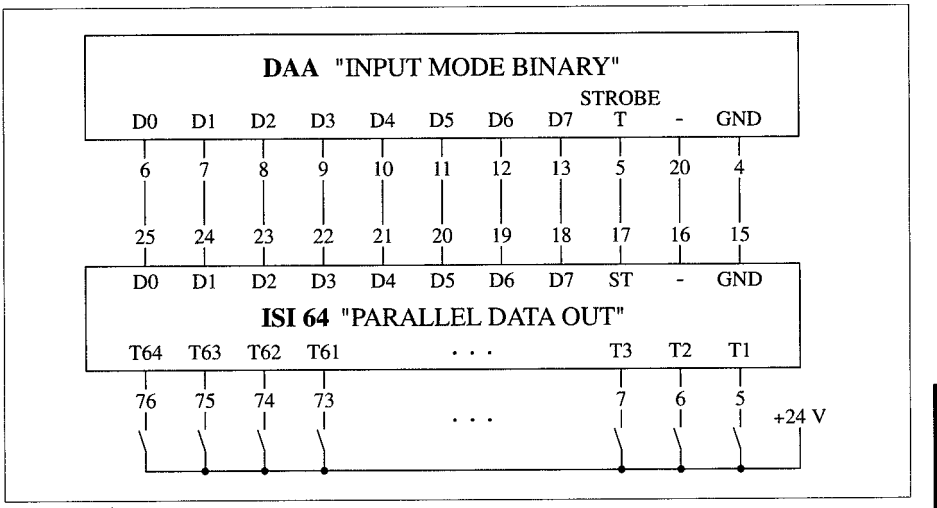

Fig. M-24: Connection of the ISI 64 parallel-binary converter via the parallel interface to a DAA version B

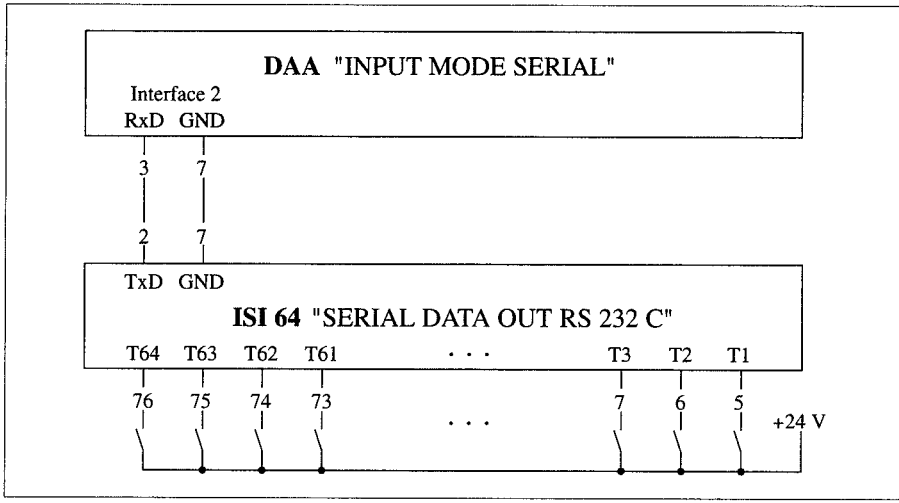

Fig. M-25: Connection of the ISI 64 parallel-binary converter via the serial interface to a DAA 144-120 B

3.3 Message Output

3.3.1 Protocol Printer IPP 144-40

When the texts are called, all messages are output to the printer via the serial interface, if the print parameter PRN ON has been set during the text input. The output format PRINT FORMAT in the menu program must be set to NORMAL or STANDARD.

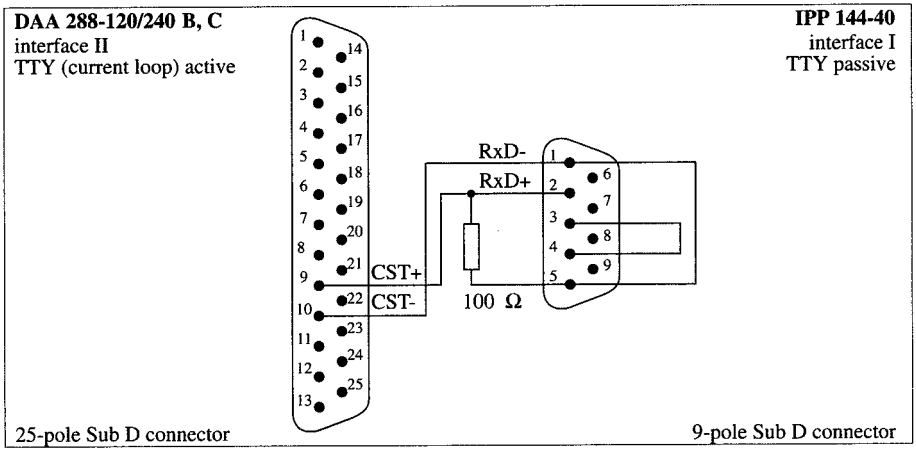

Fig. M-26: Connection of the IPP 144-40 protocol printer to the DAA via the TTY interface

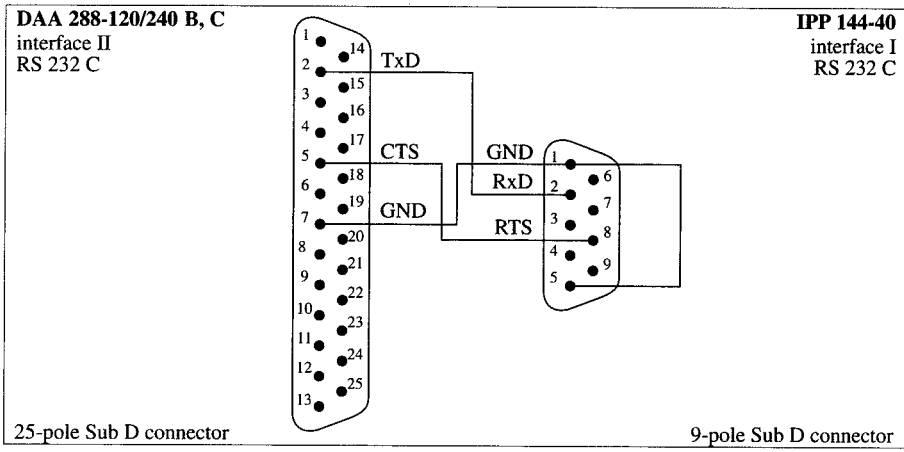

Fig. M-27: Connection of the IPP-144-40 protocol printer to the DAA via the 25-pole RS 232 C interface with CTS/RTS hardware handshake

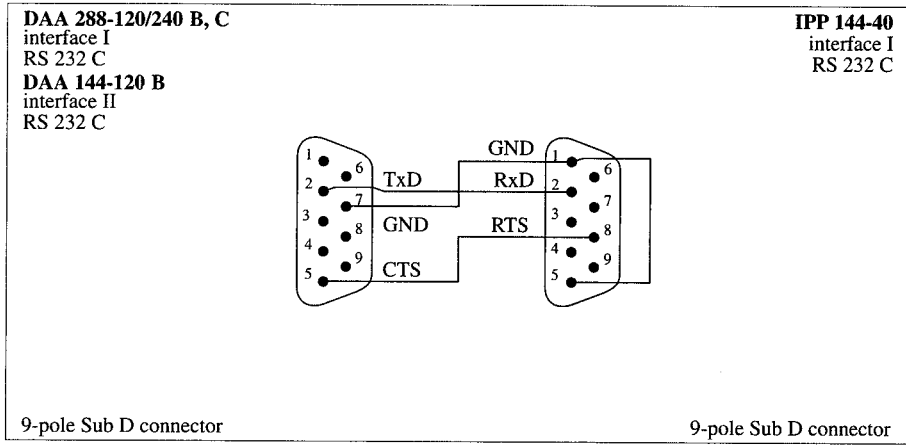

Fig. M-28: Connection of the IPP-144-40 protocol printer to the DAA via the 9-pole RS 232 C interface with CTR/RTS hardware handshake

3.3.2 Output to another DAA

When texts are called, all messages are output to a version A DAA secondary display via the serial interface, if the print parameter PRN ON has been set during the text input. The output format PRINT Format must be set to SLAVE or DAA VERSION A on both devices. The transmitting and receiving device must have the same number of lines.

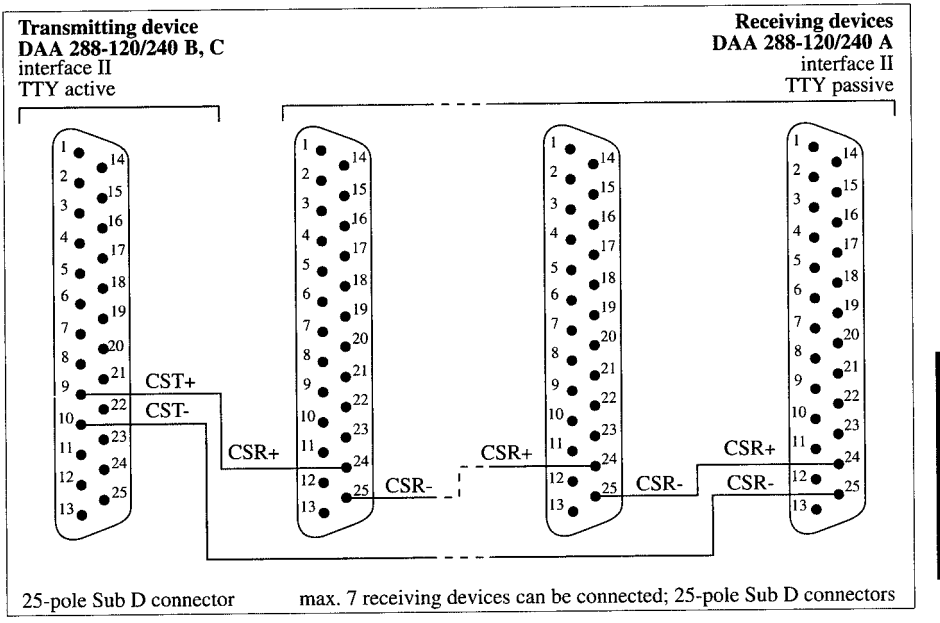

Fig. M-29: Connection of a TTY current loop

For the connection of a secondary display via the 25-pole RS 232 C interface - see Fig. M-20.

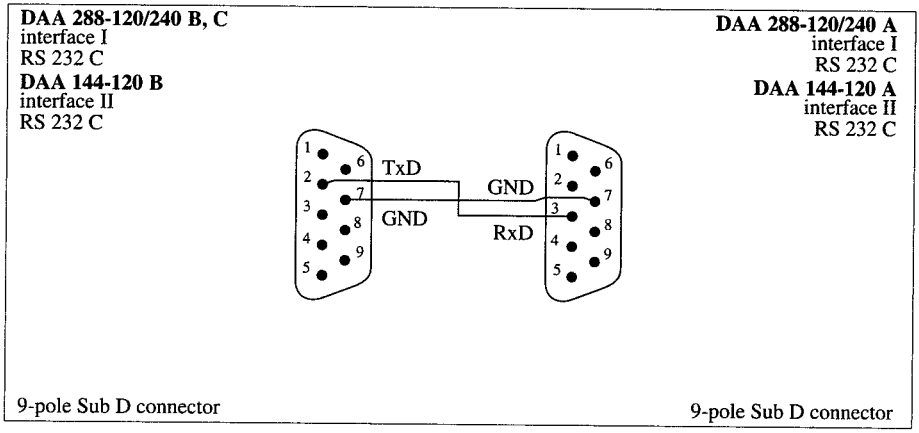

Fig. M-30: Connection of a secondary display via 9-pole serial interfaces

Trouble Shooting

Contents

Page

1 Possible Error Causes F-2

2 Error Message Table F-3

1 Possible Error Causes

Text input

Normal process: When the texts are transferred into the message memory, the text numbers are displayed "Text No. = XXX". If this is not the case, one of the following causes may apply:

- the connecting cable is missing or defective;
- the interface parameters are not matching: baud rate, parity, data length, stop bits;
- the baud rate of 2400 baud is too high for the cable length or there are electrical disturbances;
- incorrect selection of interface I or II on the DAA;
- incorrect selection of the interface COM1 or COM2 on the PC;
- incorrect file structure (can be avoided by using MWTA).
- incorrect operating sequence during file transfer to B versions when using MWTA. (Prepare MWTA to transmit first, than prepare DAA B version - TEXT INPUT file mode - to receive file. Next <ENTER> at PC keyboard starts transfer).

The communication can be checked by means of the keyboard command <CTRL T> in terminal emulation (the message display responds by outputting date and time).

Triggering

Normal process: After the call, the text is displayed with variable characters (ASCII), if any. If this is not the case, one of the following causes may apply:

- the input mode or the strobe function is incorrectly set: direct, binary, BCD or serial;
- the wrong interface has been selected for serial input;
- no text is defined with this text number;
- the variable characters arrive later than 300 ms after the call;
- the variable characters have not been closed with <CR> (0D H);
- a dynamic field has not been included when programming the text.

For the DAA version C, the function "TEST MODE" in the menu program can be used for checking the input. For DAA version B or C the TEST INPUT LINES function can be used to check the parallel interface.

2 Error Message Table

DAA 144-120 B DAA 288-120 B	DAA 288-240 B DAA 288-240 C	Cause
!ERROR!	**!ERROR!**	Text file format error - text number too long - too many parameters - invalid character(s) in the text or parameters Send/receive error - cabling error - cables were connected while DAA was waiting for input
Remedy: Check the text file and the cabling and make corrections, if necessary; repeat the input.		
!PARITY!	**!PARITY ERROR!**	Incorrect transmission format
Remedy: Set the same send format on the transmitting and the receiving device.		
!OVERFLOW!	**!RAM OVERFLOW!**	Text file too big for message memory
Remedy: Check the text file; a text occupies min. 48 byte (10 in version C), even an empty text which consists only of <CR>.		
!LOCK!	**!MEMORY LOCKED!**	Message memory locked
Remedy: Check the serial interface. The pins 1 and 6 (9-pole interface) or 1 and 13 (25-pole interface) must be linked.		
–	**!INVALID NUMBER!** (only DAA 288-240 C)	The desired text number is not assigned
Remedy: Select another text number or enter a text into the message memory (see C-2.3.1, "Modification of existing texts").		

Table F-1: Error messages and remedies

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Technical Data

Contents

Page

1 Technical Data D-2
1.1 Technical Data Version A D-2
1.2 Technical Data Version B D-4
1.3 Technical Data Version C D-6

2 Default Settings D-9

3 Mounting Dimensions D-10
3.1 DAA 144-120 Mounting Dimensions D-10
3.2 DAA 288-120 and 288-240 Mounting Dimensions D-12

4 Character Sets D-14

5 ASCII Control Characters D-17

1 Technical Data

1.1 Technical Data Version A

Designation	DAA 144-120 A	DAA 288-120 A	DAA 288-240 A
Character representation			
Character size	5 mm	9 mm	5 mm
Characters per line	20	20	40
Number of lines	1	1	2
Character sets	ASCII, German, French, Swedish/Finnish, Danish/Norwegian, Cyrillic		
Display type	Fluorescent display, green		
Text transfer	Via serial interface		
Serial interfaces			
Quantity/type	2 RS 232 C (and current loop for DAA 288 interface 2), all lines are galvanically isolated by means of optocouplers		
Baud rate	110, 150, 300, 600, 1200, 2400 Baud		
Data format	7 or 8 Bit		
Stop bits	1 or 2		
Parity bit	even, odd, mark, space, none (no parity check)		
Power supply			
Device design	DC	DC or AC	
DC	19 to 36 V DC, approx. 6 W, galvanically isolated starting current 1.5 A		
AC	–	115 V AC ± 15%, 230 V AC ± 15%, approx. 10 VA, 45 to 65 Hz	
Fuse	2 A(T)	115 VAC: 200 mA(M) 230 VAC: 100 mA(M)	

Table D-1: Technical data Version A, part 1

Designation	**DAA 144-120 A**	**DAA 288-120 A**	**DAA 288-240 A**
Ambient conditions			
Storage temp. Operating temp. Climatic requirem.	-40 to 80 °C 0 to 50 °C Climatic category 2 acc. to VDE/VDI 3540		
Protection class			
Housing Power cable	IP 65 acc. to DIN 40 050 IP 20		
Dimensions			
Width x height x depth	144 x 36 x 147.5 mm	288 x 72 x 95 mm	
Weight	approx. 0.43 kg	approx. 0.9 kg	
Connections			
Power supply	Screw terminal connector, e.g. Phönix MSTB 1, 6/3-ST contact spacing 5 mm.		
Text input, interface I	3-pole plug connector	9-pole Sub-D socket	
Text input, interface II	9-pole Sub-D socket	25-pole Sub-D socket	

Table D-2: Technical data Version A, part 2

1.2 Technical Data Version B

Designation	DAA 144-120 B	DAA 288-120 B	DAA 288-240 B
Character representation			
Character size	5 mm	9 mm	5 mm
Characters per line	20	20	40
Number of lines	1	1	2
Character sets	ASCII, German, French, Swedish/Finnish, Danish/Norwegian, Cyrillic		
Display type	Fluorescent display, green		
Text input	Via serial interface		
Message Memory			
Type	CMOS-RAM, EPROM 27 C 256		
Memory size	16 KB incl. control characters		
Storage time	> 10 years in typical operation		
Text scope	max. 255 texts, max. 175 characters per running line		
Text call	Direct, binary or BCD coded, serial		
Display modes			
Operating modes	Primary value, final value, final value without paging-back option, sequence messages		
Variables			
Variable overlay	Parallel, serial		
Alarm			
Alarm output	Relay with n.o. contact 250 V AC/2 A, 30 V DC/2 A		
Control Inputs			
Parallel interface, 20-pole	Galvanic isolation of all lines, inputs active "high" high level: +15 V to +30 V, low level: 0 V to +7 V input current at 24 V : approx. 2 mA		

Table D-3: Technical data Version B, part 1

Designation	DAA 144-120 B	DAA 288-120 B	DAA 288-240 B
Serial interface			
Quantity/type	2 RS 232 C (and current loop for DAA 288 interface 2), all lines are galvanically isolated by means of optocouplers		
Baud rate	110, 150, 300, 600, 1200, 2400 Baud		
Data format	7 or 8 Bit		
Stop bits	1 or 2		
Parity bit	even, odd, mark, space , none (no parity check)		
Power supply			
Device design	DC	DC or AC	
DC	19 to 36 V DC, approx. 6 W, galvanically isolated starting current 1.5 A		
AC	–	115 V AC ± 15%, 230 V AC ± 15%, appr. 10 VA, 45 to 65 Hz	
Fuse	2 A(T)	115 VAC: 200 mA(M) 230 VAC: 100 mA(M)	
Ambient conditions			
Storage temp. Operating temp. Climatic requirem.	-40 to 80 °C 0 to 50 °C Climatic category 2 acc. to VDE/VDI 3540		
Protection class			
Housing Power cable	IP 65 acc. to DIN 40 050 IP 20		
Dimensions			
Width x height x depth	144 x 36 x 147.5 mm	288 x 72 x 95 mm	
Weight	approx. 0.43 kg	approx. 0.9 kg	

Table D-4: Technical data Version B, part 2

Designation	DAA 144-120 B	DAA 288-120 B	DAA 288-240 B
Connections			
Power supply	Screw terminal connector, e.g. Phönix MSTB 1, 6/3-ST contact spacing 5 mm.		
Interface I	3-pole plug connector	9-pole Sub-D socket	
Interface II	9-pole Sub-D socket	25-pole Sub-D socket	

Table D-5: Technical data Version B, part 3

1.3 Technical Data Version C

Designation	DAA 288-240 C
Character representation	
Character size	5 mm
Characters per line	40
Number of lines	2
Character sets	ASCII, German, French, Swedish/Finnish, Danish/Norwegian, Cyrillic
Display type	Fluorescent display, green
Text input	Via serial interface
Message memory	
Type	CMOS-RAM, EPROM 27 C 512
Memory size	64 KB incl. control characters
Storage time	> 10 years in typical operation
Text scope	max. 1024 texts with approx. 54 characters/text, running line max. 175 characters
Text call	Direct, binary or BCD coded, serial

Table D-6: Technical data Version C, part 1

Designation	DAA 288-240 C
Display modes	
Operating modes	Primary value, final value, final value without paging-back option, sequence messages
Variables	
Variable overlay Timers Counters	serial, parallel, parallel 5 decade BCD. up to 9,999 hrs (1 sec. resolution) up to 999,999 counts
Alarm	
Alarm outputs	Relay with n.o. contact 250 V AC/2 A, 30 V DC/2 A 2 open collector outputs; 3 alarm levels in total
Data logging memory	
Memory type Capacity Output formats	CMOS-RAM 64 KB, battery-backed appr. 2500 events Interval: 3 different periods Statistics: 4 different sorting sequences
Control inputs	
Parallel interfaces 2 x 20-pole	Galvanic isolation of all lines; inputs active "high" High level: +15 V to +30 V, low level: 0 V to +7 V Input current at 24 V : approx. 2 mA
Serial interfaces	
Quantity/type Baud rate Data format Stop bits Parity bit	2 RS 232 C (and current loop interface 2), all lines are galvanically isolated by means of optocouplers 110, 150, 300, 600, 1200, 2400 Baud 7 or 8 Bit 1 or 2 even, odd, mark, space, none (no parity check)

Table D-7: Technical data Version C, part 2

Designation	DAA 288-240 C
Power supply	
Device design DC AC Fuse	DC or AC 19 to 36 V DC, appr. 6 W, galvanically isolated starting current 1.5 A 115 V AC ± 15%, approx. 10 VA 230 V AC ± 15%, approx. 10 VA 45 to 65 Hz 24 VDC: 2 A(T), 115 VAC: 200 mA(M) 230 VAC: 100 mA(M)
Ambient conditions	
Storage temp. Operating temp. Climatic requirements	-40 to 80 °C 0 to 50 °C Climatic category 2 acc. to VDE/VDI 3540
Protection class	
Housing Power cable	IP 65 acc. to DIN 40 050 IP 20
Dimensions	
Width x height x depth	288 x 72 x 95 mm
Weight	approx. 0.9 kg
Connections	
Power supply	Screw terminal connector, e.g. Phönix MSTB 1, 6/3-ST contact spacing 5 mm.
Interface I	9-pole Sub-D socket
Interface II	25-pole Sub-D socket

Table D-8: Technical data Version C, part 3

2 Default Settings

The below table shows the default settings of the devices. The set values can be modified in a menu program by means of the 4 function keys.

Designation	Version A	Version B	Version C
BRIGHTNESS	4		
SET TIME/DATE	–	Date and time	
CHARACTER SET	ASCII		
INTERFACE Baud rate Data format Stop bits Parity	II 2400 8 Bit 1 no		
PRINT FORMAT	–	STANDARD / NORMAL	
TEXT INPUT *)	–	MODE EDIT	
TEXT OUTPUT *)	–	MODE FILE	
INPUT MODE	–	BINARY	
STROBE T	–	ACTIVE	
OPERATING MODE	–	EXTERNAL / EXT	
VARIABLE MODE	–	PARALLEL	
DISPLAY TIME	–	5 s	

*) This setting is not stored.

Table D-9: Default settings

3 Mounting Dimensions

3.1 DAA 144-120 Mounting Dimensions

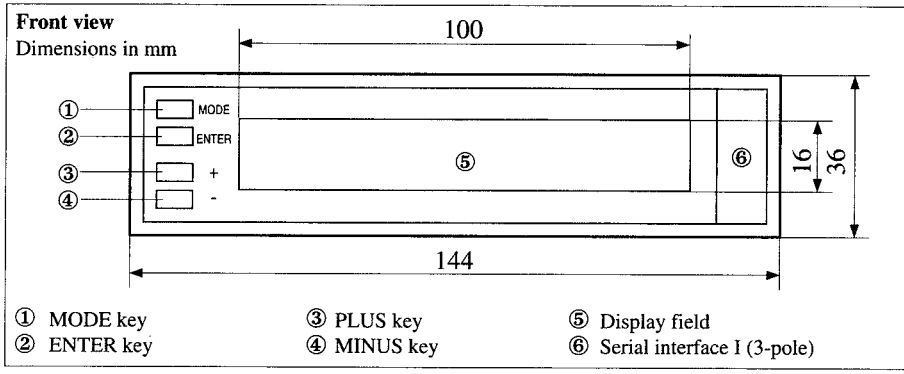

Fig. D-1: DAA 144-120 mounting dimensions front view

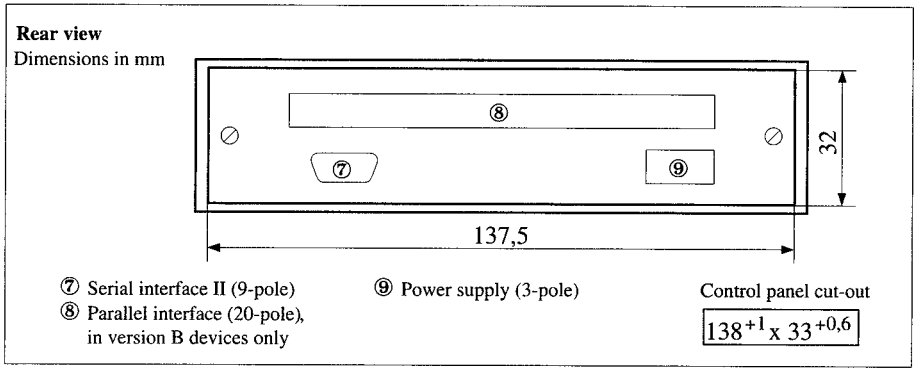

Fig. D-2: DAA 144-120 mounting dimensions, rear view

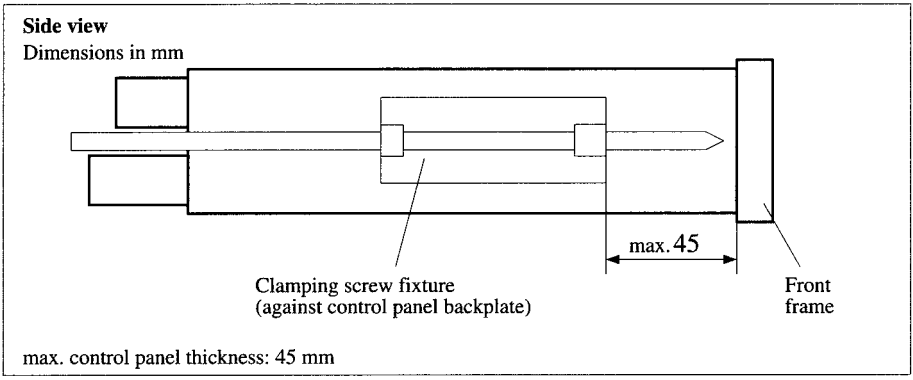

Fig. D-3: DAA 144-120 Mounting dimensions, side view

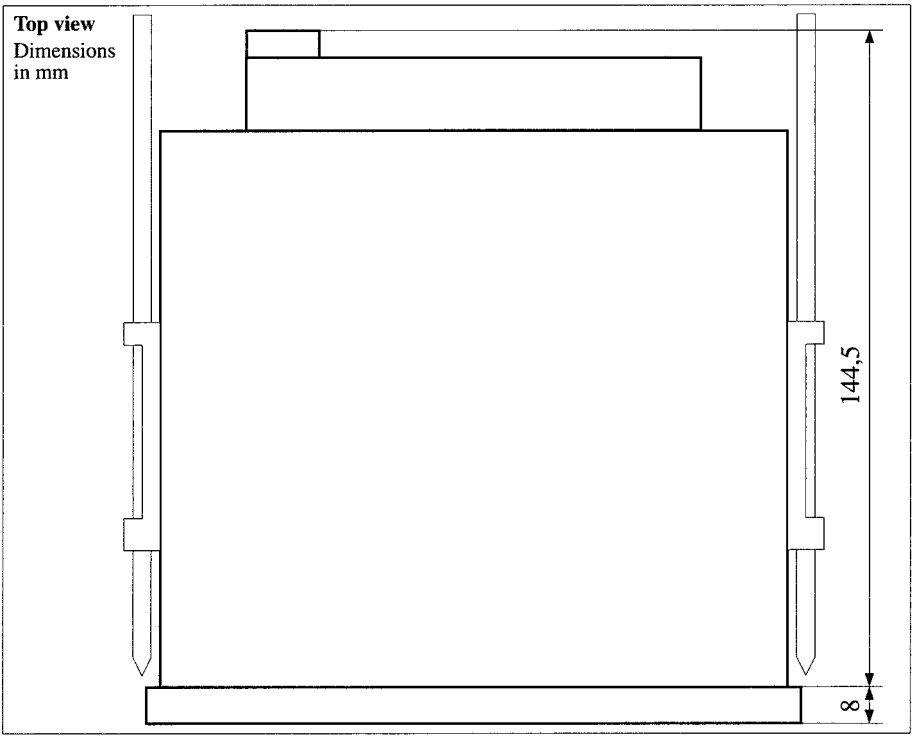

Fig. D-4: DAA 144-120 mounting dimensions, top view

3.2 DAA 288-120 and 288-240 Mounting Dimensions

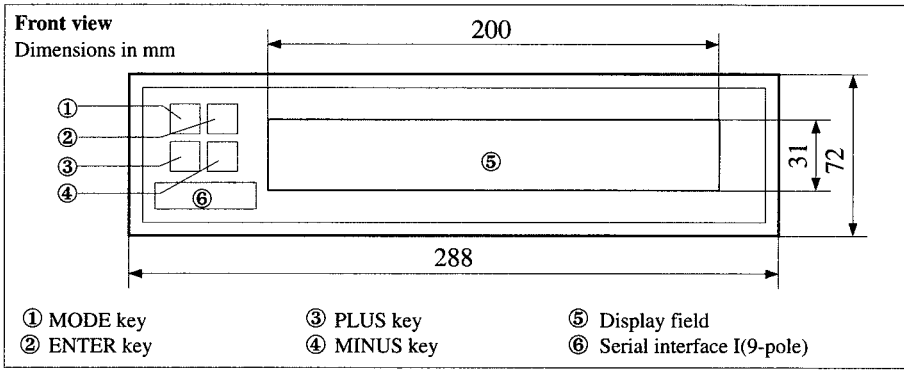

Fig. D-5: DAA 288-120/240 mounting dimensions, front view

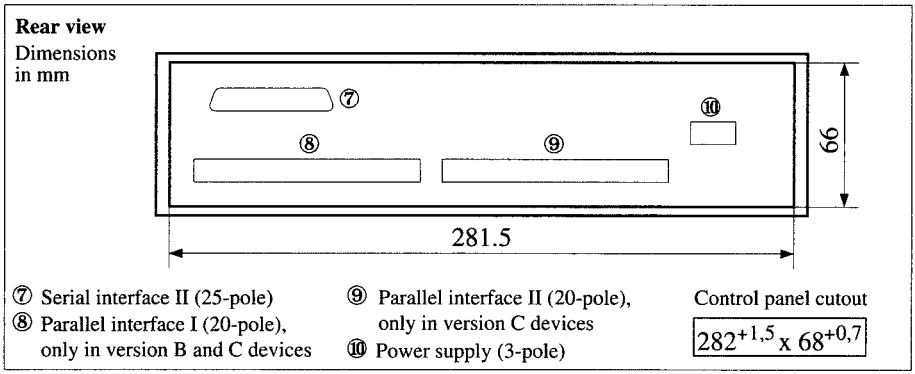

Fig. D-6: DAA 288-120/240 mounting dimensions, rear view

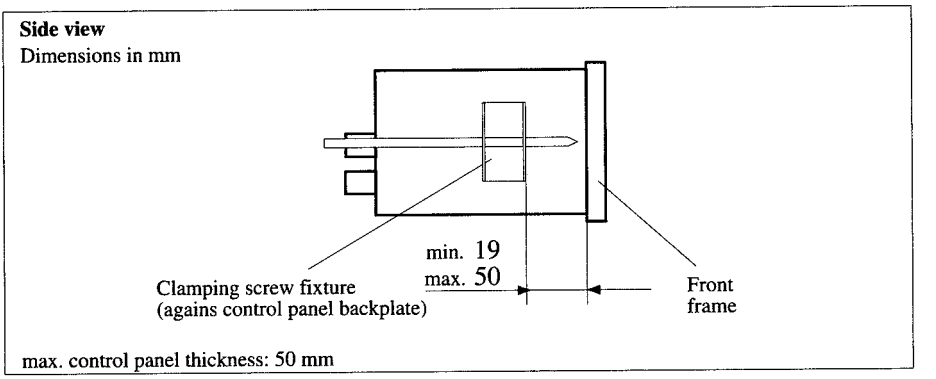

Fig. D-7: DAA 288-120/240 mounting dimensions, side view

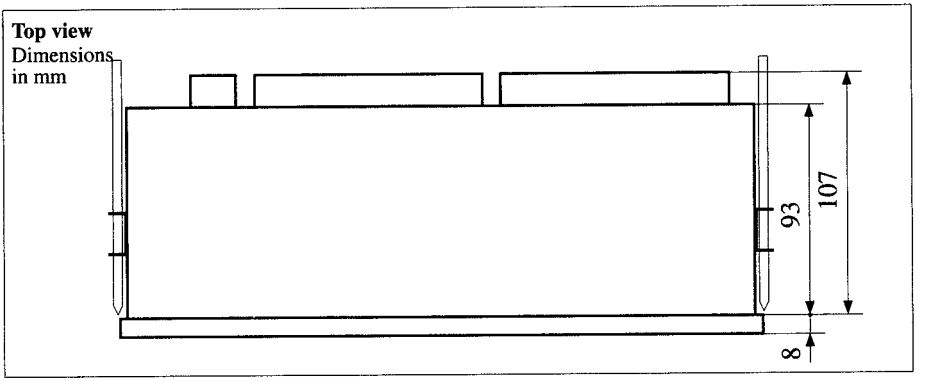

Fig. D-8: DAA 288-120/240 mounting dimensions, top view

4 Character Sets

National Character Sets

Hexa-decimal	ASCII 7 Bit	G	F	S/SF	DK/N
23	#	#	£	§	#
24	$	$	$		
40	@	§	à	É	É
5B	[	Ä	°	Ä	Æ
5C	\	Ö	ç	Ö	Ø
5D	]	Ü	§	Å	Å
5E*	^*	^*	^*	^	Ü
60	‘	‘	ê	é	é
7B	{	ä	é	ä	æ
7C	|	ö	ù	ö	ø
7D	}	ü	è	å	å
7E	~	ß	ë	ü	ü

* If this character shall be displayed, it must be entered twice in the text file.

Table. D-10: National character sets

Hexa-decimal	Representation
0-9	0-9
A	–
B	+
C	•
D	<CR>
E	<
F	>

Table D-11: BCD character representation

ASCII and Cyrillic Character Set

Hexa-decimal	Decimal	ASCII-character		Hexa-decimal	Decimal	ASCII-charact.	Cyrillic
00	000	^@	NUL	20	032	SPACE	SPACE
01	001	^A	SOH	21	033	!	!
02	002	^B	STX	22	034	"	"
03	003	^C	ETX	23	035	#	#
04	004	^D	EOT	24	036	$	$
05	005	^E	ENQ	25	037	%	%
06	006	^F	ACK	26	038	&	&
07	007	^G	BEL	27	039	'	Ю
08	008	^H	BS	28	040	(	(
09	009	^I	HT	29	041	)	)
0A	010	^J	LF	2A	042	*	ъ
0B	011	^K	VT	2B	043	+	+
0C	012	^L	FF	2C	044	,	,
0D	013	^M	CR	2D	045	-	-
0E	014	^N	SO	2E	046	.	.
0F	015	^O	SI	2F	047	/	/
10	016	^P	DLE	30	048	0	0
11	017	^Q	DC1	31	049	1	1
12	018	^R	DC2	32	050	2	2
13	019	^S	DC3	33	051	3	3
14	020	^T	DC4	34	052	4	4
15	021	^U	NAK	35	053	5	5
16	022	^V	SYN	36	054	6	6
17	023	^W	ETB	37	055	7	7
18	024	^X	CAN	38	056	8	8
19	025	^Y	EM	39	057	9	9
1A	026	^Z	SUB	3A	058	:	:
1B	027	^[	ESC	3B	059	;	;
1C	028	^\	FS	3C	060	<	<
1D	029	^]	GS	3D	061	=	=
1E	030	^^	RS	3E	062	>	>
1F	031	^_	US	3F	063	?	Ь

Table D-12: ASCII and Cyrillic character set, part 1

Hexa-decimal	Decimal	ASCII charact.	Cyrillic	Hexa-decimal	Decimal	ASCII charact.	Cyrillic
40	064	@	@	60	096	‘	Ю
41	065	A	Ф	61	097	a	ф
42	066	B	И	62	098	b	и
43	067	C	С	63	099	c	с
44	068	D	В	64	100	d	в
45	069	E	У	65	101	e	у
46	070	F	А	66	102	f	а
47	071	G	Ч	67	103	g	ч
48	072	H	П	68	104	h	п
49	073	I	Ш	69	105	i	ш
4A	074	J	О	6A	106	j	о
4B	075	K	Л	6B	107	k	л
4C	076	L	Д	6C	108	l	д
4D	077	M	Е	6D	109	m	ё
4E	078	N	Т	6E	110	n	т
4F	079	O	Щ	6F	111	o	щ
50	080	P	З	70	112	p	з
51	081	Q	Й	71	113	q	й
52	082	R	К	72	114	r	к
53	083	S	Ы	73	115	s	ы
54	084	T	Е	74	116	t	е
55	085	U	Г	75	117	u	г
56	086	V	М	76	118	v	м
57	087	W	Ц	77	119	w	ц
58	088	X	Р	78	120	x	р
59	089	Y	Я	79	121	y	я
5A	090	Z	Н	7A	122	z	н
5B	091	[	Э	7B	123	{	Э
5C	092	\	Ж	7C	124	|	Ж
5D	093	]	Х	7D	125	}	Х
5E	094	^		7E	126	~	б
5F	095	_	ь	7F	127	⌂	■

Table D-13: ASCII and Cyrillic character set, part 2

5 ASCII Control Characters

The below tables shows all control characters used for controlling the intelligent message displays of the DAA 144/288 series.

Hexa-decimal	Control charact.	CTRL... = ^...	DAA 144/288-specific significance	
			EDIT mode	Operating Mode
03	ETX	^C	Modify existing text or parameter	
04	EOT	^D	Delete text number or character	End of the transmission
05	ENQ	^E		Enquiry
06	ACK	^F	Start flashing	
07	BEL	^G	End flashing	
08	BS	^H	Cursor left	MINUS key (versionA)
09	HT	^I	Insert character	PLUS key (versionA)
0C	FF	^L	Cursor right	
0D	CR	^M	<CR>	ENTER key (versionA)
10	DLE	^P	Text output from diagnosis storage (only Version C)	Output of the memory table
12	DC2	^R	Single line running line (version A)	
13	DC3	^S		Input of date and time (version B, C)
14	DC4	^T		Output of date and time (version B, C)
16	SYN	^V	Start variable overlay	
17	ETB	^W	End variable overlay	
18	CAN	^X	Overall deletion of the control characters ^F, ^G, ^V and ^W	Clear the memory table after CTRL P (Version B, C)
1A	SUB	^Z	Close ASCII file	
1B	ESC	^[		MODE key (versionA)

Table D-14: ASCII control characters

Accessories and Options

Contents

Page

1 Order Numbers Z-2

2 Accessories and Options Z-4
2.1 Cables Z-4
2.2 MWTA Software Z-5
2.3 Text Input in our Factory Z-6
2.4 Expansion of the Direct Input Mode Z-6
2.5 Input Devices Z-7
2.6 EPROM Message Memory Z-7

1 Order Numbers

Designation	Description	Power supply	Order number
Intelligent message display, dimensions (w x h x d) 144 x 36 x 145 mm; VF display 5 x 7 DOT matrix 1 x 20 characters; character size 5 mm.			
DAA 144-120 A	Intelligent message display without message memory	19 to 36 V DC	
DAA 144-120 B	Intelligent message display with 16 KB message memory	19 to 36 V DC	
Intelligent message display, dimensions (w x h x d) 288 x 72 x 95; VF display 5 x 7 DOT matrix 1 x 20 characters; character size 9 mm.			
DAA 288-120 A	Intelligent message display without message memory	19 to 36 V DC 115 V AC 230 V AC	
DAA 288-120 B	Intelligent message display with 16 KB message memory	19 to 36 V DC 115 V AC 230 V AC	
Intelligent message display, dimensions (w x h x d) 288 x 72 x 95 mm; VF display 5 x 7 DOT matrix 2 x 40 characters; character size 5 mm.			
DAA 288-240 A	Intelligent message display without message memory	19 to 36 V DC 115 V AC 230 V AC	
DAA 288-240 B	Intelligent message display with 16 KB message memory	19 to 36 V DC 115 V AC 230 V AC	
DAA 288-240 C	Int. message displ. with 64 KB message memory 64 KB data logging memory	19 to 36 V DC 115 V AC 230 V AC	

Table Z-1: Intelligent message displays

Designation	Description	Power supply	Order number
Protocol printer with thermal print head, dimensions (w x h x d) 144x72x159 mm; 5 x 7 DOT matrix; 40 characters/line.			
IPP 144-40	Protocol printer without text memory	12 V DC 24 V DC 110 V AC 220 V AC 240 V AC	
IPP 144-40 E	Protocol printer with text memory for 600 characters and real-time clock	12 V DC 24 V DC 110 V AC 220 V AC 240 V AC	
IPP 144-40 S	Protocol printer with ASCII 8 Bit character set	12 V DC 24 V DC 24 V AC 110 V AC 220 V AC 240 V AC	
Paper (Pack 10 rolls)	Document proof thermal paper		AC 0001
Housing gaskets			
Rubber gasket	for all **144x36 mm** housings		MW 0106
Rubber gasket	for all **288x72 mm** housings		MW 0107
Connectors for custom-made connecting cables			
9-pole Sub-D	Connector 9-pole with connector housing		MW 0935
25pol. Sub-D	Connector 25-pole with connector housing		MW 0936

Table Z-2: Printers, gaskets and Sub-D plug connectors

2 Accessories and Options

2.1 Cables

Connecting cable from the DAA to:	DAA interface		
	3-pole	9-pole	25-pole
PC 9-pole	MW 1215	MW 1213	MW 1212
PC 25-pole or programmer, V.24[1] / RS 232 C / TTY	MW 1220	MW 1210	MW 1208
Programmer Siemens PG 675 to 695, printer interface	MW 1219	MW 1201	MW 1200
Preh keyboard, 3-pole	-	MW 1211	-
DAA 9-pole	-	MW 1216 for secondary display MW 1207 for transmission of the message memory	
DAA 25-pole	-	-	MW 1206
IPP 144-40	-	MW 1217	MW1205

[1] Siemens PG 7th series, adapter pins-pins: MW 0036

Table Z-3: Cables

2.2 MWTA Software

Different versions of the MWTA software are available to simplify the programming of the message memory. The software is suitable for all DAA 144/288 version B and C intelligent message displays and for all IPP 144-40 E protocol printers. Each diskette contains a printable operating manual.

☞ Each diskette is copyrighted .

Designation	Description		Order number
Program for IBM compatible PCs with MS-DOS operating system. The program contains additional function blocks for controlling the PLC for Siemens STEP 5 under S5DOS, e.g. for the Siemens processors FB 239: S 115 U, FB 238: S 135 U and FB 235: S 150 U.			
MWTA / D 5,25"	Software on diskette 5.25''	German English	ZU 0415 ZU 0417
MWTA / D 3,5"	Software on diskette 3.5''	German English	ZU 0418 ZU 0419
Program for Siemens P/PCM-86 operating system, executable on all PGs. The program contains the function blocks for controlling the PLC for Siemens STEP 5 under S5DOS, e.g. for the Siemens processors FB 239: S 115 U, FB 238: S 135 U and FB 235: S 150 U.			
MWTA / P 5,25"	Software on diskette 5.25''	German English	ZU 0414 ZU 0416
MWTA / P 3,5"	Software on diskette 3.5''	German English	ZU 0419 ZU 0421

Table Z-4: Software

2.3 Text Input in our Factory

Optionally, the message memory of your version B or C DAA 144/288 device can be programmed in our factory according to your specifications.

Designation	Order number
Text generation acc. to spec. on CMOS-RAM (master file) Additional copies of the master file on CMOS-RAM	
Text generation acc. to spec. on EPROM (master file) Additional copies of the master file on EPROM	

Table Z-5: Options

2.4 Expansion of the Direct Input Mode

The parallel-binary converter ISI 64 is available for the expansion of the direct control functions. For controlling DAA intelligent message displays without PLC or to support the PLC, dimensions (w x h x d) 295 x 95 x 65 mm; monitoring of up to 64 inputs, extendible by cascading to max. 255 inputs; parallel and RS 232 C interface; auxiliary voltage output 24 V DC.

Designation	Description	Power supply	Order number
ISI 64	Parallel-binary converter	115 V AC or 24 V DC 230 V AC or 24 V DC	

Table Z-6: Parallel binary converter ISI 64

2.5 Input Devices

Designation	Description	Power supply	Order number
Keyboard for data input into the PLC, dimensions (w x h x d) 288 x 72 x 95 mm; parallel and RS 232 C interface.			
DBT 288-1	Keyboard for connection to a PLC	115 V AC or 24 V DC 230 V AC or 24 V DC	
Keyboard for connection to a version B DAA 144/288 or for direct programming of the message memory (only for devices with CMOS-RAM).			
Preh Commander	Keyboard for connection to a DAA		

Table Z-7: Input devices

2.6 EPROM Message Memory

Message memory EPROMs for replacing the CMOS-RAM of your DAA are also separately available.

Designation	Order number
Separate EPROM 27256, programmed	SE 0389
Separate EPROM 27256, not programmed	01900 1000000043B
Separate EPROM 27512, not programmed, for DAA 288-240 C only	01900 1000000050A

Table Z-8: Message memory ICs

Conversion of the message memory from RAM to EPROM

DAA 288-120 B, 288-240 B and 288-240 C:

- Loosen the 8 housing screws and remove the housing from the base plate.
- Loosen the screws of the display PCB and disconnect the flat ribbon cable.
- Replace the RAM memory IC 501 by the EPROM IC.
- Set the jumpers for IC 502 according to the below drawing.
- Re-assemble the device in reverse order.

DAA 144-120 B:

- Loosen the 4 housing screws and pull off the housing to the front.
- Loosen the 2 screws of the display PCB, pull off the centre push button sleeve and remove the display PCB.
- Loosen 2 screws each of the PCBs 100 and 300 and remove the subrack. Separate the two PCBs.
- Replace the RAM memory chip IC 309 by the EPROM IC.
- Set the jumpers for IC 310 according to the below drawing.
- Re-assemble the device in reverse order.

In case of version C, 4 jumpers on the edge of the PCB must be set (RAM), for the EPROM the jumpers on the opposite side apply.

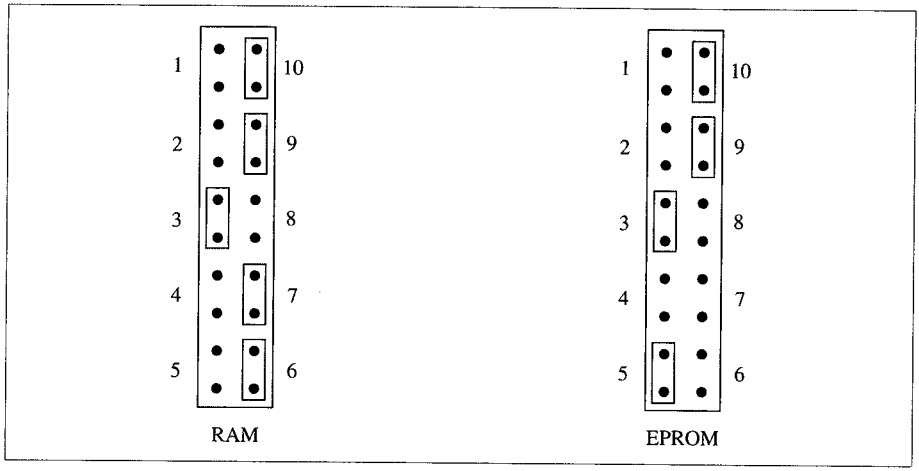

Fig. Z-1: Jumper settings IC 502 and IC 310 (version B)

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