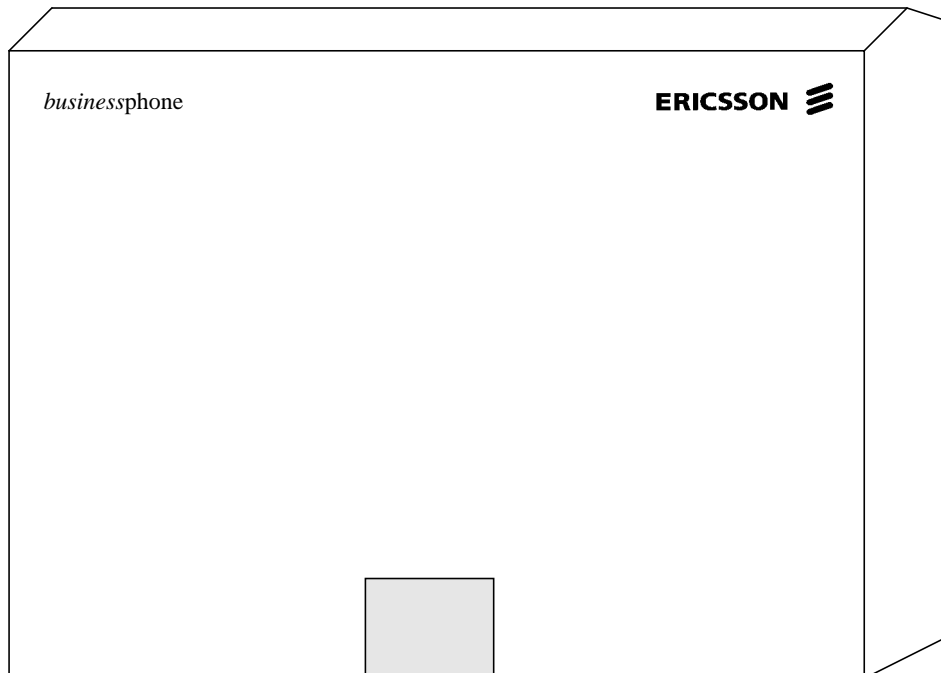


Prepared SEA/EBMP Stangelberger	Subject responsible SEA/EBAX/F	Documentnumber 1531-BDV BS 101 01 Uen		
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INSTALLATION INSTRUCTION
EXCHANGE CABINET
BDV BS 101 01



Prepared	Subject responsible	Documentnumber 1531-BDV BS 101 01 Uen	
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1 GENERAL

Exchange cabinet BDV BS 101 01 is designed to be furnished with Printed Board Assemblies (hereafter = boards or PBAs) belonging to ERICSSON's PBX-system ASB 150 02. System functions, desired by the customer, are realised with appropriate boards and system programming.

The PBX is powered by an internally mounted power supply that is available in two versions. The standard version is an AC/DC converter and the version with battery charger offers the same facility but additionally provides battery back-up or can be supplied from an external DC-source.

The installed PBX shall be made operational in accordance with the stipulations that apply for system ASB 150 02. See document [START OF OPERATION \(1537-ASB 150 02\)](#).

NOTE: Boards **may only** be inserted or removed from the cabinet when the power supply in the cabinet is switched off.

The new cabinet is adapted for boards with brackets containing screws to provide a ground connection and should only be equipped with these boards. These screws must always be fastened to ensure proper operation.

Don't use older board revision states in the new cabinet.

In principle, a cabinet's board position can be used for arbitrary furnishing with boards belonging to PBX system ASB 150 02 but the first position is reserved for the CPU-D_.

Due to the limited load of the cabinet's power supply units, the definitive board configuration in a cabinet must follow the prerequisites in [section 6.3](#).

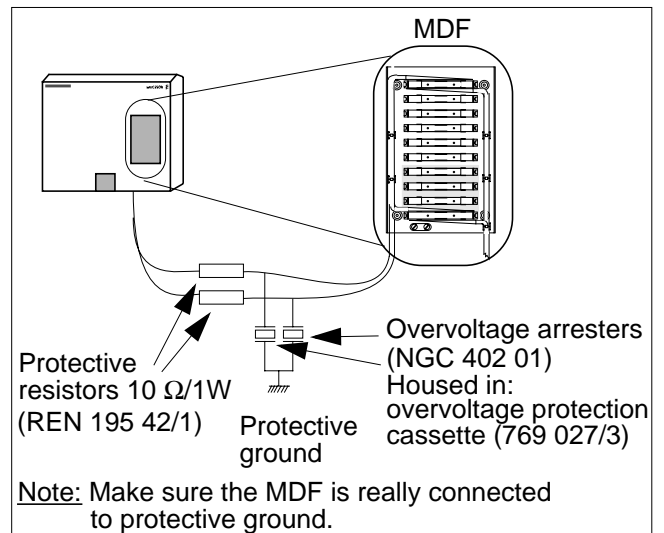
However, it is advisable to protect trunk lines with extra overvoltage protectors especially in geographical areas highly exposed to lightning.

Any lines connected to the PBX that are subjected to excess voltage (transients) in conjunction with e.g. lightning discharges must be equipped with excess voltage protection.

Special considerations must be taken to analogue extension lines that are placed outdoors. In order to prevent the analogue extension boards secondary protection device from blowing in case of lightning.

Each branch on the extension line must have:

- 1 A protective resistor of 10 Ω/1W (REN 195 42/1) connected in series between cabinet and MDF
- 2 An overvoltage arrester (gas discharge tube) for quenching surges to protective ground should be installed on the network side of the protective resistor.



Principal circuit drawing.

1.1 Supplementary documents

- Document collection EN/LZB 103 1233
- [INSTALLATION INSTRUCTION \(1531-BML BS 101 01\)](#) for the power supply, equipped with battery charger

1.2 Tools

In addition to customary installation tools, the following are recommended:

- Use the appropriate connection tool 769 027/2 to connect the cables in the internal MDF.
- Use the appropriate slotting tool LSY 138 252 to connect the cables to the external MDF SXK 106 4139/1.
- Board extractor for PBAs (handle LTD 117 02 and bottom LTD 117 12)

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2**DECLARATION OF CONFORMITY**

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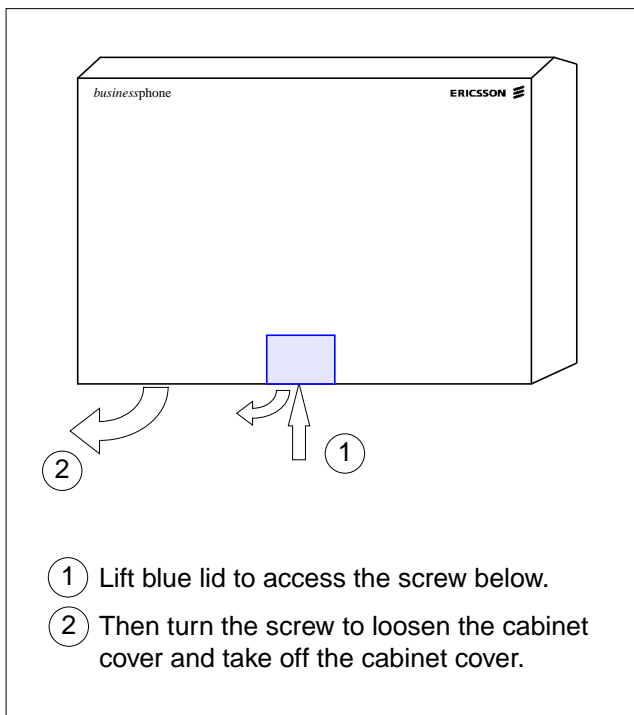
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3 HOW TO OPEN THE CABINET

Unpack the exchange cabinet.

Using a screw driver lift the blue lid. Unscrew the screw below and remove the cabinets front cover. Check that everything has been received according to the delivery note and that nothing has been damaged during the transport.



4 INSTALLATION

The PBX can be delivered as a customer configured unit or the add-in boards are delivered separately. The cabinet is always equipped with a power supply, suitable for the local mains. Please check the label stating the permitted mains voltage. The cabinet is to be mounted on an indoor wall. A mains outlet must be provided near the equipment and shall be easily accessible. The premises shall comply with the following prerequisites:

- The air shall be free from dust and smoke
- Environmental conditions according to ETS 300 019 (1-4) (Temperature shall be between + 5 °C and +40 °C and relative humidity may vary between 15% and 80%)
- The PBX shall not be exposed to direct sunlight
- The cable shall preferably run into the PBX from below the cabinet to ensure sufficient air flow.

4.1 Mounting of the cabinet

Use the enclosed drilling plan and drill four 8 mm holes. Mount the cabinet by using the enclosed screws and plugs. Take into consideration the normal working height above the floor (about 1.30 m to the lower edge of the cabinet) and leave enough room for access on both sides of the cabinet.

Overall dimensions of the cabinet:

- 485 x 600 x 134 (H x W x D in mm).

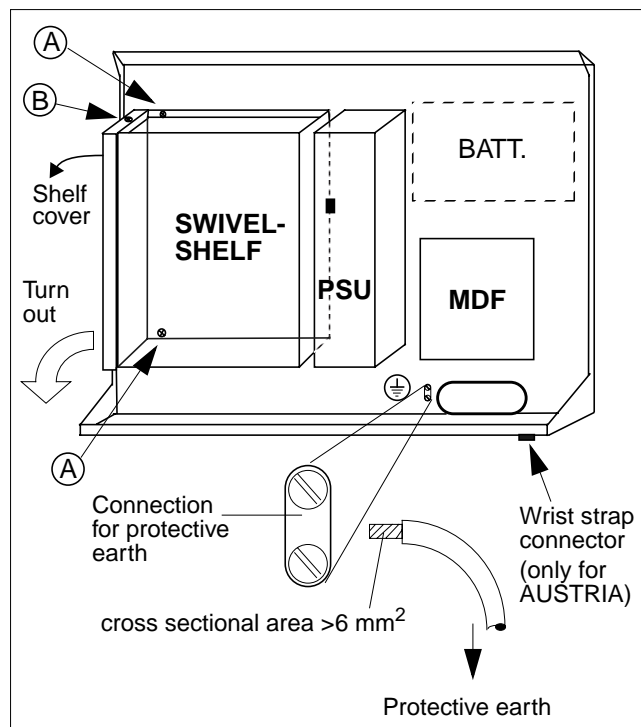
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4.2 Safety and EMC

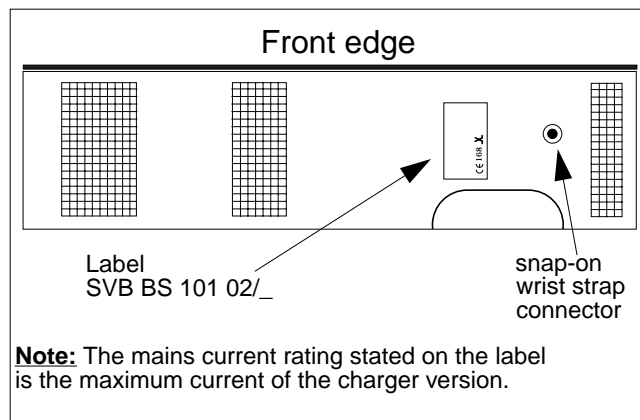
To fulfil electrical safety requirements IEC 950 and EN 60950 respectively EN 41003, the exchange must be connected to protective earth via a flexible wire with a cross sectional area of at least 6 mm².

Local requirements shall be adhered to.

The connection must be carried out by authorised personnel.



Before operating, ensure that the chassis is connected to a hard wired protective earth.



Bottom view of cabinet BDV BS 101 01

All line interfaces in the PBX are protected in accordance with K.21 (voltage transients up to 1.5 kV).

BTU-A, BTU-A2, BTU-B, BTU-C, BTU-D and BTU-E are working with interface TNV.

All other boards and the V.24 port work with interface SELV.

4.2.1 EMC

The ferrites, with the ERICSSON ordering number STF 82 601, should be situated close to the slot where the cables are led out of the cabinet. Two turns through the ferrite core are sufficient to comply with EN 55022 Class B and to avoid disturbances in non-industrial, residential (home) usage.

4.3 Access to the boards

NOTE: Make sure that a sound ground connection to the exchange has been established. Otherwise this can be hazardous in case of lightning. Use a grounding wrist strap when handling PBAs sensitive to electrostatic discharges.



Turn out the transport screws (A) about 1 cm at the top and bottom of the swivel shelf. See figure in [section 4.2](#). Hold the bottom of the shelf, lift the shelf slightly and turn the swivel shelf counter clockwise (ccw). Turn the screw (B) two turns at the top of the shelf cover and remove the cover.

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5 POWER SUPPLY UNIT

The power supply units (PSU) for the cabinet are AC/DC switching power supplies with two input voltage ranges. Please check if the label states the proper mains voltage as required. For mains supplies with 230V to 250V AC, two versions are available:

- **BML BS 101 02/1** (PSU 230V standard)
- **BML BS 101 01/1** (PSU 230V equipped with battery charger).

For mains supplies with 115V to 127V AC two versions are available:

- **BML BS 101 02/2** (PSU 115V standard)
- **BML BS 101 01/2** (PSU 115V equipped with battery charger).

The PSUs deliver 25 W on the PBA supply voltages and 80 W on the 48 V supply voltage. After switching on, the power supply has a start-up delay of 8 seconds.

Warning: The power switch does not disconnect from mains. The mains cord must be unplugged to disconnect the mains.

The PSU is equipped with a mains fuse rated

250VAC 6,3 A T.

NOTE: This fuse NGH 243 01/6300 can be ordered from Ericsson but is a non-accessible and non-user serviceable part. **Only authorised personnel is allowed to change the fuse.** Contact the local supplier in this matter.

Battery backup time

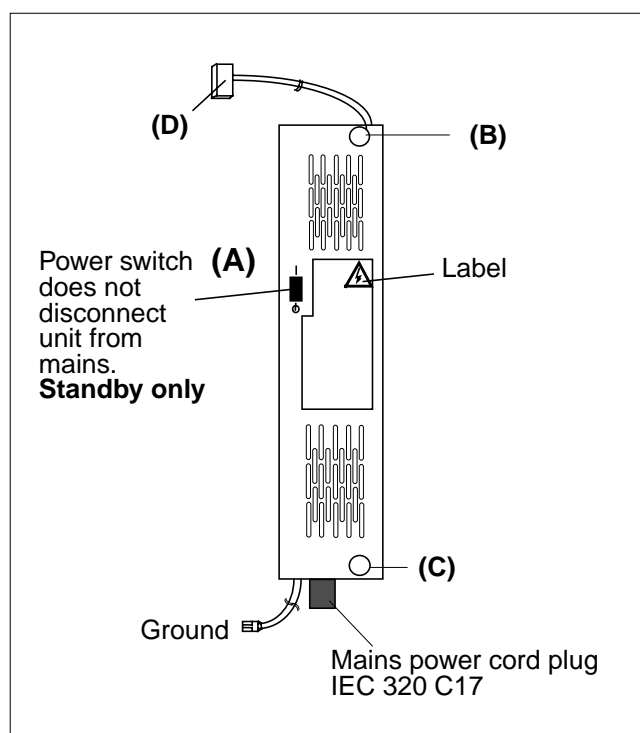
The batteries in the integrated battery pack have a capacity of 2Ah. The power consumption on the 48 V should be less than 1.7A. Using fresh batteries a backup time of 20 minutes is guaranteed and depending on the system configuration longer backup times could be achieved.

5.1 Replacement of the power supply unit

The cabinet is delivered with a PSU already installed. The procedure how to dismount the unit is described below.

- Switch off the PSU (A) and unplug the mains from the wall outlet. If the unit is a PSU with battery charger, disconnect the DC supply line to the batteries and plug off the alarm connector on the unit.
- Disconnect the DC supply cord (D) to the swivel shelf.
- Unscrew the transport screw (B) completely and make 3 turns on screw (C) counter clock wise.
- Push the PSU from the bottom and turn out the PSU clock wise, un hinge and take it out. Then pull off the mains plug at the bottom of the PSU and disconnect the ground wire.
- Install the PSU in the reverse manner.

When installing a power supply unit with battery charger and battery backup please refer to the [INSTALLATION INSTRUCTION \(1531-BML BS 101 01\)](#).



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5.2 Power feeding with an external DC supply

When the PBX is supplied with power by an external battery with 48V nom. (44 - 56V), the installation of a power supply equipped with a battery charger (BML BS 101 01/_) is required. The DC supply is connected directly to the PSU.

An externally accessible fuse 250VAC 6,3 A T is provided on the PSU, but additionally a fuse must be installed in the supply line with DC current switching capability greater than 160 A.

Note: To prevent arcing never connect the DC source when the PSU has not started-up.

Use the mains to power up or use an external switch to connect the DC source. This is a precaution to minimise the contact loads on the plug.

For further details see [INSTALLATION INSTRUCTION \(1531-BML BS 101 01\)](#).

Battery operation often requires different preconditions consequently, only an overview can be provided with regard to battery capacity/charging capacity. The batteries should be supplied locally. The type is described in detail in [INSTALLATION INSTRUCTION \(1531-BML BS 101 01\)](#).

6 ALLOCATION

In principle, all board positions in cabinet BDV BS 101 01 can be used for arbitrary configurations with PBAs belonging to PBX-system ASB 150 02.

The boards are equipped with ground brackets on the top and bottom. When installing make sure to fasten the boards with the supplied screws.

There are recommendations for configurations in order to simplify operation and maintenance. For further information see document collection EN/LZB 103 1233.

Sub-equipped boards:

Install sub-equipped boards in the last position after the standard boards to enable easy upgrading without having to re-number trunks and extensions.

6.1 Power supervision of ELU-A

The board is equipped with an automatic traffic limiter restricting the internal power dissipation on the board to a maximum of 12W. This depends on both the line length and the number of lines busy.

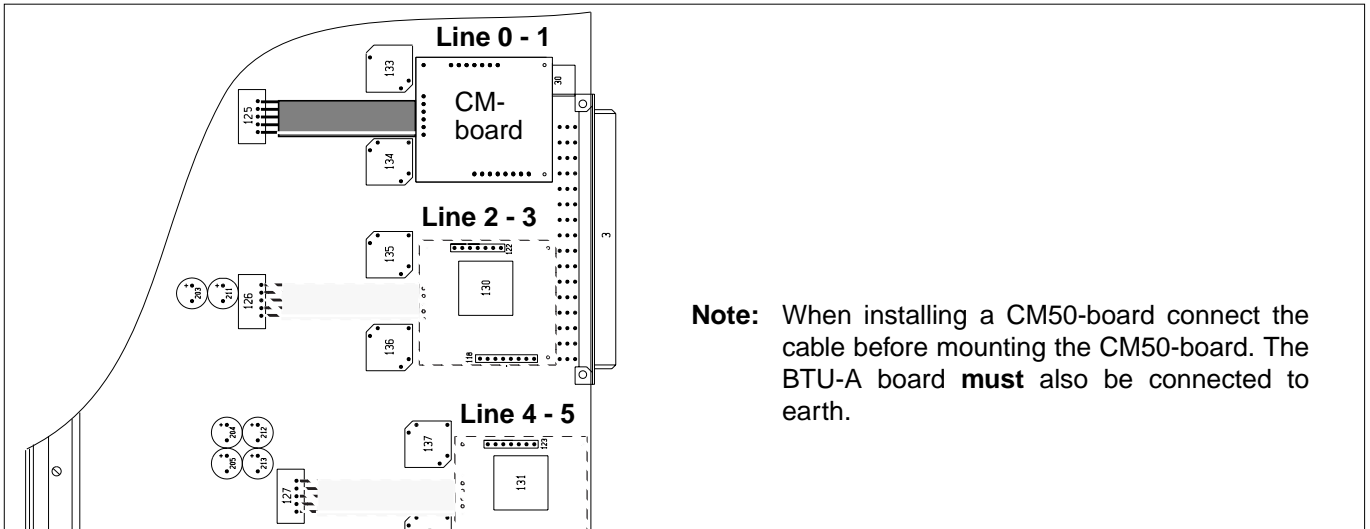
When the power consumption exceeds the limit, no more lines have access for use and at least two lines have to go on hook for all lines to work normally again.

When connecting external voice systems a maximum of 8 lines are recommended on each board. The remaining lines on the board are to be connected to low-traffic extensions.

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6.2 Connection of CM-Boards

Connect the correct type of call metering board, according to the figure below, on BTU-A board ROF 157 5110/_ or ROF 157 5127/_ and in the same fashion on the BTU-C board ROF 157 5111/_ . The BTU-C cannot be equipped with a CM50 board as the flat ribbon cable cannot be connected and CM12/16 (ROA 219 5135/1).



Note: When installing a CM50-board connect the cable before mounting the CM50-board. The BTU-A board **must** also be connected to earth.

The following boards are available CM50 ROA 219 5064/1, with flat ribbon cable and CM12/16 ROA 219 5135/1 or ROA 219 5062/1 without cable.

6.3 System Power Consumption

The power demand of the system comprises the sum of the current demands of all extensions, base stations etc. This total current has to be delivered by the power supply. Choose the one delivering the rated current with a suitable margin for add on equipment depending on the installation site.

Base Station Power Demand

To minimise the power dissipation on the serial communication wires EPP should be used extensively. Up to 60 BS can be installed in a cabinet. Short power peaks can be covered by installing a battery cabinet.

The total current for all BS must be less than the power supply(s) capacity. The total 48 VDC load on the power supply has to be calculated as follows:

Cable length	STD	EPP	STD	EPP
	0,5 mm Ø		0,6 mm Ø	
0m	104	104	104	104
100m	110	106	108	106
200m	114	110	110	108
300m	121	112	114	109
400m	129	115	118	110
500m		119		112
600m		121		114
700m		125		117
800m		129		118
900m		133		121
1,0km		139		123
1,1km		146		125
1,2km		152		127
1,3km		160		129
1,4km		171		131
1,5km		183		135
1,6km		204		137

This table states the current demand in mA for a Base Station depending on the cable length and cable diameter.

Calculation example:

Line length to Base Station: 200m
 Resistance of loop: 0.18 Ω/m
 Cable diameter (φ): 0,6 mm

Assuming 4 Base Stations are already connected they consume a current of: 440 mA
 Power demand taken from Power Calculations below, for telephones: 984 mA

Total load on power supply: 1424 mA

This total load for the exchange can be supplied by the power supply as it is less than 1.7A.

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Extension Power Demand

TELEPHONES	CURRENT CONSUMPTION Typ (mA) Max (mA)			TELEPHONES	CURRENT CONSUMPTION Typ (mA) Max (mA)		
BASIC	DBC 210	14	35	OPERATOR CONSOLE	DBC 214	40	120
	DBC 199	25	35		DBC 663	67	110
ECONOMY	DBC 601	27	32	DBC 754	75		
	DBC 751	38		DBC 214 with 2 DBY 409 01	35	70	
ECONOMY ^{plus}	DBC 211	14	35	DBC 214 with 4 DBY 409 02*)	35	70	
	DBC 201	30	50	ANALOGUE (in active state)	40		
STANDARD	DBC 212	14	35	TAU 2610	4	4	
	DBC 202	30	50	Desktop Adapter		23	
	DBC 631	65	70	BTU-B (S-interface per physical link)		50	
	DBC 755	50	73	BTU-C index (/1,/2) 1)	(per trunk)	14	35
	DBC 752	50	73	Radio base station: refer to table above			
EXECUTIVE	DBC 213	35	70				
	DBC 203	35	70				
	DBC 662	70	73				
	DBC 753	75					
DBC 213 with 2 DBY 409 01		42	70				
DBC 213 with 4 DBY 409 02*)		35	70				

1) provides current on trunk lines in active state to public exchange.

The maximum values for telephones result when all LEDs are lit and if available, loudspeaking is on at max. volume.

*) with connected external power supply.

Power calculation example

LINE EQUIPMENT	QUANTITY	CURRENT (mA)
DBC 210	3	54
DBC 201	5	150
DBC 202	13	390
DBC 203	10	350
DBC 214	1	40
TOTAL	32	984

Calculation example:

selected line equipment {
 3 x DBC 210
 5 x DBC 201
 13 x DBC 202
 10 x DBC 203
 1 x DBC 663
 Total: 32 system telephones

The calculation above shows how to calculate the current demand for a given installation. This amount of current has to be supplied by the installed power supply.

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6.4 BTU-A (ROF 157 5110/-) and BTU-A2 (ROF 157 5120/_)

On delivery from the factory both contacts are in the **OFF** position, and the line is a normal trunk.

When both contacts on a DIP-switch are set to position **ON**, the line is to be regarded as a music source input.

Different contact positions are not allowed.

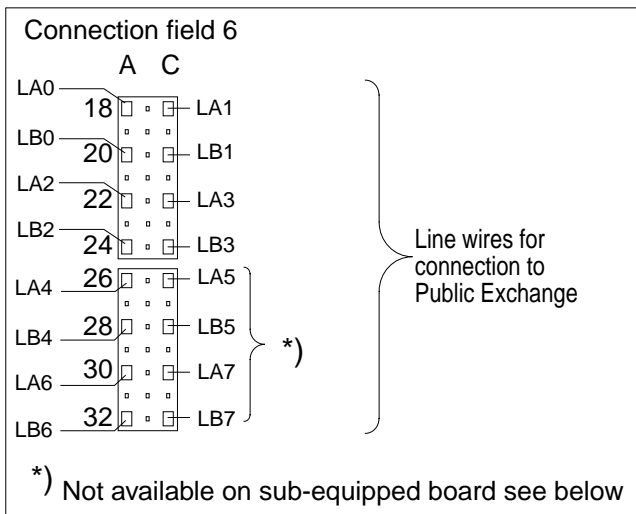
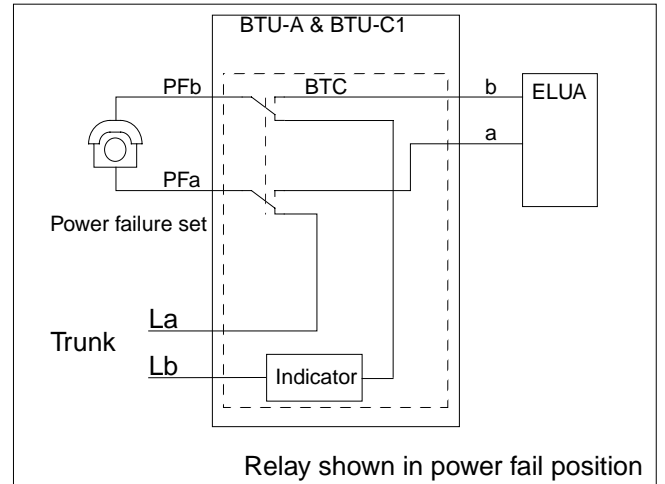
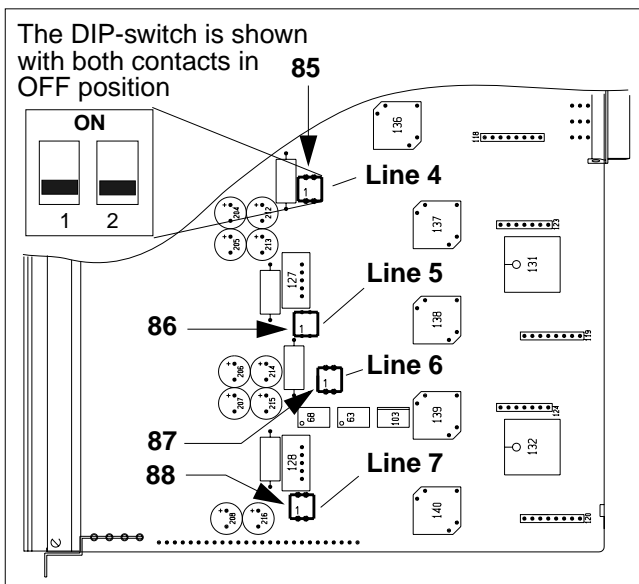
Note: Only lines 4 - 7 can be used as a music source input. Not available on BTU-A subequipped ROF 157 5127/_.

6.5 Power failure circuit (PFC)

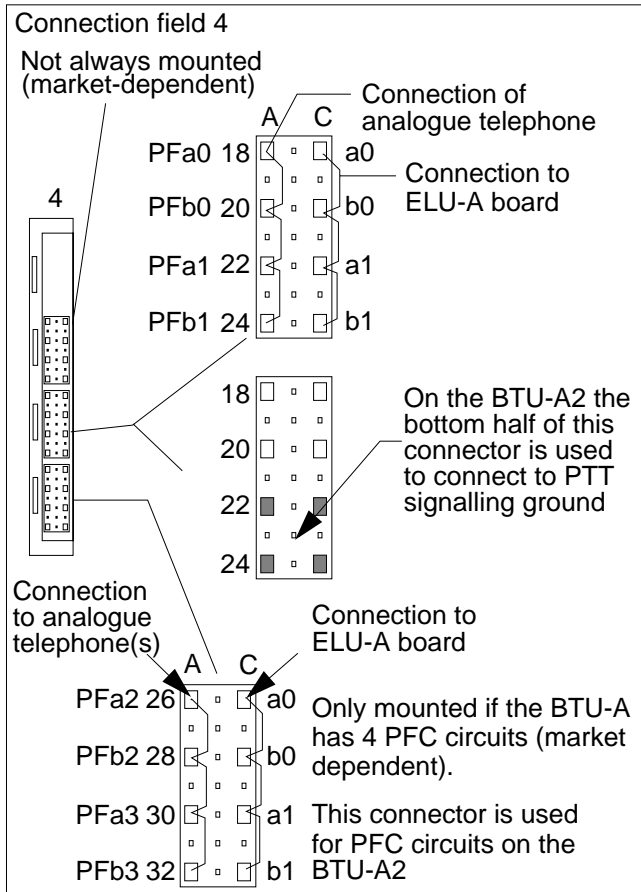
In the event of mains failure and if no battery back up is available for the PBX, there are normally 2 lines on the BTU-A and BTU-C (see under BTU-C on next page) board which automatically switch the trunk lines to analogue telephones connected to this board.

On power failure, these telephones will automatically be connected to the public exchange.

It is also possible to use the power failure telephones during normal operation, if an ELU-A board is installed.



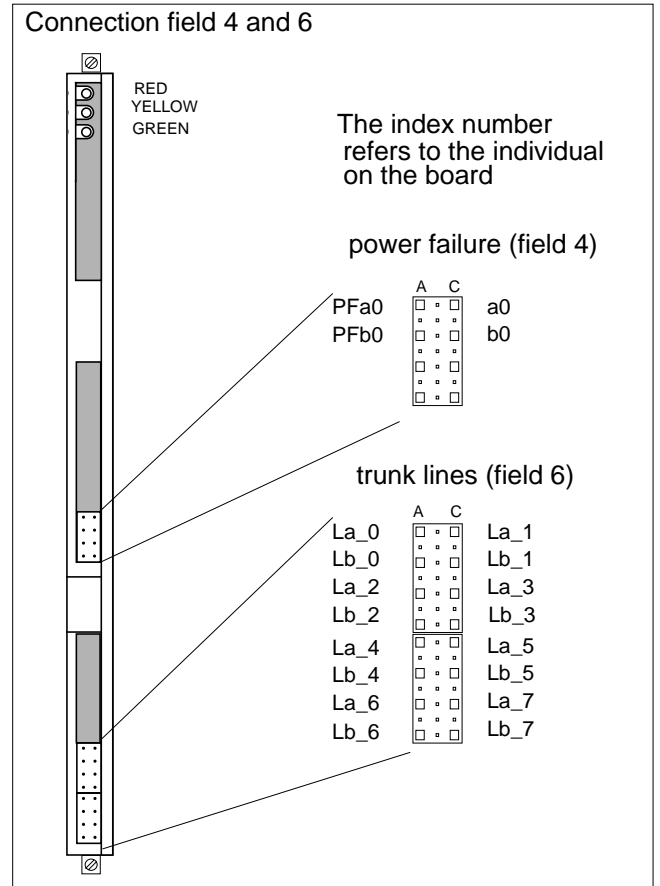
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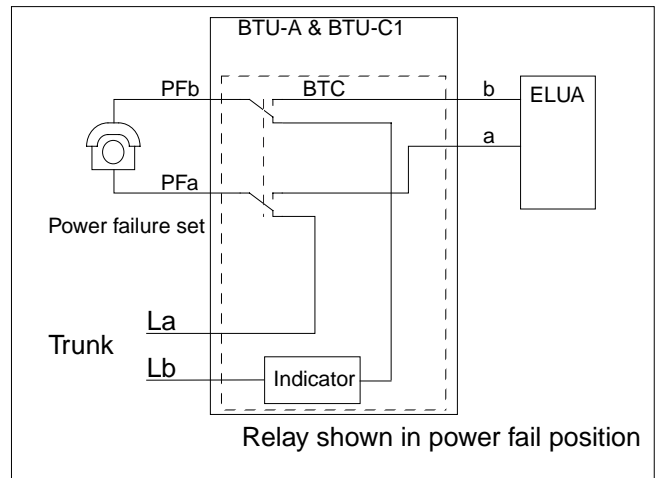
Earth connection on BTU-A2 (Austria only)

Some markets require an earth connection of the incoming PTT earth (functional earth) to the exchange. This is provided on the connector installed above the PFC circuit connector on pins A22, A24, C22 and C24. Use an extra Krone bar to connect the PTT earth wires to the wires going to the board connector.

6.6 BTU-C (ROF 157 5111/-)



The BTU-C (ROF 1575 111/1) features eight incoming trunk lines with DID. The first four individuals can also be used for outgoing traffic.

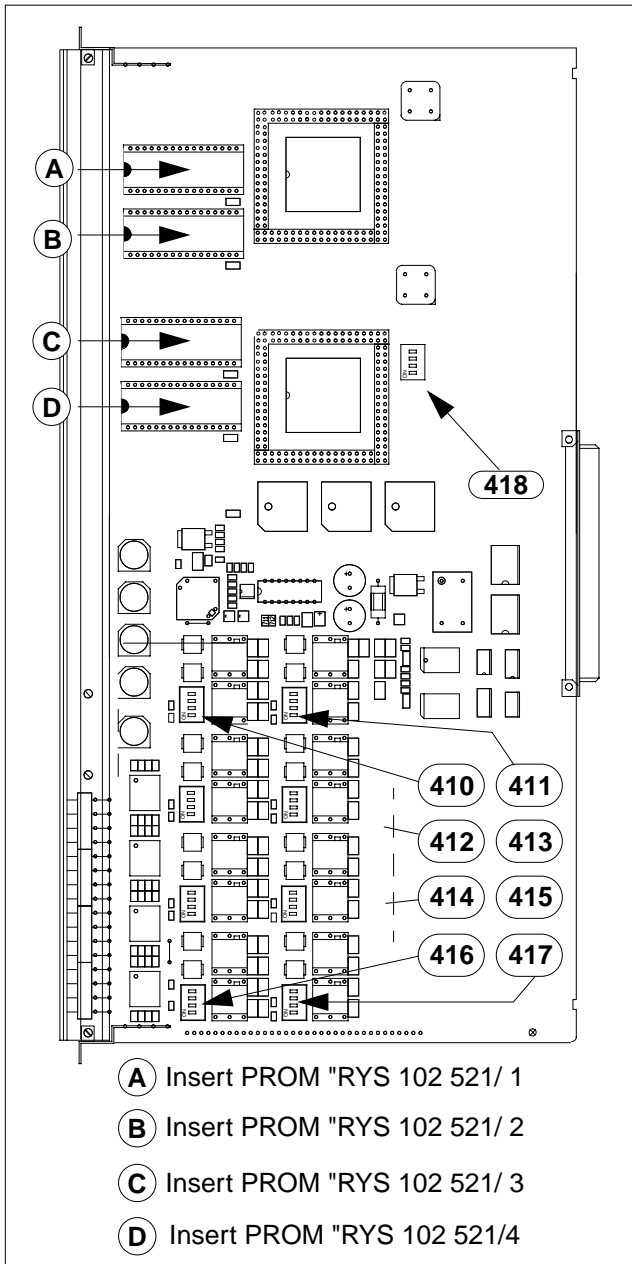


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6.7 BTU-B (ROF 157 5121/_)

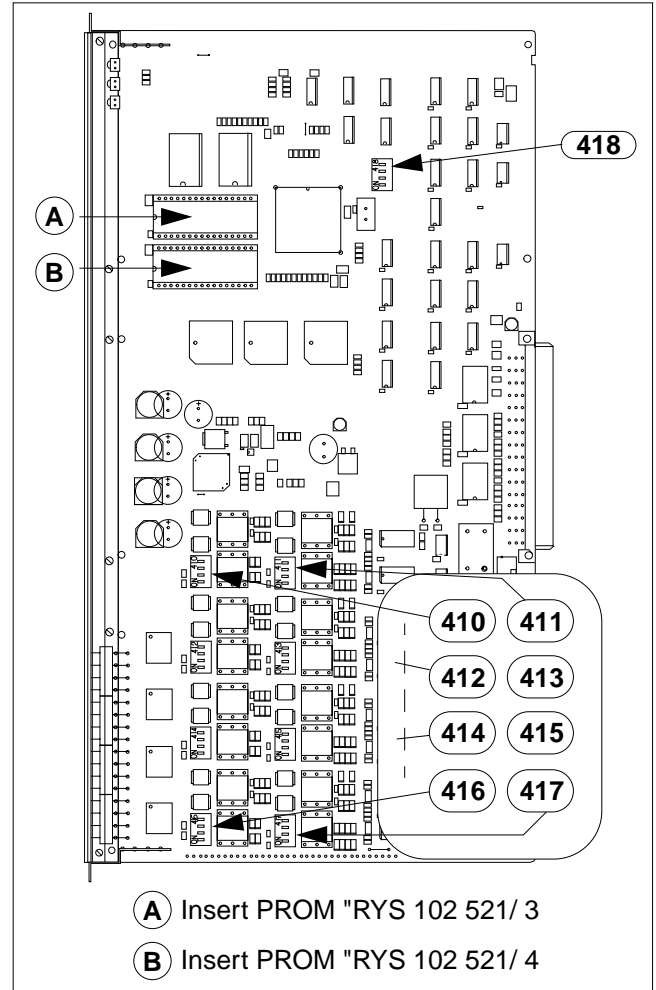
Applies for indices 1 and 3

The BTU-B provides connection for up to 8 physical links and every physical link can be configured as a S- or T-interface. On the S-interface every link provides remote power feeding with 40V/50 mA = 2W and connection for up to 8 terminals.



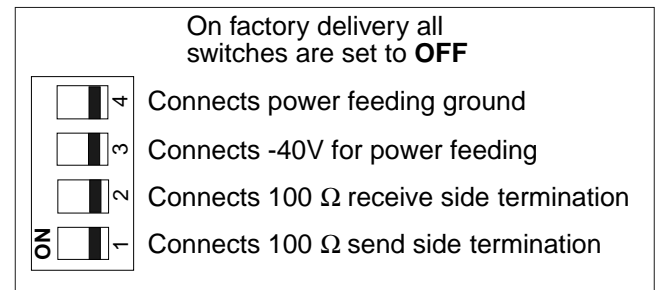
6.8 BTU-B2 (ROF 157 5121/_)

Applies for indices 4 and 5



DIP-switches position 410-417

These switches control S- and T-interface termination and S-interface power feeding on the link 0...7.



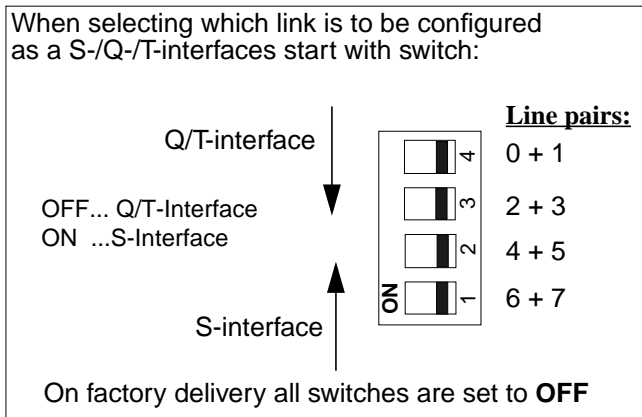
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Note: at the end of each line a termination resistor must be installed (e.g. in the last wall outlet).

The switch 1 selects the termination on the transmitter interface and switch 2 selects the termination on the receiver interface. Switches 3 and 4 enable remote power feeding to ISDN terminals connected to a link. When connected as S-interface switches 1...4 should be set to **ON**.

Settings of the S-interface relevant on board indices -3,-4,-5

DIP-switch position 418



Note: When selecting S- or T-interfaces start by setting the T-interfaces using switches 4, 3, 2 and 1 in consecutive order then set the S-interfaces starting with switches 1, 2, 3 and 4.

Settings of the S-interface

Choose with RASC the configuration of the interface:

Extended passive bus default setting
and Short passive bus.

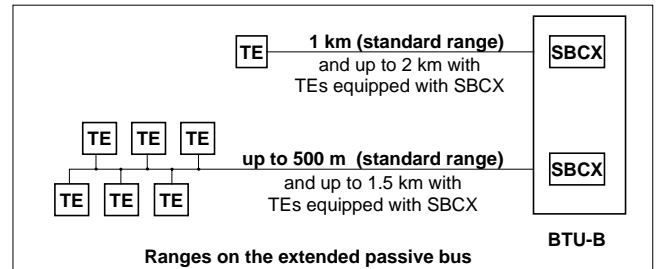
Ranges on the interface

The BTU-B is equipped with the **S/T Bus Interface Circuit eXtended (SBCX)**. This circuit offers the advantage of covering a higher attenuation on cables.

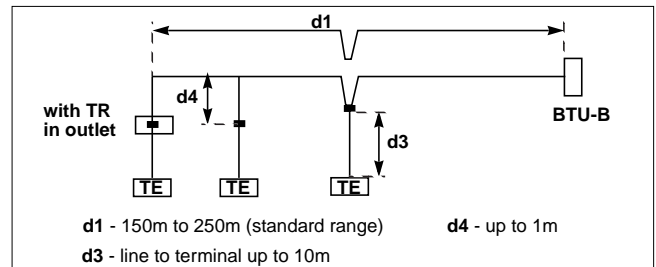
The standard S/T-interface specification considers cables with 6,5 dB attenuation equivalent to about 1000m cable length in single terminal configuration.

Using the **S/T Bus Interface Circuit eXtended (SBCX)** up to 13 dB line attenuation can be covered. The figure below shows the ranges using standard 0.6 mm diameter twisted pair unshielded cables with a capacitive load of max. 30nF per km and the terminal equipment

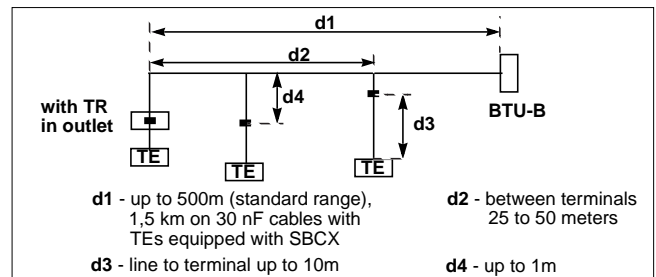
(refer to documentation of the TE) is also equipped with a SBCX or equivalent.



Short passive bus



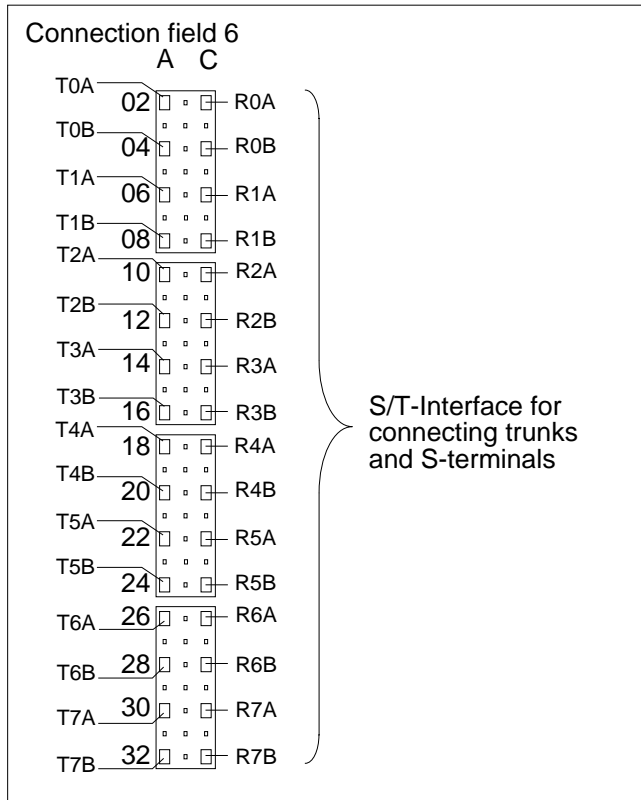
Extended passive bus



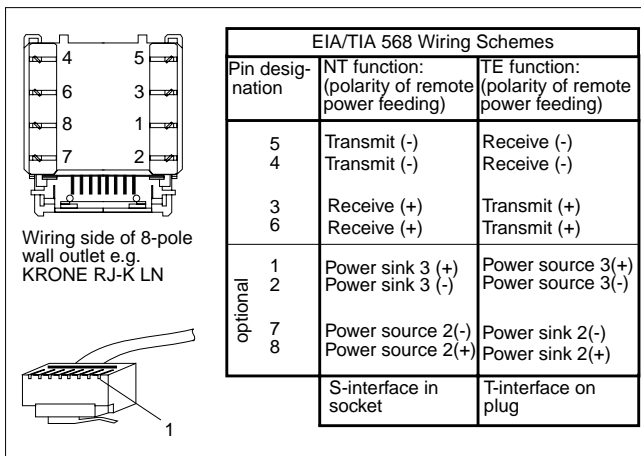
Abbreviations:

- TE Terminal Equipment
- TR Termination Resistor (*installed at the end of the interface line. Use outlets with resistor mounted*)
- Outlet according to IEC 603-7 with termination
- Outlet according to IEC 603-7 without termination

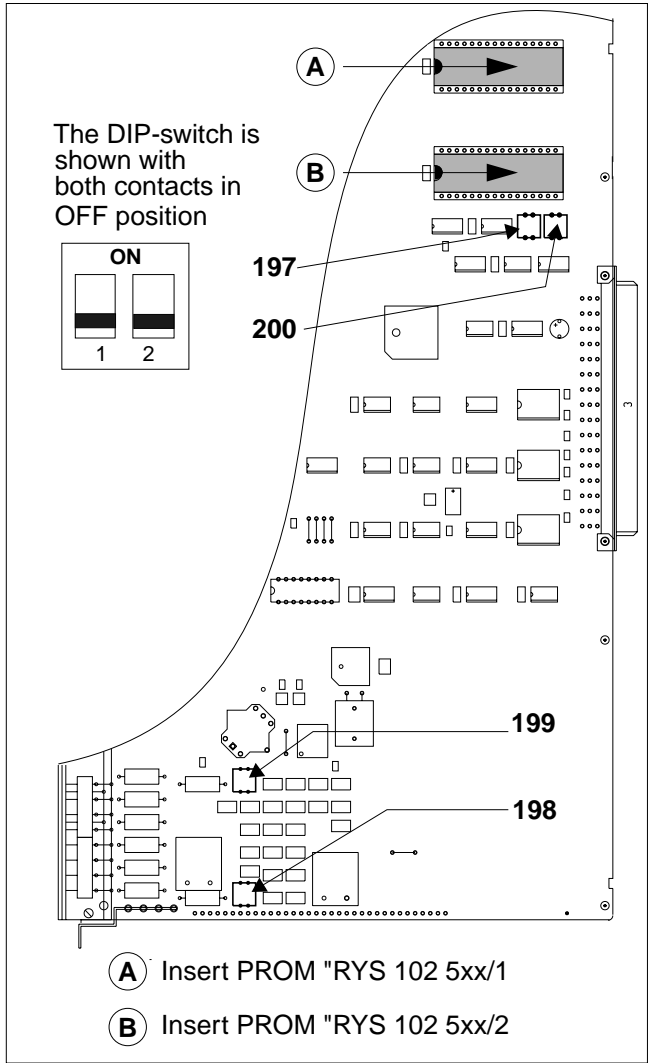
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Wall outlet connection



6.9 BTU-D (ROF 157 5112/1) and REG (ROF 157 5112/2)



6.9.1 DIP-switches in position 197 and 200

Depending on the firmware used, this board enables either ISDN or CAS function. The PROM set is available for CAS (LZY203 2212/1) or ISDN PRA (LZY203 2213/1). DIP-switch pos. **197** on BTU-D selects the register function of the board. The switch **200** is reserved for future use.

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197/1	197/2	FUNCTION		
OFF	OFF ON	digital trunk MFC	digital trunk MFE	only BTU-D
ON	OFF ON	Register MFC	Register MFE	BTU-D or REG.

6.9.2 DIP-switches in positions 198 and 199

Selection of ground strapping for the coax 75 Ω or selection of the 120 Ω twisted pair interface.

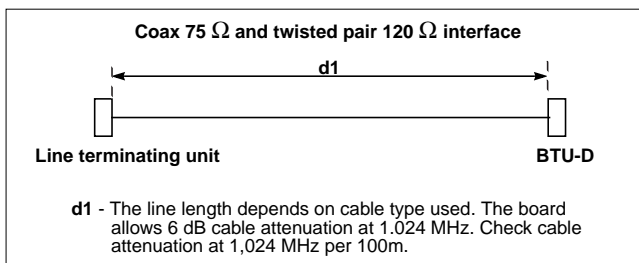
198/1 199/1	198/2 199/2	FUNCTION
OFF	OFF	120 Ω connection ¹⁾
OFF	ON	screen connected to ground
ON	OFF	screen connected to ground via 1nF capacitor

1) Factory setting

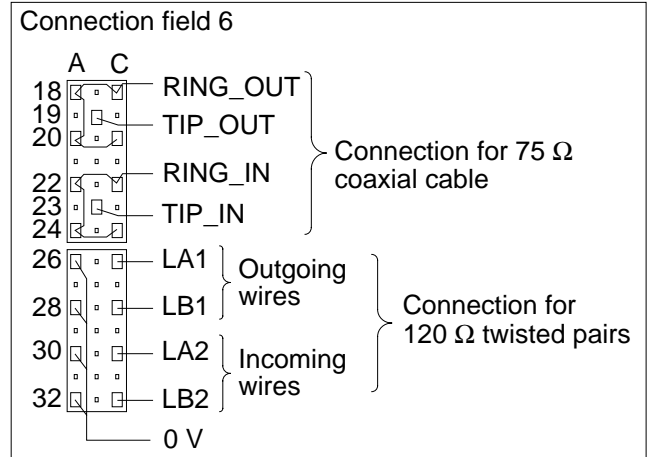
On factory delivery the switches are set to **OFF**-position = no ground thus enabling 120 Ω interface with a twisted pair cable. These DIP-switches connect the 75 Ω interface coax screen to ground, either directly to 0V or via a 1 nF capacitor. DIP-switch **198** switches the receiver and **199** the transmitter side. The screen shall normally be grounded on the transmitter side. Normally, the screen on the reception side is not connected to ground. Refer to local market requirements

Ranges on the interface of the BTU-D

This interface covers the short distance to the next NT or Line Terminating Unit as the end point of a public or private network. The range is only defined in terms of the covered attenuation by the interface that is 6 dB. If required choose cables with low attenuation to achieve a maximum distance.



For ranges exceeding 6 dB attenuation additional digital data transmission equipment is required. Line Terminating Unit (LTU) ASB 501 04 is available for such purposes.



There are specific requirements for the digital interface wiring to meet the demands of EMC.

If a twisted pair connection should be installed and the requirements of EN 55022, class B have to be fulfilled, a ferrite is available with the ERICSSON ordering number STF 82 601. Taking the cable and making three turns around the ferrite core meets the demand of sufficient noise reduction. The ferrite should be situated close to the slot where the cables are led out of the cabinet. In most cases this cable is supplied by the PTT and should not be fed via the MDF.

Some markets (e.g. Austrian PTT) require the use of a double-shielded interface cable. The outer shield should be connected to frame earth and the inner shield should be connected to 0V on the board. A 20 m long standard cable is available with the ERICSSON ordering number TSR 901 0481/20000.

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6.10 BTU-E (ROF 157 5113/_)

SPEECH CONNECTION SETTINGS

2-wire connection		4-wire connection	
106...406	108/308	106...406	108/308
on	on	on	on
(S1 S2 S3 S4 S5)		(S1 S2 S3 S4 S5)	

INDIVIDUAL 0 uses switches 106 and 108/1

INDIVIDUAL 1 uses switches 206 and 108/2

INDIVIDUAL 2 uses switches 306 and 308/1

INDIVIDUAL 3 uses switches 406 and 308/2

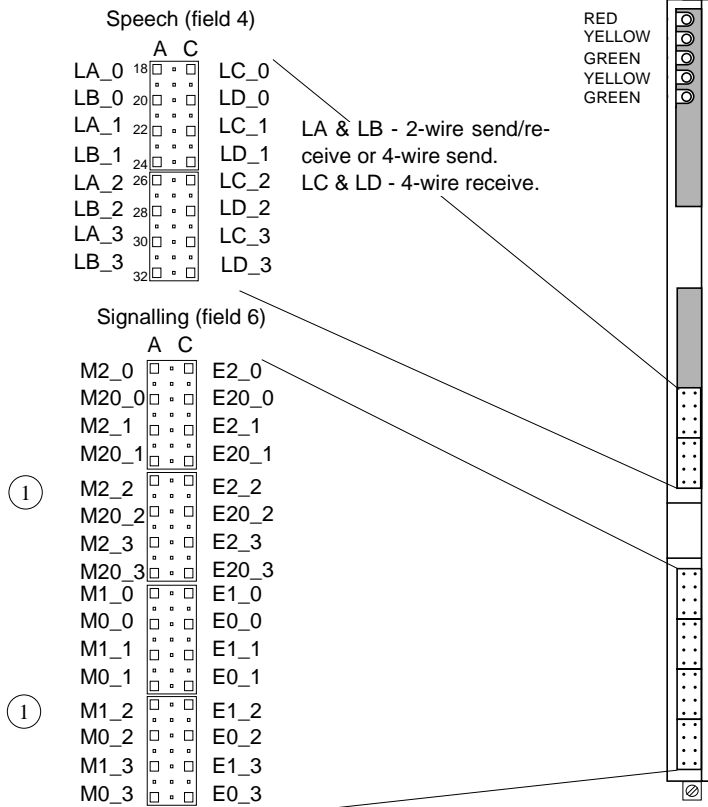
M-WIRE CONNECTION SETTINGS

APPLICATION	SPEECH	M-WIRES
PAGING	2-wire	S6..off S7..off S8..off
AMERICAN E&M SIGNALLING	4-wire	S6, S7 and S8 see local requirements
DOUBLE M-WIRE SIGNALLING	4-wire	S6..on S7..on S8..off
CAILHO E&M SIGNALLING	4-wire	S6..off S7..off S8..off
CEPT L1/SSAC 15 Only on /2 boards	4-wire	S6..off S7..off S8..off

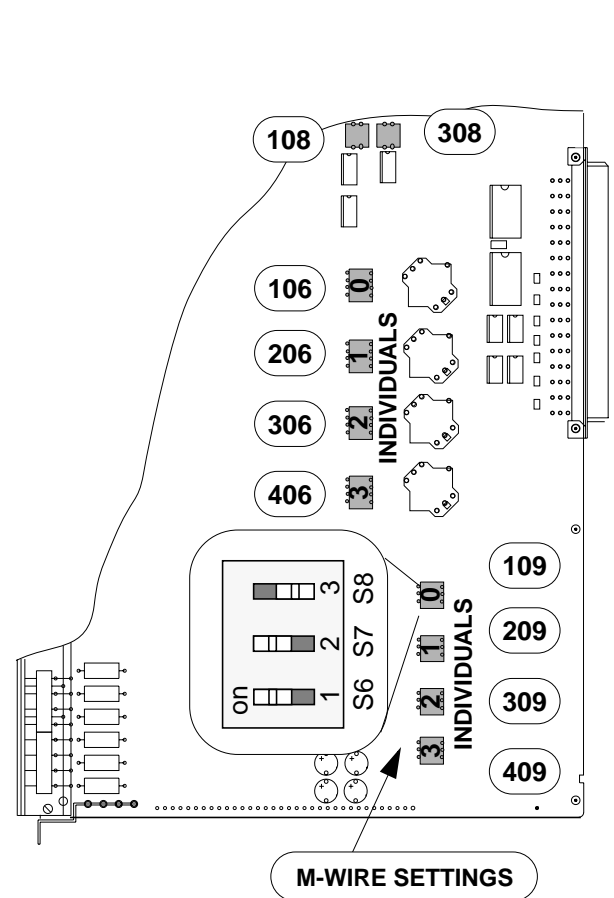
SPEECH CONNECTION SETTINGS
Switches select between 2- or 4-wire speech connection. Two individuals share switches 108 and 308
On boards with Rev. R2A these switches are replaced by relays. These relays are set automatically by programming the filter coefficients.

S6 connects -48V to M1 terminal via 6.2 Kohm
S7 connects 0V to M0 wire locally.
S8 connects 0V to M20-wire.

Connection field 4 and 6 at front of BTU-E_



① M20_ and M0_ can be switched by **S7** and **S8** to 0V on the BTU-E_ locally.

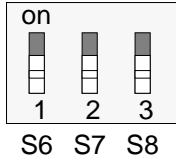


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6.10.1 Paging connection

The figure shows how to connect the paging equipment Ericall Contactor with 2 wire speech. The PBX sends paging information to paging system (pin 6A18) using M1 contact, and information about 'paging in progress' or 'paging equipment not present' is received on the E1-wire (pin 6C18) from the paging equipment.

Switch settings



This switch setting is used for signalling on E1 and M1.

Applies for switches 109, 209, 309 and 409.

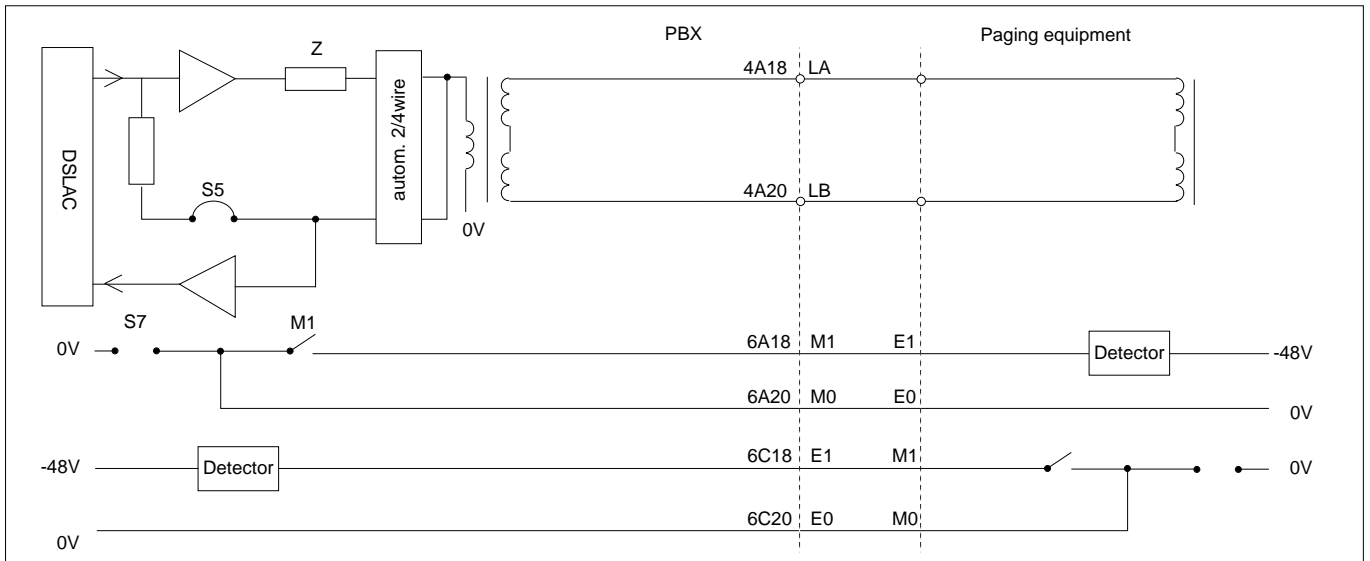


Figure showing Paging equipment and 2-wire speech with 'loop connection' of the E&M-wires.

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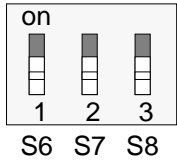
6.10.2 Four wire speech connection

The four wire speech and signalling connection has the benefit of not needing additional signalling wires. There are two different types of signalling supported:

Cailho E&M-signalling (balanced battery). The two way signalling utilises common mode DC pulses via the centre tap of the transformer. On one side a detector is connected between the -48 VDC and the centre tap of the transformer. The other end uses opto relay M4 to switch the line to 0V (Ground). The detector reads the current flow to ground every time M4 closes.

CEPT L1/SSAC 15 with 2280 Hz tones. In this case no DC signalling is used but instead signalling is performed by switching on and off a 2280 Hz tone, which is detected by a tone receiver on the other side. This is only available on index 2 boards.

Switch settings



This switch setting inhibits signalling on E1 and M1. Only AC or DC signalling on the four wire speech connection is used.

Applies for switches 109, 209, 309 and 409.

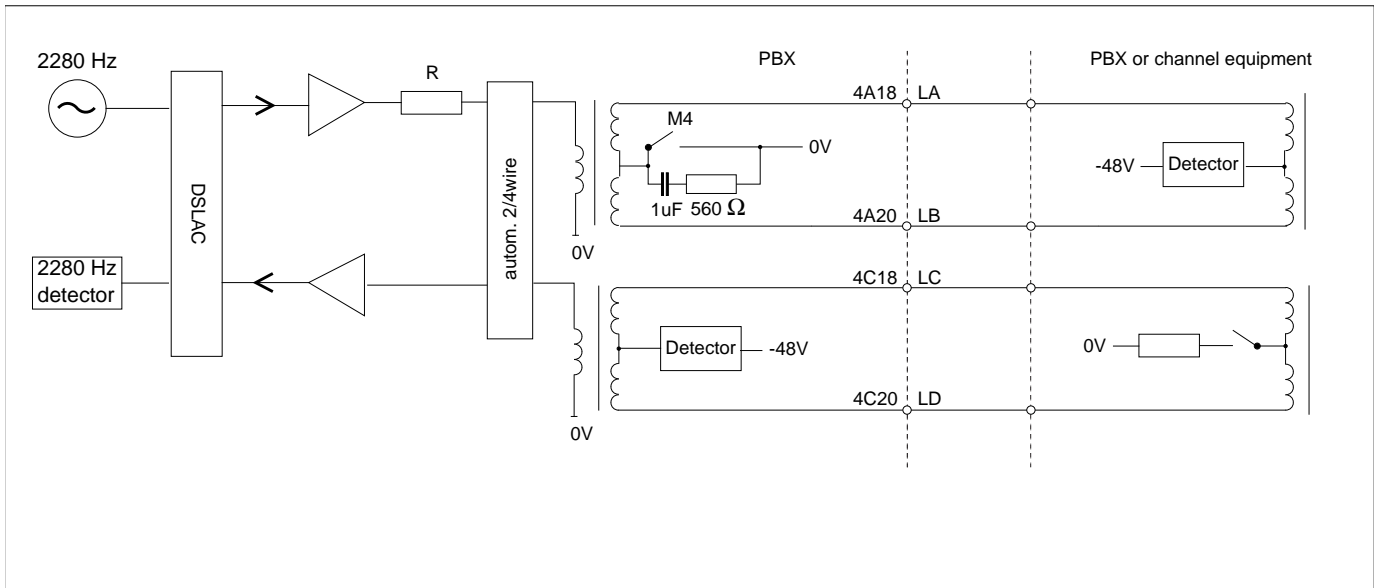


Figure showing Cailho E&M signalling and CEPT L1 or SSAC 15 with tone signalling

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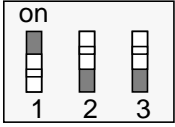
6.10.3 E&M-signalling

Signalling on E & M wires is done either using one or two E&M pairs depending on what is required. Using just E1 and M1 is a very common practice. One case to mention is the American E&M signalling where the M1 wire toggles between -48VDC and 0V.

Double E&M signalling requires the E1/M1 wires for the signalling of information and the E2/M2 wires indicate blocking of the connection. The E1/M1-wires are used for signalling and E2/M2-wires are used for blocking. The figure shows 0V connection to the M-wires in both ends.

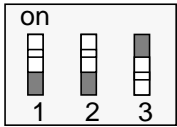
Switch settings

Standard E & M signalling



This switch setting is used for signalling on E1 and M1.

Double E & M signalling



This is the switch setting when E1, E2, M1 and M2 are used for signalling.

Applies for switches 109, 209, 309 and 409.

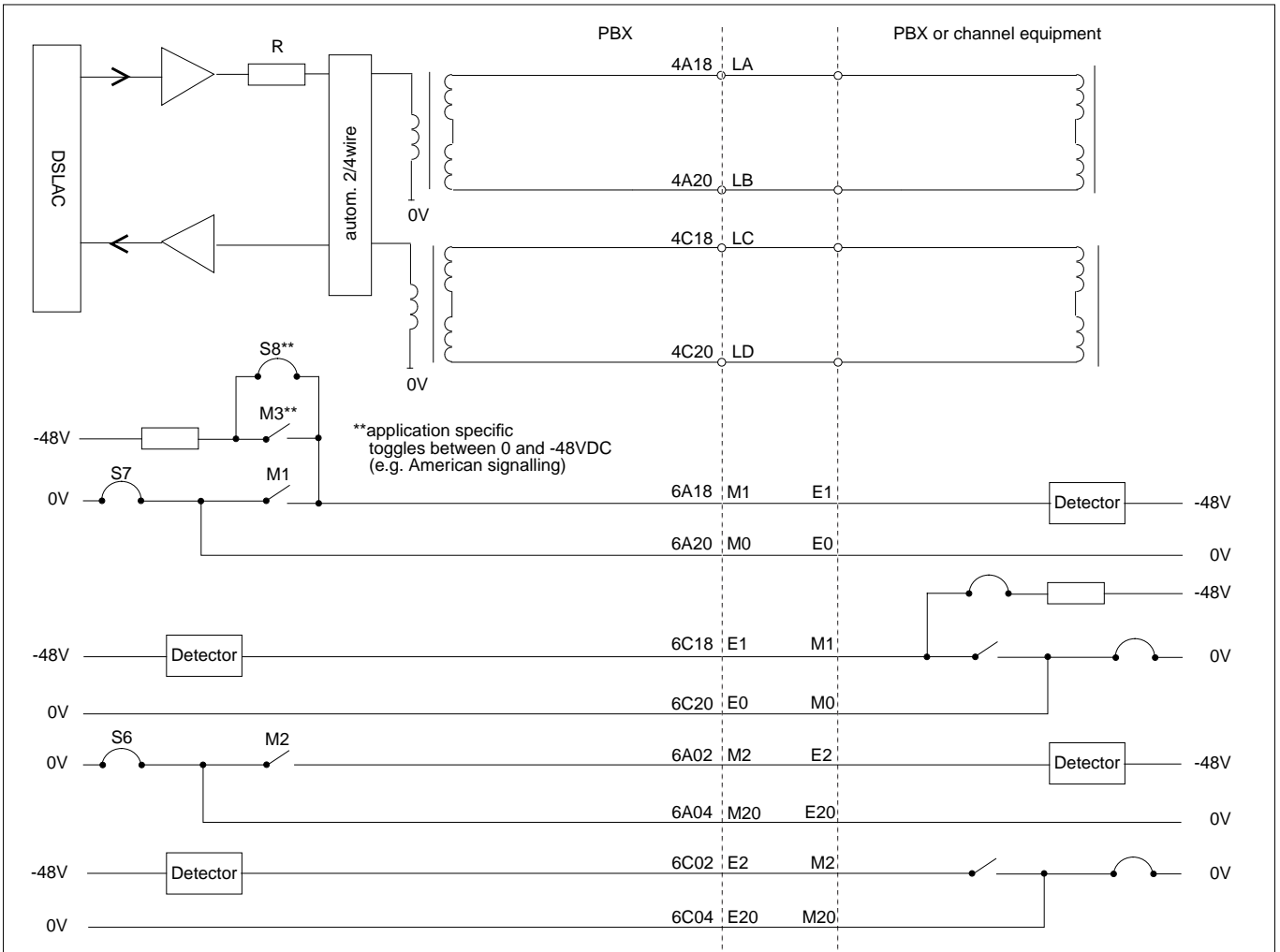
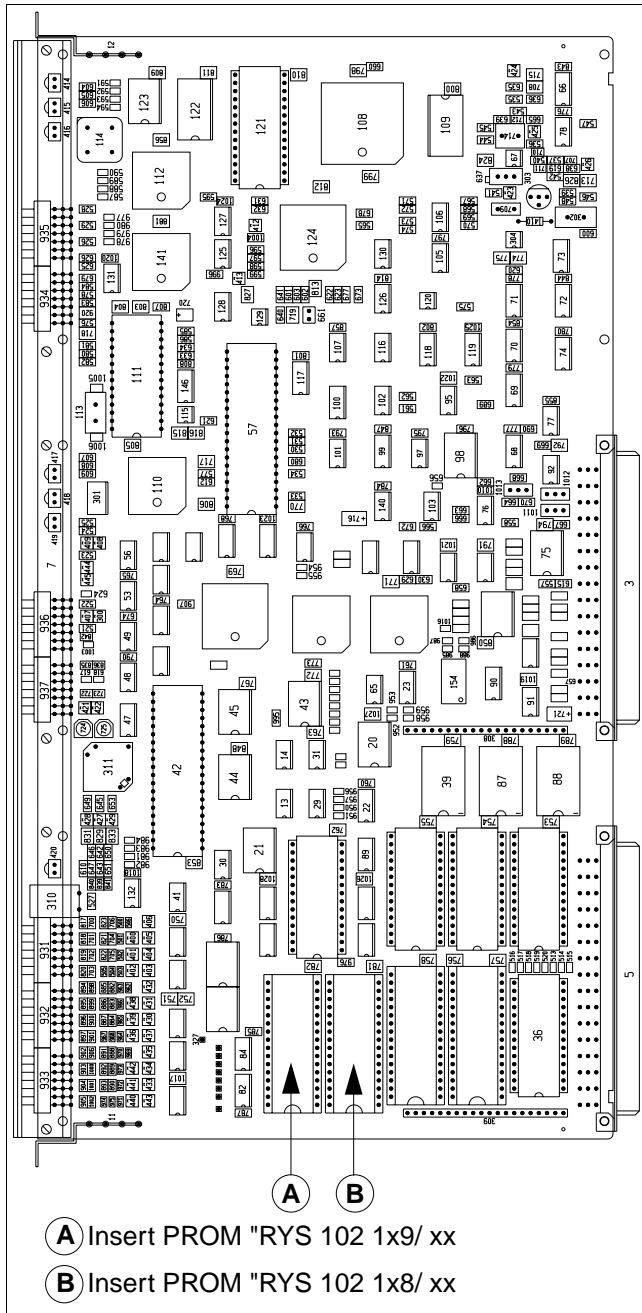


Figure showing four wire speech and standard (double) E&M signalling.

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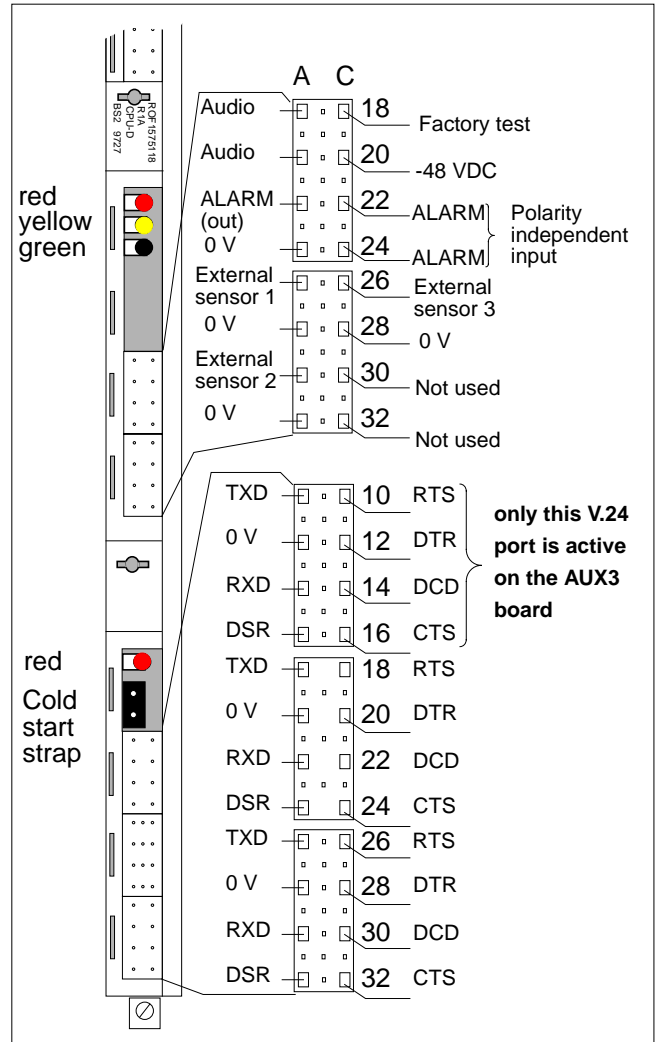
6.11 CPU-D_ (ROF 157 5118/_) and AUX_ (ROF1575 119/_)

Before installing the board mount the system software PROMs in the appropriate positions.



Connections on the CPU-D_

For connection of TEMPERATURE SENSOR KIT, see [INSTALLATION INSTRUCTION \(1531-RPM 603 339\)](#).



The ALARM input is optically isolated and the voltage has to be between 20 - 60 VDC.

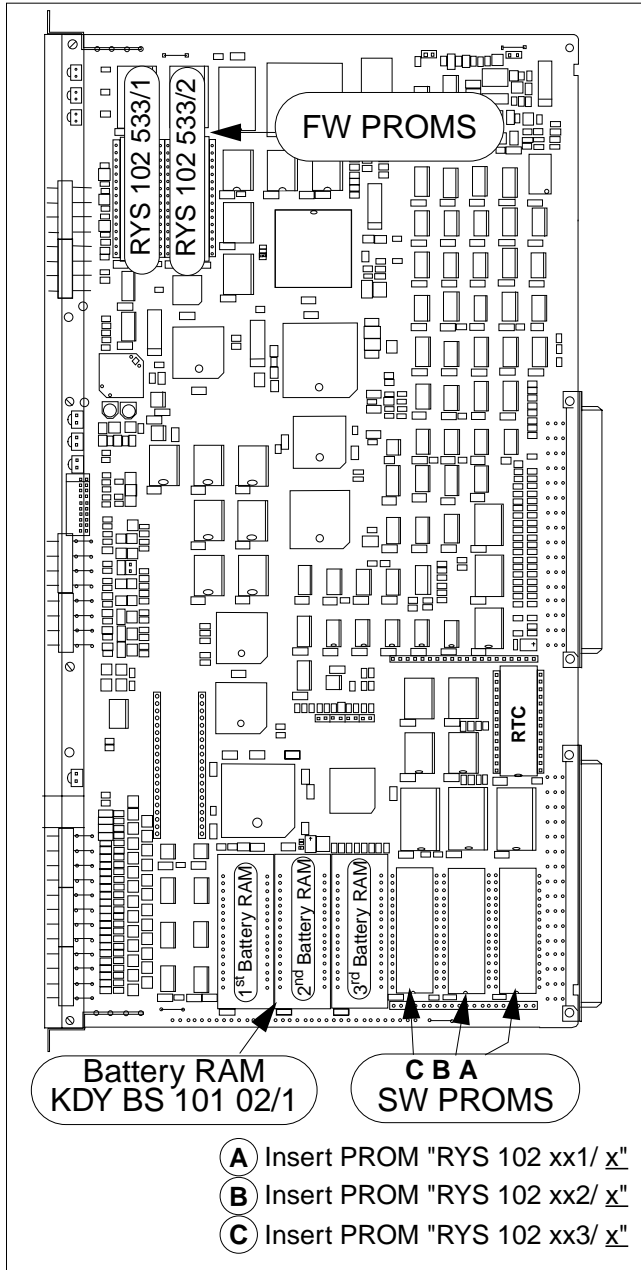
The ALARM output is equipped with an open collector transistor with a capacity of 20 mA at 12 VDC (Maximum 14 VDC).

Use the following prefabricated cables to connect the peripheral data equipment to CPU-D_ and AUX_ :

- PC is TSR 902 0448/1
- printer is TSR 902 0476/1
- modem is TSR 902 0466/1

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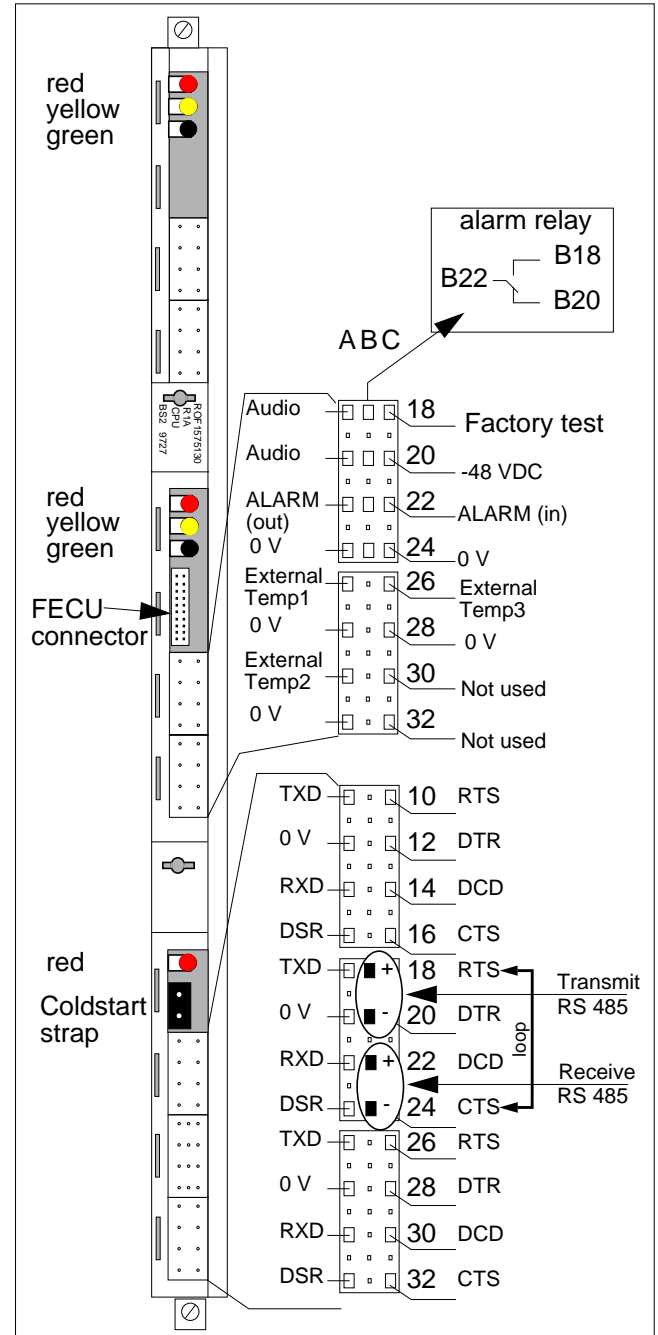
6.12 CPU-D4 (ROF 157 5124/_)



To put the board in operation mount the system software PROMS in the appropriate positions. The number of battery RAMs mounted on the CPU-D4 board is functionality dependent.

Connections on the CPU-D4

Similar to the previous versions this board provides the V.24 interfaces but additionally the RS-485 interface for longer ranges. With the software key (FECU) KDU BS 130 06/_ new functionalities can be accessed.



To connect the RS-485 data interface use plug RNV 321 01 02 be sure to loop RTS with CTS other-

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wise data is lost if printer is OFF. The range of the interface is up to 1200m.

Several converters may be used but with the following successful tests were accomplished:
 IC-485SI from ARP DATACON and
 232<->485/422 Converter Plus IC-109AE from Black Box Corp.

6.12.1 Feature Enabling Control Unit (FECU)

Connecting this plug activates the appropriate applications and features as ordered depending on the FECU index number. If no plug is connected only a limited Version 3.0 system functionality is available. The indices 2 to 10 always include the Basic Version 3 functionality (index 1).

For detailed information of the features enabled by the different FECUs refer to [15534-ASB 150 02 Uen FACILITY DESCRIPTION GENERAL](#).

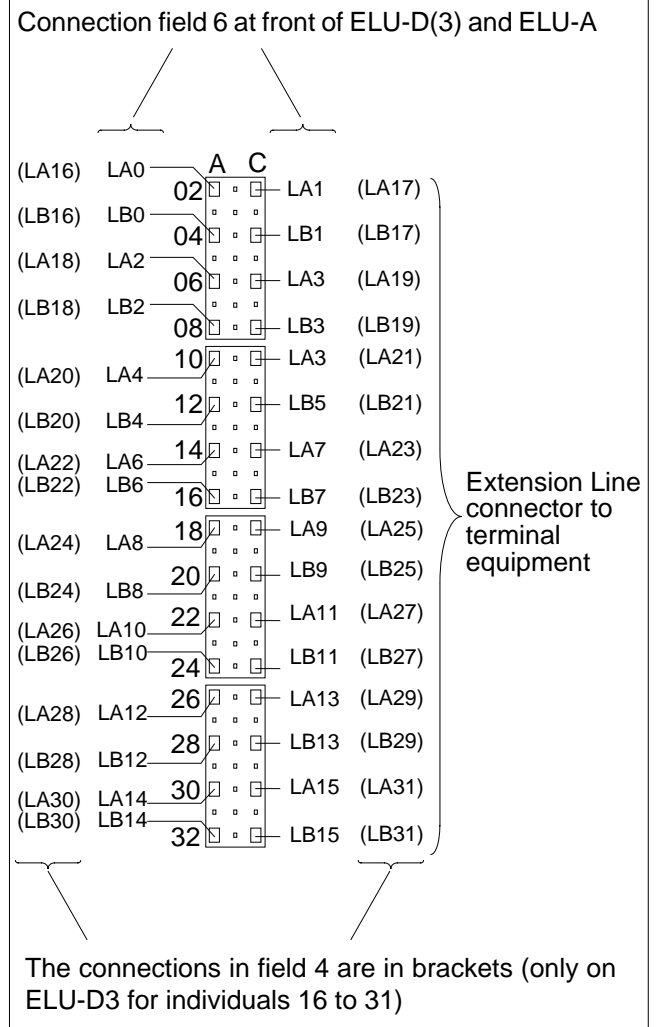
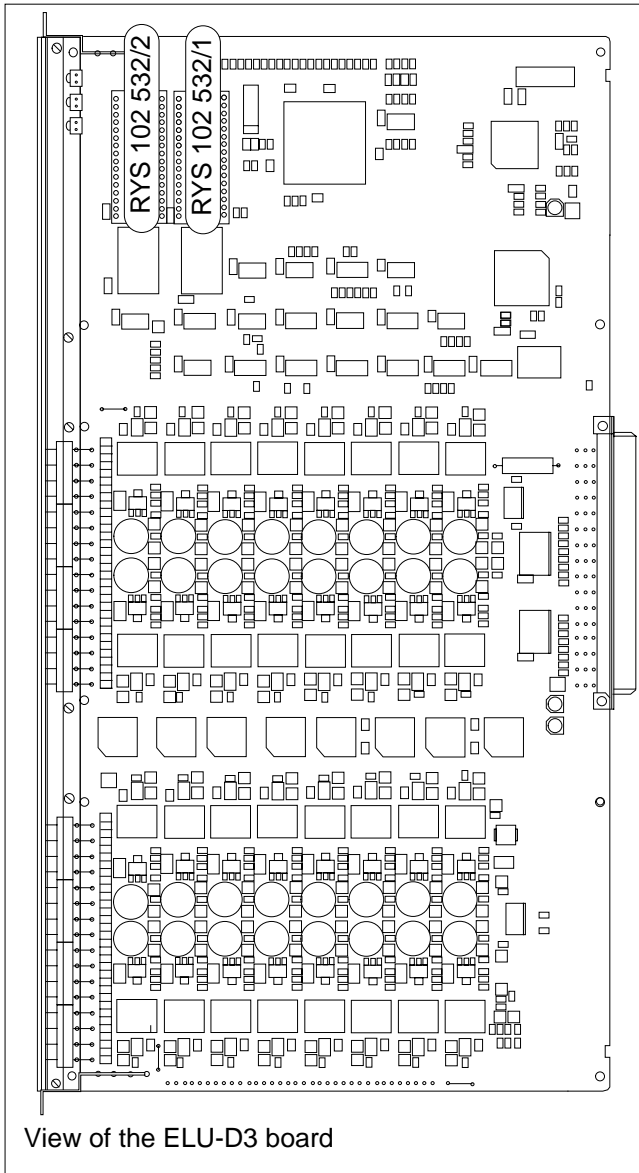
FECU number	Functionality Version 3.1
KDU BS 130 06/1	Basic Version 3.0 functionality
KDU BS 130 06/2	+ std. digital networking for max. 32 interfaces
KDU BS 130 06/3	+ std. digital networking
KDU BS 130 06/4	+ full. digital networking for max. 32 interfaces
KDU BS 130 06/5	+ full. digital networking
KDU BS 130 06/6	+ CTI
KDU BS 130 06/7	+ CTI and std. digital networking for max. 32 interfaces
KDU BS 130 06/8	+ CTI and std. digital networking
KDU BS 130 06/9	+ CTI + full. digital networking for max. 32 interfaces
KDU BS 130 06/10	+ CTI + full. digital networking for unlimited number of interfaces

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6.13 ELU-A and ELU-D

The relevant boards are:

- ELU-D (ROF 1575 116/_)
- ELU-A (ROF 1575 114/1)
- ELU-A2 (ROF 1575 114/2)
- ELU-D3 (ROF 157 5130/_)



On the first ELU-D_ board in the system the first three extension positions should be used to connect the OPERATOR telephones.

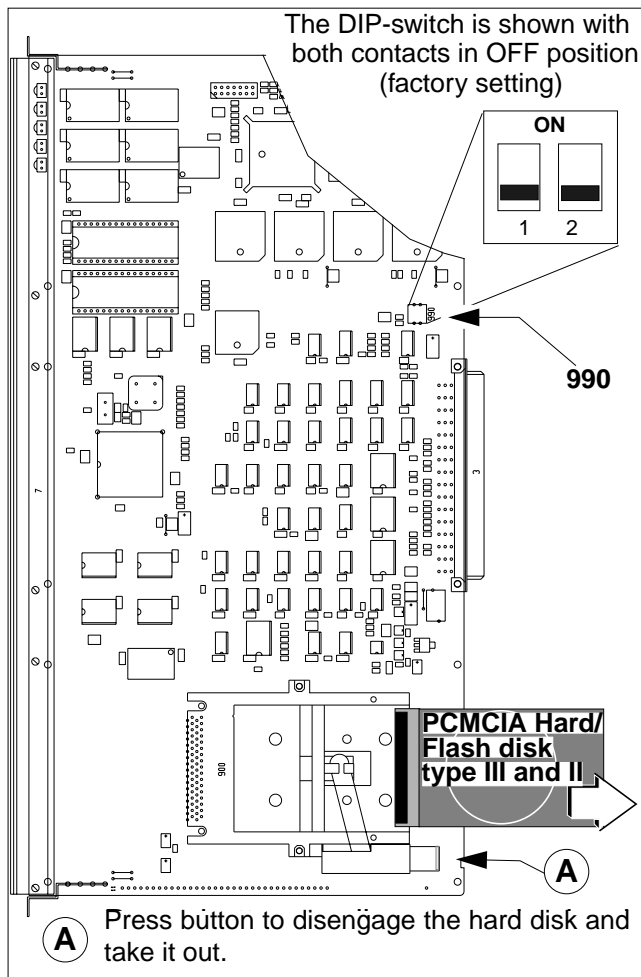
On sub-equipped ELU-A and ELU-D_ boards the connection for extensions 8...15 (32) are not mounted.

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6.14 VMU-HD (ROF 157 5126/1)

To install unpack the VMU-HD board with the mounted hard disk. The Flash disks are available with a capacity of 60 MB. Remove the transport protection for the hard disk and keep it in case of re-shipment e.g. factory repair. Install and configure the VMU-HD in the cabinet according to the stipulations in [1537-ASB15002Uen](#) **START OF OPERATION.**

Note: The VMU-HD will not start up without internal directories created on the hard disk.



DIP switch on VMU-HD

DIP switch **990** selects whether register function is enabled or not.

Limitations:

Only one VMU-HD can be mounted per cabinet and just one type either VMU-HD or VMU-D can be installed in a system.

990/1	990/2	FUNCTION
OFF	ON or OFF	16 channels, no register function
ON	OFF	8 channels with MFC detection and DTMF / Tone receiver
	ON	8 channels with MFE detection and DTMF / Tone receiver

Structure of directories on hard disk or Flash card

```

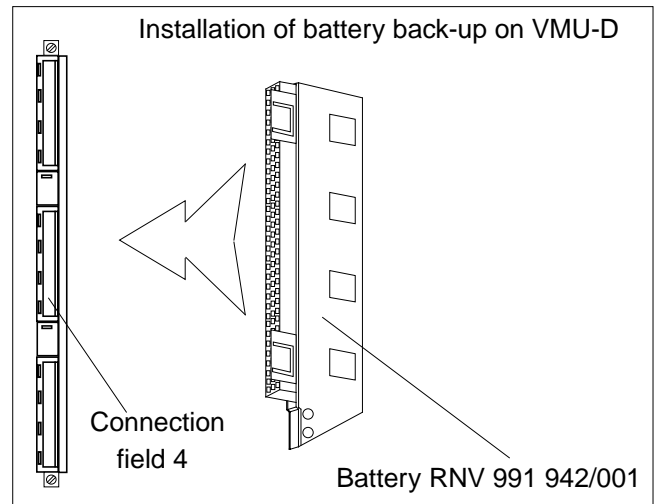
\Info0      \message2      \anno0
\Info1      \message3      \anno1
              \message4      \anno2
              \message5      \anno3
              :
              \annoF
    
```

Removal of hard disk or Flash card

To remove the hard disk take out the board from the system. Disengage the hard disk with lever **A** and pull out the hard disk.

6.15 VMU-D (ROF 157 5117/1)

The VMU-D has no switches, but is equipped with a back up battery, RNV 991 942/001 to prevent loss of data in case of power failure. Install the battery to connection field 4. before the exchange is started. For safe operation, replace this battery periodically every five years in accordance with document [MAINTENANCE INSTRUCTION \(1541-ASB 150 02 Uen\)](#).



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7 INTEGRATED CORDLESS

The Integrated Cordless (IC) is a digital cordless telephone solution complying to the DECT standard providing wireless connection for up to 108 portables with the A-protocol and 210 portables in GAP-protocol applications. Several components comprise a complete system.

After the system has been physically installed use RASC and the Cordless System Manager (CSM) for initialization, maintenance, updating, fault finding and when possible to recover the PBX from errors. The CSM is orderable under LZYNB 201 01 R6A or higher for the A-protocol and LZYNB 201 05 R1B or higher for GAP applications.

plug is available for various numbers of cordless telephones. For up to 8 portables no plug is required.

FECU number	Number of Portables
KDU 130 05/1	16
KDU 130 05/2	24
KDU 130 05/3	32
KDU 130 05/4	48
KDU 130 05/5	64
KDU 130 05/6	108
KDU 130 05/7	210 (only with IC-CU2)

7.1 Board Descriptions

7.1.1 IC-Control Unit2 (IC-CU2)

The IC-CU2 is the control board supporting the DECT GAP-protocol. The IC-CU2 includes 8 voice channel units and is equipped with 4 BSs interfaces.

The wiring distance with remote power feeding to the BSs using only the serial communication wires SC0 and SC1 is limited to 400m. For line lengths up to 900m additional Express Power feeding Pairs (EPP) need to be wired. The maximum wire length between BS (fed locally) and IC-CU2 is only data limited and may reach up to 900 meters.

The board offers the following connections:

- the Cordless System Manager (on a PC)
- a printer to log errors
- 4 Base Stations
- the Feature Enabling Control Unit (FECU).

7.1.2 Feature Enabling Control Unit (FECU)

This plug determines which maximum number of portables are allowed to be connected to the system. This

7.2 Traffic capacity

The traffic capacity of the Cordless part of the PBX is mainly determined by the IC-CU_ and in exceptional cases also by the Base Stations. The IC-CU can handle a maximum of 56 simultaneous calls and the IC-CU2 can handle up to 60 simultaneous calls. Each Base Station has a capacity of 8 simultaneous calls.

The traffic capacity of the IC-CU_ is determined by:

- the Grade Of Service (GOS) required by the customer
- the number of speech circuits available, with a limit of 64.

The Grade Of Service is the probability that a call is rejected because of system congestion. The customer has to indicate which Grade Of Service is acceptable. A Grade Of Service of 1%, or 0.01, means an average of 1 lost call in every 100 calls. The IC-CU2 is equipped with a SPU providing 8 speech circuits.

The two parameters mentioned above (GOS and the 8 speech circuits) and the total amount of traffic (Erlang) that is required, are related to each other. The table below shows the capacity at a required GOS.

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Practically, this table is used to calculate from a given GOS and Erlang value the number of portable users.

IC-CU2	Speech circuits	Grade of service (GOS)			
		2%	1%	0.5%	0.1%
1	8	3.6	3.2	2.7	2.1

For the calculation it is necessary to estimate the time the portables actually make calls. The table below shows the Erlang value depending on the estimated mean call-minutes for a portable telephone. These values may be different between departments depending on their activities. These values multiplied by the number of portables result in a traffic capacity that has to be provided.

Minutes per hour	mErlang	Minutes per hour	mErlang
3	50	15	250
6	100	18	300
9	150	30	500
12	200	45	750

Example:

A customer ordering a system with 24 portable telephones. He estimates that each portable generates 200 mE each in average. These values require a system with a traffic capacity of 3,6 E (0,15x24). With an accepted GOS of 2.0% the traffic capacity can be met.

7.2.1 Traffic Capacity of Base Stations

A Base Station, having 8 channels available, has an Erlang value of 2.7 with a GOS of 0.5%. This means that each Base Station can serve 18 portables, assuming each portable generates 150 mE during busy hour or 13.5 portables generating 200 mE each.

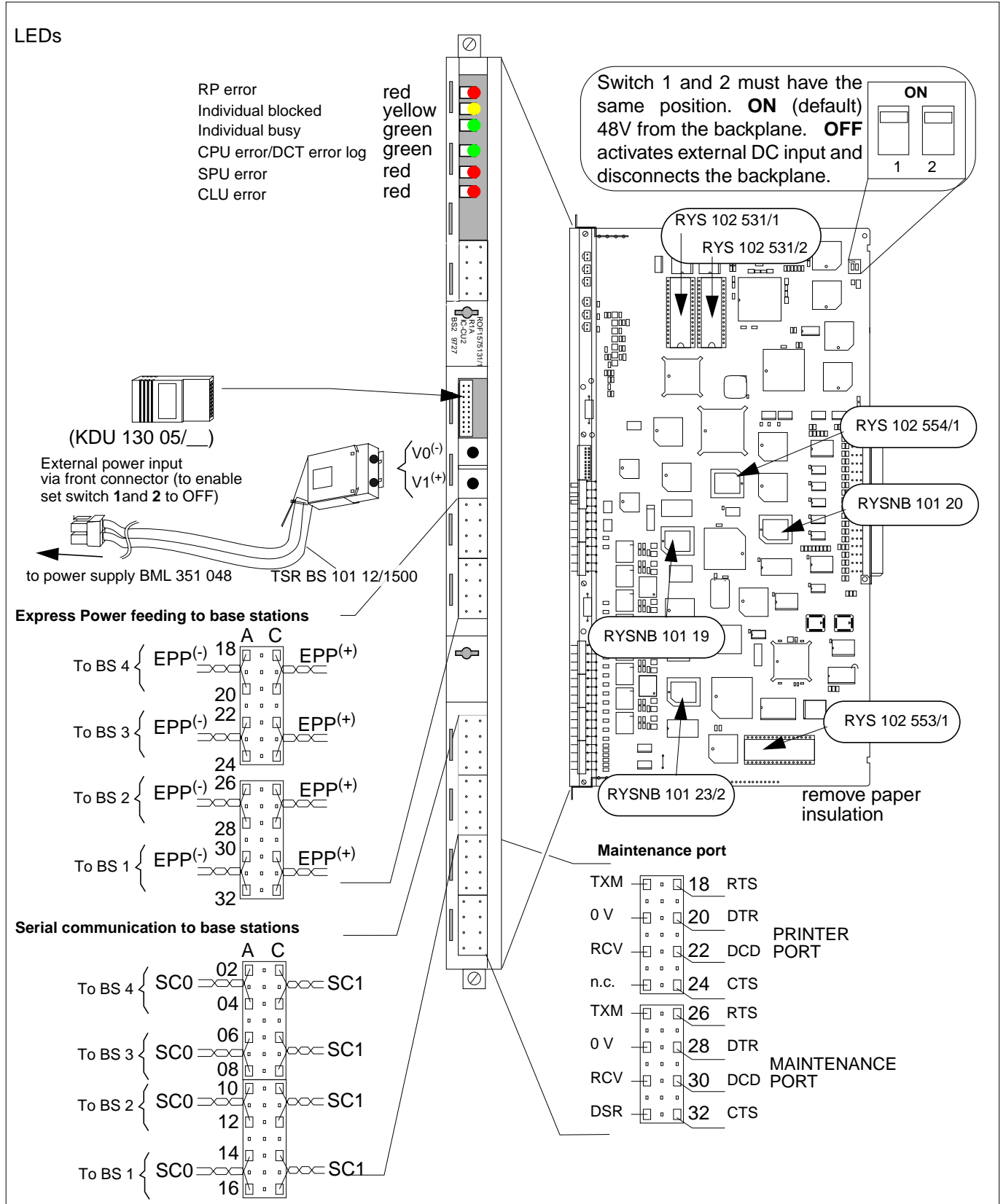
Example:

Assuming a full coverage in a building can be achieved with 2 Base Stations means that 20 portables generate together $20 \times 0.150 = 3 \text{ E}$. Every Base Station has a traffic capacity of 2.7 Erlang. To have a sufficient coverage two Base Stations covering the area of the busiest part of the company are needed.

Practically, the total capacity offered by the cordless network is generally more than sufficient, but this is from an average point of view. In certain places, traffic demands may vary such that locally the network is often blocked, or has a lower GOS than required. For instance a purchase department may easily generate 300 mE per Portable during busy hour, thus, when e.g. with 6 persons giving a very high load on the Base Station close by. It may be necessary to add a Base Station in this area to have enough capacity for others to call as well. Also think of e.g. canteens during lunch time etc.

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7.3 IC-CU2 (ROF 157 5131/_) (GAP-Protocol)



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7.4 Base Station (KRCNB 201 03/_ and KRCNB 301 01/_)

The Base Station (BS) enables radio communication between the Integrated Cordless system and the portable telephones. The communication via two 2B+D interfaces, requires two twisted pair cables. Both interfaces provide in total eight 32 kbit/s speech paths between a BS and IC-CU2, enabling a BS to handle eight simultaneous calls. The BS is connected to the IC-CU2 via two wire pairs called serial communication wires (SC0 & SC1) carrying up to 8 simultaneous digital voice connections and the central power feeding. Apart from data communication these two twisted pairs are also used to distribute power to the BSs. Two additional pairs can be wired to provide a greater powering range. There are three methods to power BSs:

1. centrally via backplane (with or without EPP)
2. centrally via external input (with / w.o EPP)
3. via local power supply (optional).

With the first and second methods power is distributed via the IC-CU2 to the BS. The cable length between BS and IC-CU2 depends on the number wires used for power feeding, the type of cable and environmental noise. In the third case (local feeding), BSs are powered by an AC-adaptor or another power source which is not routed via the cabinet.

The number of BSs used in a system depends on the area to be covered and the traffic density. Typical in-house coverage is up to 30 meter radius. In practice the cell size may vary between 10 meters indoors in worst case situations, up to 300 meters outdoor in free space.

The BS has two main functions:

- to modulate a carrier with the digital encoded information (TDMA frame directed to portable)
- to demodulate a modulated carrier (TDMA frame received from portable).

A special cover (KRY NB 101 01) is available to mount the BS (KRCNB 201 03) outdoors providing splash proof housing and water tight sealings for the wiring.

7.4.1 Base Station Planning

The major task when providing a wireless service is to estimate the number of BSs and to find their most suitable location. A number of factors tend to limit the range of a BS like the materials the wall is composed of or the location and size of machines, furniture, air-conditioning systems, elevators etc. This results in unexpected reflections or absorption of radio waves. Generally BSs should not be located on outer walls, except if the outdoor area has to be covered as well, as this reduces the area actually covered. All of these unpredictable influencing factors makes it extremely difficult to define rules for how to cover an area with a suitable number of BSs. In difficult environments the use of a site survey tool (LTT NB 101 01/_) is recommended.

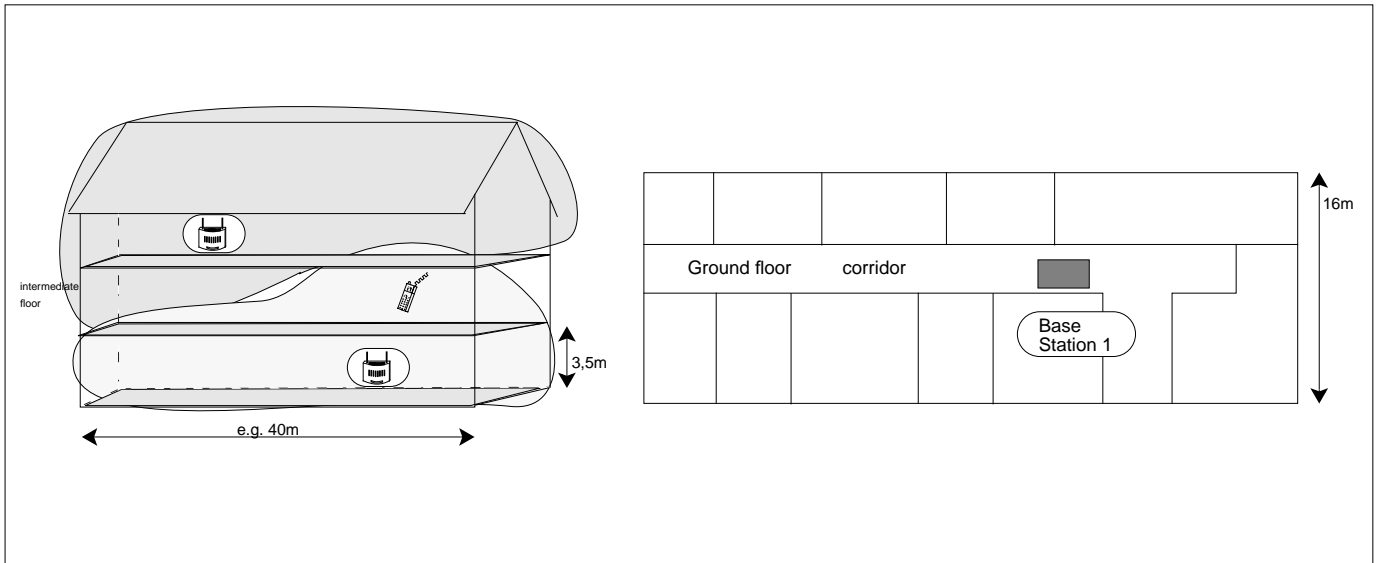
Establish a Base Station plan for the installation site to determine the best location for the BSs.

Base Station aerial range

- In an office environment in a steel concrete building up to 30 m in diameter can be covered and including, under normal conditions, the neighbouring floors.
- Production halls up to 200 m in diameter are covered but ranges can be less if bulky machines, cranes etc. are part of the interior.
- Outdoor ranges can be up to 300m.

When installing a BS, position it, then walk around to determine cell coverage area either by listening to the speech quality - whether mutes or crackling sounds are heard in the portable - or measure the RQI indicator using the portables Service Display facility (see [FAULT TRACING 1545-ASB15002Uen](#)).

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7.4.2 Base Stations Cabling

Using a four-pair cable or more-pair cable, the free cable pairs can be used as additional power wires (EPP) to increase the feeding distance and reduce overall power consumption (by reducing the ohmic resistance) to the BS. The BS can also be powered by an on-site adapter (refer to [section 7.4.7](#)).

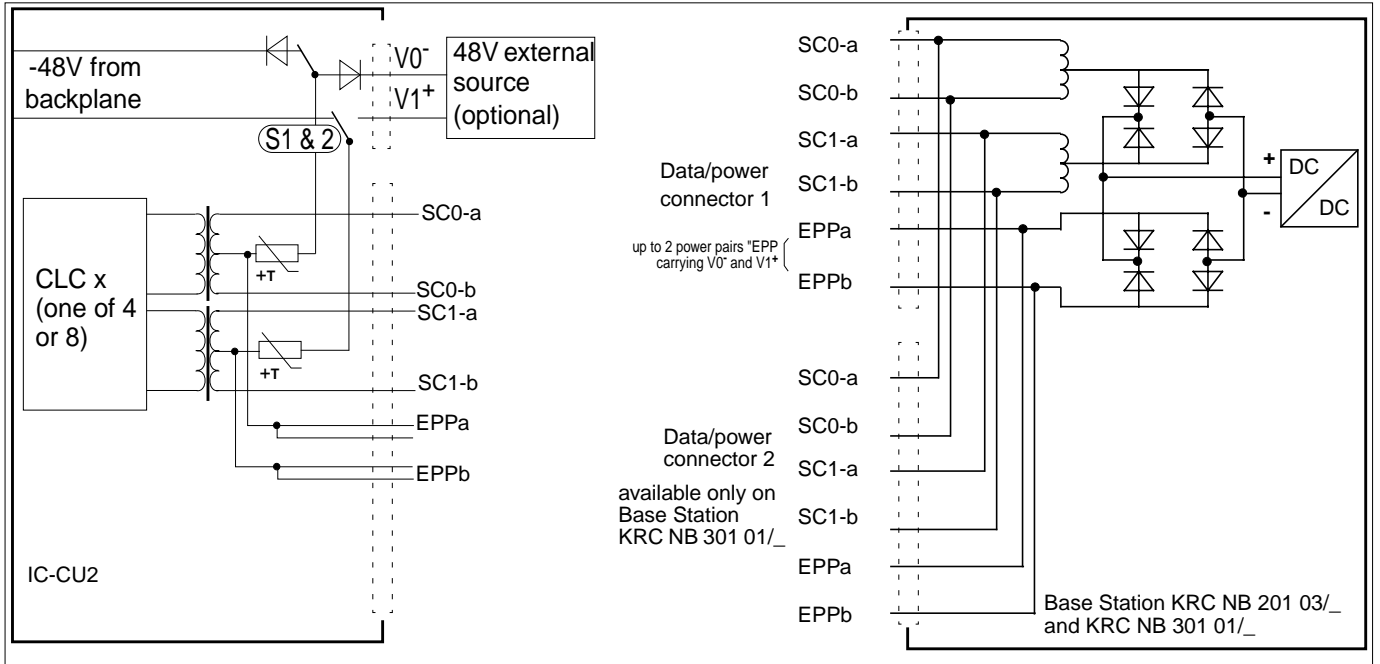
Connection of serial communication wires and EPP lines is polarity-independent. SC0-0 and SC0-1 may be interchanged but SC0-x and SC1-x **may not** be interchanged. The diagram below shows the wiring principle to each base station connected to the IC-CU2.

Power feeding of the Base Station

There are three alternatives to power feed (-48V) the Base Station:

- The power feeding can be taken via the IC-CU2 from the back plane in the cabinet. The DIP-switch on the IC-CU2 is set to **OFF**.
- From an external power source via the front connector on the IC-CU2 ($\leq 56V$). Note the polarity on the input (see drawing of IC-CU2 board). The switch on the IC-CU2 is set to **ON**.
- By an AC-adapter (see [page 38](#)). The switch on the IC-CU2 should be set to **ON** but no power feeding from an external power source via the front connector on the IC-CU2.

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7.4.3 Base station cable delay measurement

After all base stations have been installed, the cable delays must be measured in order to program the base station delays into the system at initialization time. On IC-CU2s with the revision R1C and higher automatic delay measurement is performed. In this case no measurement is needed but using the cordless system manager (CSM) go to the menu "add Base Station" and enter a "1" in the field "delay".

7.4.4 Ranges on cables

The following ranges are given for base stations connected to an IC-CU2. Depending on the cable type ranges depend on noise levels imposed on the cables. The values stated are maximum achievable ranges:

Type	Cable		Maximum cable length	
	Wire diameter (∅)	Capacitance	Superimposed noise	
			8 mV/pHz	10 mV/pHz
Twisted pair	0.4 mm	45 nF/km	1.2 km	1.0 km
Twisted pair	0.5 mm	45 nF/km	1.6 km	1.4 km
Twisted pair	0.5 mm	120 nF/km	0.9 km	0.8 km
Twisted pair	0.6 mm	45 nF/km	1.9 km	1.7 km
Twisted pair	0.6 mm	120 nF/km	1.1 km	1.0 km
Double twisted pair (J-Y (St)Y 2x2x0.6)	0.6 mm	120 nF/km	1.0 km	0.9 km

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7.4.5 Base Station (KRC NB 203 01/_)

The Base Station (BS) is supplied with a drilling template to mount the unit and 2 antennas with TNC connectors. Mount the unit in a suitable location to provide the best communication coverage.

Use the supplied drilling template and mount the BS with four screws (6 mm Φ). Complete the electrical connection according to the above drawing. Do not connect to the Base station yet.

IF power is supplied by the adapter (BMLNB 101 04), the screw/slide connector **must** be used. The serial communication wires can be connected via the modular jack or the screw/slide connector. A screw with a bundling cord holder is provided for traction relief to the left of the connection field. The BS starts up if the supply lines deliver more than 12 VDC.

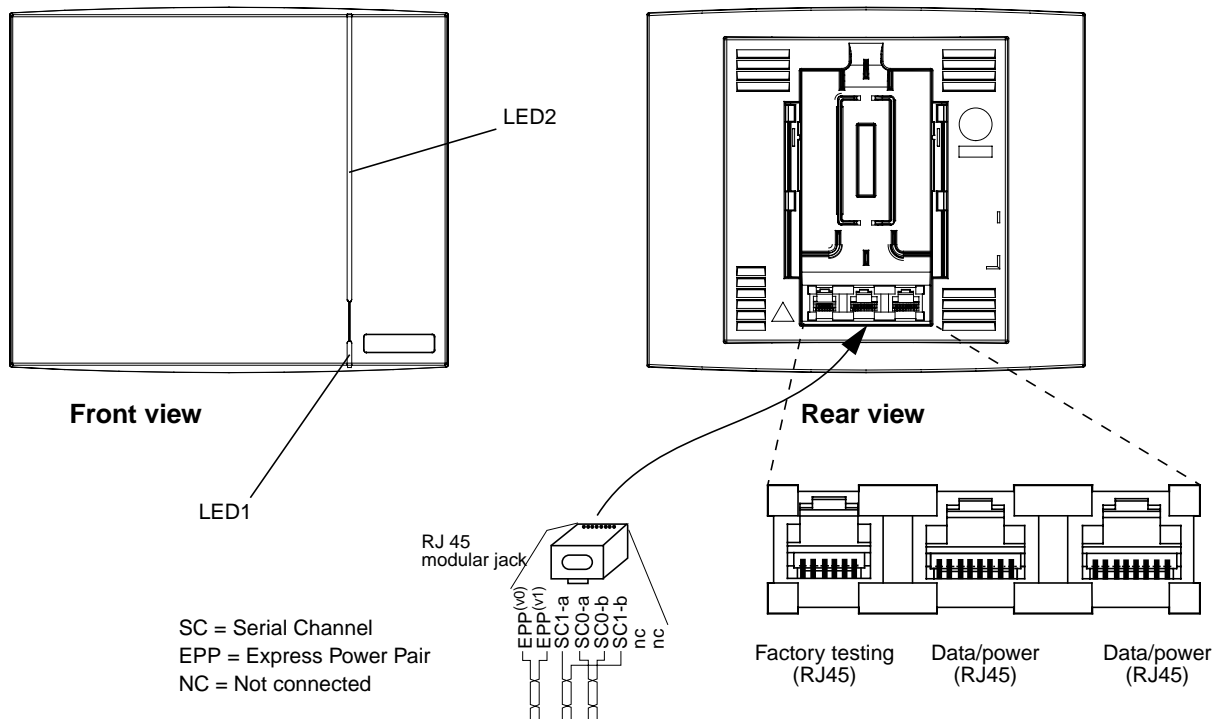
LEDs

Status of LEDs	Meaning
Power LED on (green)	BS power on
Reset LED on (red)	Power Fail/Reset
LED1 and LED2 on or LED1 and LED2 flashing	BS in non operational mode
LED1 and LED2 off	BS operational (no traffic)
LED1 off and LED2 on	BS operational (traffic)
LED1 on and LED2 off	Fatal software error

Note:) If the Base Station (KRC NB 201 03/_) is accessible by persons other than trained personnel mount the cover (SDFNB 101101/_ or similar).

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7.4.6 Base Station (KRCNB 301 01/_)



The BS is connected to the radio exchange by means of a standard twisted pair cable. The BS is can be fixed to a wall, a ceiling, a pole or a beam, by means of the mounting bracket included. When fixing the BS to a wall or ceiling the included plugs and screws must be used. When fixing it to a pole or beam a (not included) strap a flexible metal band must be used.

Connectors

- Two 8-pin RJ45 modular jacks for data and powering
- A 6-pin RJ45 modular jack for factory testing

The two data/powering connectors are interconnected on the board.

LEDs

- LED 1: Green power LED
LED 2: Three colour LED, see table below

Status of LED2	Meaning
Off	Base station operational and no traffic on the base station
Green	Base station operational and traffic on the base station
Red	Base station is malfunctioning
Amber	Base station is OK, but not available (self-test, not initialized, no communication with radio exchange)
Flashing green	All 8 channels are in use
Flashing amber	Software is being downloaded to the base station

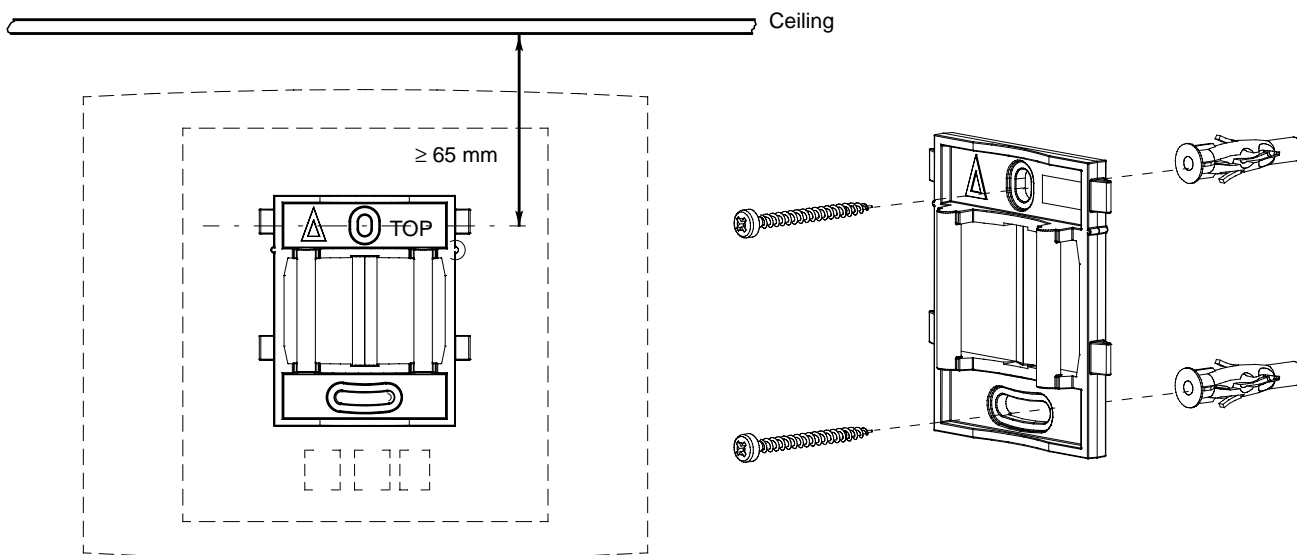
Prepared	Subject responsible	Documentnumber		
		1531-BDV BS 101 01 Uen		
Doc respons/Approved	Checked	Date	Rev	Reference
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The BSs can be mounted vertically or horizontally. Mount the BSs at places and positions as determined in the system configuration plan. The BS must be placed such that it is not facing large metal objects such as large heating pipes, machines.

Fixing the mounting bracket to a wall

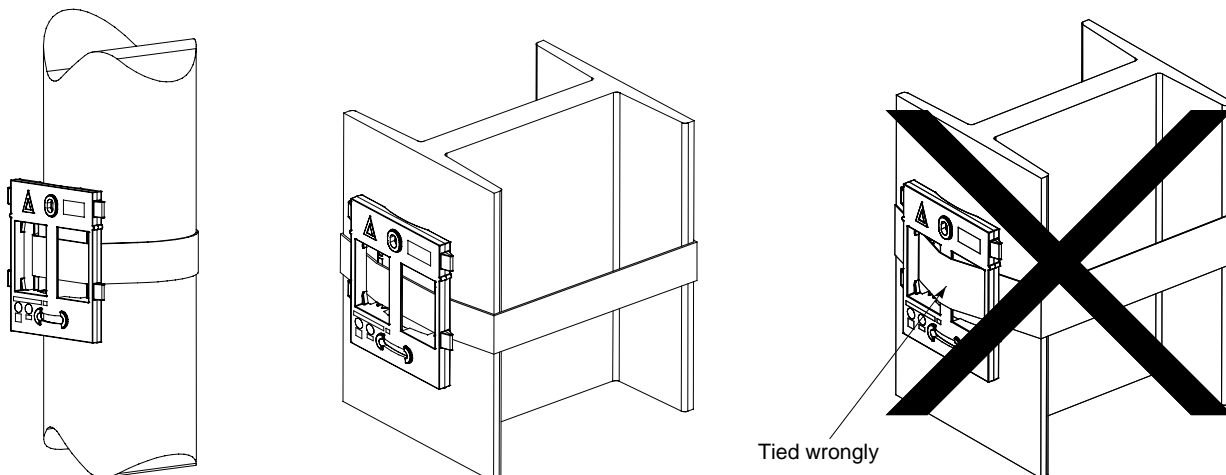
Fix the mounting bracket (see figure below) to the wall as follows:

1. Hold the mounting bracket with its flat side against the wall such that the text 'TOP' is the right way up, and mark the two holes. The minimum distance between the upper hole and the ceiling or any object above the BS must be as least 65 mm. If the distance is less than 65 mm, the BS cannot be slid onto the bracket.
2. When using wall plugs, take a \varnothing 6 mm drill and drill the two holes and insert the included wall plugs.
3. Position the mounting bracket with its flat side to the wall and fasten it with the two included \varnothing 3.5 mm screws.



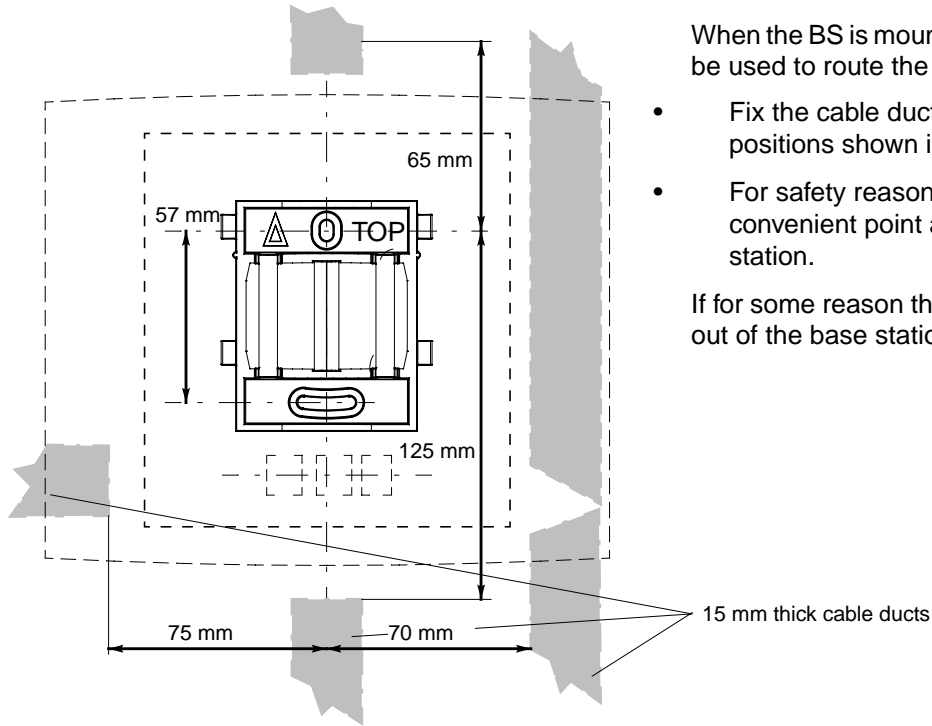
Fixing the mounting bracket to a pole or beam

The mounting bracket can be fixed to a pole (diameter \geq 45 mm) or a beam (wider than 50 mm) by means of a strap or flexible metal band less than 30 mm wide. Fix the mounting bracket to a pole or beam such that the text 'TOP' is right way up. The strap or flexible metal band must be purchased locally.



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Cable ducts



When the BS is mounted to the wall, cable ducts can be used to route the wiring through.

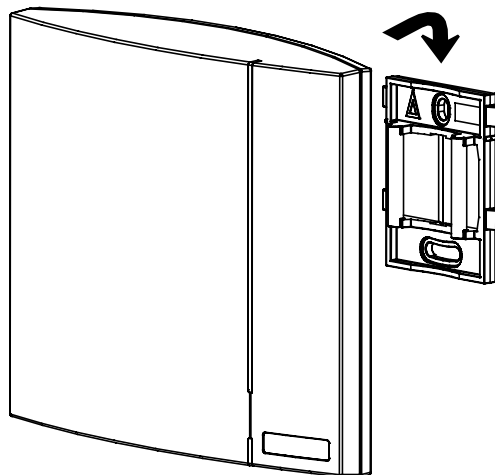
- Fix the cable duct to the wall in one of the positions shown in left figure.
- For safety reasons secure the BS cable to a convenient point at about 30 cm from the base station.

If for some reason the BS drops, the cable is pulled out of the base station.

Mounting the Base Station

1. Hold the BS flat against the mounting bracket and move it downwards until it clicks.

Note: After completion of the installation, base stations must be initialized using the cordless system manager.



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7.4.7 Power Feeding of Base Stations

When using any of the adapters mentioned below care must be taken to configure the IC-CU2 boards for local BS feeding. If the BSs are to be fed locally the remote power feeding switch on the boards should be set to the position disconnecting the feeding from the back plane and no external feeding to the board should be connected.

Adapter for Base Station (KRCNB 201 03/_)

An AC-adapter to feed the BS locally is available for 230VAC/24VDC (BMLNB 101 04) for all European countries except UK and Cyprus. In other countries this has to be purchased locally and must meet the specifications given below:

Output voltage: between 12 V and 56VDC
 Output power 7,5W minimum

Adapter for Base Station (KRCNB 301 01/_)

The 24 VDC adapter (BMLNB 101 09/n) is fitted with a 8-pin RJ45 plug that can be plugged into one of the data/power connectors of the base station.

7.4.8 Software upgrade

If necessary, the software in the BS can be updated by downloading new software to the BS. Downloading can be performed without disconnecting the BS. The new software is stored in flash memory.

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8 LINE NETWORK

The line network for PBX-extensions is to be installed in accordance with the stipulations for standard telephone networks. Twisted pair cables must be used for the lines and a wire diameter 0.5 mm is recommended in order to reach full line length, i.e. 800 m.

No stubs and/or branches may exist on a digital extension lines, as they could cause transmission problems.

- The network lines are to be connected directly to the internal Krone MDF with prefabricated cables (TSR BS 902 0001/800) leading to the boards.
- In case a separate Ericsson MDF has to be installed, prefabricated cables are used between the MDF and board connectors in the exchange cabinet.
These cables have EURO-connectors mounted at one end for connection to the board.

For connection of ELU-A, ELU-D, BTU-A, BTU-C or BTU-E to the internal MDF use the following cable:

- TSR BS 902 0001/800 is terminated on the board side with standard Ericsson connectors and Krone connectors on the other side.

For connection of ELU-A, ELU-D, BTU-A, BTU-C or BTU-E to a external MDF use following cables:

- TSR 902 0472/3 (length = 6 m) is equipped with connector only at the exchange side
- TSR 901 0472/2 (length = 15 m) is equipped with connector only at the exchange side

For connection of BTU-D, use the following cable:

- TSR 225 1304/20000, 75 Ω coaxial cable
- or use the same cable as for BTU-A for 120 Ω connection or a double shielded cable TSR 901 0481/20000 (adhere to local requirements).

The cables run into the exchange from below the cabinet.

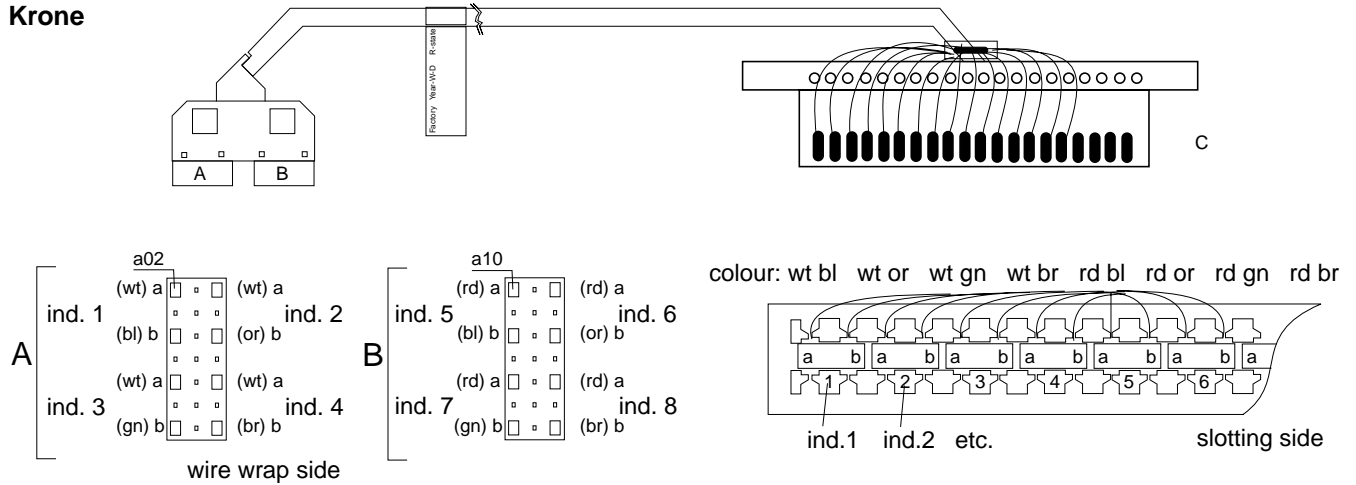
The cables from the line network are led directly to the MDF in the exchange cabinet.
Secure the cables to the exchange cabinet with the adhesive anchors and bundling cord.

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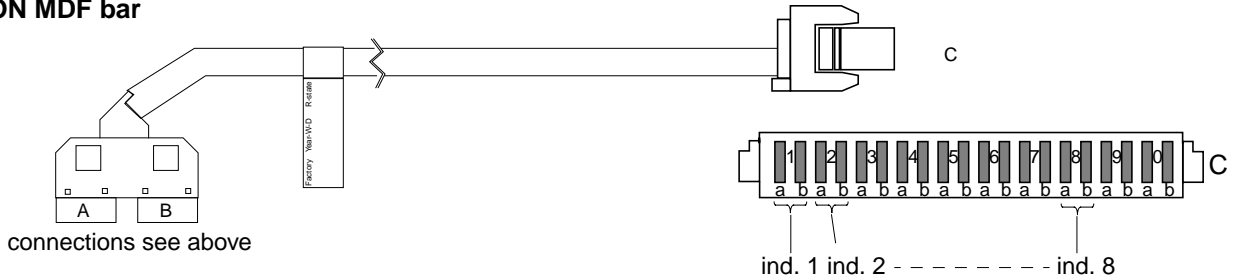
8.1 Cables for BDV 113 08

8.1.1 MDF cables

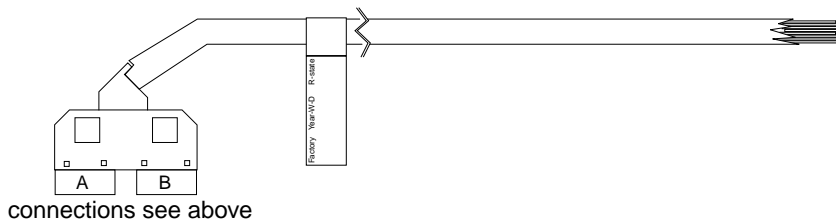
Krone



ERICSSON MDF bar



Open ends

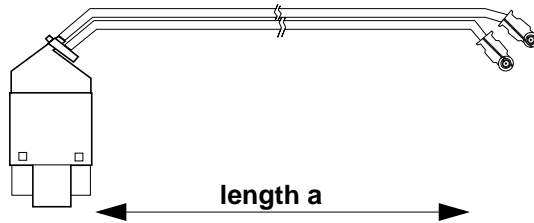


← length a →

part number	a	usage	Cable with 8 pairs, mounted with:
TSR BS 902 0001 /800 /1500 /3000	800 mm 1500 mm 3000 mm	standard cable for integrated MDF standard cable for external MDF MDF cable for existing MDF	ERICSSON plug and Krone bar.
TSR 902 0444/1 TSR 902 0444/2	1500 mm 3000 mm	standard cable for external MDF standard cable for external MDF	ERICSSON plug and ERICSSON MDF distribution bar
TSR 901 0472/3 TSR 901 0472/2	6000 mm 15000 mm	for external MDF, 120Ω for BTU-D standard cable for external MDF	ERICSSON plug and open ends

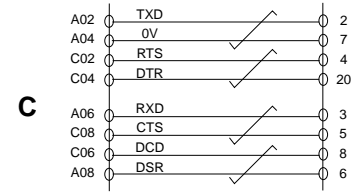
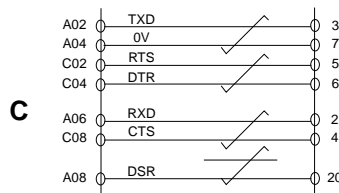
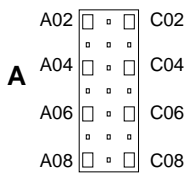
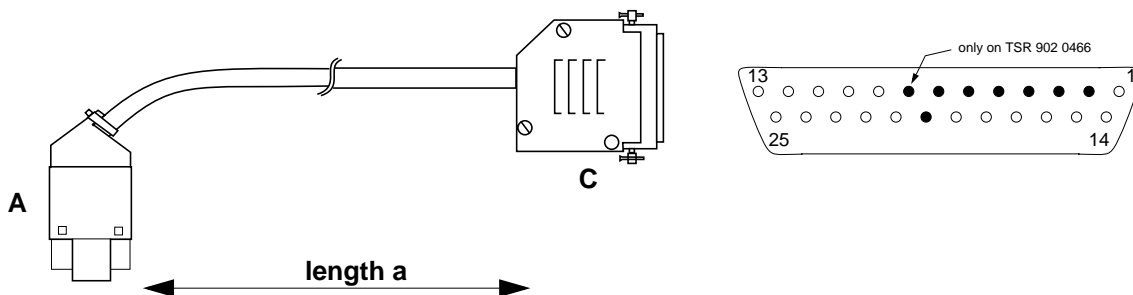
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		1531-BDV BS 101 01 Uen		
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8.1.2 Coax cable for BTU-D



part number	a	usege
TSR 225 1304/20000	20000mm	coax cable 75 Ω for BTU-D

8.1.3 V.24 cables



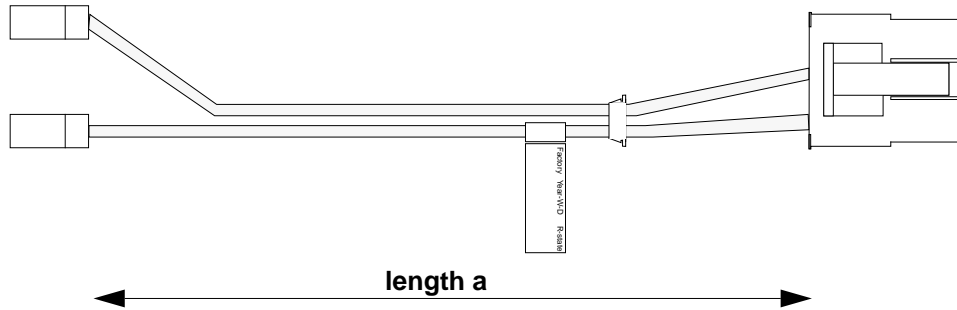
Wiring of cables: TSR 902 0476
TSR 902 0448

Wiring of cable: TSR 902 0466

part number	a	usege
TSR 902 0448/1	5000mm	cable connecting a PC to CPU-D_/AUX
TSR 902 0466/1	5000mm	cable connecting a modem to CPU-D_/AUX
TSR 902 0476/1	5000mm	cable connecting a printer to CPU-D_/AUX

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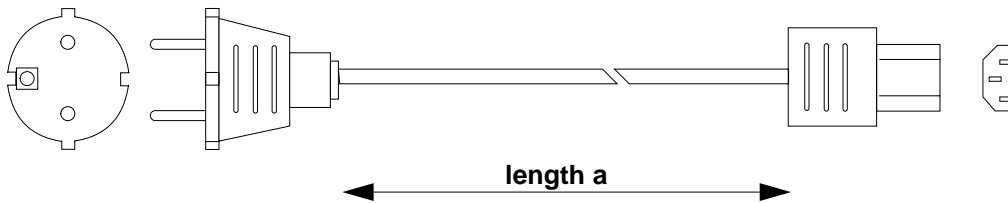
8.1.4 Battery connection cable



part number	a	usege
part of NTM BS 101 02	230mm	Battery connection cable

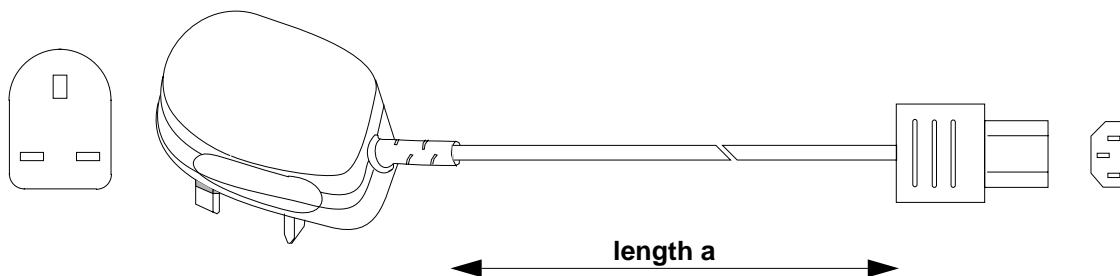
8.1.5 Mains power cables

Cable for EUROPE



part number	a	usege
RPM 945 323	2500mm	mains power cable 230V 10A

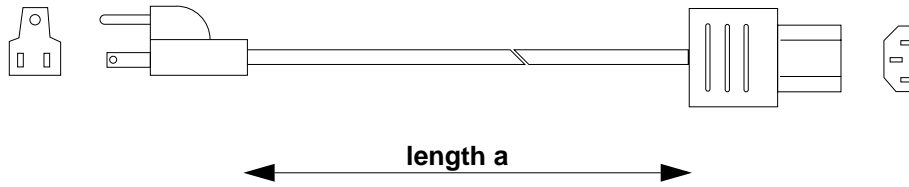
Cable for U.K.



part number	a	usege
RPM 945 326	2500mm	mains power cable 250V 10A

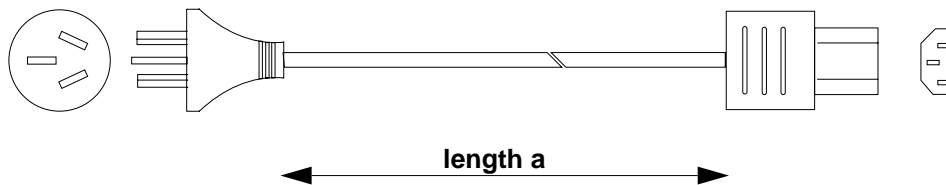
Prepared	Subject responsible	Documentnumber		
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Cable for Brazil, Mexico, Venezuela etc.



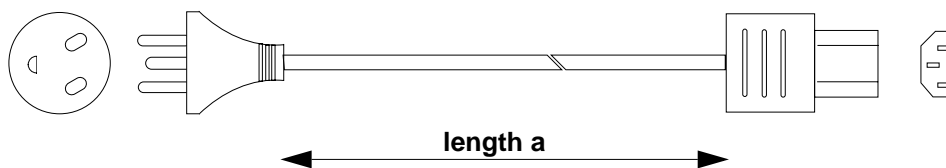
part number	a	usege
RPM 945 324	2500mm	mains power cable 125V 10A

Cable for Australia, New Zealand, China etc.



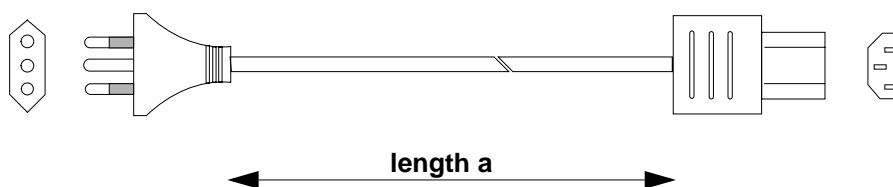
part number	a	usege
RPM 945 311	2500mm	mains power cable 250VAC 10A

Cable for Denmark



part number	a	usege
RPM 945 327	2500mm	mains power cable 250VAC 10A

Cable for Italy

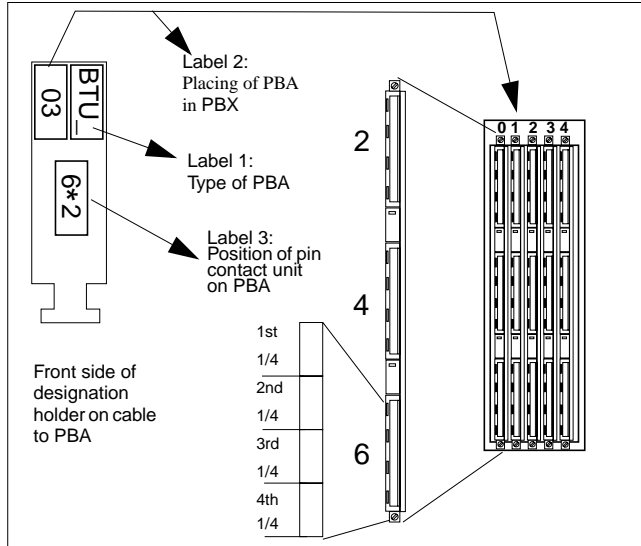


part number	a	usege
RPM 945 313	2500mm	mains power cable 250VAC 10A

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9 MARKING OF CABLES

Each cable that is connected to a PBX type ASB 150 should be marked on the cable's designation holder with the label set SVH 277 003/4, supplied for this purpose. The cable TSR 902 0444/1 is supplied with a designation holder, 860 1839, at the EURO-connector.



This label set contains three label types:

Label 1: This label indicates the abbreviated name for the PBA to which the cable is to be connected.

Example of parameter: **BTU_**

Label 2: There is one 2-digit parameter. This parameter indicates the position of the PBA-slot in the PBA where the cable is to be connected.

Example of parameter: **03**

Label 3 There are two 1-digit parameters. The first parameter indicates the position of the pin-contact unit on the PBA. The second parameter indicates the 1/4 of the pin contact.

Example of parameters: **6*2**

These three labels indicate where the upper part of the cable is to be connected and are placed on the front side of the designation holder.

When the **label 1** for PBA has a "_" included in the name, please enter the correct letter with a marker pen.

10 INTERNAL MDF (Main Distribution Frame)

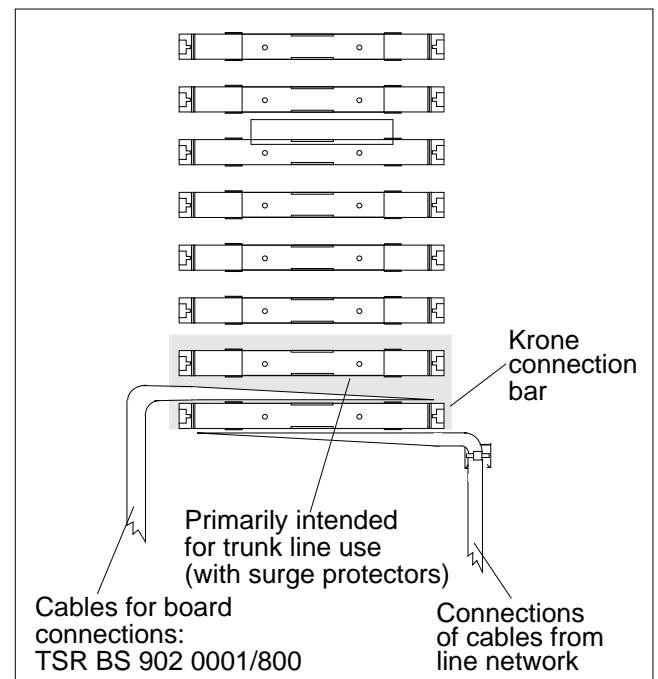
The BDV BS 101 01 is factory equipped with a Krone snap-in holder accommodating a maximum of 8 Krone connectors, which can be snapped-in if desired. Use pre-fabricated MDF cables (TSR BS 902 0001/800) to connect the boards in the swivel shelf with the MDF. The bottom row is intended for interconnections, e.g. earth connection of the BTU-A_ to the incoming PTT earth wires or connections to the CPU I/Os. The Krone connector above is reserved for the trunk lines that can be equipped with surge protection.

Be sure to fasten the cable clip at the bottom of the swivel shelf after installation before mounting the cover of the swivel shelf.

An additional MDF holder is available and orderable that can be mounted within the exchange in the space provided for the battery case.

Place the cables according to the figure below. Secure the cables to the MDF cabinet with adhesive anchors and bounding cord.

NOTE: There **must** be a ground connection for the MDF cabinet when surge protectors are used.



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11 Door Interface Unit (DIU) (BFY BS 10101/1)

Installation:

The DIU is an interface connected via one or two extension lines to the ELU-A of the exchange and via a set of wires to the door phone. The DIU should be mounted indoors on a dry wall. The door phone can be of any commercially available type as long as it meets the requirements listed in the [1555-ASB15002Uen SYSTEM OVERVIEW](#) under section 7 Technical Data for DIU.

Connection:

The wires to the speaker and microphone should be via two twisted pairs in a **separate** cable. Caution when connecting a polarity dependant microphone check polarity on connector **x1**. In another cable make the connections to the door bell button, door opener and key lights etc. This is to minimise disturbances on the microphone line. The wires to the door opener carry more current and should have a diameter greater than 0,6 mm. The length between door phone and DIU should be less than 50 m. The length between door phone and exchange should be less than 500m.

The connector **X18** is used for speech connection between DIU and exchange. The connector **X17** is used to activate the door opener. If the door opener wiring already exists the **X17** connection can be omitted and the connection **X12** leads to an existing button.

Pressing the door phone button (connection **X5**) activates the DIU and the programmed extension rings (see [Facility Description 15534-ASB15002Uen](#)). The interface stays active for the preset time selected under "**C**" and shuts off after this time has elapsed.

11.0.1 Adjustments of DIU

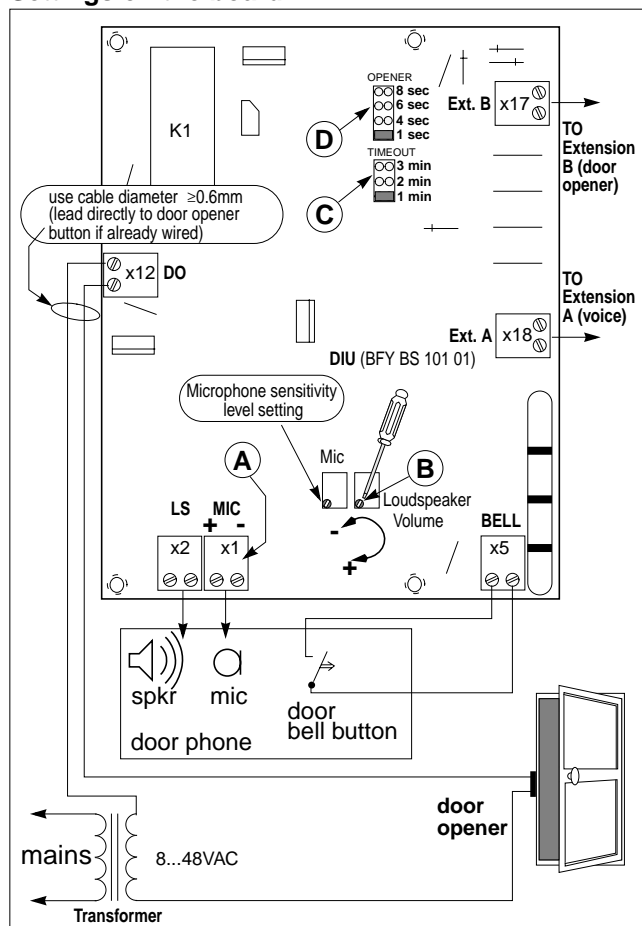
The microphone level is factory set but under certain conditions the line attenuation can exceed expectations resulting only in one way speech connection or clipping of the voice between extension and door phone. In this case **cautious** change of microphone level setting has to be performed. The potentiometers range is

- If the voice in the speaker of the door phone sounds too dim or is clipped turn the **mic** potentiometer screw two turns counter clock wise. Speak into the telephone microphone and verify that the speaker

sounds loud enough and clear otherwise repeat the procedure.

- No voice connection to the speaker of the telephone. Turn the **mic** potentiometer screw two turns clock wise. Speak into the door phone microphone and verify that it is heard in the hand set of the telephone otherwise repeat again.

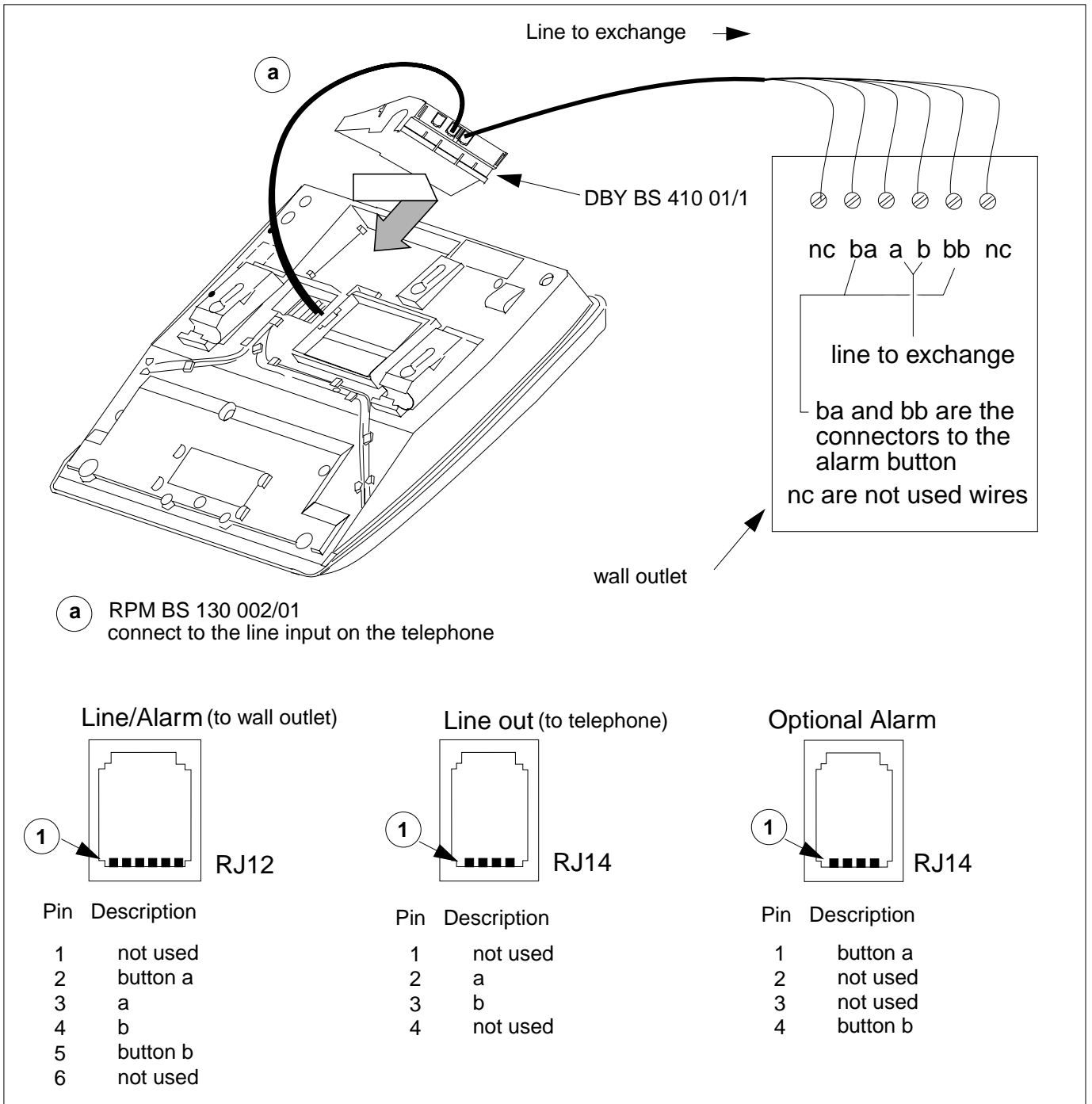
Settings on the board



- Ⓐ Microphone connection with polarity dependent 6 VDC supply for microphones with amplifiers.
- Ⓑ The loudspeaker volume level is factory set. To adjust turn the Loudspeaker potentiometer.
- Ⓒ Timeout for the interface to shut off. The jumper selects intervals between 1...2...3 minutes.
- Ⓓ Set door opener activation time 1...4...6...8 sec.

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12 INSTALLATION OF ALARM INTERFACE UNIT



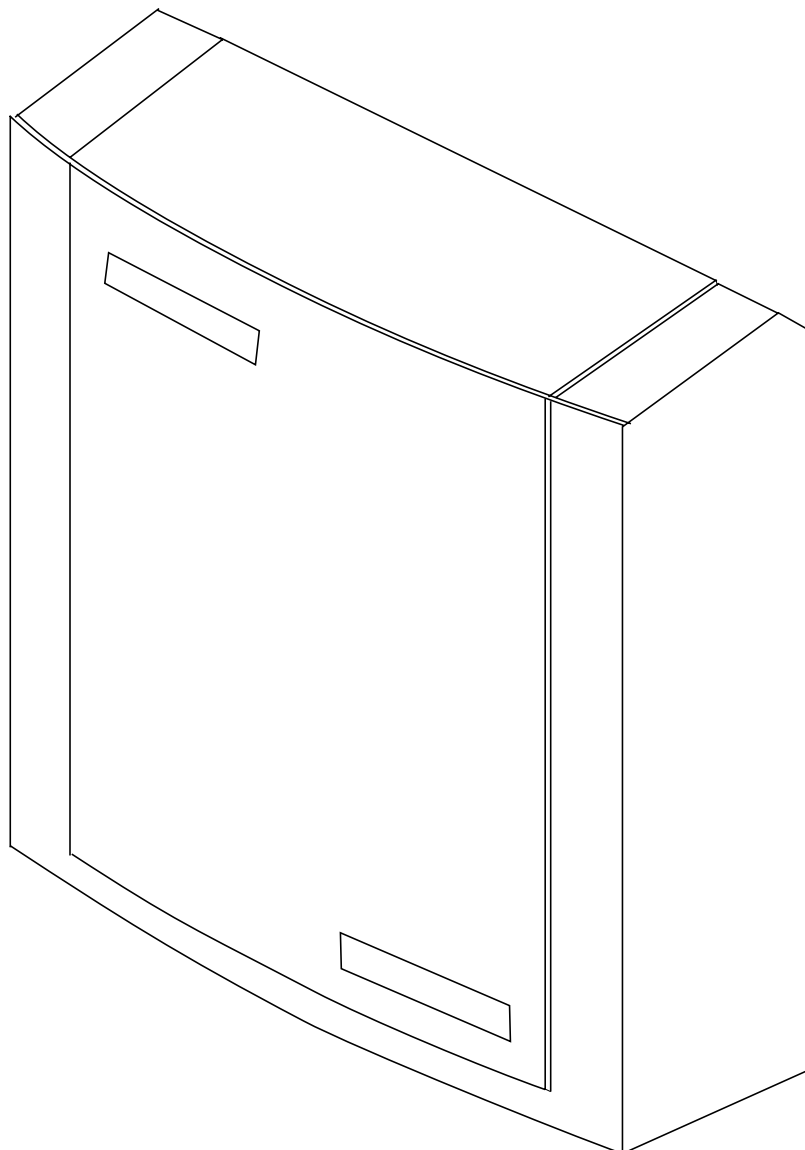
The ALARM INTERFACE UNIT is an optional equipment mounted in the case bottom of the DBC 21x telephones. This equipment is used in the hospitality area to enable distress notification from e.g. a bathroom. A normally closed switch is installed and the two terminals are connected to the pins (button a and button b) on the option unit. The connection can be made in the wall outlet then the wiring shown above applies. In case of another type of wiring the connector Optional alarm can be used.

Prepared SEA/EBBMP Stangelberger	Subject responsible SEA/EBBX/F	Documentnumber 1531-BDV BS 101 05 Uen	
Doc respons/Approved SEA/EBBMP	Checked	Date 1999-07-15	Rev A
		Reference ASB 150 02	
Database reference 1531-BDVBS10105Uen-1-A.emf			

INSTALLATION INSTRUCTION

EXCHANGE CABINET

BDV BS 101 05



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1 GENERAL

Exchange cabinet BDV BS 101 05 is designed to be furnished with Printed Board Assemblies (hereafter = boards or PBAs) belonging to ERICSSON's PBX-system ASB 150 02. System functions, desired by the customer, are realised with appropriate boards and system programming.

The PBX is powered by a switched mode power supply (SMPS) that is available for two voltage versions. The standard version is an AC/DC converter. The version with battery charger offers the same facility but additionally provides battery back-up or can be powered by an external DC-source.

Due to the limited load of the cabinet's power supply units, the definitive board configuration in a cabinet must follow the prerequisites in [section 6.3](#).

After installation the PBX shall be made operational in accordance with the stipulations that apply for system ASB 150 02. See document [START OF OPERATION \(1537-ASB 150 02\)](#). The cabinet is adapted for boards fitted with brackets containing screws. Only boards equipped with these brackets must be installed. These screws must always be fastened to ensure a proper ground connection.

Every cabinet's board position could be used for arbitrary furnishing with boards belonging to PBX system ASB 150 02 but the first position in the first cabinet must be reserved for the CPU-D_.

It is advisable to protect trunk lines with extra overvoltage protectors, especially in geographical areas that are highly exposed to lightning.

Any lines connected to the PBX that are subjected to excess voltage (transients) in conjunction with e.g. lightning discharges must be equipped with excess voltage protection, refer to figure: Line protection. The excess voltage protection can not be installed inside a BDV BS 101 05 cabinet but should be mounted in an integrated or external MDF.

Special precautions must be taken to analogue extension lines that are led outdoors, in order to prevent the analogue extension boards secondary protection device from blowing in case of lightning.

Each branch on the extension line must have:

- 1 A protective resistor of 10 Ω /1W (REN 195 42/1) connected in series between cabinet and MDF
- 2 An overvoltage arrester (gas discharge tube) for quenching surges to protective ground should be installed on the network side of the protective resistor.

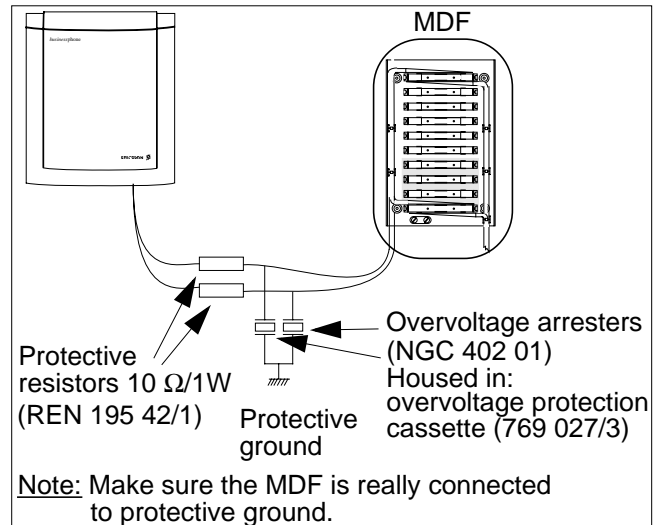


Figure: Line protection

1.1 Supplementary documents

- Document collection EN/LZB 103 1233
- [INSTALLATION INSTRUCTION \(1531-BML BS 101 01\)](#) for the power supply, equipped with battery charger

1.2 Tools

In addition to customary installation tools, the following is recommended:

- Use the appropriate connection tool 769 027/2 to connect the cables in the internal MDF.
- Use the appropriate slotting tool LSY 138 252 to connect the cables to the external MDF SXK 106 4139/1.
- Board extractor for PBAs (handle LTD 117 02 and bottom LTD 117 12)

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2**DECLARATION OF CONFORMITY**

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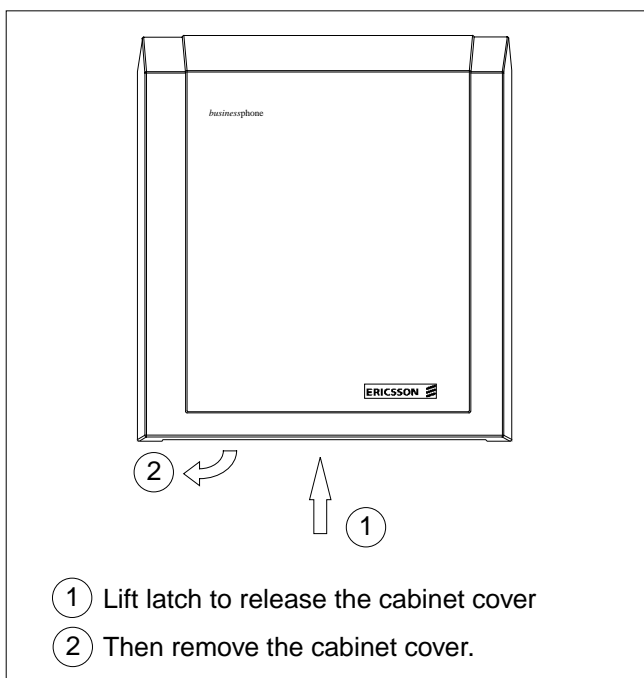
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3 HOW TO OPEN THE CABINET

Unpack the exchange cabinet.

Check that everything has been received according to the delivery note and that nothing has been damaged during the transport.

The cabinet cover is latched. To open reach inside the center cable duct from below and push lever up gently to unlock then remove the cabinet's front cover. For details of the bottom view of cabinet see page 8.



Overall dimensions of the cabinet:

- 400 x 500 x 155 (H x W x D in mm).

4 INSTALLATION

The PBX can be delivered as a customer configured unit or the add-in boards can be delivered separately. The cabinet is always equipped with a power supply, suitable for the local mains. Please check the label stating the permitted mains voltage. The cabinet is to be mounted on an indoor wall. A mains outlet must be provided near the equipment and shall be easily accessible. Connection to earth (refer to 4.2) is necessary for safe operation to discharge lightning strikes. The premises shall comply with the following prerequisites:

- The air shall be free from dust and smoke
- Environmental conditions according to ETS 300 019 (1-4) (Temperature shall be between + 5 °C and +40 °C and relative humidity may vary between 15% and 80%)
- The PBX shall not be exposed to direct sunlight

4.1 Mounting of the cabinet

Attach the proper label at the bottom of the cabinet before hanging up the cabinet (refer to section 4.2 on page 7 for the position). The label must comply to the SMPS installed and the local mains voltage level.

The cabinet's wall mounting plate is located on the rear of the cabinet during transport. Take into consideration the normal working height above the floor (about 1.30 m to the lower edge of the cabinet) and leave enough room for access on both sides of the cabinet. To pull out the cabinet's wall mounting plate remove the screw C below the swivel shelf (refer to next page). Then position the mounting plate where you want to mount the cabinet, mark and drill three 8 mm holes. Insert the enclosed wall plugs and screw tight the cabinet's wall mounting plate.

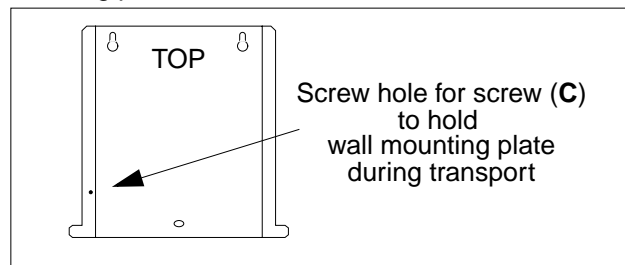


figure: wall mounting plate

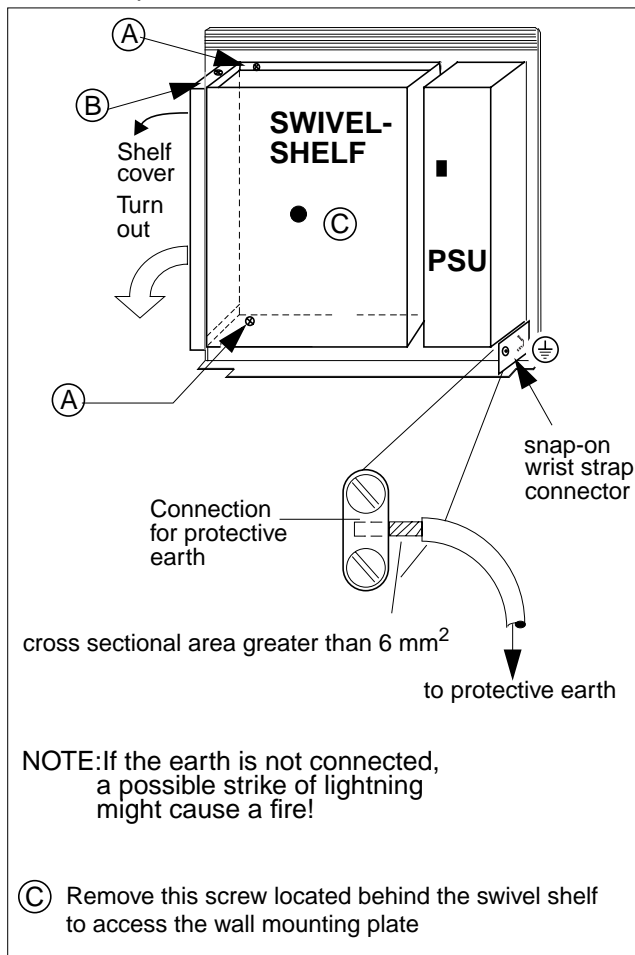
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4.2 Safety and EMC

To fulfil electrical safety requirements IEC 950 and EN 60950, the exchange must be connected to protective earth via a flexible wire with a cross sectional area of at least 6 mm².

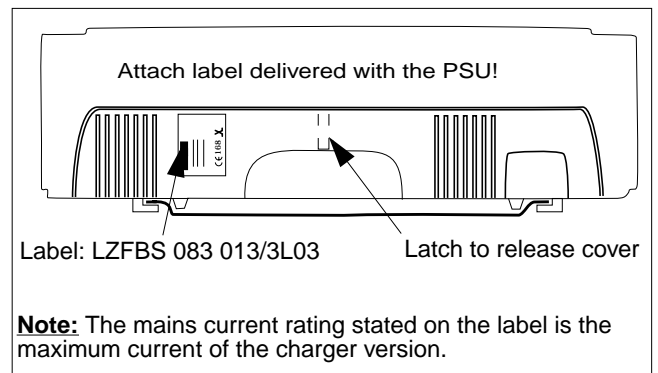
Local requirements shall be adhered to.

The electrical connection must be carried out by authorised personnel.



Before operating, make sure that the chassis is connected to a hard-wired protective earth.

Note: The wrist strap must have a 1MΩ series protection resistor to comply to the safety standards. If this resistor is missing, then accidentally touching live wires can be lethal.



Bottom view of cabinet BDV BS 101 05

All line interfaces in the PBX are protected in accordance with K.21 (voltage transients up to 1.5 kV).

BTU-A, BTU-A2, BTU-B, BTU-C, BTU-D, BTU-E and MFU are working with interface TNV.

All other boards and the V.24 port work with interface SELV.

4.2.1 EMC

The ferrites, with the ERICSSON ordering number STF 82 601, should be situated close to the slot where the cables are led out of the cabinet. Two turns through the ferrite core are sufficient to comply with EN 55022 Class B and to avoid disturbances in non-industrial, residential (home) usage.

4.3 Access to the boards

NOTE: Make sure that a sound ground connection to the exchange has been established. Otherwise this can be hazardous in case of lightning. Use a grounding wrist strap when handling PBAs sensitive to electrostatic discharges.



Turn out the transport screws (A) about 1 cm at the top and bottom of the swivel shelf. See figure in [section 4.2](#). Hold the bottom of the shelf, lift the shelf slightly and turn the swivel shelf counter clockwise (ccw). Turn the screw (B) two turns at the top of the shelf cover and remove the cover.

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5 POWER SUPPLY UNIT

The SMPS for the cabinet are AC/DC switch mode power supplies complying to ETS 61 000-3-2 (power factor correction but only for the 230V version) for two mains voltages. Please check whether the label states the proper mains voltage as required. For mains with 230V to 250V AC, two versions are available:

- **BML BS 101 02/1** (PSU 230V standard)
- **BML BS 101 01/1** (PSU 230V equipped with battery charger).

For mains with 115V to 127V AC two versions are available:

- **BML BS 101 02/2** (PSU 115V standard)
- **BML BS 101 01/2** (PSU 115V equipped with battery charger).

The PSUs deliver 30 W on the PBA supply voltages and 101 W on the 48 V supply voltage.

Warning: The power switch does not disconnect from mains. The mains cord must be unplugged to disconnect the mains.

The PSU is equipped with a mains fuse rated
250VAC 6,3 A T.

NOTE: This fuse NGH 258 03/630 can be ordered from Ericsson but is a non-accessible and non-user serviceable part. **Only authorised personnel is allowed to change the fuse.** Contact the local supplier in this matter.

Battery backup time

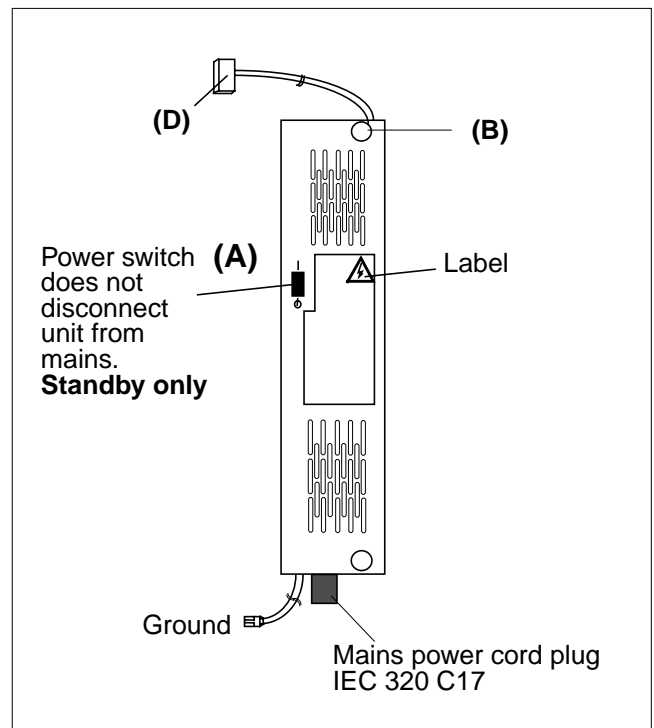
The power consumption of the telephones and base stations on the 48 V should be less than 2.1 A for all PSU types. The batteries in the integrated battery case have a capacity of 2Ah. Using fresh batteries, a backup time of 20 minutes is guaranteed and depending on the system configuration even longer backup times might be achieved.

5.1 Replacement of the power supply unit

On delivery the PSU is already installed in the cabinet. The procedure of how to dismount the unit is described below.

- Switch off the PSU (A) and unplug the mains from the wall outlet. If the unit is a PSU with battery charger, disconnect the DC supply line to the batteries and unplug the alarm connector on the unit.
- Disconnect the DC supply cord (D) from the swivel shelf.
- Unscrew the transport screw (B).
- Push the PSU from the bottom and turn out the PSU clockwise, unhinge and take it out. Then pull off the mains plug at the bottom of the PSU and disconnect the ground wire.
- Install the PSU in the reverse manner.

When installing a power supply unit with battery charger and the backup battery, please refer to the [INSTALLATION INSTRUCTION \(1531-BML BS 101 01\)](#).



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5.2 Power feeding with an external DC supply

When the PBX is supplied with power by an external battery with 48V nom. (44 - 56V), the installation of a power supply equipped with a battery charger (BML BS 101 01/_) is required. The DC supply is connected directly to the PSU.

An externally accessible fuse 250VAC 6,3 A T is provided on the PSU, but additionally a fuse must be installed in the supply line with DC current switching capability greater than 160 A.

Note: To prevent arcing never connect the DC source when the PSU has not started-up.

Use the mains to power up or use an external switch to connect the DC source. This is a precaution to minimise the contact loads on the plug. For further details see [INSTALLATION INSTRUCTION \(1531-BML BS 101 01\)](#).

As battery operation often requires different preconditions, only an overview can be provided with regard to battery capacity/charging capacity. The batteries should be supplied locally. The type is described in detail in [INSTALLATION INSTRUCTION \(1531-BML BS 101 01\)](#).

6 ALLOCATION

In principle, all board positions in cabinet BDV BS 101 05 can be used for arbitrary configurations with PBAs belonging to PBX-system ASB 150 02.

The boards are equipped with ground brackets on the top and bottom. Make sure to fasten the boards with the supplied screws during installation.

There are recommendations for configurations in order to simplify operation and maintenance. For further information see document collection EN/LZB 103 1233.

Sub-equipped boards:

Install sub-equipped boards in the last position after the standard boards to enable easy upgrading without having to re-number trunks and extensions.

6.1 Power supervision of ELU-A (ROF 157 5114/_)

The board is equipped with an automatic traffic limiter restricting the internal power dissipation on the board to a maximum of 12W. This depends on both the line length and the number of lines busy.

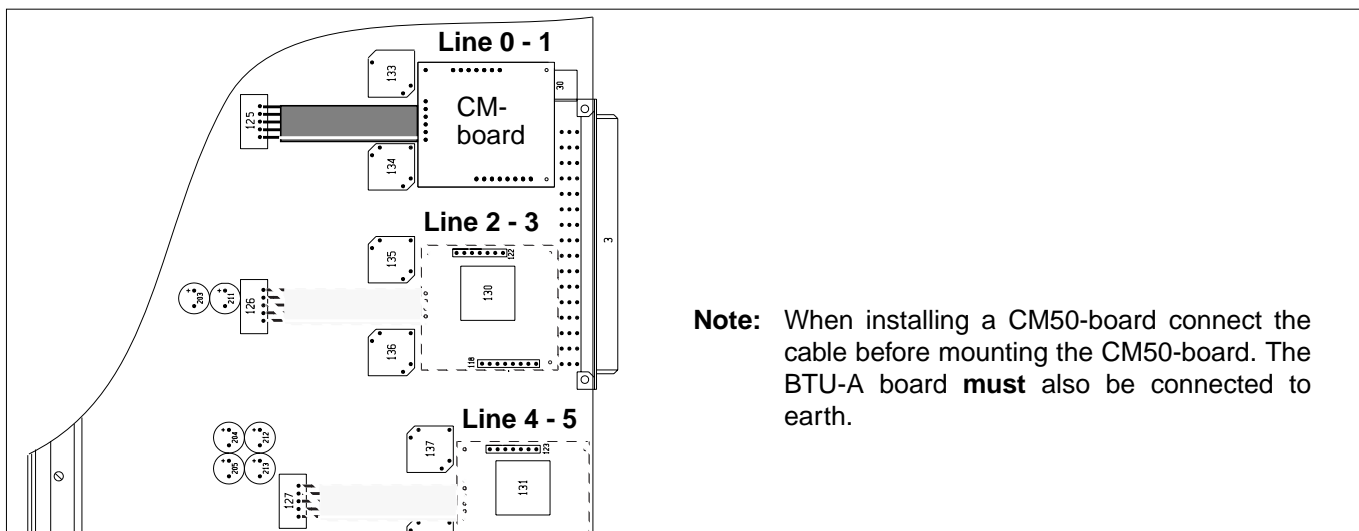
If the power consumption exceeds the limit, no further lines can access service, and at least two lines have to go on hook, for all lines to work normally again.

When connecting external voice systems a maximum of 8 lines are recommended on each board. The remaining lines on the board are to be connected to low-traffic extensions.

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6.2 Connection of CM-Boards

Connect the correct type of call metering board, according to the figure below, on BTU-A board ROF 157 5110/_ or ROF 157 5127/_ and in the same fashion on the BTU-C board ROF 157 5111/_ . The BTU-C cannot be equipped with a CM50 board as the flat ribbon cable cannot be connected and CM12/16 (ROA 219 5135/1).



The following boards are available CM50 ROA 219 5064/1, with flat ribbon cable and CM12/16 ROA 219 5135/1 or ROA 219 5062/1 without cable.

6.3 System Power Consumption

The power demand of the system comprises the sum of the current demands of all extensions, base stations etc. This total current has to be delivered by the power supply. Choose the one delivering the rated current with a suitable margin for add-on equipment depending on the installation site.

6.3.1 Base Station Power Demand

To minimise the power dissipation on the serial communication wires, EPP should be used extensively. Up to 4 BS can be connected to the IC-CU2.

The total 48 VDC current load of the BS on the power supply has to be calculated as follows:

Cable length	STD	EPP	STD	EPP
	0,5 mm Ø		0,6 mm Ø	
0m	104	104	104	104
100m	110	106	108	106
200m	114	110	110	108
300m	121	112	114	109
400m	129	115	118	110
500m		119		112
600m		121		114
700m		125		117
800m		129		118
900m		133		121
1,0km		139		123
1,1km		146		125
1,2km		152		127
1,3km		160		129
1,4km		171		131
1,5km		183		135
1,6km		204		137

This table states the current demand in mA for a Base Station depending on the cable length and cable diameter.

Calculation example:

Line length to Base Station: 200m
 Resistance of loop: 0.18 Ω/m
 Cable diameter (φ): 0,6 mm

Assuming 4 Base Stations are already connected they consume a current of: 440 mA

Power demand taken from Power Calculations below, for telephones: 984 mA

Total load on power supply: 1424 mA

This total load for the exchange can be supplied by the power supply as it is less than 2.1A.

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6.3.2 Extension Power Demand

TELEPHONES	CURRENT CONSUMPTION			TELEPHONES	CURRENT CONSUMPTION		
	Typ (mA)	Max (mA)			Typ (mA)	Max (mA)	
BASIC	DBC 210	14	35	OPERATOR CONSOLE	DBC 214	40	120
	DBC 199	25	35		DBC 663	67	110
ECONOMY	DBC 601	27	32	DBC 214 with 2 DBY 409 01		35	70
ECONOMY _{plus}	DBC 211	14	35	DBC 214 with 4 DBY 409 02*)		35	70
	DBC 201	30	50	ANALOGUE (in active state)		40	
STANDARD	DBC 212	14	35	TAU 2610		4	4
	DBC 202	30	50	Desktop Adapter			23
	DBC 631	65	70	BTU-B (S-interface per physical link)			50
EXECUTIVE	DBC 213	35	70	BTU-C index (/1,/2) 1)	(per trunk)	14	35
	DBC 203	35	70	Radio base station: refer to table above			
	DBC 662	70	73				
DBC 213 with 2 DBY 409 01		42	70				
DBC 213 with 4 DBY 409 02*)		35	70				

1) provides current on trunk lines in active state to public exchange.

The maximum values for telephones are reached when all LEDs are lit and if available, loudspeaking is on at max. volume.

*) with connected external power supply.

Power calculation example

LINE EQUIPMENT	QUANTITY	CURRENT (mA)
DBC 210	3	42
DBC 201	5	150
DBC 202	13	390
DBC 203	10	350
DBC 214	1	40
TOTAL	32	984

<u>Calculation example:</u>	
selected line equipment	{ <ul style="list-style-type: none"> 3 x DBC 210 5 x DBC 201 13 x DBC 202 10 x DBC 203 1 x DBC 663
	Total: 32 system telephones

The calculation above shows how to calculate the current demand for a given installation. This amount of current has to be supplied by the installed power supply.

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6.4 BTU-A (ROF 157 5110/_) and BTU-A2 (ROF 157 5120/_)

On delivery from the factory both contacts are in the **OFF** position, and the line is a normal trunk.

When both contacts on a DIP-switch are set to position **ON**, the line is to be regarded as a music source input.

Different contact positions are not allowed.

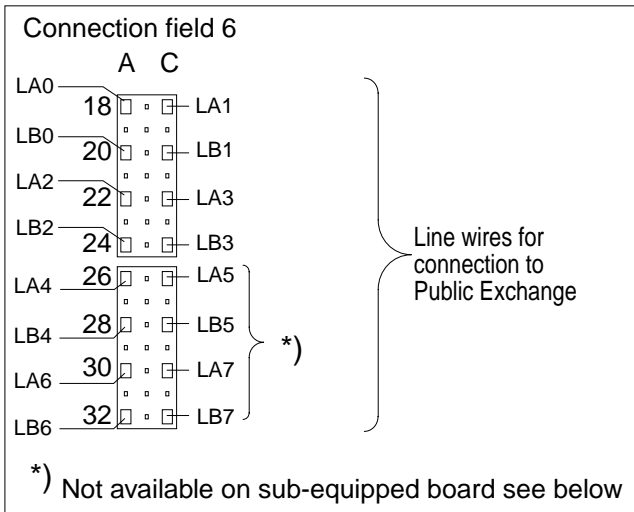
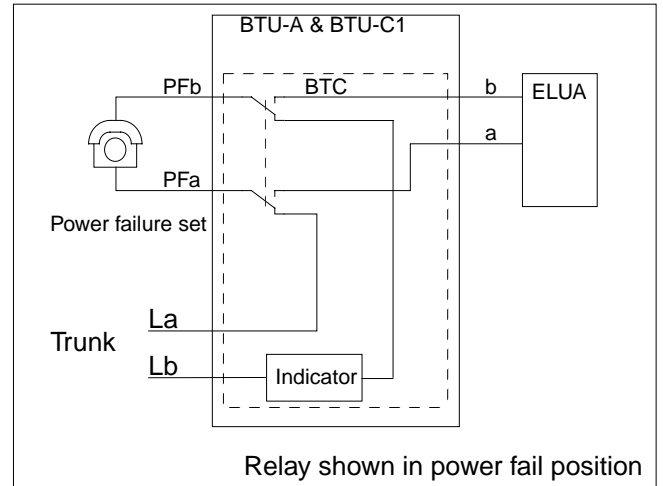
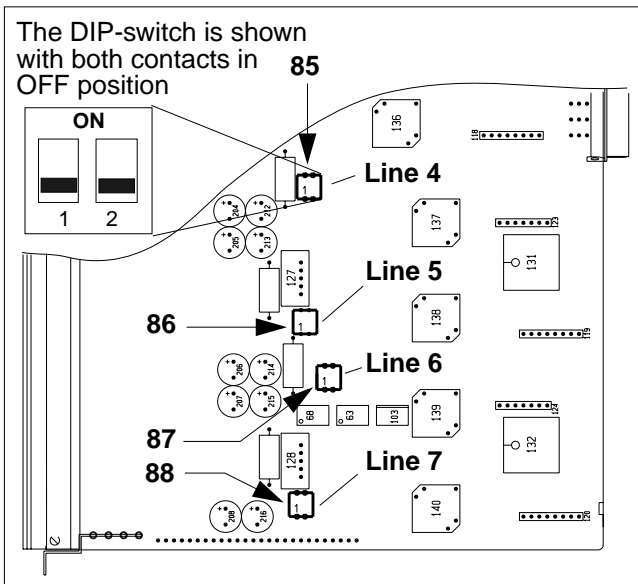
Note: Only lines 4 - 7 can be used as a music source input. Not available on BTU-A subequipped ROF 157 5127/_.

6.5 Power failure circuit (PFC)

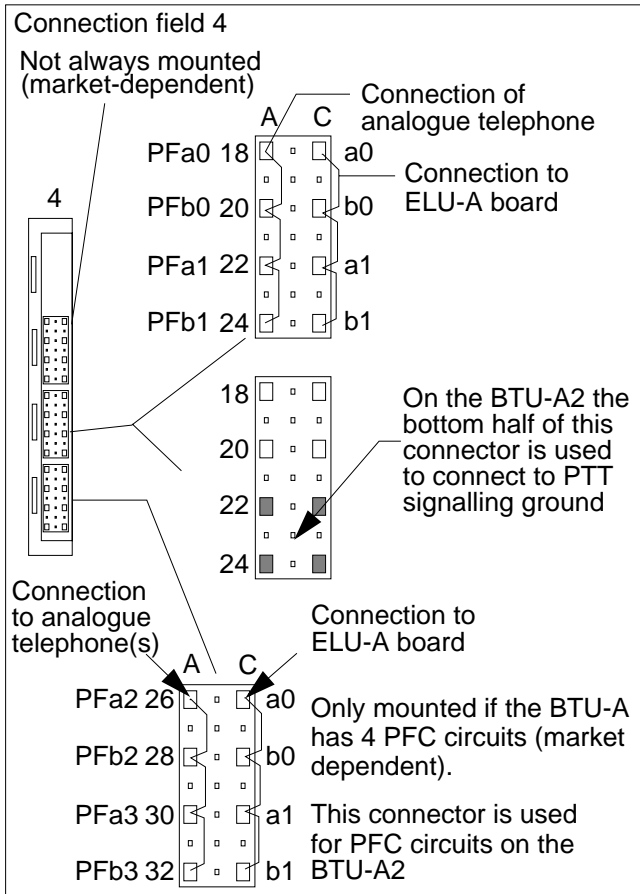
In the event of mains failure and if no battery back-up is available for the PBX, there are normally 2 lines on the BTU-A and BTU-C (see under BTU-C on next page) board which automatically switch the trunk lines to analogue telephones connected to this board.

On power failure, these telephones will automatically be connected to the public exchange.

It is also possible to use the power failure telephones during normal operation, if an ELU-A board is installed.



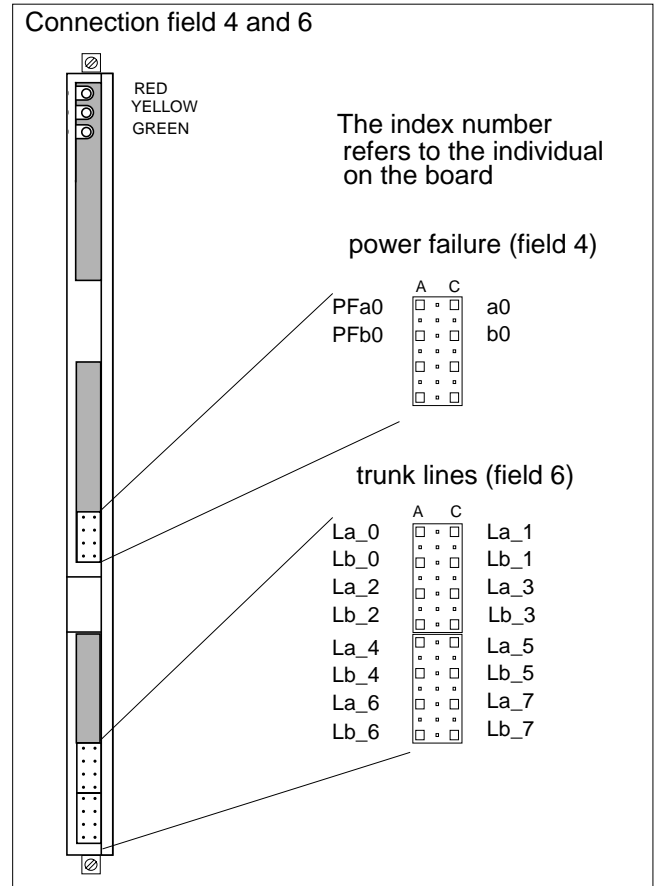
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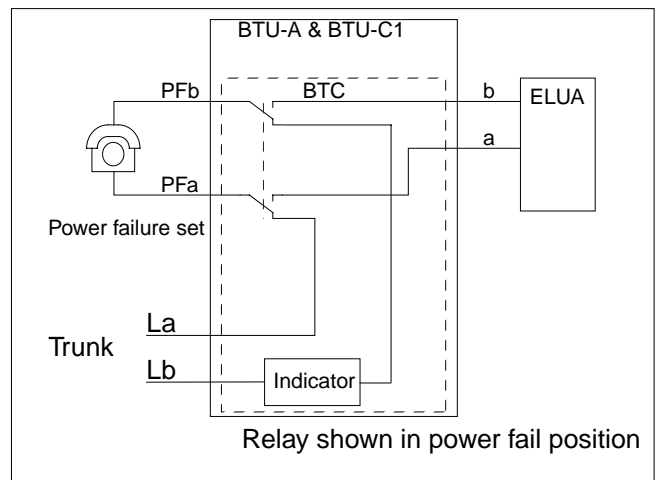
Earth connection on BTU-A2 (Austria only)

Some markets require an earth connection of the incoming PTT earth (functional earth) to the exchange. This is provided on the connector installed above the PFC circuit connector on pins A22, A24, C22 and C24. Use an extra Krone bar to connect the PTT earth wires to the wires going to the board connector.

6.6 BTU-C (ROF 157 5111/_)



The BTU-C (ROF 157 5111/1) features eight incoming trunk lines with DID. The first four individuals can also be used for outgoing traffic.

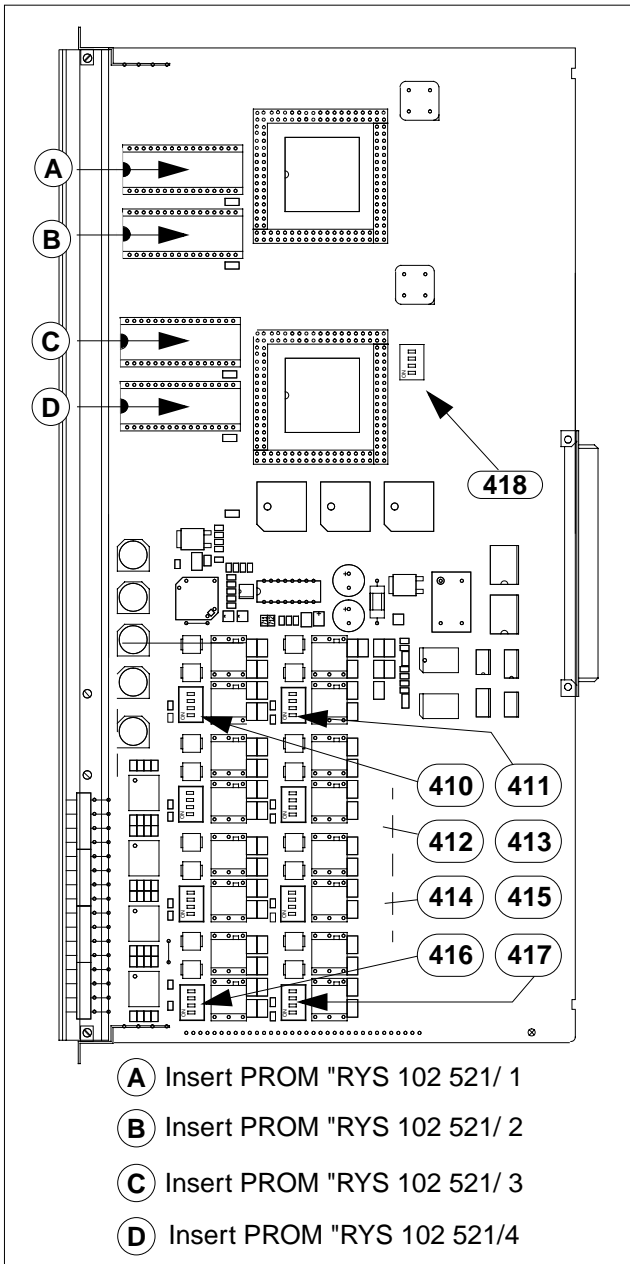


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6.7 BTU-B (ROF 157 5121/_)

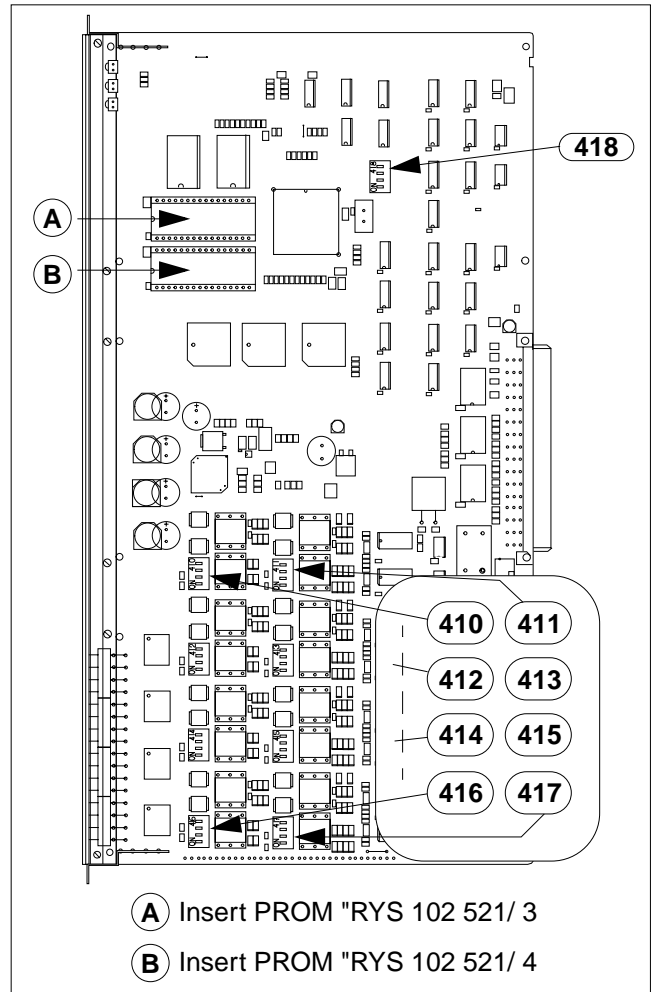
Applies for indices 1 and 3

The BTU-B provides connection for up to 8 physical links and every physical link can be configured as a S- or T-interface in point-to-point or multi-point mode. On the S-interface every link provides remote power feeding with 40V/50 mA = 2W and connection for up to 8 terminals.



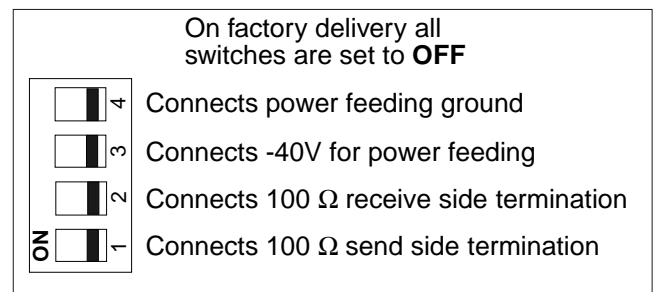
6.8 BTU-B2 (ROF 157 5121/_)

Applies for indices 4 and 5



DIP-switches position 410-417

These switches control S- and T-interface termination and S-interface power feeding on the link 0...7.



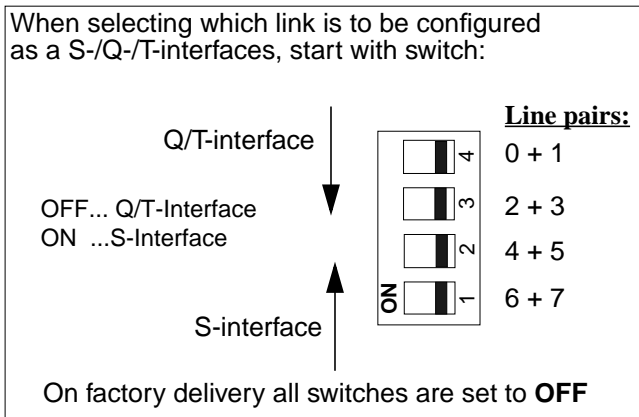
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Note: at the end of each line a termination resistor must be installed (e.g. in the last wall outlet).

Switch 1 selects the termination on the transmitter interface and switch 2 selects the termination on the receiver interface. Switches 3 and 4 enable remote power feeding to ISDN terminals connected to a link. When connected as S-interface switches 1...4 should be set to **ON**.

Settings of the S-interface relevant for board indices -3,-4,-5

DIP-switch position 418



Note: When selecting S- or T-interfaces start by setting the T-interfaces using switches 4, 3, 2 and 1 in consecutive order then set the S-interfaces starting with switches 1, 2, 3 and 4.

Settings of the S-interface

Select the configuration of the interface in RASC :

Extended passive bus default setting
and Short passive bus.

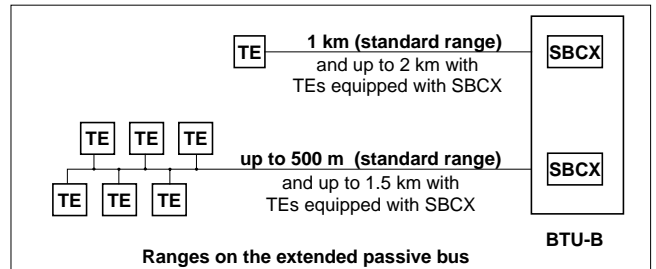
Ranges on the interface

The BTU-B is equipped with the **S/T Bus Interface Circuit eXtended (SBCX)**. This circuit offers the advantage of covering a higher attenuation on cables.

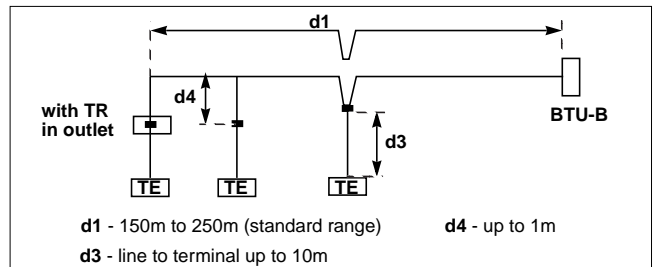
The standard S/T-interface specification considers cables with 6.5 dB attenuation equivalent to about 1000m cable length in a single terminal configuration.

Using the **S/T Bus Interface Circuit eXtended (SBCX)** up to 13 dB line attenuation can be covered. The figure below shows the ranges using standard 0.6 mm diameter twisted pair unshielded cables with a capacitive load of max. 30nF per km and the terminal equipment

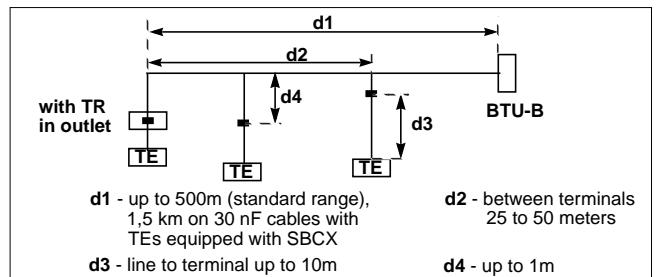
(refer to documentation of the TE) is also equipped with a SBCX or equivalent.



Short passive bus



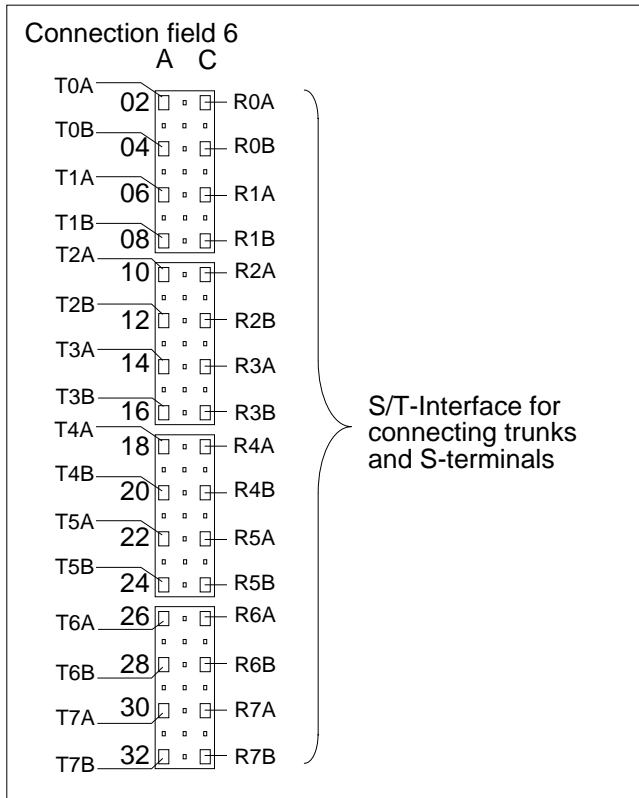
Extended passive bus



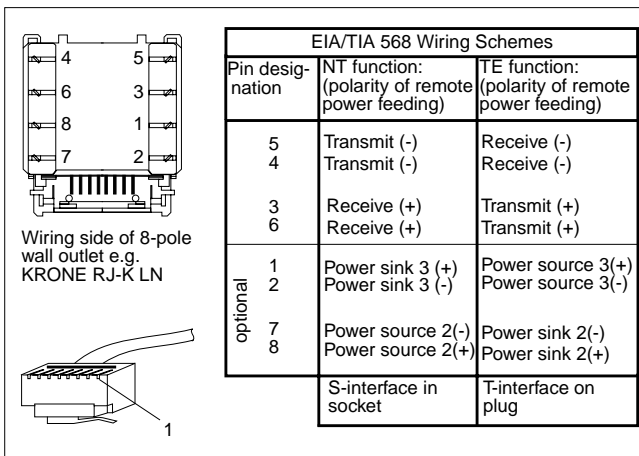
Abbreviations:

- TE Terminal Equipment
- TR Termination Resistor (*installed at the end of the interface line. Use outlets with resistor mounted*)
- Outlet according to IEC 603-7 with termination
- Outlet according to IEC 603-7 without termination

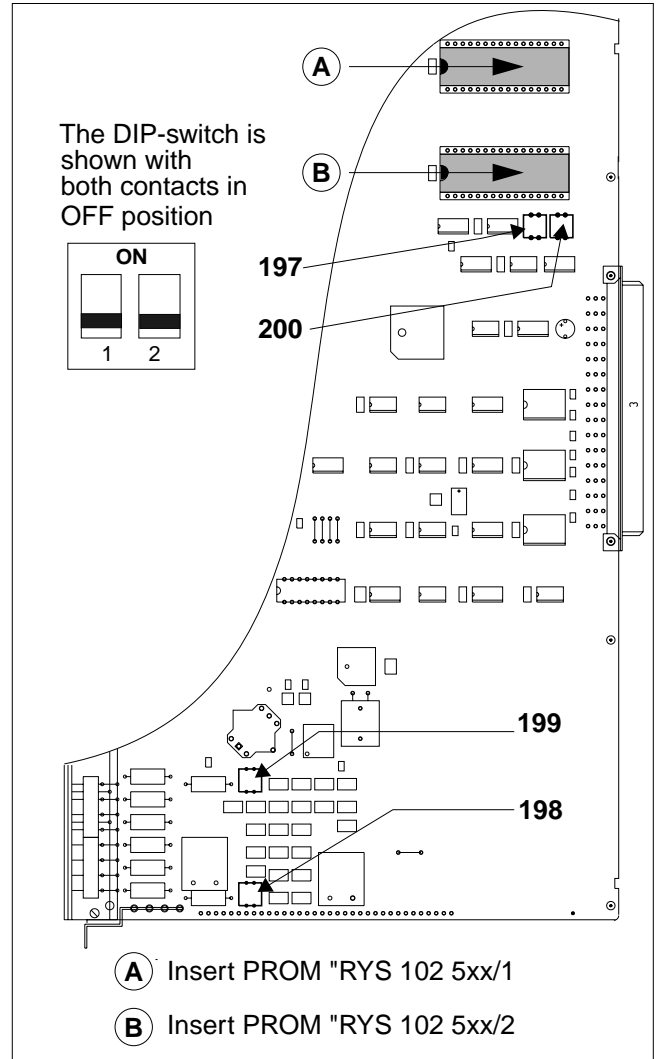
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Wall outlet connection



6.9 BTU-D (ROF 157 5112/1) and REG (ROF 157 5112/2)



6.9.1 DIP-switches in position 197 and 200

Depending on the firmware used, this board enables either ISDN or CAS function. The PROM set is available for CAS (LZY203 2212/1) or ISDN PRA (LZY203 2213/1). DIP-switch pos. **197** on BTU-D selects the register function of the board. The switch **200** is reserved for future use.

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197/1	197/2	FUNCTION		
OFF	OFF ON	digital trunk MFC	digital trunk MFE	only BTU-D
ON	OFF ON	Register MFC	Register MFE	BTU-D or REG.

6.9.2 DIP-switches in positions 198 and 199

Selection of ground strapping for the coax 75 Ω or selection of the 120 Ω twisted pair interface.

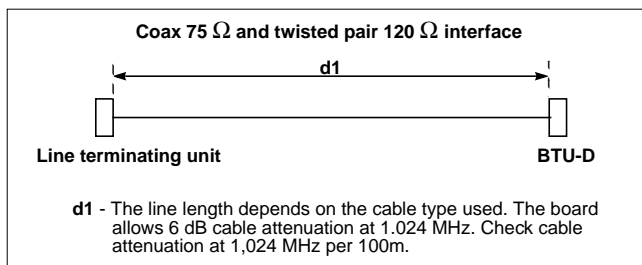
198/1 199/1	198/2 199/2	FUNCTION
OFF	OFF	120 Ω connection ¹⁾
OFF	ON	screen connected to ground
ON	OFF	screen connected to ground via 1nF capacitor

1) Factory setting

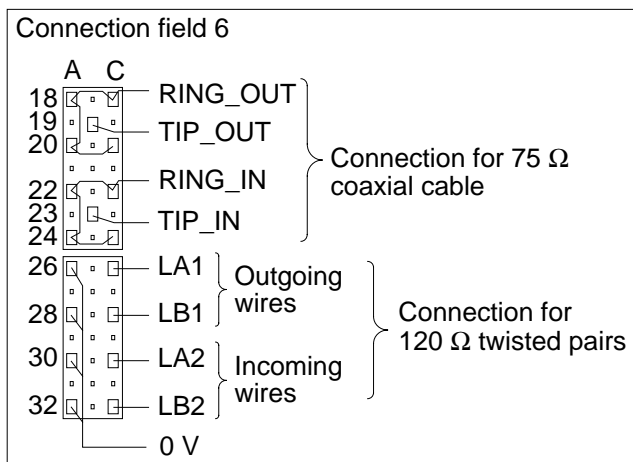
On factory delivery the switches are set to **OFF**-position = no ground thus enabling 120 Ω interface with a twisted pair cable. These DIP-switches connect the 75 Ω interface coax screen to ground, either directly to 0V or via a 1 nF capacitor. DIP-switch **198** switches the receiver and **199** the transmitter side. The screen shall normally be grounded on the transmitter side. Normally, the screen on the reception side is not connected to ground. Refer to local market requirements

Ranges on the interface of the BTU-D

This interface covers the short distance to the next NT or Line Terminating Unit as the end point of a public or private network. The range is only defined in terms of the covered attenuation by the interface that is 6 dB. If required choose cables with low attenuation to achieve a maximum distance.



For ranges exceeding 6 dB attenuation additional digital data transmission equipment is required. Line Terminating Unit (LTU) ASB 501 04 is available for such purposes.



There are specific requirements for the digital interface wiring to meet the demands of EMC.

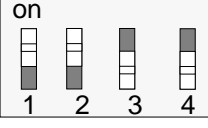

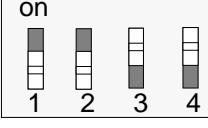
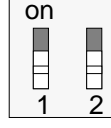
If a twisted pair connection should be installed and the requirements of EN 55022, class B have to be fulfilled, a ferrite is available with the ERICSSON ordering number STF 82 601. Taking the cable and making three turns around the ferrite core meets the demand of sufficient noise reduction. The ferrite should be situated close to the slot where the cables are led out of the cabinet. In most cases this cable is supplied by the PTT and should not be fed via the MDF.

Some markets (e.g. Austrian PTT) require the use of a double-shielded interface cable. The outer shield should be connected to frame earth and the inner shield should be connected to 0V on the board. A 20 m long standard cable is available with the ERICSSON ordering number TSR 901 0481/20000.

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6.10 BTU-E (ROF 157 5113/_)

SPEECH CONNECTION SETTINGS

2-wire connection		4-wire connection	
106...406	108/308	106...406	108/308
on 	on 	on 	on 
S1 S2 S3 S4 S5		S1 S2 S3 S4 S5	

INDIVIDUAL 0
uses switches 106 and 108/1

INDIVIDUAL 2
uses switches 306 and 308/1

INDIVIDUAL 1
uses switches 206 and 108/2

INDIVIDUAL 3
uses switches 406 and 308/2

SPEECH CONNECTION SETTINGS
Switches select between 2- or 4-wire speech connection. Two individuals share switches 108 and 308.
On boards with Rev. R2A or higher these switches are replaced by relays which are set automatically by programming the filter coefficients.

M-WIRE CONNECTION SETTINGS

APPLICATION	SPEECH	M-WIRES
PAGING	2-wire	S6..off S7..off S8..off
AMERICAN E&M SIGNALLING	4-wire	S6, S7 and S8 see local requirements
DOUBLE M-WIRE SIGNALLING	4-wire	S6..on S7..on S8..off
CAILHO E&M SIGNALLING	4-wire	S6..off S7..off S8..off
CEPT L1/SSAC 15 Only on /2 boards	4-wire	S6..off S7..off S8..off

S6 connects -48V to M1 terminal via 6.2 Kohm
S7 connects 0V to M0 wire locally.
S8 connects 0V to M20-wire.

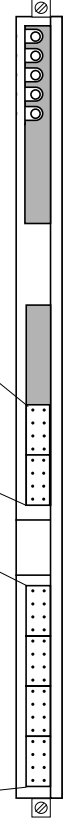
Connection field 4 and 6 at front of BTU-E_

Speech (field 4)

	A	C	
LA_0	18		LC_0
LB_0	20		LD_0
LA_1	22		LC_1
LB_1	24		LD_1
LA_2	26		LC_2
LB_2	28		LD_2
LA_3	30		LC_3
LB_3	32		LD_3

LA & LB - 2-wire send/receive or 4-wire send.
LC & LD - 4-wire receive.

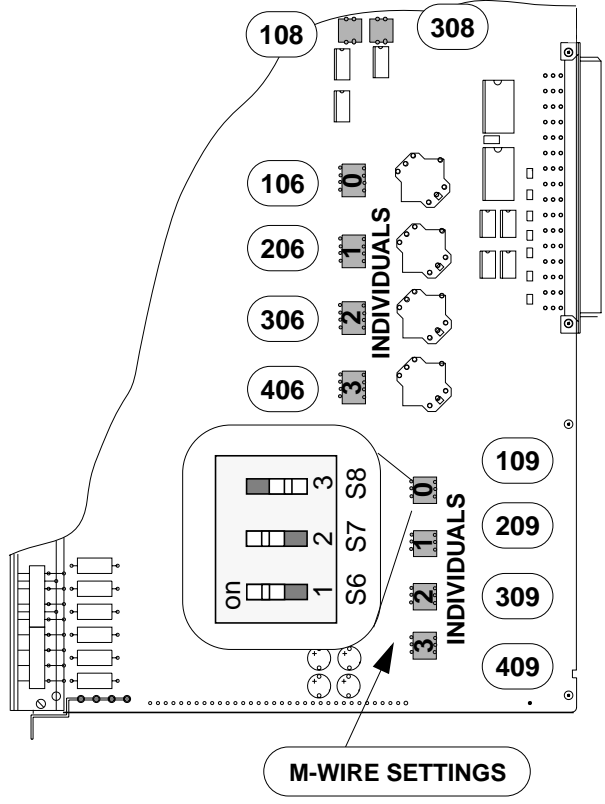
RED
YELLOW
GREEN
YELLOW
GREEN



Signalling (field 6)

	A	C	
M2_0			E2_0
M20_0			E20_0
M2_1			E2_1
M20_1			E20_1
M2_2			E2_2
M20_2			E20_2
M2_3			E2_3
M20_3			E20_3
M1_0			E1_0
M0_0			E0_0
M1_1			E1_1
M0_1			E0_1
M1_2			E1_2
M0_2			E0_2
M1_3			E1_3
M0_3			E0_3

① M20_ and M0_ can be switched by **S7** and **S8** to 0V on the BTU-E_ locally.



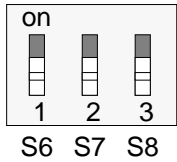
M-WIRE SETTINGS

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6.10.1 Paging connection

The figure shows how to connect the paging equipment Ericall Contactor with 2 wire speech. The PBX sends paging information to paging system (pin 6A18) using M1 contact, and information about 'paging in progress' or 'paging equipment not present' is received on the E1-wire (pin 6C18) from the paging equipment.

Switch settings



This switch setting is used for signalling on E1 and M1.

Applies for switches 109, 209, 309 and 409.

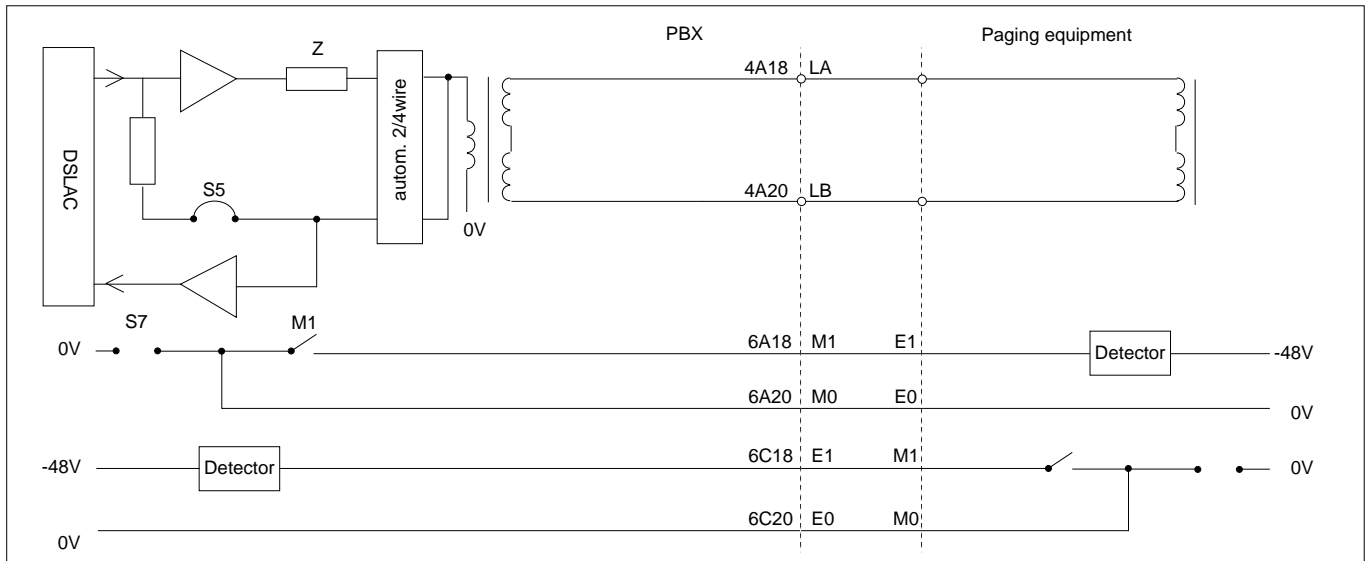


Figure showing Paging equipment and 2-wire speech with 'loop connection' of the E&M-wires.

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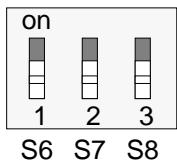
6.10.2 Four-wire speech connection

The four-wire speech and signalling connection has the benefit of not needing additional signalling wires. There are two different types of signalling supported:

Cailho E&M-signalling (balanced battery). The two way signalling utilises common mode DC pulses via the centre tap of the transformer. On one side a detector is connected between the -48 VDC and the centre tap of the transformer. The other end uses opto relay M4 to switch the line to 0V (Ground). The detector reads the current flow to ground every time M4 closes.

CEPT L1/SSAC 15 with 2280 Hz tones. In this case no DC signalling is used, but instead signalling is performed by switching on and off a 2280 Hz tone, which is detected by a tone receiver on the other side. This is only available on index 2 boards.

Switch settings



This switch setting inhibits signalling on E1 and M1. Only AC or DC signalling on the four wire speech connection is used.

Applies for switches 109, 209, 309 and 409.

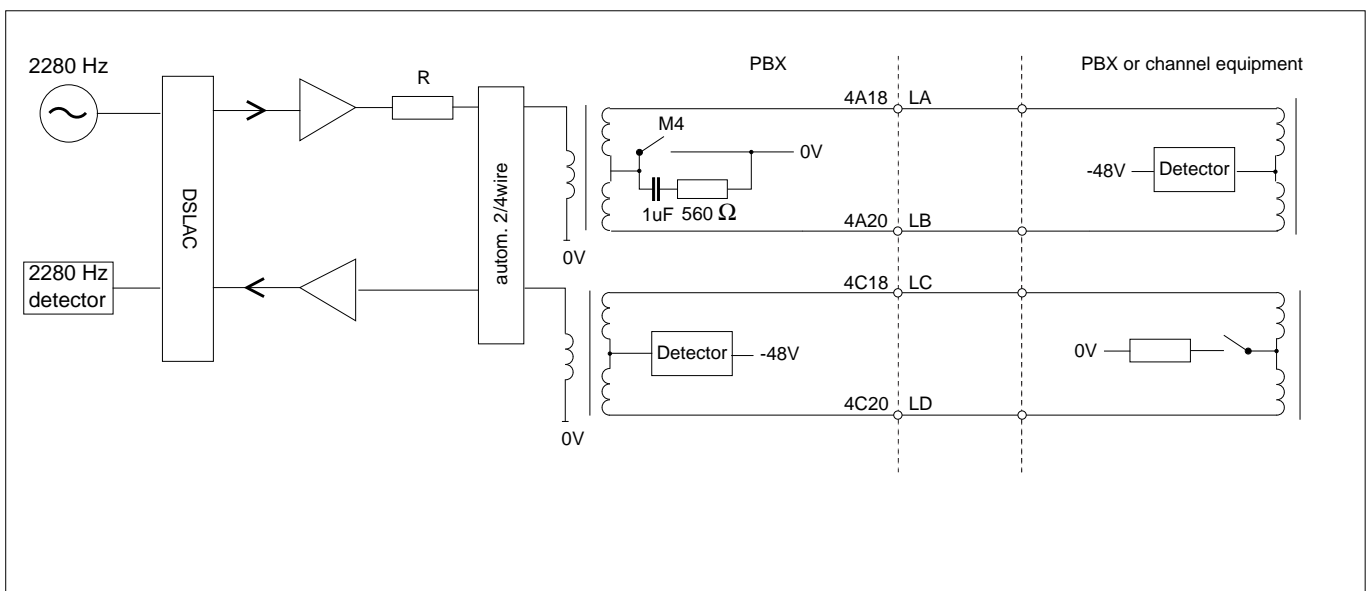


Figure showing Cailho E&M signalling and CEPT L1 or SSAC 15 with tone signalling

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Doc respons/Approved	Checked	Date 1999-07-15 Rev A Reference

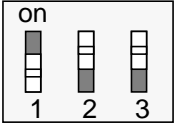
6.10.3 E&M-signalling

Signalling on E & M wires is done either using one or two E&M pairs depending on what is required. Using just E1 and M1 is a very common practice. The American E&M signalling where the M1 wire toggles between -48VDC and 0V can be mentioned here.

Double E&M signalling requires the E1/M1 wires for the signalling of information and the E2/M2 wires indicate blocking of the connection. The E1/M1-wires are used for signalling and E2/M2-wires are used for blocking. The figure shows 0V connection to the M-wires in both ends.

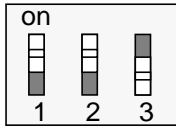
Switch settings

Standard E & M signalling



This switch setting is used for signalling on E1 and M1.

Double E & M signalling



This is the switch setting when E1, E2, M1 and M2 are used for signalling.

Applies for switches 109, 209, 309 and 409.

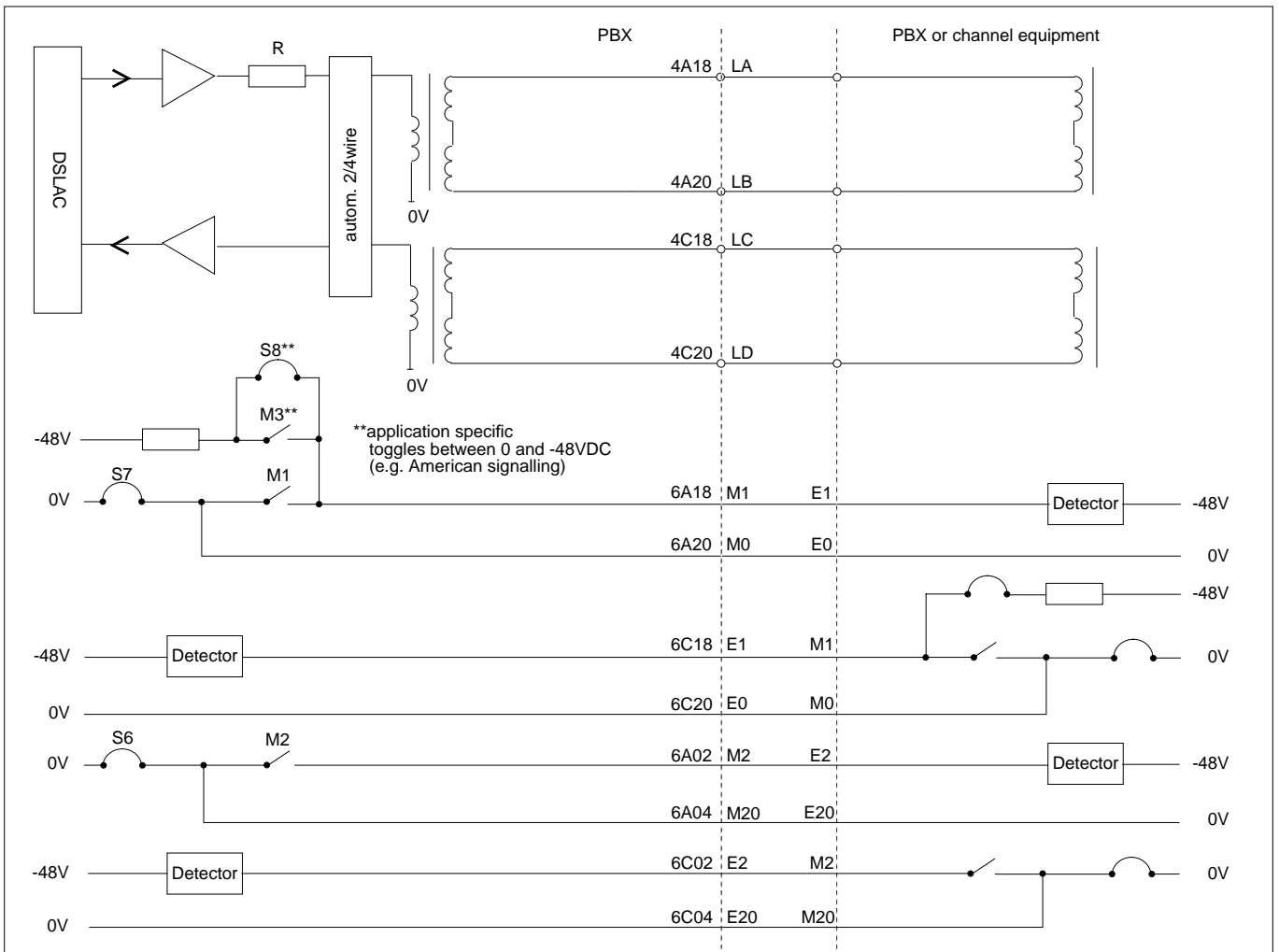
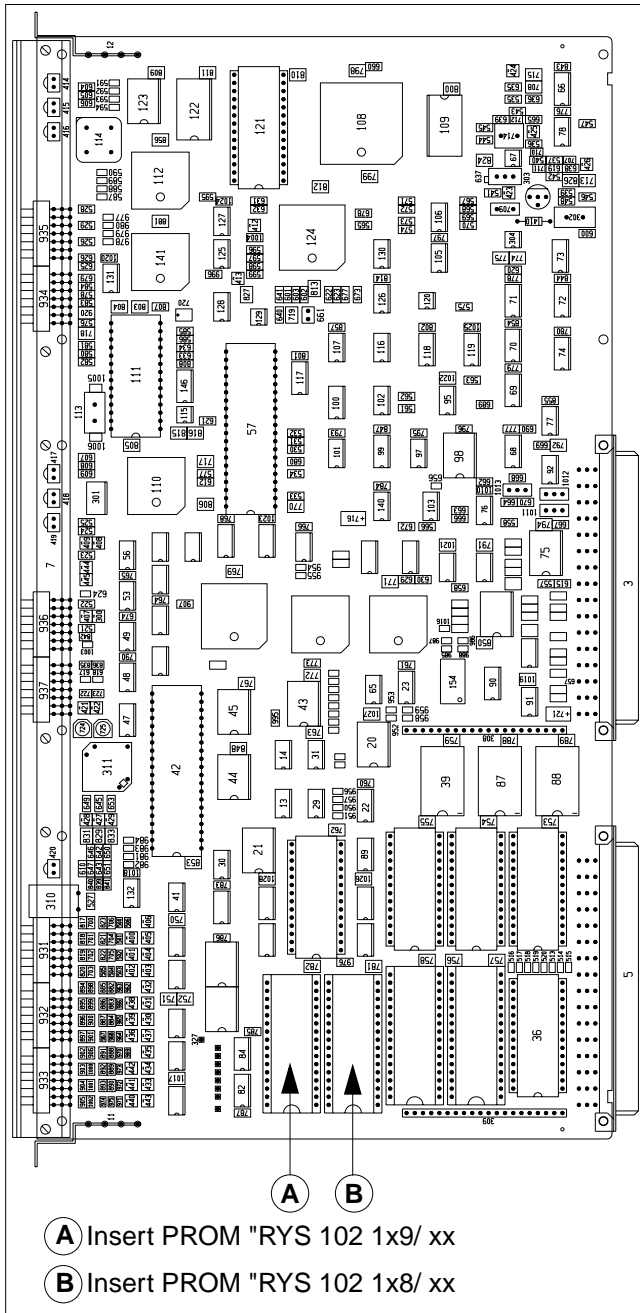


Figure showing four wire speech and standard (double) E&M signalling.

Prepared	Subject responsible	Documentnumber	
		1531-BDV BS 101 05 Uen	
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			Reference

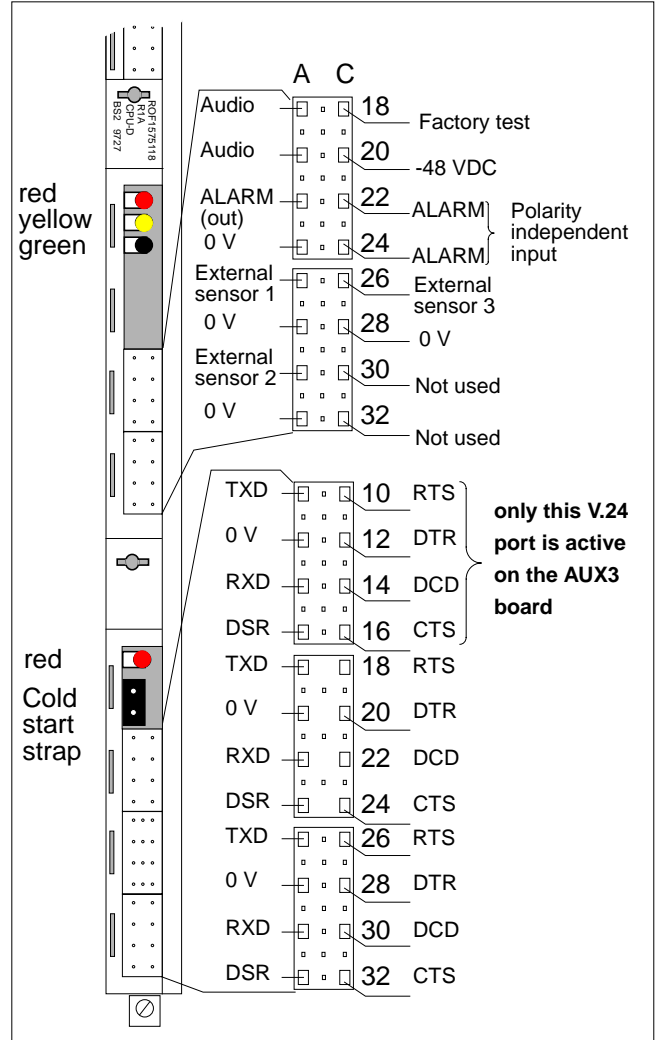
6.11 CPU-D_ (ROF 157 5118/_) and AUX_(ROF157 5119/_)

Before installing the board mount the system software PROMs in the appropriate positions.



Connections on the CPU-D_

For connection of the TEMPERATURE SENSOR KIT, see [INSTALLATION INSTRUCTION \(1531-RPM 603 339\)](#).



The ALARM input is optically isolated and the voltage has to be between 20 - 60 VDC.

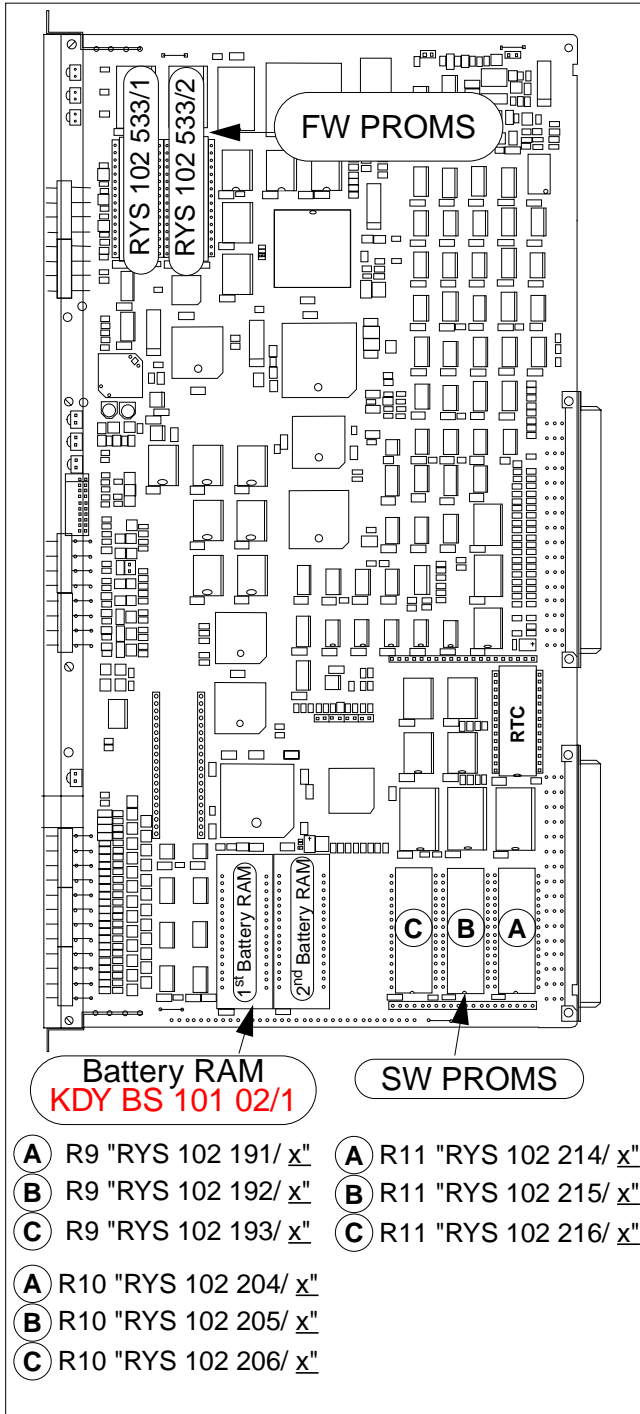
The ALARM output is equipped with an open collector transistor with a capacity of 20 mA at 12 VDC (Maximum 14 VDC).

Use the following prefabricated cables to connect the peripheral data equipment to CPU-D_ and AUX_:

- PC is TSR 902 0448/1
- printer is TSR 902 0476/1
- modem is TSR 902 0466/1

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		5131-BDV BS 101 05 Uen		

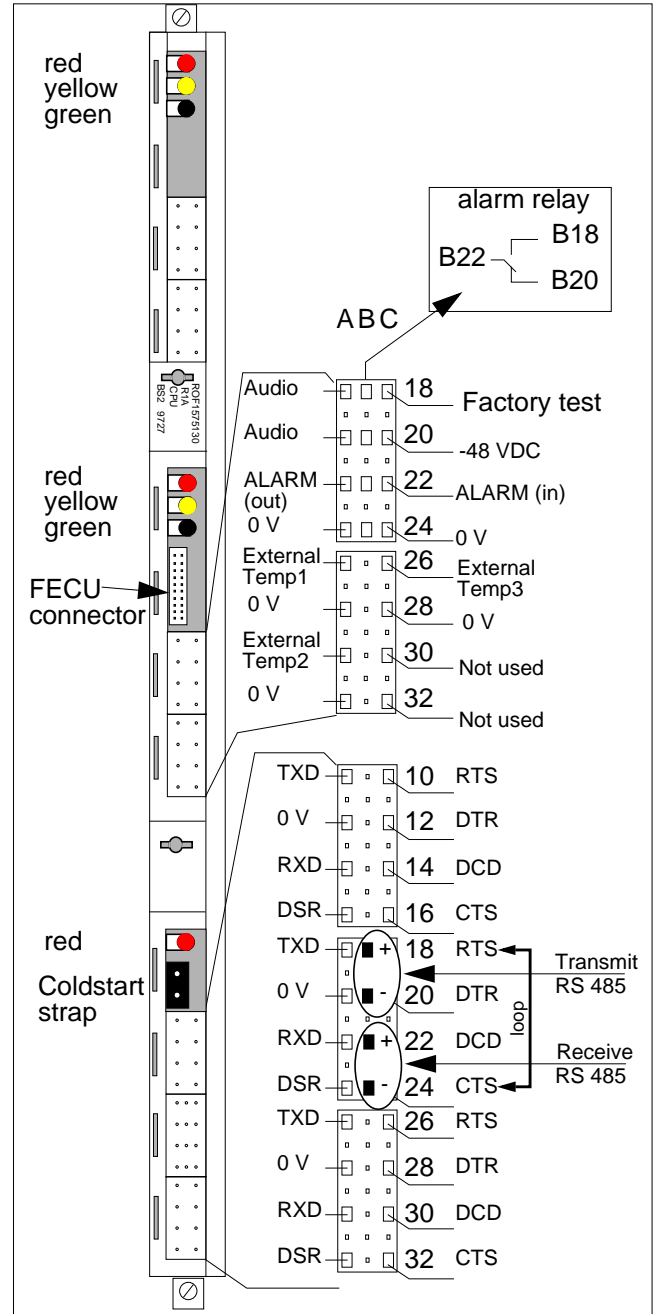
6.12 CPU-D4 (ROF 157 5124/_)



To put the board in operation mount the system software PROMS in the appropriate positions. The number of battery RAMs mounted on the CPU-D4 board depends on the functionality required.

Connections on the CPU-D4

With the software key (FECU) KDU BS 130 07/_ new functionalities can be accessed.



Similar to the previous versions, this board provides the V.24 interfaces but additionally an RS-485 interface for longer ranges. To connect the RS-485 data interface, use plug RNV 321 01 02. Be sure to loop RTS with CTS otherwise data is lost if printer is OFF. The range of the interface is up to 1200m.

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It is possible to use a variety of converters. However with the following converters: IC-485SI of ARP DATA-CON and 232<->485/422 Converter Plus IC-109AE of Black Box Corp. tests have been successful.

6.12.1 Feature Enabling Control Unit (FECU)

Connecting this plug activates the appropriate applications and features as ordered depending on the FECU index number. If no plug is connected, only a limited Version 4.0 system functionality is available. The indices 2 to 10 always include the Basic Version 4 functionality (index 1).

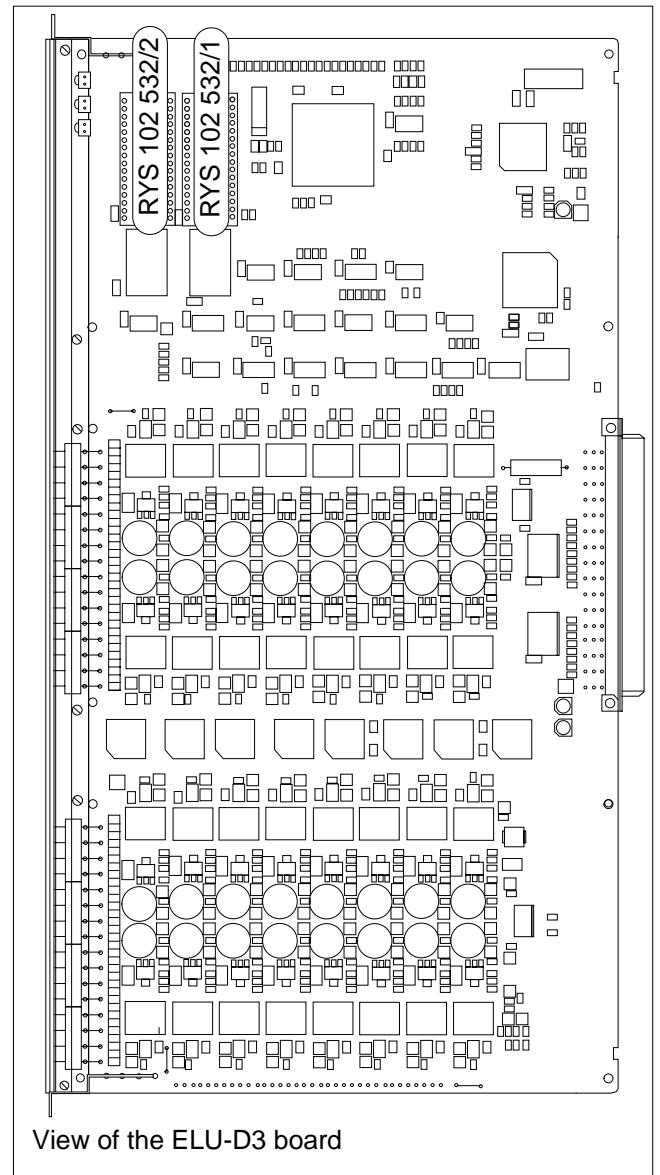
For detailed information of the features enabled by the different FECUs refer to [15534-ASB 150 02 Uen FACILITY DESCRIPTION GENERAL](#).

FECU number	Functionality Version 4.0
KDU BS 130 07/1	Basic Version 4.0 functionality
KDU BS 130 07/2	+ std. digital networking for max. 32 interfaces
KDU BS 130 07/3	+ std. digital networking
KDU BS 130 07/4	+ full. digital networking for max. 32 interfaces
KDU BS 130 07/5	+ full. digital networking
KDU BS 130 07/6	+ full. digital networking, 4 interfaces and CTI
KDU BS 130 07/7	+ std. digital networking for max. 32 interfaces and CTI
KDU BS 130 07/8	+ std. digital networking and CTI
KDU BS 130 07/9	+ CTI + full. digital networking for max. 32 interfaces
KDU BS 130 07/10	+ CTI + full. digital networking for unlimited number of interfaces

6.13 ELU-A and ELU-D

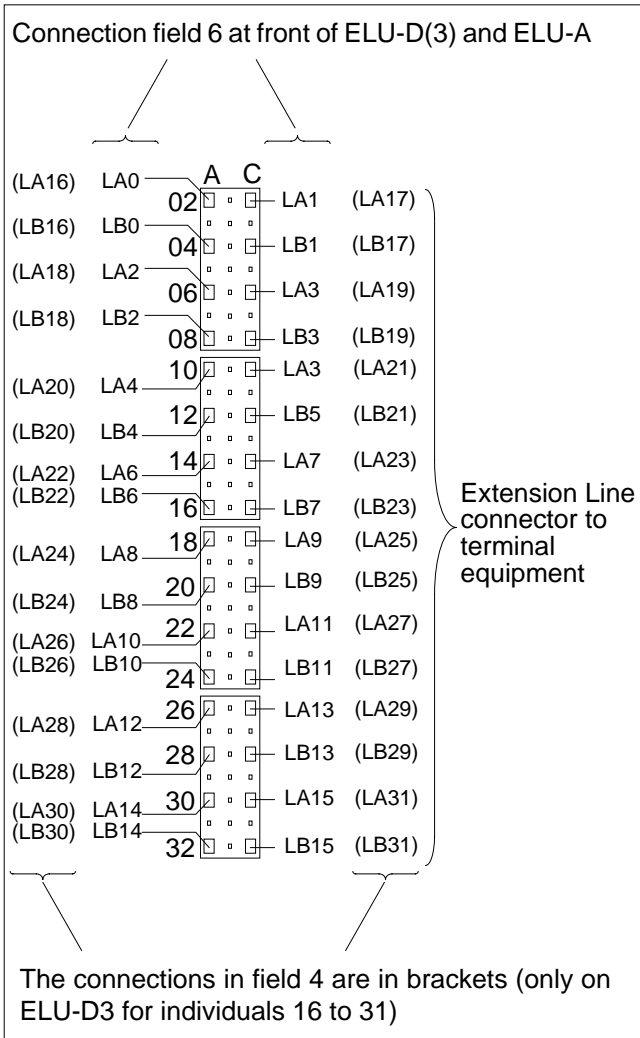
The relevant boards are:

- ELU-D (ROF 157 5116/_)
- ELU-A (ROF 157 5114/1)
- ELU-A2 (ROF 157 5114/2)
- ELU-D3 (ROF 157 5130/_)



View of the ELU-D3 board

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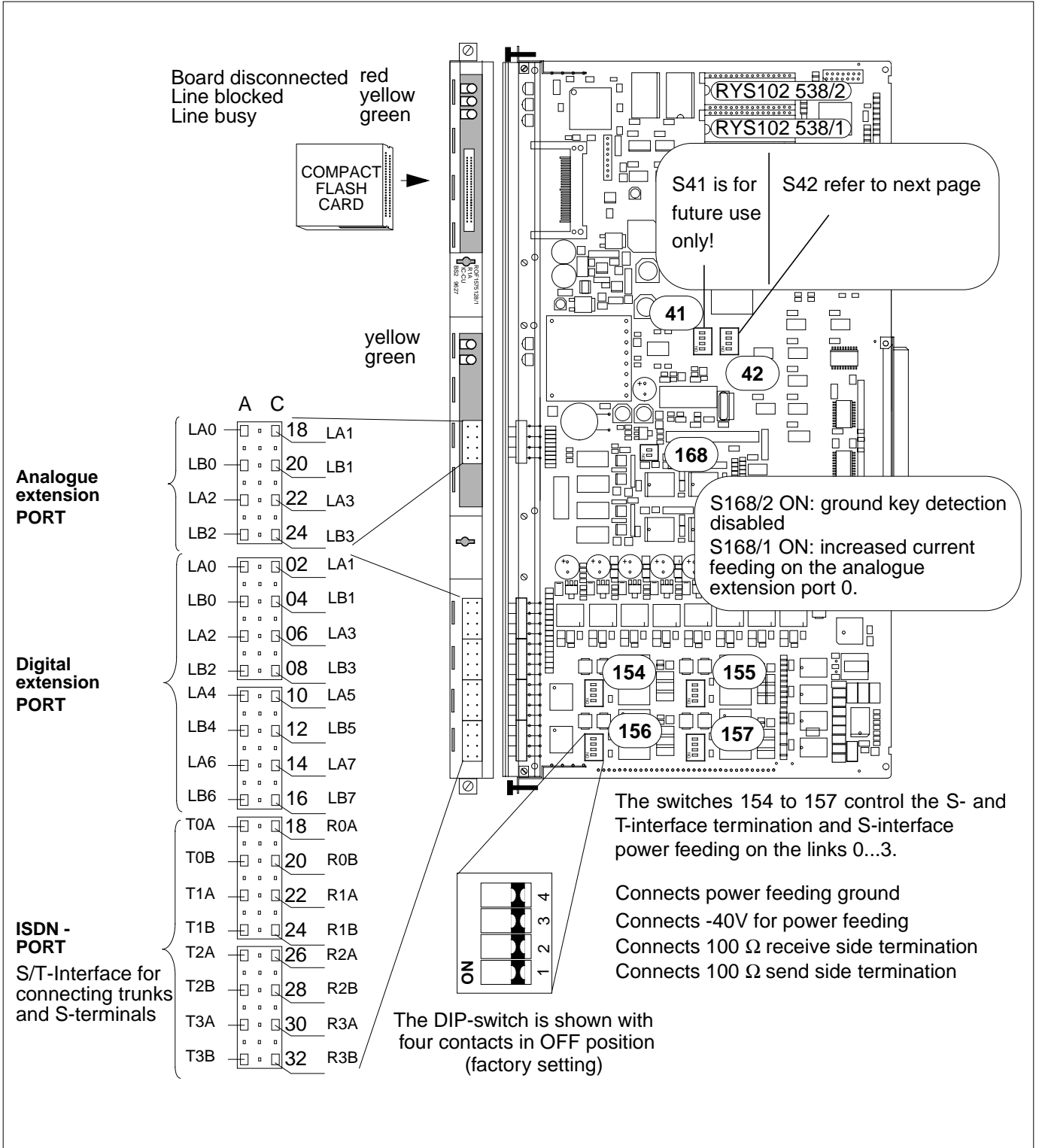


On the first ELU-D_ board in the system the first three extension positions should be used to connect the OPERATOR telephones.

On sub-equipped ELU-A and ELU-D_ boards the connection for extensions 8...15 (32) are not mounted.

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6.14 MFU (ROF 157 5132/_)



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Doc respons/Approved	Checked	Date 1999-07-15	Rev A
		Reference	

The ISDN PART

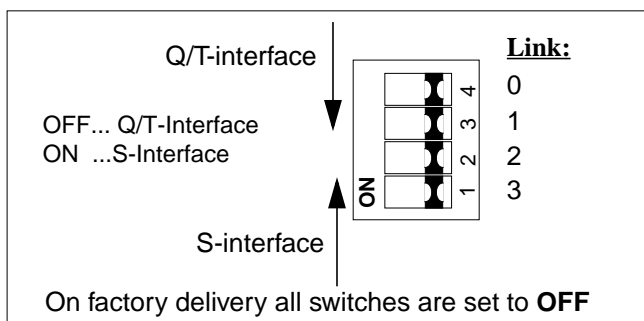
DIP-switches position 154 to 157

Switch 1 selects the termination on the send side.
 Switch 2 selects the termination on the receiver side.
 Switches 3 and 4 enable remote power feeding to the connected ISDN terminals. Switches 1...4 should be set to **ON** if the link is set as S-interface .

Note: At the end of each line a termination resistor must be installed (e.g. in the last wall outlet).

Switch position 42

When selecting S- or T-interfaces start by setting the T-interfaces using switches 4, 3, 2 and 1 in consecutive order then set the S-interfaces starting with switches 1, 2, 3 and 4.



Settings and ranges on the T-/S-interface

Refer to [section 6.8 on page 14](#)

The VMU PART

The VMU functionality and the (4) registers are available if the Compact Flash Card is inserted.

For installation and configuration refer to the stipulations in document [START OF OPERATION \(1537-ASB150 02Uen\)](#) .

Note: The VMU will not start up without the internal directories created on the Compact Flash Card. The unlock key (file named DISK.ULK) must be valid on the compact flash card.

The MFU board can use only flash cards supplied by ERICSSON. These flash cards are delivered with a control file called DISK.ULK containing a licence key. This file must not be opened by any tool as this would destroy the file and thus disable the compact flash card. This will cause an error condition indicated by slow flashing yellow and green extension LEDs.

Limitations:

Only four MFU boards may be mounted per cabinet. MFU board(s) can be mixed with VMU-HD board(s) but if a MFU board is installed, no VMU-D board may be installed in the system.

If a MFU board is installed without compact flash card, the complete VMU part is marked inactive. If later on the MFU will be upgraded with a compact flash card, then this can not be done by using the Hot swapping feature, due to different card types. The MFU without flash card has to be removed completely from the system (from HW and SW point of view) and then the MFU with flash card can be included in the system. The previous programming of the card, has to be done again.

The ELU-D3 PART

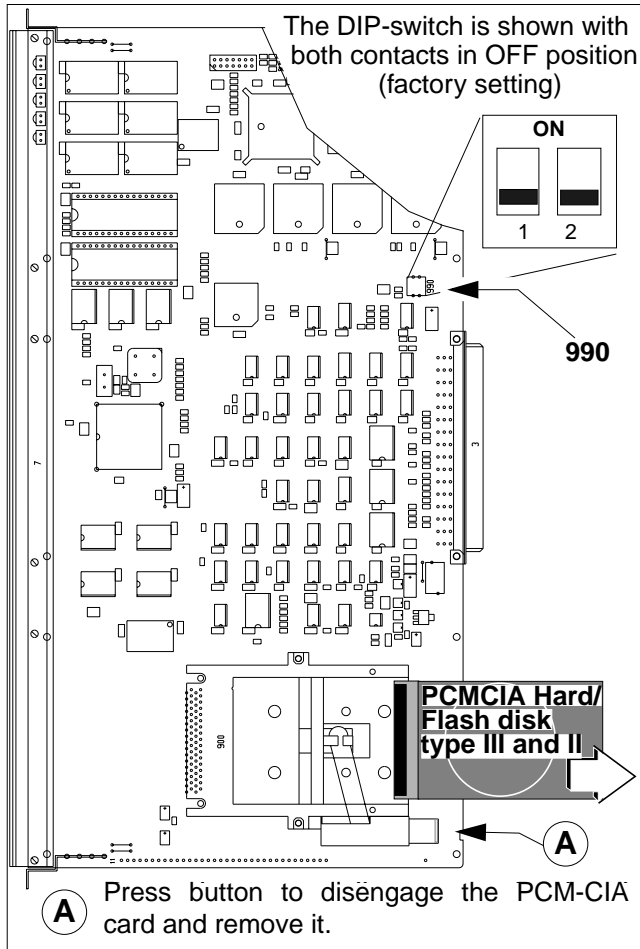
The DBC 213 and DBC 214 instruments are not supported with 4 key panels, only 2 key panels per instrument are allowed to be connected.

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6.15 VMU-HD (ROF 157 5126/1) (ROF 157 5126/3) w. Flash Card

For installation unpack the VMU-HD board with the mounted hard disk. The Flash disks are available with a capacity of 60 MB. Remove the transport protection for the hard disk and keep it in case of re-shipment e.g. factory repair. Install and configure the VMU-HD in the cabinet according to the stipulations in [1537-ASB15002Uen START OF OPERATION](#).

Note: The VMU-HD will not start up without internal directories created on the hard disk.



DIP switch on VMU-HD

DIP switch **990** selects whether register function is enabled or not.

Limitations:

Only one VMU-HD can be mounted per cabinet and just one type either VMU-HD or VMU-D can be installed in a system.

990/1	990/2	FUNCTION
OFF	ON or OFF	16 channels, no register function
ON	OFF	8 channels with MFC detection and DTMF / Tone receiver
	ON	8 channels with MFE detection and DTMF / Tone receiver

Structure of directories on hard disk or flash card

```

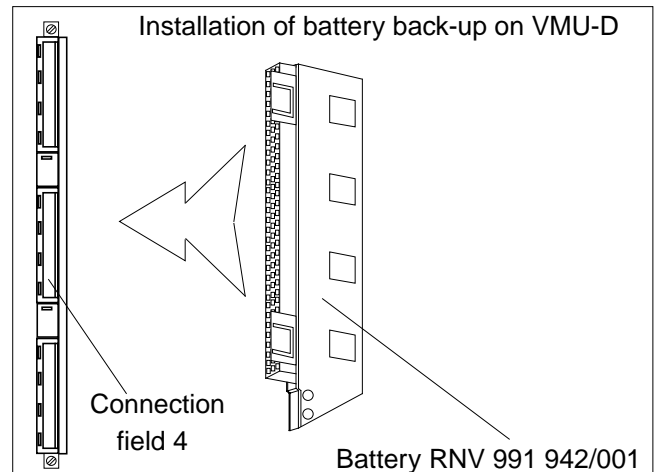
\Info0      \message2      \anno0
\Info1      \message3      \anno1
              \message4      \anno2
              \message5      \anno3
              ⋮
              \annoF
    
```

Removal of hard disk or flash card

To remove the hard disk, take out the board from the system. Disengage the hard disk with lever **A** and pull out the hard disk.

6.16 VMU-D (ROF 157 5117/1)

The VMU-D has no switches, but is equipped with a back up battery, RNV 991 942/001 to prevent loss of data in case of power failure. Install the battery to connection field 4, before the exchange is started. For safe operation, replace this battery periodically every five years in accordance with document [MAINTENANCE INSTRUCTION \(1541-ASB 150 02 Uen\)](#).



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7 INTEGRATED CORDLESS

The Integrated Cordless (IC) is a digital cordless telephone solution complying to the DECT standard providing wire-less connection for up to 108 portables with the A-protocol and 210 portables in GAP-protocol applications. Several components comprise a complete system.

After the system has been physically installed use RASC and the Cordless System Manager (CSM) for initialization, maintenance, updating, fault finding and when possible to recover the PBX from errors. The CSM can be ordered under LZYNB 201 01 R6A or higher for the A-protocol and LZYNB 201 05 R1B or higher for GAP-applications.

7.1 Board Descriptions

7.1.1 IC-Control Unit2 (IC-CU2)

The IC-CU2 is the control board supporting the DECT GAP-protocol. The IC-CU2 includes 8 voice channel units and is equipped with 4 BSs interfaces.

The wiring distance with remote power feeding to the BSs using only the serial communication wires SC0 and SC1 is limited to 400m. For line lengths up to 900m additional Express Power feeding Pairs (EPP) need to be wired. The maximum wire length between BS (fed locally) and IC-CU2 is only data limited and may reach up to 900 meters.

The board offers the following connections:

- the Cordless System Manager (on a PC)
- a printer to log errors
- 4 Base Stations
- the Feature Enabling Control Unit (FECU).

7.1.2 Feature Enabling Control Unit (FECU)

This plug determines which maximum number of portables are allowed to be connected to the system. This plug is available for various numbers of cordless telephones. For up to 8 portables no plug is required.

FECU number	Number of Portables
KDU 130 05/1	16
KDU 130 05/2	24

7.2 Traffic capacity

The IC-CU2's traffic capacity is limited by its 8 speech transcoders. Each Base Station has a capacity of 8 simultaneous calls. The Grade Of Service is the probability that a call is rejected because of system congestion. The customer has to indicate which Grade Of Service is acceptable to her/him. A Grade Of Service of 1%, or 0.01 means an average of 1 lost call in every 100 calls.

The GOS, the 8 speech circuits and the total amount of traffic (Erlang) that is required in the system are related to each other as shown in the table below. (The Erlang value at a required GOS)

Prepared	Subject responsible	Documentnumber			
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IC-CU2	Speech circuits	Grade of service (GOS)			
		2%	1%	0.5%	0.1%
1	8	3.6 Erl.	3.2 Erl.	2.7 Erl.	2.1Erl.

For the calculation it is necessary to estimate the time the portables actually make calls. The table below shows the Erlang value depending on the estimated mean call-minutes for a portable telephone. These values may be differ between departments depending on their activities. These values multiplied by the number of portables result in a traffic capacity that has to be provided.

Minutes per hour	mErlang	Minutes per hour	mErlang	Minutes per hour	mErlang	Minutes per hour	mErlang
3	50	9	150	15	250	30	500
6	100	12	200	18	300	45	750

Example:

A customer orders a system with 24 portable telephones and estimates that each portable generates 150 mE in average (that is 9 minutes off-hook time per portable per hour). With an accepted GOS of 2.0% the system has a traffic capacity of 3,6 Erl. ($0,15 \times 24 = 3,6$).

7.2.1 Traffic Capacity of Base Stations

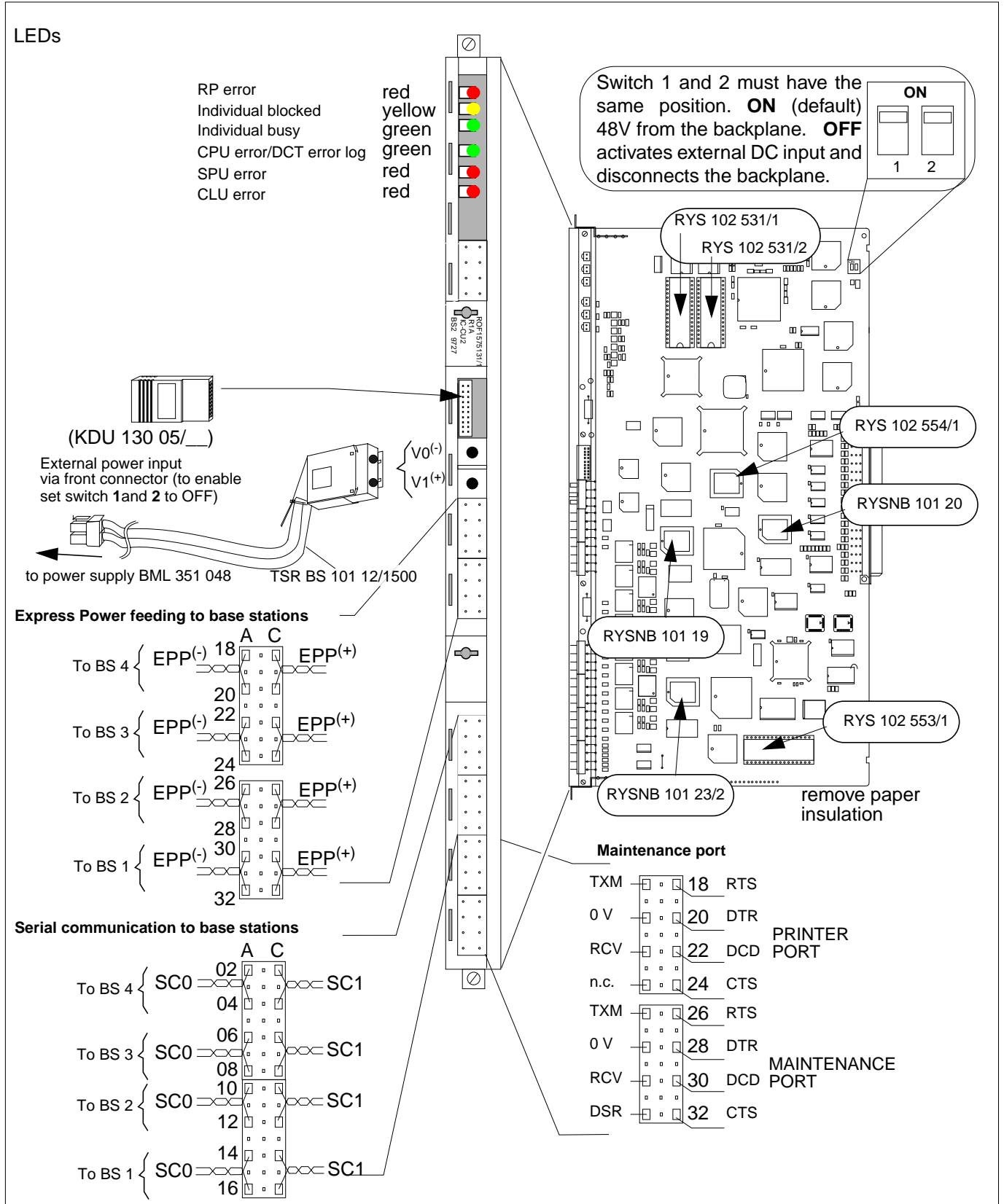
A Base Station with 8 channels available has an Erlang value of 2.7 with a GOS of 0.5%. This means that each Base Station can serve 18 portables, assuming that each portable generates 150 mE during busy hour or 13.5 portables generating 200 mE each.

Example: Assuming a full coverage in a building can be achieved with 2 Base Stations which means that 20 portables generate together $20 \times 0.150 = 3$ E. Every Base Station has a traffic capacity of 2.7 Erlang. To offer sufficient coverage two Base Stations covering the busiest area of the company are needed.

Generally the total capacity offered by the cordless network is more than sufficient. However in certain places, traffic demands may vary to such extent that the network is often blocked locally, or has a lower GOS than required. For instance a purchase department may easily generate 300 mE per Portable during busy hour, thus, when e.g. with a number persons giving a very high load on the Base Station close by. It may be necessary to add a Base Station in this area to have enough capacity for others to call as well. Also think of e.g. canteens during lunch time etc.

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7.3 IC-CU2 (ROF 157 5131/_) (GAP-Protocol)



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Doc respons/Approved	Checked	Date	Rev	Reference
		1999-07-15	A	

7.4 Base Station (KRCNB 201 03/_ and KRCNB 301 03/_)

The Base Station (BS) enables radio communication between the Integrated Cordless system and the portable telephones. The communication via two 2B+D interfaces requires two twisted pair cables. Both interfaces provide in total eight 32 kbit/s speech paths between a BS and IC-CU2, enabling a BS to handle eight simultaneous calls. The BS is connected to the IC-CU2 via two wire pairs called serial communication wires (SC0 & SC1) carrying up to 8 simultaneous digital voice connections and the central power feeding. Apart from data communication these two twisted pairs are also used to distribute power to the BSs. Two additional pairs can be wired to provide a greater powering range. There are three methods to power BSs:

1. centrally via backplane (with or without EPP)
2. centrally via external input (with / w.o EPP)
3. via local power supply (optional).

With the first and second methods power is distributed via the IC-CU2 to the BS. The cable length between BS and IC-CU2 depends on the number of wires used for power feeding, the type of cable and environmental noise. In the third case (local feeding), BSs are powered by an AC-adaptor or another power source which is not routed via the cabinet.

The number of BSs used in a system depends on the area to be covered and the traffic density. Typical in-house coverage is a radius of up to 30 meters. In practice the cell size may vary between 10 meters indoors in worst case situations, up to 300 meters outdoor in free space.

The BS has two main functions:

- to modulate a carrier with the digital encoded information (TDMA frame directed to portable)
- to demodulate a modulated carrier (TDMA frame received from portable).

A special cover (KRY NB 101 01) is available to mount the BS (KRCNB 201 03) outdoors providing splash proof housing and water tight sealings for the wiring.

7.4.1 Base Station Planning

The major task when providing a wireless service is to estimate the number of BSs and to find their most suitable location. A number of factors tend to limit the range of a BS like the materials the wall is composed of or the location and size of machines, furniture, air-conditioning systems, elevators etc. This results in unexpected reflections or absorption of radio waves. Generally BSs should not be located on outer walls, except if the outdoor area has to be covered as well, as this reduces the area actually covered. All of these unpredictable influencing factors make it extremely difficult to define rules for how to cover an area with a suitable number of BSs. In difficult environments the use of a site survey tool (LTT NB 101 01/_) is recommended.

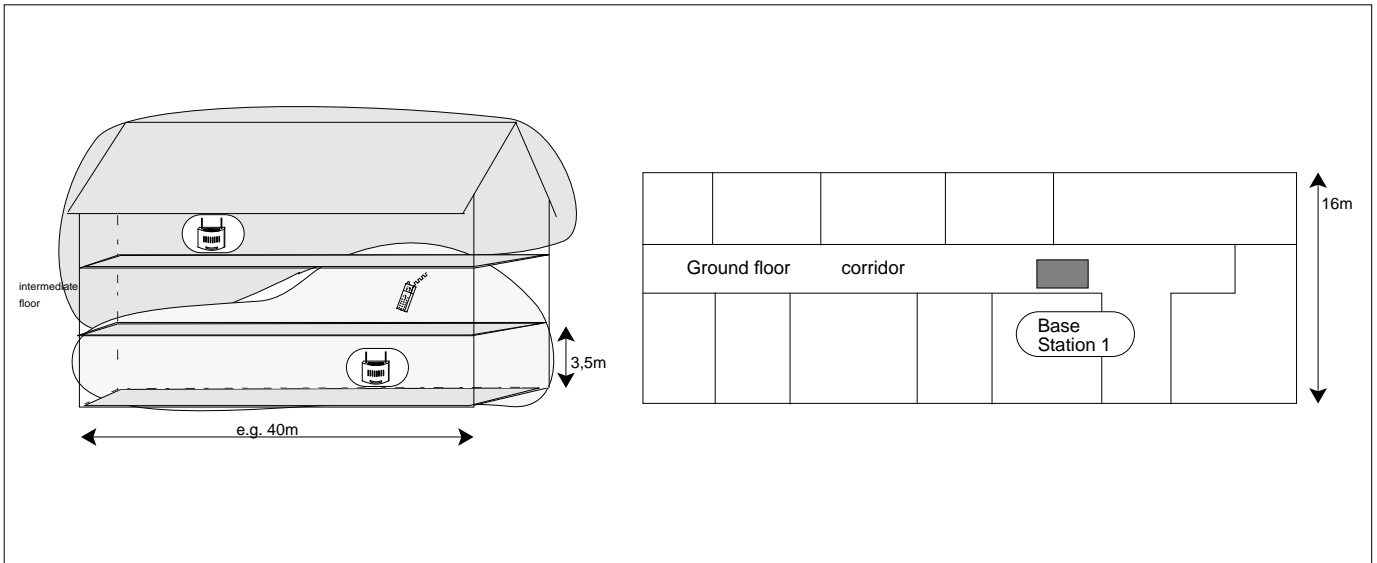
Establish a Base Station plan for the installation site to determine the best location for the BSs.

Base Station aerial range

- In an office environment located in a steel concrete building up to 30 m in diameter can be covered, including, in normal conditions, the neighbouring floors as well.
- Production halls up to 200 m in diameter are covered but ranges can be smaller if bulky machines, cranes etc. are part of the interior.
- Outdoor ranges can be up to 300m.

When installing a BS, position it, then walk around to determine cell coverage area either by listening to the speech quality - whether mutes or crackling sounds are heard in the portable - or measure the RQI indicator using the portables Service Display facility (see [FAULT TRACING 1545-ASB15002Uen](#)).

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		Reference	



7.4.2 Base Stations Cabling

Using a four-pair cable or more-pair cable, the free cable pairs can be used as additional power wires (EPP) to increase the feeding distance and reduce overall power consumption (by reducing the ohmic resistance) to the BS. The BS can also be powered by an on-site adapter (refer to [section 7.4.7](#)).

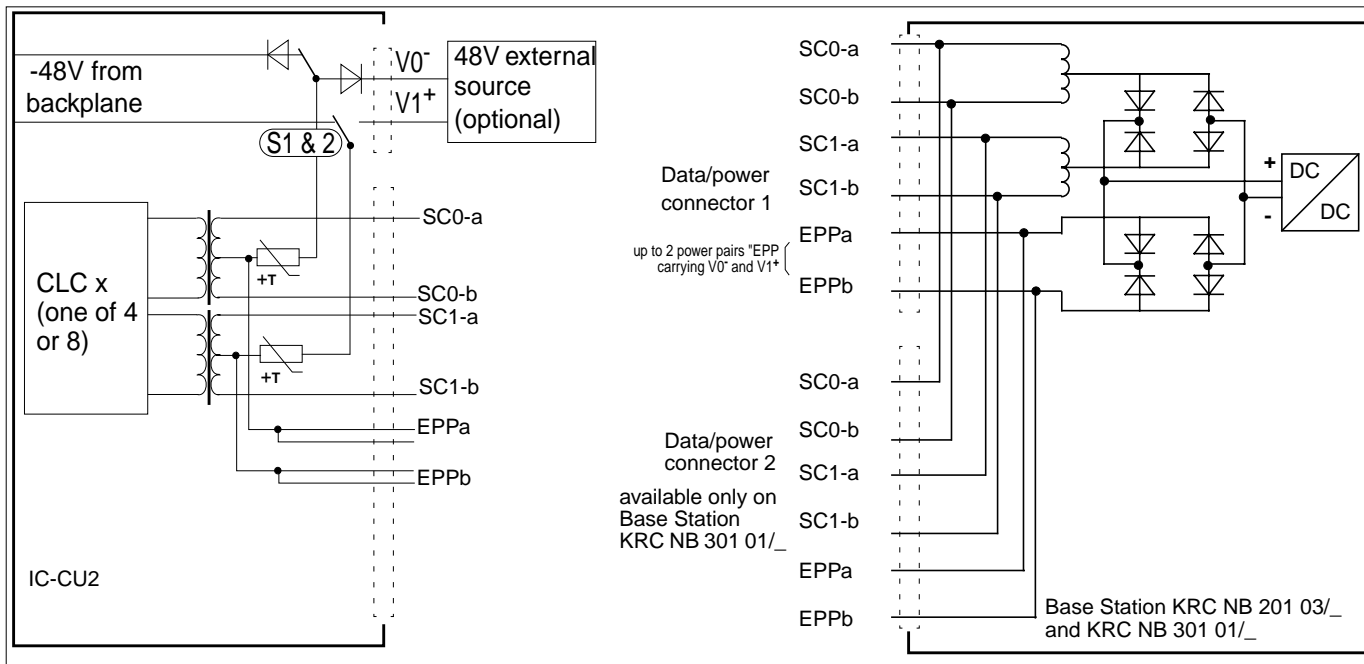
Connection of serial communication wires and EPP lines is polarity-independent. SC0-0 and SC0-1 may be interchanged but SC0-x and SC1-x **may not** be interchanged. The diagram below shows the wiring principle to each base station connected to the IC-CU2.

Power feeding of the Base Station

There are three alternatives to power feed (-48V) the Base Station:

- The power feeding can be taken via the IC-CU2 from the back plane in the cabinet. The DIP-switch on the IC-CU2 is set to **OFF**.
- From an external power source via the front connector on the IC-CU2 ($\leq 56V$). Note the polarity on the input (see drawing of IC-CU2 board). The switch on the IC-CU2 is set to **ON**.
- By an AC-adapter (see [page 39](#)). The switch on the IC-CU2 should be set to **ON** to cut off power feeding via the front connector on the IC-CU2.

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7.4.3 Base station cable delay measurement

After all base stations have been installed, the cable delays must be measured in order to program the base station delays into the system at initialization time. On IC-CU2s with the revision R1C and higher automatic delay measurement is performed. In this case no measurement is needed but using the cordless system manager (CSM) go to the menu "add Base Station" and enter a "1" in the field "delay".

7.4.4 Ranges on cables

The following ranges are given for base stations connected to an IC-CU2. Depending on the cable type ranges depend on noise levels imposed on the cables. The values stated are maximum achievable ranges:

Type	Cable		Maximum cable length	
	Wire diameter (∅)	Capacitance	Superimposed noise	
			8 mV/pHz	10 mV/pHz
Twisted pair	0.4 mm	45 nF/km	1.2 km	1.0 km
Twisted pair	0.5 mm	45 nF/km	1.6 km	1.4 km
Twisted pair	0.5 mm	120 nF/km	0.9 km	0.8 km
Twisted pair	0.6 mm	45 nF/km	1.9 km	1.7 km
Twisted pair	0.6 mm	120 nF/km	1.1 km	1.0 km
Double-twisted pair (J-Y (St)Y 2x2x0.6)	0.6 mm	120 nF/km	1.0 km	0.9 km

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7.4.5 Base Station (KRC NB 203 01/_)

The Base Station (BS) is supplied with a drilling template to mount the unit and 2 antennas with TNC connectors. Mount the unit in a suitable location to provide the best communication coverage.

Use the supplied drilling template and mount the BS with four screws (6 mm Φ). Complete the electrical connection according to the above drawing. Do not connect to the Base station yet.

IF power is supplied by the adapter (BMLNB 101 04), the screw/slide connector **must** be used. The serial communication wires can be connected via the modular jack or the screw/slide connector. A screw with a bundling cord holder is provided for traction relief to the left of the connection field. The BS starts up if the supply lines deliver more than 12 VDC.

The diagram shows the physical Base Station unit with two antennas and four mounting holes. Below it, a detailed view of the electrical connection panel is shown. It includes a modular jack (X52) and a screw/slide connector (X51). The screw/slide connector has 8 pins labeled: 1 (Power), 2 (Reset), 3 (LED 1), 4 (LED 2), 5 (SC1-a), 6 (SC0-a), 7 (SC1-b), 8 (SC0-b). Below the modular jack, pins are labeled: EPP(v0), EPP(v1), SC1-a, SC0-a, SC1-b, SC0-b, and n.c. Below the screw/slide connector, pins are labeled: SC1-a, SC0-a, SC1-b, SC0-b, EPP(v0), EPP(v1), and n.c.

LEDs

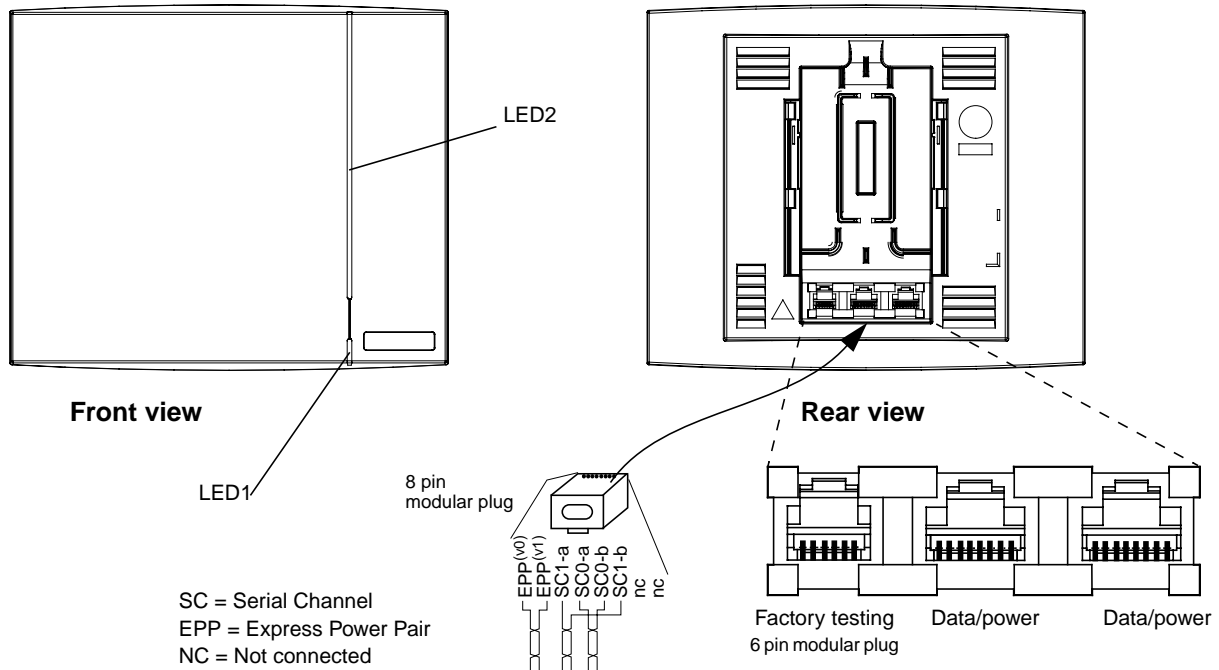
Status of LEDs	Meaning
Power LED on (green)	BS power on
Reset LED on (red)	Power Fail/Reset
LED1 and LED2 on or LED1 and LED2 flashing	BS in non operational mode
LED1 and LED2 off	BS operational (no traffic)
LED1 off and LED2 on	BS operational (traffic)
LED1 on and LED2 off	Fatal software error

Use connectors 5 & 6 for AC adapter connection. This input is insensitive to polarity reversal

Note:) If the Base Station (KRC NB 201 03/_) is accessible by persons other than trained personnel mount the cover (SDFNB 101101/_ or similar.

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7.4.6 Base Station (KRCNB 301 03/_)



The BS is connected to the radio exchange by means of a standard twisted pair cable. The BS is can be fixed to a wall, a ceiling, a pole or a beam, by means of the mounting bracket included. When fixing the BS to a wall or ceiling the included plugs and screws must be used. When fixing it to a pole or beam a (not included) strap or a flexible metal band must be used.

Connectors

- Two 8-pin modular jacks for data and powering
- A 6-pin modular jack for factory testing

The two data/powering connectors are interconnected on the board.

LEDs

- LED 1: Green power LED
 LED 2: Three colour LED, see table below

Status of LED2	Meaning
Off	Base station operational and no traffic on the base station
Green	Base station operational and traffic on the base station
Red	Base station is malfunctioning
Amber	Base station is OK, but not available (self-test, not initialized, no communication with radio exchange)
Flashing green	All 8 channels are in use
Flashing amber	Software is being downloaded to the base station

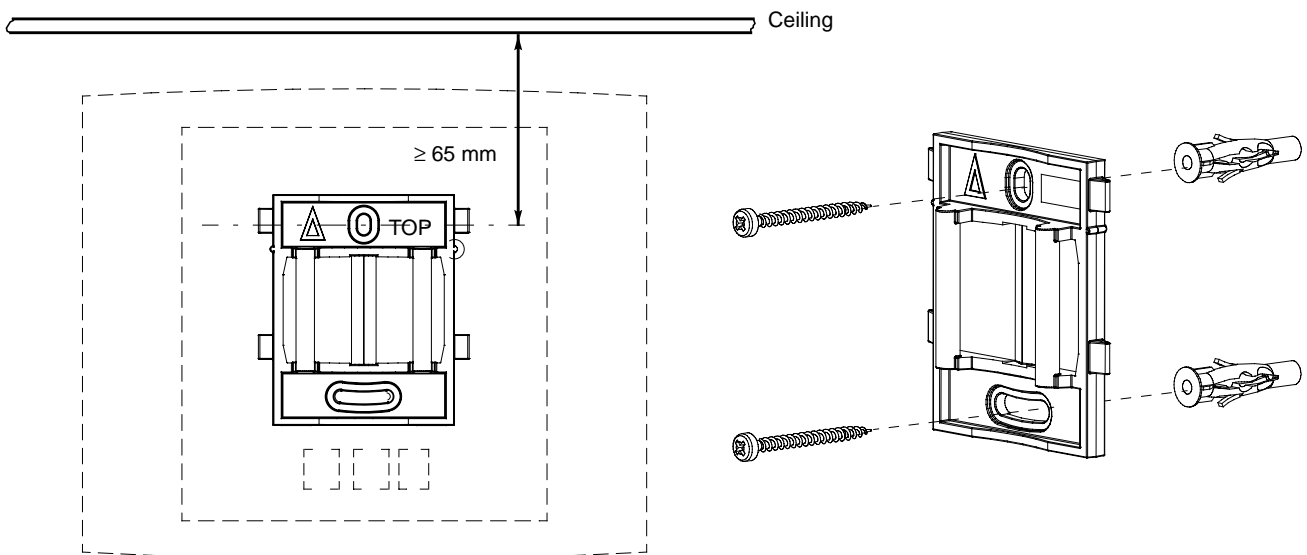
The BSs can be mounted vertically or horizontally. Mount the BSs at places and positions as determined in the system configuration plan. The BS must be placed so that it is not facing large metal objects such as large heating pipes, machines.

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Fixing the mounting bracket to a wall

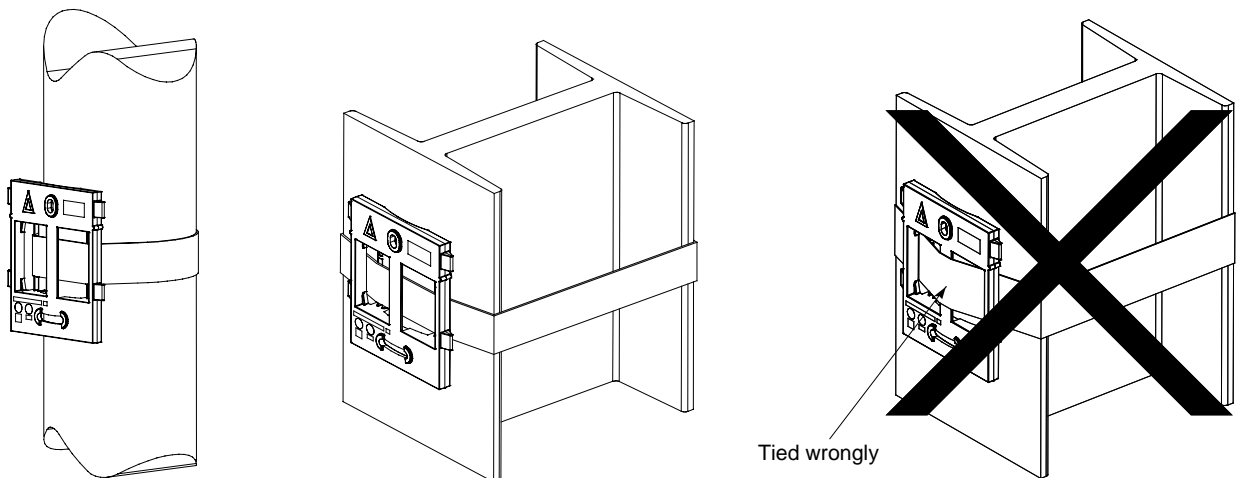
Fix the mounting bracket (see figure below) to the wall as follows:

1. Hold the mounting bracket with its flat side against the wall such that the text 'TOP' is the right way up, and mark the two holes. The minimum distance between the upper hole and the ceiling or any object above the BS must be as least 65 mm. If the distance is less than 65 mm, the BS cannot be slid onto the bracket.
2. When using wall plugs, take a \varnothing 6 mm drill and drill the two holes and insert the included wall plugs.
3. Position the mounting bracket with its flat side to the wall and fasten it with the two included \varnothing 3.5 mm screws.



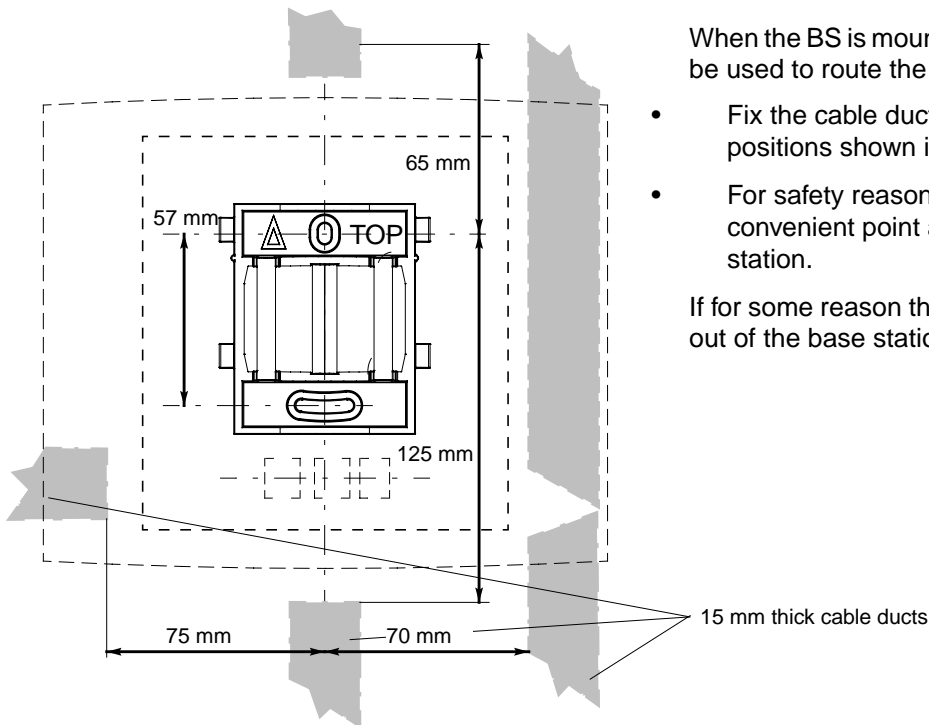
Fixing the mounting bracket to a pole or beam

The mounting bracket can be attached to a pole (diameter \geq 45 mm) or a beam (wider than 50 mm) by means of a strap or flexible metal band less than 30 mm wide. Position the mounting bracket to a pole or a beam so that the text 'TOP' is right way up. The strap or flexible metal band must be purchased locally.



Cable ducts

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When the BS is mounted to the wall, cable ducts can be used to route the wiring through.

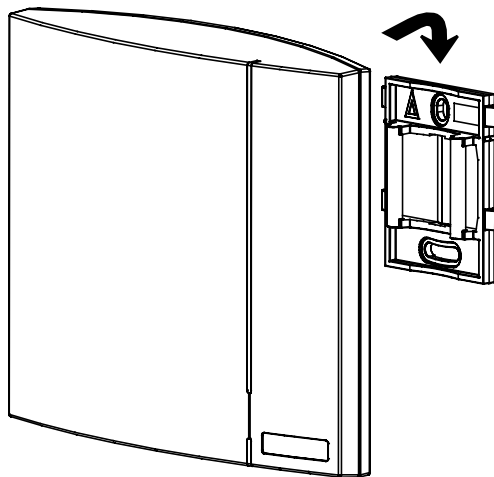
- Fix the cable duct to the wall in one of the positions shown in the left figure.
- For safety reasons secure the BS cable to a convenient point at about 30 cm from the base station.

If for some reason the BS drops, the cable is pulled out of the base station.

Mounting the Base Station

1. Hold the BS flat against the mounting bracket and move it downwards until it clicks.

Note: After completion of the installation, base stations must be initialized using the cordless system manager.



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7.4.7 Power Feeding of Base Stations

When using any of the adapters mentioned below care must be taken to configure the IC-CU2 boards for local BS feeding. If the BSs are to be fed locally the remote power feeding switch on the boards should be set to the position disconnecting the feeding from the back plane and no external feeding to the board should be connected.

Adapter for Base Station (KRCNB 201 03/_)

An AC-adapter to feed the BS locally is available for 230VAC/24VDC (BMLNB 101 04) for all European countries except for the UK and Cyprus. In other countries it has to be purchased locally and must meet the specifications given below:

Output voltage: between 12 V and 56VDC
 Output power 7.5W minimum

Adapter for Base Station (KRCNB 301 03/_)

The 24 VDC adapter (BMLNB 101 09/n) is fitted with a 8-pin modular plug that can be plugged into one of the data/power connectors of the base station.

7.4.8 Software upgrade

If necessary, the software in the BS can be updated by downloading new software to the BS. Downloading can be performed without disconnecting the BS. The new software is stored in flash memory.

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8 LINE NETWORK

The line network for PBX-extensions is to be installed in accordance with the stipulations for standard telephone networks. Twisted pair cables must be used for the lines and a wire diameter of 0.5 mm is recommended in order to reach full line length, i.e. 800 m.

No stubs and/or branches may exist on digital extension lines, as they could cause transmission problems.

- In case a separate Ericsson MDF has to be installed, prefabricated cables are used between the MDF and board connectors in the exchange cabinet. These cables have EURO-connectors mounted at one end for connection to the board.

For connection of ELU-A, ELU-D, ELU-D3, MFU, BTU-A, BTU-C or BTU-E to the MDF use the following cable:

- TSR BS 902 0001/800 is terminated on the board side with standard Ericsson connectors and Krone connectors on the other side.
- TSR 902 0472/3 (length = 6 m) is equipped with a connector only at the exchange side
- TSR 901 0472/2 (length = 15 m) is equipped with a connector only at the exchange side

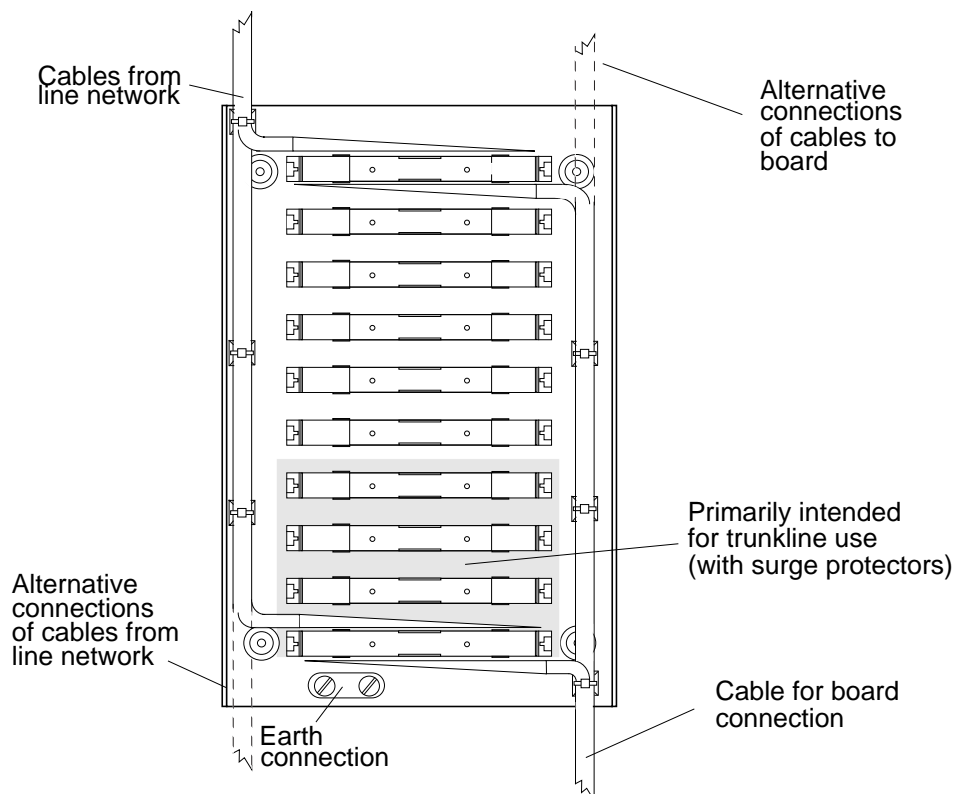
For connection of BTU-D, use the following cable:

- TSR 225 1304/20000, 75 Ω coaxial cable
- or use the same cable as for BTU-A for 120 Ω connection or a double shielded cable TSR 901 0481/20000 (adhere to local requirements).

The cables run into the exchange from below the cabinet. The cables from the line network are led directly to the MDF in the exchange cabinet. Secure the cables to the exchange cabinet with the adhesive anchors and tie wraps.

Place the cables according to the figure.

NOTE: There must be a connection to earth for the MDF cabinet when surge protectors are installed.

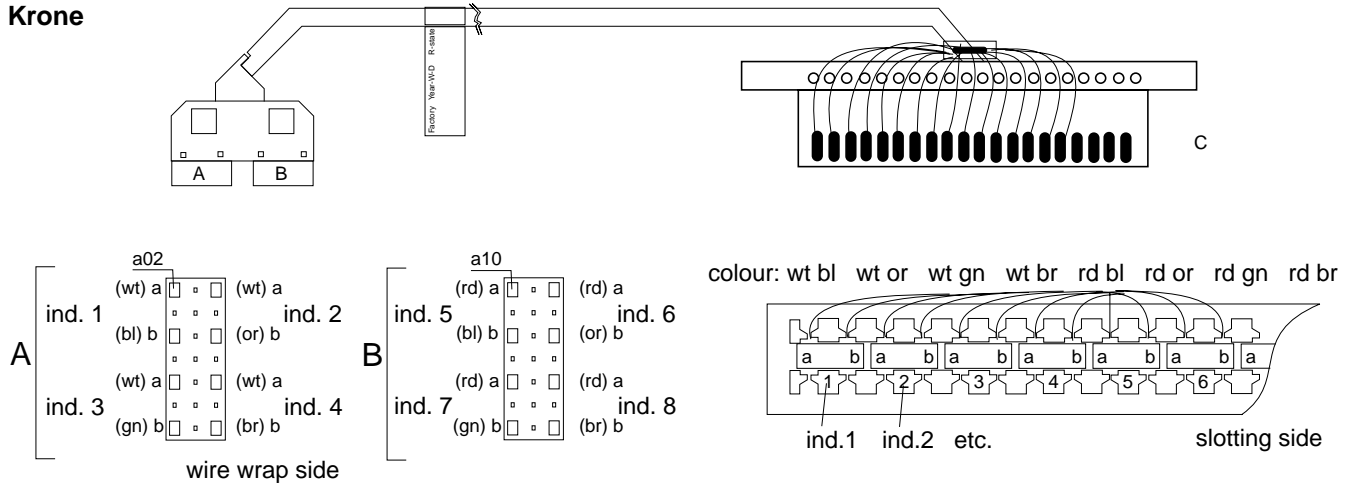


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		1531-BDV BS 101 05 Uen	
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			Reference

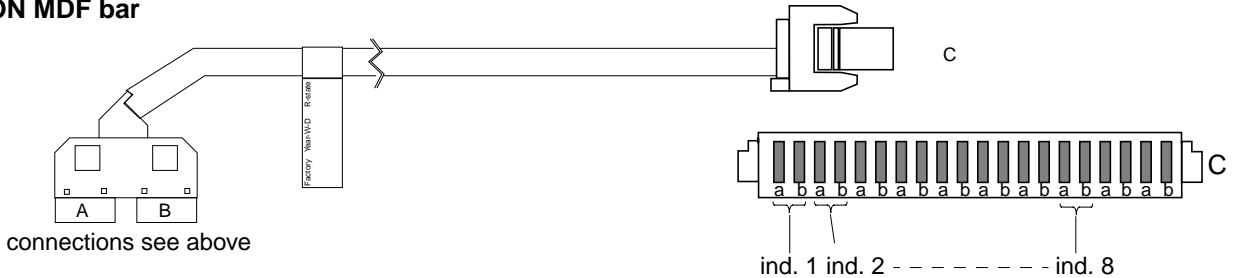
8.1 Cables for BDV 101 05

8.1.1 MDF cables

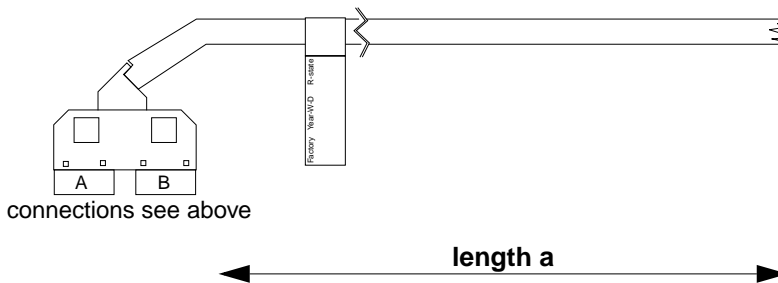
Krone



ERICSSON MDF bar



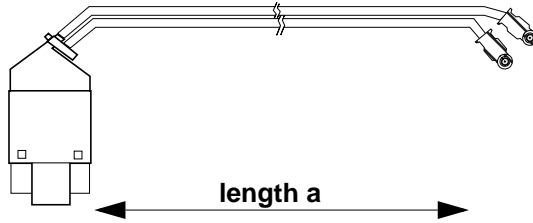
Open ends



part number	a	usage	Cable with 8 pairs, mounted with:
TSR BS 902 0001 /1500 /3000	1500 mm 3000 mm	standard cable for external MDF MDF cable for existing MDF	ERICSSON plug and Krone bar
TSR 902 0444/1	1500 mm	standard cable for external MDF	ERICSSON plug and ERICSSON MDF distribution bar
TSR 902 0444/2 TSR 901 0472/3 TSR 901 0472/2	3000 mm 6000 mm 15000 mm	standard cable for external MDF for external MDF, 120Ω for BTU-D standard cable for external MDF	ERICSSON plug and open ends

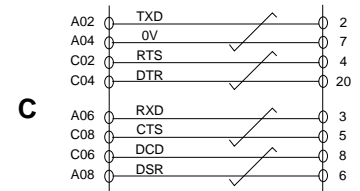
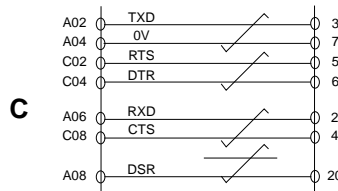
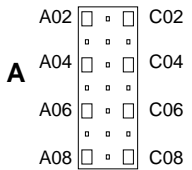
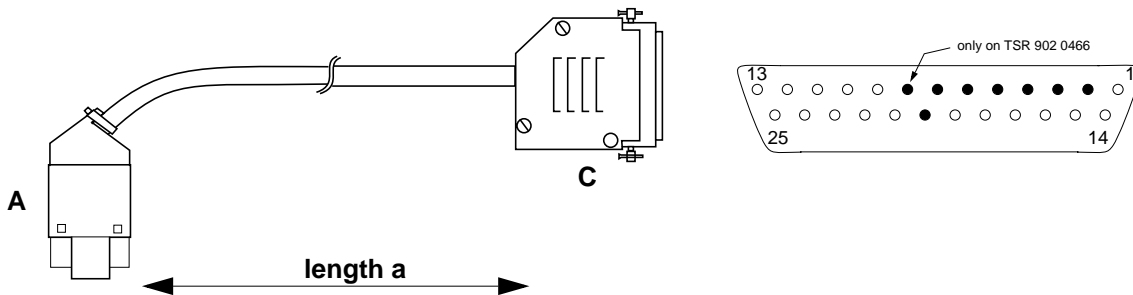
Prepared	Subject responsible	Documentnumber		
		1531-BDV BS 101 05 Uen		
Doc respons/Approved	Checked	Date	Rev	Reference
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8.1.2 Coax cable for BTU-D



part number	a	usage
TSR 225 1304/20000	20000mm	coax cable 75 Ω for BTU-D

8.1.3 V.24 cables



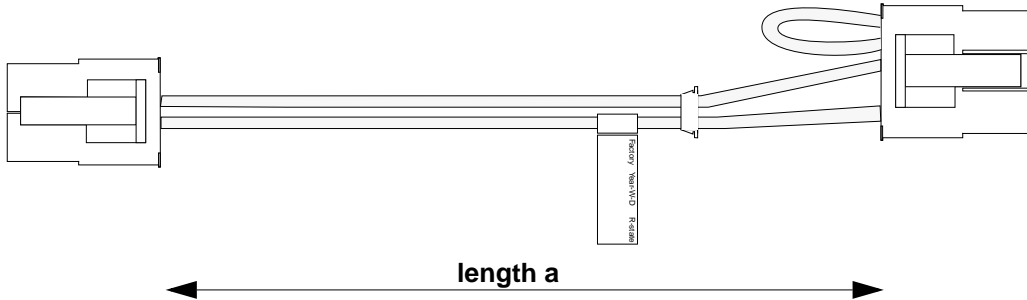
Wiring of cables: TSR 902 0476
TSR 902 0448

Wiring of cable: TSR 902 0466

part number	a	usage
TSR 902 0448/1	5000mm	cable connecting a PC to CPU-D_/AUX
TSR 902 0466/1	5000mm	cable connecting a modem to CPU-D_/AUX
TSR 902 0476/1	5000mm	cable connecting a printer to CPU-D_/AUX

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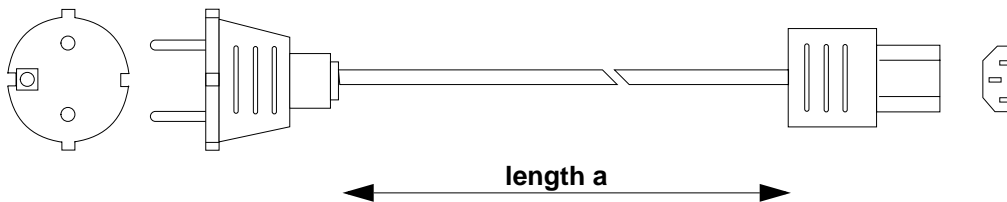
8.1.4 Battery connection cable



part number	a	usage
part of NTM BS 101 28	3000mm	Battery connection cable

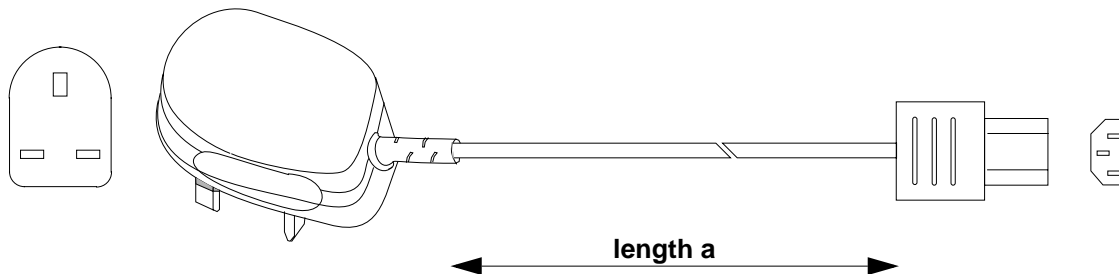
8.1.5 Mains power cables

Cable for EUROPE



part number	a	usage
RPM 945 323	2500mm	mains power cable 230V 10A

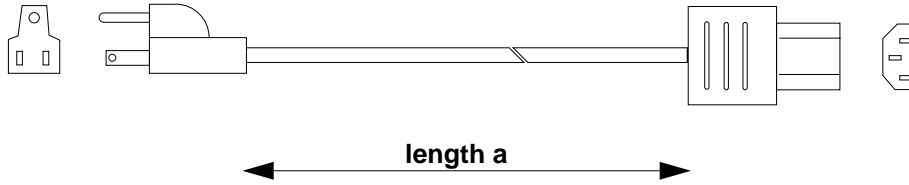
Cable for U.K.



part number	a	usage
RPM 945 326	2500mm	mains power cable 250V 10A

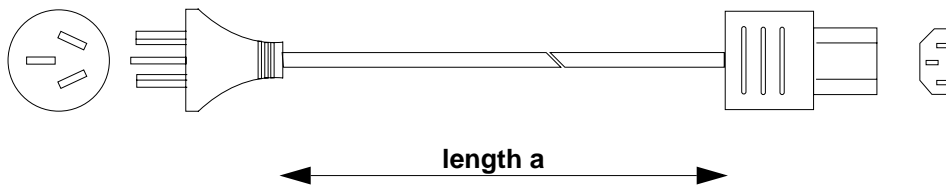
Prepared	Subject responsible	Documentnumber		
		1531-BDV BS 101 05 Uen		
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Cable for Brazil, Mexico, Venezuela etc.



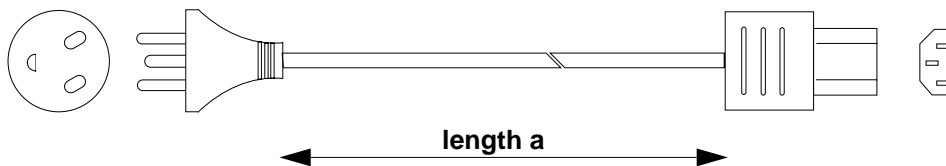
part number	a	usage
RPM 945 324	2500mm	mains power cable 125V 10A

Cable for Australia, New Zealand, China etc.



part number	a	usage
RPM 945 311	2500mm	mains power cable 250VAC 10A

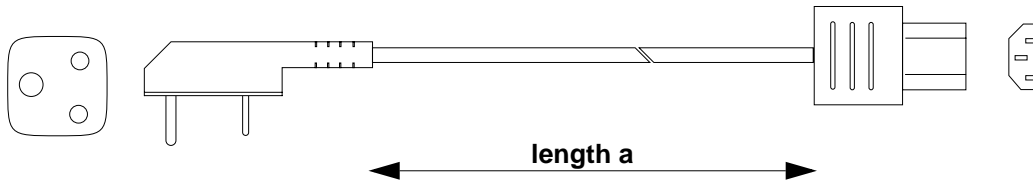
Cable for Denmark



part number	a	usage
RPM 945 327	2500mm	mains power cable 250VAC 10A

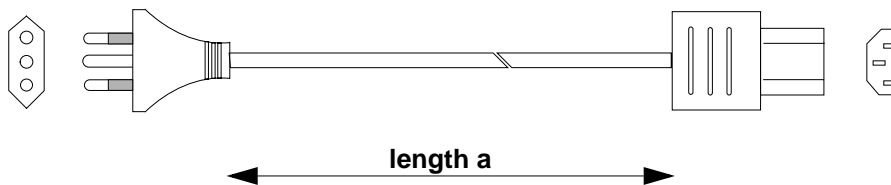
Prepared	Subject responsible	Documentnumber		
		1531-BDV BS 101 05 Uen		
Doc respons/Approved	Checked	Date	Rev	Reference
		1999-07-15	A	

Cable for India and South Africa



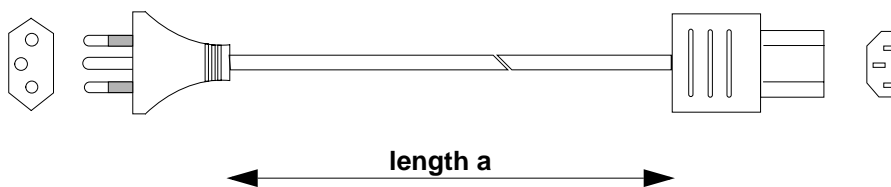
part number	a	usage
RPM 945 325	2500mm	mains power cable 250VAC 10A

Cable for Italy



part number	a	usage
RPM 945 313	2500mm	mains power cable 250VAC 10A

Cable for Switzerland

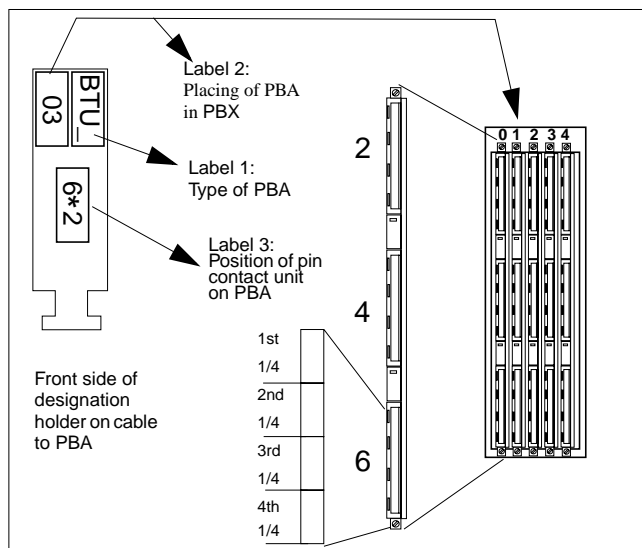


part number	a	usage
RPM 945 322	2500mm	mains power cable 250VAC 10A

Prepared	Subject responsible	Documentnumber	
		1531-BDV BS 101 05 Uen	
Doc respons/Approved	Checked	Date	Rev
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			Reference

9 MARKING OF CABLES

Each cable that is connected to a PBX type ASB 150 should be marked on the cable's designation holder with the label set SVH 277 003/4, supplied for this purpose. The cable TSR 902 0444/1 is supplied with a designation holder, 860 1839, at the EURO-connector.



This label set contains three label types:

Label 1: This label indicates the abbreviated name for the PBA to which the cable is to be connected.

Example of parameter: **BTU_**

Label 2: There is one 2-digit parameter. This parameter indicates the position of the PBA-slot in the PBA where the cable is to be connected.

Example of parameter: **03**

Label 3 There are two 1-digit parameters. The first parameter indicates the position of the pin-contact unit on the PBA. The second parameter indicates the 1/4 of the pin contact.

Example of parameters: **6*2**

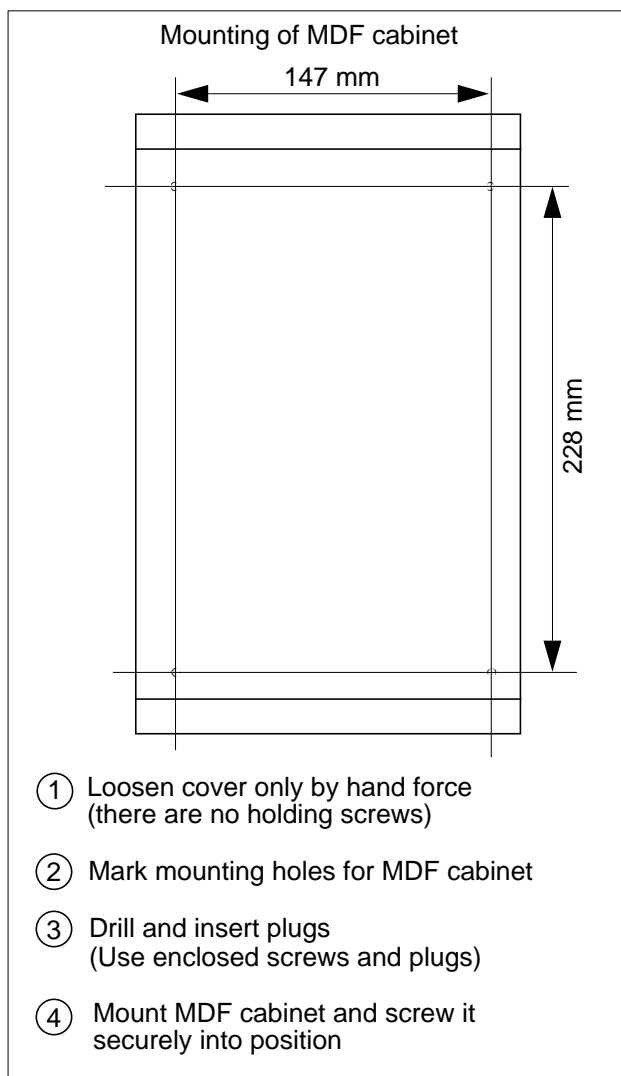
These three labels indicate where the upper part of the cable is to be connected and are placed on the front side of the designation holder.

When the **label 1** for PBA has a "_" included in the name, please enter the correct letter with a marker pen.

9.1 External MDF SXK 106 4139/1

Unpack the MDF cabinet and remove its front cover. Mount the MDF cabinet on its designated position. Take into consideration the normal working height above the floor (about 1.30 m to the lower edge of the MDF cabinet) and the length (1.5 m) of prefabricated cable TSR 902 0444/1.

Overall dimensions of the MDF cabinet: 295x184x68 (HxWxD in mm).



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			Reference

10 Door Interface Unit (DIU) (BFY BS 10101/1)

Installation:

The DIU is an interface connected via one or two extension lines to the ELU-A of the exchange and via a set of wires to the door phone. The DIU should be mounted indoors on a dry wall. The door phone can be of any commercially available type as long as it meets the requirements listed in the [1555-ASB15002Uen SYSTEM OVERVIEW](#) under section 7 Technical Data for DIU.

Connection:

The wires to the speaker and microphone should be led via two twisted pairs in a **separate** cable. Caution when connecting a polarity-dependant microphone. Check polarity on connector **x1**. Make the connections to the door bell button, door opener and key lights etc in another cable. This is to minimise disturbances on the microphone line. The wires to the door opener carry more current and should have a diameter greater than 0.6 mm. The length between door phone and DIU should be less than 50 m. The length between door phone and exchange should be less than 500m.

The connector **X18** is used for speech connection between DIU and exchange. The connector **X17** is used to activate the door opener. If the door opener wiring already exists the **X17** connection can be omitted and the connection **X12** leads to an existing button.

Pressing the door phone button (connection **X5**) activates the DIU and the programmed extension rings (see [Facility Description 15534-ASB15002Uen](#)). The interface stays active for the preset time selected under "**C**" and shuts off after this time has elapsed.

10.0.1 Adjustments of DIU

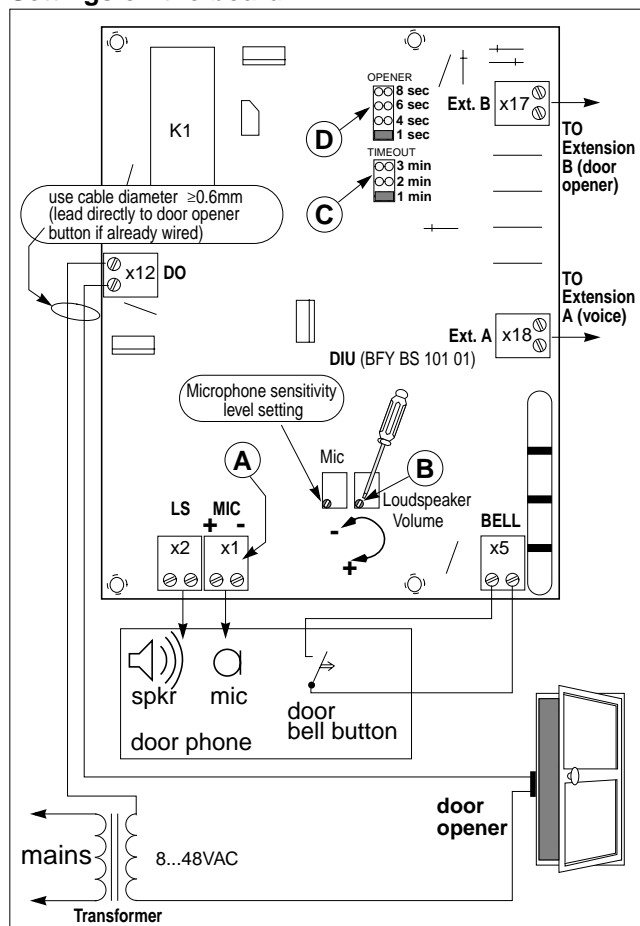
The microphone level is factory set, but under certain conditions the line attenuation can exceed expectations resulting only in one way speech connection or clipping of the voice between extension and door phone. In this case **cautious** change of microphone level setting has to be performed. The potentiometers range is

- If the voice in the speaker of the door phone sounds too dim or is clipped, turn the **mic** potentiometer screw two turns counter clockwise. Speak into the telephone microphone and verify that the speaker

sounds loud and clear enough otherwise repeat the procedure.

- No voice connection to the speaker of the telephone. Turn the **mic** potentiometer screw two turns clock wise. Speak into the door phone microphone and verify that it is heard in the hand set of the telephone otherwise repeat again.

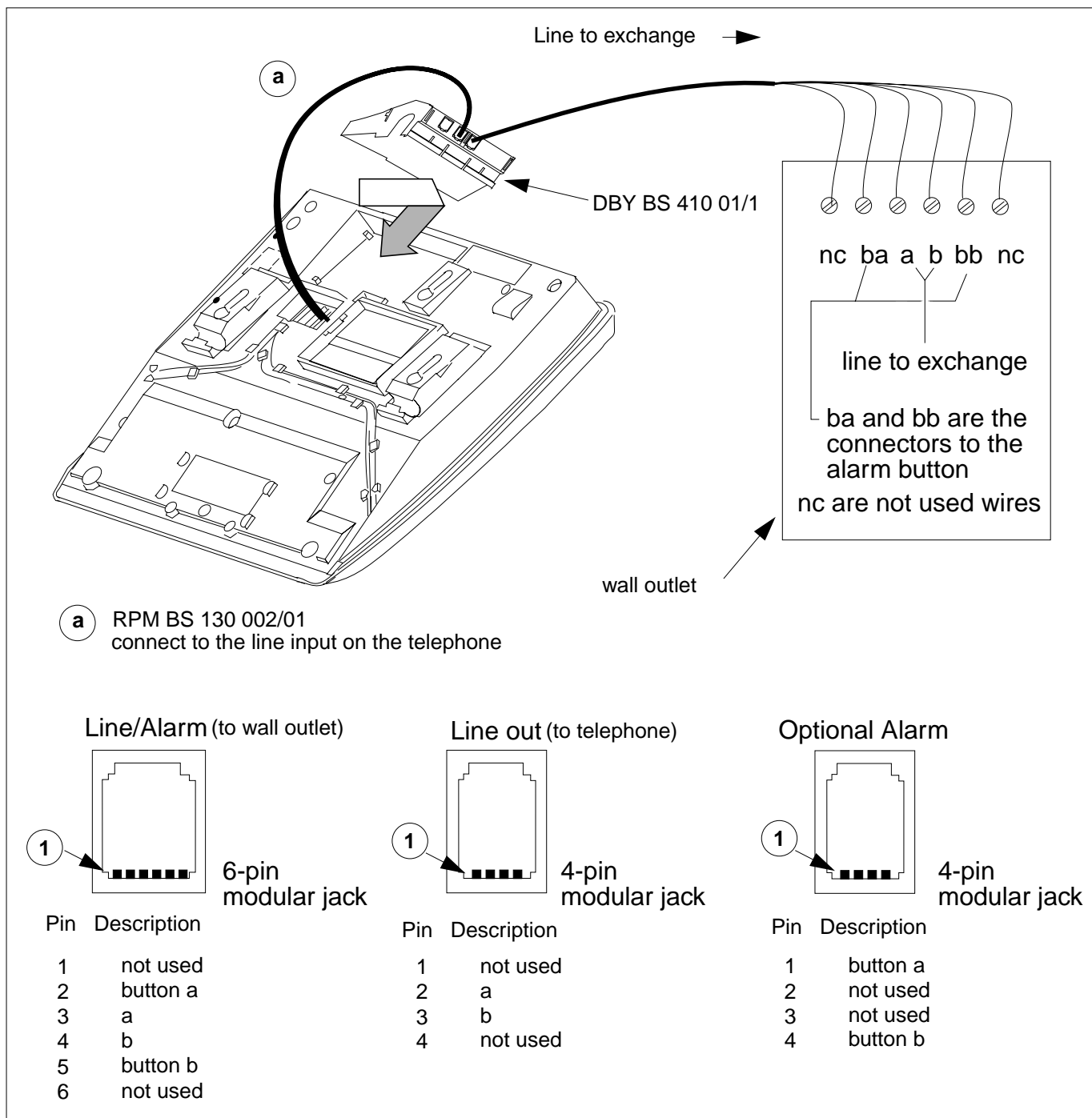
Settings on the board



- A** Microphone connection with polarity dependent 6 VDC supply for microphones with amplifiers.
- B** The loudspeaker volume level is factory set. To adjust turn the Loudspeaker potentiometer.
- C** Timeout for the interface to shut off. The jumper selects intervals between 1...2...3 minutes.
- D** Set door opener mic activation time 1...4...6...8 sec.

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11 INSTALLATION OF ALARM INTERFACE UNIT



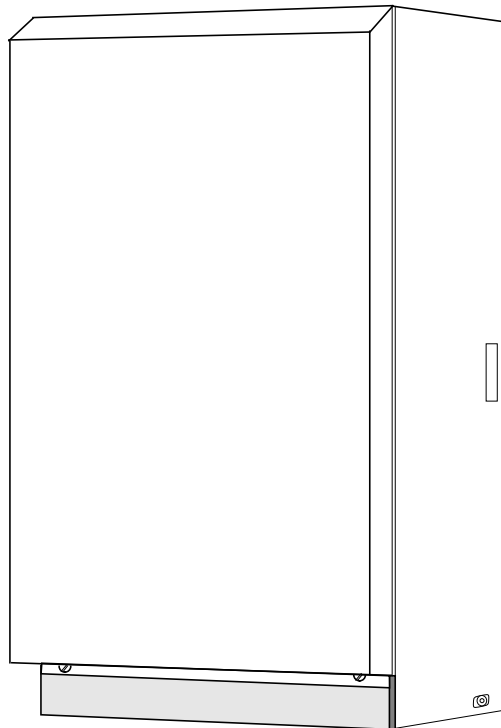
The ALARM INTERFACE UNIT is an optional equipment mounted in the case bottom of the DBC 21x telephones. This equipment is used in the hospitality area to enable distress notification from e.g. a bathroom. A normally closed switch is installed and the two terminals are connected to the pins (button a and button b) on the option unit. The connection can be made in the wall outlet. Then the wiring shown above applies. If another type of wiring is used the connector Optional alarm can be used.

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		Tillhör/Referens-File/Reference ASB 150 02	
Database reference 1531_250.fm			

INSTALLATION INSTRUCTION

EXCHANGE CABINET

BDV 113 08



Prepared	Subject responsible	Documentnumber 1531-BDV 113 08 Uen	
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1 GENERAL

The exchange cabinet BDV 113 08 can be furnished with Printed Board Assemblies (PBAs or boards) belonging to ERICSSON's PBX-system ASB 150 02. The desired system functions are made possible by means of the appropriate boards and system programming. The ASB 150 02 system can be expanded to a maximum of three exchange cabinets of type BDV 113 08.

The PBX can be powered either by a transformer unit, a switched mode power supply, installed in the back of the cabinet, or by an existing external 48 V DC-source.

After installation the PBX shall be made operational in accordance with the stipulations that apply for system ASB 150 02. See document [START OF OPERATION \(1537-ASB 150 02\)](#). The cabinet is adapted for boards fitted with brackets containing screws. Only boards equipped with these brackets must be installed. These screws must always be fastened to ensure a proper ground connection.

Every cabinet's board position could be used for arbitrary furnishing with boards belonging to PBX system ASB 150 02 but the first position in the first cabinet must be reserved for the CPU-D_.

Any lines connected to the PBX that are subjected to excess voltage (transients) in conjunction with e.g. lightning discharges must be equipped with excess voltage protection, refer to figure: Line protection. The excess voltage protection can not be installed inside a BDV 113 08 cabinet but should be mounted in an integrated or external MDF.

Special precautions must be taken for analogue extension lines that are leading outdoors to prevent the analogue extension board's secondary protection devices from blowing in case of lightning.

In this case the extension line must have:

- 1 A protective resistor of 10 Ω/1W (REN 195 42/1) connected in series between cabinet and MDF
- 2 An overvoltage arrester (gas discharge tube) for quenching surges to protective ground should be installed on the network side of the protective resistor

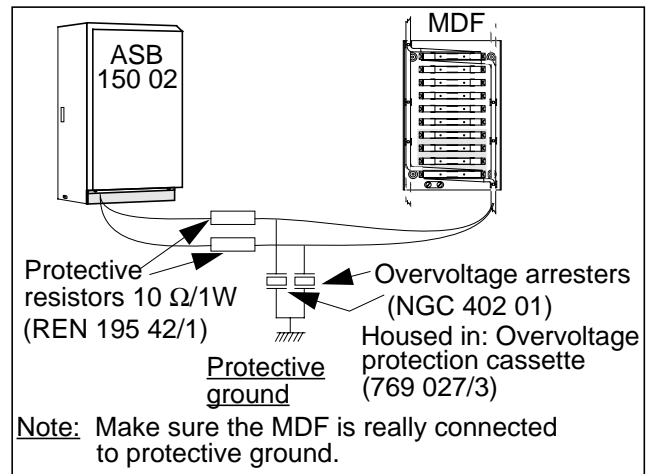


Figure: Line protection

Note: The article numbers stated in this document are included for information purpose **only**. For ordering please refer to the relevant system ORDERING INFORMATION (131 62-1x/ASB150 02).

1.1 Supplementary Documents

- Document collection EN/LZB 103 1233

1.2 Tools

In addition to customary installation tools, the following are recommended:

- Appropriate slotting tool for connecting cables to external MDF. For MDF SXK 106 4139/1, use slotting tool LSY 138 252 and for the MDFs with KRONE connectors, use slotting tool 769 027/2
- Board extractor for PBAs (Handle LTD 117 02 and Bottom LTD 117 12)

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2 DECLARATION OF CONFORMITY

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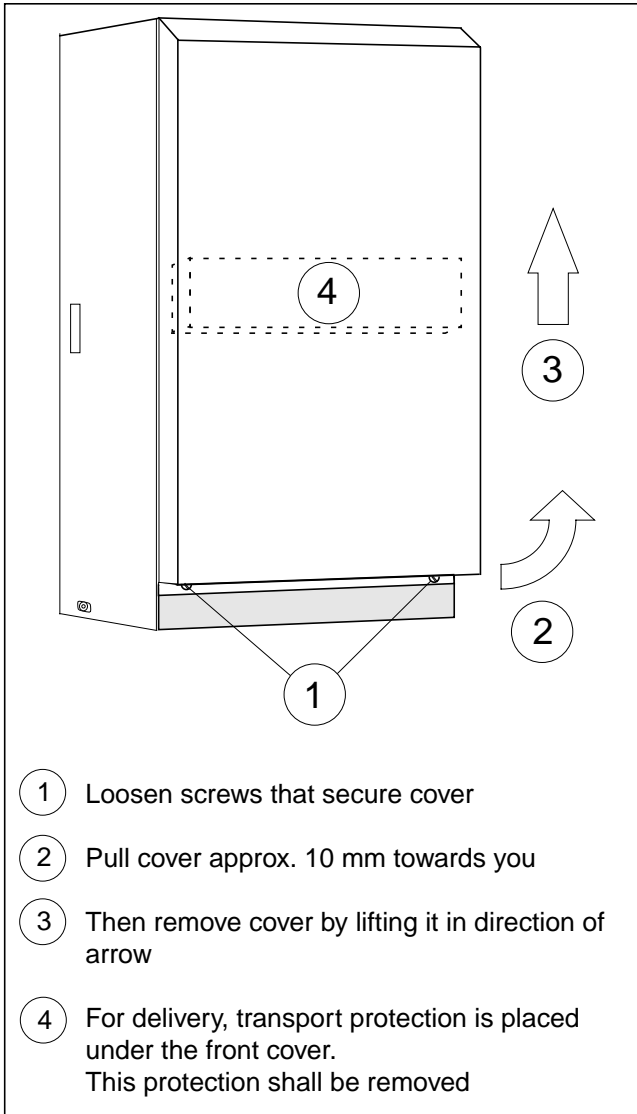
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3 UNPACKING

Unpack the exchange cabinet and remove its front cover.



Check that all ordered items have been received according to the delivery note and nothing has been damaged during the transport.

4 INSTALLATION

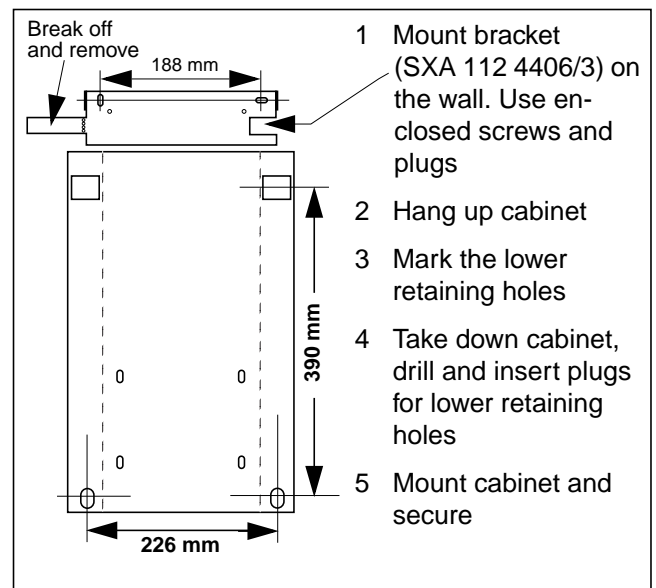
The PBX cabinet with the power supply in the back is to be mounted on an indoor wall. A mains outlet must be provided near the equipment and shall be easily accessible. The premises shall comply with the following prerequisites:

- The air shall be free of dust and smoke
- Environmental conditions according to Ak 8. (Temperature shall be between + 5° C and + 40° C and relative humidity may vary between 15% and 80%)
- The PBX shall not be exposed to direct sunlight
- Cable shall preferably run into the PBX from below the cabinet to ensure sufficient air flow and space for the power supply is provided.

4.1 PBX with one cabinet

Mount the exchange cabinet in its designated position. Take into consideration that the normal working height above the floor is about 1.30 m of the lower edge of the cabinet.

Overall dimensions of cabinet: 432 x 256 x 299 (H x W x D in mm)

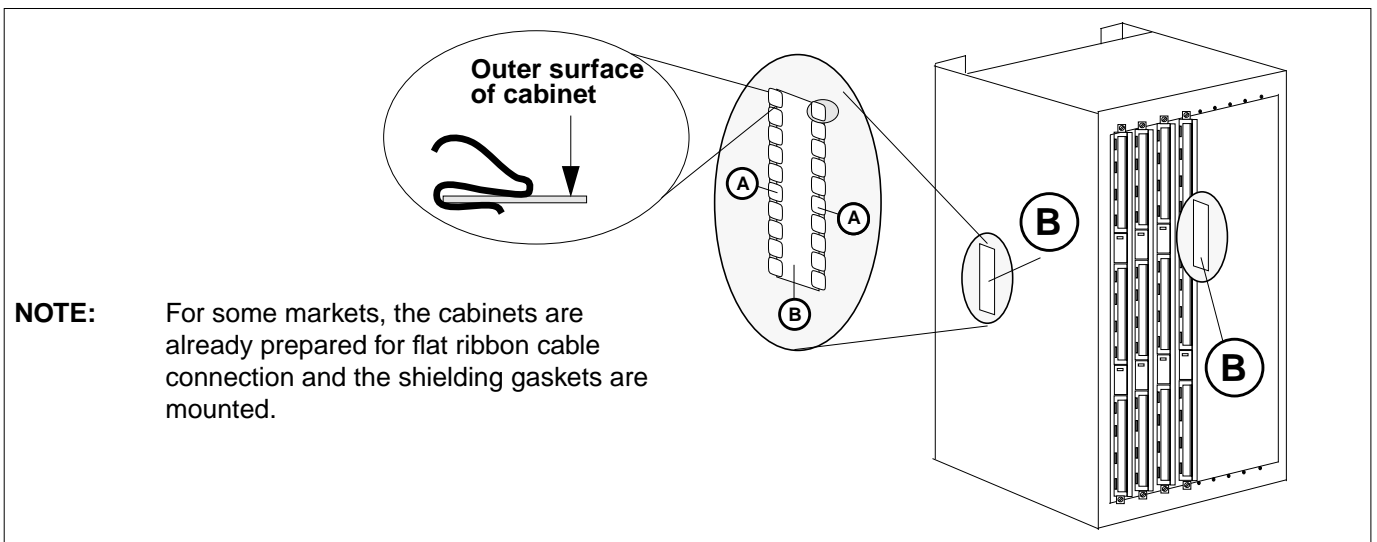


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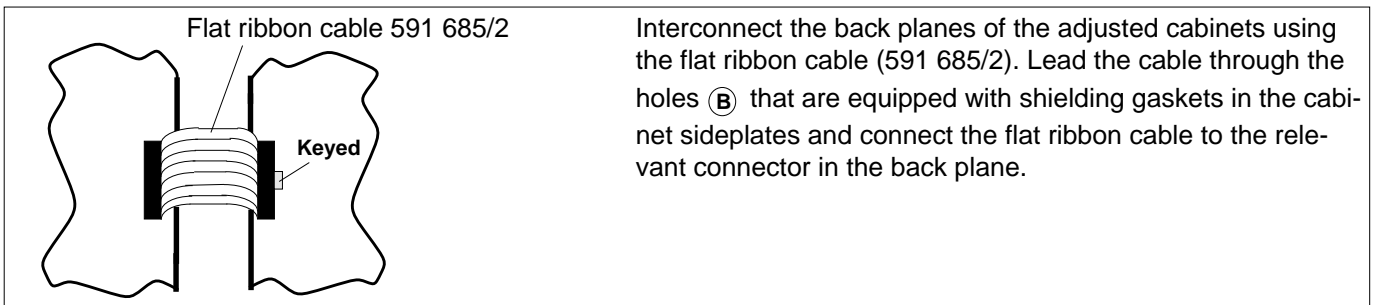
4.2 PBX with more than one cabinet

A system comprising more than one cabinet is to be expanded in the following way:

- 1 Remove inserted PBAs from cabinet (if necessary)
- 2 Prepare all cabinets included in the PBX by removing the break-off piece (B) on the cabinet sideplate(s) that is to be mounted adjacent to another cabinet's side plate
- 3 Now insert the shielding gaskets (A) (enclosed with expansion kit) in the hole (B) as shown below



4.2.1 Interconnection of Back Planes



Note: The connector is keyed.

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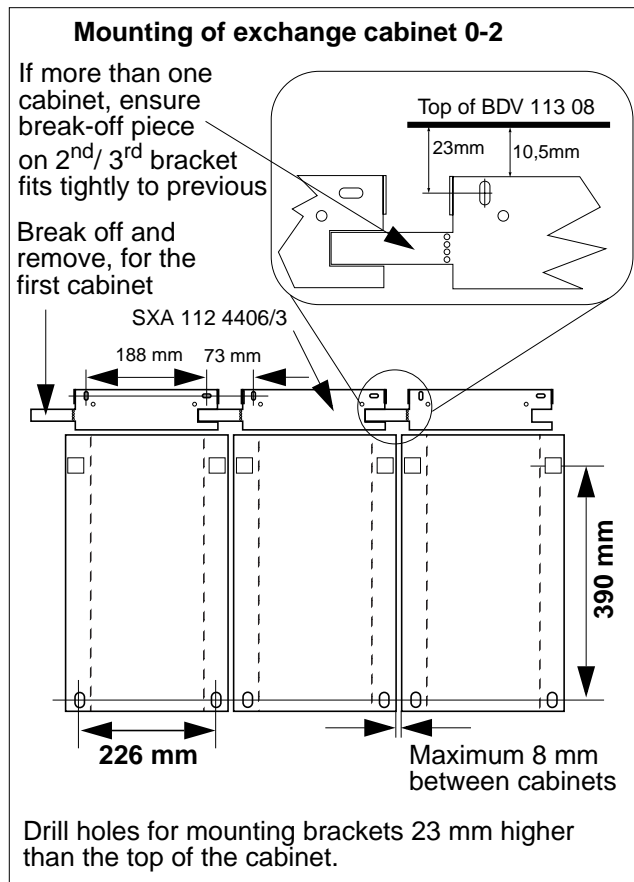
4.2.2 Wall mounting

- 1 Mount brackets (SXA 112 4406/3), for all cabinets, on the wall. See figure below
- 2 Mount the cabinets onto the brackets
- 3 Adjust the cabinets by pushing them towards each other.

The "square holes" enable the cabinets to be moved to both sides a few millimetres, that the contact springs of the shielding gaskets always have good contact to one another.

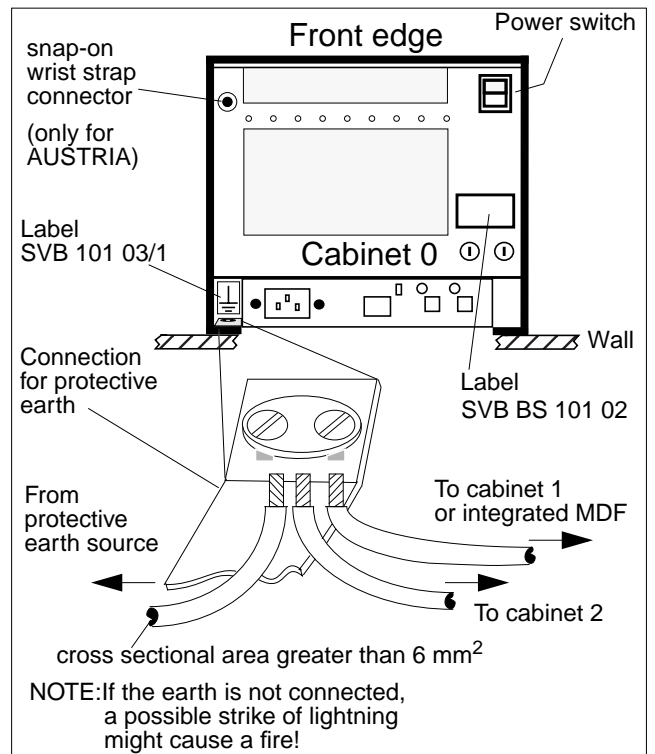
The lower retaining screws are used to secure the cabinets in the correct position:

- 4 Mark the position of the screws and remove the cabinet(s) from the wall
- 5 Drill and plug the retaining holes
- 6 Mount the cabinet(s) and secure them, using all retaining screws.



4.3 Safety Rules

To fulfil electrical safety requirements IEC 950/ EN 60950 respectively EN 41003, the exchange must be connected to protective earth. Local requirements shall be adhered to. Before operating, ensure that the



chassis is connected to a hard wired protective earth.

NOTE: Make sure that a sound ground connection to the exchange has been established. Otherwise this can be hazardous in case of lightning.

Note: The wrist strap must have a 1MΩ series protection resistor to comply to the safety standards. If this resistor is missing, then accidentally touching live wires can be lethal.

4.3.1 Safety statement for line connection

All line interfaces in the PBX are protected in accordance with K.21 (voltage transients up to 1.5 kV). BTU-A, BTU-A2, BTU-B, BTU-C, BTU-D and BTU-E are working with interface TNV.

All other boards and the V.24 port work with interface SELV.

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4.4 Power Supply

The power supplies listed below are designed to be powered by sinusoidal mains voltages:

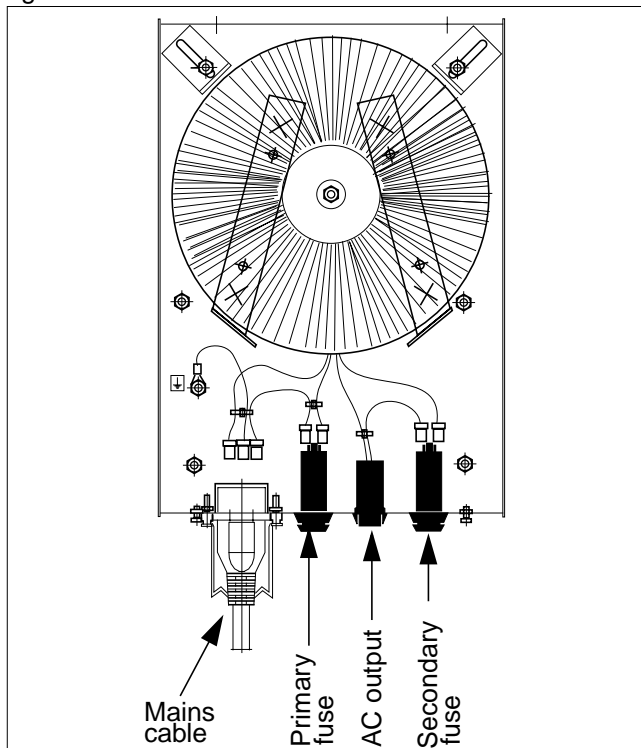
- A transformer 36 - 38 VAC, 50-60 Hz; 325 VA (RES 147 051/_)
- A fused external DC source (42V...56V, 48 V nom.; 5.0 A)
- A power supply with battery charger (BML 351 048, 48 V; 5.0 A) (BML 351 013, 48 V; 5.0 A)

As the power feeding input of the PBX is equipped with a rectifier bridge, the same input can be used to connect 36 V AC or polarity-independent 48 V DC.

Both transformer and switched mode power supply are mounted on the rear of the cabinet and the power connection is shown below.

4.4.1 Mains transformer

In a standard installation the PBX is fed by a protective safety class I transformer with a rated secondary voltage of 36 VAC.



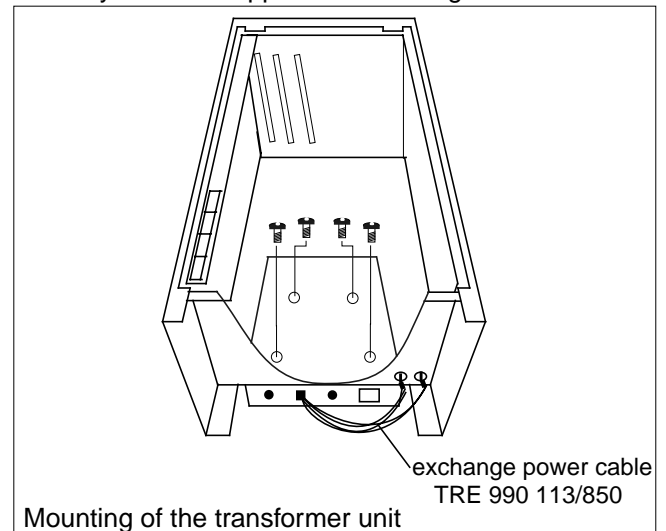
Note: The PBX shall have its own mains fuse and must be connected to an earthed mains outlet

This transformer is available for the following mains voltages:

- for 230 V RES 147 051/1
- for 127 V RES 147 051/3

Mounting of the transformer unit

To mount the transformer unit in the rear of the cabinet BDV 113 08 insert the unit from the top into the slot at the rear of the cabinet with the mounting holes facing to the front. Align with the 4 cabinet holes and fasten securely with the supplied self-etching TORX screws.



Use the cable TRE 990 113/850 to connect the transformer to the exchange. Plug in the 4-pole connector to the AC outlet of the transformer unit and connect the other end to the flatpin connectors on the input filter in the cabinet.

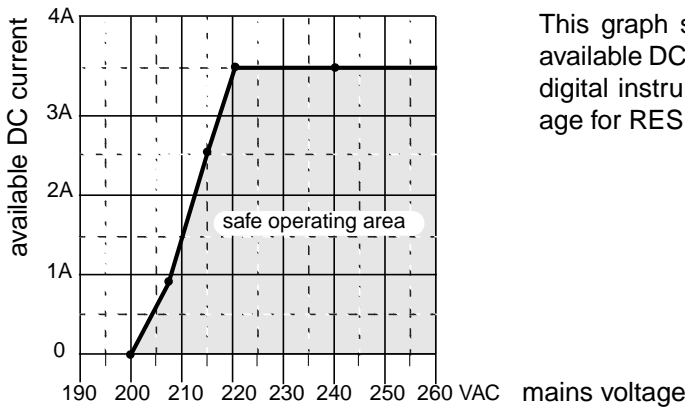
Technical data:

Input voltage tolerance	+/- 10%
Input frequency	50/60 Hz
Dielectric strength primary/secondary	3500V

• Fuse ratings for transformer unit

voltage version	primary	secondary
230 V	T 3.15 A	T 6.3 A
127 V	T 6.3 A	T 6.3 A

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This graph shows the dependency of mains voltage deviation to available DC output current. This will result in reduced line length for digital instruments. the available output current versus mains voltage for RES 147 051/1

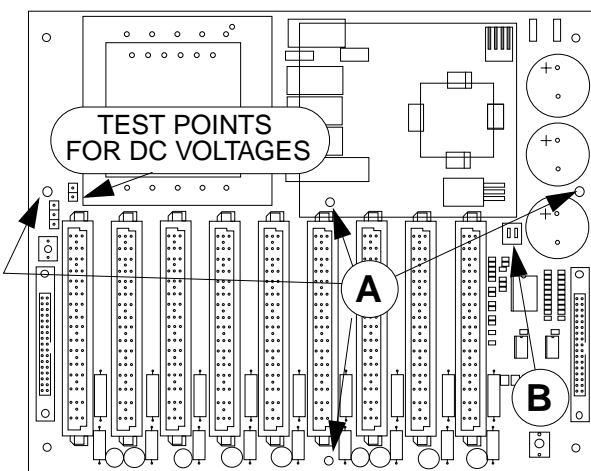
4.4.2 Power Supply with battery charger (BML 351 013/_)

For installation of the switched mode battery charger, alarm interface and batteries refer to the document [INSTALLATION INSTRUCTION \(1531-BML 351 013\)](#) describing the batteries and charger.

4.4.3 Power Supply with battery charger (BML 351 048)

A switched mode power supply is available for applications where a higher current than the transformer and/or a battery backup for the PBX is required. This unit can also be used without battery backup. For installation of alarm interface and batteries refer to the document [INSTALLATION INSTRUCTION \(1531-BML 351 048\)](#) describing the batteries and charger.

4.5 Backplane (ROA 119 5132) PUB 6



The PUB 6 is mounted in the cabinet BDV 113 08. The board is equipped with an input rectifier for 36VAC or 48VDC from the transformer or battery charger. The on board DC/DC converter steps down to the system voltages. Additionally up to nine add on boards can be connected.

The output buffer to the next cabinet can be disabled by means of the DIP-switch location **(B)** (pos. OFF) when mounted.

Replacing the PUB 6 (refer to drawing on left)

Unscrew the TORX no. 10 screws in the four corners. The squeeze the protruding plastic holders in the locations **(A)**. Remove the heat sink on the rectifier to access the holder below. Remove board and replace with new one.

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4.6 Power supervision on ELU-A

The ELU-A board is equipped with an automatic traffic limiter restricting the internal power dissipation on the board to a maximum of 12 W. This depends on both the line length and the number of lines busy.

When the power consumption exceeds this limit, no more lines can be accessed and until at least two lines go on hook again are all lines accessible.

When connecting external voice systems a maximum of 8 lines are recommended on each board. The remaining lines on the board are to low traffic extensions.

4.7 System Power Consumption

The power demand of the system comprises the sum of the current demands of all extensions, base stations etc. This total current has to be delivered by the power supply. Choose the one delivering the rated current with a suitable margin for add on equipment depending on the installation site.

Base Station Power Demand

To minimise the power dissipation on the serial communication wires EPP should be used extensively. Up to 60 BS can be installed in a cabinet. Short power peaks can be covered by installing a battery cabinet.

The current limit for remote feeding to the BS per IC-LU is 1.5A on the 48V if supplied from the backplane and 2.1A when supplied via an external power input at the front of the connector. The total current for all BS must be less than the power supply(s) capacity. The total 48 VDC load on the power supply has to be calculated as follows:

Cable length	STD	EPP	STD	EPP
	0,5 mm \varnothing		0,6 mm \varnothing	
0m	104	104	104	104
100m	110	106	108	106
200m	114	110	110	108
300m	121	112	114	109
400m	129	115	118	110
500m		119		112
600m		121		114
700m		125		117
800m		129		118
900m		133		121
1,0km		139		123
1,1km		146		125
1,2km		152		127
1,3km		160		129
1,4km		171		131
1,5km		183		135
1,6km		204		137

This table states the current demand in mA for a Base Station depending on the cable length and cable diameter.

Calculation example:

Line length to Base Station:	700m	
Resistance of loop:	0.18 Ω /m	
Cable diameter (ϕ):	0,6 mm	
Assuming 7 Base Stations are already connected they consume a current of:		1300 mA
Current of BS 0,6 (ϕ) and 700m:		+ 117 mA
Total current for all Base Stations is:		1417mA
(This current can be supplied by the back plane)		

Power demand taken from Power Calculations below, for telephones, boards:

Total load on power supply: 4592mA

This total load for the exchange can be supplied by the battery charger as it is less than 5A.

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Extension Power Demand

TELEPHONES	CURRENT CONSUMPTION			TELEPHONES	CURRENT CONSUMPTION		
	Typ (mA)	Max (mA)			Typ (mA)	Max (mA)	
BASIC	DBC 210	14	35	OPERATOR CONSOLE	DBC 214	40	120
	DBC 199	25	35		DBC 663	67	110
ECONOMY	DBC 601	27	32	DBC 754	75		
	DBC 751	38		DBC 214 with 2 DBY 409 01	35	70	
ECONOMY ^{plus}	DBC 211	14	35	DBC 214 with 4 DBY 409 02*)	35	70	
	DBC 201	30	50	ANALOGUE (in active state)	40		
STANDARD	DBC 212	14	35	TAU 2610	4	4	
	DBC 202	30	50	Desktop Adapter		23	
	DBC 631	65	70	BTU-B (S-interface per physical link)		50	
	DBC 755	50	73	BTU-C index (/1,/2) ¹⁾	(per trunk)	14	35
	DBC 752	50	73	Radio base station: refer to table above			
EXECUTIVE	DBC 213	35	70				
	DBC 203	35	70				
	DBC 662	70	73				
	DBC 753	75					
DBC 213 with 2 DBY 409 01		42	70				
DBC 213 with 4 DBY 409 02*)		35	70				

¹⁾ provides current on trunk lines in active state to public exchange.

The maximum values for telephones result when all LEDs are lit and if available, loudspeaking is on at max. volume.

*) with connected external power supply.

Power calculation example

LINE EQUIPMENT	QUANTITY	CURRENT (mA)
DBC 199	32	800
DBC 201	20	600
DBC 202	10	300
DBC 203	3	105
DBC 214	1	70
Power for boards		800
Battery charging		500
TOTAL	66	3175

The BDV 113 08 can be equipped with two different power supplies. The transformer unit supplies an AC current that is rectified on the backplane in the cabinet. The available DC current for the transformer unit is 3.5 A. Using the switched mode power supply with battery charger a DC current of 5.0 A is available. To calculate the available current for the telephone sets subtract 0.8 A for the boards installed in the exchange. If backup batteries are connected to the BML unit, subtract again 0.5 A for charging the batteries.

The calculation above shows how to calculate the current demand for a given installation. This amount of current has to be supplied by the installed power supply.

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5 BOARD POSITIONS

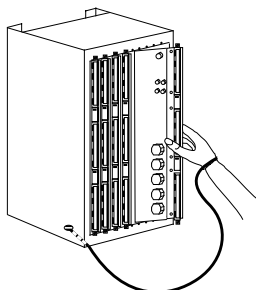
Handling of PBAs

Service personnel shall always connect themselves to ground to prevent damage caused by static discharges.

Boards with **Electrostatic Sensitive Devices (ESD)** are marked with a  sign.

Some of the benefits of ESD protection are:

- less failures/service calls
- lower maintenance costs
- higher customer satisfaction

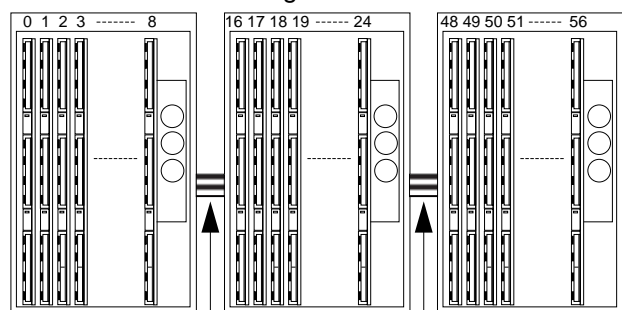


Use portable equipment as protection against electrostatic discharges e.g. LYA 30101

In the interest of quality and reliability of the system boards always handle static sensitive boards with special care. Always use a **wrist strap** connected to a low resistance ground e.g. provided on the cabinet.

5.1 Board position numbering

Note the slot numbering for entire PBX



Cabinet 0 (1*) ^① **Cabinet 1 (2*)** ^① **Cabinet 2 (4*)**

The values in brackets define the cabinet numbering for Integrated Cordless as used by the Cordless System Manager.

Board position numbering for:

- the basic unit: 0,1 --- 8.
- first additional unit: 16,17 --- 24.
- last additional unit: 48,49 --- 56.

① = Flat ribbon cable 591 685/2

5.2 Placing of boards

The cabinet BDV 113 08 is prepared for arbitrary furnishing of boards belonging to the ASB15002 system but certain constraints should be considered for best performance results. The cabinet 0 is to be equipped as follows:

- Pos. 0** Reserved for CPU-D_
- Pos. 1-8** Available for arbitrary PBA configuration like IC-CU_, IC-LU, ELU-, VMU-D, AUX_, BTU-_ and REG.
- Pos. 8** VMU-HD thermal considerations regarding the hard disk require this position. If any other position has to be chosen then the board in the next right hand position should be one of the following: AUX_, REG, BTU-D or free space.

Note: It is advisable to use a maximum of two BTU-Ds in one PBX. Not applicable if used as REG board.

Arbitrary board configuration on positions 1, 2 - 56. The Integrated Cordless system should be installed within one cabinet furnished with a PUB5 or higher. This leaves room for a maximum of 7 IC-LUs. RASC cannot detect IC-LU boards installed in the system so it is advisable to locate these boards to the right of the IC-CU_ board. IC-LU boards can be removed and replaced without needing to shut down the exchange. All boards except the CPU-D_ can be exchanged under power provided that the board is replaced by a board of the same type and configuration. New boards

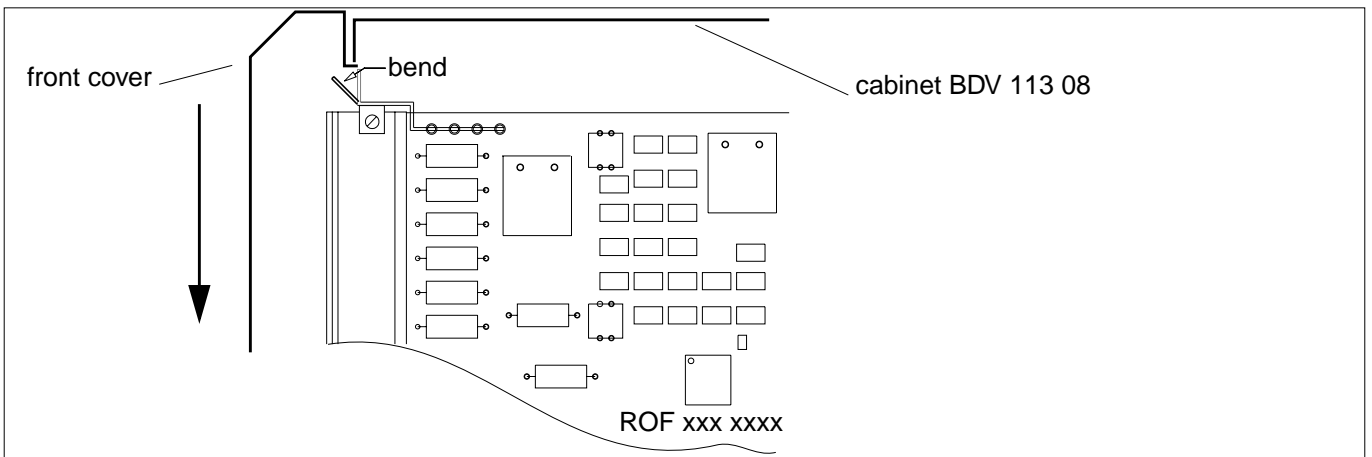
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e.g. to upgrade the system, can be installed under power in a free slot of the cabinet.

Sub-equipped boards:

Install sub-equipped boards in the last position after the standard boards to enable easy upgrading without having to re-number trunks and extensions.

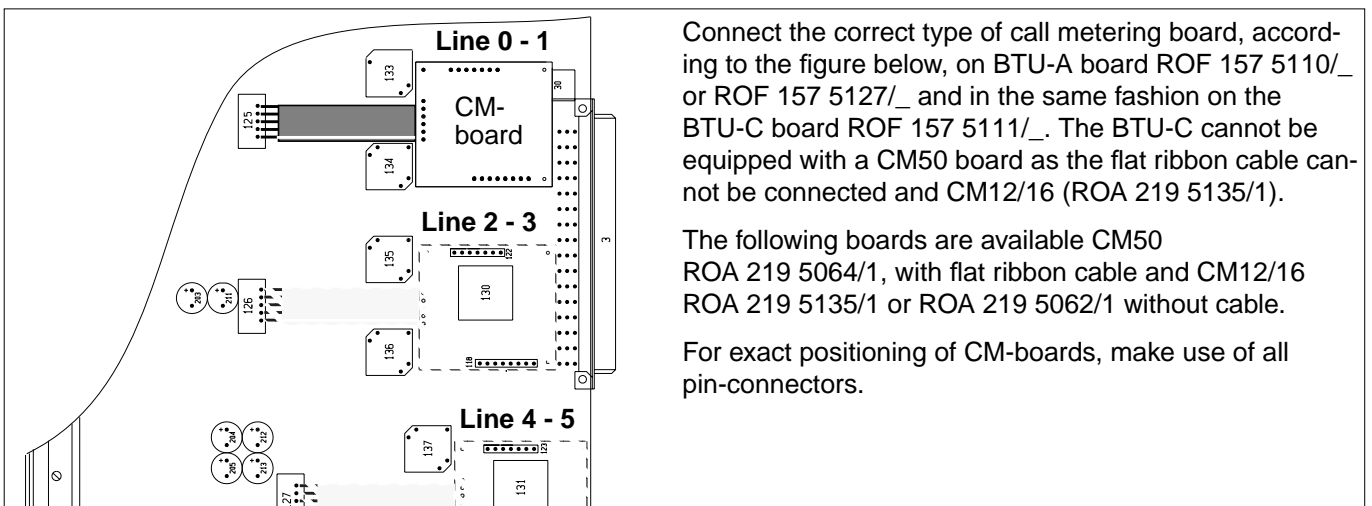
When installing boards with ground brackets in a cabinet of an earlier release not prepared for them, take out the screws of the ground brackets at the top and bottom of the boards. Then bend the bracket at the top slightly away from the cabinet to allow a clearance for the front cover to slip on correctly.



5.2.1 EMC

The ferrites, with the ERICSSON ordering number STF 82 601, should be situated close to the slot where the cables are led out of the cabinet. Two turns through the ferrite core are sufficient to comply with EN 55022 Class B and to avoid disturbances in non-industrial, residential (home) usage.

5.3 Connection of CM-boards



Connect the correct type of call metering board, according to the figure below, on BTU-A board ROF 157 5110/_ or ROF 157 5127/_ and in the same fashion on the BTU-C board ROF 157 5111/_. The BTU-C cannot be equipped with a CM50 board as the flat ribbon cable cannot be connected and CM12/16 (ROA 219 5135/1).

The following boards are available CM50
 ROA 219 5064/1, with flat ribbon cable and CM12/16
 ROA 219 5135/1 or ROA 219 5062/1 without cable.

For exact positioning of CM-boards, make use of all pin-connectors.

Note: When installing a CM50-board connect the cable before mounting the CM50-board. The BTU-A board **must** also be connected to earth.

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		File/Reference	

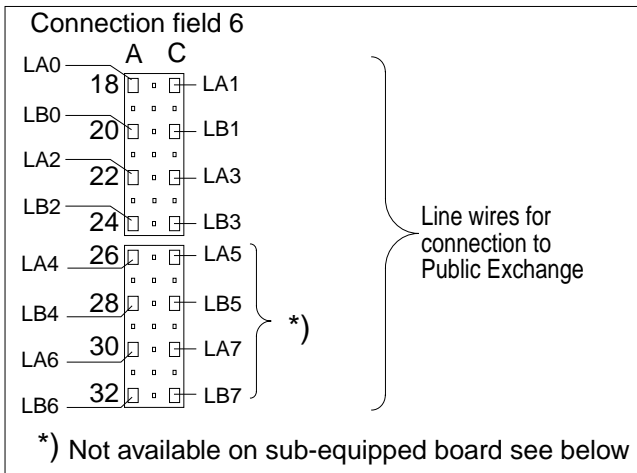
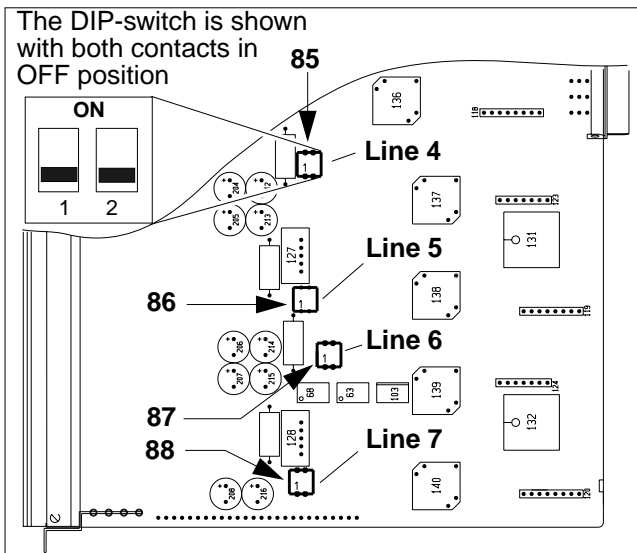
5.4 BTU-A (ROF 157 5110/_) and BTU-A2 (ROF 157 5120/_)

On delivery from the factory both contacts are in the **OFF** position, and the line is a normal trunk.

When both contacts on a DIP-switch are set to position **ON**, the line is to be regarded as a music source input.

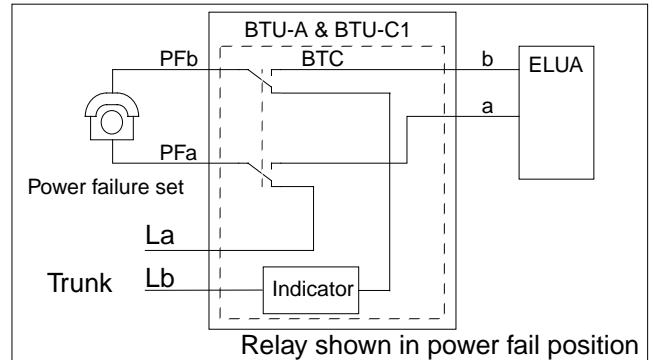
Different contact positions are not allowed.

Note: Only lines 4 - 7 can be used as a music source input. Not available on BTU-A subequipped ROF 157 5127/_.



5.5 Power failure circuit (PFC)

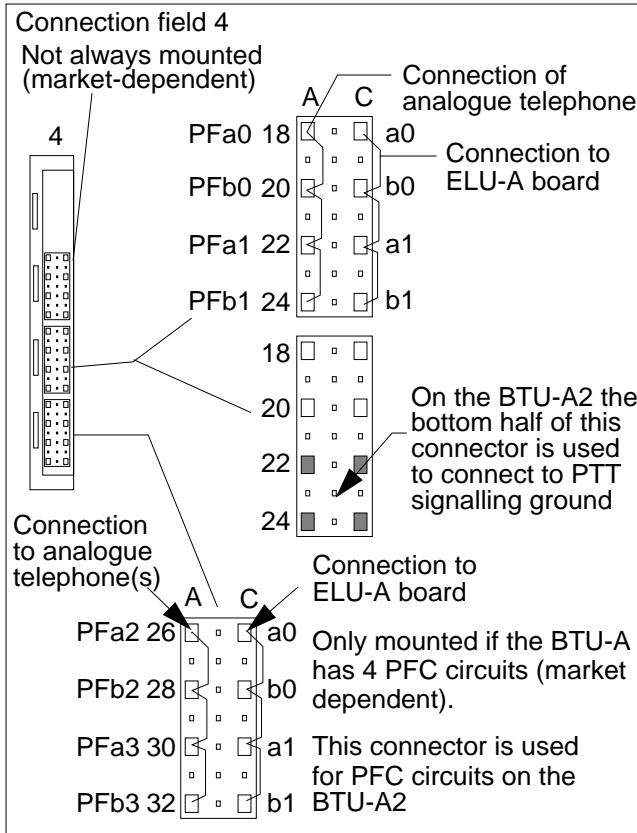
In the event of mains failure and if no back-up battery is connected to the PBX, a relay on the BTU-A and BTU-C (see under BTU-C on next page) board automatically switches the trunk lines (generally 2) to analogue telephones, if connected to this board.



If an ELU-A board is installed these telephones can be used during normal operation and in case of power failure they will be automatically connected to the public exchange.

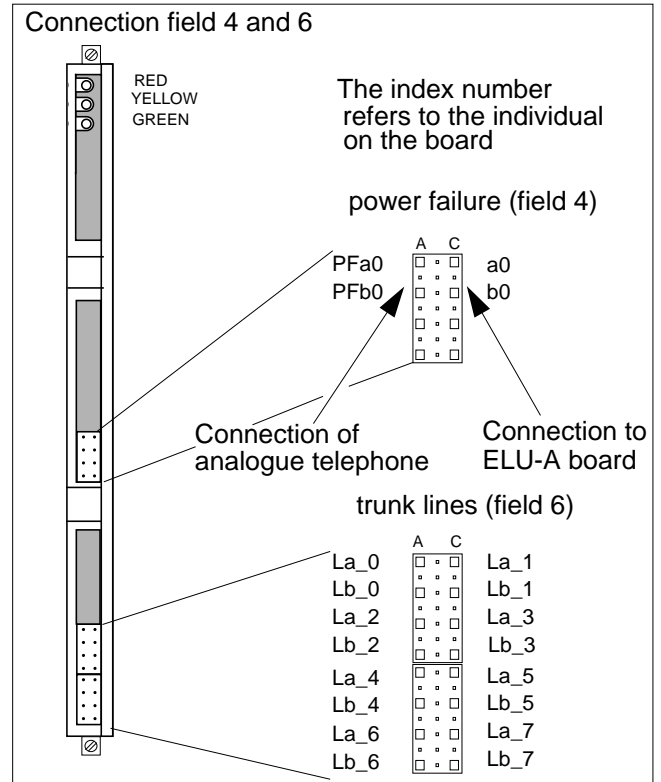
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5.6 BTU-C (ROF 157 5111/_)



Earth connection on BTU-A2 (Austria only)

Some markets require an earth connection of the incoming PTT earth (functional earth) to the exchange. This is provided on the connector installed above the PFC circuit connector on pins A22, A24, C22 and C24. Use an extra Krone bar to connect the PTT earth wires to the wires going to the board connector.



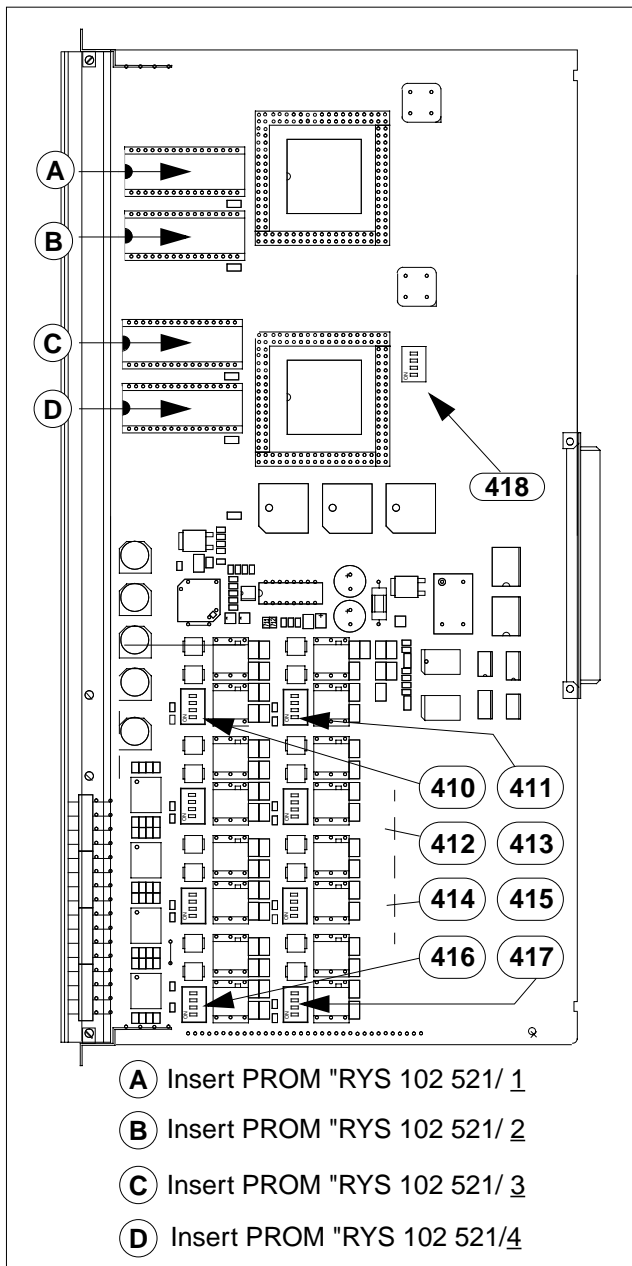
The BTU-C (ROF 1575 111/1) features eight incoming trunk lines with DID. The first four individuals can also be used for outgoing traffic.

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5.7 BTU-B (ROF 157 5121/_)

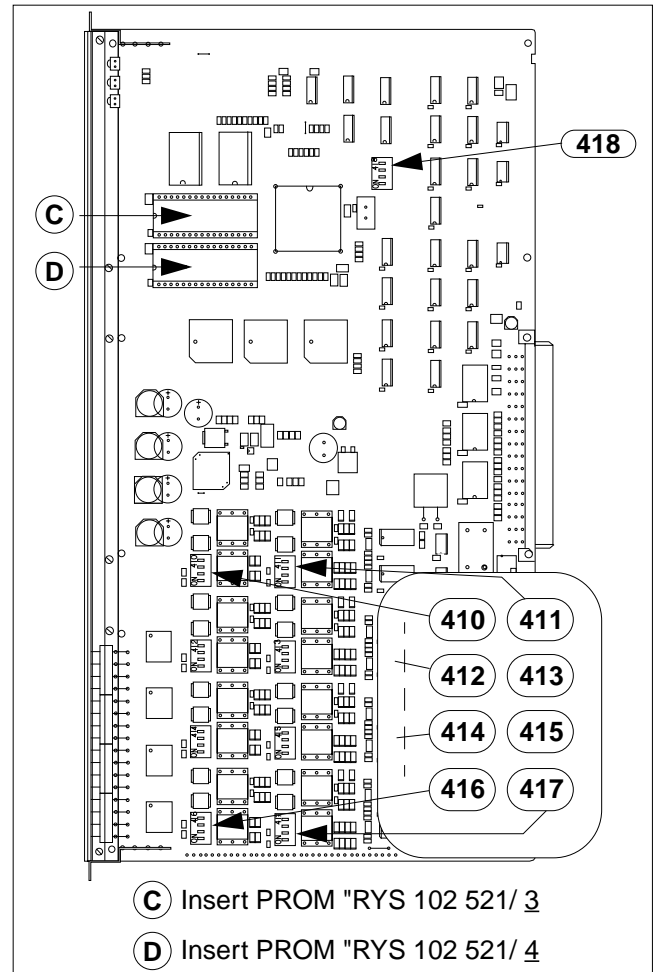
Applies for indices 1 and 3

The BTU-B provides connection for up to 8 physical links and every physical link can be configured as a S- or T-interface in point-to-point or multi-point mode. On the S-interface every link provides remote power feeding with 40V/50 mA = 2W and connection for up to 8 terminals.



5.8 BTU-B2 (ROF 157 5121/_)

Applies for indices 4 and 5



DIP-switches position 410-417

These switches control S- and T-interface termination and S-interface power feeding on the link 0...7.

On factory delivery all switches are set to **OFF**

	Connects power feeding ground
	Connects -40V for power feeding
	Connects 100 Ω receive side termination
	Connects 100 Ω send side termination

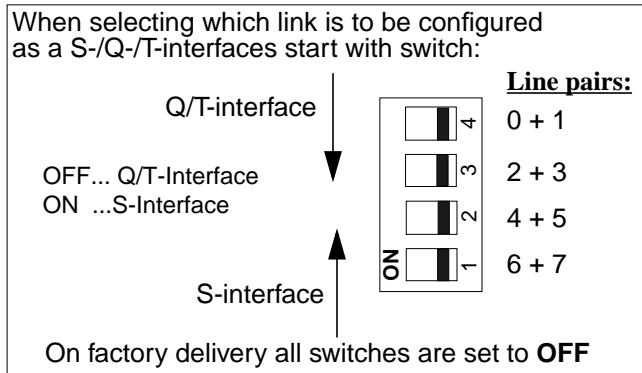
Note: at the end of each line a termination resistor must be installed (e.g. in the last wall outlet).

The switch 1 selects the termination on the transmitter interface and switch 2 selects the termination on the

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receiver interface. Switches 3 and 4 enable remote power feeding to ISDN terminals connected to a link. When connected as S-interface switches 1...4 should be set to **ON**.

Switch position 418



Note: When selecting S- or T-interfaces start by setting the T-interfaces using switches 4, 3, 2 and 1 in consecutive order then set the S-interfaces starting with switches 1, 2, 3 and 4.

Settings of the S-interface

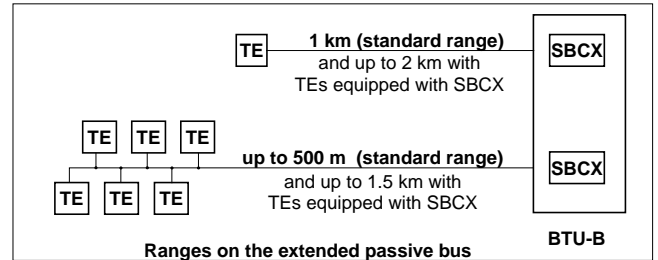
Choose with RASC the configuration of the interface: Extended passive bus default setting and Short passive bus.

Ranges on the interface

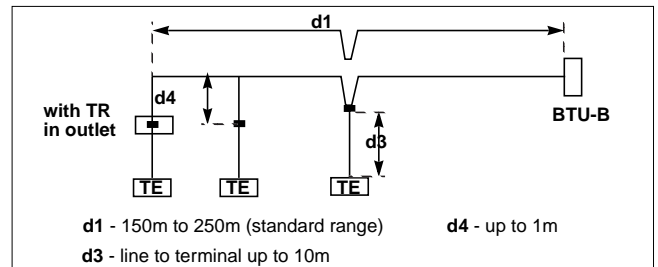
The BTU-B is equipped with the **S/T Bus Interface Circuit eXtended (SBCX)**. This circuit offers the advantage of covering a higher attenuation on cables.

The standard S/T-interface specification considers cables with 6,5 dB attenuation equivalent to about 1000m cable length in single terminal configuration.

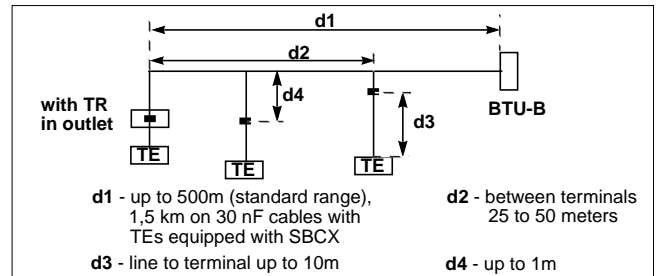
Using the **S/T Bus Interface Circuit eXtended (SBCX)** up to 13 dB line attenuation can be covered. The figure below shows the ranges using standard 0.6 mm diameter twisted pair unshielded cables with a capacitive load of max. 30nF per km and the terminal equipment (refer to documentation of the TE) is also equipped with a SBCX or equivalent.





Short passive bus



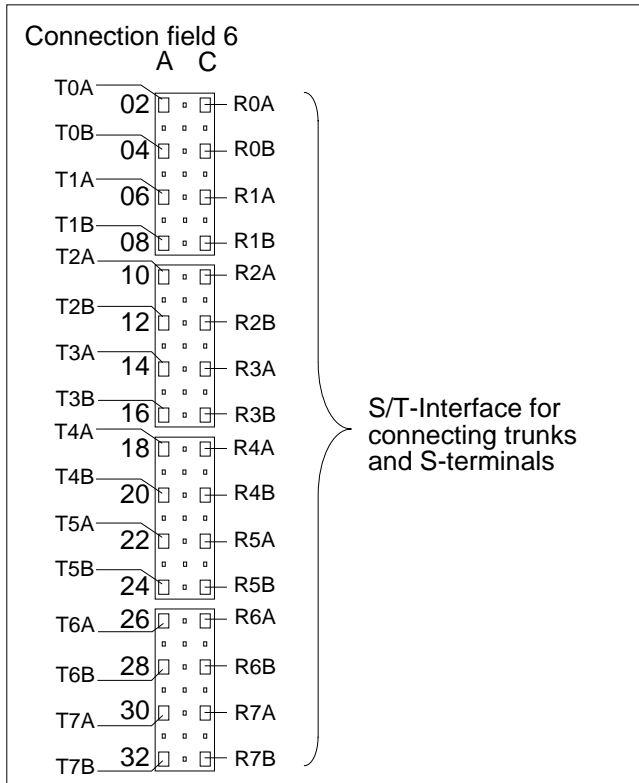
Extended passive bus



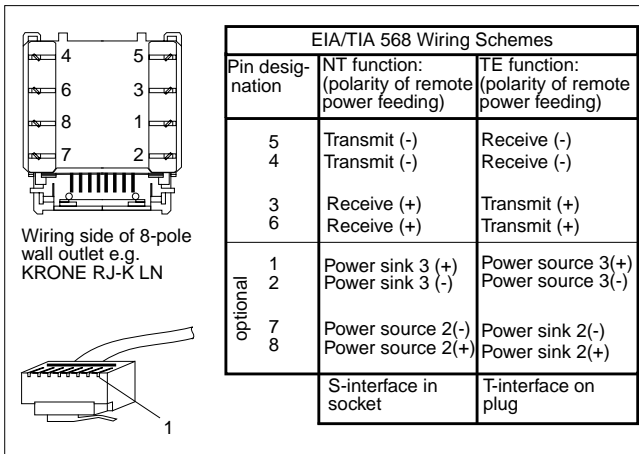
Abbreviations:

- TE Terminal Equipment
- TR Termination Resistor (*installed at the end of the interface line. Use outlets with resistor mounted*)
-  Outlet according to IEC 603-7 with termination
-  Outlet according to IEC 603-7 without termination

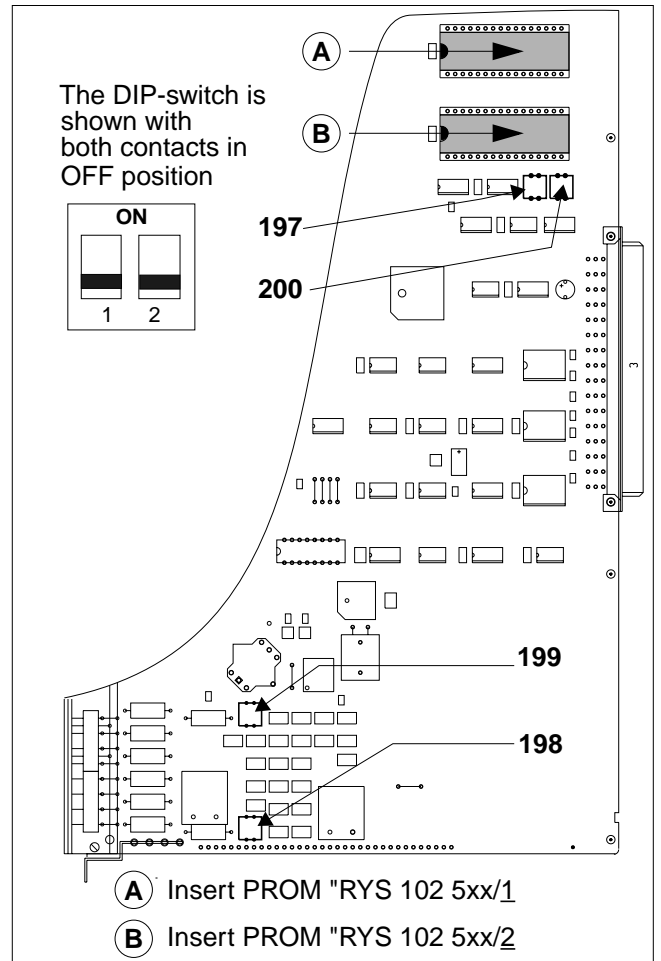
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			File/Reference



Wall outlet connection



5.9 BTU-D (ROF 157 5112/1) and REG (ROF 157 5112/2)



5.9.1 DIP-switches in position 197 and 200

Depending on the firmware used, this board enables either ISDN or CAS function. The PROM set is available for CAS (LZY203 2212/1) or ISDN PRA (LZY203 2213/1). DIP-switch pos. 197 on BTU-D selects the register function of the board. The switch 200 is reserved for future use.

197/1	197/2	FUNCTION	
OFF	OFF	digital trunk MFC	only BTU-D
	ON	digital trunk MFE	
ON	OFF	Register MFC	BTU-D
	ON	Register MFE	or REG.

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5.9.2 DIP-switches in positions 198 and 199

Selection of ground strapping for the coax 75 Ω or selection of the 120 Ω twisted pair interface.

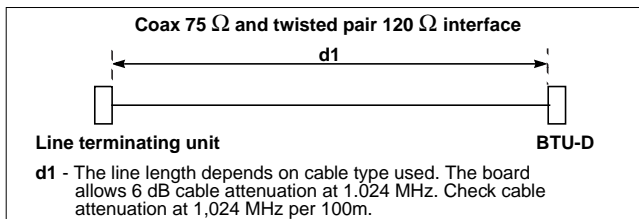
198/1 199/1	198/2 199/2	FUNCTION
OFF	OFF	120 Ω connection ¹⁾
OFF	ON	screen connected to ground
ON	OFF	screen connected to ground via 1nF capacitor

1.) Factory setting

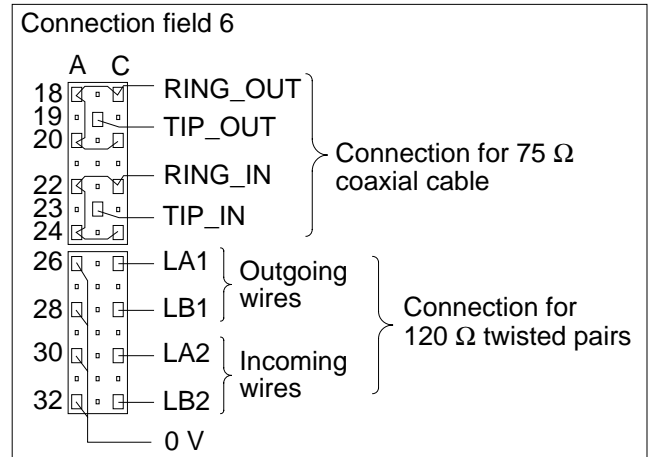
On factory delivery the switches are set to **OFF**-position = no ground thus enabling 120 Ω interface with a twisted pair cable. These DIP-switches connect the 75 Ω interface coax screen to ground, either directly to 0V or via a 1 nF capacitor. DIP-switch **198** switches the receiver and **199** the transmitter side. The screen shall normally be grounded on the transmitter side. Normally, the screen on the reception side is not connected to ground. Refer to local market requirements

Ranges on the interface of the BTU-D

This interface covers the short distance to the next NT or Line Terminating Unit as the end point of a public or private network. The range is only defined in terms of the covered attenuation by the interface that is 6 dB. If required choose cables with low attenuation to achieve a maximum distance.



For ranges exceeding 6 dB attenuation additional digital data transmission equipment is required. Line Terminating Unit (LTU) ASB 501 04 is available for such purposes.



Some markets (e.g. Austrian PTT) require the use of a double-shielded interface cable. The outer shield should be connected to frame earth and the inner shield should be connected to 0V on the board. A 20 m long standard cable is available with the ERICSSON ordering number TSR 901 0481/20000.

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5.10 BTU-E (ROF 157 5113/_)

SPEECH CONNECTION SETTINGS

2-wire connection		4-wire connection	
106...406	108/308	106...406	108/308
on	on	on	on
(S1 S2 S3 S4 S5)		(S1 S2 S3 S4 S5)	

INDIVIDUAL 0 uses switches 106 and 108/1

INDIVIDUAL 1 uses switches 206 and 108/2

INDIVIDUAL 2 uses switches 306 and 308/1

INDIVIDUAL 3 uses switches 406 and 308/2

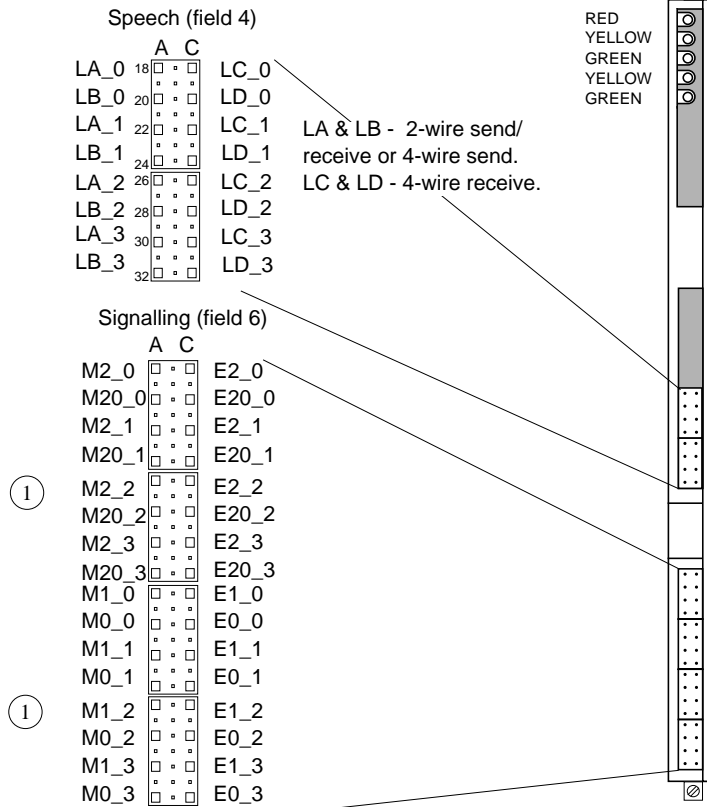
SPEECH CONNECTION SETTINGS
Switches select between 2- or 4-wire speech connection. Two individuals share switches 108 and 308
On boards with Rev. R2A these switches are replaced by relays. These relays are set automatically by programming the filter coefficients.

M-WIRE CONNECTION SETTINGS

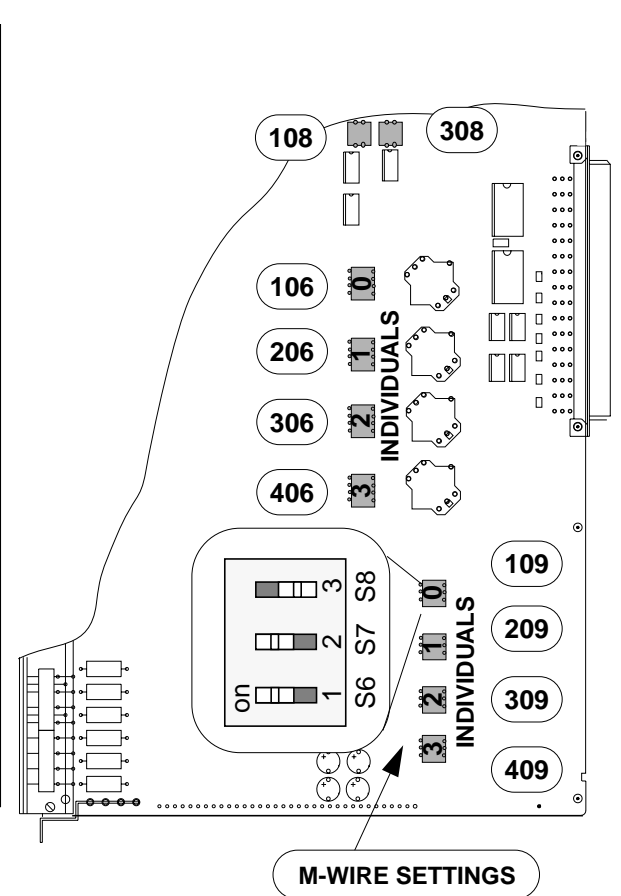
APPLICATION	SPEECH	M-WIRES
PAGING	2-wire	S6..off S7..off S8..off
AMERICAN E&M SIGNALLING	4-wire	S6, S7 and S8 see local requirements
DOUBLE M-WIRE SIGNALLING	4-wire	S6..on S7..on S8..off
CAILHO E&M SIGNALLING	4-wire	S6..off S7..off S8..off
CEPT L1/SSAC 15 Only on /2 boards	4-wire	S6..off S7..off S8..off

S6 connects -48V to M1 terminal via 6.2 Kohm
S7 connects 0V to M0 wire locally.
S8 connects 0V to M20-wire.

Connection field 4 and 6 at front of BTU-E_



① M20_ and M0_ can be switched by **S7** and **S8** to 0V on the BTU-E_ locally.

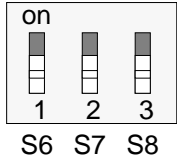


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5.10.1 Paging connection

The figure shows how to connect the paging equipment Ericall Contactor with 2 wire speech. The PBX sends paging information to paging system (pin 6A18) using M1 contact, and information about 'paging in progress' or 'paging equipment not present' is received on the E1-wire (pin 6C18) from the paging equipment.

Switch settings



This switch setting is used for signalling on E1 and M1.

Applies for switches 109, 209, 309 and 409.

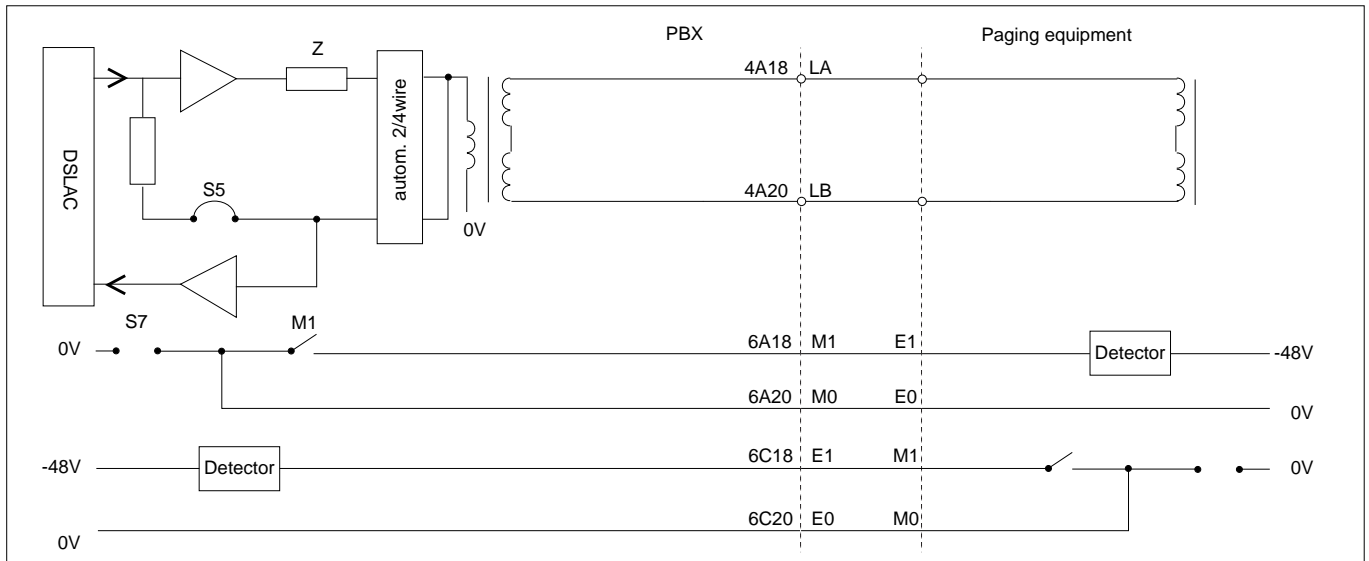


Figure showing Paging equipment and 2-wire speech with 'loop connection' of the E&M-wires.

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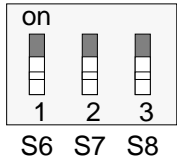
5.10.2 Four wire speech connection

The four wire speech and signalling connection has the benefit of not needing additional signalling wires. There are two different types of signalling supported:

Cailho E&M-signalling (balanced battery). The two way signalling utilises common mode DC pulses via the centre tap of the transformer. On one side a detector is connected between the -48 VDC and the centre tap of the transformer. The other end uses opto relay M4 to switch the line to 0V (Ground). The detector reads the current flow to ground every time M4 closes.

CEPT L1/SSAC 15 with 2280 Hz tones. In this case no DC signalling is used but instead signalling is performed by switching on and off a 2280 Hz tone, which is detected by a tone receiver on the other side. This is only available on index 2 boards.

Switch settings



This switch setting inhibits signalling on E1 and M1. Only AC or DC signalling on the four wire speech connection is used.

Applies for switches 109, 209, 309 and 409.

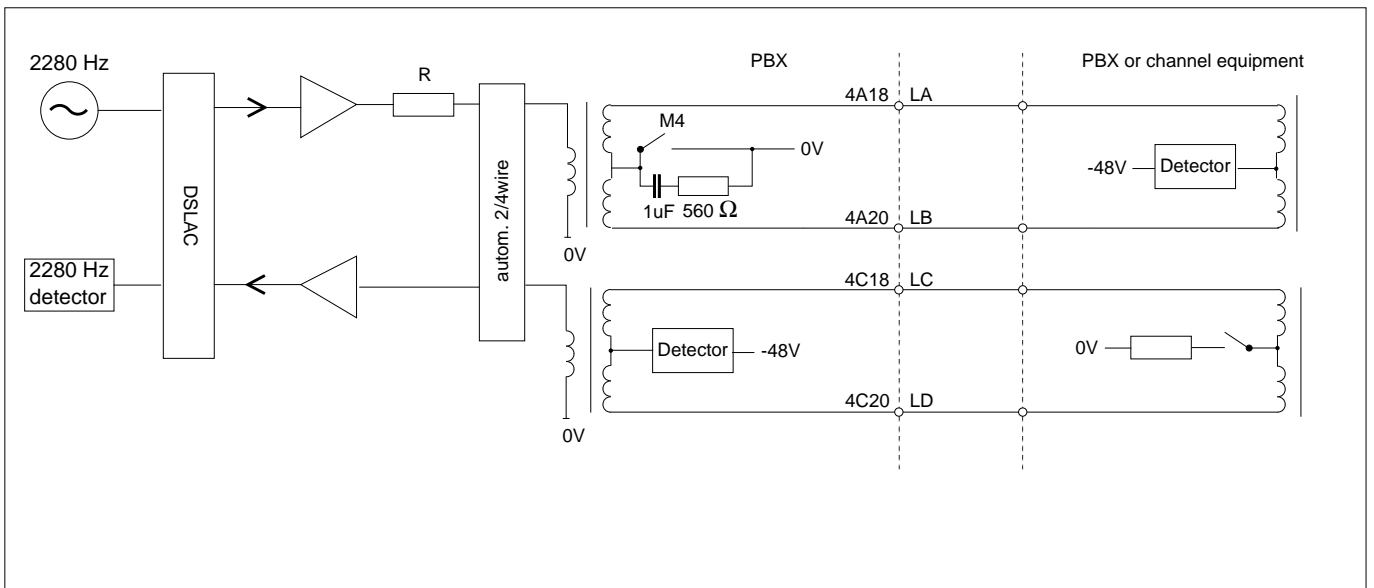


Figure showing Cailho E&M signalling and CEPT L1 or SSAC 15 with tone signalling

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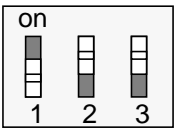
5.10.3 E&M-signalling

Signalling on E & M wires is done either using one or two E&M pairs depending on what is required. Using just E1 and M1 is a very common practice. One case to mention is the American E&M signalling where the M1 wire toggles between -48VDC and 0V.

Double E&M signalling requires the E1/M1 wires for the signalling of information and the E2/M2 wires indicate blocking of the connection. The E1/M1-wires are used for signalling and E2/M2-wires are used for blocking. The figure shows 0V connection to the M-wires in both ends.

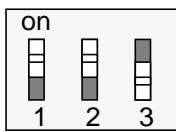
Switch settings

Standard E & M signalling



This switch setting is used for signalling on E1 and M1.

Double E & M signalling



This is the switch setting when E1, E2, M1 and M2 are used for signalling.

Applies for switches 109, 209, 309 and 409.

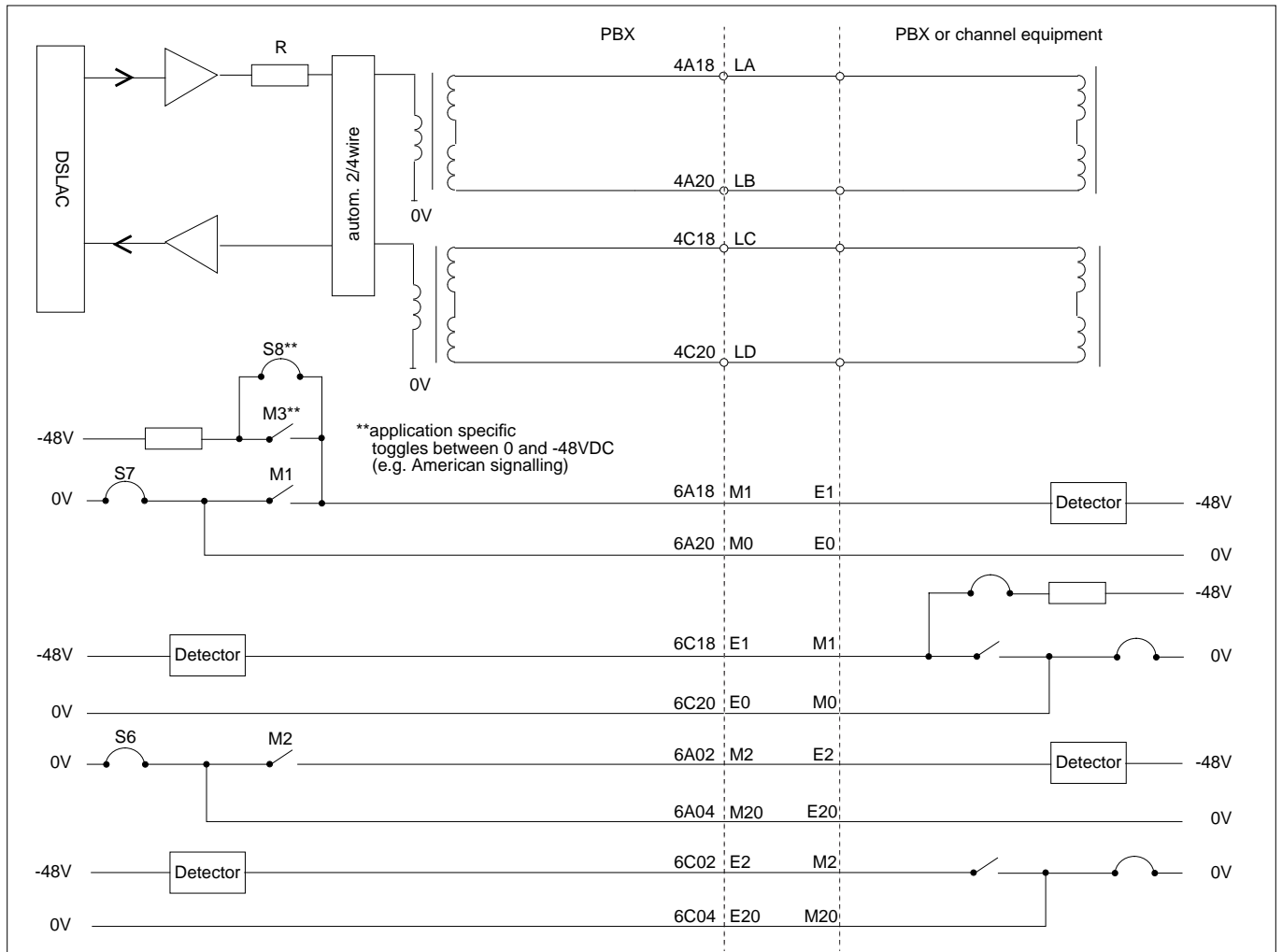
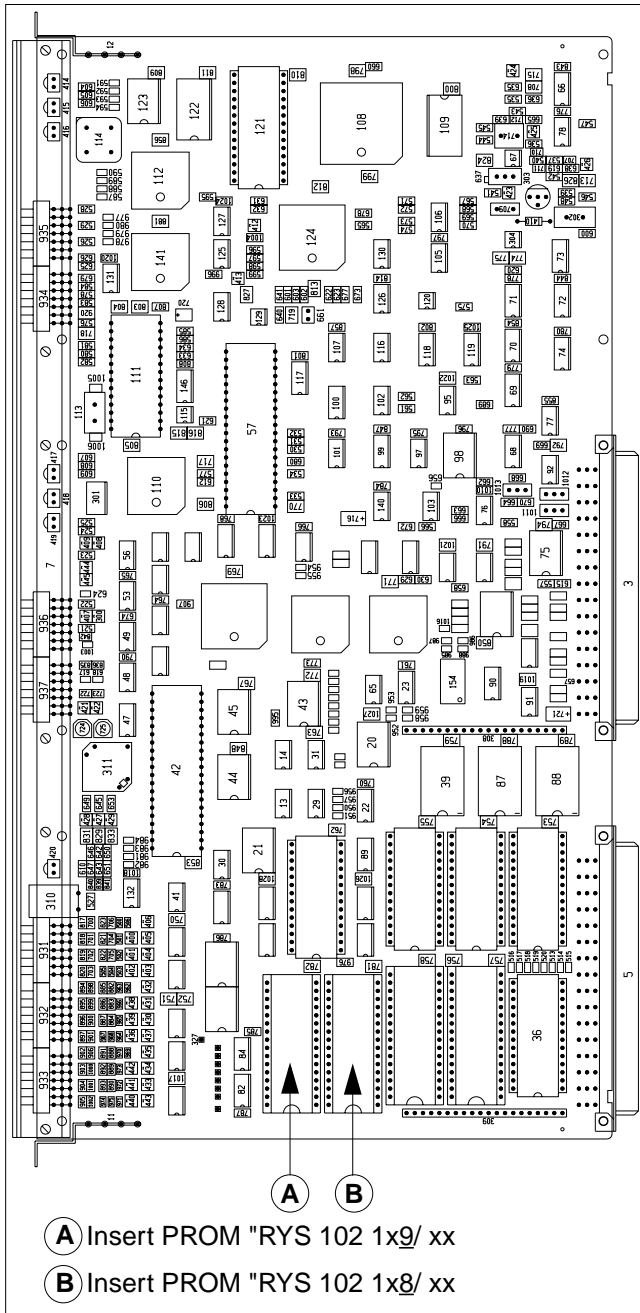


Figure showing four wire speech and standard (double) E&M signalling.

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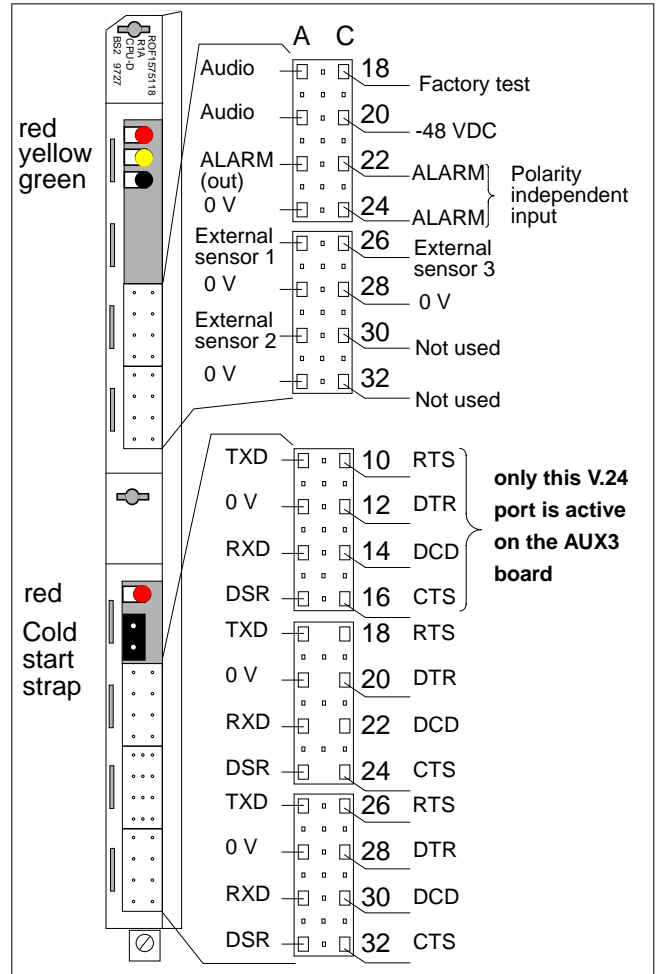
5.11 CPU-D_ (ROF 157 5118/_) and AUX_ (ROF1575 119/_)

Before installing the board mount the system software PROMs in the appropriate positions.



Connections on the CPU-D_

For connection of TEMPERATURE SENSOR KIT, see [INSTALLATION INSTRUCTION \(1531-RPM 603 339\)](#).



The ALARM input is optically isolated and the voltage has to be between 20 - 60 VDC.

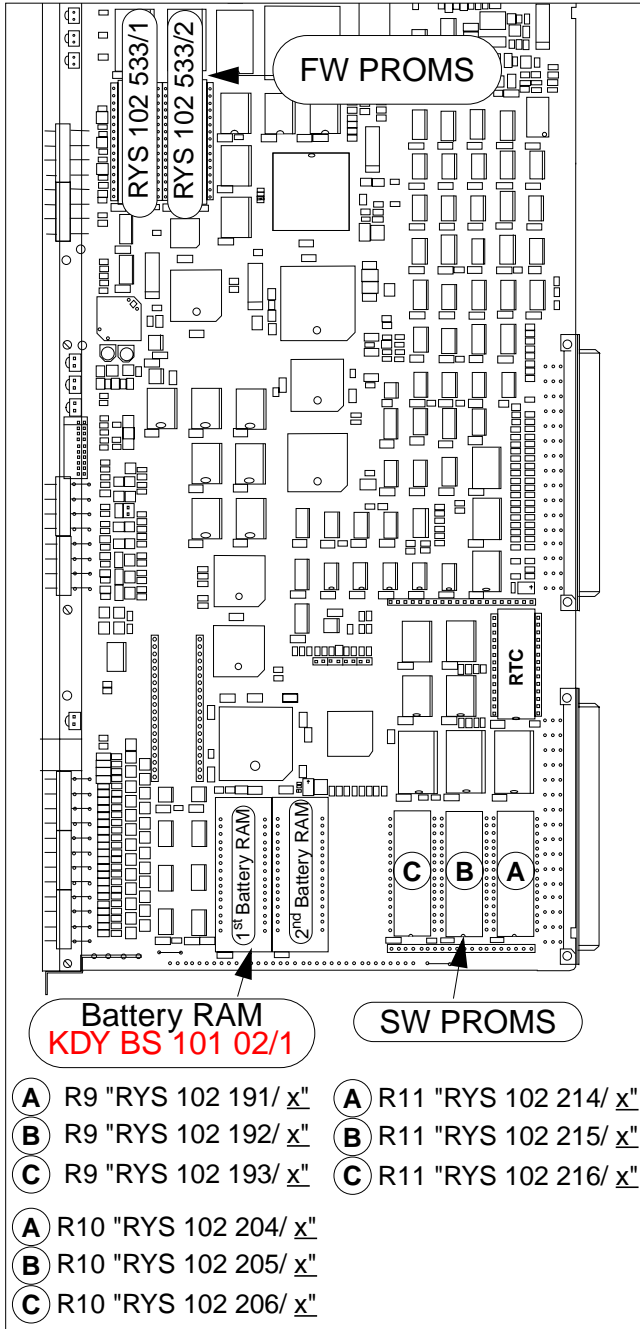
The ALARM output is equipped with an open collector transistor with a capacity of 20 mA at 12 VDC (Maximum 14 VDC).

Use the following prefabricated cables to connect the peripheral data equipment to CPU-D_ and AUX_:

- PC is TSR 902 0448/1
- printer is TSR 902 0476/1
- modem is TSR 902 0466/1

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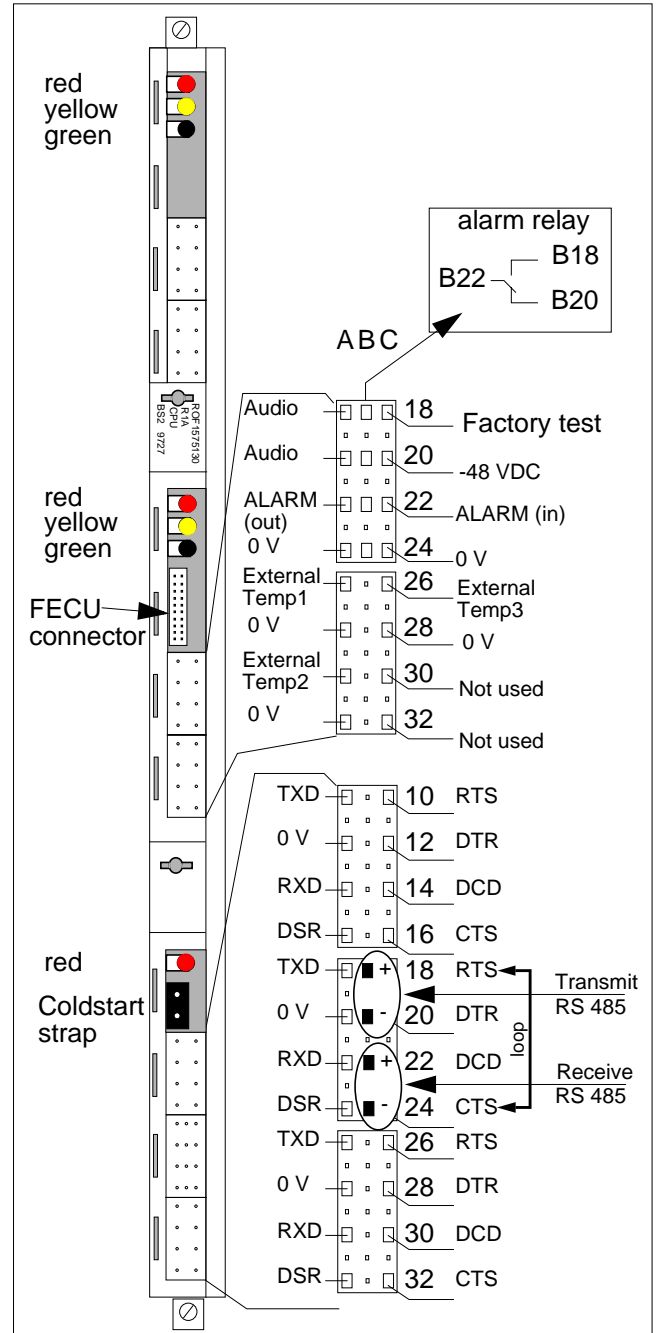
5.12 CPU-D4 (ROF 157 5124/_)



To put the board in operation mount the system software PROMS in the appropriate positions. The number of battery RAMs mounted on the CPU-D4 board is functionality dependent.

Connections on the CPU-D4

Similar to the previous versions this board provides the V.24 interfaces but additionally the RS-485 interface for longer ranges. With the software key (FECU) KDU BS 130 06/_ new functionalities can be accessed.



To connect the RS-485 data interface use plug RNV 321 01 02 be sure to loop RTS with CTS other-

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wise data is lost if printer is OFF. The range of the interface is up to 1200m.

Several converters may be used but with the following successful tests were accomplished:
 IC-485SI from ARP DATACON and
 232<->485/422 Converter Plus IC-109AE from Black Box Corp.

5.12.1 Feature Enabling Control Unit (FECU)

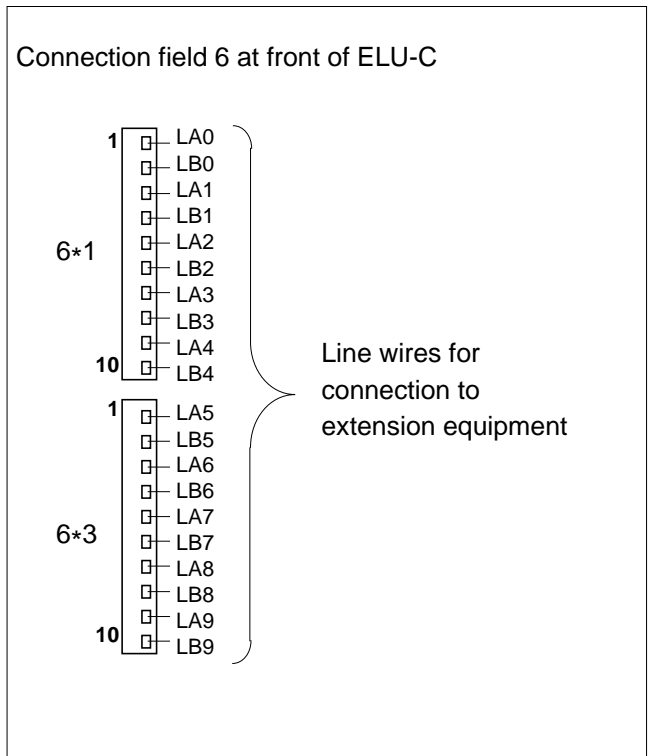
Connecting this plug activates the appropriate applications and features as ordered depending on the FECU index number. If no plug is connected only a limited Version 4.0 system functionality is available. The indices 2 to 10 always include the Basic Version 4 functionality (index 1).

For detailed information of the features enabled by the different FECUs refer to [15534-ASB 150 02 Uen FACILITY DESCRIPTION GENERAL](#).

FECU number	Functionality Version 4.0
KDU BS 130 07/1	Basic Version 4.0 functionality
KDU BS 130 07/2	+ std. digital networking for max. 32 interfaces
KDU BS 130 07/3	+ std. digital networking
KDU BS 130 07/4	+ full. digital networking for max. 32 interfaces
KDU BS 130 07/5	+ full. digital networking
KDU BS 130 07/6	+ full. digital networking, 4 interfaces and CTI
KDU BS 130 07/7	+ std. digital networking for max. 32 interfaces and CTI
KDU BS 130 07/8	+ std. digital networking and CTI
KDU BS 130 07/9	+ CTI + full. digital networking for max. 32 interfaces
KDU BS 130 07/10	+ CTI + full. digital networking for unlimited number of interfaces

5.13 ELU-C (ROF 157 5115/1)

This board is used to connect the DBC 7xx series to the ASB 150 02 system.

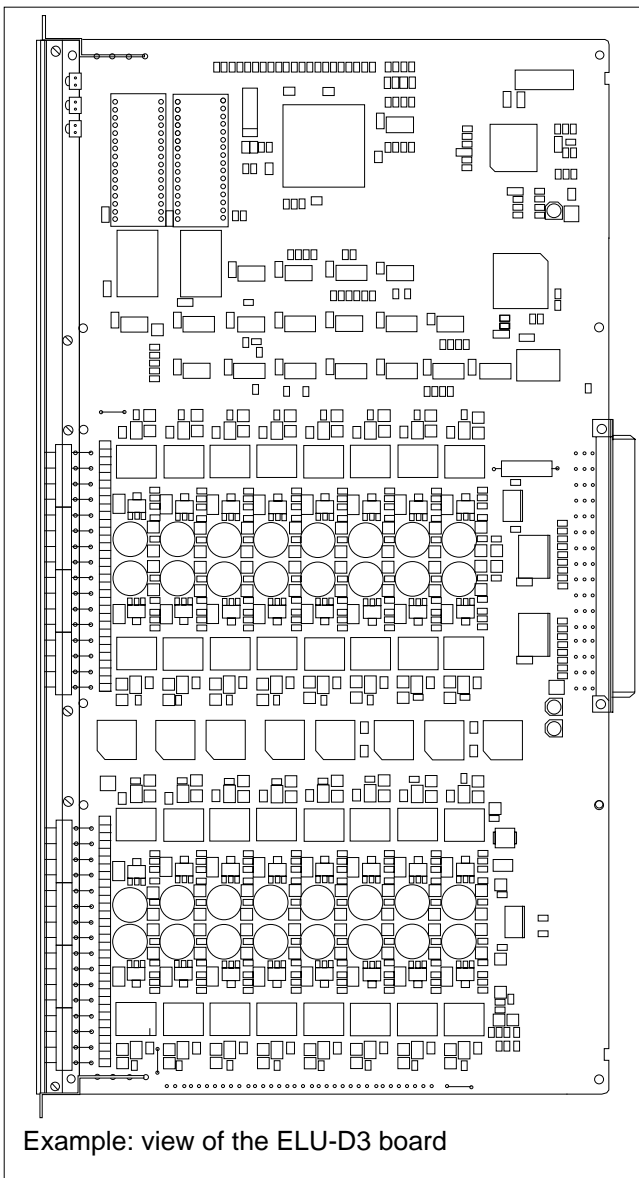


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5.14 ELU-A and ELU-D_

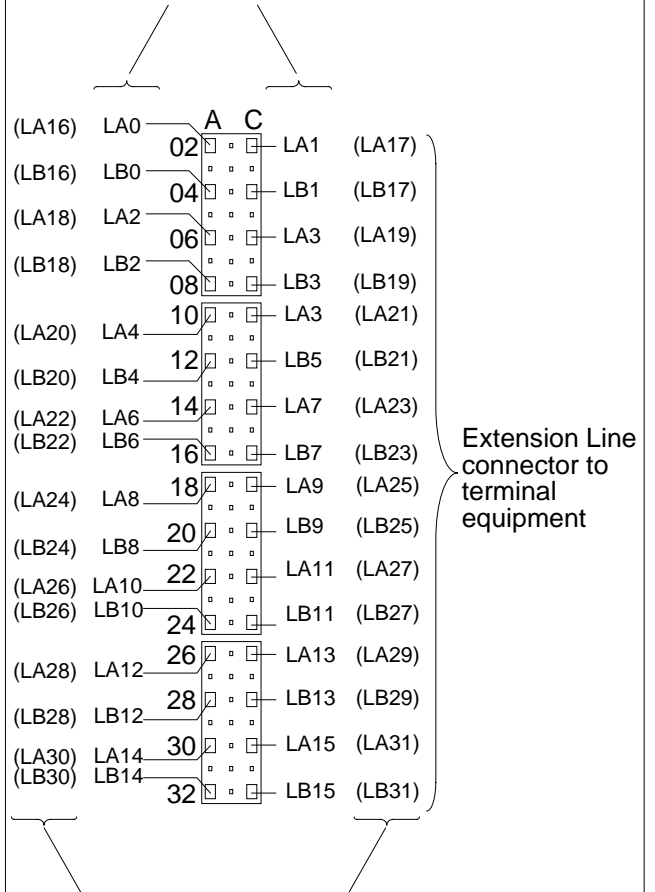
The connection of extension boards described in this chapter are:

- ELU-A (ROF 1575 114/1)
- ELU-A2 (ROF 1575 114/2)
- ELU-D (ROF 1575 116/_)
- ELU-D3 (ROF 157 5130/_)



Example: view of the ELU-D3 board

These terms and connections apply in connection field 6 at front of an ELU-D(3) and ELU-A



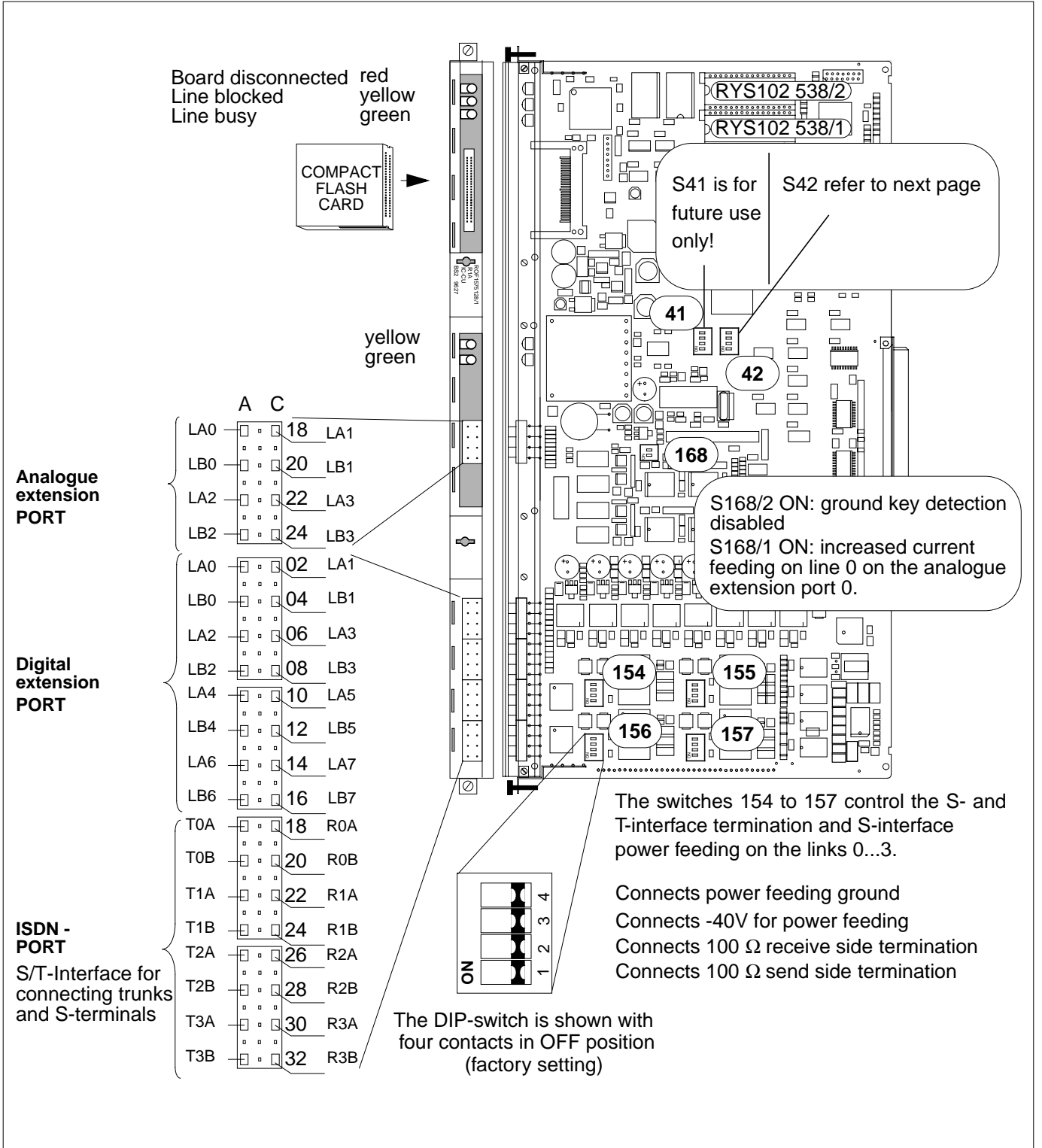
The connections in field 4 are in brackets (only on ELU-D3 for individuals 16 to 31)

On the first ELU-D_ board in the system the first three extension positions should be used to connect the OPERATOR telephones.

On sub-equipped ELU-A and ELU-D_ boards the connection for extensions 8...15 (32) are not mounted.

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5.15 MFU (ROF 157 5132/_)



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The ISDN PART

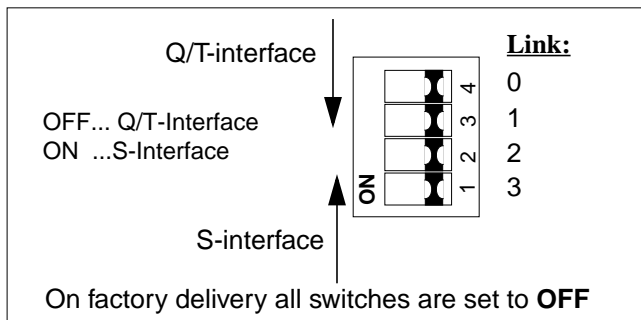
DIP-switches position 154 to 157

Switch 1 selects the termination on the send side.
 Switch 2 selects the termination on the receiver side.
 Switches 3 and 4 enable remote power feeding to the connected ISDN terminals. Switches 1...4 should be set to **ON** if the link is set as S-interface .

Note: At the end of each line a termination resistor must be installed (e.g. in the last wall outlet).

Switch position 42

When selecting S- or T-interfaces start by setting the T-interfaces using switches 4, 3, 2 and 1 in consecutive order then set the S-interfaces starting with switches 1, 2, 3 and 4.



Settings and ranges on the T-/S-interface

Refer to [section 5.8 on page 17](#)

The VMU PART

The VMU functionality and the (4) registers are available if the Compact Flash Card is inserted.

For installation and configuration refer to the stipulations in document [START OF OPERATION \(1537-ASB150 02Uen\)](#) .

Note: The VMU will not start up without the internal directories created on the Compact Flash Card. The unlock key (file named DISK.ULK) must be valid on the compact flash card.

The MFU board can use only flash cards supplied by ERICSSON. These flash cards are delivered with a control file called DISK.ULK containing a licence key. This file must not be opened by any tool as this would destroy the file and thus disable the compact flash card. This will cause an error condition indicated by slow flashing yellow and green extension LEDs.

Limitations:

Only four MFU boards may be mounted per system. MFU board(s) can be mixed with VMU-HD board(s) but if a MFU board is installed, no VMU-D board may be installed in the system.

If a MFU board is installed without compact flash card, the complete VMU part is marked inactive. If later on the MFU will be upgraded with a compact flash card, then this can not be done by using the Hot swapping feature, due to different card types. The MFU without flash card has to be removed completely from the system (from HW and SW point of view) and then the MFU with flash card can be included in the system. The previous programming of the card, has to be done again.

The ELU-D3 PART

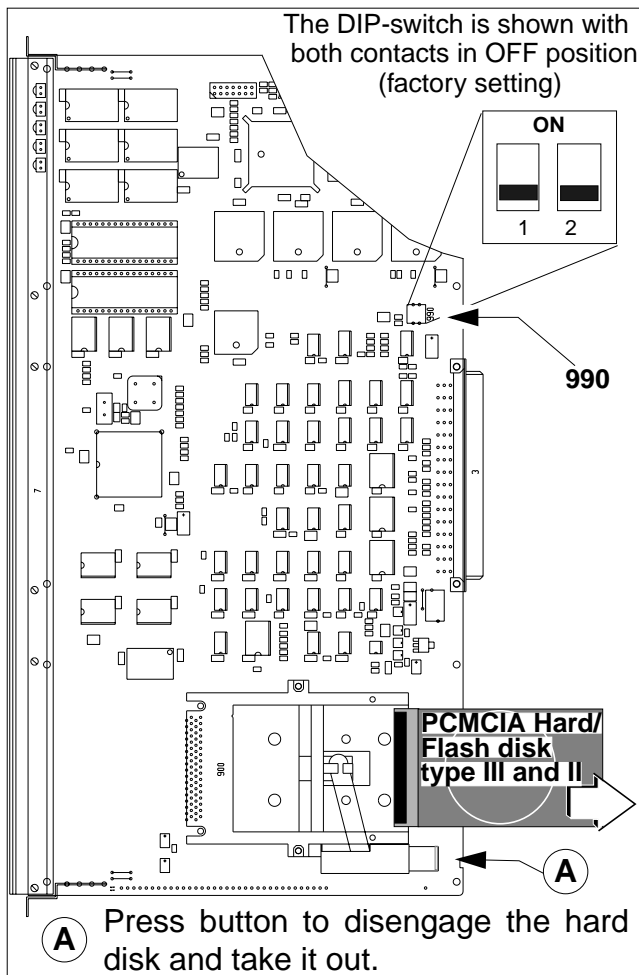
The DBC 213 and DBC 214 instruments are not supported with 4 key panels, only 2 key panels per instrument are allowed to be connected.

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5.16 VMU-HD (ROF 157 5126/_)

To install unpack the VMU-HD board with the mounted hard disk. The Flash disks are available with a capacity of 60 MB. Remove the transport protection for the hard disk and keep it in case of re-shipment e.g. factory repair. Install and configure the VMU-HD in the cabinet according to the stipulations in [1537-ASB15002Uen](#) **START OF OPERATION.**

Note: The VMU-HD will not start up without internal directories created on the hard disk.



DIP switch on VMU-HD

DIP switch **990** selects whether register function is enabled or not.

Limitations:

Only one VMU-HD can be mounted per cabinet and just one type either VMU-HD or VMU-D can be installed in a system.

990/1	990/2	FUNCTION
OFF	ON or OFF	16 channels, no register function
ON	OFF	8 channels with MFC detection and DTMF / Tone receiver
	ON	8 channels with MFE detection and DTMF / Tone receiver

Structure of directories on hard disk or Flash card

```

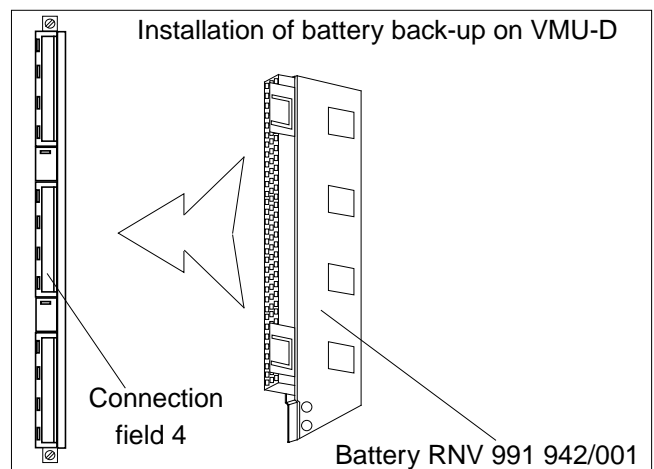
\Info0      \message2      \anno0
\Info1      \message3      \anno1
            \message4      \anno2
            \message5      \anno3
            :
            \annoF
    
```

Removal of hard disk or Flash card

To remove the hard disk take out the board from the system. Disengage the hard disk with lever **A** and pull out the hard disk.

5.17 VMU-D (ROF 157 5117/1)

The VMU-D has no switches, but is equipped with a back up battery, RNV 991 942/001 to prevent loss of data in case of power failure. Install the battery to connection field 4. before the exchange is started. For safe operation, replace this battery periodically every five years in accordance with document [MAINTENANCE INSTRUCTION \(1541-ASB 150 02 Uen\)](#).



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6 INTEGRATED CORDLESS

The Integrated Cordless (IC) is a digital cordless telephone solution complying to the DECT standard providing wireless connection for up to 108 portables with the A-protocol and 210 portables in GAP-protocol applications. Several components comprise a complete system.

After the system has been physically installed use RASC and the Cordless System Manager (CSM) for initialization, maintenance, updating, fault finding and when possible to recover the PBX from errors. The CSM is orderable under LZYNB 201 01 R6A or higher for the A-protocol and LZYNB 201 05 R1B or higher for GAP applications.

6.1 Board Descriptions

6.1.1 IC-Control Unit (IC-CU)

The IC-CU_ is the control board supporting the A-protocol and up to 7 IC-LUs located in the same cabinet. Up to 56 BSs can be connected. The board offers 2 connections for:

- the Cordless System Manager (on a PC)
- a printer to log errors.

6.1.2 IC-Control Unit2 (IC-CU2)

The IC-CU2 is the control board supporting the DECT GAP-protocol and up to 7 IC-LUs located in the same cabinet. The IC-CU2 includes 8 voice channel units (SPU as on the IC-LU) and is equipped with 4 BSs interfaces. With the maximum of 7 IC-LUs up to 60 BSs can be connected.

The wiring distance with remote power feeding to the BSs using only the serial communication wires SC0 and SC1 is limited to 400m. For greater line lengths additional Express Power feeding Pairs (EPP) need to be wired. The maximum wire length between BS (fed locally) and IC-CU2 or IC-LU is only data limited and may reach up to 1900 meters.

The board offers the following connections:

- the Cordless System Manager (on a PC)
- a printer to log errors
- 4 Base Stations
- the Feature Enabling Control Unit (FECU).

6.1.3 Feature Enabling Control Unit (FECU)

This plug determines which maximum number of portables are allowed to be connected to the system. This plug is available for various numbers of cordless telephones. For up to 8 portables no plug is required.

FECU number	Number of Portables
KDU 130 05/1	16
KDU 130 05/2	24
KDU 130 05/3	32
KDU 130 05/4	48
KDU 130 05/5	64
KDU 130 05/6	108
KDU 130 05/7	210 (only with IC-CU2)

6.1.4 IC-Line Unit (IC-LU)

The IC-LU is the line board controlling up to 8 Base Stations (BS). This board transcodes the voice signal (PCM <-> ADPCM) for 8 simultaneous speech channels in the Speech Processing Unit (SPU), provides echo cancelling, controls the digital link and power feeding. The wiring distance with remote power feeding to the BSs using only the serial communication wires SC0 and SC1 is limited to 400m.

For line lengths up to 1600m additional Express Power

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feeding Pairs (EPP) need to be wired. The maximum wire length between BS (fed locally) and IC-LU is only data limited and may reach up to 1900 meters.

In any case the total current capability of the power supply(s) has to be considered. Refer to chapter power consumption of the telephones when calculating total system power demand.

Usually the ranges mentioned above will be sufficient for most installations. For special cases where greater distances have to be covered, see [section 4.7 on page 11](#). Install the board in the cabinet, after the prerequisites mentioned in [section 5.2 on page 13](#) have been provided.

6.2 Traffic capacity

The traffic capacity of the Cordless part of the PBX is mainly determined by the IC-CU_ and in exceptional cases also by the Base Stations. The IC-CU can handle a maximum of 56 simultaneous calls and the IC-CU2 can handle up to 60 simultaneous calls. Each Base Station has a capacity of 8 simultaneous calls.

The traffic capacity of the IC-CU_ is determined by:

- the Grade Of Service (GOS) required by the customer
- the number of speech circuits available, with a limit of 64.

The Grade Of Service is the probability that a call is rejected because of system congestion. The customer has to indicate which Grade Of Service is acceptable. A Grade Of Service of 1%, or 0.01, means an average of 1 lost call in every 100 calls.

The IC-CU2 and each IC-LU is equipped with a SPU providing 8 speech circuits that are shared by the whole cordless system. So the number of installed (up to 7) IC-LUs determine how many circuits are available to the system.

The two parameters mentioned above (GOS and the number of speech circuits) and the total amount of traffic (Erlang) that is required, are related to each other. The table below shows the capacity at a required GOS. Practically, this table is used to calculate from a given GOS and Erlang value the number of IC-LUs needed. The Erlang value is the total traffic generated by all portables. The table below shows the Erlang values for a number of speech channels and at a required GOS.

Systems with IC-CU2 Number of IC-LUs	Systems with IC-CU Number of IC-LUs	Speech circuits	Grade of service (GOS)			
			2%	1%	0.5%	0.1%
0	1	8	3.6	3.2	2.7	2.1
1	2	16	9.8	8.9	8.1	6.7
2	3	24	16.6	15.3	14.2	12.2
3	4	32	23.8	22.1	20.6	18.2
4	5	40	31	29	27.3	24.5
5	6	48	38.4	36.1	34.2	30.9
6	7	56	45.9	43.3	41.2	37.5
7	-	64	53.4	50.6	48.3	44.2

Note: 64 speech channels are available but only 60 portables can simultaneously initiate calls

For the calculation it is necessary to estimate the time the portables actually make calls. The table below shows the Erlang value depending on the estimated mean call-minutes for a portable telephone. These values may be different between departments depending on their activities. These values multiplied by the number of portables result in a traffic capacity that has to be provided.

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Minutes per hour	mErlang	Minutes per hour	mErlang
3	50	15	250
6	100	18	300
9	150	30	500
12	200	45	750

Example:

A customer ordering a system with 55 portable telephones estimates that each portable generates 200 mE traffic in average. These values require a system with a traffic capacity of 11 E (0,2x55). With an accepted GOS of 0.5% the number of IC-LUs is found as follows:

The total traffic is 11 E. In the column of 0.5% GOS, the next higher value of 11 E is 14.2 E, resulting in 3 IC-LUs.

So, the system shall be equipped with 3 IC-LUs, offering the client 14.4 E in stead of 11. This means that the system has an over-capacity of 3.2 E, which allows expansion of the system with 16 portables without reducing the Grade Of Service nor the need of more IC-LUs.

Thus 56 circuits with an accepted GOS of 0.5% result in a maximum traffic capacity of 41.2 E for the system.

6.2.1 Traffic Capacity of Base Stations

A Base Station, having 8 channels available, has an Erlang value of 2.7 with a GOS of 0.5%. This means that each Base Station can serve 18 portables, assuming each portable generates 150 mE during busy hour or 13.5 portables generating 200 mE each.

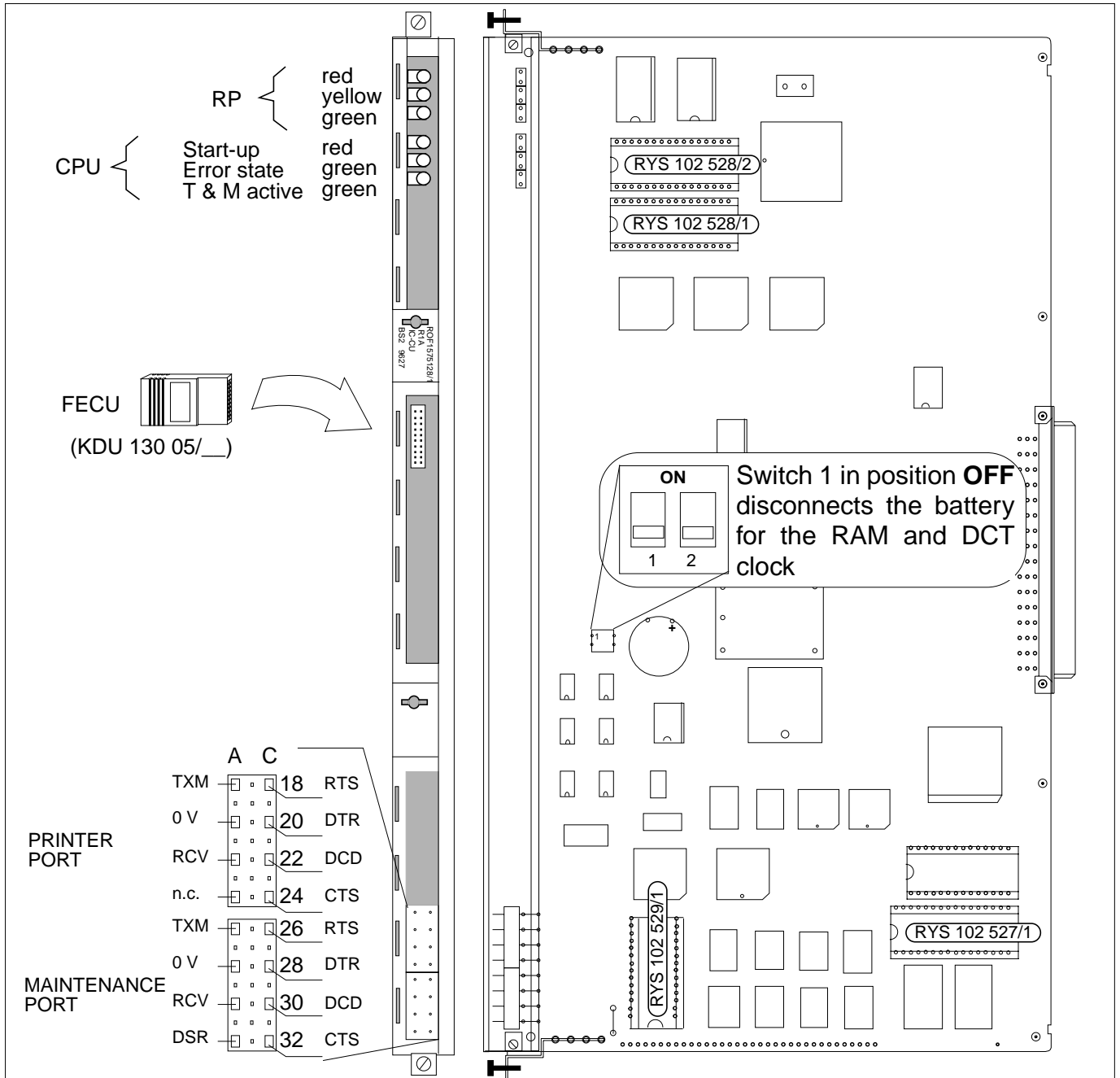
Example:

Assuming a full coverage in a building can be achieved with 4 Base Stations means that 55 portables generate together $55 \times 0.200 = 11$ E, while the Base Stations traffic capacity is only $4 \times 2.7 = 10.8$ Erlang. This is insufficient so another Base Station in the area of the busiest part of the company has to be added.

Practically, the total capacity offered by the cordless network is generally more than sufficient, but this is from an average point of view. In certain places, traffic demands may vary such that locally the network is often blocked, or has a lower GOS than required. For instance a purchase department may easily generate 300 mE per Portable during busy hour, thus, when e.g. with 6 persons giving a very high load on the Base Station close by. It may be necessary to add a Base Station in this area to have enough capacity for others to call as well. Also think of e.g. canteens during lunch time etc.

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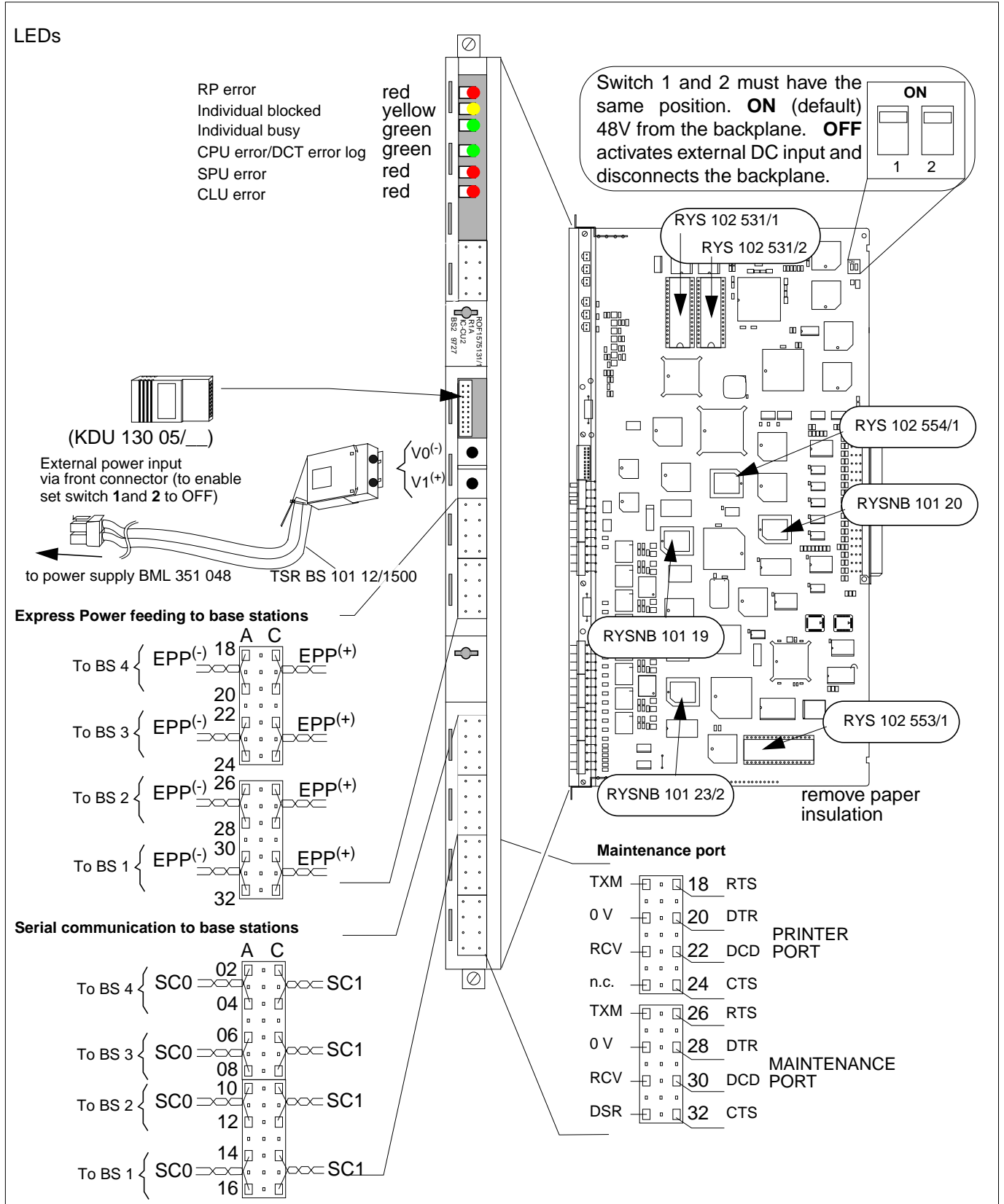
6.3 Board IC-CU (ROF 157 5128) (A-Protocol)



Note: When connecting the maintenance port to a modem for remote maintenance first connect the RASC cable to the maintenance port and the other end to a 0-modem plug/cable and then to the modem.

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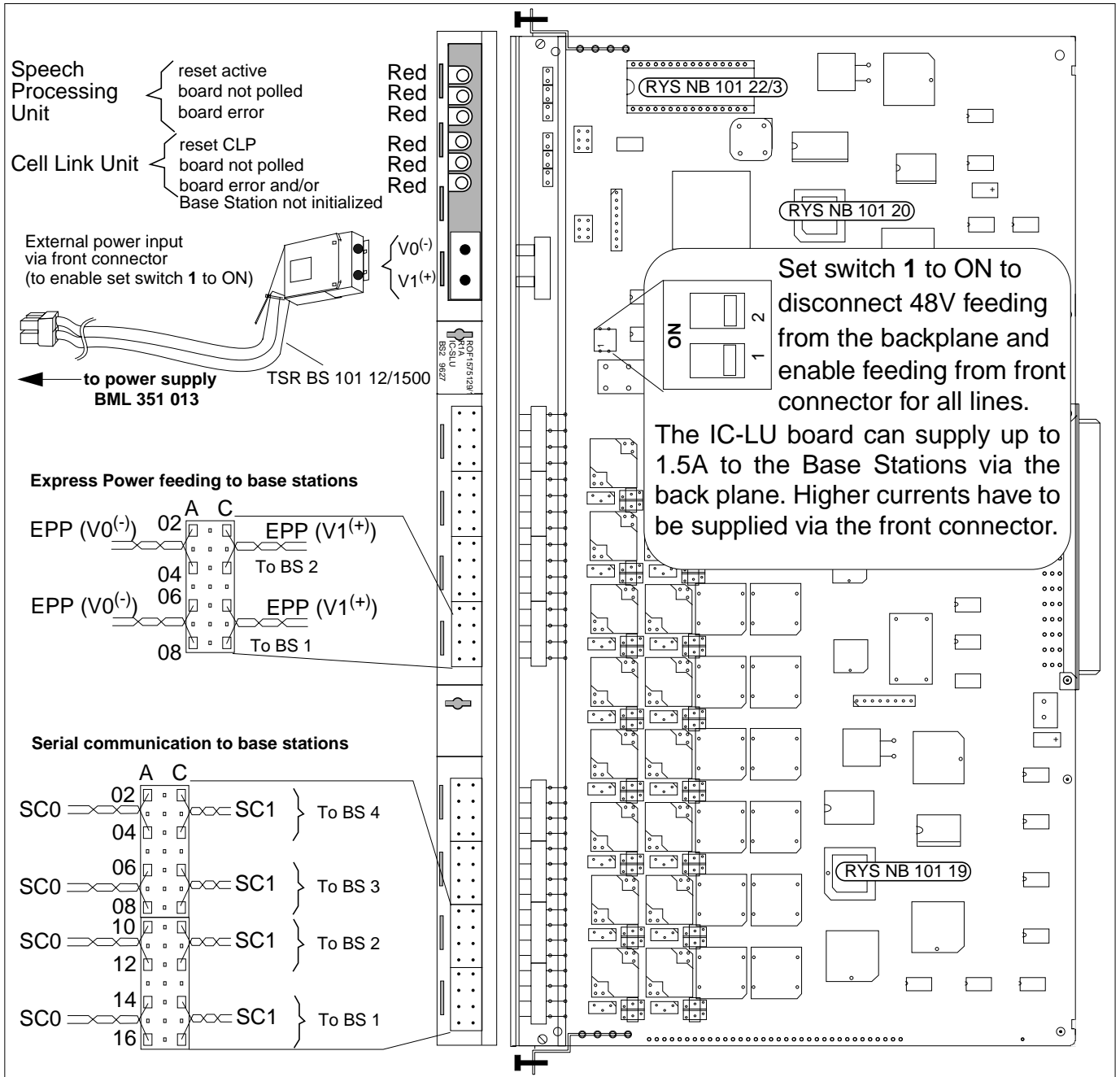
6.4 IC-CU2 (ROF 157 5131/_) (GAP-Protocol)



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6.5 Board IC-LU (ROF 157 5129)

Up to revision R2A



Note: Use **only** the cable (TSR BS 902 0001/___ or equivalent) for the wiring to the MDF.

External power input: This cable is used if the current of all Base Stations connected to the IC-LU exceeds 1.5A. This cable connects either to another power supply in another cabinet or to the same cabinet's power supply. The current fed by this cable must also be considered in the power calculation of the BML 351 048.

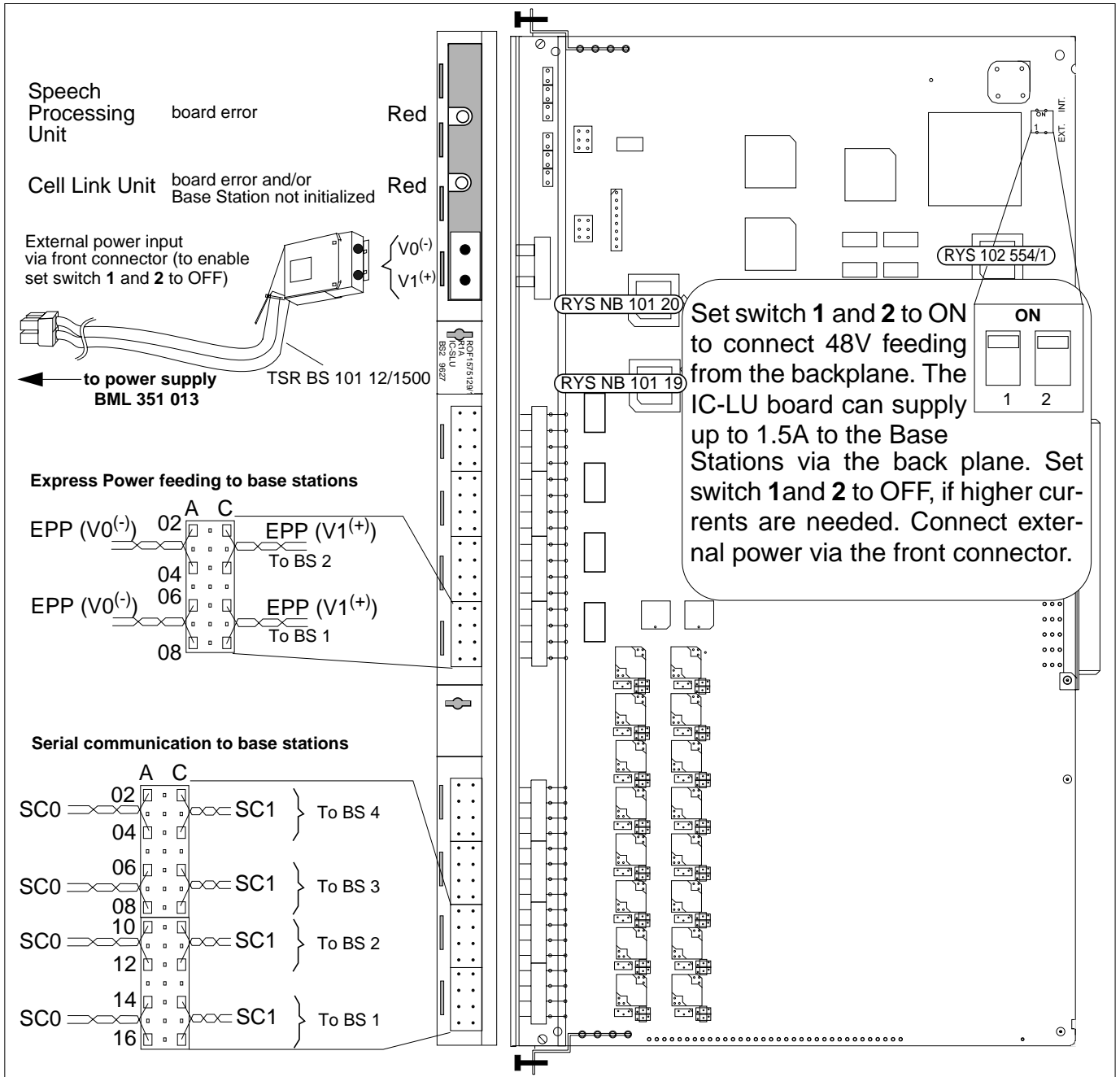
Overvoltage Protection

All lines leading outside the building to Base Stations must be fitted with 90V gas-filled surge arresters between every wire to ground.

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6.6 Board IC-LU (ROF 157 5129)

Revision R2A and higher



Note: Use **only** the cable (TSR BS 902 0001/___ or equivalent) for the wiring to the MDF.

External power input: This cable is used if the current of all Base Stations connected to the IC-LU exceeds 1.5A. This cable connects either to another power supply in another cabinet or to the same cabinet's power supply. The current fed by this cable must also be considered in the power calculation of the BML 351 048.

Overvoltage Protection

All lines leading outside the building to Base Stations must be fitted with 90V gas-filled surge arresters between every wire to ground.

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6.7 Base Station (KRCNB 201 03/_ and KRCNB 301 03/_)

The Base Station (BS) enables radio communication between the Integrated Cordless system and the portable telephones. The communication via two 2B+D interfaces, requires two twisted pair cables. Both interfaces provide in total eight 32 kbit/s speech paths between a BS and IC-LU, enabling a BS to handle eight simultaneous calls. The BS is connected to the IC-CU2 or IC-LU via two wire pairs called serial communication wires (SC0 & SC1) carrying up to 8 simultaneous digital voice connections and the central power feeding. Apart from data communication these two twisted pairs are also be used to distribute power to the BSs. Two additional pairs can be wired to provide a greater powering range. There are three methods to power BSs:

1. centrally via backplane (with or without EPP)
2. centrally via external input (with / w.o EPP)
3. via local power supply (optional).

With the first and second methods power is distributed via the IC-LU to the BS. The cable length between BS and IC-LU depends on the number wires used for power feeding, the type of cable and environmental noise. In the third case (local feeding), BSs are powered by an AC-adaptor or another power source which is not routed via the cabinet.

The number of BSs used in a system depends on the area to be covered and the traffic density. Typical in-house coverage is up to 30 meter radius. In practice the cell size may vary between 10 meters indoors in worst case situations, up to 300 meters outdoor in free space.

The BS has two main functions:

- to modulate a carrier with the digital encoded information (TDMA frame directed to portable)
- to demodulate a modulated carrier (TDMA frame received from portable).

A special cover (KRY NB 101 01) is available to mount the BS (KRCNB 201 03) outdoors providing splash proof housing and water tight sealings for the wiring.

6.7.1 Base Station Planning

The major task when providing a wireless service is to estimate the number of BSs and to find their most suitable location. A number of factors tend to limit the range of a BS like the materials the wall is composed of or the location and size of machines, furniture, air-conditioning systems, elevators etc. This results in unexpected reflections or absorption of radio waves. Generally BSs should not be located on outer walls, except if the outdoor area has to be covered as well, as this reduces the area actually covered. All of these unpredictable influencing factors makes it extremely difficult to define rules for how to cover an area with a suitable number of BSs. In difficult environments the use of a site survey tool (LTT NB 101 01/_) is recommended.

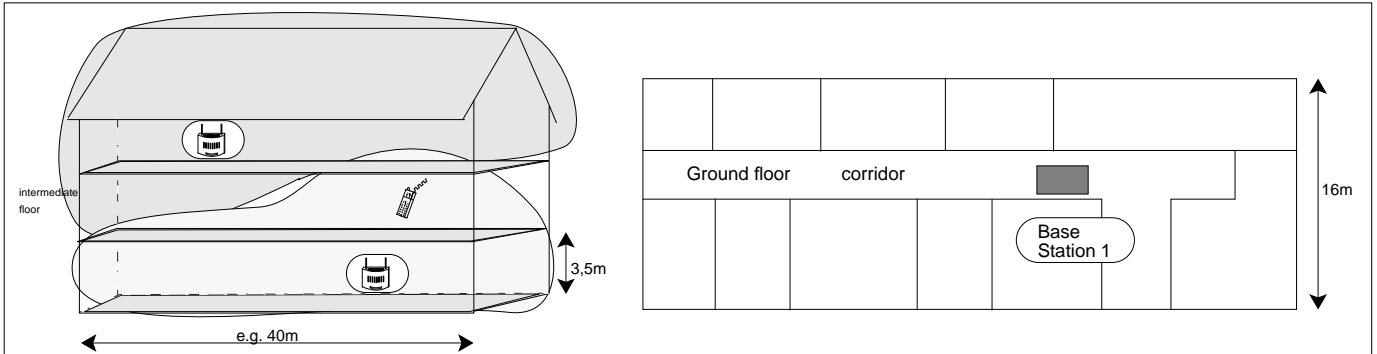
Establish a Base Station plan for the installation site to determine the best location for the BSs.

Base Station aerial range

- In an office environment in a steel concrete building up to 30 m in diameter can be covered and including, under normal conditions, the neighbouring floors.
- Production halls up to 200 m in diameter are covered but ranges can be less if bulky machines, cranes etc. are part of the interior.
- Outdoor ranges can be up to 300m.

When installing a BS, position it, then walk around to determine cell coverage area either by listening to the speech quality - whether mutes or crackling sounds are heard in the portable - or measure the RQI indicator using the portables Service Display facility (see [FAULT TRACING 1545-ASB15002Uen](#)).

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6.7.2 Base Stations Cabling

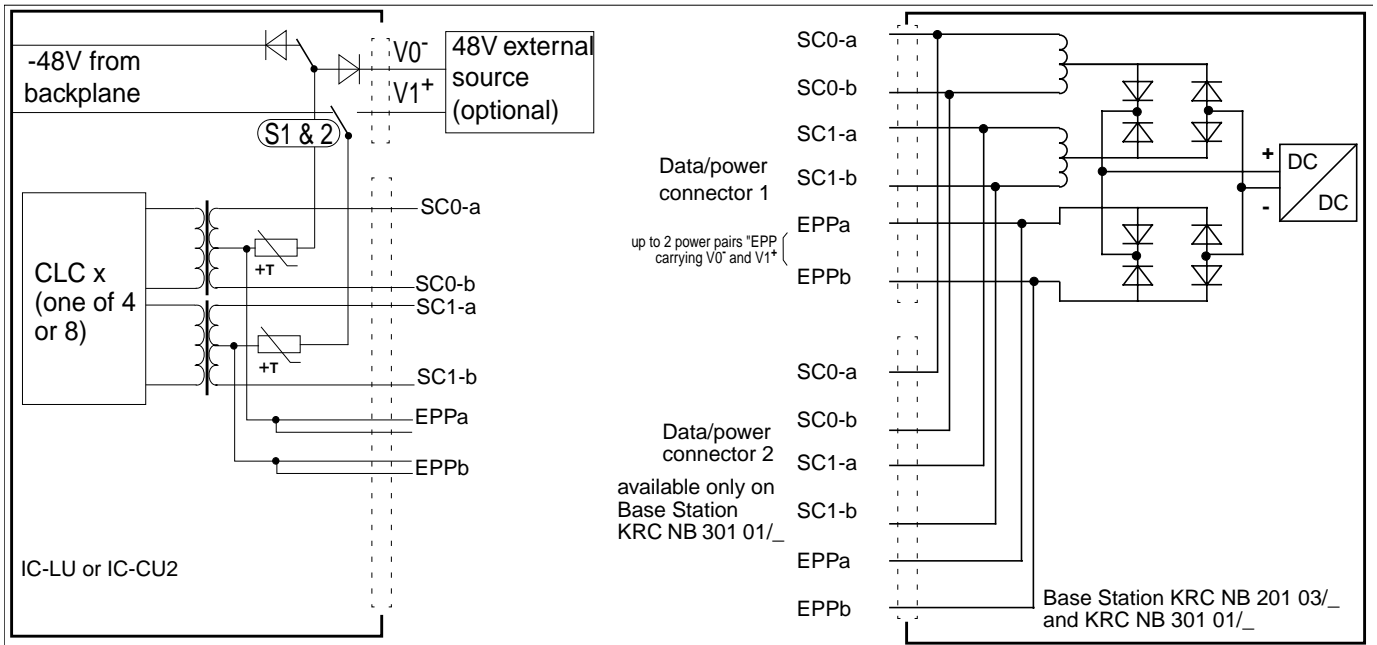
Using a four-pair cable or more-pair cable, the free cable pairs can be used as additional power wires (EPP) to increase the feeding distance and reduce overall power consumption (by reducing the ohmic resistance) to the BS. The BSs can also be powered by an on-site adapter (refer to [section 6.7.7](#)).

Connection of serial communication wires and EPP lines is polarity-independent. SC0-0 and SC0-1 may be interchanged but SC0-x and SC1-x **may not** be interchanged. The diagram below shows the wiring principle to each base station connected to the IC-CU2 or IC-LU.

Power feeding of the Base Station

There are three alternatives to power feed (-48V) the Base Station:

- The power feeding can be taken via the IC-CU2 or IC-LU from the back plane in the cabinet. The DIP-switch on the IC-LU is set to **OFF**.
- From an external power source via the front connector on the IC-CU2 or IC-LU ($\leq 56V$). Note the polarity on the input (see drawing of IC-CU2 or IC-LU board). The switch on the IC-CU2 or IC-LU is set to **ON**.
- By an AC-adaptor (see [page 45](#)). The switch on the IC-CU2 and IC-LU should be set to **ON** but no power feeding from the external power source via the front connector on the IC-LU.



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6.7.3 Base station cable delay measurement

After all base stations have been installed, the cable delays must be measured in order to program the base station delays into the system at initialization time. On IC-LUs with the revision R1D and higher and IC-CU2 revision R1C or higher automatic delay measurement is performed. In this case no measurement is needed but using the cordless system manager (CSM) go to the menu "add Base Station" and enter a "1" in the field "delay".

Base station delays are measured at the radio exchange with an echo-meter connected to cable data pair SC0 or SC1 and with the cable open ended at both sides. So the cable must be disconnected from the IC-LU or IC-CU2 as well as the base station.

1. Make sure that the base station cable is unplugged from the base station and the relevant connector on the relevant IC-LU or IC-CU2.
2. Connect an echo-meter to cable pair SC0 or SC1.
3. Measure the cable delay. The measured delay is the time between sending a pulse down the line and receiving the echo. Therefore the recorded value is twice the cable delay and must be halved. The resulting value must have an accuracy of 200 ns (corresponding with 20 – 30 m).
4. Record on paper the delay value measured for each base station in microseconds, together with the base station number.
5. Repeat the delay measurement for all base stations.
6. Re-connect the connectors to the IC-LU or IC-CU2.

Another possibility is measuring the ohmic resistance:

Connect to SC0 or SC1 measure the resistance of the loop and divide the result by 3,3. This is the value to be entered at system initialization in the Cordless System Manager.

This formula applies for wires of 0.5 mm diameter. After all lines to the Base Stations have been measured, connect the Base Stations by plugging-in the connector.

6.7.4 Ranges on cables

The following ranges are given for base stations connected to an IC-CU2 and IC-LU. Depending on the cable type ranges depend on noise levels imposed on the cables. The values stated are maximum achievable ranges:

Type	Cable		Maximum cable length	
	Wire diameter (∅)	Capacitance	Superimposed noise	
			8 mV/pHz	10 mV/pHz
Twisted pair	0.4 mm	45 nF/km	1.2 km	1.0 km
Twisted pair	0.5 mm	45 nF/km	1.6 km	1.4 km
Twisted pair	0.5 mm	120 nF/km	0.9 km	0.8 km
Twisted pair	0.6 mm	45 nF/km	1.9 km	1.7 km
Twisted pair	0.6 mm	120 nF/km	1.1 km	1.0 km
Double twisted pair (J-Y (St)Y 2x2x0.6)	0.6 mm	120 nF/km	1.0 km	0.9 km

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6.7.5 Base Station (KRC NB 203 01/_)

The Base Station (BS) is supplied with a drilling template to mount the unit and 2 antennas with TNC connectors. Mount the unit in a suitable location to provide the best communication coverage.

Use the supplied drilling template and mount the BS with four screws (6 mm Φ). Complete the electrical connection according to the above drawing. Do not connect to the Base station yet.

IF power is supplied by the adapter (BMLNB 101 04), the screw/slide connector **must** be used. The serial communication wires can be connected via the modular jack or the screw/slide connector. A screw with a bundling cord holder is provided for traction relief to the left of the connection field. The BS starts up if the supply lines deliver more than 12 VDC.

LEDs

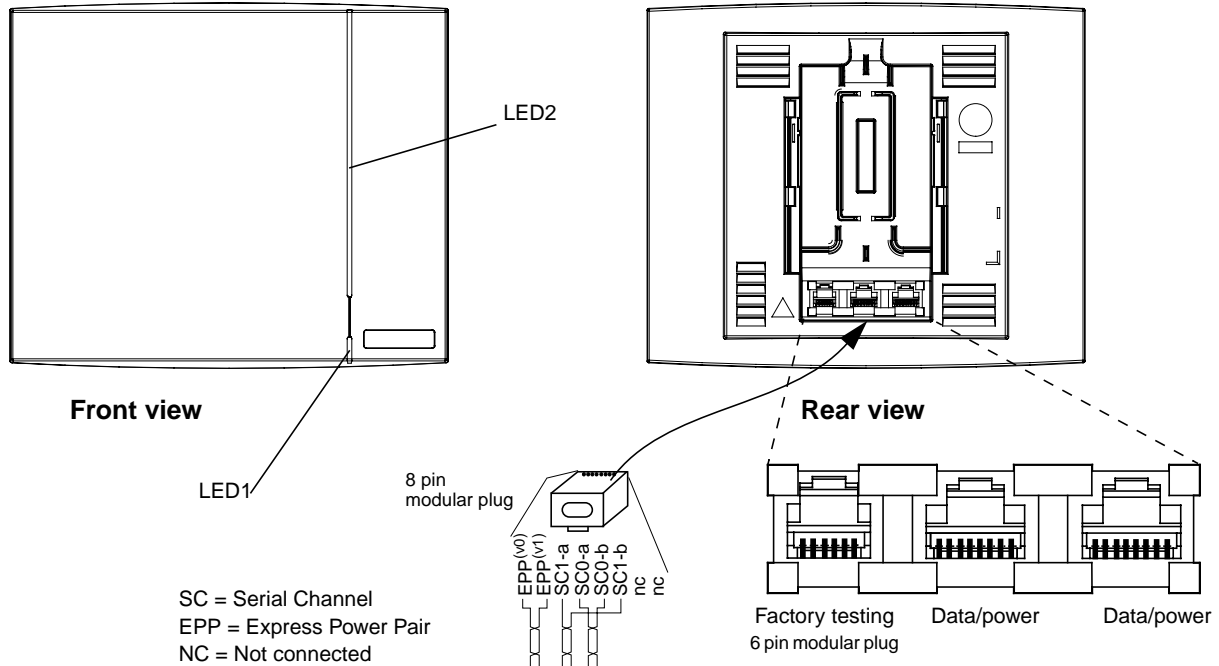
Status of LEDs	Meaning
Power LED on (green)	BS power on
Reset LED on (red)	Power Fail/Reset
LED1 and LED2 on or LED1 and LED2 flashing	BS in non operational mode
LED1 and LED2 off	BS operational (no traffic)
LED1 off and LED2 on	BS operational (traffic)
LED1 on and LED2 off	Fatal software error

Use connectors 5 & 6 for AC adapter connection. This input is insensitive to polarity reversal

Note:) If the Base Station (KRC NB 201 03/_) is accessible by persons other than trained personnel mount the cover (SDFNB 101101/_ or similar.

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6.7.6 Base Station (KRCNB 301 03/_)



The BS is connected to the radio exchange by means of a standard twisted pair cable. The BS is can be fixed to a wall, a ceiling, a pole or a beam, by means of the mounting bracket included. When fixing the BS to a wall or ceiling the included plugs and screws must be used. When fixing it to a pole or beam a (not included) strap or a flexible metal band must be used.

Connectors

- Two 8-pin modular jacks for data and powering
- A 6-pin modular jack for factory testing

The two data/powering connectors are interconnected on the board.

LEDs

LED 1: Green power LED

LED 2: Three colour LED, see table below

Status of LED2	Meaning
Off	Base station operational and no traffic on the base station
Green	Base station operational and traffic on the base station
Red	Base station is malfunctioning
Amber	Base station is OK, but not available (self-test, not initialized, no communication with radio exchange)
Flashing green	All 8 channels are in use
Flashing amber	Software is being downloaded to the base station

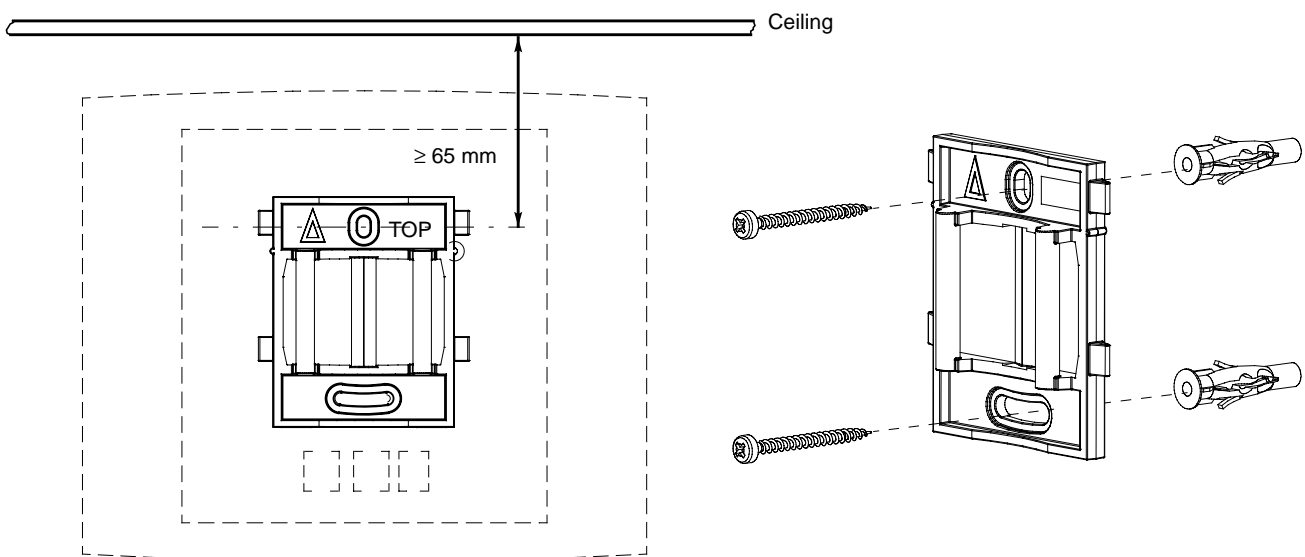
The BSs can be mounted vertically or horizontally. Mount the BSs at places and positions as determined in the system configuration plan. The BS must be placed so that it is not facing large metal objects such as large heating pipes, machines.

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Fixing the mounting bracket to a wall

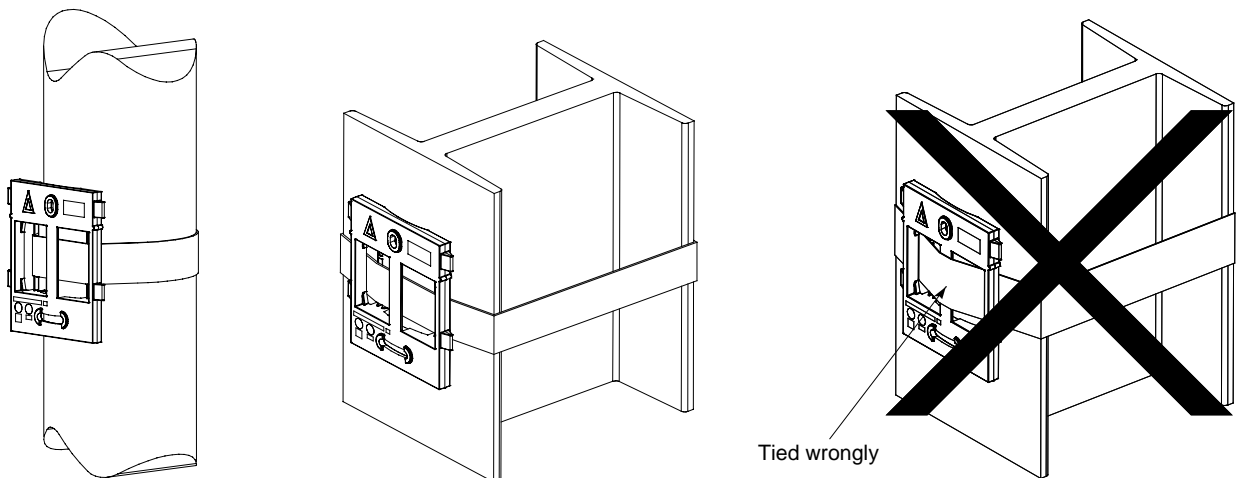
Fix the mounting bracket (see figure below) to the wall as follows:

1. Hold the mounting bracket with its flat side against the wall such that the text 'TOP' is the right way up, and mark the two holes. The minimum distance between the upper hole and the ceiling or any object above the BS must be as least 65 mm. If the distance is less than 65 mm, the BS cannot be slid onto the bracket.
2. When using wall plugs, take a \varnothing 6 mm drill and drill the two holes and insert the included wall plugs.
3. Position the mounting bracket with its flat side to the wall and fasten it with the two included \varnothing 3.5 mm screws.



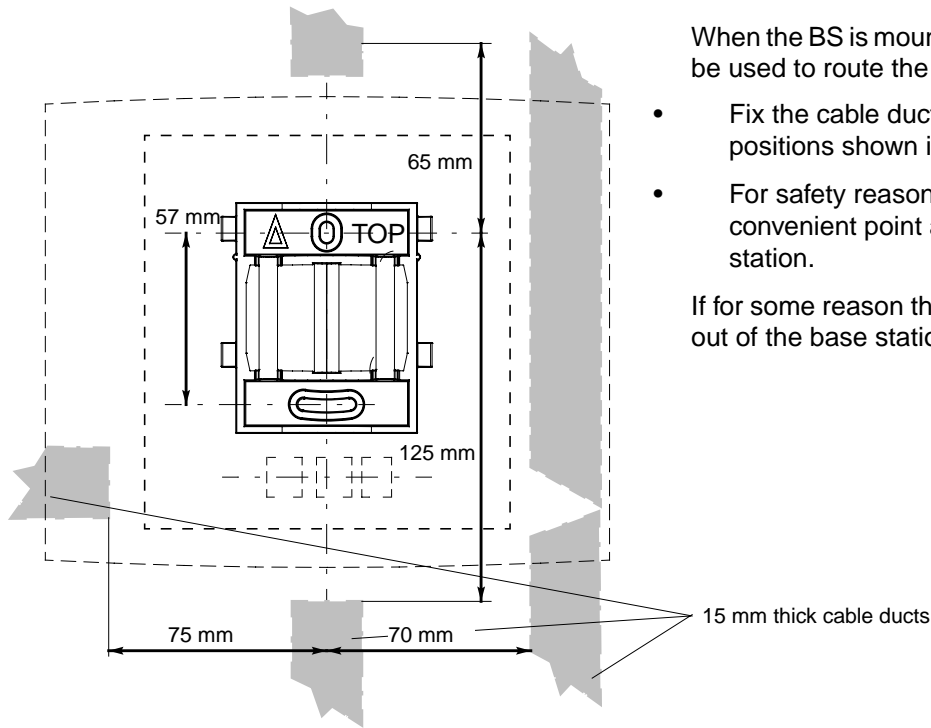
Fixing the mounting bracket to a pole or beam

The mounting bracket can be attached to a pole (diameter \geq 45 mm) or a beam (wider than 50 mm) by means of a strap or flexible metal band less than 30 mm wide. Position the mounting bracket to a pole or a beam so that the text 'TOP' is right way up. The strap or flexible metal band must be purchased locally.



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Cable ducts



When the BS is mounted to the wall, cable ducts can be used to route the wiring through.

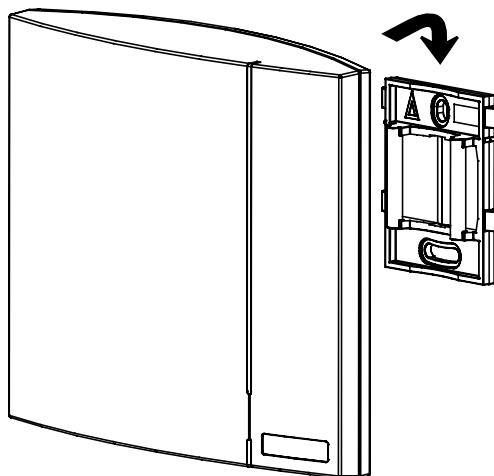
- Fix the cable duct to the wall in one of the positions shown in the left figure.
- For safety reasons secure the BS cable to a convenient point at about 30 cm from the base station.

If for some reason the BS drops, the cable is pulled out of the base station.

Mounting the Base Station

1. Hold the BS flat against the mounting bracket and move it downwards until it clicks.

Note: After completion of the installation, base stations must be initialized using the cordless system manager.



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6.7.7 Power Feeding of Base Stations

When using any of the adapters mentioned below care must be taken to configure the IC-CU2 boards for local BS feeding. If the BSs are to be fed locally the remote power feeding switch on the boards should be set to the position disconnecting the feeding from the back plane and no external feeding to the board should be connected.

Adapter for Base Station (KRCNB 201 03/_)

An AC-adapter to feed the BS locally is available for 230VAC/24VDC (BMLNB 101 04) for all European countries except for the UK and Cyprus. In other countries it has to be purchased locally and must meet the specifications given below:

Output voltage: between 12 V and 56VDC
Output power 7.5W minimum

Adapter for Base Station (KRCNB 301 03/_)

The 24 VDC adapter (BMLNB 101 09/n) is fitted with a 8-pin modular plug that can be plugged into one of the data/power connectors of the base station.

6.7.8 Software upgrade

If necessary, the software in the BS can be updated by downloading new software to the BS. Downloading can be performed without disconnecting the BS. The new software is stored in flash memory.

7 LINE NETWORK

The line network for PBX-extensions is to be installed in accordance with the stipulations for standard telephone networks. Twisted pair cables must be used for the lines and a wire diameter 0.5 mm is recommended in order to reach full line length, i.e. 800 m.

No stubs and/or branches may exist on a digital extension lines, as they could cause transmission problems. This does not apply for ISDN configurations.

- The network lines are to be connected directly to the boards with prefabricated cables which are equipped with EURO-connectors for 4 wire-pairs
- In those cases where a separate ERICSSON MDF has been installed, prefabricated cables are used between the MDF and board connectors in the exchange cabinet.
These cables have EURO-connectors mounted at one end for connection to the board

To connect the ELU-A, ELU-D, MFU, BTU-A, BTU-C and BTU-E to MDF, use cable:

- TSR 902 0444/1 (length = 1.5 m) is terminated with standard ERICSSON connectors
- TSR 902 0472/3 (length = 6 m) is equipped with connector only at the exchange side
- TSR 901 0472/2 (length = 15 m) is equipped with connector only at the exchange side

For connection of BTU-D, use cable:

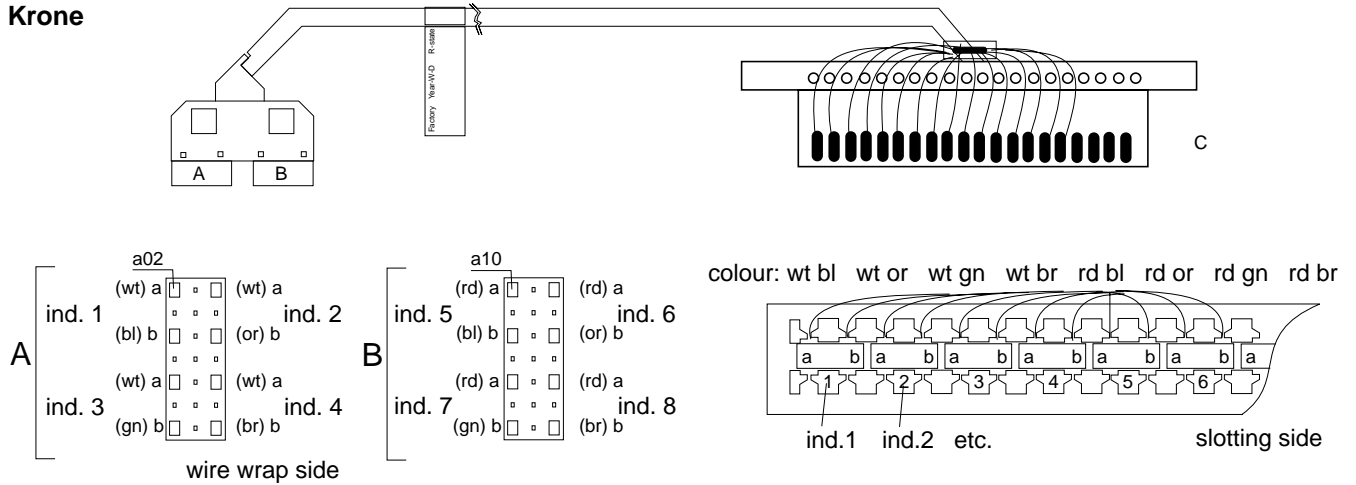
- TSR 225 1304/20000, 75 Ω coaxial cable
- use the cable TSR 902 0444/1 for 120 Ω connection or a double shielded cable TSR 901 0481/20000 (adhere to local requirements).

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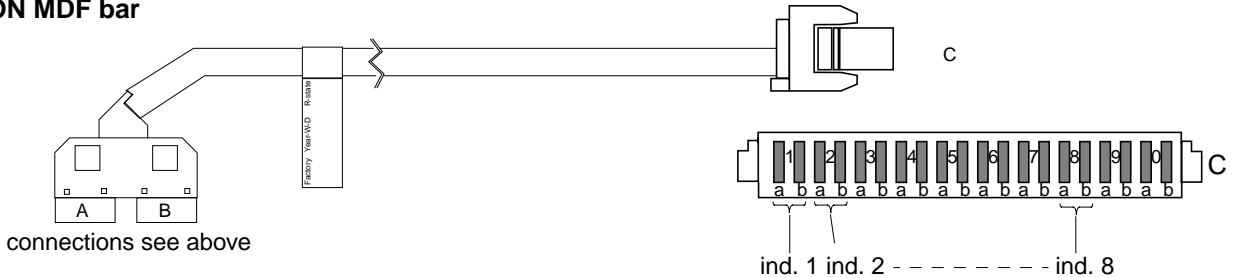
7.1 Cables for BDV 113 08

7.1.1 MDF cables

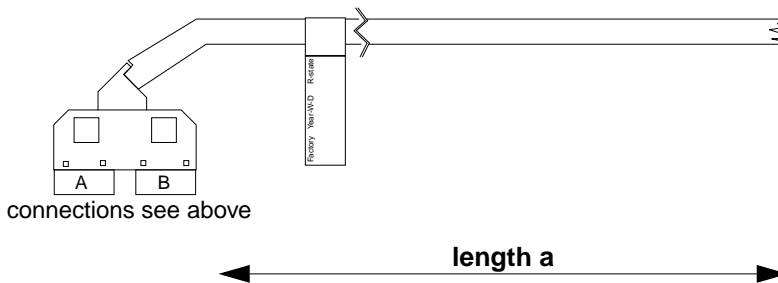
Krone



ERICSSON MDF bar



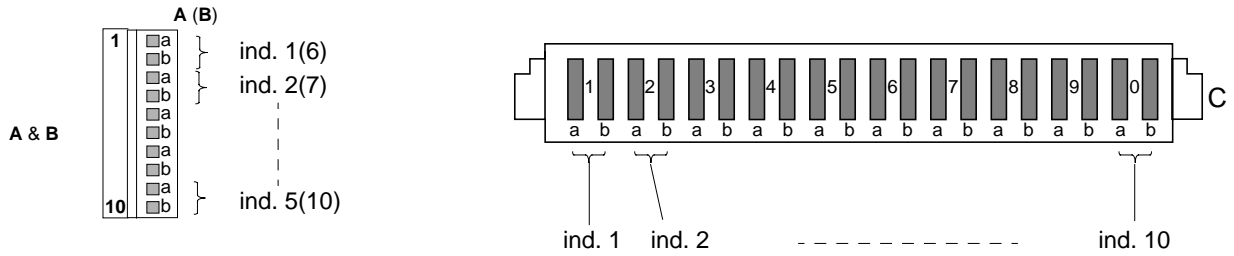
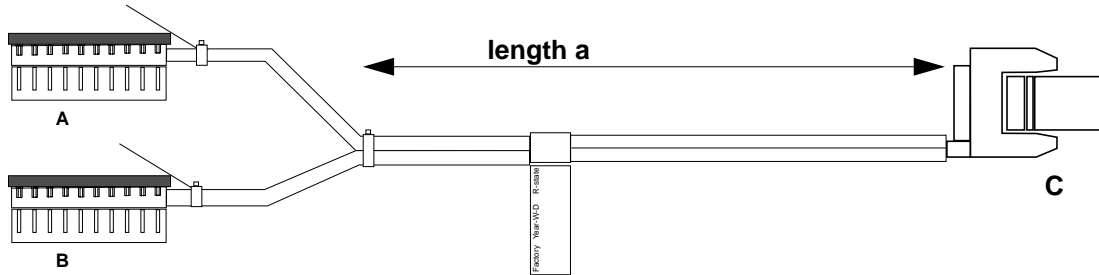
Open ends



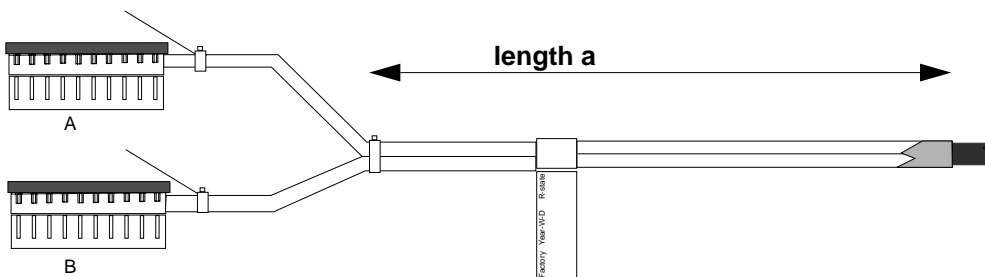
part number	a	usege	Cable with 8 pairs, mounted with:
TSR BS 902 0001/800 /1500 /3000	800 mm 1500 mm 3000 mm	standard cable for integrated MDF standard cable for external MDF MDF cable for existing MDF	ERICSSON plug and Krone bar.
TSR 902 0444/1 TSR 902 0444/2	1500 mm 3000 mm	standard cable for external MDF standard cable for external MDF	ERICSSON plug and ERICSSON MDF distribution bar
TSR 901 0472/3 TSR 901 0472/2	6000 mm 15000 mm	for external MDF, 120Ω for BTU-D standard cable for external MDF	ERICSSON plug and open ends

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7.1.2 Cable for ELU-C



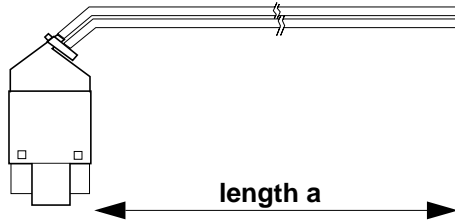
part number	a	usege
RPM 603 337/1	1500mm	standard cable for ERICSSON MDF



part number	a	usege
383 718/3	3000mm	standard cable for ERICSSON MDF
RPM 603 310/15000	15000mm	standard cable for ERICSSON MDF

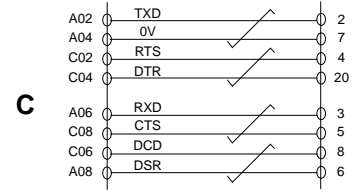
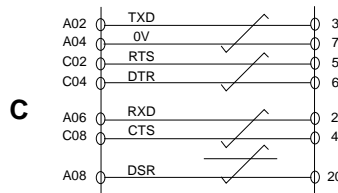
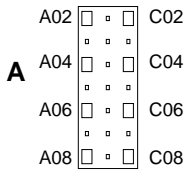
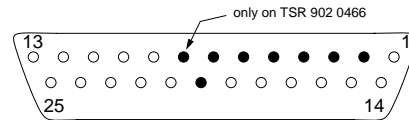
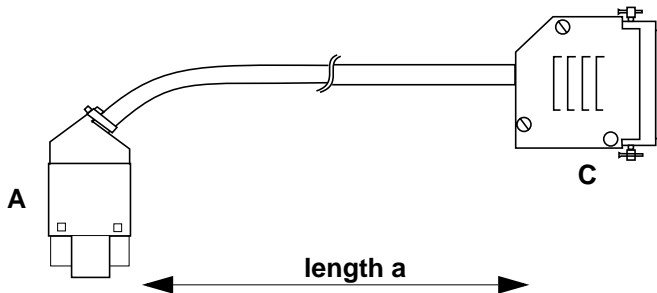
Uppgjord/Prepared	Faktaansvarig - Subject responsible	Dokumentnr/Documentnr	
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7.1.3 Coax cable for BTU-D



part number	a	usege
TSR 225 1304/20000	20000mm	coax cable 75 Ω for BTU-D

7.1.4 V.24 cables



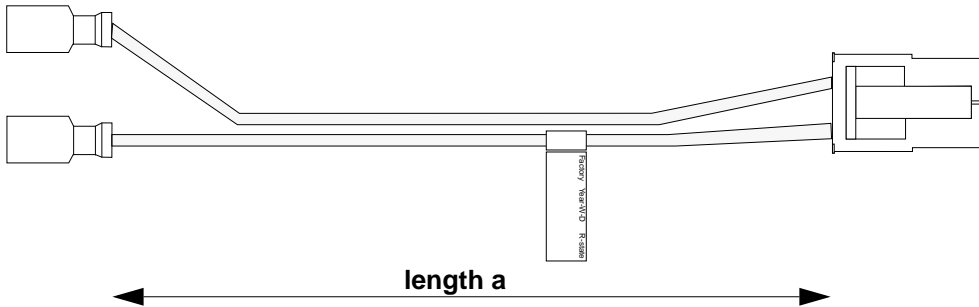
Wiring of cables: TSR 902 0476
TSR 902 0448

Wiring of cable: TSR 902 0466

part number	a	usege
TSR 902 0448/1	5000mm	cable connecting a PC to CPU-D_/AUX
TSR 902 0466/1	5000mm	cable connecting a modem to CPU-D_/AUX
TSR 902 0476/1	5000mm	cable connecting a printer to CPU-D_/AUX

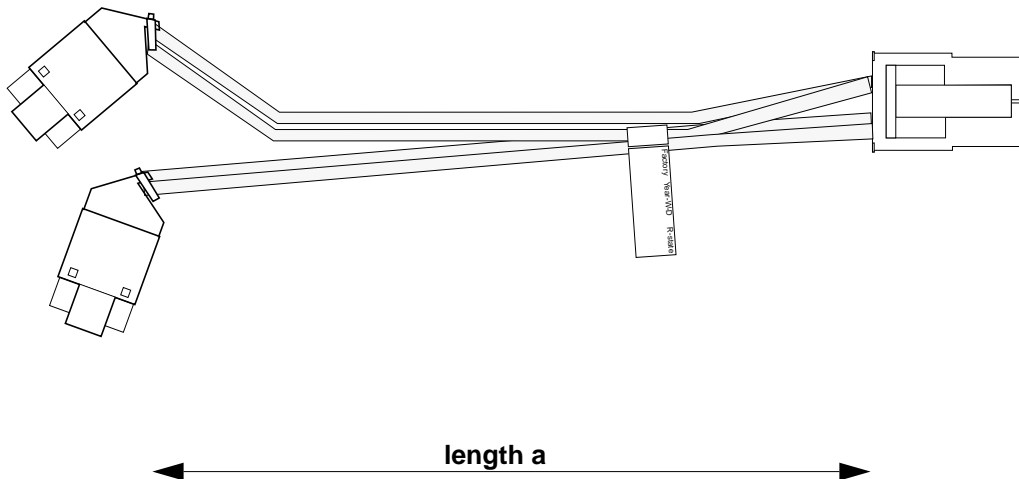
Uppgjord/Prepared	Faktaansvarig - Subject responsible	Dokumentnr/Documentnr	
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Dokansv/Godkänd - Doc respons/Approved	Kontr/Checked	Datum/Date	Rev
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7.1.5 Exchange power cables



part number	a	usege
TRE 990 113/850	850mm	exchange power cable
TRE 990 113/1500	1500mm	exchange power cable

7.1.6 IC-LU power cable

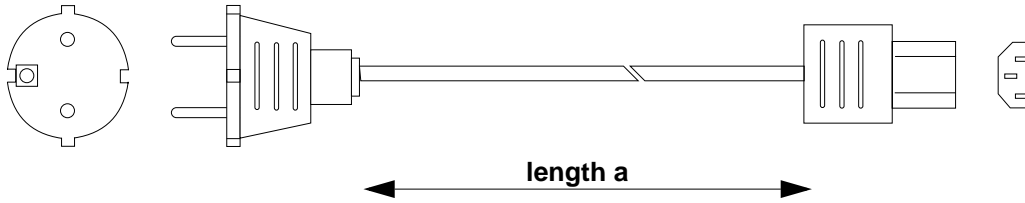


part number	a	usege
TSR BS 101 12/1500	1500mm	IC-LU power cable

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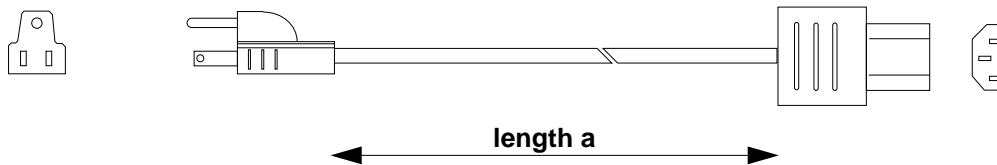
7.1.7 Mains power cables

Cable for EUROPE



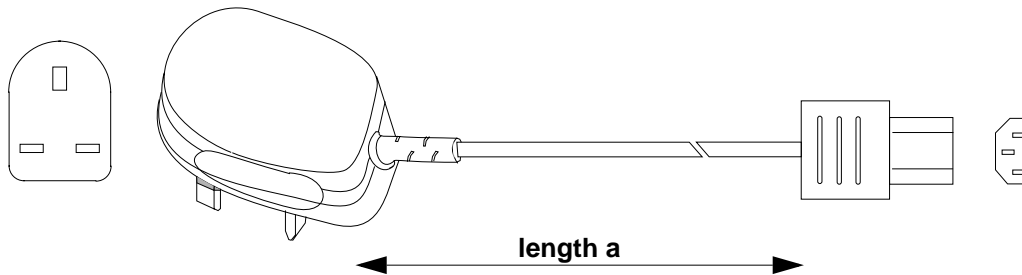
part number	a	usege
RPM 945 323	2500mm	mains power cable 230V 10A

Cable for Brazil, Mexico, Venezuela etc.



part number	a	usege
RPM 945 324	2500mm	mains power cable 125V 10A

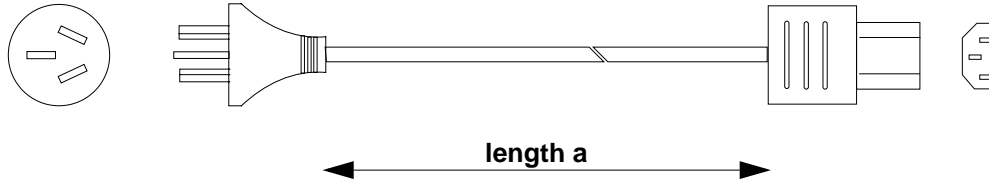
Cable for U.K.



part number	a	usege
RPM 945 326	2500mm	mains power cable 250V 10A

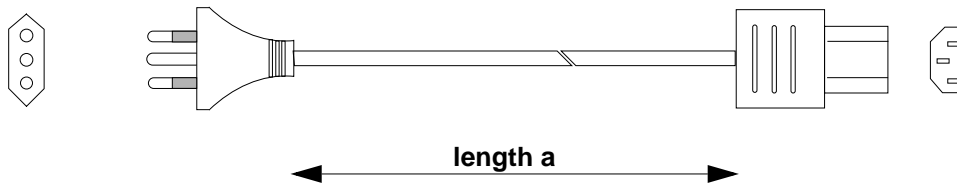
Uppgjord/Prepared	Faktaansvarig - Subject responsible	Dokumentnr/Documentnr 1531-BDV 113 08 Uen	
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Cable for Australia, New Zealand, China etc.



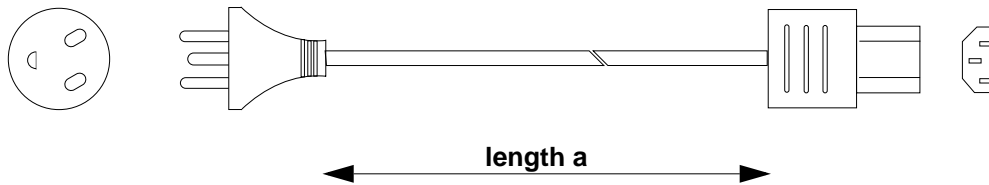
part number	a	usege
RPM 945 311	2500mm	mains power cable 250VAC 10A

Cable for Italy, Chile



part number	a	usege
RPM 945 313	2500mm	mains power cable 250VAC 10A

Cable for Denmark

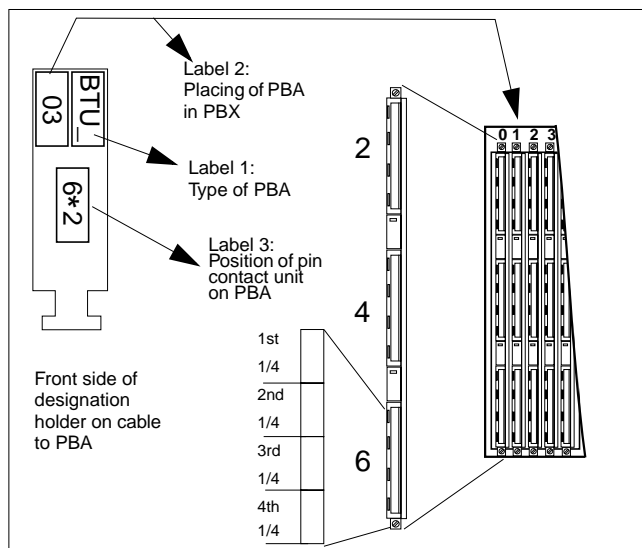


part number	a	usege
RPM 945 327	2500mm	mains power cable 250VAC 10A

Prepared	Subject responsible	Documentnumber	
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8 MARKING OF CABLES

Each cable that is connected to a PBX type ASB 150 should be marked on the cable's designation holder with the label set SVH 277 003/4, supplied for this purpose. The cable TSR 902 0444/1 is supplied with a designation holder, 860 1839, at the EURO-connector.



This label set contains three label types:

Label 1: This label indicates the abbreviated name for the PBA to which the cable is to be connected.

Example of parameter: **BTU_**

Label 2: There is one 2-digit parameter. This parameter indicates the position of the PBA-slot in the PBA where the cable is to be connected.

Example of parameter: **03**

Label 3 There are two 1-digit parameters. The first parameter indicates the position of the pin-contact unit on the PBA. The second parameter indicates the 1/4 of the pin contact.

Example of parameters: **6*2**

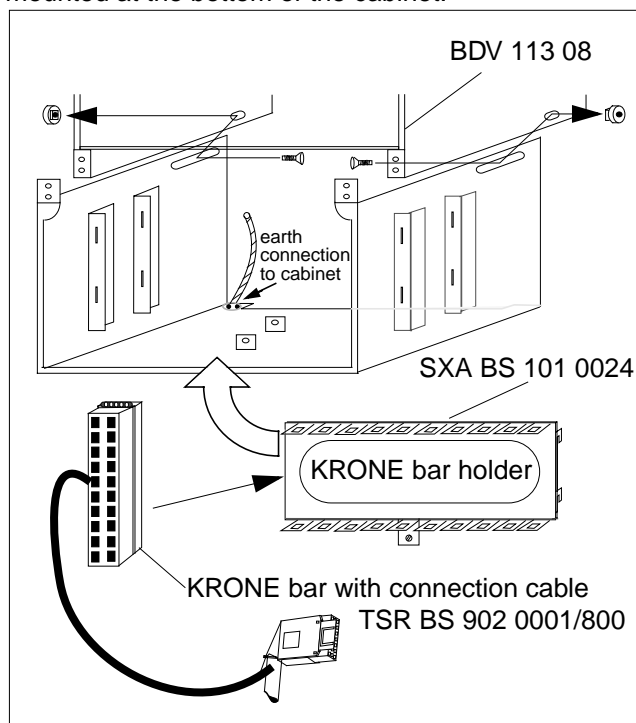
These three labels indicate where the upper part of the cable is to be connected and are placed on the front side of the designation holder.

When the **label 1** for PBA has a "_" included in the name, please enter the correct letter with a marker pen.

9 INSTALLATION OF MDF (Main Distribution Frame)

9.1 Integrated MDF SXK 106 4208/1

The integrated MDF is used for an add-on installation mounted at the bottom of the cabinet.



Using the supplied screws and nuts the MDF should be installed in the manner shown above. The bolts at the back allows the MDF to tilt down for service access to the back of the cabinet.

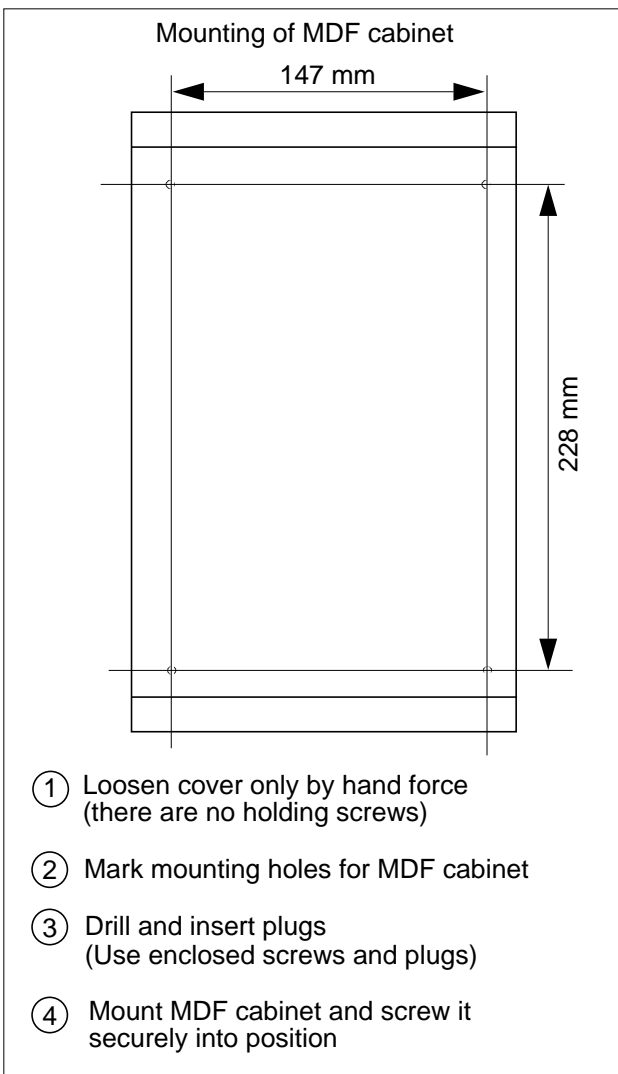
Two KRONE bar holders can be installed, each accommodating up to ten KRONE bars. The front holder should preferably be used for trunk lines as it can additionally accommodate the cartridge containing the gas discharge tubes for protection against lightning. Section 3.4 refers to the mandatory ground connection. When using this MDF the earth wire should **first** be connected to the exchange cabinet and then continue down to the integrated MDF. The earth connection on the MDF is located in the same position as on the cabinet. The screw (earth connection) on the front row bar holder must be fastened securely when the gas discharge tubes are mounted.

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9.2 External MDF SXK 106 4139/1

Unpack the MDF cabinet and remove its front cover. Mount the MDF cabinet on its designated position. Take into consideration the normal working height above the floor (about 1.30 m to the lower edge of the MDF cabinet) and the length (1.5 m) of prefabricated cable
TSR 902 0444/1.

Overall dimensions of the MDF cabinet: 295x184x68 (HxWxD in mm).

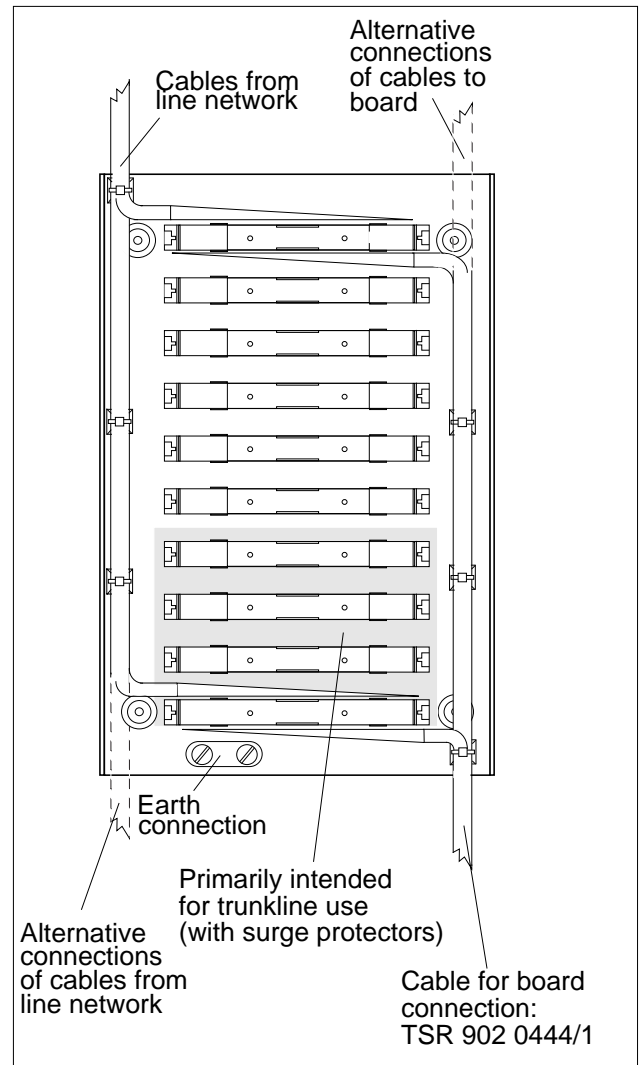


9.3 Line network

Place the cables according to the figure.

Secure the cables to the MDF cabinet with the adhesive anchors and cable fastener.

NOTE: There must be a connection to earth for the MDF cabinet when surge protectors are installed.



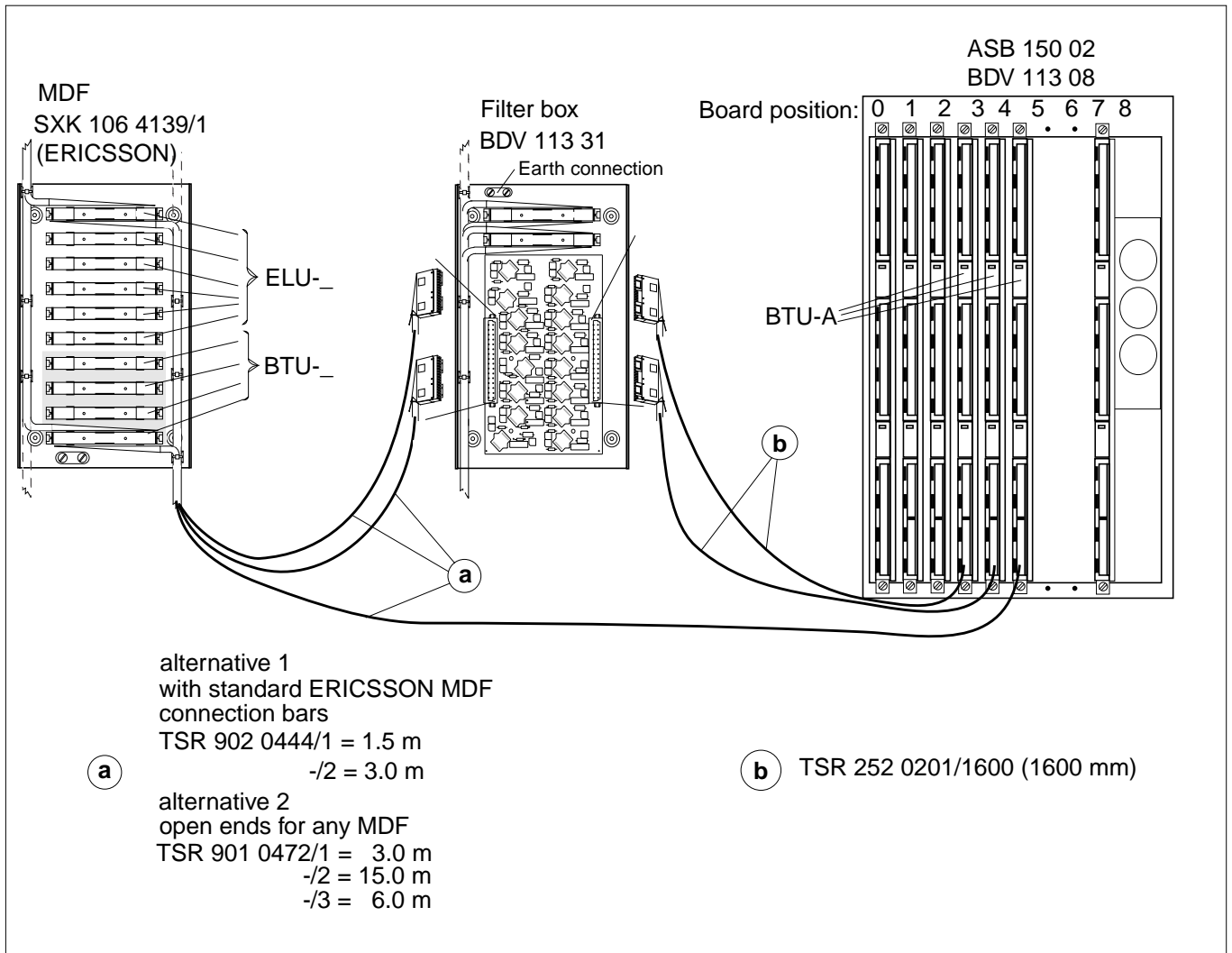
Uppgjord/Prepared	Faktaansvarig - Subject responsible	Dokumentnr/Documentnr 1531-BDV 113 08 Uen	
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10 INSTALLATION OF FILTER BOX (BDV 113 31) WITH BE12/16, CALL METERING FILTER BOARD (ROA 219 5110/1, -/2), MOUNTED

Mount the FILTER BOX (BDV 113 31) on the wall, just as the MDF under section 11.2.

Installation of BE12/16 is to be made as shown in the figure below.

If surge protectors are installed, the FILTER BOX **must** be connected to earth.



Mount the FILTER BOX (BDV 113 31) on the wall, just as the MDF under section 11.2.

Installation of BE12/16 is to be made as shown in the figure below.

If surge protectors are installed, the FILTER BOX **must** be connected to earth.

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11 Door Interface Unit (DIU) (BFY BS 10101/1)

Installation:

The DIU is an interface connected via one or two extension lines to the ELU-A of the exchange and via a set of wires to the door phone. The DIU should be mounted indoors on a dry wall. The door phone can be of any commercially available type as long as it meets the requirements listed in the [1555-ASB15002Uen SYSTEM OVERVIEW](#) under section 7 Technical Data for DIU.

Connection:

The wires to the speaker and microphone should be led via two twisted pairs in a **separate** cable. Caution when connecting a polarity-dependant microphone. Check polarity on connector **x1**. Make the connections to the door bell button, door opener and key lights etc in another cable. This is to minimise disturbances on the microphone line. The wires to the door opener carry more current and should have a diameter greater than 0.6 mm. The length between door phone and DIU should be less than 50 m. The length between door phone and exchange should be less than 500m.

The connector **X18** is used for speech connection between DIU and exchange. The connector **X17** is used to activate the door opener. If the door opener wiring already exists the **X17** connection can be omitted and the connection **X12** leads to an existing button.

Pressing the door phone button (connection **X5**) activates the DIU and the programmed extension rings (see [Facility Description 15534-ASB15002Uen](#)). The interface stays active for the preset time selected under "**C**" and shuts off after this time has elapsed.

11.0.1 Adjustments of DIU

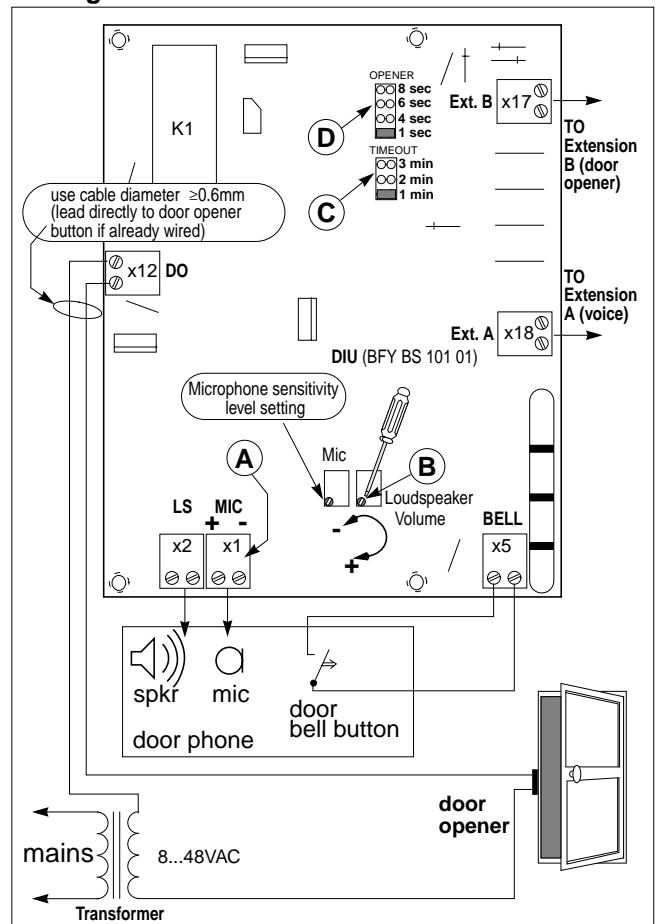
The microphone level is factory set, but under certain conditions the line attenuation can exceed expectations resulting only in one way speech connection or clipping of the voice between extension and door phone. In this case **cautious** change of microphone level setting has to be performed. The potentiometers range is

- If the voice in the speaker of the door phone sounds too dim or is clipped, turn the **mic** potentiometer screw two turns counter clockwise. Speak into the telephone microphone and verify that the speaker

sounds loud and clear enough otherwise repeat the procedure.

- No voice connection to the speaker of the telephone. Turn the **mic** potentiometer screw two turns clock wise. Speak into the door phone microphone and verify that it is heard in the hand set of the telephone otherwise repeat again.

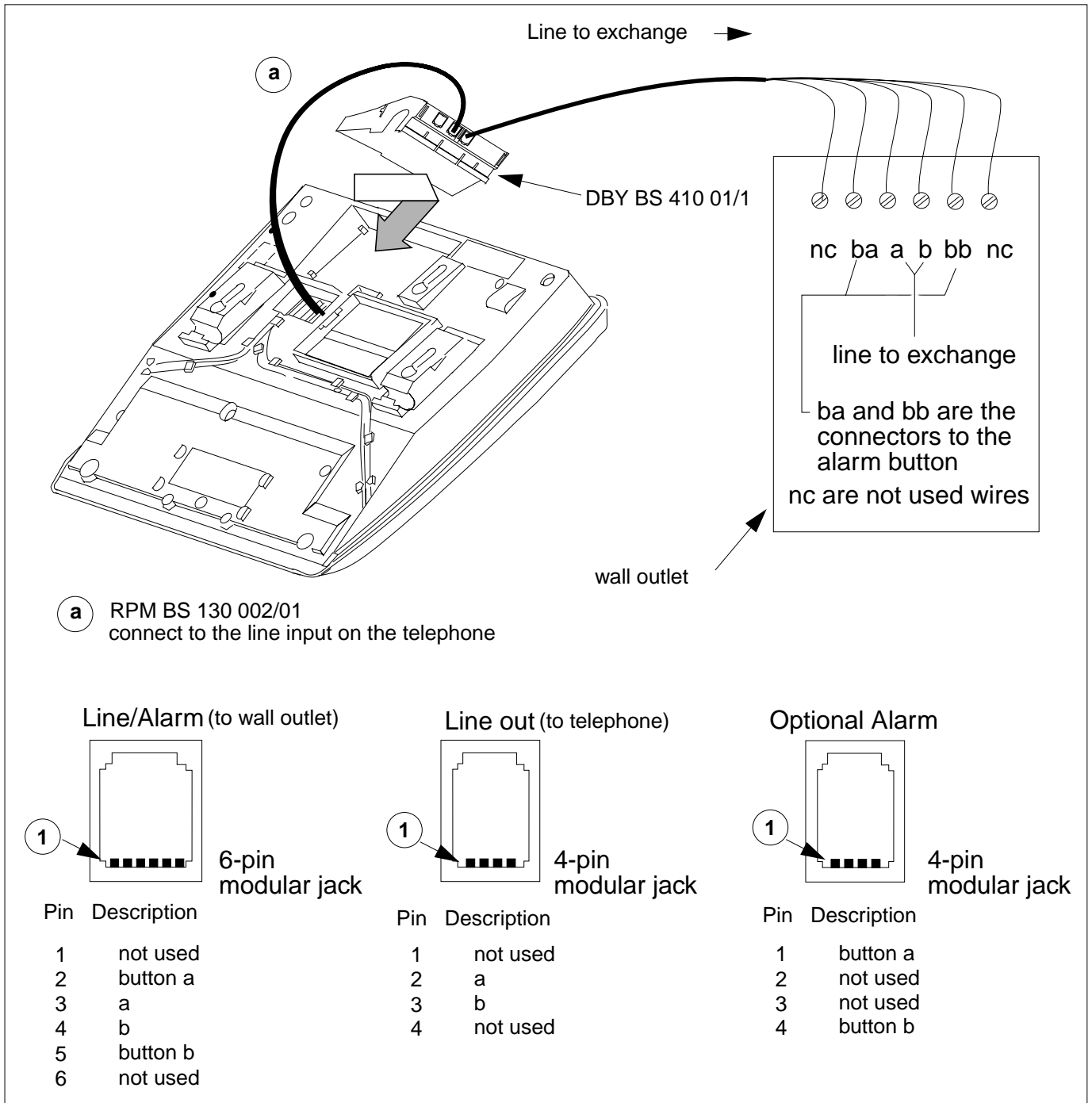
Settings on the board



- Ⓐ Microphone connection with polarity dependent 6 VDC supply for microphones with amplifiers.
- Ⓑ The loudspeaker volume level is factory set. To adjust turn the Loudspeaker potentiometer.
- Ⓒ Timeout for the interface to shut off. The jumper selects intervals between 1...2...3 minutes.
- Ⓓ Set door opener mic activation time 1...4...6...8 sec.

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12 INSTALLATION OF ALARM INTERFACE UNIT

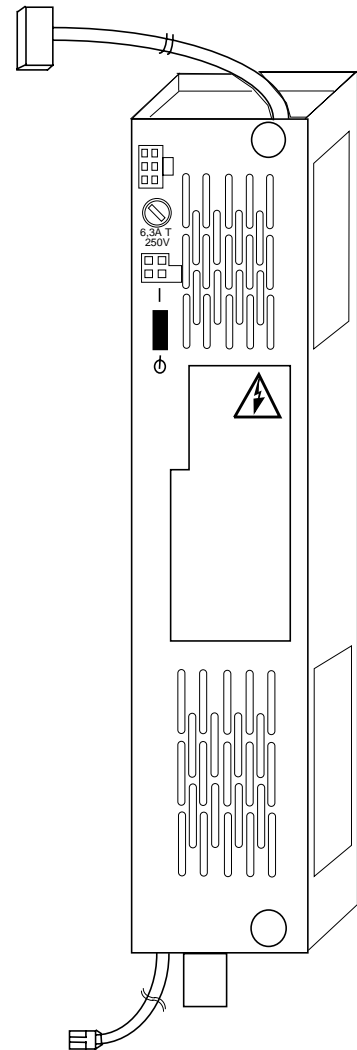


The ALARM INTERFACE UNIT is an optional equipment mounted in the case bottom of the DBC 21x telephones. This equipment is used in the hospitality area to enable distress notification from e.g. a bathroom. A normally closed switch is installed and the two terminals are connected to the pins (button a and button b) on the option unit. The connection can be made in the wall outlet. Then the wiring shown above applies. If another type of wiring is used the connector Optional alarm can be used.

Uppgjord/Prepared SEA/EBBMP Stangelberger	Faktaansvarig - Subject responsible EBBX/F	Dokumentnr/Documentnr 1531-BML BS 101 01 Uen
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		Rev C
		Tillhör/Referens-File/Reference ASB 150 02
Database reference 1531-BML BS 101 01 Uen-1-C.emf		

POWER SUPPLY WITH BATTERY CHARGER BML BS 101 01/_

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1 GENERAL

This document covers the installation and replacement of the power supply with battery charger BML BS 101 01/_ and the installation of the battery backup unit.

The power supply unit with battery charger is available in 2 different mains versions:

- for 230 VAC.....BML BS 101 01/1
- for 115 VAC.....BML BS 101 01/2

For more information of power calculation examples, see document [INSTALLATION INSTRUCTION \(1531-BDV BS 101 05 Uen\)](#).

The power supply unit supplies the exchange cabinet and a battery backup with power at the same time, provided that the total output power (2,1 A on 48V) of the power supply unit is not exceeded.

The power supply unit is mounted within the cabinet BDV BS 101 05 and BDV BS 101 01.

If initially an exchange with battery backup is ordered, the unit is preconfigured with a power supply with battery charger. The batteries are delivered separately and have to be installed according to this installation instruction.

In order to install the alarm feature, the CPU-D (ROF 157 5118/1) must have revision R1A/A or higher. CPU-D/2 (ROF 157 5118/2) must have revision R1A or higher. The CPU-D4 (ROF 157 5124/_) must have revision R1A or higher.

2 UNPACKING

Verify with the ordering list that the delivery is complete. The power supply unit BML BS 101 01/_ can be delivered separately or together with batteries, battery case and the cable set necessary to install a battery pack.

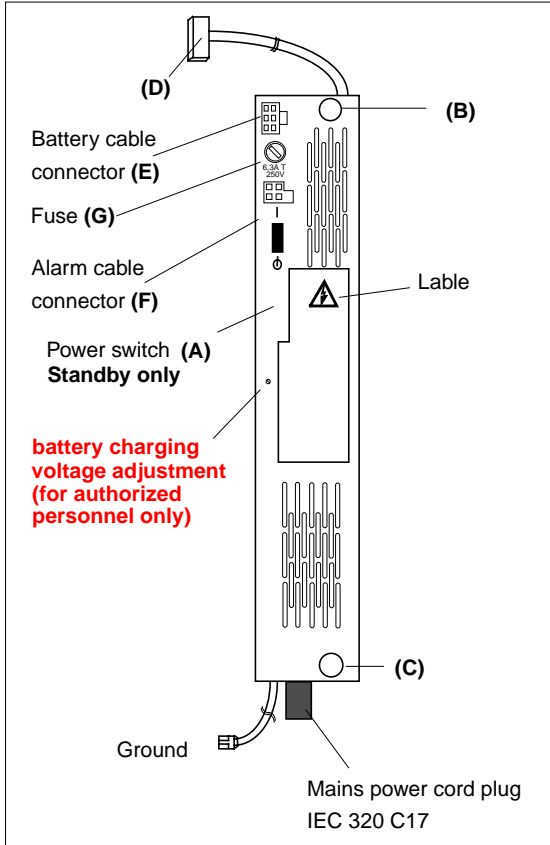
The mains cord is not part of the BML BS 101 01/_. Use the cord already installed in the exchange. The mains cord is ordered as an individual item, in order to fit each individual market.

Unpack the 4 batteries, the battery case and the power supply unit. Make sure no parts have been damaged or have become loose during transport. Check each battery's voltage (12.5V - 12.9V) to make sure they are charged and operational.

Check the DC battery cables for insulation breaks before installing. Short circuits can be hazardous and cause fire.

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3 LOCATIONS



A: Power switch does **not** disconnect the unit from mains. This switch only shuts down the unit to **standby**.

B & C: are screws required for mounting the power supply unit (screw **(C)** is only for BDV BS 101 01).

D: this is the DC supply cable to the exchange.

E: battery cable connection (reverse polarity protected)

F: alarm cable connection leading to the internal MDF where they are connected to the I/O cable of the CPU-D.

G: fuse: see section 4.6 for replacement.

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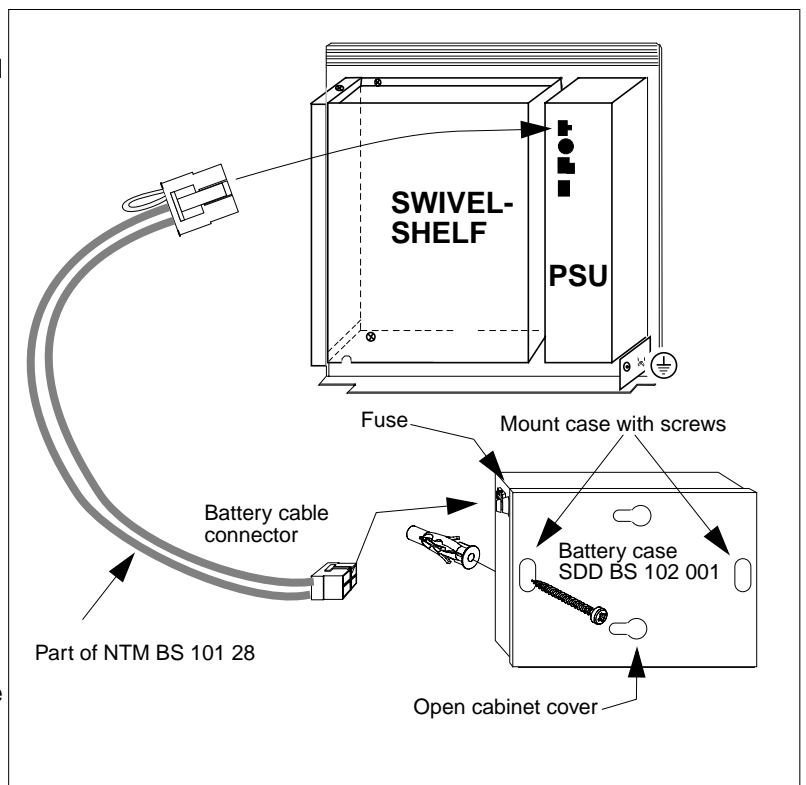
4 INSTALLATION

4.1 Installation Of The Battery Case (SDD BS 102 001)

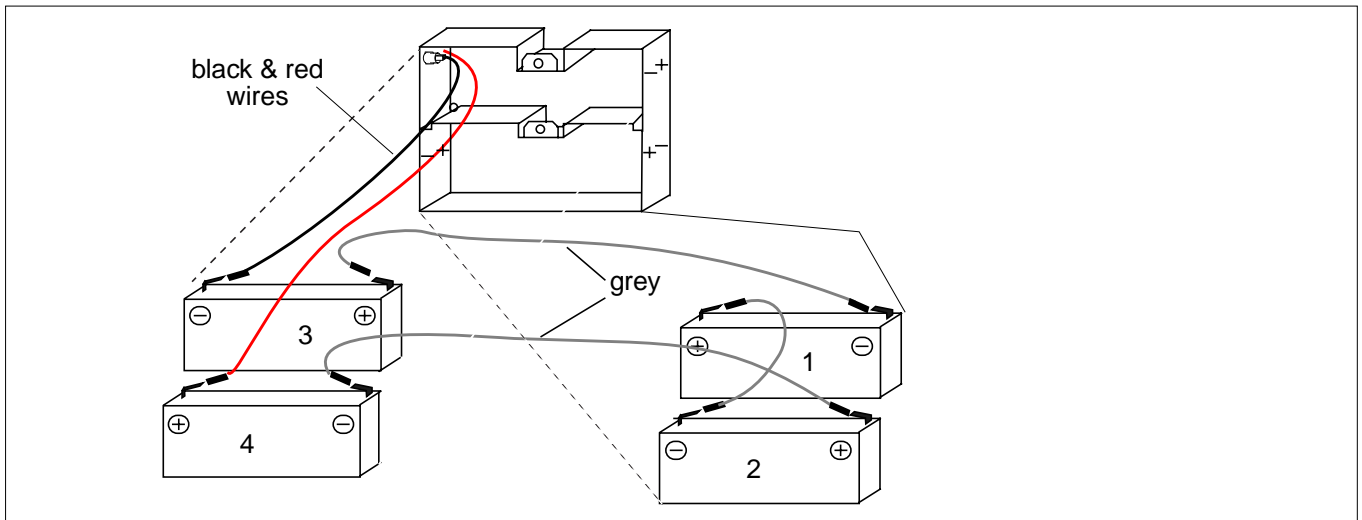
- 1 If the system is already installed and running, inform the customer that your work is going to stop his exchange for a while.
- 2 Choose a suitable location for the battery case. Do not mount the battery case above the exchange. Mark the holes on the wall and drill. Fit the holes with wall plugs.

MAKE SURE THE BATTERY CABINET IS 100% SECURED TO THE WALL, AS THE BATTERIES ARE HEAVY.

- 3 Use the battery cable set (NTM BS 101 28) for making the connections in the battery case according to the drawing below. Insert the batteries with the correct polarity according to the markings on the battery case sides. Attach the grey cables to the battery no. 1. Make the (+) connection to the battery no. 2 and put both batteries into the case. Lead the grey cable (-) to the back and connect this cable directly to the battery no. 3 installed above. The grey coloured cables must be led in the shortest possible way on the front and back side.
- 4 Connect the battery cable to the battery case (4 pole connector refer to drawing above) and put the front cover on the battery case and fasten the screws.
- 5 With the supplied two screws mount the battery case on the wall. Two holes are provided in the cover to access the screws. Make sure the screws are tightened securely.
- 6 Remove the front cover from the exchange cabinet. Before switching off the exchange please check that the green LEDs on the extension boards are off (no traffic), then turn off the power switch **(A)**.
- 7 Remove the DC supply cable **(D)** to the swivel shelf and unplug the mains cable from the wall outlet and at the bottom of the power supply unit. Then remove the screw **(B)** at the top and turn the bottom screw **(C)** two turns counter clockwise (the screw **(C)** applies only in cabinet BDV BS 101 01). Push up the power supply unit and turn it completely to the right, disengage the unit on the left side wall and pull it out.



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- 8 Install the power supply with battery charger in the reverse procedure as described in position 7 of this chapter. Switch on the power supply. Measure the battery DC voltage on the battery cable connector to verify proper connections.
- 9 The reading should be within 50 - 54 V for good batteries. To prevent arcing never connect the battery unit until the power supply unit has powered up (please observe the power supply has a startup delay of 8 seconds). Connect the battery cable to the power supply unit (E).
- 10 Connect the power supply alarm cable to the four-pin outlet (F) on the PSU and connect the free ends to an appropriate position on the KRONE connector bar where the I/O cable connection to the alarm input on the CPU-D_ is made. See section 5 for alarm connection.
- 11 If this is a new installation, start-up the system according to the document [START OF OPERATION \(1537-ASB 150 02\)](#).
- 12 The battery case is equipped with a fuse. This part has the ERICSSON ordering number **NGH 258 03/630**. This fuse is required to prevent a short circuit on the supply cables which might cause a fire.
- 13 Attach label: LZFB 083 013/3L03 on the bottom of the cabinet. Refer to [INSTALLATION INSTRUCTION \(1531-BDV BS 101 05 Uen\)](#).
- 14 Put the front cover on the cabinet frame.
- 15 Remove all old excess material and inform the customer that the system is up and running.

4.2 BATTERY REPLACEMENT

The batteries (BKC BS 101 01/1) 4 pieces, for the integrated battery pack SDD BS 102 001 have to be ordered separately. If the system is operating on mains, the batteries can be replaced during operation. The objective is to minimise arcing of the battery cable plug during plugging and unplugging. This condition is met only during presence of 48 V DC on the power supply unit.

The battery type to be used is a maintenance free lead acid accumulator with a capacity of 2 Ah and a minimum current charging capability of 3 A.

NOTE: *Batteries are a threat to the environment and should be handled with great care.*

*Used batteries should be taken care of by specialists for recycling. Please contact the supplier in this respect. **Make sure they get them!***

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4.3 Installation of battery backup with greater capacity

Should a higher battery capacity be necessary, please contact the vendor for details. The battery must be capable of handling a charging current of 3A. The battery must be of lead acid type.

The external batteries must be installed in a separate housing. As the gases are explosive take care of a good ventilation to the outside to keep vapours from seeping into hazardous areas.

To protect against fire in case of short circuit, install an additional circuit breaker with switch. This is useful to prevent arching on the DC connector (E) of the power supply when removing and inserting the plugs of the battery cable.

4.4 Installation with an external DC source

If there is no mains supply provided, the system can also be run on an external DC source e.g. large utilities. The input voltage range is 44....54 V DC. The installation must provide a circuit breaker (CB) capable of switching currents in excess of 150 A DC.

This is mandatory to prevent hazardous fires.

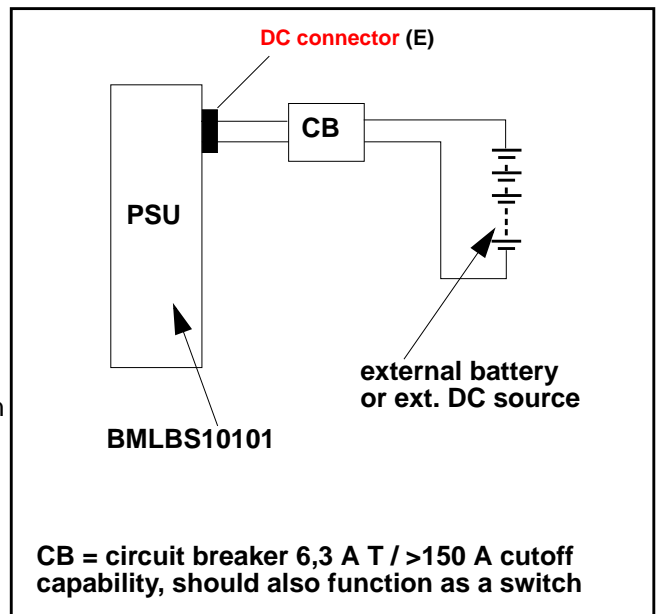
In this case a separate cable (TSR BS 101 10/2000) is required to connect the DC source. This cable inhibits the lock on discharged batteries. This cable must not be used for larger battery backups.

4.5 Setting the charging voltage

The power supply unit is equipped with a potentiometer to adjust the battery charging voltage.

This potentiometer is factory set

Any change in the setting may only be done by authorised personnel as it might reduce battery life. The battery (BKC BS 101 01/1) used has a trickle charging voltage of 54.5V DC, so this is the maximum output voltage delivered on the (E) connector. If an external battery with greater capacity should be connected instead, the charging voltage setting must comply with the demands of the battery manufacturer.



4.6 Changing the battery fuse

The battery fuse is accessible from the front of the unit. Replace it only by a fuse with the ERICSSON ordering number

NGH 258 03/630

Ask your local supplier for details.

This fuse meets the requirement of cutting off a DC current in excess of 150 A. This is a mandatory requirement to prevent hazardous fires.

NOTE: Always disconnect the battery supply cable before changing the fuse.

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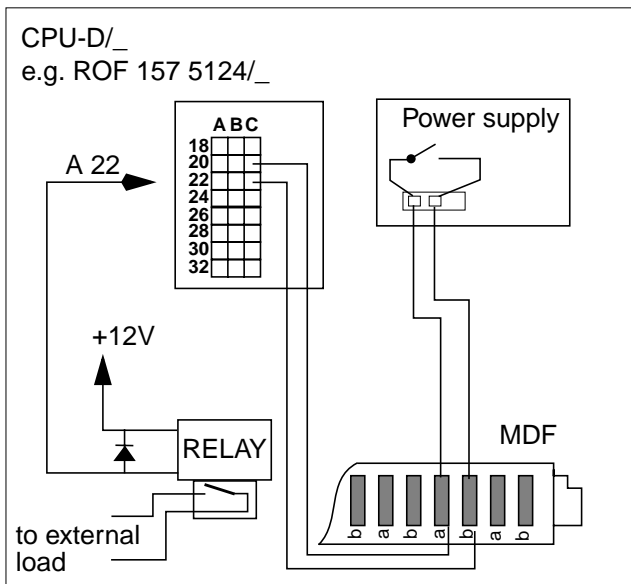
5 ALARM CONNECTION

For connection of the ALARM input to indicate that the system is running on battery power, use an ERICSSON standard I/O cable or if an MDF is already equipped use a cable with open ends to make the alarm connection.

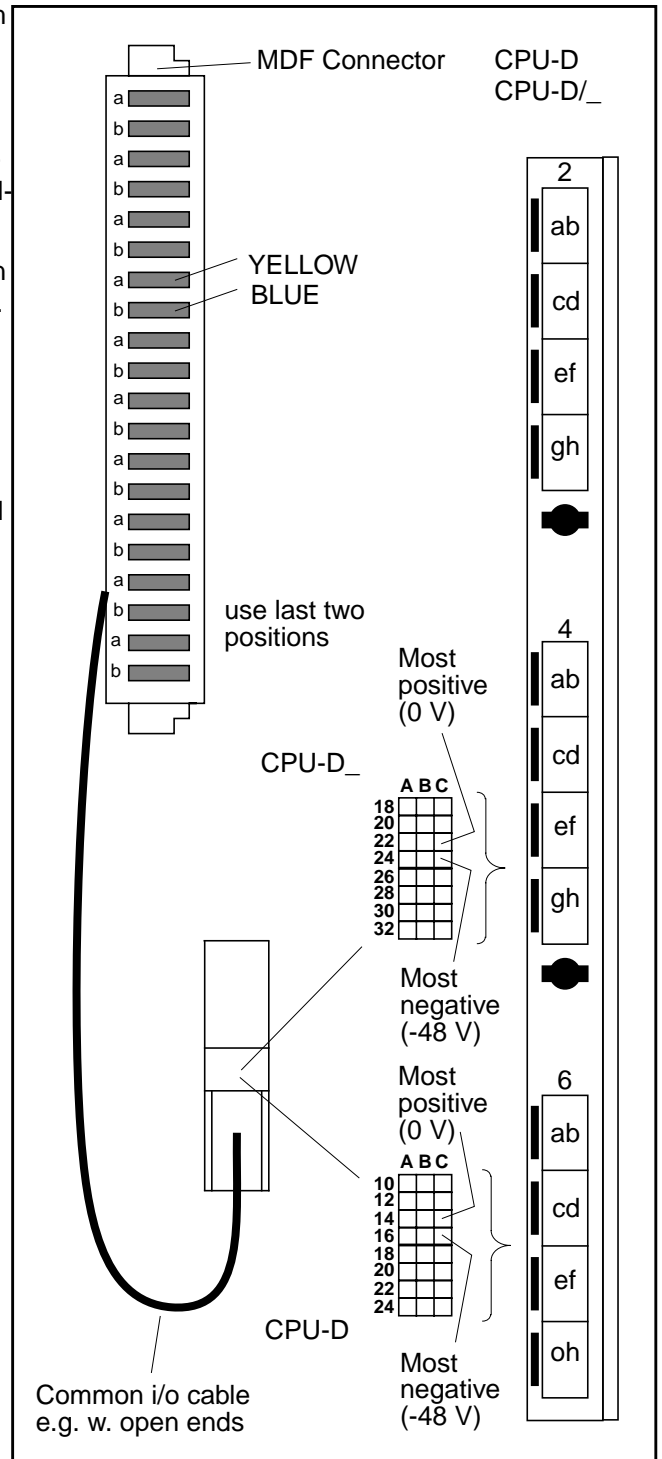
Should the system be already using some of the system features, (MUSIC input, ALARM output or TEMPERATURE SENSORS), this cable has already been installed.

On the CPU-D, the connection is provided in field 6 CD,EF. On the CPU-D/_ , the connections are provided on field 4 EF,GH.

If the connection is to be done directly to the front of the CPU-D, CPU-D/_ board, use cable e.g. TSR 901 0472/3 (open ends and 6m long) and connect the most positive wire (YELLOW) to pin C14 on CPU-D and pin C22 on CPU-D/_ . The most negative (BLUE) is to be connected to pin C16 on CPU-D and to pin C24 on CPU-D/_ . Use the connection field 6 on the CPU-D and the connection field 4 on CPU-D/_ .



The above figure shows an example for a 2 wire connection for the alarm input and the alarm output connection.

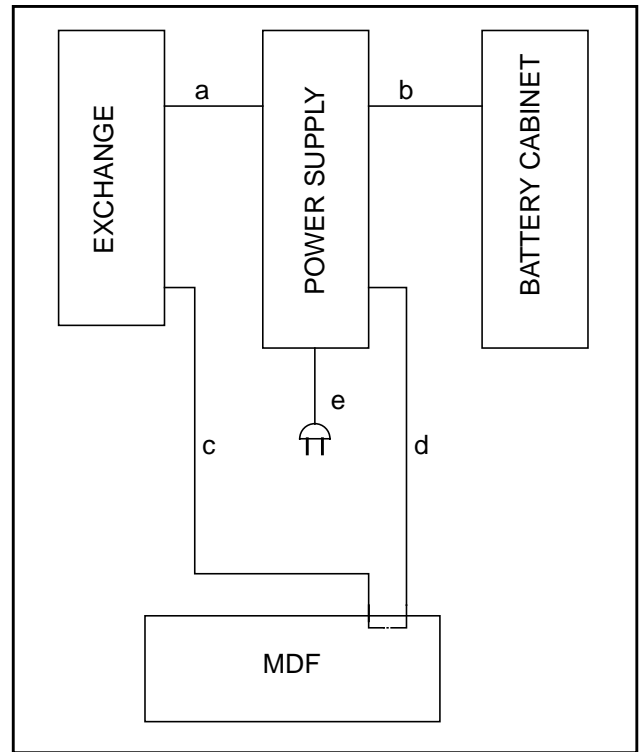


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6 ELECTRICAL CONNECTION

The following supply cables are required for a complete installation of an exchange with battery backup:

- a DC power supply cable from the power supply to the exchange.
- b Battery power cable with 6-pin connector and a 4-pin connector. This cable is part of the battery-cable-set NTM BS 101 28
- c Common I/O cable e.g. TSR 901 0472/3 or TSR BS 902 0001/xxxxx
- d 2-pole power supply alarm cable TRE 990 112/3000 or the cable supplied with cable set NTM BS 101 28
- e Mains cord (see 1531-BDV 101 05 sect. 8.1). This cord set must be approved by the local authorities in the country where it is to be used. The plug (type IEC 320 C13) must be right angular for the connection to the power supply unit and moulded to the cord.



7 ACCESSORIES

7.1 Fuse

ERICSSON ordering number **NGH 258 03/630**.

7.2 Batteries

The batteries for this exchange must comply to:

ERICSSON product No.	BKC BS 101 01/1	
VOLTAGE:	12 V	
CAPACITY:	minimum 2 Ah	
TYPE:	maintenance-free	
SIZE:	L=178 mm H=60 mm W=34 mm	
WEIGHT:	approx. 0,93 kg	
Representative types:	VARTA	CF 12-2,0
	Onr.56 220 706 063	
	Hitachi	HP2-12

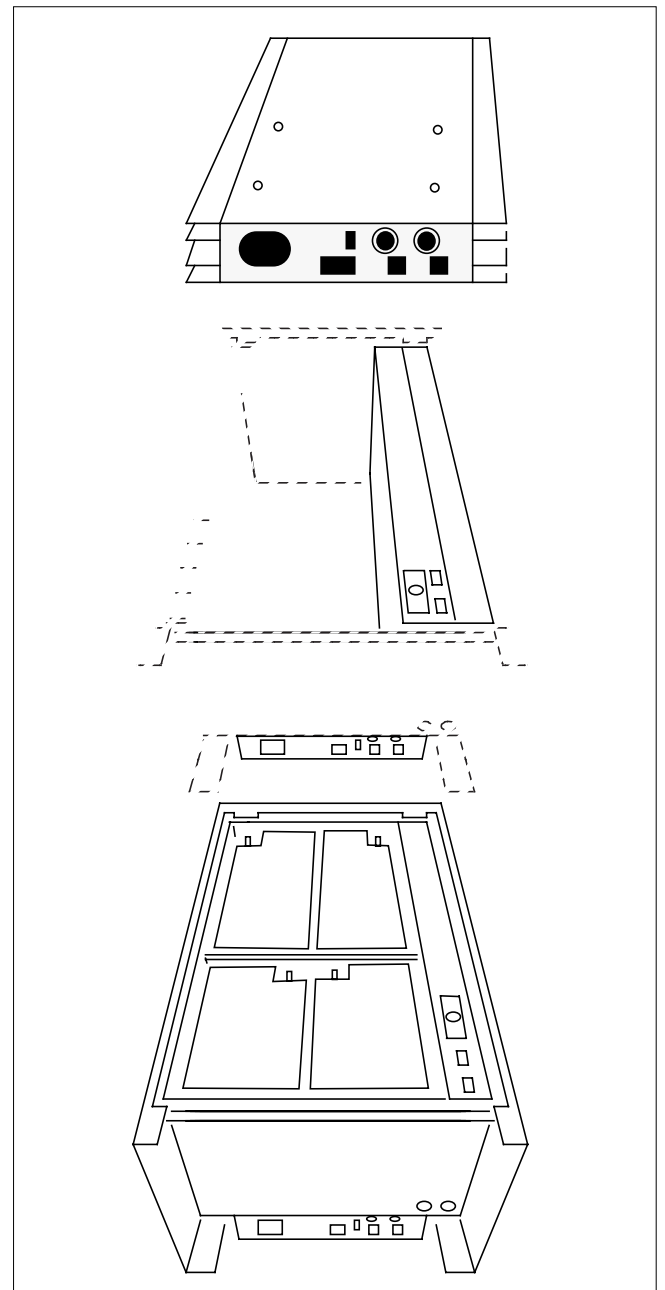
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Database reference 1531-BML 351 013 Uen-1-G.emf		

POWER SUPPLY & BATTERY CHARGER

BML 351 013/1, -2, -5, -6

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1 GENERAL

This document describes the installation and replacement of:

- power supply with battery charger BML351 013/-,
 - integrated battery unit (BKB 210 001) and
 - battery cabinet (BKB 210 002)
- in the systems ASB 150 01 and ASB 150 02.

The following power supplies are available:

230 VAC 48V / 5A (BML 351 013/1) class II unit
 115 VAC 48V / 5A (BML 351 013/2) class II unit

230 VAC 48V / 5A (BML 351 013/5) class I unit
 115 VAC 48V / 5A (BML 351 013/6) class I unit

The BML unit with safety class I acc. to EN 60 950 provides a protective earth connection from the mains outlet to the BML unit case and therefore has to be fastened to the cabinet with 4 self etching screws (SBA 121 040/100) supplied together with the BML unit to make a sound ground connection.

The *integrated battery unit* can be used in small exchanges equipped with up to 6 circuit boards. The battery unit itself occupies slots 6 - 8.

The *battery cabinet* is intended for a larger installation with up to two exchange cabinets.

One BML unit can supply power for up to two exchange cabinets and a battery pack at the same time, provided the power requirements of the installed extension sets do not exceed the current rating of the BML unit.

For examples of power calculation, see document INSTALLATION INSTRUCTIONS (1531-BDV 113 08).

The BML unit is always mounted on the rear side of the cabinets BDV 113 08 or BDV 113 07 and is connected to the system by cables supplied with each unit.

The BML unit can be used solely as a power supply for the exchange(s) independent of back up batteries.

The *power cord* is ordered as an individual item, in order to fit the mains plug deviations of each market.

2 UNPACKING

2.1 BML 351 013/- and the integrated battery unit BKB 201 001

The BML unit is delivered together with the integrated battery unit, the cables and other parts necessary for installation.

Before starting please verify that the delivered material is complete.

2.2 BML 351 013/- and battery cabinet BKB 201 002

On delivery the BML unit is already mounted on the rear of the *battery cabinet* with the mechanics for the batteries installed in the cabinet. The cables and other parts necessary to install and connect the *battery cabinet* to the exchange are included in the delivery.

The batteries are not included with the *battery cabinet* and must be ordered separately.

Before starting the installation please make sure that the delivered material is complete.

3 DEPENDENCES

3.1 ASB 150 01

Prerequisites: to install the BML unit, the cabinet must be a BDV 113 07 with 4 mounting holes in the rear.

The alarm feature cannot be used in ASB 150 01.

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4 LOCATIONS

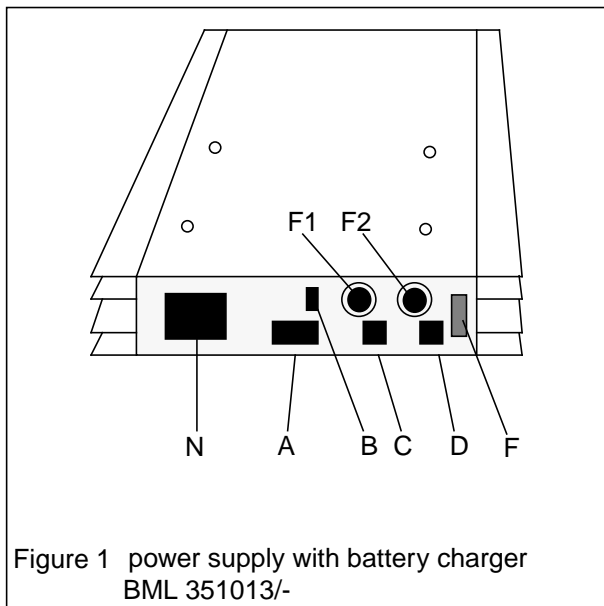


Figure 1 power supply with battery charger BML 351013/-

The physical connections on the BML unit are listed below, together with a simple explanation of their purpose.

All connectors in the BML unit are keyed to prevent wrong cable connections.

- **A** is the 6-pin connector that feeds -48 VDC to the batteries in the battery cabinet or the integrated battery unit.
- **B** is the output of the alarm relay inside the BML unit. Its contact will close when the AC power drops out then indicating that the system is running on battery back up.
- **C** and **D** are the -48 VDC outputs that feed the exchange cabinets.
- **N** is an IEC 320 C13 (17) input connector for the 220 VAC or 115 VAC mains. This input has a mechanical locking for the power cord to prevent it from slipping off.
- **F1** and **F2** are the fuses for the outputs **C** and **D**.
- **F** is a label stating the fuse ratings in the power supply unit.

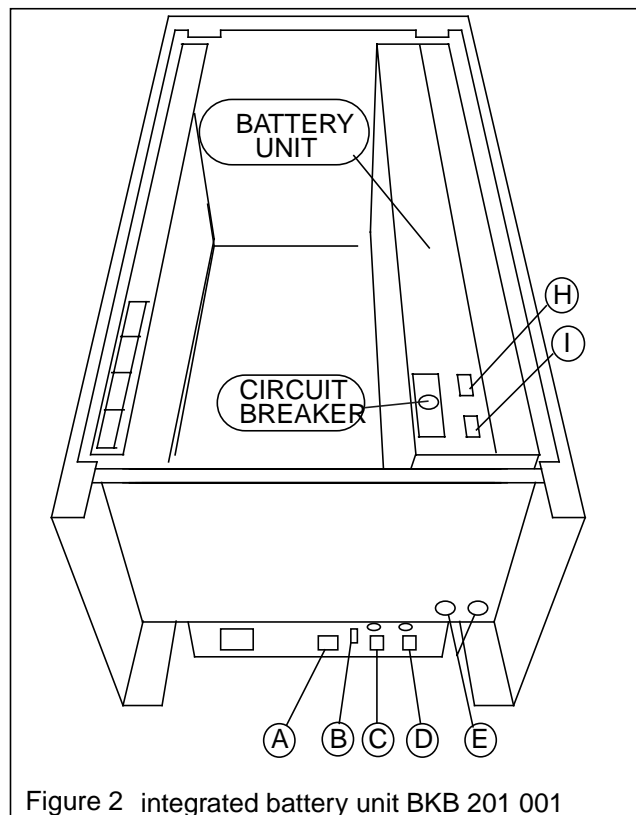


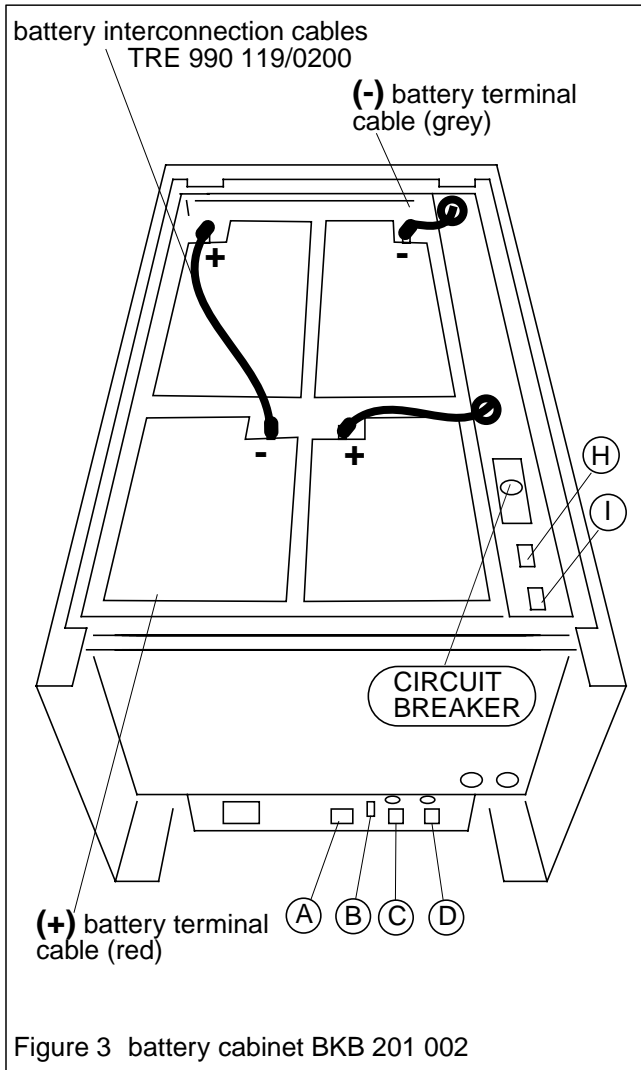
Figure 2 integrated battery unit BKB 201 001

The *integrated battery* unit provides the additional connections:

- **H** and **I** for the alarm cables.
- **E** is the polarity independent flat pin connection for the -48 V DC to the exchange.

This *integrated battery* unit is equipped with a circuit breaker to disconnect the batteries from the power supply unit.

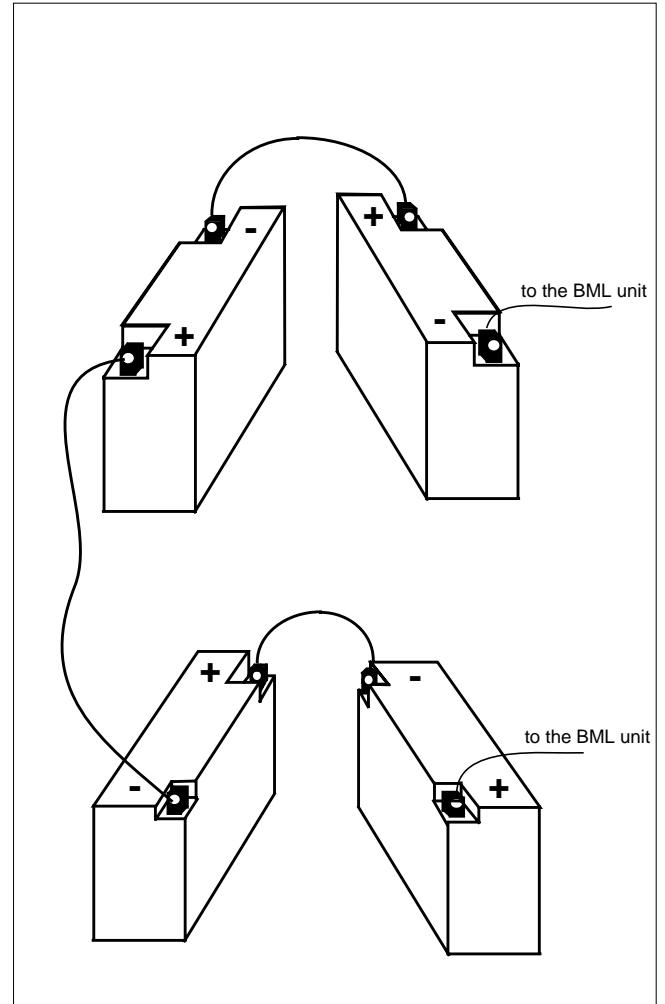
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The battery cabinet provides the additional connections:

- H and I for the alarm cables.

Make the connections in the battery cabinet according to the wiring diagram below, using the supplied cables.



WARNING: TAKE CARE WHEN USING METAL NON-INSULATED TOOLS AS THE BATTERIES DELIVER HIGH CURRENTS IN CASE OF SHORT CIRCUIT.

This unit is equipped with a circuit breaker disconnecting the batteries from the power supply unit.

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5 INSTALLATION

- 1 If the system is already installed and operating, inform the customer that your work is going to shut down his exchange.
- 2 Unscrew and remove the front cover from the exchange cabinet and note the position and connections of all boards.
- 3 Lower the bottom plate and switch **off** the power switch. Then remove the 36 VAC power cable, entering the bottom of the cabinet (**E**), coming from the transformer or similar equipment.
- 4 Note the position of the boards and remove them all. Position the BML unit so that the connectors are facing the bottom of the cabinet and the four mounting holes facing the rear of the cabinet.
- 5 Slide the BML unit in at the rear of the cabinet and secure it with the supplied four screws. For safety reasons on class I units verify that the screws are tightened to the cabinet as they ensure the connection to protective earth.
- 6 Connect the power cord to the BML unit and plug into mains. Connect cable TRE 990 113/0850 to one of the two four-pin outlets (**C** or **D**) on the BML unit. It is good practice to measure the -48 volt (-54 volt) before installing the rest of the equipment.
- 7 Connect the other end with the flat-pin connectors (**E**) on the bottom of the cabinet. This is polarity independent.
- 8 Re-install all boards according to your notes of the initial configuration.
- 9 If you just had to install the BML 351 013 with no back up battery take the 6-pin plug delivered with the BML unit. Plug it into position (**A**) to prevent ESD discharges directly to the connector. Then switch **on** the cabinet and start up the exchange (see under 5.4). Otherwise continue with the installation of the appropriate battery back up.

5.1 Installing the integrated battery unit BKB 201 001

- 1 Mount the integrated battery unit with its left frame, sliding into slot 6 of the cabinet. Set the circuit breaker to **off** position.
- 2 Plug the cable coming from the battery unit to the six-pin outlet (**A**) on the BML unit. Note that as soon as this cable is plugged in, and the circuit breaker is turned **on**, there are 48 V present in the system. Continue with 5.3 or 5.4.

5.2 Installing the battery cabinet BKB 201 002

- 1 The battery cabinet should be located in the leftmost position on the wall.
MAKE SURE THE CABINET IS 100% SECURED TO THE WALL, SINCE THE BATTERIES ARE VERY HEAVY.
- 2 Drill holes (4) and mount the wall bracket SXA 112 4406 on the wall. Place the battery cabinet on the bracket. Tighten the 2 screws at the bottom of the cabinet to secure it to the wall.
- 3 Set the circuit breaker to **off** position. Mount the four batteries in the battery cabinet. Interconnect the batteries with the supplied cables. Then connect the grey wire with the negative terminal and the red wire with the positive.
WARNING: TAKE CARE WHEN USING METAL NON-INSULATED TOOLS AS THE BATTERIES DELIVER HIGH SHORT CIRCUIT CURRENTS.
- 4 Use cable TRE 990 113/0850 to connect the outlets (**C** or **D**) of the BML unit with the connectors (**E**) on the bottom of the exchange cabinet(s). This is polarity independent.
- 5 Connect the cable coming from the battery cabinet to the outlet (**A**) on the BML unit.
Note that as soon as cable A is plugged in and the circuit breaker is **on**, there are

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48 V present in the system if the switch is turned **on**. Continue with 5.3 or 5.4.

5.3 Alarm connections

ASB 150 01

This feature is not applicable for the ASB 150 01. To prevent electrostatic discharges (ESD) directly to the alarm connector pins use the enclosed plastic 2-pin plug and plug it into output B when the alarm feature is not used.

ASB 150 02

The alarm output which is activated by a mains power failure in the BML 351 013, consists of a closing relay contact on output B (see figure 1)

- 1 Connect the power supply alarm cable TRE 990 111/0400 to the two-pin outlet **(B)** on the BML unit, and the other end to one of the inputs **(H or I)** on the specific battery units.
- 2 Connect the free end of the alarm cable TRE990 112/2000 to the MDF connector block (YELLOW to a4 and BLUE to b4). Connect the other end to the remaining two-pin input connector **(H or I)** on the battery unit.

To prevent electrostatic discharges (ESD) directly to the alarm connector pins use the enclosed plastic 2-pin plug and plug it into output B when the alarm feature is not used.

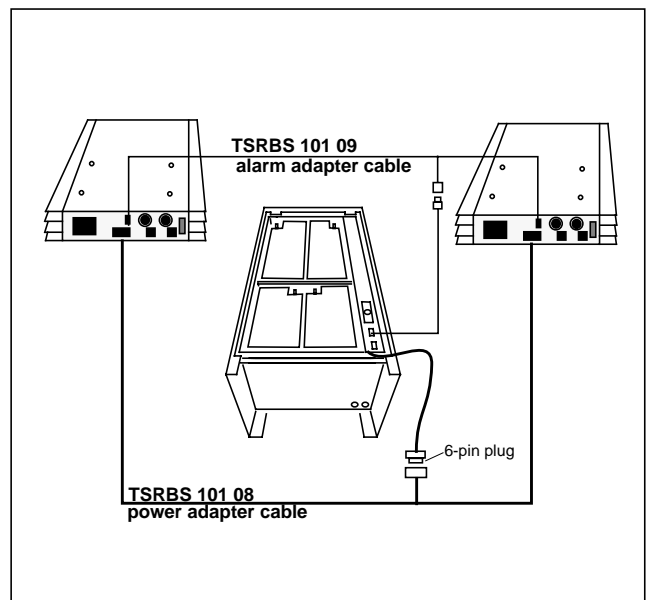
5.4 Start-up of the exchange

- 1 Turn on the circuit breaker and switch on the power in the cabinet. Observe that the system starts up correctly. If this is a new installation, start up the system according to the document START OF OPERATION (1537-ASB 150 02 Uen).
- 2 RASC provides the facility for measuring the secondary voltages. Use this feature to check the values of the -48V, +5V and +/- 12V in the system for proper operation.

- 3 Raise the bottom plate, replace the front cover and tighten the two screws at the bottom of the front cover.
- 4 Remove all excess material and inform the customer that the system is back in operation.

5.5 Single battery cabinet with two battery chargers

System configurations having 2 cabinets and 2 chargers installed can be switched to just one battery cabinet if the additional cabinet has a power consumption of less than 60 W. This restriction is made to achieve a sufficient back up time. Use the adapter cable TSR BS 101 08 and the alarm adapter cable TSR BS 101 09. If this load restriction cannot be fulfilled two chargers and two battery cabinets are necessary. If the distance between cabinet and output **(C)** or **(D)** on the charger exceeds 85 cm use 1,5 m cable TRE 990 113/1500.



NOTE: Due to battery capacity reasons this applies only to the battery cabinet.

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6 REPLACING THE BML UNIT

6.1 BML 351 013/- mounted on an exchange cabinet.

- 1 Inform the customer that your work is going to stop his exchange for a while.
- 2 Unscrew and remove the front cover from the exchange cabinet. Note the position of the boards and cables.
- 3 Lower the bottom plate, turn **off** power and the circuit breaker on the battery unit.
- 4 Remove all cables and the boards from the exchange. Disconnect the power cord from the wall and from the BML unit.
- 5 Disconnect the three cables (**A,B,C** or **D**) from the BML unit that run to the system (do not disconnect the other end).
- 6 If installed, slide out the battery unit from the exchange cabinet. The cables connected to it, will follow the battery unit. Take off the backplane.
- 7 Unscrew the four screws in the rear of the cabinet holding the BML unit.
NOTE: releasing the last screw will let the BML unit drop out. Hold it from below and remove it by letting it slide down.
- 8 Position the new BML unit so that the connectors are located at the bottom and the four mounting holes are facing the rear of the cabinet.
- 9 Slide the BML unit in at the rear of the cabinet and secure it with the four screws.
- 10 If available, install the battery unit by sliding it into slot 6 of the exchange cabinet.
- 11 Reconnect the three cables (**A,B,C** or **D**) disconnected under item 5.
- 12 Install the power cord and connect to mains. It is good practice to measure the -48 volt (-54 volt) before installing the rest of the equipment.
Then turn on the circuit breaker.

13 Note that as soon as the cable is plugged in (**A**) and the circuit breaker is **on**, the -48 V are present in the system.

14 If no battery back up unit is to be installed, an empty 6-pin connector, supplied with the unit, must be plugged in position (**A**) to prevent ESD discharges directly to the connector.

To prevent electrostatic discharges (ESD) directly to the alarm connector pins use the enclosed plastic 2-pin plug and plug it into output (**B**) when the alarm feature is not used.

15 The replacement of the BML unit is now completed. Reinstall the boards and cables. Turn on the power in the cabinet. Take care that the system starts up correctly.

16 Raise the bottom plate, replace the front cover and tighten the two screws at the bottom of the front cover.

17 Inform the customer that the system is in operation.

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7 BATTERY REPLACEMENT

Battery replacement should be done while the system is in operation and running on mains.

NOTE: ***Batteries are a threat to the environment and should be handled with great care. Worn out batteries should be taken care of by recycling specialists. Make sure they get them!***

7.1 Replacing the integrated battery unit BKB 210 001

The single batteries in the integrated battery unit are no field replaceable parts. To minimize service time replace the whole unit.

- 1 Unscrew and remove the front cover from the exchange cabinet.
- 2 Verify that the unit is running on mains then turn **off** the circuit breaker in the front of the battery unit.
- 3 Disconnect the alarm cables on connectors **(H)** and **(I)** but not the other cable end. Unplug the 6-pin connector **(A)** on the BML unit which feeds the battery unit.
- 4 It is now possible to slide out the battery unit from the exchange cabinet. The 6-pin connector cable will follow the battery unit out.
- 5 Install the new battery unit by sliding it into slot 6 of the exchange cabinet.
- 6 Make sure the circuit breaker is in the **off** position and then replace the cables **(H, I, A)** removed under 3 and 4.
- 7 Turn the circuit breaker **on** and observe that the exchange is still operating.
- 8 Raise the bottom plate, replace the front cover and tighten the two screws at the bottom of the front cover on the exchange cabinets.
- 9 The replacement of the integrated battery unit is now complete.

7.2 Replacing batteries in the battery cabinet BKB 201 002.

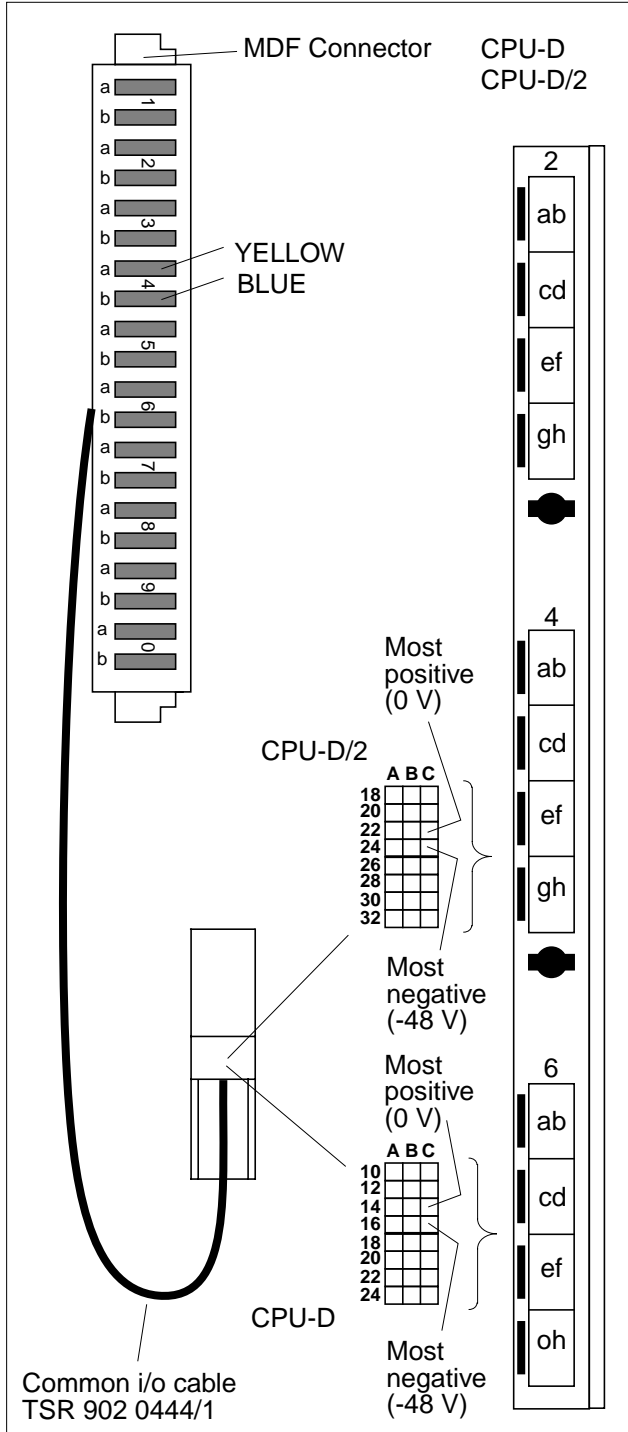
When replacing batteries, make sure that all batteries are replaced at the same time.

WARNING: TAKE CARE WHEN USING METAL NON-INSULATED TOOLS AS THE BATTERIES DELIVER HIGH CURRENTS IN CASE OF SHORT CIRCUIT.

- 1 Unscrew and remove the front cover from the battery cabinet.
- 2 Make sure that the mains voltage is present, then turn **off** the circuit breaker in the front of the battery unit
- 3 Unplug the 6-pin connector **(A)** on the BML unit which feeds the battery unit.
- 4 Pull out the bottom right battery 4 cm and remove the cable connection on the **plus** terminal. Then proceed with the battery above and remove the **minus** terminal connection.
- 5 Continue with the batteries on the left and take off the interconnection cable.
- 6 Remove both batteries from the top and the bottom of the cabinet as they are connected together, replace them with new ones and re-install them in reverse manner. Reconnect the 6-pin connector to the BML unit.
- 7 Turn the circuit breaker **on** and take care that the exchange continues operation.
- 8 Raise the bottom plate, replace the front cover and tighten the two screws at the bottom of the front cover on the cabinet.
- 9 The replacement of the batteries is now complete.

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8 ALARM CONNECTION



8.1 ASB 150 01

The ALARM feature cannot be used in ASB 150 01.

8.2 ASB 150 02

Prerequisites: In order to install the alarm feature, the CPU-D (ROF 157 5118/1) must have revision R1A/A or higher. CPU-D/2 (ROF 157 5118/2) must have revision R1A or higher.

In case of mains failure the ALARM feature indicates that the system is running on battery power. The Ericsson standard I/O cable TSR 902 0444/1 carries all feature connections from the front connector of the CPU-D board to the MDF connection block.

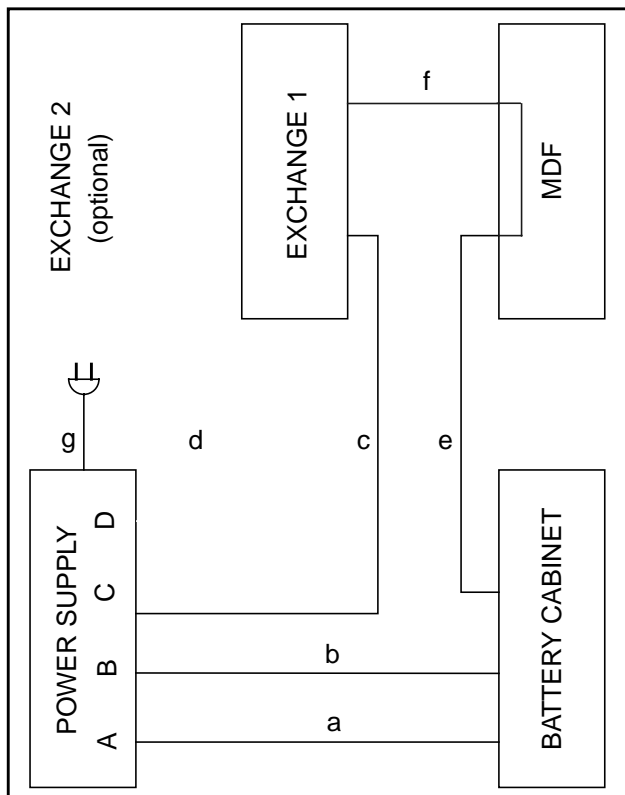
Should the system already use some of the system features, (MUSIC input, ALARM output or TEMPERATURE SENSORS) such a cable has already been installed.

For the CPU-D, the connection is to be made to field 6 CD,EF, and for CPU-D/2 the connection is to be made to 4 EF,GH.

If the connection is to be done directly on the front of the CPU-D_ board, use cable TRE 990 112/3000 and connect the most positive wire (YELLOW) to pin C14 on CPU-D and pin C22 on CPU-D/2. The most negative (BLUE) is to be connected to pin C16 on CPU-D and to pin C24 on CPU-D/2.

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9 ELECTRICAL CONNECTION



The cables required to connect the BML unit to the exchange and the battery units are listed below.

- a battery power cable. This cable is part of the battery unit or battery cabinet
- b power supply alarm cable TRE 990 111/0400
- c exchange power cable TRE 990 113/0850
- d exchange power cable TRE 990 113/0850 (a longer power cable TRE 990 113/1500 (1,5m long) is available, if this cable is too short)
- e alarm cable TRE 990 112/3000
- f common MDF cable
- g mains cord (see ordering information)
The plug must be straight style and moulded to the cord. For class II equipment use a plug of the type IEC 320 C17 and for class I equipment use a plug of the type IEC 320 C13.

10 BATTERY DATA

10.1 Integrated battery unit

The 8 batteries (BKC 850 007) in the integrated battery unit BKB 201 001 can be ordered separately, but the whole lot should be replaced at the same time.

For replacement, we recommend the batteries should be purchased from ERICSSON, as they are a HIGH-quality LONG-life type that is not commonly available.

10.2 Battery cabinet

When replacing batteries, make sure that all batteries are replaced at the same time. The batteries can be purchased from ERICSSON with the ordering number BKC 851 003, or you can purchase the battery at a local vendor.

The batteries required should have the following ratings:

ERICSSON product number. BKC 851 003

VOLTAGE: 12 V

CAPACITY: min. 15 Ah

TYPE: VR (valve regulated)

SIZE: L=181 mm H=167 mm W=76 mm

The terminal should provide screw type connection.

Representative types: VARTA accu-CF 12V/15 Ah

HITACHI HP15-12

YUASA NP15-12

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11 BATTERY BACK UP

For the BusinessPhone 250 there are 2 different types of battery back up units. The AC/DC switcher converter BML 351 013/x is used to charge the batteries, deliver power to the exchange and switch over to emergency powering from the connected battery in case of mains power failure.

When the system is running on batteries the BML 351 013/x provides an under voltage trip to disconnect the batteries after the 44 volt limit has been reached. Thus deep discharge of the batteries is prevented.

Handling batteries is a delicate job and requires thought and care. Batteries do NOT last for ever, but with the right treatment they will serve a long time without any trouble.

Both battery back-up units use sealed batteries that do not require any service, however batteries must not be subjected to high temperatures, which reduces their lifetime and batteries should NOT be left uncharged after a discharge cycle, as this may destroy the batteries permanently.

BKB 201 001

This is the smaller integrated unit with the batteries located inside the exchange cabinet (in position 6), occupying 3 board slots. The back up time for 3 different current loads are shown below.

A system with 53 DBC 203 telephones uses 2.5 Amp (1.6 Amp) from the battery.

A system with 33 DBC 203 telephones uses 1.9 Amp (1 Amp) from the battery.

A system with 13 DBC 203 telephones uses 1.3 Amp (0.4 Amp) from the battery.

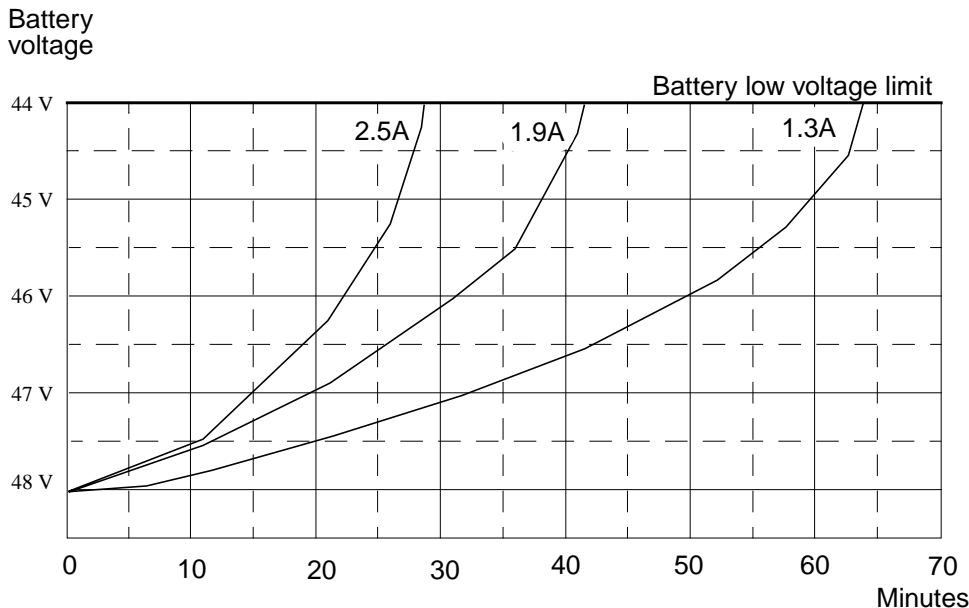
So charge them again as soon as possible after the power failure. If the batteries are completely discharged and it is not possible to charge them, turn off the circuit breaker on the battery unit to prevent deep discharging and charge them again as soon as possible.

Under normal operating conditions this will not be a problem as battery charging commences as soon as the mains returns. If the batteries have to be left discharged the circuit breaker should be turned off.

Back up time

Measurements on back up time have been taken from the different battery back up units. The value stated within brackets () are the available line currents. Power consumption for all boards in the cabinet and battery charging have been deduced from the figure within brackets.

The small battery back up unit (BKB 201 001) is used to supply up to 6 boards and the battery cabinet (BKB 201 001) is used to supply a fully equipped cabinet with 9 boards.



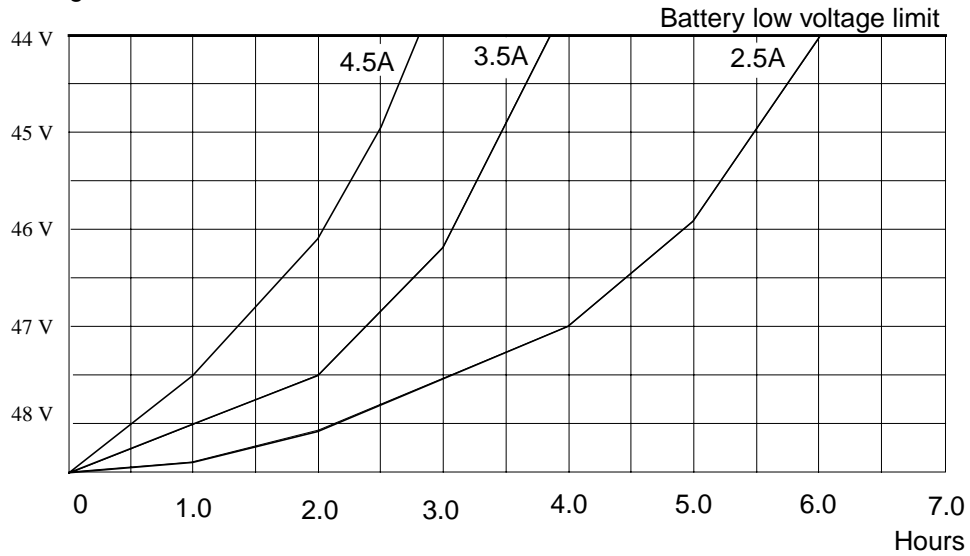
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BKB 201 002

This larger battery back up unit housed in a separate cabinet with batteries rated with 15Ah has the charger BML 351 013/x mounted at the rear of the cabinet. The back up times with three current loads are shown below.

- A system with 116 DBC 203 telephones uses 4.5 Amp (3.5 Amp) from the battery.
- A system with 83 DBC 203 telephones uses 3.5 Amp (2.5 Amp) from the battery.
- A system with 50 DBC 203 telephones uses 2.5 Amp (1.5 Amp) from the battery.

Battery voltage

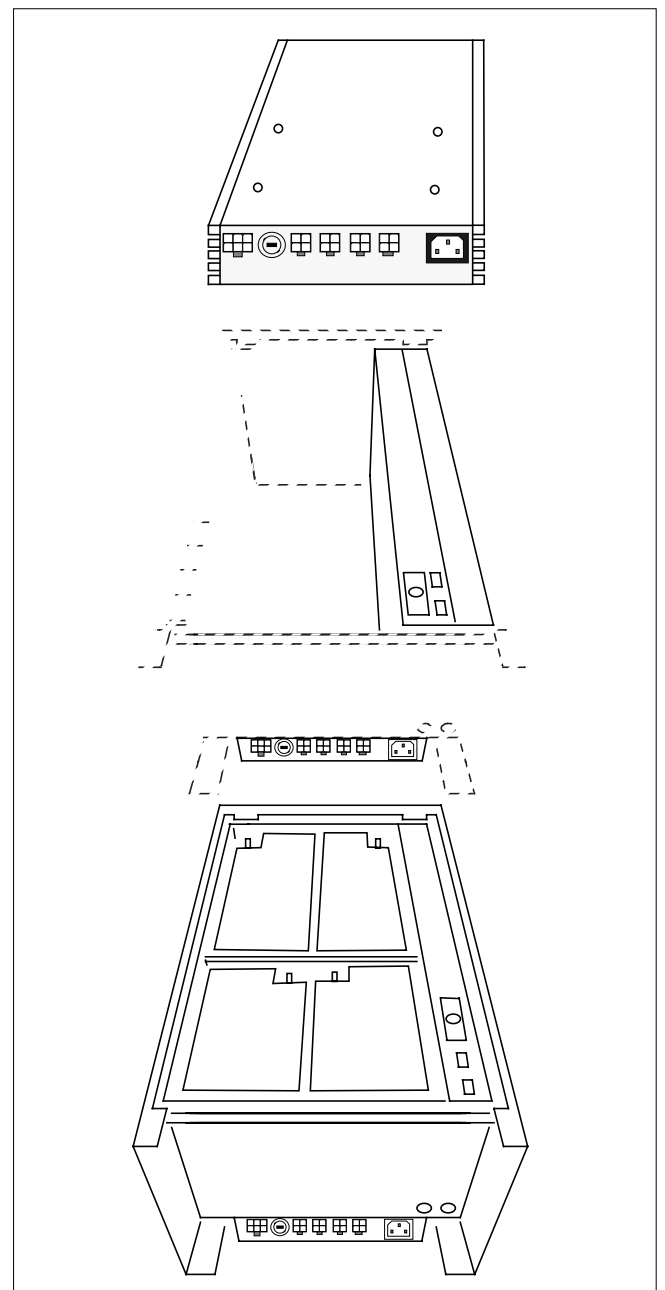


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POWER SUPPLY PSU 75 & BATTERY CHARGER BML 351 048

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1 GENERAL

This document describes the installation and replacement of:

- power supply with battery charger BML351 048,
 - integrated battery unit (BKB 210 001) and
 - battery cabinet (BKB 210 002)
- in the systems ASB 150 01 and ASB 150 02.

The power supply PSU 75 is available as:

230 VAC 48V / 5A (BML 351 048) class I unit

The BML unit with safety class I acc. to EN 60 950 provides a protective earth connection from the mains outlet to the BML unit case and therefore has to be fastened to the cabinet with 4 self etching screws supplied together with the BML unit to make a sound ground connection.

The *integrated battery unit* can be used in small exchanges equipped with up to 6 circuit boards. The battery unit itself occupies slots 6 - 8.

The *battery cabinet* is intended for a larger installation with up to two exchange cabinets.

One BML unit can supply power for up to two exchange cabinets and a battery pack at the same time, provided the power requirements of the installed extension sets do not exceed the current rating of the BML unit.

The BML unit is always mounted on the back side of the cabinets BDV 113 08 or BDV 113 07 and is connected to the system by cables supplied with each unit.

The BML unit can be used solely as a power supply for the exchange(s) independent of backup batteries.

The *power cord* is ordered as an individual item, in order to fit the mains plug deviations of each market.

2 UNPACKING

2.1 BML 351 048 and the integrated battery unit BKB 201 001

The BML unit is delivered together with the integrated battery unit, the cables and other parts necessary for installation.

Before starting please verify that the delivered material is complete.

2.2 BML 351 048 and battery cabinet BKB 201 002

On delivery the BML unit is already mounted on the back of the *battery cabinet* with the mechanics for the batteries installed in the cabinet. The cables and other parts necessary to install and connect the *battery cabinet* to the exchange are included in the delivery.

The batteries are not included with the *battery cabinet* and must be ordered separately.

Before starting the installation please make sure that the delivered material is complete.

3 DEPENDENCES

3.1 ASB 150 01

Prerequisites: to install the BML unit, the cabinet must be a BDV 113 07 with 4 mounting holes in the back.

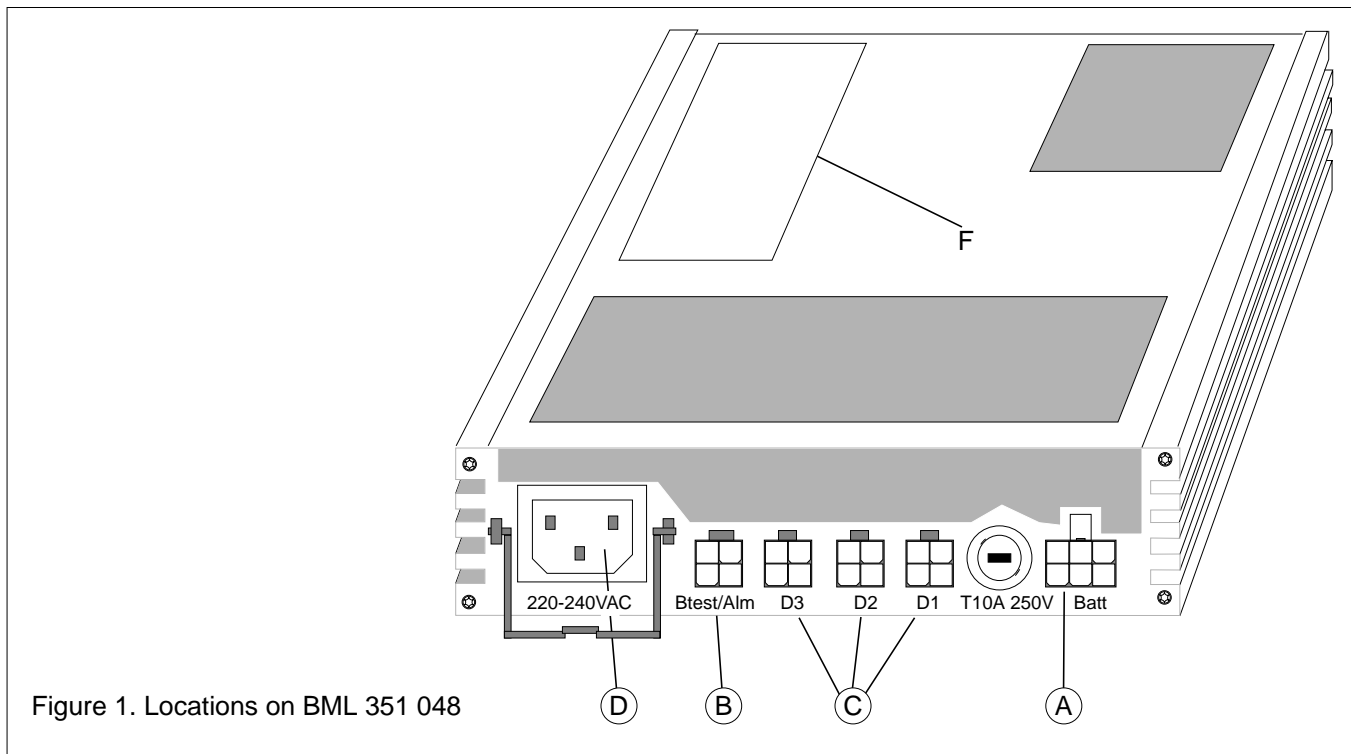
The alarm feature cannot be used in ASB 150 01.

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4 LOCATIONS

4.0.1 Power Supply PSU 75 with battery charger (BML 351 048)

The switched mode power supply is available for applications demanding a higher current than supplied by the transformer and/or a battery backup for the PBX is required. This unit can also be used without battery backup.



The physical connections on the BML 351 048 are listed below, together with a simple explanation of their purpose. All connectors in the BML unit are keyed to prevent wrong cable connections.

- **Batt** is the 6-pin connector feeding the -48 VDC batteries in the battery cabinet or the integrated battery unit
- **Btest/Alm** is the output of the alarm relay inside the BML unit. The left part of the connector should be left free and supports Btest, which is a functionality prepared for future use. The right part of the connector provides the contacts for the alarm which closes the circuit during AC power outage
- **D1** and **D2** are the full rate -48 VDC outputs that feed the exchange cabinets, **D3** is the -48 VDC output for auxiliary equipment e.g. IC-CU, IC-LU, ISDN NT if needed. This output is current limited to 2.0A
- **Mains** is connected via an IEC 320 C13 (17) input connector for the 230 VAC. This input has a mechanical locking for the straight power cord to prevent it from slipping off
- **Fuse (T10A/250VAC)** is the output fuse for **D1** and **D2**
- **F** is a label stating the equipment, ratings serial number, production information, safety and CE marking.

NOTE: Mount the power supply unit securely to the cabinet with the supplied self-etching TORX screws .

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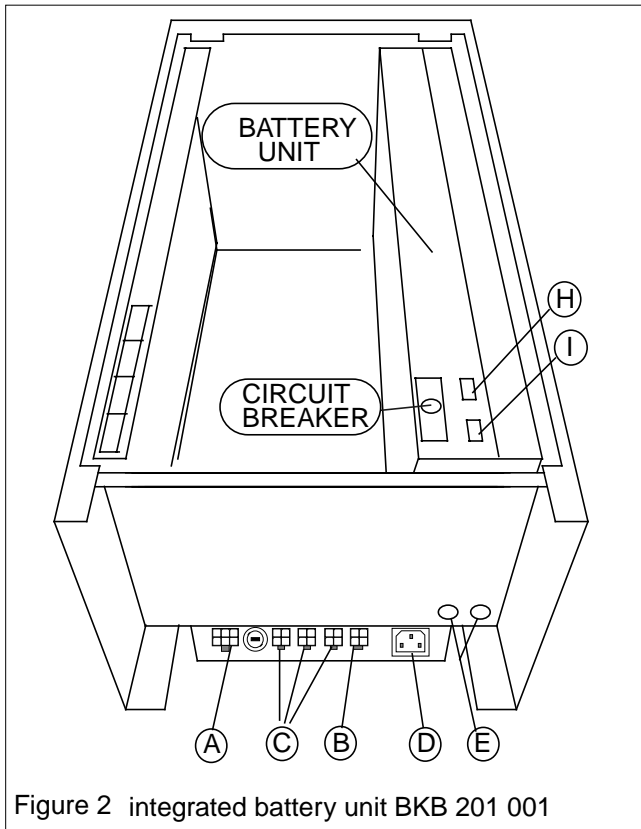


Figure 2 integrated battery unit BKB 201 001

The *integrated battery* unit provides the additional connections:

- **H** and **I** for the alarm cables.
- **E** is the polarity independent flat pin connection for the -48 V DC to the exchange.

This *integrated battery* unit is equipped with a circuit breaker to disconnect the batteries from the power supply unit.

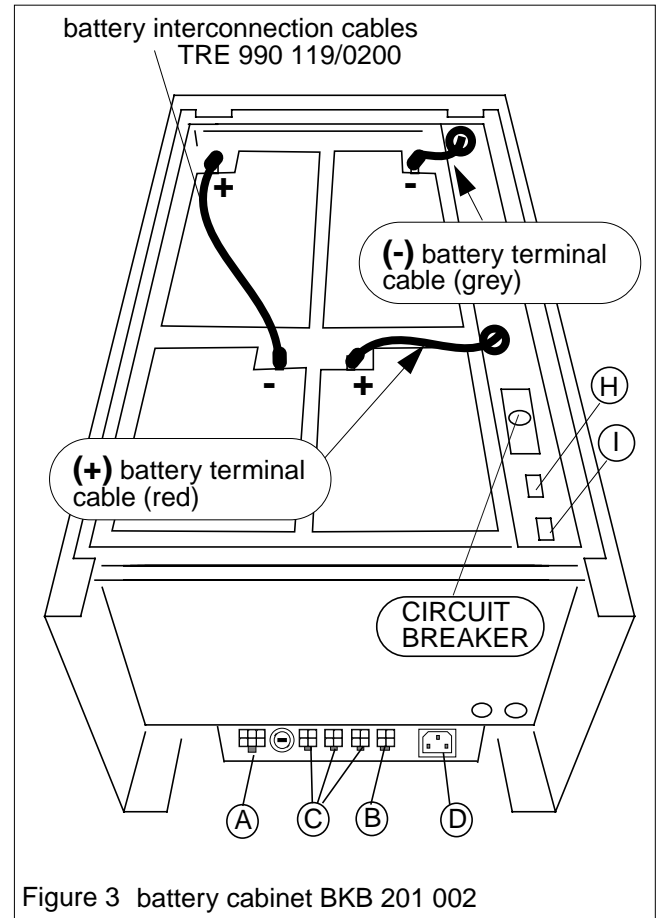


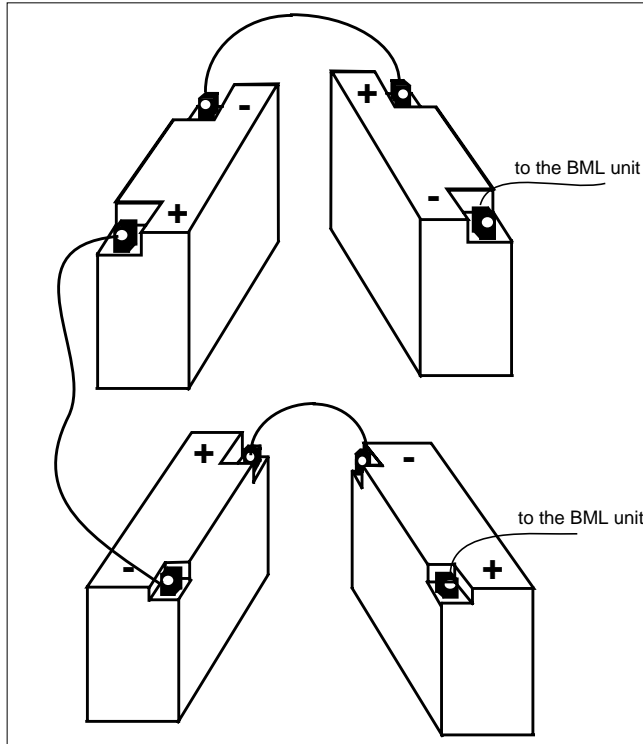
Figure 3 battery cabinet BKB 201 002

The *battery cabinet* provides the additional connections:

- **H** and **I** for the alarm cables.

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Make the connections in the battery cabinet according to the wiring diagram below, using the supplied cables.



WARNING: TAKE CARE WHEN USING METAL NON-INSULATED TOOLS AS THE BATTERIES DELIVER HIGH CURRENTS IN CASE OF SHORT CIRCUIT.

This unit is equipped with a circuit breaker disconnecting the batteries from the power supply unit.

5 INSTALLATION

- 1 If the system is already installed and operating, inform the customer that your work is going to shut down his exchange.
- 2 Unscrew and remove the front cover from the exchange cabinet and note the position and connections of all boards.
- 3 Lower the bottom plate and switch **OFF** the power switch. Then remove the 36 VAC power cable, entering the bottom of the cabinet (**E**), coming from the transformer or similar equipment.
- 4 Note the position of the boards and remove them all. Position the BML unit so that the connectors are facing the bottom of the cabinet and the four mounting holes facing the back of the cabinet.
- 5 Slide the BML unit in at the back of the cabinet and secure it with the supplied four screws. For safety reasons on class I units verify that the screws are tightened to the cabinet as they ensure the connection to protective earth.
- 6 Connect the power cord to the BML unit and plug into mains. Connect cable TRE 990 113/0850 to one of the two four-pin outlets (**D1 and D2**) on the BML unit. It is good practice to measure the -48 volt (-54 volt) before installing the rest of the equipment.
- 7 Connect the other end with the flat-pin connectors (**E**) on the bottom of the cabinet. This is polarity independent.
- 8 Re-install all boards according to your notes of the initial configuration.
- 9 If you just had to install the BML 351 048 with no backup battery take the 6-pin plug delivered with the BML unit. Plug it into position (**A**) to prevent ESD discharges directly to the connector. Then switch the cabinet **ON** and start up the exchange (see under 5.4). Otherwise continue with the installation of the appropriate battery backup.

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5.1 Installing the integrated battery unit BKB 201 001

- 1 Install the integrated battery unit in slot 6 of the cabinet. Set the circuit breaker to position **OFF**.
- 2 Plug the cable coming from the battery unit into the six-pin outlet (**A**) on the BML unit. Note that as soon as this cable is plugged in, and the circuit breaker is turned **ON**, 48 V are present in the system. Continue with 5.3 or 5.4.

5.2 Installing the battery cabinet BKB 201 002

- 1 The battery cabinet should be located in the leftmost position on the wall.
MAKE SURE THE CABINET IS 100% SECURED TO THE WALL, AS THE BATTERIES ARE VERY HEAVY.
- 2 Drill holes (4) and mount the wall bracket SXA 112 4406 on the wall. Hang the battery cabinet on the bracket and secure the cabinet with 2 screws at the bottom.
- 3 Set the circuit breaker to **OFF** position. Connect the batteries in series with the supplied cables and put the four batteries in the battery cabinet. Then connect the grey wire with the negative terminal and the red wire with the positive.
WARNING: TAKE CARE WHEN USING METAL NON-INSULATED TOOLS AS THE BATTERIES DELIVER HIGH SHORT CIRCUIT CURRENTS.
- 4 Use cable TRE 990 113/0850 to connect the outlets (**D1 and D2**) of the BML unit with the connectors (**E**) on the bottom of the exchange cabinet(s).
- 5 Connect the battery cable (**a**) to the outlet (**A**) on the BML unit. Note that as soon as cable A is plugged in and the circuit breaker is **ON**, 48 V are present in the system if the switch is turned **ON**. Continue with 5.3 or 5.4.

5.3 Alarm connections

ASB 150 01

This feature is not applicable for the ASB 150 01. To prevent electrostatic discharges (ESD) directly to the alarm connector pins use the enclosed plastic 2-pin plug and plug it into output B when the alarm feature is not used.

ASB 150 02

The alarm output (**B**) closes during mains power failure (see figure 1).

- 1 Connect the power supply alarm cable TRE 990 111/0400 to right part of outlet (**B**) on the BML unit, and the other end to one of the inputs (**H** or **I**) on the specific battery units.
- 2 Connect the free end of the alarm cable TRE990 112/2000 to the MDF connector block (YELLOW to a4 and BLUE to b4).

To prevent electrostatic discharges (ESD) directly to the alarm connector pins use the enclosed plastic 2-pin plug and plug it into output B when the alarm feature is not used.

5.4 Start-up the exchange

- 1 Turn on the circuit breaker and switch **ON** the power in the cabinet. Observe that the system starts up correctly. If this is a new installation, start up the system according to the document [START OF OPERATION](#) (1537-ASB 150 02 Uen).
- 2 RASC provides the facility for measuring the secondary voltages. Use this feature to check the values of the -48V, +5V and +/- 12V in the system.
- 3 Raise the bottom plate, replace the front cover and tighten the two screws at the bottom of the front cover.
- 4 Remove all excess material and inform the customer that the system is back in operation.

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6 REPLACING THE BML UNIT

6.1 BML 351 048 mounted on an exchange cabinet.

- 1 Inform the customer that your work is going to stop his exchange for a while.
- 2 Unscrew and remove the front cover from the exchange cabinet. Note the position of the boards and cables.
- 3 Lower the bottom plate, turn **OFF** power and the circuit breaker on the battery unit.
- 4 Remove all cables and the boards from the exchange. Disconnect the power cord from the wall and from the BML unit.
- 5 Disconnect the three cables (**A,B,C** or **D**) from the BML unit that run to the system (do not disconnect the other end).
- 6 If installed, slide out the battery unit from the exchange cabinet. The cables connected to it, will follow the battery unit. Take off the back plane.
- 7 Unscrew the four screws in the back of the cabinet holding the BML unit.
NOTE: releasing the last screw will let the BML unit drop out. Hold it from below and remove it by letting it slide down.
- 8 Position the new BML unit so that the connectors are located at the bottom and the four mounting holes are facing the back of the cabinet.
- 9 Slide the BML unit in at the rear of the cabinet and secure it with the four screws.
- 10 If available, install the battery unit by sliding it into slot 6 of the exchange cabinet.
- 11 Reconnect the three cables (**A,B,C** or **D**) disconnected under item 5.
- 12 Install the power cord and connect to mains. It is good practice to measure the -48 volt (-54 volt) before installing the rest of the equipment.
Then turn on the circuit breaker.

13 Note that as soon as the cable is plugged in (**A**) and the circuit breaker is **ON**, the -48 V are present in the system.

14 If no battery backup unit is to be installed, an empty 6-pin connector, supplied with the unit, must be plugged in position (**A**) to prevent ESD discharges directly to the connector.

To prevent electrostatic discharges (ESD) directly to the alarm connector pins use the enclosed plastic 2-pin plug and plug it into output (**B**) when the alarm feature is not used.

15 The replacement of the BML unit is now completed. Reinstall the boards and cables. Turn on the power in the cabinet. Take care that the system starts up correctly.

16 Raise the bottom plate, replace the front cover and tighten the two screws at the bottom of the front cover.

17 Inform the customer that the system is in operation.

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7 BATTERY REPLACEMENT

Battery replacement should be done while the system is in operation and running on mains.

NOTE: ***Batteries are a threat to the environment and should be handled with great care. Worn out batteries should be taken care of by recycling specialists. Make sure they get them!***

7.1 Replacing the integrated battery unit BKB 210 001

The single batteries in the integrated battery unit are no field replaceable parts. To minimize service time replace the whole unit.

- 1 Unscrew and remove the front cover from the exchange cabinet.
- 2 Verify that the unit is running on mains then turn the circuit breaker of the battery unit **OFF**.
- 3 Disconnect the alarm cables (connectors **(H)** and **(I)**) but not the other cable end. Unplug the 6-pin connector **(A)** on the BML unit which feeds the battery unit.
- 4 It is now possible to slide out the battery unit and the 6-pin connector cable will follow the battery unit out.
- 5 Install the new battery unit by sliding it into slot 6 of the exchange cabinet.
- 6 Make sure the circuit breaker is in the **OFF** position and then replace the cables **(H, I, A)** removed under 3 and 4.
- 7 Turn the circuit breaker **ON** and observe that the exchange is still operating.
- 8 Raise the bottom plate, replace the front cover and tighten the two screws at the bottom of the front cover on the exchange cabinets.
- 9 The replacement of the integrated battery unit is now complete.

7.2 Replacing batteries in the battery cabinet BKB 201 002.

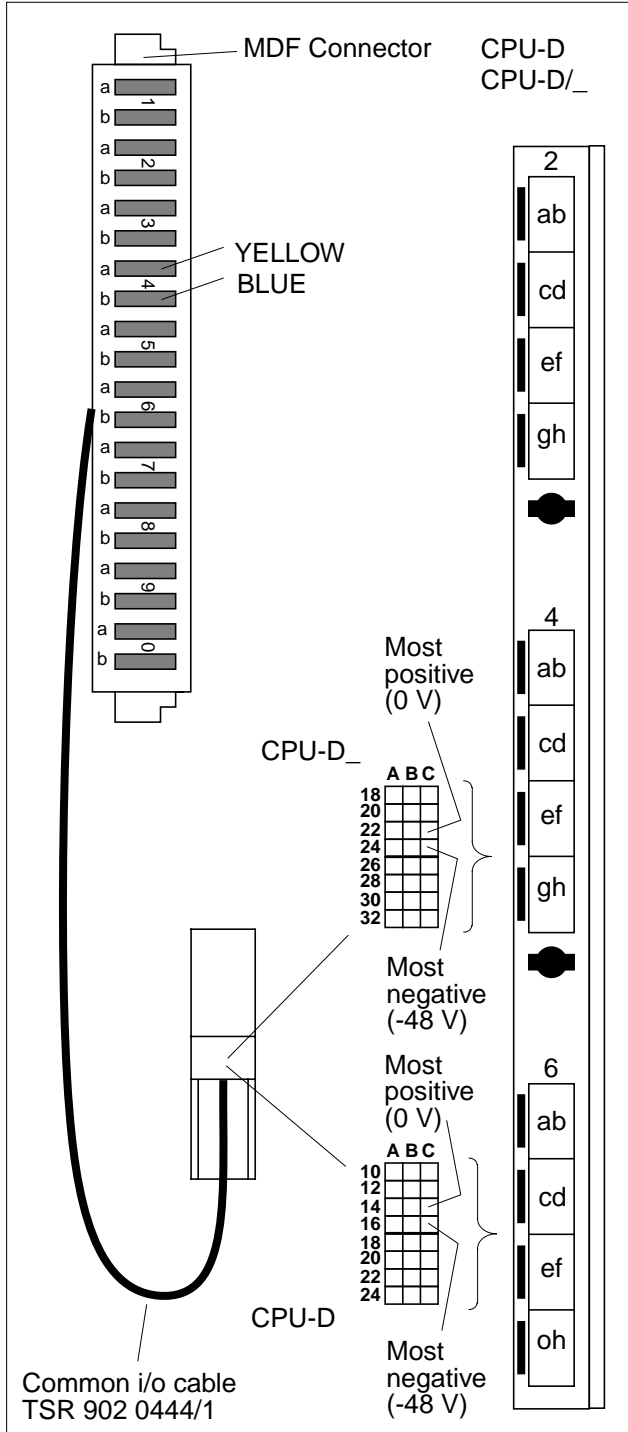
When replacing batteries, make sure that all batteries are replaced at the same time.

WARNING: TAKE CARE WHEN USING METAL NON-INSULATED TOOLS AS THE BATTERIES DELIVER HIGH CURRENTS IN CASE OF SHORT CIRCUIT.

- 1 Unscrew and remove the front cover from the battery cabinet.
- 2 Make sure that the mains voltage is present, then turn **OFF** the circuit breaker in the front of the battery unit
- 3 Unplug the 6-pin connector **(A)** on the BML unit which feeds the battery unit.
- 4 Pull out the bottom right battery 4 cm and remove the cable connection on the **plus** terminal. Then proceed with the battery above and remove the **minus** terminal connection.
- 5 Continue with the batteries on the left and take off the interconnection cable.
- 6 Remove both batteries from the top and the bottom of the cabinet as they are connected together, replace them with new ones and re-install them in reverse manner. Reconnect the 6-pin connector to the BML unit.
- 7 Turn the circuit breaker **ON** and take care that the exchange continues operation.
- 8 Raise the bottom plate, replace the front cover and tighten the two screws at the bottom of the front cover on the cabinet.
- 9 The replacement of the batteries is now complete.

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		1531-BML 351 048 Uen	
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		1998-05-29	A
		Tillhör/Referens-File/Reference	

8 ALARM CONNECTION



8.1 ASB 150 01

The ALARM feature cannot be used in ASB 150 01.

8.2 ASB 150 02

Prerequisites: In order to install the alarm feature, the CPU-D (ROF 157 5118/1) must have revision R1A/A or higher.

In case of mains failure the ALARM feature indicates that the system is running on battery power. The Ericsson standard I/O cable TSR 902 0444/1 carries all feature connections from the front connector of the CPU-D board to the MDF connection block.

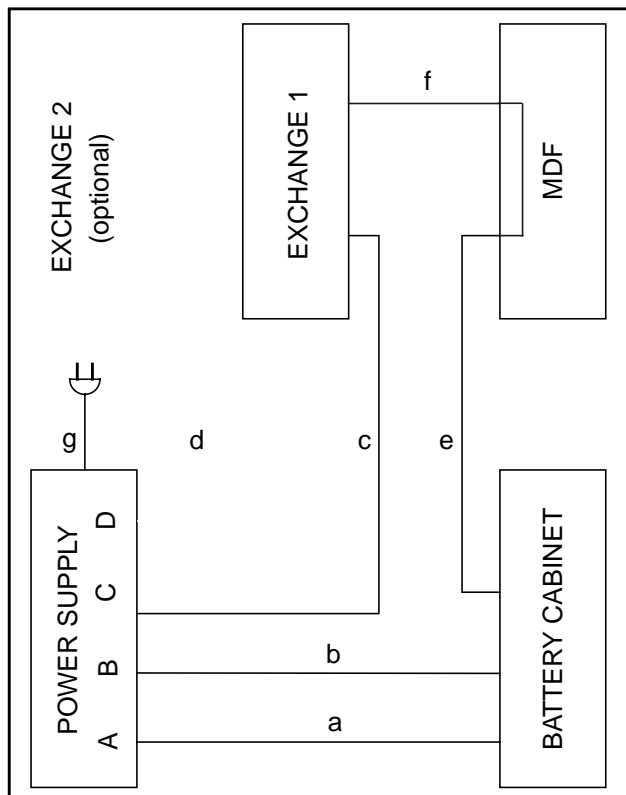
Should the system already use some of the system features, (MUSIC input, ALARM output or TEMPERATURE SENSORS) such a cable has already been installed.

For the CPU-D, the connection is to be made to field 6 CD,EF, and for CPU-D_ the connection is to be made to 4 EF,GH.

If the connection is to be done directly on the front of the CPU-D_ board, use cable TRE 990 112/3000 and connect the most positive wire (YELLOW) to pin C14 on CPU-D and pin C22 on CPU-D_. The most negative (BLUE) is to be connected to pin C16 on CPU-D and to pin C24 on CPU-D_.

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9 ELECTRICAL CONNECTION



The cables required to connect the BML unit to the exchange and the battery units are listed below.

- a battery power cable. This cable is part of the battery unit or battery cabinet
- b power supply alarm cable TRE 990 111/0400
- c exchange power cable TRE 990 113/0850
- d exchange power cable TRE 990 113/0850 (a longer power cable TRE 990 113/1500 (1,5 m long) is available, if this cable is too short)
- e alarm cable TRE 990 112/3000
- f common MDF cable
- g mains cord (see ordering information)
The plug must be straight style and moulded to the cord. For class II equipment use a plug of the type IEC 320 C17 and for class I equipment use a plug of the type IEC 320 C13.

10 BATTERY DATA

10.1 Integrated battery unit

The 8 batteries (BKC 850 007) in the integrated battery unit BKB 201 001 can be ordered separately, but the whole lot should be replaced at the same time.

For replacement, we recommend the batteries should be purchased from ERICSSON, as they are a HIGH-quality LONG-life type that is not commonly available.

10.2 Battery cabinet

When replacing batteries, make sure that all batteries are replaced at the same time. The batteries can be purchased from ERICSSON with the ordering number BKC 851 003, or you can purchase the battery at a local vendor.

The batteries required should have the following ratings:

ERICSSON product number. BKC 851 003

VOLTAGE: 12 V

CAPACITY: min. 15 Ah

TYPE: VR (valve regulated)

SIZE: L=181 mm H=167 mm W=76 mm

The terminal should provide screw type connection.

Representative types: VARTA accu-CF 12V/15 Ah

HITACHI HP15-12

YUASA NP15-12

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		Tillhör/Referens-File/Reference ASB 150
Database reference 1531-RPM 603 339 Uen-2-C.emf		

TEMPERATURE SENSOR KIT

RPM 603 339/1

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1 GENERAL

This document describes how to install the water proof temperature sensor(s) RPM 603 339. The temperature sensor(s) may be situated outdoor to measure the outdoor temperature.

The document describes the connection to both ASB 150 01 and ASB 150 02.

1.1 ASB 150 01

The sensor is connected to ELU-A10 by a 10m cable, and is attached to the front of ELU-A10 (4*3) by a molex connector. The molex connector is not mounted in order to cut/extend the cable to suitable length.

These components are necessary to get the temperature function:

- ELU-A10 (please see section 2.1.2 for demanded revision on PCB (revision R3 or higher on TVM 115 5025))
- Tools for cable stripping and mounting of temperature sensor on the wall
- Cable kit RPM 603 339/1 which contains:
 - Molex connector
 - cable with temperature sensor
 - wood screw

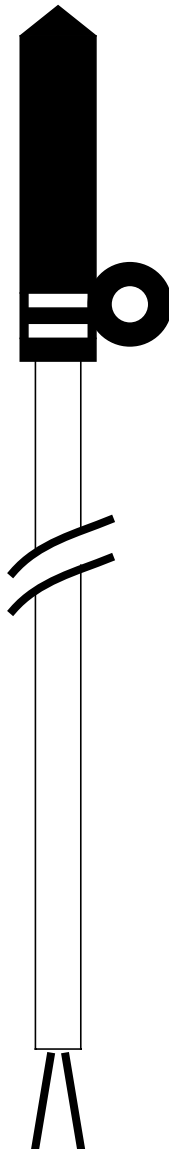
1.2 ASB 150 02

The sensor(s) is connected to the ASB 150 02 system through a 10m cable.

For connection of the temperature sensor(s) to the CPU-D or AUX board, the standard i/o cable TSR 902 0444 may be used.

This cable will carry all feature connections from the CPU-D board to the MDF (Main Distribution Frame). Should this system already be using some of the system features (music input, alarm output, alarm input or temperature sensors) there is already such a cable installed.

It is possible to connect 3 external temperature sensors to either board type.



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These components are necessary to get the temperature function:

- AUX board ROF 157 5119 or/and CPU-D board ROF 157 5118
- (cable TSR 902 0444)
- Tools for mounting of temperature sensor on the wall.
- Tools for connecting the sensor cable to the connection block in the MDF.
- Cable kit RPM 603 339/1 which contains:
 - cable with temperature sensor
 - wood screw
 - MOLEX connector (not used in ASB 150 02)

Central software release R1 does NOT support more than one sensor. This sensor must be installed as sensor 1 connected to the CPU-D.

2 FUNCTIONALITY

The temperature is displayed on the digital phones with display. The temperature trend, increasing or decreasing, is indicated by " ^ " for increasing and " v " for decreasing. Please note that the indication of temperature trend, for the first 30 minutes after installation may not be correct (while reference values are being recorded).

2.1 ASB 150 01

2.1.1 Programming

No commands is needed to get the temperature indication. The temperature indication is automatically turned on after the sensor is connected to ELU-A10, and turned off after disconnection of the sensor. Please note that only **one** temperature sensor is to be installed for one system.

2.1.2 Possible revisions for temperature function

These revisions are necessary for ROF 157 50 25/X to get the temperature function:
/2,3,4,5,7,8,11,12 R2A/A or higher revision
/6,10 R3A/A or higher revision.

2.2 ASB 150 02

2.2.1 Programming

In central software release R1 there is no programming necessary.

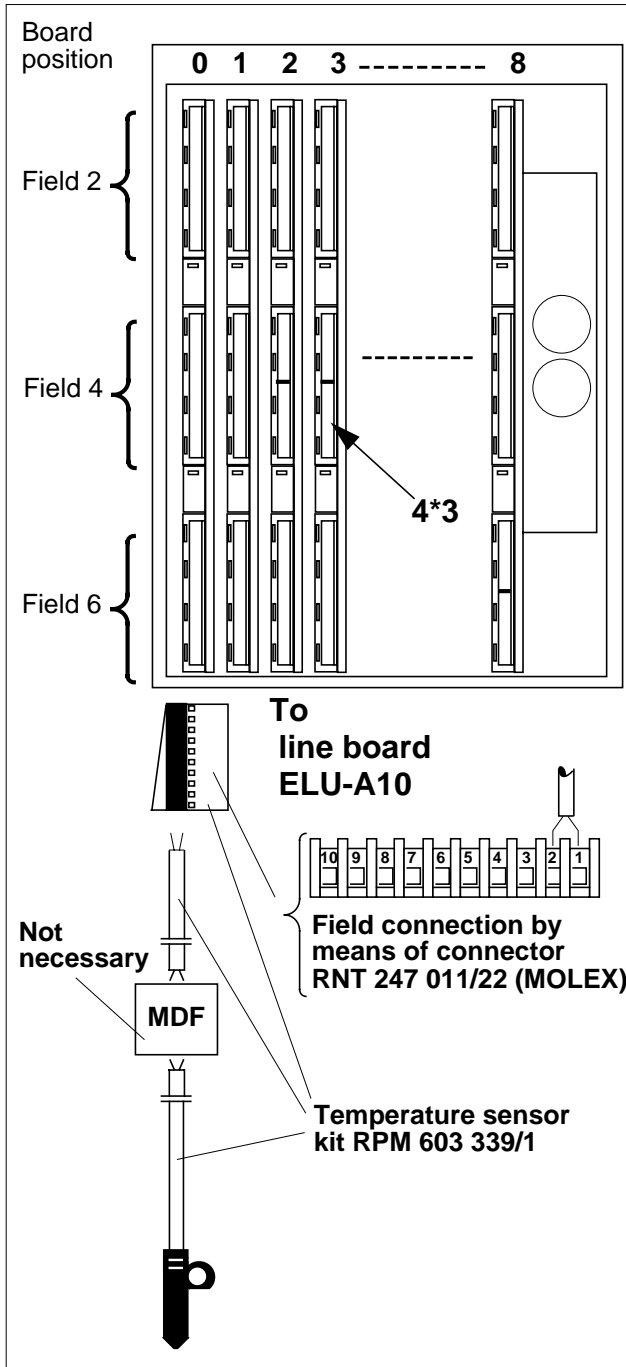
In forthcoming central software releases there will be some programming required to select sensor and how to display its data.

Programming of these features will be done in the RASC support system.

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3 **HARDWARE INSTALLATION**

3.1 **ASB 150 01**



If the sensor is to be placed outside it is preferably mounted on a wall outside, with the attached screw, that is not placed in direct sunlight. A desirable place is for instance a shady place under the roof. Try not to place the sensor near a window that is often open for airing or near an output for the ventilation. The cable is preferably drawn as little as possible outdoor.

The cable should be run to ELU-A10 directly, superfluous cable is to be cut off. The wires are connected to pin 1 & 2 in the molex connector (non-polarized connection).

The molex connector is connected to field 4*3 to a ELU-A10 printed circuit board (please see section 2.1.2 for from what revision it is possible)

If the sensor is located more than 10 m from the exchange, we recommend you to use a twisted pair cable for extension.

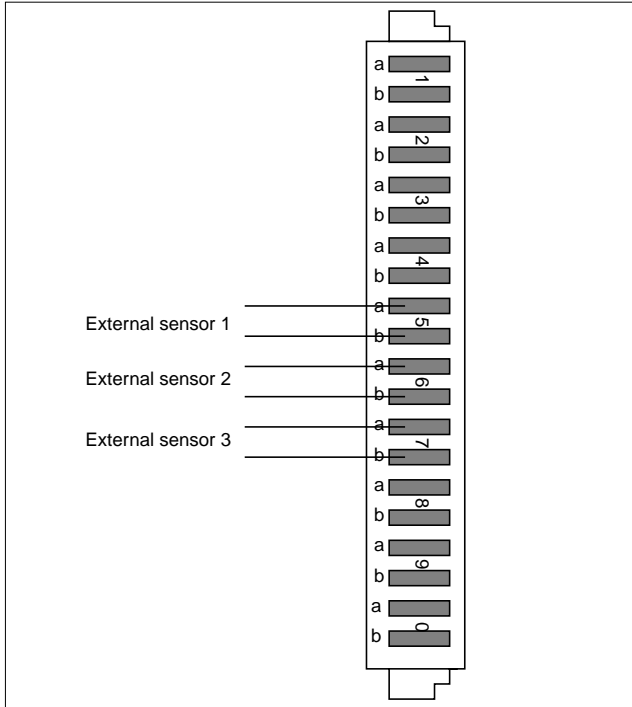
3.2 **ASB 150 02**

If the sensor is to be placed outside it is preferably mounted on a wall outside, with the attached screw, that is not placed in direct sunlight. A desirable place is for instance a shady place under the roof. Try not to place the sensor near a window that is often open for airing or near an output for the ventilation. The cable is preferably drawn as little as possible outdoor and directly to the MDF, superfluous cable is to be cut off.

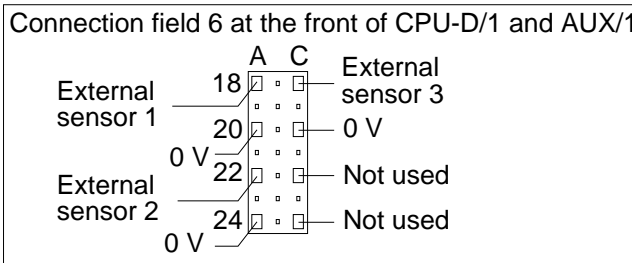
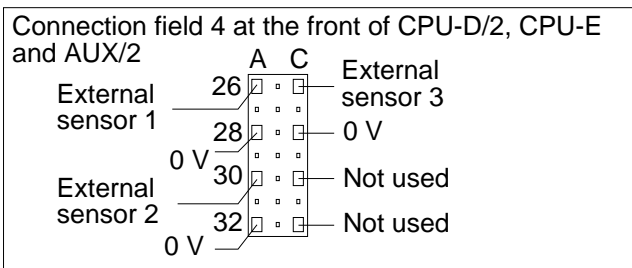
If the sensor is located more than 10 m from the exchange, we recommend you to use a twisted pair cable for extension.

The wires are connected to the connection block pin a5 and b5, a6 and b6, a7 and b7 (non-polariz)

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The temperature sensor may also be directly connected to the front of CPU-D/1 or AUX/1 at connection field 6 and CPU-D/2, CPU-E or AUX/2 at connection field 4.



4 FUNCTION VERIFICATION

4.1 ASB 150 01

Verify on a digital telephone with display that the temperature indication correspond with actual temperature. Note that there is a set up time after installation of the temperature sensor on about 1 minute before the temperature indication starts.

Please note that the indication of temperature trend, for the first 30 minutes after installation may not be correct (while reference values are being recorded).

If there is a short cut on the temperature sensor cable, the temperature indication will show +99° C.

There is no necessity or possibility to adjust the sensitivity of the temperature sensor.

4.2 ASB 150 02

Verify on a digital telephone with display that the temperature indication correspond with actual temperature. Note that there is a set up time after installation of the temperature sensor of about 1 minute before the temperature indication is correct.

Please note that the indication of temperature trend, for the first 30 minutes after installation may not be correct (while reference values are being recorded).

If the sensor is open or short circuit there is no indication (blank) on the telephone display.

There is no necessity or possibility to adjust the sensitivity of the temperature sensor.

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5 TECHNICAL DATA

Measure accuracy: $\pm 0.5^{\circ} \text{C}$
 (at $-24 - +75^{\circ} \text{C}$)

 $\pm 1^{\circ} \text{C}$
 (at $-40^{\circ} \text{C} - +100^{\circ} \text{C}$)

Temperature range: $-40 - +75^{\circ} \text{C}$

**Maximum recom-
mended line length:** 50 m

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		Tillhör/Referens-File/Reference ASB 150 02	
Database reference 1_1531-ASB 150 02 Uen-1-B.emf			

MUSIC INPUT INSTALLATION

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1 GENERAL

This document describes how to connect the MUSIC input to the ASB 150 02 system.

The description is valid for CPU-D, CPU-E and AUX boards.

The MUSIC input can be used in the system to provide, for example MUSIC ON HOLD when connected to either or both CPU-D (ROF 157 5118/1, -/2), CPU-E (ROF 157 5124) and AUX (ROF 157 5119/1, -/2).

2 FUNCTIONALITY

The music output from a radio or tape recorder is fed into the system via the CPU-D, CPU-E or AUX boards. By programming the exchange, the output from the connected equipment can be distributed throughout the system.

3 DEPENDENCIES

CPU-D and AUX boards must have revision R1A/A or higher and CPU-E board must have revision R1A.

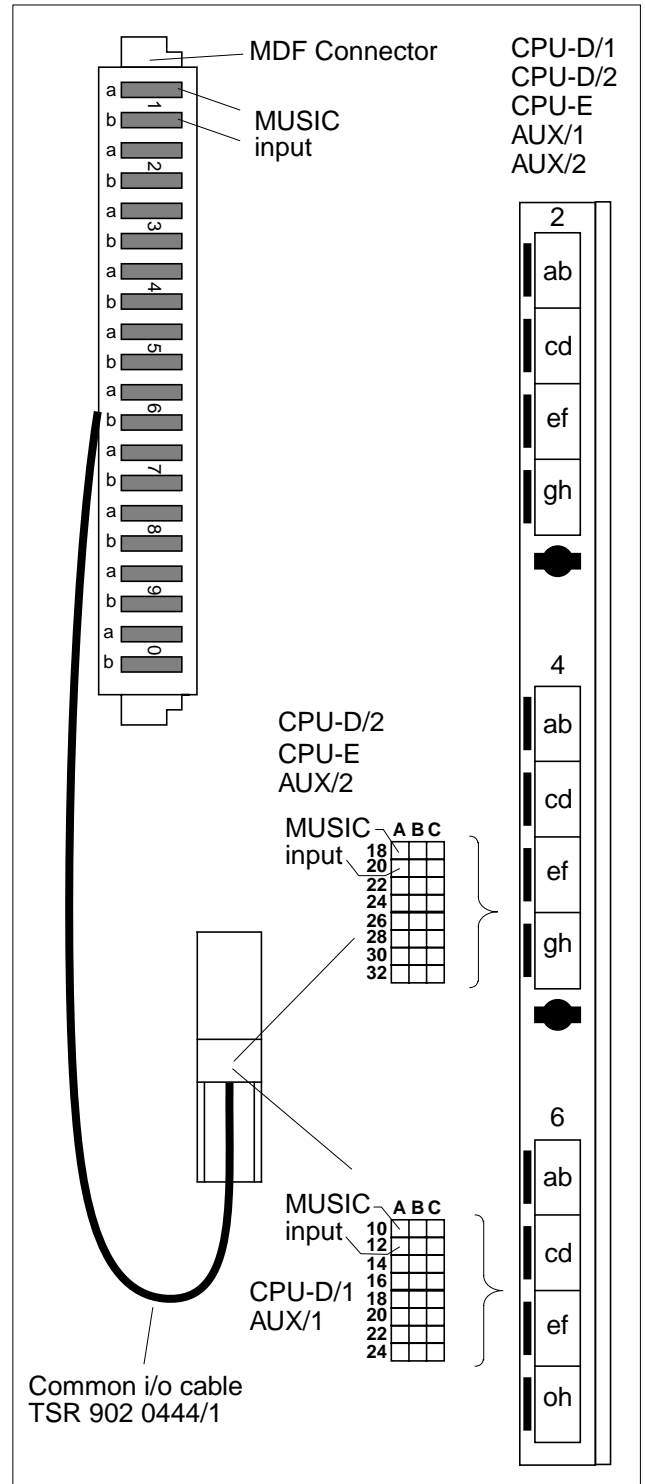
Central software release R1 does not support this function for the AUX board.

4 HARDWARE INSTALLATION

A twisted pair or a shielded cable should be connected from the tape recorder output on a radio or tape recorder to a1, b1 on the connector block of the Ericsson standard MDF cable TSR 902 0444/1.

The Ericsson standard MDF cable will carry all connections of the CPU-D, CPU-E and AUX options, to the MDF. If any of the board options are installed in the system, this cable is already installed.

It is also possible to connect a cable from the music equipment directly to the input of the CPU-D, CPU-E or AUX board front. The connection should then be made to pins A10, A12 of connector 6 for CPU-D/1 or AUX/1 and to pin A18, A20 of connector 4 for CPU-D/2, CPU-E and AUX/2.



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5 PROGRAMMING

Programming of this feature is done with the aid of the support system RASC.

Please consult the document [START OF OPERATION \(1537-ASB 150 02\)](#) or use the RASC system directly for details.

6 FUNCTION VERIFICATION

Please consult the document [START OF OPERATION \(1537-ASB 150 02\)](#) .

7 TECHNICAL SPECIFICATION

MUSIC input: Impedans 600 ohm
 Voltage 1 V max

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EBC/EN/DMTL Thomas Åsberg		1531- DBC 210 01 Uen		
Dokansv/Godkänd - <i>Doc respons/Approved</i>	Kontr - <i>Checked</i>	Datum - <i>Date</i>	Rev	File
EN/DMTL (Sture Winther)		1997-06-18	A	

Telephone sets (DBC 210 01and DBY 410 02)

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1 General

1.1 Scope

The digital telephone sets (DTS) and peripherals described in these installation instructions are to be used together with the Ericsson exchanges ASB 501, ASB 150 02 or equivalent.

The DTS is connected to a digital extension board, ELU 28, or equivalent.

1.2 Environmental requirements

The products covered in these installation instructions comply with the prerequisites stipulated for placing in office and exchange room environments.

2 Aids

Wall mounting requires additional screws.

Wall mounting with option unit requires additional washers (spacers).

3 Preparations

Verify that it is possible to connect an extension line.

Check that a line cord is available.

4 Power equipment

The DTS and its peripherals are powered from the extension line.
Maximum power consumption: 2 W

5 Earthing

The DTS and its peripherals need no special earthing.

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6 Cabling

Maximum line length between DTS and extension line unit (ELU) using EKKX 0,5 mm (180 ohms/km) cable: 1000 m (3280 ft):

7 Installation of DTS

7.1 Delivery method

The DTS is normally delivered in a box together with two foot consoles, one handset, one handset cord, two designation labels and two designation covers.

7.2 Connection of the handset

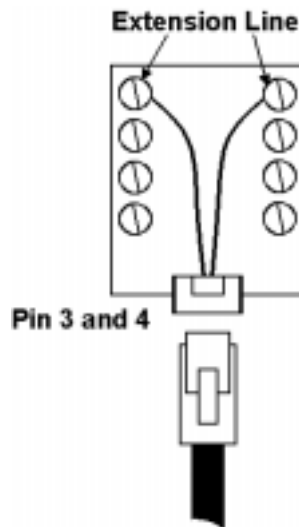
The handset cord shall be connected in one end (short uncoiled) to the handset and the other end (long uncoiled) to the connector in the bottom of the set marked HANDSET. Use the cord guide to secure the handset cord to the DTS.

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			File

7.3 Connection to the extension line

The line cord shall be connected in one end to the wall box according to fig 7-1 and the other end to the connector in the bottom of the set marked LINE.

Figure: 7-1. Connection of extension line

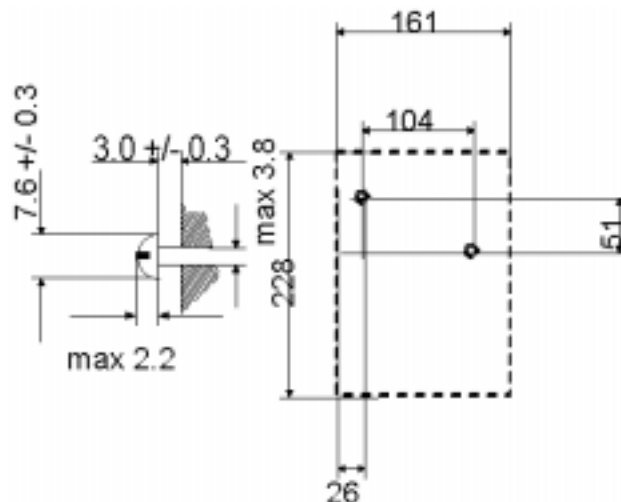


7.4 Wall mounting

- Mount the two screws on the wall according to fig 7-2.
- Snap off and turn the hook around according to fig 7-3.
- If the adjustable foot consoles are mounted they must be removed.
- Mount the telephone on the screws.

Figure: 7-2. (All distances in mm)

Positions for screws DBC 210 01

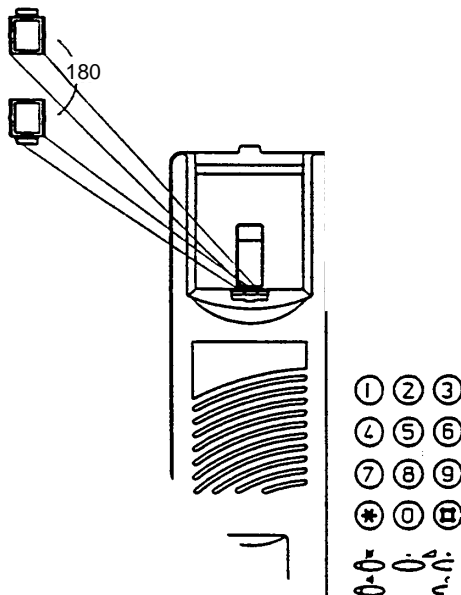


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Figure: 7-3. Mounting of hook

Position for hook:

Wall mounting



7.5 Post installation measures

Verify that a call can be established from and to the DTS.

8 Installation of option unit DBY 410 02

Make necessary arrangements to avoid electrostatic discharges:

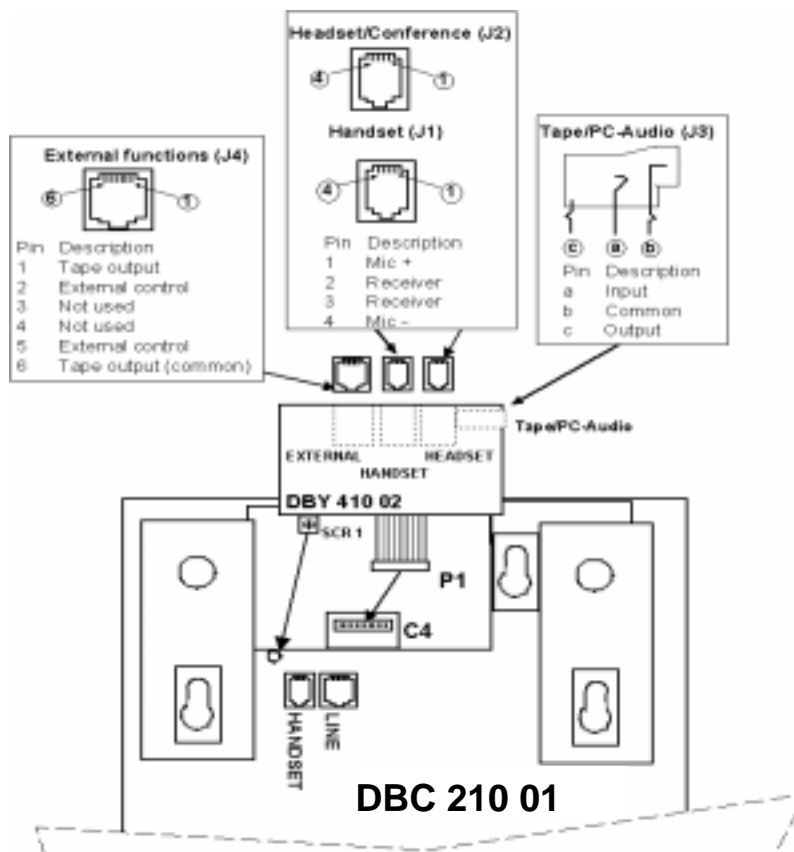
- Disconnect the telephone set from the exchange
- Avoid if possible to touch the contacts
- Break off the blinder covering the contact C4.
- Connect the cable P1 from DBY 410 02 to the contact C4 on the telephone.
- Insert DBY 410 02 to its place in the bottom of the telephone. Secure it with the screw SCR 1.
- Remove the blinder covering the connectors.
- Move the handset cord from the DTS to the jack J1 marked HANDSET.

Note: When using DBY 410 02 the handset connector on the DTS will be disabled.

With the DBY 410 02 mounted, the telephone must be wall mounted using extra spacers. Spacers, with a thickness > 22 mm, have to be mounted between the telephone and the wall.

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Figure: 8-1. Rear view of DTS with DBY 410 02 connectors.

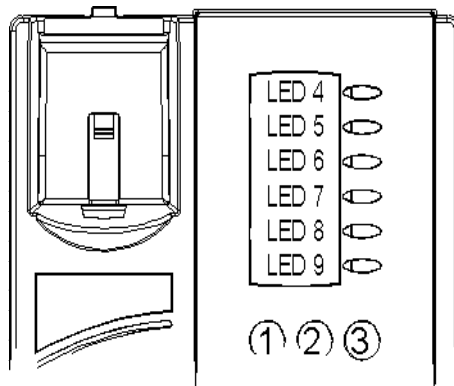


8.1 Programming of option unit functions

To program the option unit functions, OPTION UNIT FUNCTION MODE must be selected by pressing buttons C, * and 1 simultaneously during 1 second. The present setting is then indicated by the four bottom LEDs of the DTS.

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Figure: 8-2. Option unit function mode settings



LED Number	LED ON	LED OFF
6	PC-Audio	Tape recorder mode
7	Headset mode	Extra handset
8	Busy signal	Extra bell
9	HA level (See below)	Normal level

To change the settings the corresponding buttons can be pressed and the change of status will be indicated by the associated LED.

To exit the programming mode press # or wait 30 seconds. The settings will now be permanently stored in the DTS until they are re-programmed.

8.2 Level adaptation for people with impaired hearing (HA-level)

To increase the handset level both for the handset and the headset (for people with impaired hearing), the LED 9 can be set to on. This will give an extra amplification of 7 dB.

NOTE: The handset is as standard equipped with an hearing aid coil.

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8.3 Extra bell / busy signal

There are two alternatives using this function. The function is selected by means of LED 8.

Extra bell: Active when the DTS receives a ring signal. LED 8 shall be set to OFF. The function can control an external alerting device or equal.

Busy signal: Active when the DTS is in off-hook mode. The LED 8 shall be set to ON. The function can be used to control a "Do not disturb" lamp at the door or other.

The function can be reached between pin 2 and pin 5 in jack J4. A short-circuit is obtained when the function is ACTIVE (An opto relay is used to separate the external device electrically from the telephone). Maximum load on EXTERNAL DEVICE is 1 A resistive or 0.3 A capacitive or 0,3 A inductive load at maximum 24 V AC or 48 V DC (An external over voltage protection is recommended).

8.4 Connection of extra handset

An extra handset can be connected to jack J2 fig 8-1. This handset will be connected in parallel with the original handset. This means that two persons can listen to the conversation. Only one person at the time shall speak due to speech quality. LED 7 shall be set to OFF.

8.5 Connection of headset or conference unit

A headset or conference unit can be connected to jack J2 fig 8 -1. When connecting a headset or conference unit LED 7 shall be programmed to ON to activate the locally supported headset/conference mode.

Headset/conference mode enables a dedicated key (KEY 4) on the DTS to work as the on/off switch for the headset/conference connection. When on (LED 4 ON), an incoming call can be answered using either the line key or the dedicated headset/conference key (KEY 4). The connection can be closed using the clear ("C") key.

To switch off the headset/conference mode, press the dedicated headset/conference key in idle mode. The dedicated LED 4 will then be OFF.

To switch to handset mode during a headset/conference conversation the dedicated headset/conference key can be pressed.

Lifting the handset in headset or idle mode will activate the handset mode.

Uppgjord (även faktaansvarig om annan) - Prepared (also subject responsible if other)	Nr - No.			
	1531- DBC 210 01 Uen			
Dokansv/Godkänd - Doc respons/Approved	Kontr - Checked	Datum - Date	Rev	File
		1997-06-18	A	

8.6 Connection of tape recorder

A tape recorder can be connected for recording of calls. The recorder can be connected either to jack J3 fig 8-1 or jack J4 fig 8-1. In jack J3 pins a and b and in jack J4 pins 1 and 6 are used for tape recorder output. The levels are adapted for 150 ohms load impedance. When using a tape recorder or equivalent LED 6 shall be set to OFF.

8.7 Connection of PC-sound board

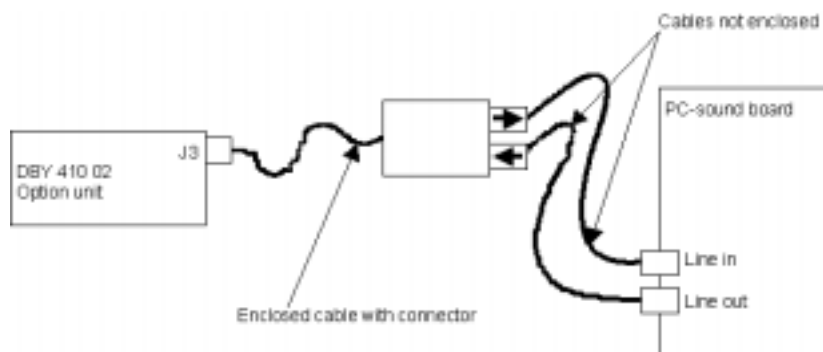
A PC sound board or equivalent can be connected to jack J3 fig 8-1. When connecting a "sound board" two different modes can be selected. For easy connection of the "sound board" the enclosed cable, RPM 130 017/1 can be connected to jack J3 fig 8-1.

The outgoing signal from the option unit, marked --> on the cable, shall be connected to the input, often called LINE IN, of the "sound board". If applicable the incoming signal to the option unit, marked <-- on the cable, shall be connected to the output, often called LINE OUT, of the "sound board". See fig 8-3.

Recording mode: This mode can be used when the "sound board" shall record an ongoing conversation. This mode is the same as tape recorder mode i.e. LED 6 is set to OFF.

PC/AUDIO mode: This mode can be used when the "sound board" shall be used for conversation. This mode requires the LED 6 to be set to ON.

Figure: 8-3. Connection of PC-sound board with cable RPM 130 017/1



8.8 Post installation measures

Connect the extension line and check that a call can be established and check that the installed extra equipment can be used in both directions (if applicable).

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EBC/EN/DMTL Jonas Pettersson		1531- DBC 211 01 Uen		
Dokansv/Godkänd - <i>Doc respons/Approved</i>	Kontr - <i>Checked</i>	Datum - <i>Date</i>	Rev	File
EBC/EN/DMTL (Sture Winther)		1998-04-20	B	

Telephone sets (DBC 211 01, DBC 212 01, DBC 213 01, DBY 409 01 or DBY 409 02 and DBY 410 02)

1	General	2
2	Aids	2
3	Preparations	2
4	Power equipment	2
5	Earthing	2
6	Cabling	3
7	Installation of DTS	3
8	Installation of key panel DBY 409 01 or DBY 409 02 to DBC 213 01	5
9	Installation of option unit DBY 410 02	7

Uppgjord (även faktaansvarig om annan) - <i>Prepared (also subject responsible if other)</i>	Nr - No. 1531- DBC 211 01 Uen			
Dokansv/Godkänd - <i>Doc respons/Approved</i>	Kontr - <i>Checked</i>	Datum - <i>Date</i> 1998-04-20	Rev B	File

1 General

1.1 Scope

The digital telephone sets (DTS) and peripherals described in these installation instructions are to be used together with the Ericsson exchanges ASB 501, ASB 150 02 or equivalent.

The DTS is connected to a digital extension board, ELU 28, or equivalent.

1.2 Environmental requirements

The products covered in these installation instructions comply with the prerequisites stipulated for placing in office and exchange room environments.

2 Aids

Wall mounting requires additional screws.

Wall mounting with option unit requires additional washers (spacers).

3 Preparations

Verify that it is possible to connect an extension line.

Check that a line cord is available.

4 Power equipment

The DTS and its peripherals are powered from the extension line.
Maximum power consumption: 3.5 W

5 Earthing

The DTS and its peripherals need no special earthing.

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	1531- DBC 211 01 Uen		
Dokansv/Godkänd - <i>Doc respons/Approved</i>	Kontr - <i>Checked</i>	Datum - <i>Date</i>	Rev
		1998-04-20	B
			File

6 Cabling

Maximum line length between DTS and extension line unit (ELU) using EKKX 0,5 mm (180 ohms/km) cable: 1000 m (3280 ft):

7 Installation of DTS

7.1 Delivery method

The DTS is normally delivered in a box together with two foot consoles, one handset, one handset cord, two designation labels and two designation covers.

7.2 Connection of the handset

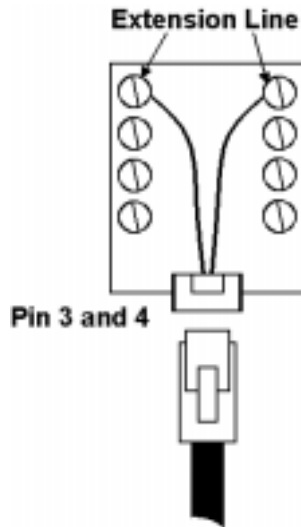
The handset cord shall be connected in one end (short uncoiled) to the handset and the other end (long uncoiled) to the connector in the bottom of the set marked HANDSET.

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		1531- DBC 211 01 Uen		
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		1998-04-20	B	

7.3 Connection to the extension line

The line cord shall be connected in one end to the wall box according to fig 7-1 and the other end to the connector in the bottom of the set marked LINE.

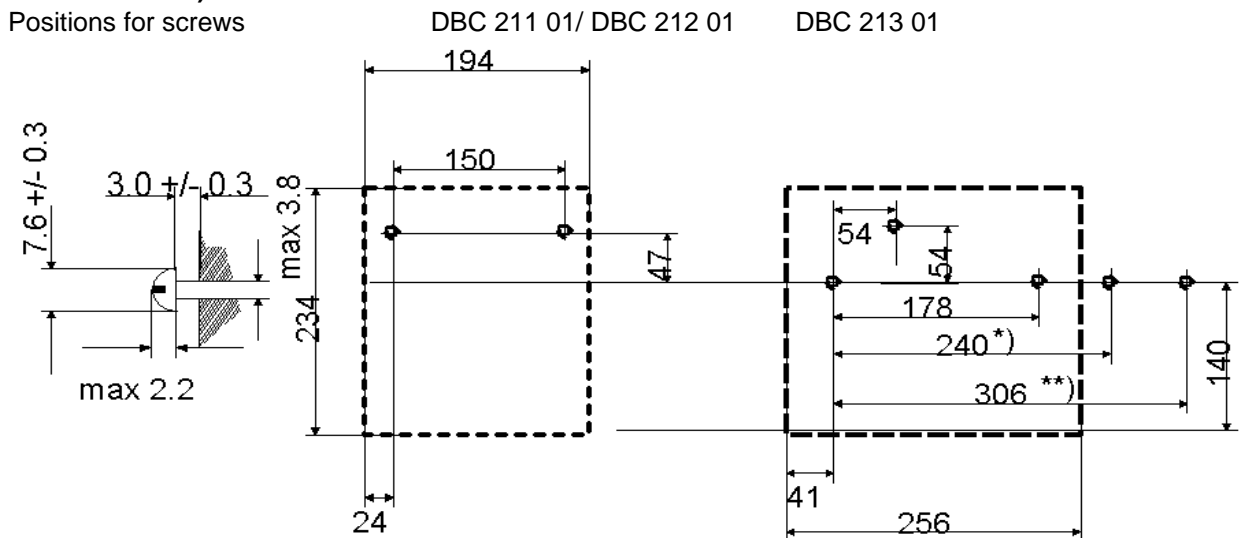
Connection of extension line



7.4 Wall mounting

- Mount the two/three screws on the wall according to fig 7-2.
- Snap off and turn the hook around according to fig 7-3.
- If the adjustable foot consoles are mounted they must be removed.
- Mount the telephone on the screws.

(All distances in mm)



*) For DBY 409 No. 1

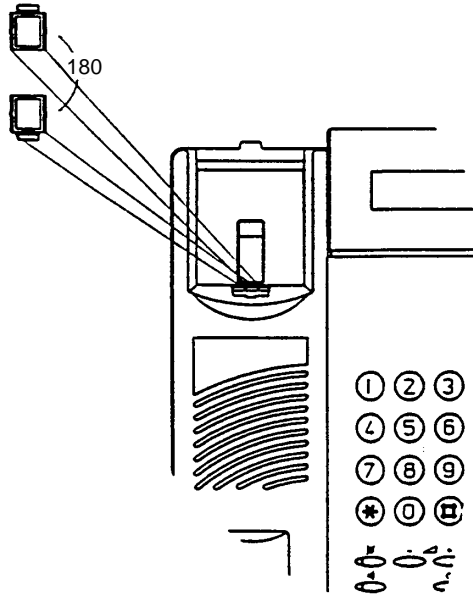
***) For DBY 409 No. 2

Uppgjord (även faktaansvarig om annan) - Prepared (also subject responsible if other)	Nr - No.		
	1531- DBC 211 01 Uen		
Dokansv/Godkänd - Doc respons/Approved	Kontr - Checked	Datum - Date	Rev
		1998-04-20	B
			File

Mounting of hook

Position for hook:

Wall mounting



7.5 Post installation measures

Verify that a call can be established from and to the DTS.

8 Installation of key panel DBY 409 01 or DBY 409 02 to DBC 213 01

To connect one or two key panels use DBY 409 01.

To connect more than two, up to four, key panels use only DBY 409 02 for all positions, it is not possible to mix DBY 409 01 and DBY 409 02.

8.1 Installation of key panel DBY 409 01 to telephone DBC 213 01

- Make necessary arrangements to avoid electrostatic discharges.
- Disconnect the DTS from the exchange
- Avoid if possible to touch the contacts
- Remove the foot console next to contact J8
- Break off the blinder covering the contact J8
- Connect the cable from DBY 409 01 to contact J8
- Attach DBY 409 01 to DBC 213 01 and secure it with the three screws (S1, S2 and S3)
- Snap the foot console on to the DBY 409 01

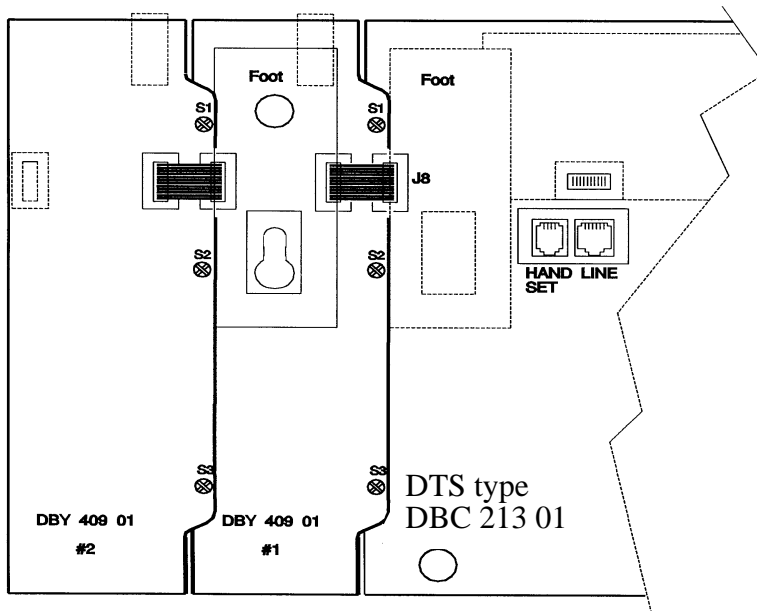
Uppgjord (även faktaansvarig om annan) - Prepared (also subject responsible if other)	Nr - No.		
	1531- DBC 211 01 Uen		
Dokansv/Godkänd - Doc respons/Approved	Kontr - Checked	Datum - Date	Rev
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		File	

If a second DBY 409 01 is to be installed, do as follows

- The procedure above is repeated for the second DBY 409 01
- Move the foot to the second DBY 409 01

A third DBY 409 01 cannot be connected

Rear view of DBC 213 01 with two DBY 409 01 connected.



8.2 Post installation measures

Connect the DBC 213 01 with the DBY 409 01 to the extension line and verify that the bottom LED at each DBY 409 01 is activated during start-up. Establish a call using the keys located on the DBY 409 01.

8.3 Installation of key panel DBY 409 02 to DTS DBC 213 01

- Make necessary arrangements to avoid electrostatic discharges.
- Disconnect the OPI from the exchange
- Avoid if possible to touch the contacts
- Break off the blinder covering the contact J8
- Connect the cable from DBY 409 02 to contact J8
- Attach DBY 409 02 to DBC 214 01 and secure it with the three screws (S1, S2 and S3)

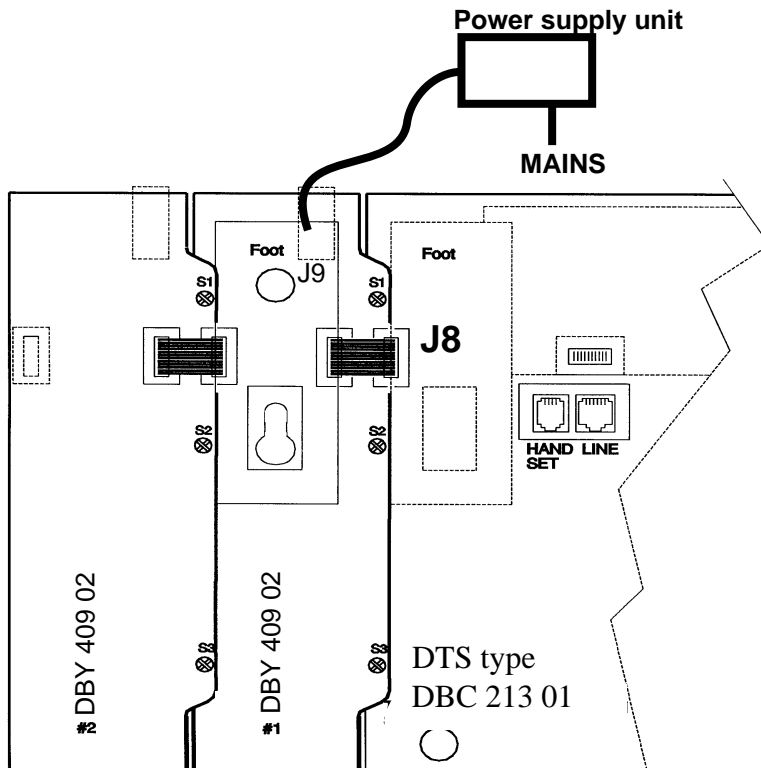
If additional DBY 409 02 are to be installed (maximum four), do as follows

- The procedure above is repeated for the second DBY 409 02

Uppgjord (även faktaansvarig om annan) - Prepared (also subject responsible if other)		Nr - No.		
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Snap the enclosed foot console to the last DBY 409 02 installed
 Remove the blinder covering the contact J9
 Connect the power supply unit (RES 141 305/2 or equal) to the DBY 409 02 closest to the DBC 213 01 and then to the mains.

Rear view of DBC 213 01 with two DBY 409 02 connected.



8.4 Post installation measures

Connect the DBC 213 01 with the DBY 409 02 to the extension line and verify that the bottom LED at each DBY 409 02 is activated during start-up. Establish a call using the keys located on each of the DBY 409 02.

9 Installation of option unit DBY 410 02

Make necessary arrangements to avoid electrostatic discharges:

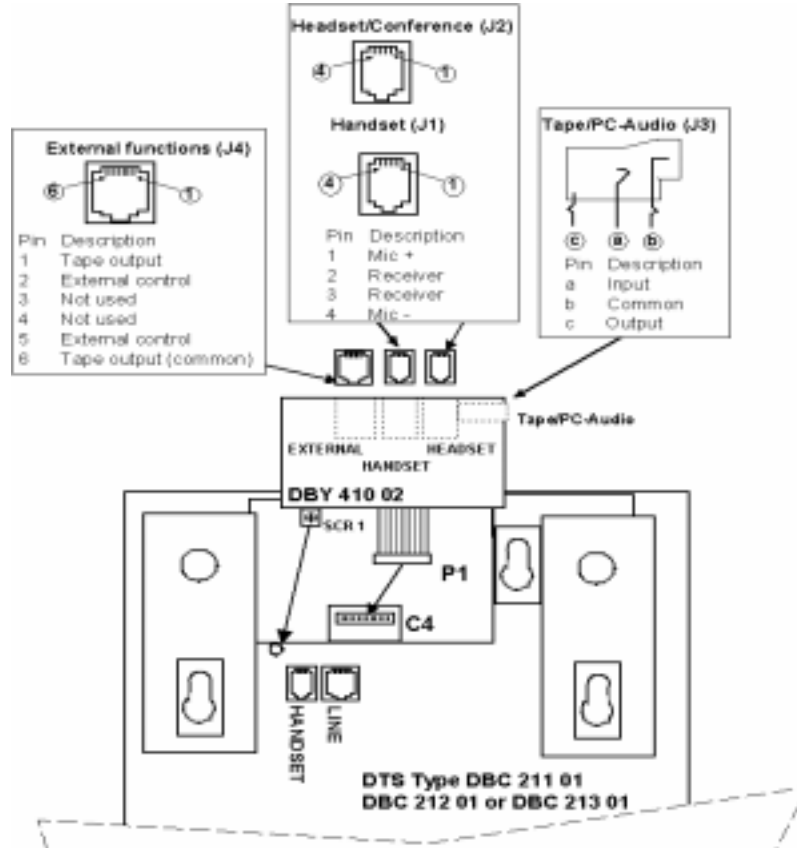
- Disconnect the telephone set from the exchange
- Avoid if possible to touch the contacts
- Break off the blinder covering the contact C4.
- Connect the cable P1 from DBY 410 02 to the contact C4 on the telephone.
- Insert DBY 410 02 to its place in the bottom of the telephone. Secure it with the screw SCR 1.
- Remove the blinder covering the connectors.
- Move the handset cord from the DTS to the jack J1 marked HANDSET.

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		1531- DBC 211 01 Uen		
Dokansv/Godkänd - Doc respons/Approved	Kontr - Checked	Datum - Date	Rev	File
		1998-04-20	B	

Note: When using DBY 410 02 the handset connector on the DTS will be disabled.

With the DBY 410 02 mounted, the telephone cannot be wall mounted without extra measures. Spacers, with a thickness > 15 mm, have to be mounted between the telephone and the wall.

Rear view of DTS with DBY 410 02 connectors.



9.1 Programming of option unit functions

To program the option unit functions, OPTION UNIT FUNCTION MODE must be selected by pressing buttons C, * and 1 simultaneously during 1 second. The present setting is then indicated by the four bottom LEDs of the DTS.

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Dokansv/Godkänd - <i>Doc respons/Approved</i>	Kontr - <i>Checked</i>	Datum - <i>Date</i> 1998-04-20	Rev B
		File	

Option unit function mode settings

LED 4	<input type="checkbox"/>	<input type="checkbox"/>
LED 5	<input type="checkbox"/>	<input type="checkbox"/>
LED 6	<input type="checkbox"/>	<input type="checkbox"/>
LED 7	<input type="checkbox"/>	<input type="checkbox"/>
LED 8	<input type="checkbox"/>	<input type="checkbox"/>
LED 9	<input type="checkbox"/>	<input type="checkbox"/>

LED Number	LED ON	LED OFF
9	HA level (See below)	Normal level
8	Busy signal	Extra bell
7	Headset mode	Extra handset
6	PC-Audio	Tape recorder mode

To change the settings the corresponding buttons can be pressed and the change of status will be indicated by the associated LED.

To exit the programming mode press # or wait 30 seconds. The settings will now be permanently stored in the DTS until they are re-programmed.

9.2 Level adaptation for people with impaired hearing (HA-level)

To increase the handset level both for the handset and the headset (for people with impaired hearing), the LED 9 can be set to on. This will give an extra amplification of 7 dB.

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Dokansv/Godkänd - Doc respons/Approved	Kontr - Checked	Datum - Date	Rev	File
		1998-04-20	B	

9.3 Extra bell / busy signal

There are two alternatives using this function. The function is selected by means of LED 8.

Extra bell: Active when the DTS receives a ring signal. LED 8 shall be set to OFF. The function can control an external alerting device or equal.

Busy signal: Active when the DTS is in off-hook mode. The LED 8 shall be set to ON. The function can be used to control a "Do not disturb" lamp at the door or other.

The function can be reached between pin 2 and pin 5 in jack J4. A short-circuit is obtained when the function is ACTIVE (An opto relay is used to separate the external device electrically from the telephone). Maximum load on EXTERNAL DEVICE is 1 A resistive or 0.3 A capacitive or 0,3 A inductive load at maximum 24 V AC or 48 V DC (An external over voltage protection is recommended).

9.4 Connection of extra handset

An extra handset can be connected to jack J2 fig 9-1. This handset will be connected in parallel with the original handset. This means that two persons can listen to the conversation. Only one person at the time shall speak due to speech quality. LED 7 shall be set to OFF.

9.5 Connection of headset or conference unit

A headset or conference unit can be connected to jack J2 fig 9-1. When connecting a headset or conference unit LED 7 shall be set to ON to activate the locally supported headset/conference mode.

This function enables a dedicated key on the DTS to work as the on/off switch for headset/conference mode. When the LED on the DTS is activated an incoming call can be answered using either the line key or the dedicated headset/conference key (KEY 4). The connection can be closed using the clear ("C") key.

To switch off the headset/conference mode, press the dedicated headset/conference key in idle mode. The dedicated LED 4 will then be OFF.

To switch to handset mode during a headset/conference conversation the dedicated headset/conference key can be pressed.

Lifting the handset in headset or idle mode will activate the handset mode.

Uppgjord (även faktaansvarig om annan) - Prepared (also subject responsible if other)	Nr - No.		
	1531- DBC 211 01 Uen		
Dokansv/Godkänd - Doc respons/Approved	Kontr - Checked	Datum - Date	Rev
		1998-04-20	B
			File

9.6 Connection of tape recorder

A tape recorder can be connected for recording of calls. The recorder can be connected either to jack J3 fig 9-1 or jack J4 fig 9-1. In jack J3 pins a and b and in jack J4 pins 1 and 6 are used for tape recorder output. The levels are adapted for 150 ohms load impedance. When using a tape recorder or equivalent LED 6 shall be set to OFF.

9.7 Connection of PC-sound board

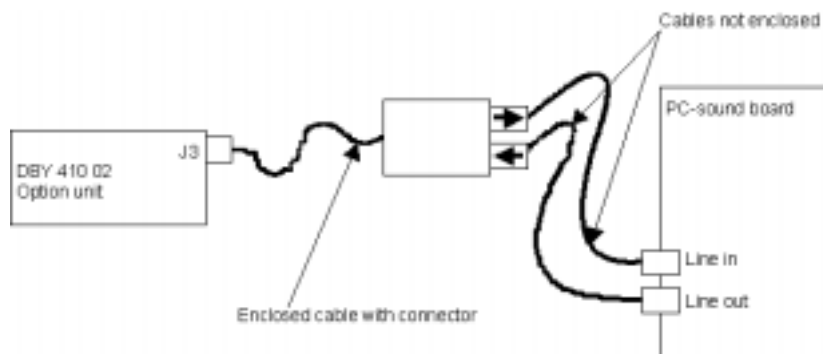
A PC sound board or equivalent can be connected to jack J3 fig 9-1. When connecting a "sound board" two different modes can be selected. For easy connection of the "sound board" the enclosed cable, RPM 130 017/1 can be connected to jack J3 fig 9-1.

The outgoing signal from the option unit, marked --> on the cable, shall be connected to the input, often called LINE IN, of the "sound board". If applicable the incoming signal to the option unit, marked <-- on the cable, shall be connected to the output, often called LINE OUT, of the "sound board". See fig 9-3.

Recording mode: This mode can be used when the "sound board" shall record an ongoing conversation. This mode is the same as tape recorder mode i.e. LED 6 is set to OFF.

PC/AUDIO mode: This mode can be used when the "sound board" shall be used for conversation. This mode requires the LED 6 to be set to ON.

Connection of PC-sound board with cable RPM 130 017/1



9.8 Post installation measures

Connect the extension line and check that a call can be established and check that the installed extra equipment can be used in both directions (if applicable).

Uppgjord (även faktaansvarig om annan) - <i>Prepared (also subject responsible if other)</i>		Nr - No.		
EBC/EN/DMTL Thomas Åsberg		1531-DBC 214 01 Uen		
Dokansv/Godkänd - <i>Doc respons/Approved</i>	Kontr - <i>Checked</i>	Datum - <i>Date</i>	Rev	File
EBC/EN/DMTL (Sture Winther)		1997-11-19	A	

Operator's console (DBC 214 01, DBY 409 01 or DBY 409 02 and DBY 410 02)

1	General	2
2	Aids	2
3	Preparations	2
4	Power equipment	2
5	Earthing	2
6	Cabling	3
7	Installation of OPI	3
8	Installation of key panel DBY 409 01 or DBY 409 02 to DBC 214 01	5
9	Installation of option unit DBY 410 02	7

Uppgjord (även faktaansvarig om annan) - <i>Prepared (also subject responsible if other)</i>	Nr - No. 1531-DBC 214 01 Uen			
Dokansv/Godkänd - <i>Doc respons/Approved</i>	Kontr - <i>Checked</i>	Datum - <i>Date</i> 1997-11-19	Rev A	File

1 General

1.1 Scope

The digital operator's instrument (OPI) and peripherals described in these installation instructions are to be used together with the Ericsson exchanges ASB 150 02 or equivalent.

The OPI is connected to a digital extension board, ELU-D_ or equivalent.

1.2 Environmental requirements

The products covered in these installation instructions comply with the prerequisites stipulated for placing in office and exchange room environments.

2 Aids

Wall mounting requires additional screws.

Wall mounting with option unit requires additional washers (spacers).

3 Preparations

Verify that it is possible to connect an extension line.

Check that a line cord is available.

4 Power equipment

The OPI and its peripherals are powered from the extension line.

If using DBY 409 02 the first (closest to the OPI) shall be supplied from the mains using a power supply unit RES 141 305/2 or equal.

5 Earthing

The OPI and its peripherals need no special earthing.

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Dokansv/Godkänd - <i>Doc respons/Approved</i>	Kontr - <i>Checked</i>	Datum - <i>Date</i> 1997-11-19	Rev A	File

6 Cabling

Maximum line length between OPI and extension line unit (ELU) using EKKX 0,5 mm (180 ohms/km) cable: 1000 m (3280 ft).

7 Installation of OPI

7.1 Delivery method

The OPI is normally delivered in a box together with two foot consoles, one handset, one handset cord, two designation labels and two designation covers.

7.2 Connection of the handset

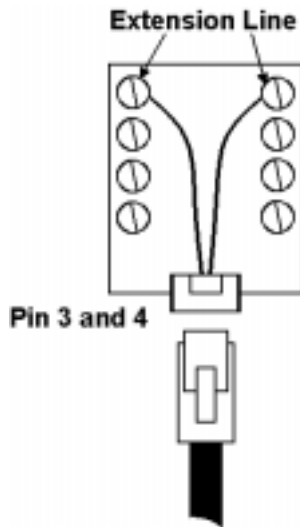
The handset cord shall be connected in one end (short uncoiled) to the handset and the other end (long uncoiled) to the connector in the bottom of the set marked HANDSET.

Uppgjord (även faktaansvarig om annan) - Prepared (also subject responsible if other)		Nr - No.		
		1531-DBC 214 01 Uen		
Dokansv/Godkänd - Doc respons/Approved	Kontr - Checked	Datum - Date	Rev	File
		1997-11-19	A	

7.3 Connection to the extension line

The line cord shall be connected in one end to the wall box according to fig 7-1 and the other end to the connector in the bottom of the set marked LINE.

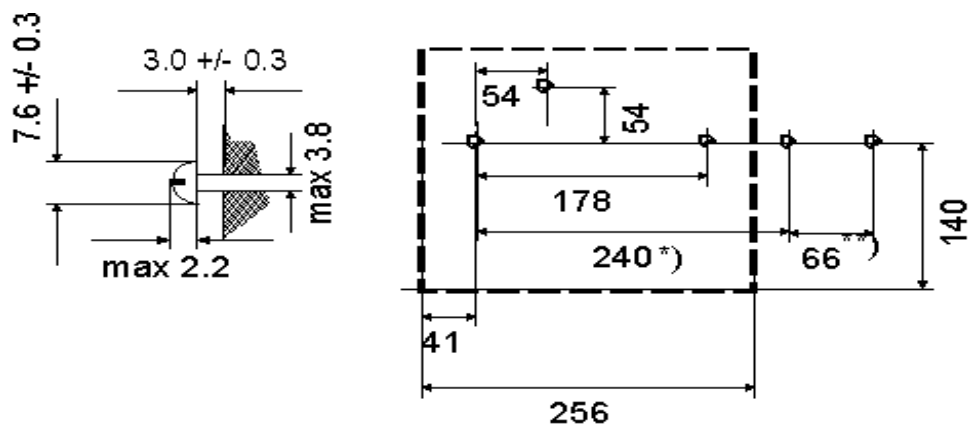
Connection of extension line



7.4 Wall mounting

- Mount the two/three screws on the wall according to fig 7-2.
- Snap off and turn the hook around according to fig 7-3.
- If the adjustable foot consoles are mounted they must be removed.
- Mount the OPI on the screws.

Positions for screws (All distances in mm)



*) For DBY 409 No. 1

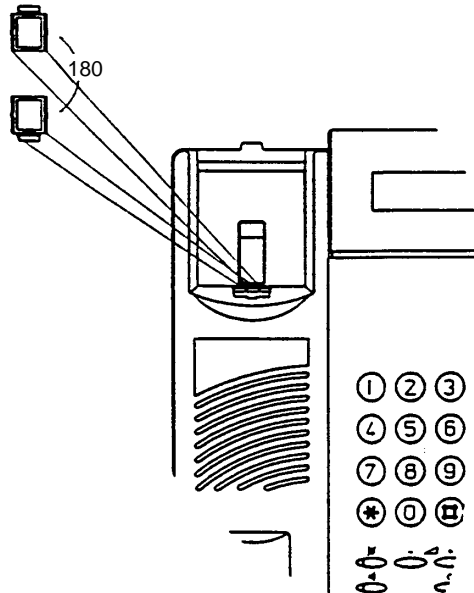
***) For DBY 409 No. 2,3 and 4 add 66mm

Uppgjord (även faktaansvarig om annan) - Prepared (also subject responsible if other)	Nr - No.		
	1531-DBC 214 01 Uen		
Dokansv/Godkänd - Doc respons/Approved	Kontr - Checked	Datum - Date	Rev
		1997-11-19	A
			File

Mounting of hook

Position for hook:

Wall mounting



7.5 Post installation measures

Verify that a call can be established from and to the OPI.

8 Installation of key panel DBY 409 01 or DBY 409 02 to DBC 214 01

To connect one or two key panels use DBY 409 01.

To connect more than two, up to four, key panels use only DBY 409 02 for all positions, it is not possible to mix DBY 409 01 and DBY 409 02.

8.1 Installation of key panel DBY 409 01 to OPI DBC 214 01

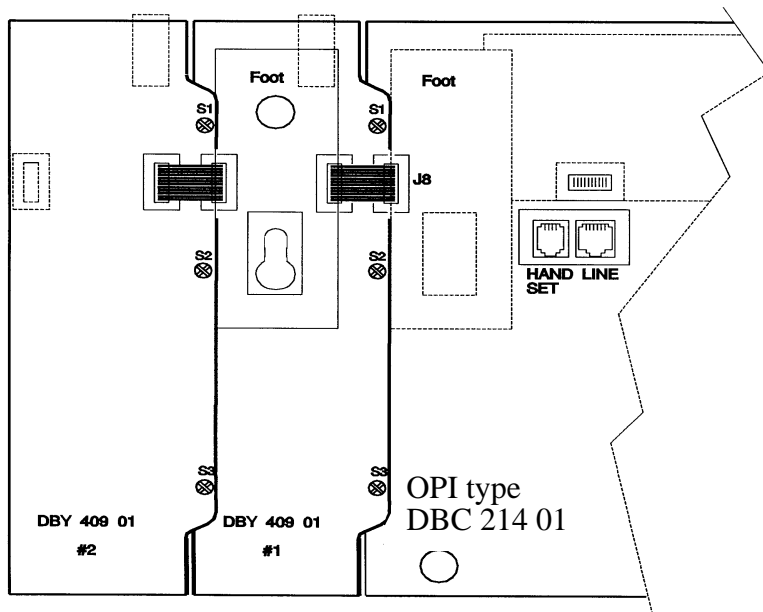
- Make necessary arrangements to avoid electrostatic discharges.
- Disconnect the OPI from the exchange
- Avoid if possible to touch the contacts
- Remove the foot console next to contact J8
- Break off the blinder covering the contact J8
- Connect the cable from DBY 409 01 to contact J8
- Attach DBY 409 01 to DBC 214 01 and secure it with the three screws (S1, S2 and S3)
- Snap the foot console on to the DBY 409 01

Uppgjord (även faktaansvarig om annan) - Prepared (also subject responsible if other)		Nr - No.		
		1531-DBC 214 01 Uen		
Dokansv/Godkänd - Doc respons/Approved	Kontr - Checked	Datum - Date	Rev	File
		1997-11-19	A	

If a second DBY 409 01 is to be installed, do as follows

- The procedure above is repeated for the second DBY 409 01
- Move the foot to the second DBY 409 01

Rear view of DBC 214 01 with two DBY 409 01 connected.



8.2 Installation of key panel DBY 409 02 to OPI DBC 214 01

- Make necessary arrangements to avoid electrostatic discharges.
- Disconnect the OPI from the exchange
- Avoid if possible to touch the contacts
- Break off the blinder covering the contact J8
- Connect the cable from DBY 409 02 to contact J8
- Attach DBY 409 02 to DBC 214 01 and secure it with the three screws (S1, S2 and S3)

If additional DBY 409 02 are to be installed (maximum four), do as follows

- The procedure above is repeated for the second DBY 409 02

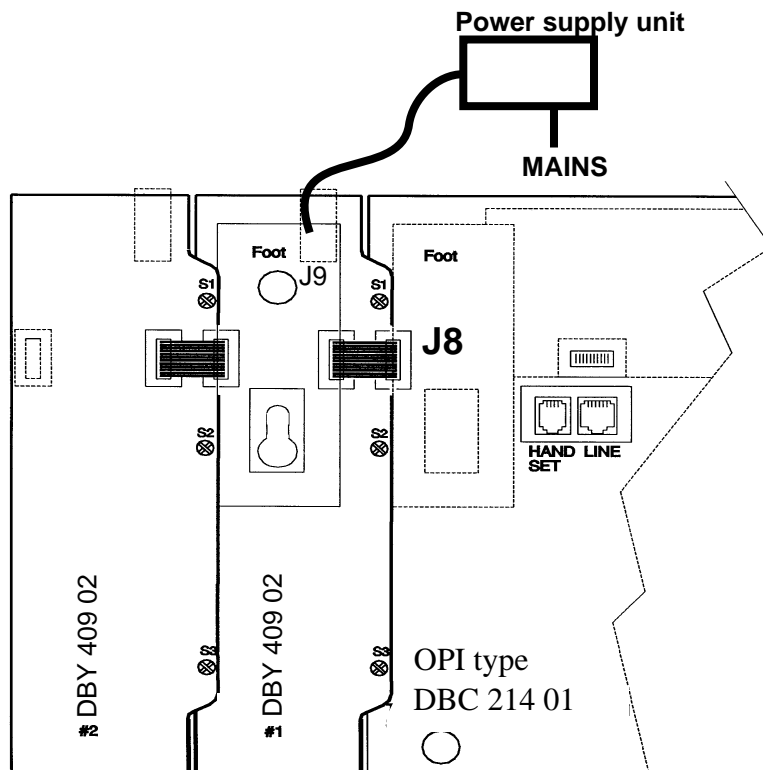
Snap the enclosed foot console to the last DBY 409 02 installed

Remove the blinder covering the contact J9

Connect the power supply unit (RES 141 305/2 or equal) to the DBY 409 02 closest to the DBC 214 01 and then to the mains.

Uppgjord (även faktaansvarig om annan) - Prepared (also subject responsible if other)	Nr - No.		
	1531-DBC 214 01 Uen		
Dokansv/Godkänd - Doc respons/Approved	Kontr - Checked	Datum - Date	Rev
		1997-11-19	A
			File

Rear view of DBC 214 01 with two DBY 409 02 connected.



8.3 Post installation measures

Connect the DBC 214 01 with the DBY 409 02 to the extension line and verify that the bottom LED at each DBY 409 02 is activated during start-up. Establish a call using the keys located on each of the DBY 409 02.

9 Installation of option unit DBY 410 02

Make necessary arrangements to avoid electrostatic discharges:

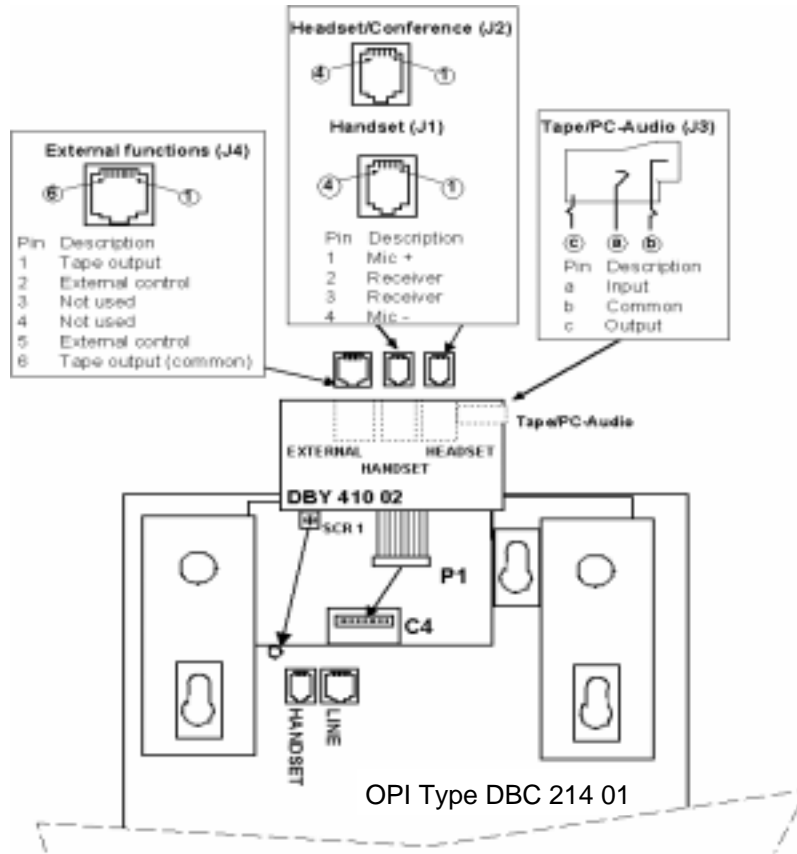
- Disconnect the OPI set from the exchange
- Avoid if possible to touch the contacts
- Break off the blinder covering the contact C4.
- Connect the cable P1 from DBY 410 02 to the contact C4 on the OPI.
- Insert DBY 410 02 to its place in the bottom of the OPI. Secure it with the screw SCR 1.
- Move the handset cord from the OPI to the jack J1 marked HANDSET.
- Mount the enclosed cover to protect the connectors from ESD.

Note: When using DBY 410 02 the handset connector on the OPI will automatically be disabled.

Uppgjord (även faktaansvarig om annan) - Prepared (also subject responsible if other)		Nr - No.		
		1531-DBC 214 01 Uen		
Dokansv/Godkänd - Doc respons/Approved	Kontr - Checked	Datum - Date	Rev	File
		1997-11-19	A	

With the DBY 410 02 mounted, the OPI shall be wall mounted using extra spacers, with a thickness > 15 mm, have to be mounted between the OPI and the wall.

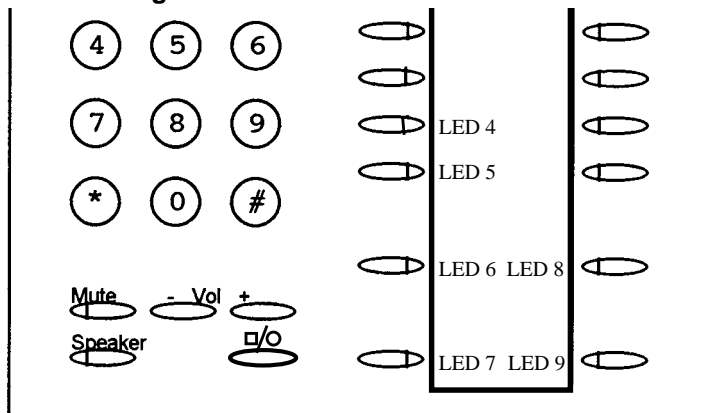
Rear view of OPI with DBY 410 02 connectors.



9.1 Programming of option unit functions

To program the option unit functions, OPTION UNIT FUNCTION MODE must be selected by pressing buttons C, * and 1 simultaneously during 1 second. The present setting is then indicated by the four bottom LEDs of the OPI.

Uppgjord (även faktaansvarig om annan) - <i>Prepared (also subject responsible if other)</i>		Nr - No.	
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Option unit function mode settings


LED Number	LED ON	LED OFF (Default setting)
6	PC-Audio	Tape recorder mode
7	Headset mode	Extra handset
8	Busy signal	Extra bell
9	HA level (See below)	Normal level

To change the settings the corresponding buttons can be pressed and the change of status will be indicated by the associated LED.

To exit the programming mode press # or wait 30 seconds. The settings will now be permanently stored in the OPI until they are re-programmed.

9.2 Level adaptation for people with impaired hearing (HA-level)

To increase the handset level both for the handset and the headset (for people with impaired hearing), the LED 9 can be set to on. This will give an extra amplification of 7 dB.

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9.3 Extra bell / busy signal

There are two alternatives using this function. The function is selected by means of LED 8.

Extra bell: Active when the OPI receives a ring signal. LED 8 shall be set to OFF. The function can control an external alerting device or equal.

Busy signal: Active when the OPI is in off-hook mode. The LED 8 shall be set to ON. The function can be used to control a "Do not disturb" lamp at the door or other.

The function can be reached between pin 2 and pin 5 in jack J4. A short-circuit is obtained when the function is ACTIVE (An opto relay is used to separate the external device electrically from the OPI). Maximum load on EXTERNAL DEVICE is 1 A resistive or 0.3 A capacitive or 0,3 A inductive load at maximum 24 V AC or 48 V DC (An external over voltage protection is recommended).

9.4 Connection of extra handset

An extra handset can be connected to jack J2 fig 9-1. This handset will be connected in parallel with the original handset. This means that two persons can listen to the conversation. Only one person at the time should speak due to speech quality. LED 7 shall be set to OFF.

9.5 Connection of headset or conference unit

A headset or conference unit can be connected to jack J2 fig 9-1. When connecting a headset or conference unit LED 7 shall be set to ON to activate the locally supported headset/conference mode.

This function enables a dedicated key on the OPI to work as the on/off switch for headset/conference mode. When the LED on the OPI is activated an incoming call can be answered using either the line key or the dedicated headset/conference key (K 4). The connection can be closed using the clear ("C") key.

To switch off the headset/conference mode, press the dedicated headset/conference key in idle mode. The dedicated LED 4 will then be OFF.

To switch to handset mode during a headset/conference conversation the dedicated headset/conference key can be pressed.

Lifting the handset in headset or idle mode will activate the handset mode.

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9.6 Connection of tape recorder

A tape recorder can be connected for recording of calls. The recorder can be connected either to jack J3 fig 9-1 or jack J4 fig 9-1. In jack J3 pins a and b and in jack J4 pins 1 and 6 are used for tape recorder output. The levels are adapted for 600 ohms load impedance. When using a tape recorder or equivalent LED 6 shall be set to OFF.

9.7 Connection of PC-sound board

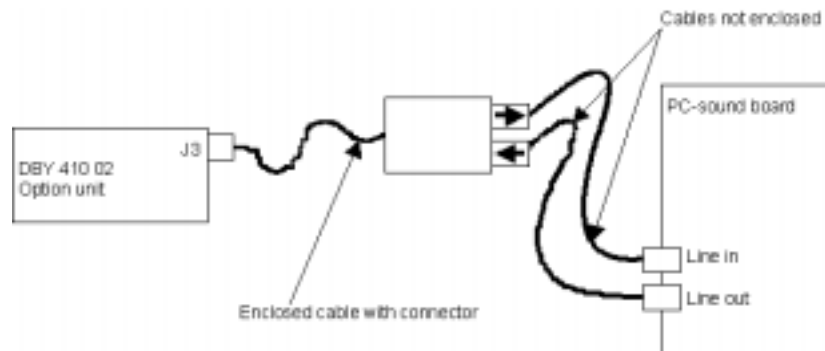
A PC sound board or equivalent can be connected to jack J3 fig 9-1. When connecting a "sound board" two different modes can be selected. For easy connection of the "sound board" the enclosed cable, RPM 130 017/1 can be connected to jack J3 fig 9-1.

The outgoing signal from the option unit, marked --> on the cable, shall be connected to the input, often called LINE IN, of the "sound board". If applicable the incoming signal to the option unit, marked <-- on the cable, shall be connected to the output, often called LINE OUT, of the "sound board". See fig 9-3.

Recording mode: This mode can be used when the "sound board" shall record an ongoing conversation. This mode is the same as tape recorder mode i.e. LED 6 is set to OFF.

PC/AUDIO mode: This mode can be used when the "sound board" shall be used for conversation. This mode requires the LED 6 to be set to ON.

Connection of PC-sound board with cable RPM 130 017/1



9.8 Post installation measures

Connect the extension line and check that a call can be established and check that the installed extra equipment can be used in both directions (if applicable).

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EBC/FMD/TL (Thomas Åsberg)		1996-04-10	D	

TAU D

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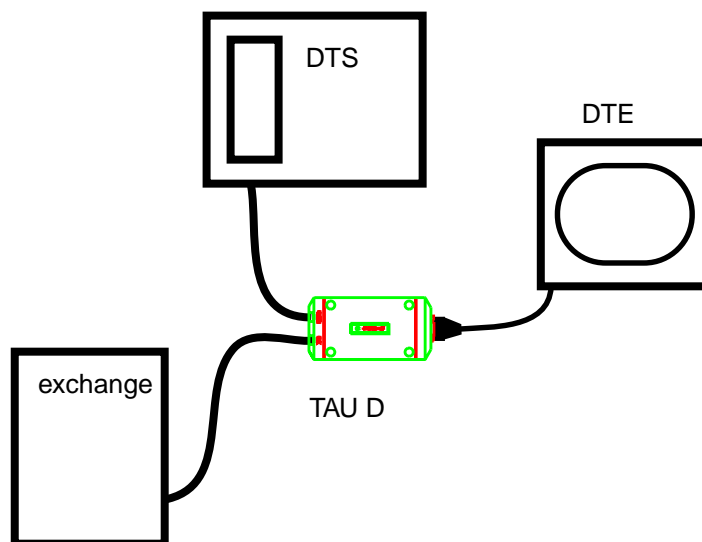
1 General

1.1 Scope

TAU D, TERMINAL ADAPTER UNIT with product number: ZAT 505 120/X is a terminal adapter for connection of Data Terminal Equipment (DTE) that wants to access to the proprietary signal channel in the Ericsson exchanges ASB 501, ASB 150 or equivalent. It can operate in stand alone mode or share the extension line with a digital system telephone. It can share the telephone line with digital system telephones (DTS) of the DBC 600, DBC 200 families or equivalent. The telephone is connected to the TAU D. The TAU D is mainly intended for use with the OWS, Application link, Personal Screen Call and PC-OPI for ASB 150. A Service provider software is also included in the package and installed according to installation guide XX/LZT 102 2301

TAU D is connected to a digital extension board ELU 28 or equivalent in the exchange via an extension line.

Example of TAU D connection with DTS



1.2 Space requirements

Dimensions: width 152 mm
height 33 mm
depth 75 mm

TAU can be placed in lying position or wall mounted by using an adhesive Velcro(R)

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1.3 Technical data

Power consumption: maximum 1.0 W

1.4 Environmental requirements

TAU D complies with the prerequisites stipulated for placing in office and exchange room environments.

2 Aids

Wall mounting requires an adhesive Velcro(R).

3 Preparations

Verify that is possible to connect an extension line.
Switch of the DTE to be connected to the TAU D.

4 Delivery method

TAU D is delivered with a 2200 mm (7,2 ft) connection cable with modular RJ12 connectors in both ends. It shall be used to connect a telephone to the TAU D. A 9 to 9 pole (female/male) cable (V.24/RS-232-C) is also delivered with TAU D. It shall be used to connect a computer(PC) to the TAU D. Enclosed is also a Service Provider software.

The connection cable to the exchange is not included.

5 Unpacking

6 Mounting

6.1 Program units

No special program unit in the exchange is required.

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7 Power equipment

The TAU D is powered from the Extension line.

8 Earthing

The TAU D needs no special earthing.

9 Cabling

Maximum line length using DBC 200 series telephones and 0,5 mm EKKX cable:
1000m (3280 ft)

exemption: using a DBC 203 with 2 DBY 409 and 0,5 mm EKKX cable: 800m (2625 ft)

Maximum line length using DBC 600 series telephones and 0,5 mm EKKX cable:
1000m (3280 ft)

Recommended maximum cable length between:

TAU D and PC: 3,0m (9,8 ft)

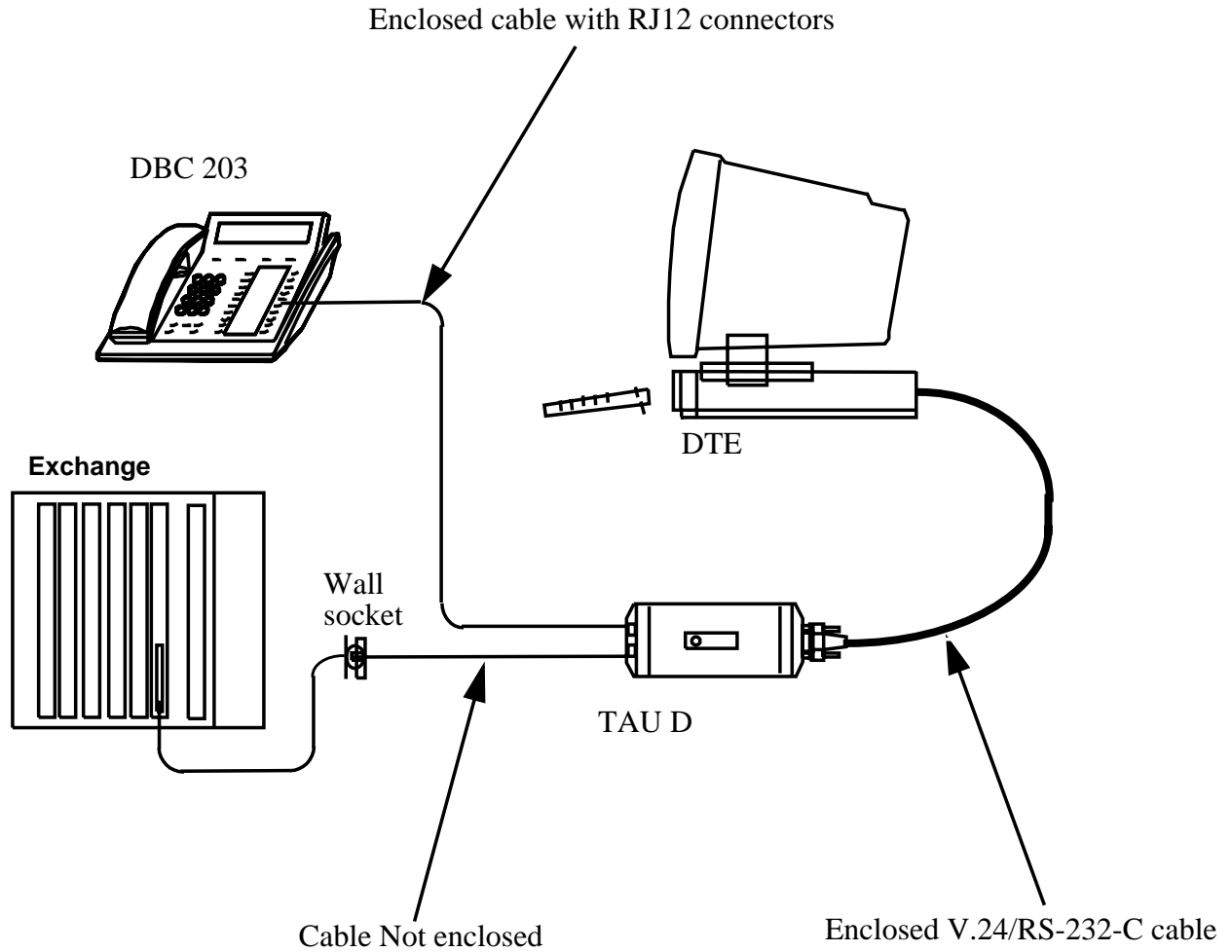
The following cables are used:

- Telephone jack cable with modular RJ12 connector towards the TAU D
- Telephone cable with modular RJ12 connector in both ends to be used when a digital system telephone shall be connected to the TAU D
- Standard 9 pole V.24/RS-232-C cable with a male connector towards the TAU D.

NOTE: Using TAU D together with DBC 600 series telephones connected to ELU 28 or ELU 25/3 will in some configurations slightly exceed the maximum line current. This will cause the TAU D and DBC 600 telephone not to start or work properly.

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Overview of TAU D connection



10 Post installation measures

Connect a DTS and check that a call can be established.
 Check that the LED is slowly blinking.
 For the Service provider consult the installation guide XX/LZT 102 2301