SÜTRON

ELECTRONIC GMBH

Technical Manual

TesiMod Operating Terminal

BT35

BT35C

Version 1.0 issued 02.09.1998

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1 Explanation of Symbols

This manual uses the following symbols to indicate notes and hazardous situations.

 Notes for the User

 General Danger

 Specific Danger

2 Operating Terminal BT35

The **BT35** is a TesiMod operating terminal with an integrated display which allows even large amounts of text and data to be clearly represented. The device is equipped with an extensive keyboard consisting of function keys and soft keys. Additional mounting holes are provided in the front panel for command and signaling devices. The function keys can be labeled by means of slide-in identification strips.

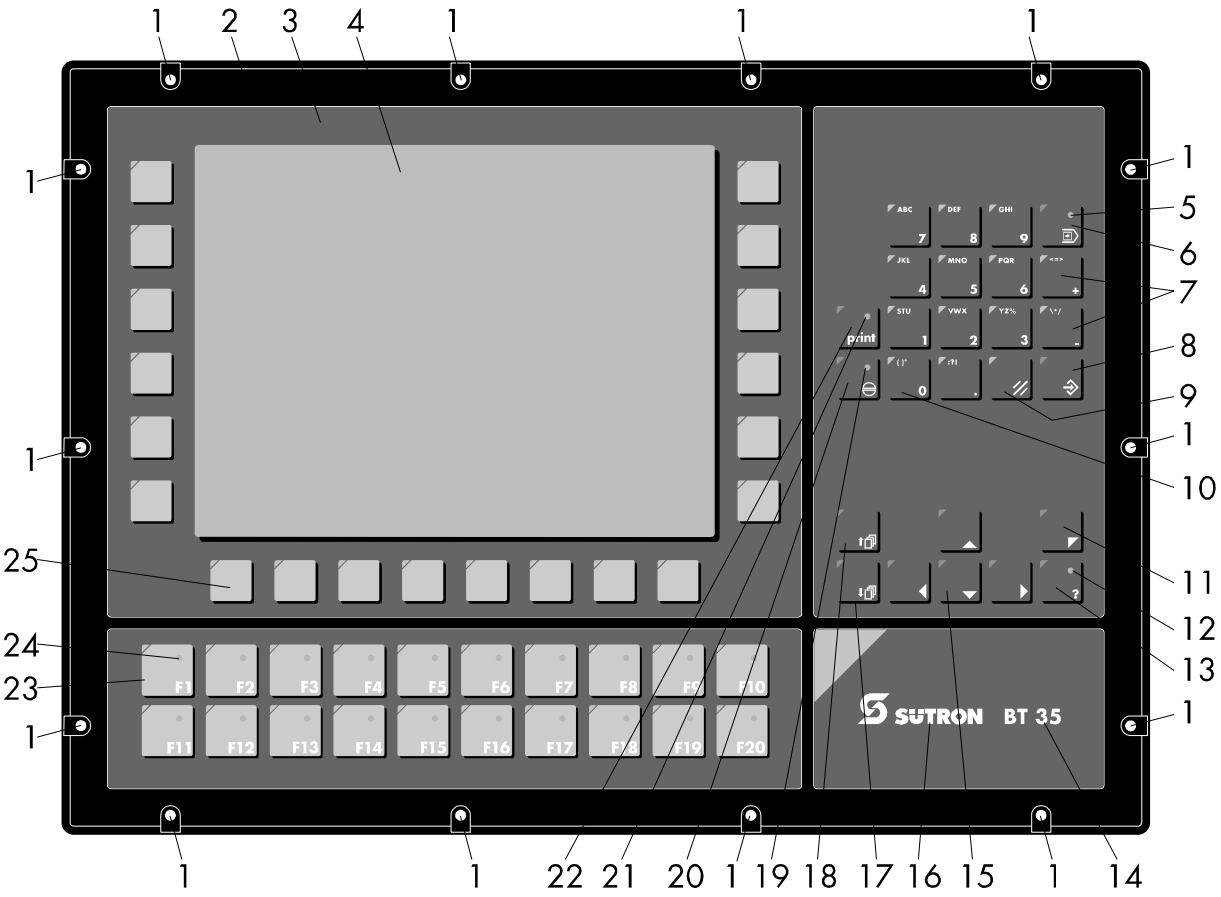
When properly mounted, the device provides a degree of protection to IP65 (on the front).

In standard mode, TesiMod operating terminals completely relieve the controller of operating tasks. The hierarchical menu structures with direct selector keys for frequently used masks provide for a clearly-arranged and powerful man-machine-interface (MMI). All function keys can be defined in a menu-specific manner (soft key technology). A variety of text and variable formats are available to design the masks as required.
The function keys can be programmed to perform direct operating functions within the controller. The operating status of the integrated LED in the keys indicates whether a function has been activated.
The context-sensitive help system provides a maximum of assistance to the operator making time-consuming leafing through manuals unnecessary.

In standard mode, the user description of the terminal consisting of masks, variables and the operator guidance is generated by means of a user-friendly PC program.

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2.1 Front View

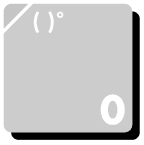


1 Fastening Holes
2 Front Panel
3 Polyester Front Cover
4 Filter Plate, Display Cutout
5 Status LED, Data Release Key
6 Data Release Key
7 Plus, Minus Keys
8 Data Transfer Key (Enter)
9 Delete Key (Clear)
10 Keys 0..9, Alphabet
11 Cursor Home Key
12 Status LED, Help Key
13 Help Key
14 Operating Terminal Type Logo
15 Cursor Keys Right, Left, Up, Down
16 Company Logo
17 Page up Key
18 Page down Key
19 Status LED, Acknowledge Key
20 Acknowledge Key
21 Status LED, Print Key
22 Print Key
23 Function Keys F1..F20
24 Status LED, Function Keys
25 Soft Keys Sk1..Sk20

2.2 Keyboard

The large number of keys makes the **BT35-DÜRR** particularly user friendly. Upon request, all important key functions can be operated without dual assignment. The keyboard is equipped with mechanical short-stroke keys and membrane keys. The keys are covered with an embossed polyester sheet which is resistant to environmental effects. This combination allows a sensitive use of the keys. Some keys are implemented with green LEDs which are integrated into the corresponding keys. In transparent mode, the keys supply a fixed start and stop code. In standard mode, the function of the keys is as defined by the user.

2.2.1 Editing Keys



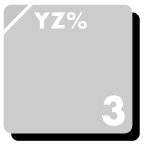
Key: **0 and ( ) °** is used to edit data within the editor. If the system variable "Shift" or "ShiftCase" is programmed, the characters (and) and ° can be entered.



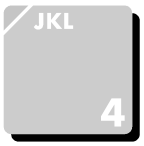
Key: **1 and STU** is used to edit data within the editor. If the system variable "Shift" or "ShiftCase" is programmed, the characters S and T and U can be entered.



Key: **2 and VWX** is used to edit data within the editor. If the system variable "Shift" or "ShiftCase" is programmed, the characters V and W and X can be entered.



Key: **3 and YZ%** is used to edit data within the editor. If the system variable "Shift" or "ShiftCase" is programmed, the characters Y and Z and % can be entered.



Key: **4 and JKL** is used to edit data within the editor. If the system variable "Shift" or "ShiftCase" is programmed, the characters J and K and L can be entered.



Key: **5 and MNO** is used to edit data within the editor. If the system variable "Shift" or "ShiftCase" is programmed, the characters M and N and O can be entered.



Key: **6 and PQR** is used to edit data within the editor. If the system variable "Shift" or "ShiftCase" is programmed, the characters P and Q and R can be entered.

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Key: **7 and ABC** is used to edit data within the editor. If the system variable "Shift" or "ShiftCase" is programmed, the characters A and B and C can be entered.



Key: **8 and DEF** is used to edit data within the editor. If the system variable "Shift" or "ShiftCase" is programmed, the characters D and E and F can be entered.



Key: **9 and GHI** is used to edit data within the editor. If the system variable "Shift" or "ShiftCase" is programmed, the characters G and H and I can be entered.



Key: **Decimal Point and :?!** is used to edit data within the editor. If the system variable "Shift" or "ShiftCase" is programmed, the characters : and ? and ! can be entered.



Key: **Minus and */** can be used to enter negative values within the editor. In the increment editor, the variable value is decremented by 1. When the key is held down, the function is repeated at a rate of repetition that is automatically increased. If the system variable "Shift" or "ShiftCase" is programmed, the characters \ and * and / can be entered.



Key: **Plus and <=>** can be used to enter positive values within the editor. In the increment editor, the variable value is incremented by 1. When the key is held down, the function is repeated at a rate of repetition that is automatically increased. If the system variable "Shift" or "ShiftCase" is programmed, the characters < and = and > can be entered.

2.2.2 Control Keys



Key: **Cursor left** can be programmed to directly select adjacent node and I/O masks.
In the editor, it moves the cursor to the left.



Key: **Cursor right** can be programmed to directly select adjacent node and I/O masks.
In the editor, it moves the cursor to the right.



Key: **Cursor up** can be programmed to directly select adjacent I/O masks.
In the editor, it moves the cursor upwards.



Key: **Cursor down** can be programmed to directly select adjacent I/O masks.
In the editor, it moves the cursor downwards.



Key: **Cursor home** can be programmed to directly select higher-level node and I/O masks.
In the editor, it moves the cursor to the position of the first input variable.



Key: **Page down** is used to page through tables, recipes and messages. The functionality corresponds to the system variable "**TabPgDn**". The key allows data contents towards the bottom of the table to be viewed.

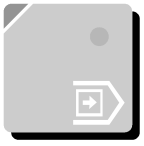


Key: **Page up** is used to page through tables, recipes and messages. The functionality corresponds to the system variable "**TabPgUp**". The key allows data contents towards the top of the table to be viewed.

2.2.3 Special Keys



Key: The **Help key** always displays the current help text (online help). When the help key LED flashes, it signals that an error message is pending. The error or system message is always displayed in plain-text.



Key: The **Data Release** key is used to switch from a menu into the editor. The integrated LED lights up when the editing mode is active. When the Data Release key is pressed within the editor, the editing mode is exited.



Key: The **Data Transfer key** (**Enter)** is used to conclude data entry. When pressed while in the startup mask, the key switches into the setup mask.



Key: In the editor, the **Delete key** deletes the character beneath the cursor. Deletes the selected messages from the data memory.

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Key: **Acknowledge** is used as an acknowledge key for the message system.



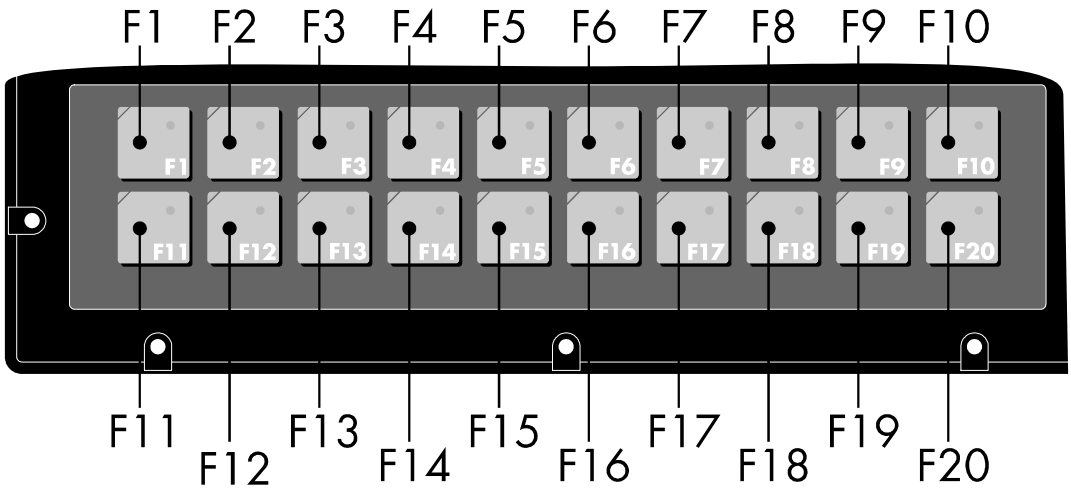
Key: **Print** can be used as a soft key to activate various print processes.

2.2.4 Function Keys



Keys: **Function Keys F1 to F20** with integrated LEDs for functional feedback. In standard mode, the key functions can be freely assigned a soft key functionality; either as direct keys for menu control or to activate a function in the controller.

2.2.4.1 Function Key Arrangement

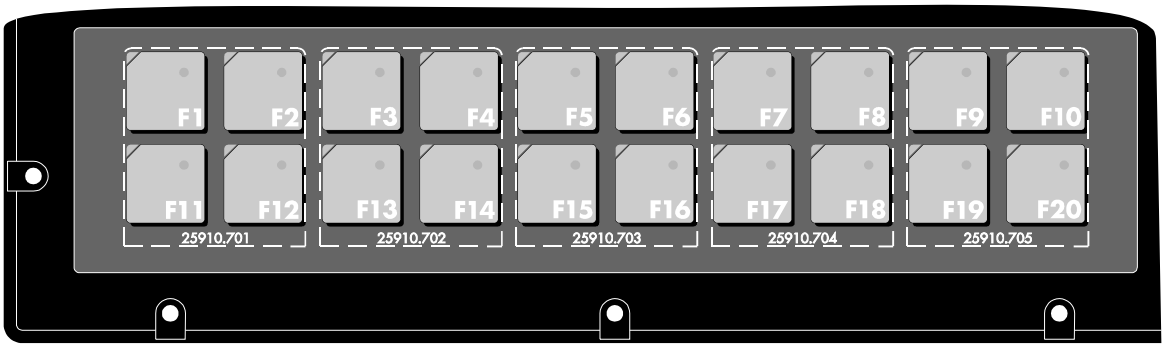


2.2.4.2 Slide-in Identification Strips for the Function Keys

The slide-in identification strips can be replaced after the terminal is dismounted. Inserting the strips from the rear of the front panel does not affect the tightness specified for the terminal. Three identification strips labeled F1..F8, F9...F16 and F17...F20 as well as blank identification strips are provided. Various labeling methods are recommended, depending on the number of terminals involved.

Suitable labeling methods for:

custom-made terminals, prototypes:	labeling with an indelible pen
small number of terminals:	transparency with laser printing
large number of terminals:	identification strips printed according to customer's needs



*Position of identification strips in the **BT35***

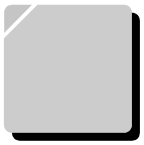
Labeled identification strips, standard

Blank identification strip, standard

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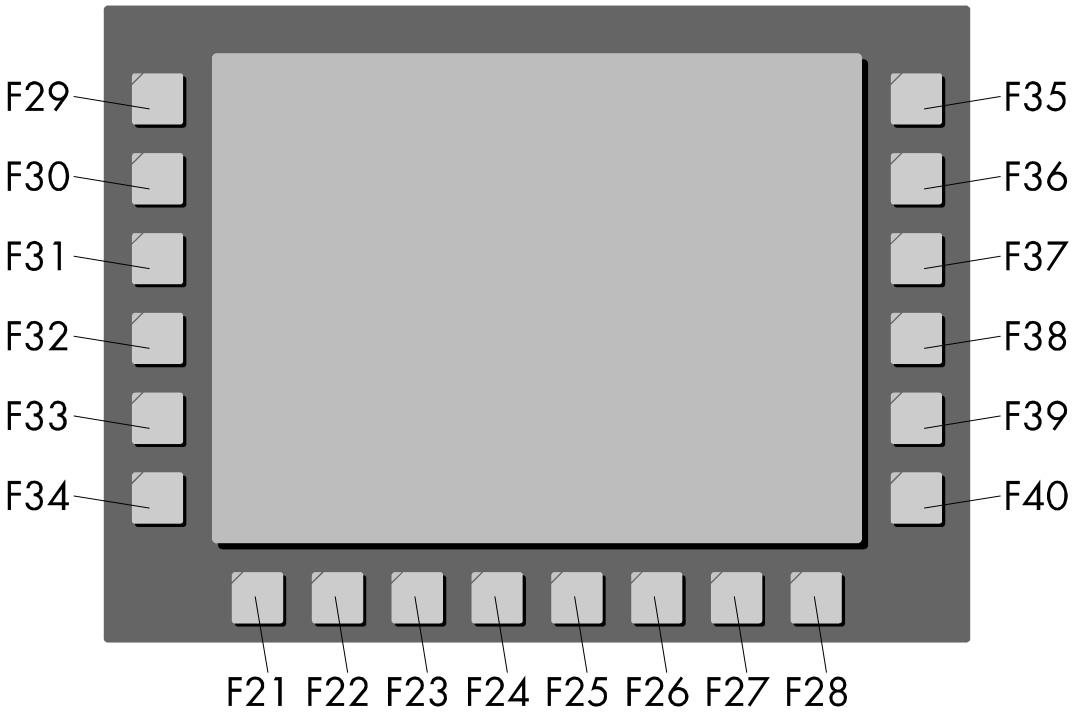
2.2.5 Soft Keys

Soft keys are function keys that are not labeled by means of slide-in identification strips. Their function is normally shown on the display and can vary from mask to mask.



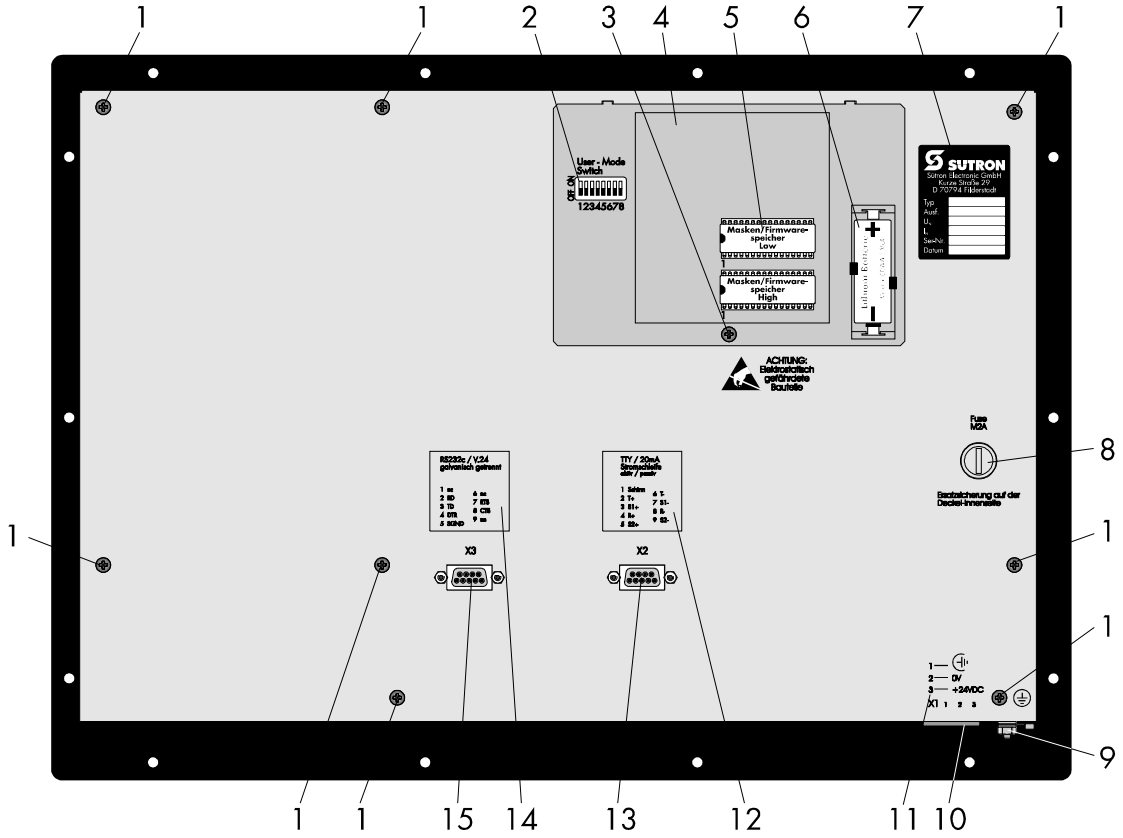
Keys: **Soft keys F21 to F40**, whose function is specified in standard mode related to a specific menu.

2.2.5.1 Arrangement of the Soft Keys



2.3 Rear View

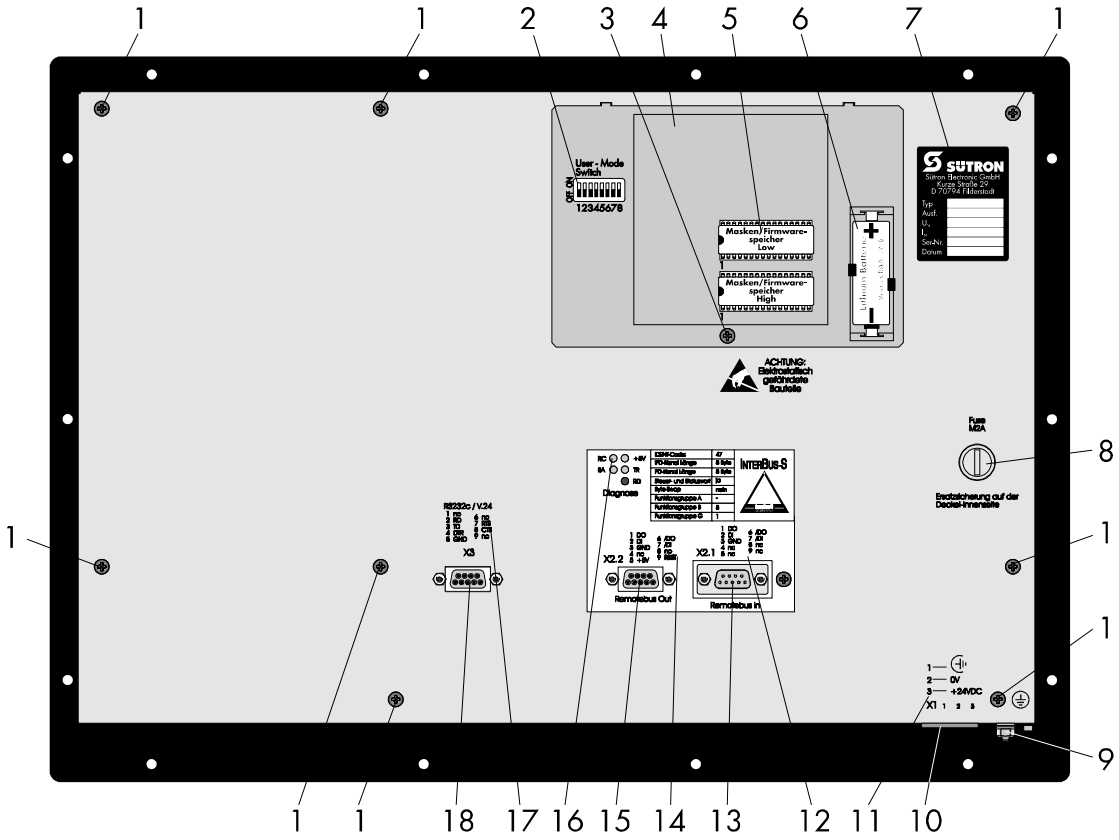
2.3.1 Standard Version



1	Fastening Screws for Rear Panel of Enclosure	9	Ground Screw
2	Mode Selector Switch (inside device)	10	Connector X1 (Supply Voltage)
3	Screw for Hinged Cover	11	Pin Assignment Connector X1
4	Hinged Cover	12	Pin Assignment Interface X2 (TTY / 20 mA)
5	Position & Orientation of Memory (inside dev.)	13	Female Connector Interface X2 (TTY / 20 mA)
6	Position & Orientation of Battery (inside device)	14	Pin Assignment Interface X3 (RS232)
7	Position of Name Plate	15	Female Connector Interface X3 (RS232)
8	Fuse		

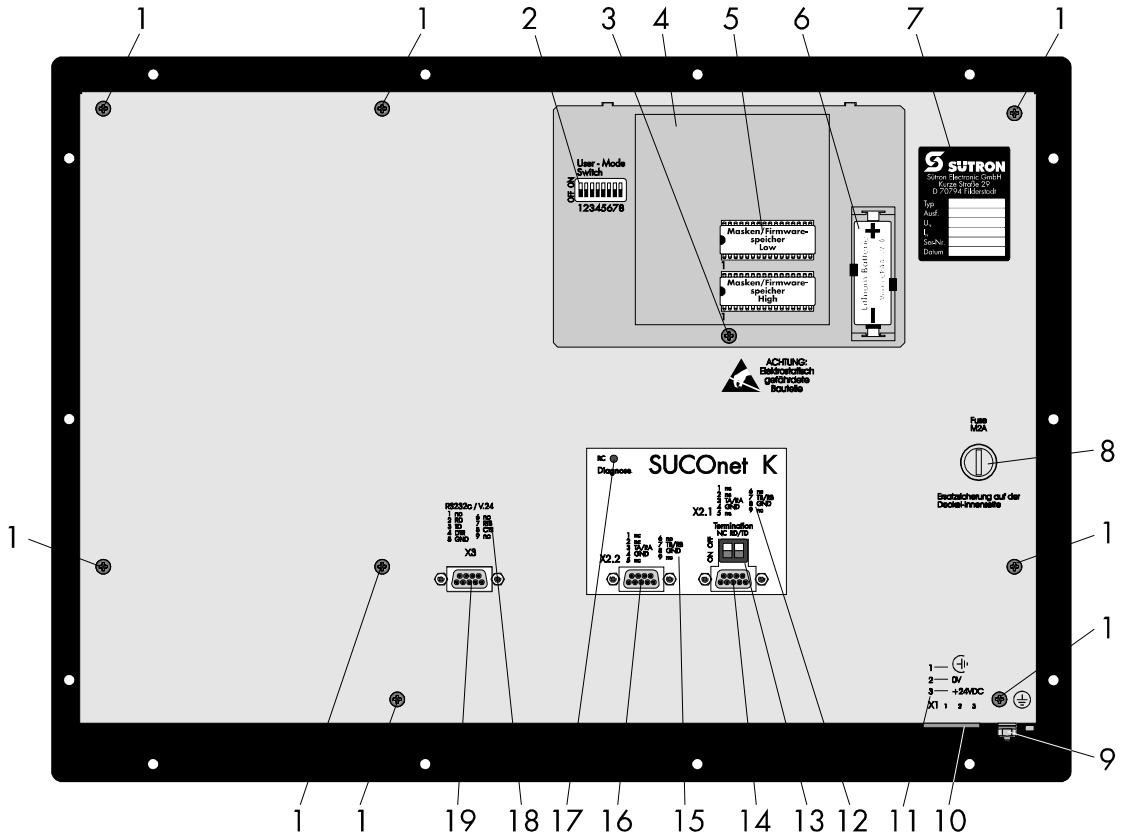
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BT35x/xxx031.30000QK0

2.3.2 InterBus



1 Fastening Screws for Rear Panel of Enclosure
2 Mode Selector Switch (inside device)
3 Screw for Hinged Cover
4 Hinged Cover
5 Position & Orientation of Memory (inside dev.)
6 Position & Orientation of Battery (inside device)
7 Position of Name Plate
8 Fuse
9 Ground Screw
10 Connector X1 (Supply Voltage)
11 Pin Assignment Connector X1 (Supply Voltage)
12 Pin Assignment Interface X2.1 (Remotebus In)
13 Male Connector X2.1 (Remotebus In)
14 Pin Assignment Interface X2.2 (Remotebus Out)
15 Female Connector Interface X2.2 (Remotebus Out)
16 Diagnostic LEDs InterBus
17 Pin Assignment Interface X3 (RS232)
18 Female Connector Interface X3

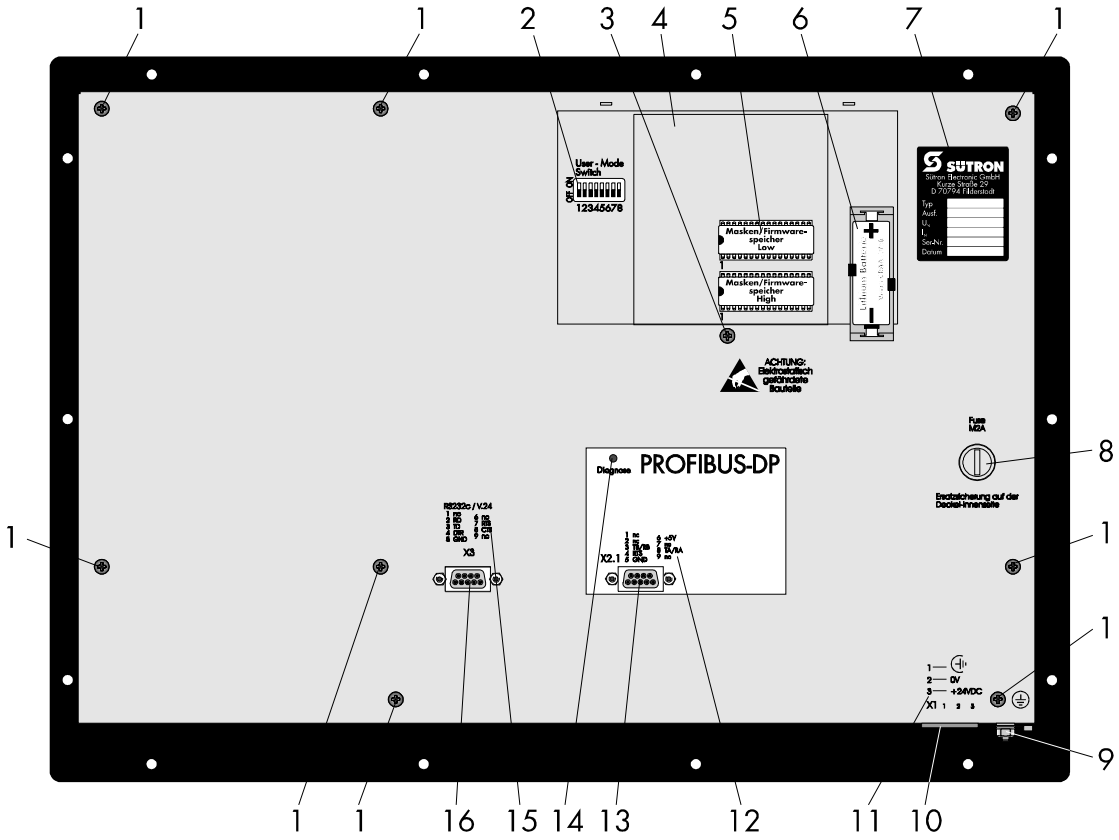
2.3.3 SUCOnet K



1 Fastening Screws for Rear Panel of Enclosure
2 Mode Selector Switch (inside device)
3 Screw for Hinged Cover
4 Hinged Cover
5 Position & Orientation of Memory (inside dev.)
6 Position & Orientation of Battery (inside device)
7 Position of Name Plate
8 Fuse
9 Ground Screw
10 Connector X1 (Supply Voltage)
11 Pin Assignment Connector X1 (Supply Voltage)
12 Pin Assignment Interface X2.1 (SUCOnet K)
13 Terminator Switch (X2.1 - SUCOnet K)
14 Female Connector X2.1 (SUCOnet K)
15 Pin Assignment Interface X2.2 (SUCOnet K)
16 Female Connector Interface X2.2 (SUCOnet K)
17 Diagnostic LED SUCOnet K
18 Pin Assignment Interface X3 (RS232)
19 Female Connector Interface X3

/000-8245/ Technical details are subject to change
BT35x/xxx031.30000QK0

2.3.4 Profibus-DP



1	Fastening Screws for Rear Panel of Enclosure	9	Ground Screw
2	Mode Selector Switch (inside device)	10	Connector X1 (Supply Voltage)
3	Screw for Hinged Cover	11	Pin Assignment Connector X1 (Supply Voltage)
4	Hinged Cover	12	Pin Assignment Interface X2.1 (Profibus-DP)
5	Position & Orientation of Memory (inside dev.)	13	Female Connector X2.1 (Profibus-DP)
6	Position & Orientation of Battery (inside device)	14	Diagnostic LEDs Profibus-DP
7	Position of Name Plate	15	Pin Assignment Interface X3 (RS232)
8	Fuse	16	Female Connector Interface X3

2.4 Mounting the Terminal

The front panel mounting of the **BT35** facilitates fastening even at places where the rear side is not accessible. It is particularly suitable for mounting in control cabinets.
The front panel permits sealed installation of the operating terminal in accordance with the IP65 degree of protection (front panel). A seal is fitted into a groove that is milled around the rear of the front panel. The mounting materials are included with the accessories.
Special care needs to be taken during installation to maintain this high degree of protection. The seal must be positioned evenly and the fasteners (bolts and screws) tightened uniformly. The operating terminal is inserted from the front through the panel cutout and fastened in position with the cheese head screws provided with the accessories.
When installing the unit, keep a minimum space of 30 mm around the terminal for adequate air circulation.

The tightness between the front panel and the mounting surface depends on the type of installation.

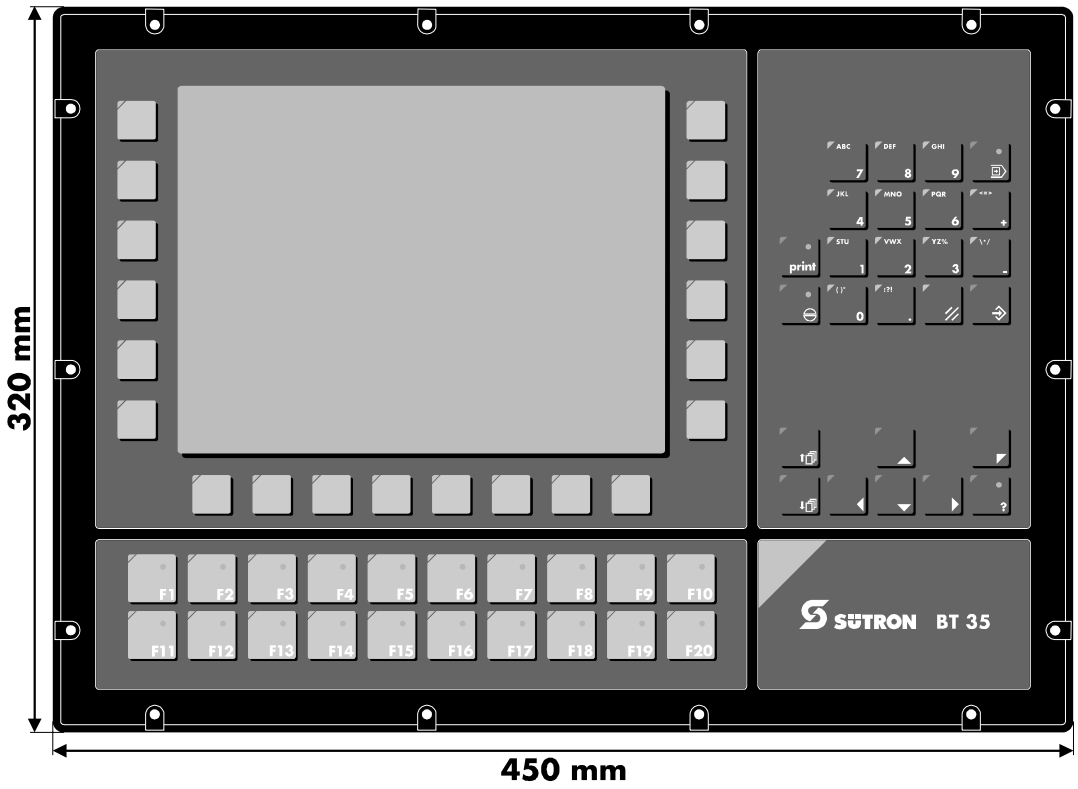


Please follow the safety references coming with the mounting instructions manual.

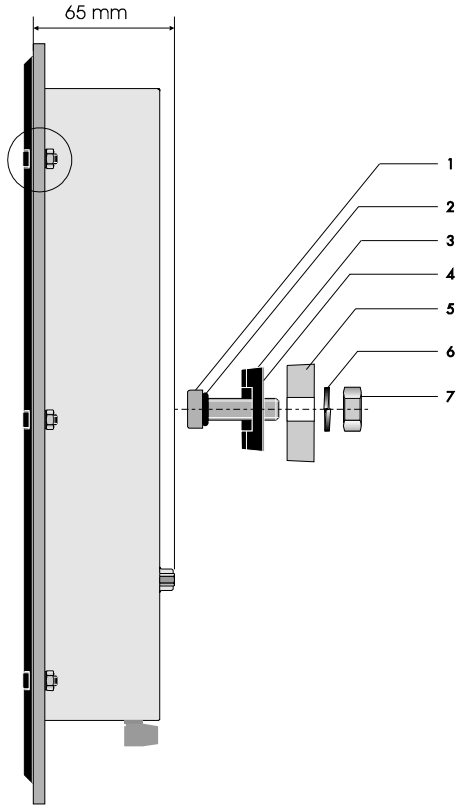
Front Panel Dimensions	240.0 x 280.0 x 4.0 mm	(H x L x D)
Panel Cutout	226 x 248 mm	(H x L)

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2.4.1 Front Panel Dimensions



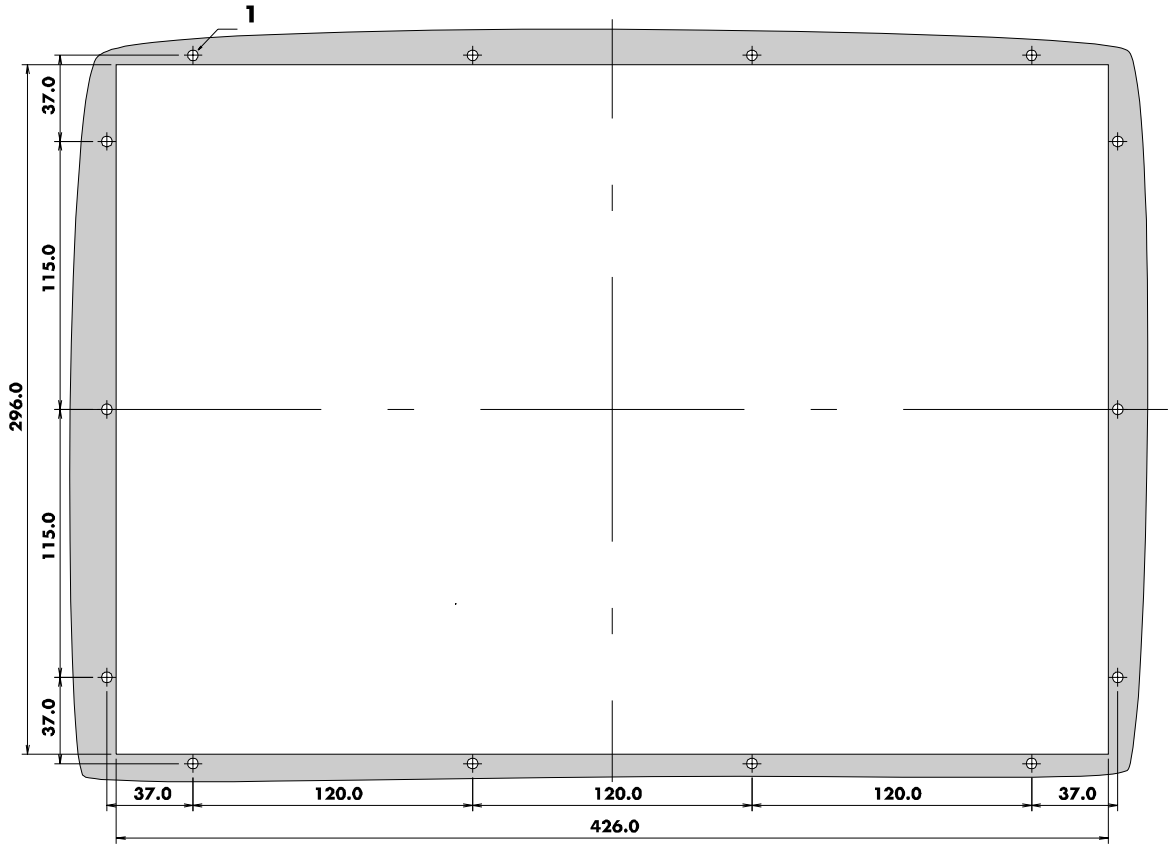
2.4.2 Side View, Mounting Depth



1 Cheese-head screw M4 x 12 DIN7984
2 O-Ring 4.0 x 0.6 N70B
3 BT35 Front Panel
4 Circumferential Sealing
5 Mounting Surface Thickness 1 to 10 mm
6 B4 DIN127 Spring Lock Washer Form B
7 M4 DIN934 Nut

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2.4.3 Panel Cutout



1 14 holes with a diameter of 4.5 mm, alternatively 14 threaded holes M4

2.5 Pin Assignments

The **BT35** operating terminal is fitted with the following interfaces as standard:

Connector X1	Supply Voltage
Female Connector X2	TTY / 20 mA
Female Connector X3	RS232c / V.24

Instead of the standard interfaces the **BT35** can come with the interfaces shown below:

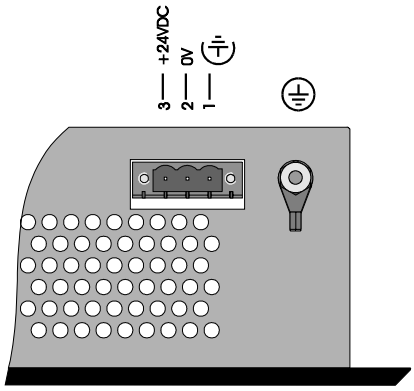
InterBus
Profibus-DP
SUCOnet K

The interfaces are galvanical insulatel against the electronic circuitry inside and against each other.

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2.5.1 Pin Assignment X1 Supply Voltage

The supply voltage is supplied via connector X1.



Pin assignment X1

Pin 1	Signal ground
Pin 2	0 V
Pin 3	24 VDC

Separate earthing screw

The supply voltage is connected via a plug-in 3-pin female connector strip. The cable is secured in the female connector strip by means of screw terminals. Cables with fine wires with a cross-section of up to 2.5mm^2 can be used. The female connector strip is secured in position by means of a screw-type locking.
The female connector strip of the type **Phönix COMBICON MSTB 2.5/3-STF** is supplied.

Please follow the safety references coming with the mounting instructions.

Please note with respect to pin assignment:
If shielded connecting cables are used for the supply voltage, the shield should be connected to the ground screw.
Any protective conductors in the cable must be connected with pin 1.
A separate ground conductor must be provided for the ground screw in each case. The minimum cross-section of the ground conductor must be 1.5 mm^2. Compliance with this information increases the operational safety.

2.5.2 Pin Assignment X2 TTY / 20 mA Current Loop

TTY / 20 mA current loop passive

Pin	Designation	Function
1	Shield	ESD Shield
2	T+	Transmitted Data, Positive Polarity
4	R+	Received Data, Positive Polarity
6	T-	Transmitted Data, Negative Polarity
8	R-	Received Data, Negative Polarity

The shield must be connected to the metal housing of the connector!

TTY / 20 mA current loop active

Pin	Designation	Function
1	Shield	ESD Shield
2	T+	Transmitted Data, Positive Polarity
3	S1+	Power Source 1, Positive Polarity
4	R+	Received Data, Positive Polarity
5	S2+	Power Source 2, Positive Polarity
6	T-	Transmitted Data, Negative Polarity
7	S1-	Current Sink 1, Negative Polarity
8	R-	Received Data, Negative Polarity
9	S2-	Current Sink 2, Negative Polarity

The shield must be connected to the metal housing of the connector!

Depending on the wiring, it is possible to connect the interface (CL2) as either an active or passive current loop. The transmit line as well as the receive line are each provided with separate 20 mA power sources. The compliance voltage amounts to approximately 24 VDC.
The maximum baud rate is 19200 Bd. The maximum cable length varies with the baud rate and the rate of transmission errors.

For longer cable lengths, the power supply of 20 mA should be fed by the transmitting unit. This can decrease crosstalk considerably.
In idle state (signal logic 1) a current of 20 mA can be measured in the cable.

Signal logic 1 - Current flow 20 mA
Signal logic 0 - Current flow is interrupted

For current loop connections, a shielded cable with twisted pairs (Cable type LiYCY-TP) and a minimum cross-section of 0.08 mm² is used. A maximum cable length of 100 m is permitted.



The shield of the cable must be connected to the metal housing of the connector!

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2.5.3 Pin Assignment X3 RS232c / V.24

RS232c/V.24 (V_S Interface)

Connector in the operating terminal: 9-pin SubminD female connector strip

The assignment is PC-AT compatible!

Assignment:
(Pins marked "-" are unassigned)

Pin	Ass.	Designation	Function
1	-	*DCD*	*Data Carrier Detect (Data Channel Received)*
2	x	RD	Receive Data
3	x	TD	Transmit Data
4	x	DTR	Data Terminal Ready
5	x	GND	Signal Ground
6	-	*DSR*	*Data Set Ready*
7	x	RTS	Request To Send
8	x	CTS	Clear To Send
9	-	*RI*	*Ring Indicator*

italic - signals are not available

A shielded cable with stranding in layers and with a minimum cross-section of 0.25 mm^2 (cable type LiYCY) must be used. The maximum cable length is 15 m.



Connect the cable shield to the metal hoods of the connectors over as large a surface as possible!

2.5.4 Pin Assignment X2.1 / X2.2 InterBus

The **BT35** operating terminal is fitted with the bus interfaces X2.1/X2.2 for connection to the InterBus. This connection is certified under the number 076. The connectors are of the 9-pin Submin D female and male connector strip type.

Connector in the operating terminal: 9-pin SubminD male connector strip for **Remotebus In**

Assignment:

Pin	Ass.	Designation	Function
1	x	DO	Data Out
2	x	DI	Data In
3	x	GND	Signal Ground
4	-	nc	No internal connection
5	-	nc	No internal connection
6	x	/DO	Data Out reverse
7	x	/DI	Data In reverse
8	-	nc	No internal connection
9	-	nc	No internal connection

Pins marked "-" are unassigned

Connector in the operating terminal: 9-pin SubminD female connector strip for **Remotebus Out**

Assignment:

Pin	Ass.	Designation	Function
1	x	DO	Data Out
2	x	DI	Data In
3	x	GND	Signal Ground
4	-	nc	No internal connection
5	x	+5 V	Power Supply +5 VDC
6	x	/DO	Data Out reverse
7	x	/DI	Data In reverse
8	-	nc	No internal connection
9	x	RBST	Remote Bus Status

Pins marked "-" are unassigned

A shielded cable with twisted pairs (Cable type LiYCY-TP) is used. The maximum cable length depends on the usage within the InterBus topology.

/000-8245/ Technical details are subject to change
BT35x/xxx031.30000QK0

2.5.5 Pin Assignment X2.1/X2.2 SUCOnet K

In place of the TTY/20 mA interface, the **BT35** operating terminal can be fitted with the special interfaces for SUCOnet-K connections. 9-pin SubminD female and male connector strips are used as connectors. The assignment is identical in both cases.

➔ Always activate the **termination** of the physically first station (master) and last station in the network. The termination of the stations located in between remains deactivated. To activate the termination, the termination switch RD/TD must be placed to ON.

Connector on the operating terminal: 9-pin SubminD female and male connector strip

Pin Assignment:

Pin	Ass.	Designation	Function
1	-	nc	unassigned
2	-	nc	unassigned
3	x	TA/RA	Transmit / Receive Channel A
4	x	GND	Signal Ground
5	-	nc	unassigned
6	-	nc	unassigned
7	x	TB/RB	Transmit / Receive Channel B
8	x	GND	Signal Ground
9	-	nc	unassigned

Pins marked - are not assigned.

A shielded cable with twisted pair wires (cable type LiYCY-TP) must be used. The maximum cable length depends on the data transmission rate. For a transmission rate of 187.5 kbps, a maximum cable length of 600 m and for a transmission rate of 375 kpbs a cable length of 300 m should not be exceeded. If longer cable lengths are required, repeaters must be used for signal conditioning. Automatic repeaters can be used for this purpose.

2.5.6 Pin Assignment X2.1 Profibus DP

In place of the interfaces TTY/20 mA and RS422/RS485, the **BT35** operating terminal can be fitted with the special interface for Profibus-DP connection. A 9-pin SubminD female connector strip is used as a connector.

Connector on the operating terminal: 9-pin SubminD male connector strip

Assignment:

Pin	Ass.	Designation	Function
1	-	nc	unassigned
2	-	nc	unassigned
3	x	TB/RB	Transmit / Receive Data Plus
4	x	RTS	Request to Send
5	x	GND	Signal Ground
6	x	+5 V	Power Supply +5 VDC
7	x	nc	unassigned
8	x	TA/RA	Transmit / Receive Data Minus
9	-	nc	unassigned

Pins marked - are unassigned.

Principally, all cable types specified in EN 50170 as cable type A can be used.
This allows the following cable lengths (depending on the baud rate):

Baud Rate (bps)	Cable Length (m)
9 600	1200
19 200	1200
93 750	1200
187 500	1000
500 000	400
1 500 000	200
12 000 000	100

2.6 Shield

The shield must be connected to the metal hoods of the connector housings at both ends and over as large a surface as possible. It should be noted that a potential equalization line with a minimum cross-section equal to 10 times that of the shield may be necessary as a result of the grounding on both sides.

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2.7 Display

The display in the **BT35** operating terminal consists of
- a high-resolution, color, backlit TFT module or
- a high-resolution, monochrome, backlit STN module.

Both displays feature a resolution of 640 x 480 pixels (VGA) and are capable of simultaneously displaying up to 2000 characters with a matrix of 8 x 12 dots. The format allows 40 lines with 80 characters each to be displayed. The operating terminal has an optimum viewing angle of approximately 90°.
The default contrast can be adjusted at operating time by means of a system variable.

The displays are capable of displaying an extended ASCII character set (semigraphics). In addition, the character attributes inverse, flashing, zoom and underlined are available. These options offer a variety of possibilities in representing text and variables.

Overview of the Displays of the **BT35**:

Monochrome:

Type:	STN module, 640 x 480 dots, 16 gray scales, with full graphics capabilities, CFL-backlit
Lines:	40
Characters/Line:	80
Background Color:	white
Visible Front Cutout:	162 mm x 215 mm

Color:

Type:	TFT module, 640 x 480 dots, 256 colors, with full graphics capabilities, CFL-backlit
Lines:	40
Characters/Line:	80
Background Color:	white
Visible Front Cutout:	162 mm x 215 mm



If the display is damaged, do not swallow or breathe in the liquids or gases being emitted and avoid direct contact with skin.
Danger of Poisoning! Could Result in Burns!

2.7.1 Display Contrast Setting

The brightness and contrast of the display can be adjusted at operating time. This requires the system variable **LCDContrast** to be set up in an I/O-mask. The value can then be modified using any editor that enables the operator to input integer numbers. The upper and lower limits for the input must be set to the following values:

Upper limit: -40
Lower limit: +75

If this variable is not defined in the menus or the value is out of the valid range of values, a default setting (value 25) will be loaded when the system is initialized.
In the transparent-mode the system variable is placed in the setup-mask!
In the standard-mode the system variable can be placed in any I/O-mask!

2.7.2 Default Contrast Setting

If the contrast setting of the display should be such that the masks are no longer legible, the default contrast setting can be restored using the mode selector switch S4.

Position of switch to restore the contrast:

S1	ON
S2	OFF
S3	OFF
S4	ON

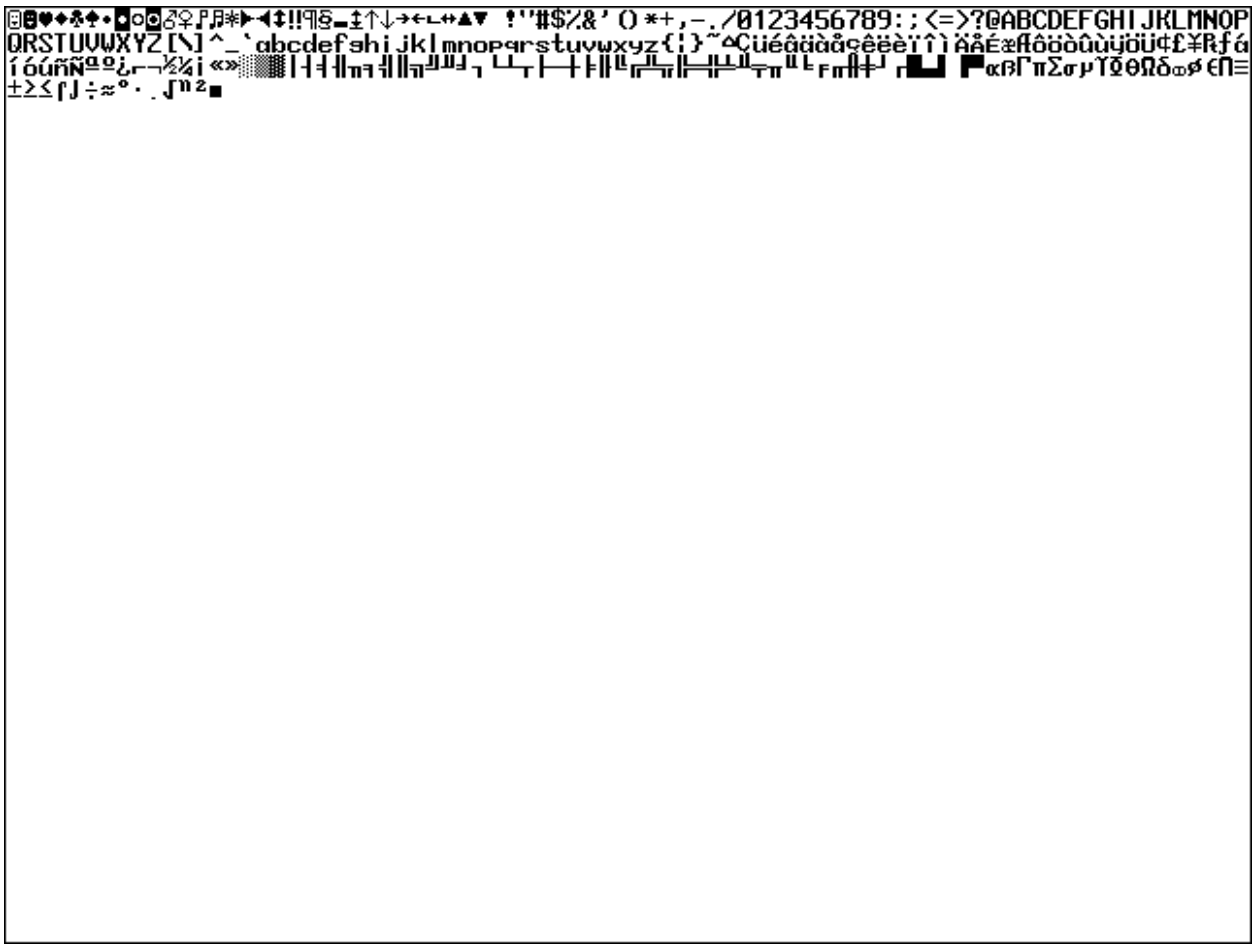
Should this switch position coincide with “activating download by hardware”, the contrast is reset before the warning is displayed. The warning will be displayed in a legible manner. Upon display of this warning, switch off the terminal, set the switch 4 to the off-position and switch the terminal on again.

2.7.3 Character Attributes

By preselecting an attribute, any characters can be displayed as follows:
- normal, using one of the 16 grayscales / 256 colors
- flashing
- inverse
- underlined
- in any combination

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2.7.3.1 Font Normal



2.7.3.2 Font Zoom



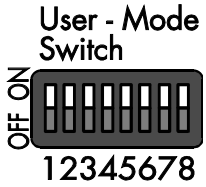
/000-8245/ Technical details are subject to change
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2.7.4 ASCII Character Set Table

000		032		064	@	096	`	128	Ç	160	á	192	└	224	α
001	☺	033	!	065	A	097	a	129	ü	161	í	193	┴	225	β
002	☻	034	"	066	B	098	b	130	é	162	ó	194	┬	226	Γ
003	♥	035	#	067	C	099	c	131	â	163	ú	195	├	227	π
004	♦	036	$	068	D	100	d	132	ä	164	ñ	196	─	228	Σ
005	♣	037	%	069	E	101	e	133	à	165	Ñ	197	┼	229	σ
006	♠	038	&	070	F	102	f	134	å	166	ª	198	╞	230	µ
007	•	039	'	071	G	103	g	135	ç	167	º	199	╟	231	τ
008	◘	040	(	072	H	104	h	136	ê	168	¿	200	╚	232	Φ
009	○	041	)	073	I	105	i	137	ë	169	⌐	201	╔	233	Θ
010	◙	042	*	074	J	106	j	138	è	170	¬	202	╩	234	Ω
011	♂	043	+	075	K	107	k	139	ï	171	½	203	╦	235	δ
012	♀	044	,	076	L	108	l	140	î	172	¼	204	╠	236	∞
013	♪	045	-	077	M	109	m	141	ì	173	¡	205	═	237	ø
014	♫	046	.	078	N	110	n	142	Ä	174	«	206	╬	238	∈
015	☼	047	/	079	O	111	o	143	Å	175	»	207	╧	239	∩
016	►	048	0	080	P	112	p	144	É	176	░	208	╨	240	≡
017	◄	049	1	081	Q	113	q	145	æ	177	▒	209	╤	241	±
018	↕	050	2	082	R	114	r	146	Æ	178	▓	210	╥	242	≥
019	‼	051	3	083	S	115	s	147	ô	179	│	211	╙	243	≤
020	¶	052	4	084	T	116	t	148	ö	180	┤	212	╘	244	⌠
021	§	053	5	085	U	117	u	149	ò	181	╡	213	╒	245	⌡
022	▬	054	6	086	V	118	v	150	û	182	╢	214	╓	246	÷
023	↨	055	7	087	W	119	w	151	ù	183	╖	215	╫	247	≈
024	↑	056	8	088	X	120	x	152	ÿ	184	╕	216	╪	248	°
025	↓	057	9	089	Y	121	y	153	Ö	185	╣	217	┘	249	∙
026	→	058	:	090	Z	122	z	154	Ü	186	║	218	┌	250	·
027	←	059	;	091	[	123	{	155	¢	187	╗	219	█	251	√
028	∟	060	<	092	\	124	¦	156	£	188	╝	220	▄	252	ⁿ
029	↔	061	=	093	]	125	}	157	¥	189	╜	221	▌	253	²
030	▲	062	>	094	^	126	~	158	₧	190	╛	222	▐	254	
031	▼	063	?	095	_	127	⌂	159	ƒ	191	┐	223	▀	255	

2.8 User-Mode Switch

The user-mode switch is placed under the hinged cover at the rear side of the **BT35**. The switch levers can be accessed by using a pen or a small screwdriver.



Switch	ON	OFF
S1	**Standard-Mode**	(inactive)
S2	unassigned	**unassigned**
S3	Demo (without PLC)	**Communication with the PLC**
S4	Unconditional Erase Flash	**Maintain Flash Data**
S5	unassigned	**unassigned**
S6	unassigned	**unassigned**
S7	unassigned	**unassigned**
S8	unassigned	**unassigned**

The switches S2, S5 to S8 can be used by the user as needed. The switch positions are passed to the controller at initialization.

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2.9 Battery

A built-in lithium battery buffers the data in the message memory and also supplies the real-time clock with power. The capacity of the battery is continuously monitored to prevent any loss of data. The following type of battery should be used:

Varta CR AA

This battery type has a capacity of 2 Ah which should provide a minimum life of 5 years, even under unfavorable operating conditions, over the full temperature range.
A system message in plain text is generated whenever the battery capacity falls below a threshold value. In that event, the battery can be replaced by the operator by opening the hinged cover.

The battery must be replaced with an original VARTA CR AA (2Ah) lithium battery.

ENSURE THAT THE POLARITY IS CORRECT WHEN INSTALLING THE BATTERY!!!

To prevent loss of the message data and time setting, the battery must be replaced while the operating voltage is connected.



Do not put lithium batteries in fire or heat them above 100° C and do not recharge them. **Danger of Explosion!**



Do not open lithium batteries. **Danger of Poisoning!**



Hazardous voltages can exist inside electrical installations that can pose a danger to humans. Coming in contact with live parts may result in **electric shock!**



Electrostatic discharges can damage electronic components! ESD protective measures must be observed!

Changing the battery may only be performed by qualified and authorized personnel! When changing the battery, observe safety notices in the mounting instructions!

2.10 Fuse

To prevent damage, the operating terminal is equipped with a 2AmT miniature fuse. A spare fuse is provided inside the hinged cover.



Hazardous voltages can exist inside electrical installations that can pose a danger to humans. Coming in contact with live parts may result in **electric shock!**



Electrostatic discharges can damage electronic components! ESD protective measures must be observed!

Changing the fuse may only be performed by qualified and authorized personnel! When changing the fuse, observe safety notices in the mounting instructions!

2.11 Application Memory

The **BT35** with monochrome displays are supplied with 2.64 MByte flash memories and the BT35 with color displays with 4.64 MByte flash menmories as application memories. This memory area is available to store the user description, the loadable protocol driver, the fonts and the recipe data. The advantage of the flash memory is that programming and deleting processes can be carried out directly in the terminal.



Hazardous voltages can exist inside electrical installations that can pose a danger to humans. Coming in contact with live parts may result in **electric shock!**



Electrostatic discharges can damage electronic components! ESD protective measures must be observed!

Changing the memory devices may only be performed by qualified and authorized personnel!

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3 Technical Data

Keyboard	66 Keys, Partially with Membrane Keyboard, Partially with Short-Stroke Keyboard, divided into: 7 Control Keys 20 Function Keys with LED and Identification Strips 20 Soft Keys 2 Special Keys without LEDs 4 Special Keys with LEDs 13 Editing Keys
Display Monochrome	Full Graphics Capabilities, Backlit STN Display, 40 Lines with 80 Characters each, Display Area 162 x 215 mm
Display Color	Full Graphics Capabilities, Backlit TFT Display, 40 Lines with 80 Characters each, Display Area 162 x 215 mm
Front Plate	with Glare Suppression for Increased Contrast
Interfaces	Electrically Insulated, Variable Baud Rates and Data Formats 600 to 19200 Bd X2.1 20 mA Current loop passive, galvanical insulated or X2.1 20 mA Current loop active, non floating X2.2 RS422/RS485 galvanical insuated X3 RS232c
Options	InterBus instead of X2.1 and X2.2 Profibus-DP instead of X2.1 and X2.2 SUCOnet K instead of X2.1 and X2.2
Optional Protocols	ABB CS31 ABB T200 AEG KS-Functions AEG Modbus Allen Bradley Bosch BUEP19/BUEP19E DIN-Meßbus Slave, DIN-Meßbus Bus Gateway GE Fanuc SNP IDEC Micro3 Jetter PASE/PCOM5 Klaschka YCOM/C Klöckner Moeller SUCOM 1 (PS306/316) Klöckner Moeller SUCOM 1 (PS4-201) Klöckner Moeller SUCOM 1 (PS416) Klöckner Moeller SUCOnet K Mitsubishi FX Series and A Series

	Siemens S7-PPI Siemens S7-HMI Siemens Sinec L1 Master Connection Siemens 3964R/RK512 Siemens PG (AS511) (Further protocols on request)
Central Unit	386EX, 25MHz, Watchdog-Timer, Real-Time Clock, Programmable Interface Parameters, Temperature Compensation of the Display, Adjustment of Brightness, Battery Monitoring, Mode Selector Switch
Memory	2.64 MByte Flash Memory as Application Memory for operating terminals with monochrome display 4.64 MByte Flash Memory as Application Memory for operating terminals with monochrome display 256 kByte stat. CMOS-RAM, Battery-Backed
Connection System	Plug-in Type, via SubminD Female Connector and Male Connector Strips
Supply Voltage	24 V Direct Voltage, Residual Ripple Max. 10% Minimum Voltage 19.2 V Maximum Voltage 30.2 V Typ. Power Consumption 0.8 A Peak Current (10 ms) 3.0 A
Connected Load	~25 W
Noise Immunity	EC Electromagnetic Compatibility Directive 89/336/EEC EN 55011 Limit Class A* EN 50081-1 Table A1 EN 50082-2 EN61000-4-2 EN61000-4-4 EN61000-4-5 DIN VDE 0843-3 DIN VDE 0843-6

*Warning: This is a class A product. In residential areas there may be radio disturbance. Appropriate protective measures must be taken by the operator.

Environmental Test Procedure	DIN40040	Operation	Storage
	Code Letter - Temperature	KW	HU
	Code Letter - Humidity	F	F

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Degrees of Protection	DIN 40050 Mechanical Degrees of Protection Front: IP65 Rear: IP20
Front Panel	Aluminium anodized, circumferential rubber seal at rear of front panel 450.0 x 320.0 x 4.0 mm
Panel Cutout	426 x 296 mm
Mounting Depth	65 mm without connector (approximately 100 mm with connector)
Enclosure	Zinc-Coated Steel Plate
Total Weight	3760 g

4 Declaration of Conformity

EG - Konformitätserklärung

Dokument - Nr./
Monat. Jahr : CE-BT35C.000_1.2/05.1997

Hersteller : SÜTRON ELECTRONIC GMBH

Anschrift : SÜTRON ELECTRONIC GMBH
Kurze Straße 29
D-70794 Filderstadt (Bonlanden)

Telefon 0711/77098-0
Telefax 0711/77098-60

Teilenummer : 81063.000
Produktbezeichnung : Tesimod - Bedienterminal BT35 Color F03 S

Hiermit wird bestätigt , daß das bezeichnete Produkt den wesentlichen Schutzanforderungen folgender Europäischen Richtlinie entspricht :

Nummer 89 / 336 / EWG

Text Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedsstaaten über die elektromagnetische Verträglichkeit , geändert durch RL 91 / 31 / EWG , geändert durch RL 93 / 68 / EWG , geändert durch Neufassung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten vom 30.08.1995.
Weitere Angaben über die Einhaltung dieser Richtlinien enthält der Anhang .

Anbringung der CE - Kennzeichnung[1]) : -

Aussteller : SÜTRON ELECTRONIC GMBH

Ort , Datum : Filderstadt , 20.05.1997

Rechtsverbindliche Unterschrift :
Angaben zum Unterzeichner : Siegfried Buck , Geschäftsführer

Die Anhänge sind Bestandteil dieser Erklärung .
Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien , beinhaltet jedoch keine Zusicherung von Eigenschaften .
Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten .

1) Nur nach der Niederspannungsrichtlinie

Seite 1

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Anhang
zur EG - Konformitätserklärung
oder EG - Herstellererklärung

Dokument - Nr./
Monat. Jahr : CE-BT35C.000_1.2/05.1997

Teilenummer : 81063.000
Produktbezeichnung : Tesimod - Bedienterminal BT35 Color F03 S

Zur Beurteilung des Erzeugnisses wurden folgende Normen herangezogen .

Harmonisierte Europäische Normen :

Referenznummer	Ausgabedatum	Referenznummer	Ausgabedatum
EN 55011	03.1991	EN 50081-1 Tabelle A 1	01.1992
EN 50082-2	03.1995	EN 61000-4-2	1995
EN 61000-4-4	1995	EN 61000-4-5	1995
EN 61000-4-6	08.1996	EN 55022	05.1995
EN 61000-4-3	02.1995	.....	.....
.....	.....	.....	.....

Nationale Normen (nach NSR oder nach MSR Art. 5 Abs. 1 Satz 2) :

Referenznummer	Ausgabedatum	Referenznummer	Ausgabedatum
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

IEC - Standards (nur NSR) :

Referenznummer	Ausgabedatum	Referenznummer	Ausgabedatum
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

Prüfbericht : 76027-1-BCD

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D-70794 Filderstadt (Bonlanden)

Telefon 0711/77098-0
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Geschäftsführer:
Siegfried Buck Karl Mohn
Manfred Süssmilch

Amtsgericht Nürtingen
HRB - Nr. 981

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