



elmeg T484

Operating instructions
English

Declaration of conformity and CE mark



This device meets the requirements of the following EC directive R&TTE 6/3/EG:

»Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity«.

You can also request this EC declaration of conformity at the following Internet URL: <http://www.teldat.de>.



The waste container symbol with the “X” through it on the device indicates that the device must be disposed of separately from normal domestic waste at an appropriate waste disposal facility at the end of its useful service life..

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Installation

Installation of the PABX

Before beginning the installation check the package to ensure that all items are included.

Contents:

- 1 PABX unit
- 1 ISDN connection cable (3 meters)
- 1 USB connection cable (3 meters)
- 1 Set of operating instructions
- 1 Drilling template
- 1 CD-ROM for configuration, drivers and software, documentation in pdf-format
- 1 enclosed package containing: 3 dowels and 3 screws.

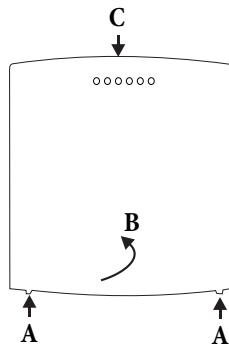
Installation sequence

This section gives you step-by-step instructions on how to install your PABX. It is important that you adhere to the installation sequence given here.

- Select an installation location that is a maximum of 1.5 meters away from a 230 V AC outlet and the network termination (ISDN connection) of the service provider.
- To prevent mutual interference, do not install your PABX system in the immediate vicinity of electronic devices such as stereo equipment, electronic office equipment or microwave units.
Avoid installing your PABX near sources of excessive heat, e.g. radiators or in rooms with excessive humidity.
The ambient temperature must be between 5 and 40° C.
- Having identified the appropriate location, place the drilling template on the selected mounting location and ensure that it is perfectly perpendicular. Take care to keep the spaces as specified on the drilling template.
- Mark the drilling points on the wall using the drilling template.
- Ensure that all the contact surfaces have firm contact with the wall. ensure that there are no power lines, cables, etc. located at or under the marked drilling holes.
- Drill the three mounting holes at the marked positions. When using anchoring studs, use a 6 mm masonry drill to drill the holes and put in the dowels.
- Screw two of the screws into the two top dowels in the wall such that there is a gap of about 5 mm between the head of the screw and the wall.

Note

Attention! You may be electrostatically charged. To ensure that you have no electrostatic charge, touch a conducting object connected to »ground« (e. g. water pipe) before you open the PABX system.



Opening the PABX: »C« is the front of the PABX system. Pull the two plastic springs marked »A« outward until the cover is released. Lift off the cover carefully toward the rear. It can then be easily lifted off. The terminal panel is then visible under the enclosure cover.

- Hang the PABX on the screws by inserting the screw heads into the rear panel mounting holes.
- After this, screw the third screw in tightly at the marked position to secure the PABX on the wall.
- Install the jacks for the ISDN terminal devices and the analog terminal devices and Connect the jacks with the PABX.
- Plug the terminal device connectors into the jacks.
- If you wish to configure your PABX system yourself via the PC, you can do this via the USB port on the PABX, or at the internal ISDN connection or the Ethernet port.
 To configure your system via the internal ISDN connection, you must have an operational ISDN PC card installed in your PC. Connect your PC and PABX system via the installed ISDN jacks.
 To configure the system via the PC port, connect the PABX system PC port to the USB port on your computer using the PC connecting cord provided with the system.
 To configure the system via Ethernet connect the Ethernet port of the PC to the LAN-port of your PABX system using a Cat.5 connecting cord.
- Connect port »S02: EXT« to the network termination unit via the ISDN connecting cord.
- Close the enclosure. To close the PABX, insert the catches (on the back of the bottom of the enclosure) into the openings in the PABX enclosure cover. Press down on the cover at the front until it catches.

Note

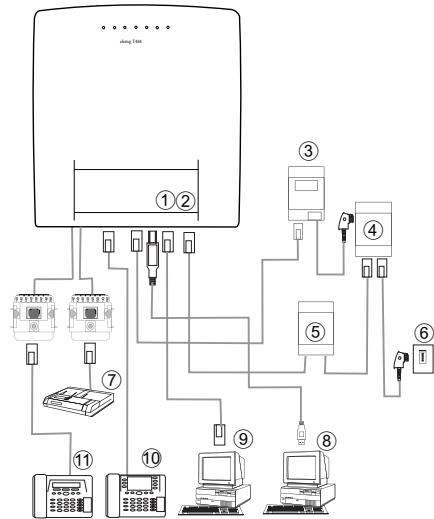
The mains plug for the network termination unit does not have to be plugged in to operate the PABX.

- You can now use your telephone system.

Note

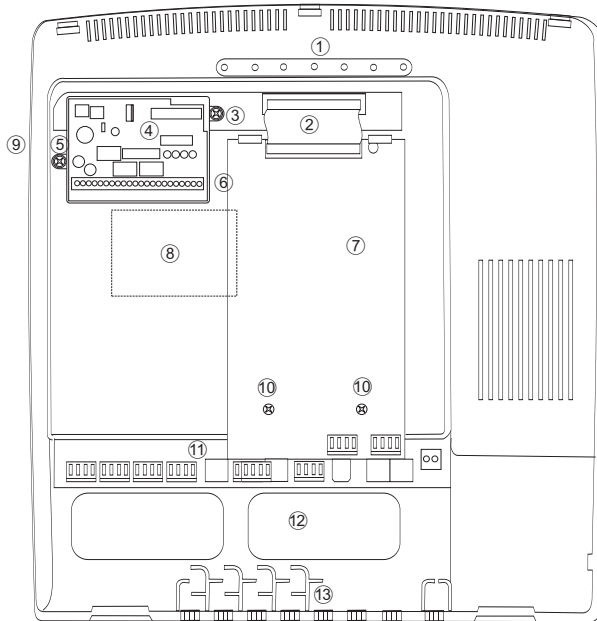
Observe the installation and commissioning instructions from the splitter and DSL modem equipment manufacturers.

Connections to the PABX system



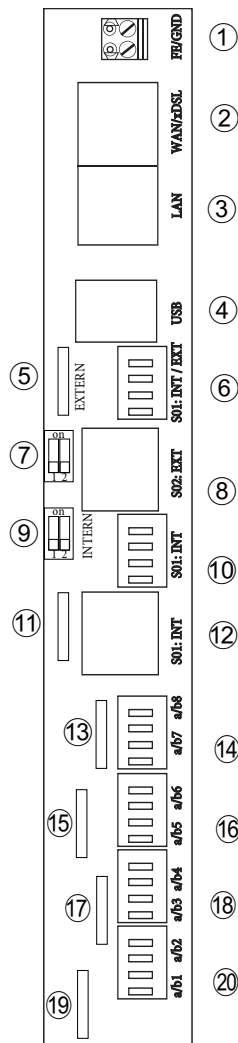
- ① LAN port
- ② WAN/xDSL-port
- ③ NT
- ④ Splitter
- ⑤ DSL modem
- ⑥ ISDN connection for the service provider
- ⑦ Fax
- ⑧ PC via USB
- ⑨ PC via LAN
- ⑩ ISDN telephone
- ⑪ Analog telephone

View inside the PABX system



- ① LEDs
- ② Module slot (a/b, S0 and POTS)
- ③ Fastening screw for emergency power supply, contacts and door terminal modules
- ④ Connector for emergency power supply, contacts and door terminal modules
- ⑤ Fastening screw for emergency power supply, contacts and door terminal modules
- ⑥ Module slot 2 (emergency power supply, contacts or door terminal)
- ⑦ Slot 1 for a/b, S0 or POTS modules
- ⑧ Slot 3 (accessible after removing the inside cover)
- ⑨ Compact Flash-Card slot
- ⑩ Fastening screw for modules a/b, S0 or POTS
- ⑪ Terminal bay of the PABX
- ⑫ Cut-out areas for installation cable
- ⑬ Cable clamp

Connections of the PABX



- ① Functional grounding
- ② »WAN/xDSL«-port
- ③ »LAN«-port
- ④ »USB«-port
- ⑤ Overload protection jack
- ⑥ internal / external ISDN port »S02: INT/EXT«
- ⑦ Switch for the terminating resistors »External«
- ⑧ External ISDN connection »S02 EXT« (RJ45)
- ⑨ Switch for the terminating resistors »INTERNAL«
- ⑩ Internal ISDN connection »S01: INT «
- ⑪ Overload protection jack
- ⑫ Internal ISDN connection »S01: INT « (RJ45)
- ⑬ Overload protection jack
- ⑭ Analog connections a/b7, a/b8
- ⑮ Overload protection jack
- ⑯ Analog connections a/b5, a/b6
- ⑰ Overload protection jack
- ⑱ Analog connections a/b3, a/b4
- ⑲ Overload protection jack
- ⑳ Analog connections a/b1, a/b2

Internal ISDN connection S01

You can connect On ISDN terminal devices directly to the PABX system. The internal ISDN connection of the PABX provides 2.5 watts of power for connecting at least two (2) ISDN terminal devices. Further terminal devices can be installed via a hardwired ISDN bus. Please read the instructions for hard wiring in the installation manual.

Externer / Internal ISDN connection S02

You can configure the ISDN port as an external or internal ISDN port.

- The external ISDN port is provided for connection to the ISDN network of your network service provider (NTBA). The connection assignments are given on the patch panel under »EXTERNAL«. Connection is made via an RJ45 jack, or using connecting terminal S02: INT/EXT. These connections may not be active simultaneously.
- The internal ISDN port S02 functions like the internal ISDN port S01. Terminal devices must only be connected via the hard-wired terminal S02: INT/EXT.

Analog connections

Only analog terminal devices with tone dialing (DTMF dialing) should be connected to the analog ports. The recall flash button must execute the flash function. The functions described in the operating and configuration instructions can be used without any restrictions with these terminal devices.

Note

Flash duration detection can be set by PC configuration.

The PABX system is equipped with 8 internal ports a/b1...a/b_ for hard-wiring of jacks. If the PABX system is operated with a TFE module, connecting terminal a/b 8 can not be used for terminal devices.

USB/PC interface

The USB port is used for linking a PC to the PABX system.

Note

The USB port of the PABX functions as a USB network card. This allows you to perform PC configuration of the ISDN router the same way as for Ethernet installation

Use the USB connecting cord supplied with the system for this. If you use a different USB connecting cord ensure that the distance between the PABX and the PC does not exceed five meters, depending on the type of USB connecting cord you are using.

The PABX system USB port is ready for use at the PC connected to the system when the »USB« LED lights up and stays lit. PC applications that run via the USB connection can be started. The LED will blink when the USB driver is active at the PC connected to the system and data is being exchanged via the USB port.

Connection Ethernet LAN

The port labeled LAN automatically assumes the maximum data transfer rate possible at the opposite terminal (PC) (from 10 Mbits/ semi-duplex to 100 Mbit/s full-duplex). Use a network cable for this (CAT.5, 1:1 with RJ-45 connectors at both ends).

Connecting the DSL modem to the Ethernet (10BaseT) port (WAN/xDSL)

If you have a DSL connection you must connect your DSL modem to the WAN port of the PABX system. Use a network cable for this (CAT. 5, 1:1 with RJ-45 connectors at both ends). This cable may be included in the standard delivery scope for your DSL modem.

Note

Please be sure to use a DSL-modem with an Ethernet (10BaseT) port. Also follow the installation instructions provided by the manufacturer of the splitters, modems and NT.

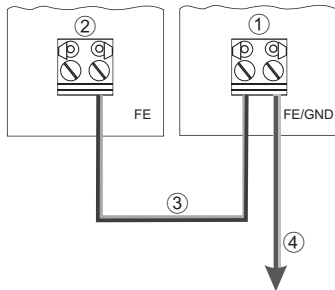
Functional grounding (FE/GND)**Functional ground**

As your PABX system is equipped with a functional grounding connection, a »ground« (waterpipe, heating system pipe or preferably an earth bonding conductor for the house wiring system) should be located near the installation location of the system. This connection is required for use of overload protection modules (FSM.) and module POTS. The connection to the PABX must be made with a connecting lead of at least 2.5 mm². The function grounding connection can be plugged in to the module. Both functional ground connections are connected together.

Note

If you use terminal devices that are linked with the PABX system via USB, you must install the functional grounding, as otherwise »hum loops« may be produced.

The functional ground terminals (FE/GND) and (FE) on the POTS module must be linked via a ground line with a cross section of 2,5mm².



- ① FE/GND-terminal of the PABX
- ② FE-terminal of the POTS-module
- ③ Connection line
- ④ Link to the »Grounding circuit connection«

Modules

Module installation

The modules have already been taken into account for the PABX system. If a module is installed prior to initial commissioning, the numbers are automatically assigned to the connections.

Various modules can be used for the PABX systems. First of all please back up the pabx data. Then reset the pabx to default setting (telephone code »999«). Turn off your PABX system. Install the modules. Restart the pabx and reset it once again to default state (telephone code »999«). Then upload the backup data and programm the module features as required.

Note

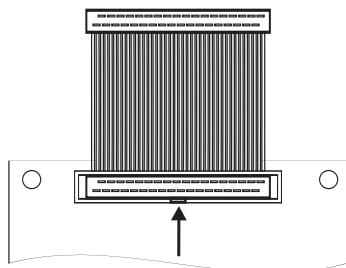
Disconnect the PABX from all analog, door terminal and ISDN connections. Attention! You may be electrostatically charged. To ensure that you have no electrostatic charge, touch a conducting object connected to »ground« (e. g. water pipe) before you open the PABX system.

Please note that only one module may be installed at each available slot in the PABX system (see Page 3):

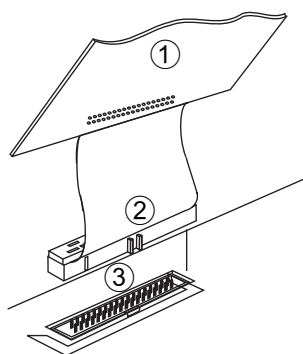
- Slot 1 = elmeg M 2 POTS V.2 module, M 4 POTS V.2, elmeg 4 a/b II module or elmeg 2 S0 V.2 module.
- Slot 2 = elmeg door intercom module, elmeg switching contacts module or elmeg NSP-module
- Slot 3 = elmeg M4 DSP module.
- Slot for a Compact Flash-Card

Installation of the elmeg modules M 2 POTS V.2, M 4 POTS V.2, 4 a/b II, 2 S0 V.2

Begin installing the modules at slot 1.

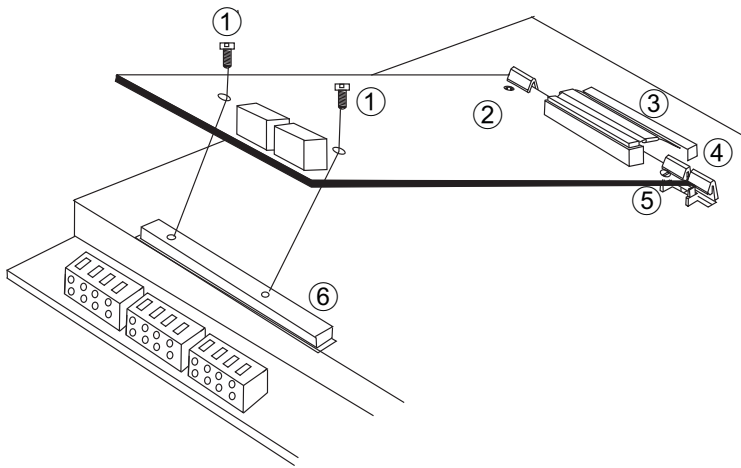


Plug the connection cable into the module socket. Mind the plugging direction! The arrow points to the mark for the connector strip and the socket connector.



- ① Module
- ② Connection cable
- ③ PABX jacks

Use the connecting cable to connect the module to the PABX system motherboard socket connector. Please observe the plugging direction.



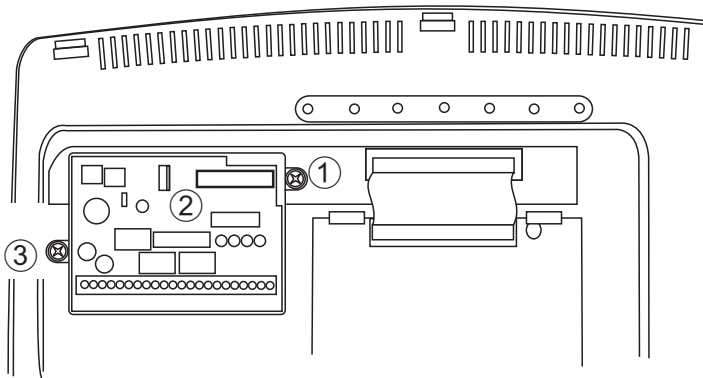
- ① Fastening screws
- ② Module
- ③ Connector
- ④ Catches
- ⑤ Fastening / holes
- ⑥ Grounding bar

Insert the module into the catches. Note that the restraints must fit into the holes in the module. Using the screws supplied with the package, fasten the module on the grounding bar.

Set the terminating resistors for the 2S0 V2.0 module to (on) or (off) as required for the current connection (default setting = on). The switches must be set to off for »Star-type connection to bus«. Reconnect the analog and ISDN lines with the PABX. Plug the 230 V~ power plug for the telephone system into the mains outlet. You can now restart your PABX system. The modules are recognized automatically and must then be configured at the PC.

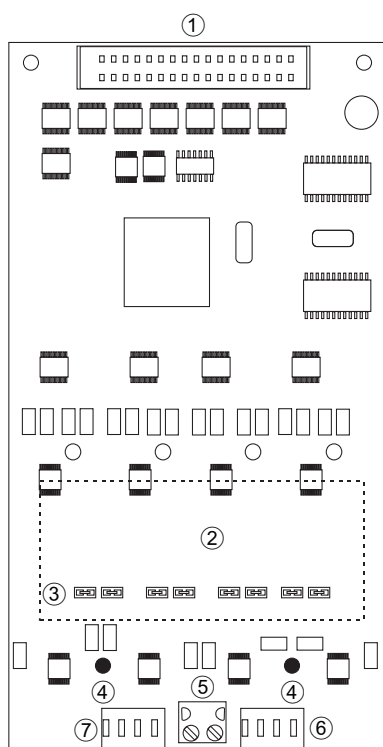
Installation of the modules NSP, contacts and door terminal

These modules are installed in slot 2.



- ① Fastening screw for emergency power supply, contacts and door terminal modules
- ② Module connector
- ③ Fastening screw for emergency power supply, contacts and door terminal modules

elmeg modules M 4 POTS V.2/ M 2 POTS V.2



- ① PABX connector
- ② Charge filter module
- ③ Connections for the charge filter module.
- ④ Fixing holes
- ⑤ Functional ground plug
- ⑥ External POTS-connection La/Lb 3, La/Lb 4
- ⑦ External POTS-connection La/Lb 1, La/Lb 2

Note

The elmeg M 2 POTS V.2 module is a modified fitting variant of that module > elmeg M 4 POTS V.2. The connections La/b 3 and La/b 4 are not used.

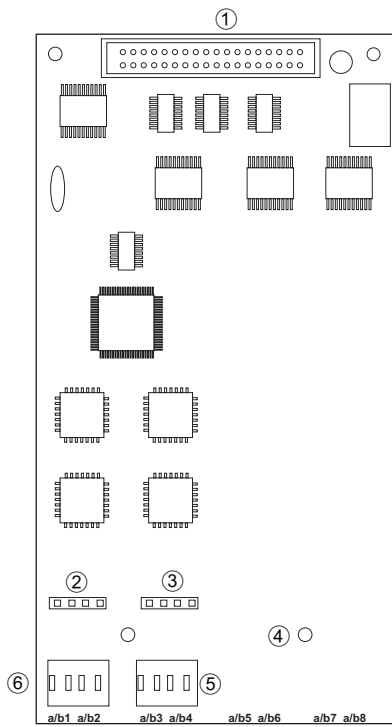
Connection to the PABX system is made using the ribbon cable provided with the system. The external analog port and connection of the functional ground is made using the ports on the module. Since the elmeg POTS modules are equipped with integrated overload protection, connection to functional ground must be made!

Ports La and Lb are electrically isolated from the PABX system circuit.

Installation of the charge filter module

To install the Charge filter module remove the jumpers installed at the »Connections for Charge filter module« and install the module at those connections. Be sure to insert the module connector pins correctly into the corresponding sockets. No other settings or configurations are required.

elmeg 4 a/b module II



- ① PABX connector
- ② Jack for Overload protection FSM connection a/b1 a/b2
- ③ Jack for Overload protection FSM connection a/b3 a/b4
- ④ Fixing holes
- ⑤ Analog connection a/b3, a/b4
- ⑥ Analog connection a/b1, a/b2

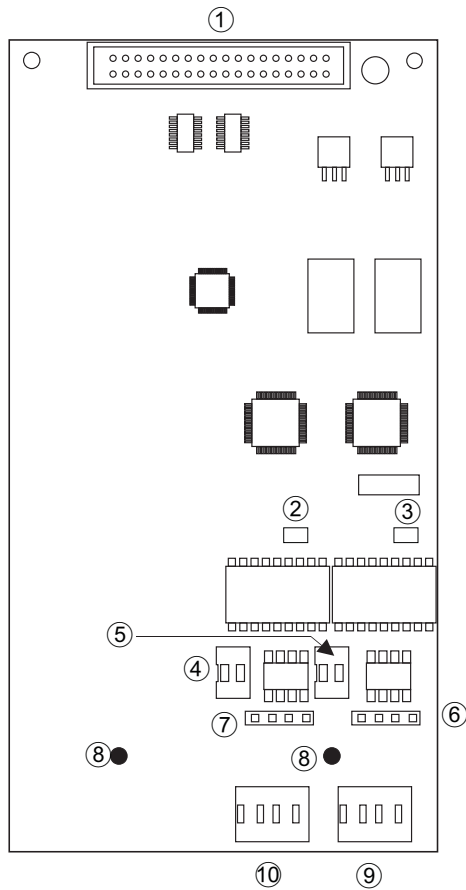
the ribbon cable provided with the system.

Connection to the PABX system is made using

elmeg 2 S0 V.2 module

This module is equipped with two S0 ports, of which the S04 port can be configured as an internal or external ISDN port. The factory settings of all connections are activated as specified by the configuration. Use the configuration to switch to the external ISDN connection. A manual switching on the module is not possible.

Be sure that for the configuration as an internal ISDN connection (with feed-in to the bus) that this connection is not combined with an external ISDN connection (NT). In this case, the opposing in-feeds could result in damage to the devices.

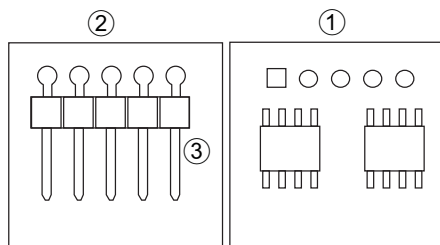


- ① PABX connector
- ② LED for S03
- ③ LED for S04
- ④ Switch for terminating resistors S03 (both switches either open or closed)
- ⑤ Switch for terminating resistors S04 (both switches either open or closed)
- ⑥ Jack for Overload protection FSM connection 4 S0
- ⑦ Jack for Overload protection FSM connection 3 S0
- ⑧ Fixing holes
- ⑨ Switchable internal / external ISDN connection S04
- ⑩ Internal ISDN connection S03

Note

The green LEDs show the operating status for a connected ISDN terminal (Layer 1).

Overload protection module



- ① Front view of the FSM module
- ② Rear view of the FSM module
- ③ Connector

The fine overload protection module (FSM) is provided to divert overvoltage at analog or ISDN connecting lines. Overload protection is required for each connection that is to be protected. Any overvoltage which occurs in the lines is diverted to the functional ground (FE/GND terminals). It is imperative that you have functional grounding installed (min. ,5 mm² wires) and that it is always connected to provide continuous protection. The FSM module is

plugged into the slots provided for it on the motherboard. The overload protection module is of symmetrical design, plug it in either way round.

Note

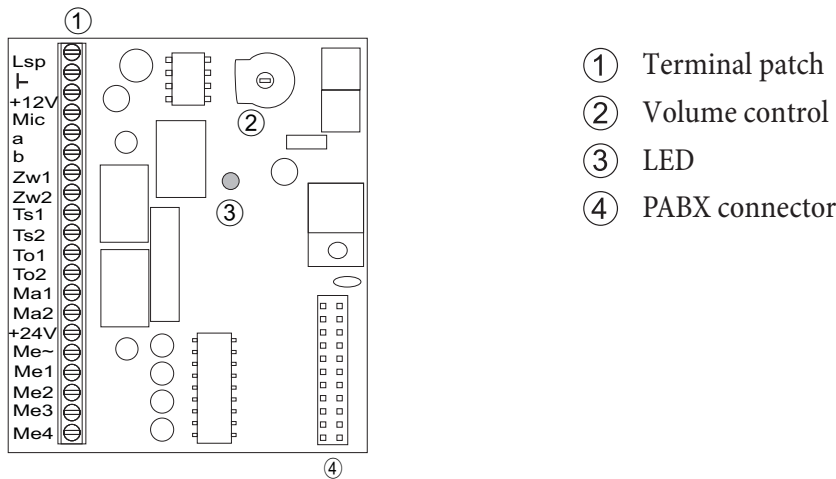
Please note that the overload protection module is an expendable fusible link, i. e. once a module has been activated it must then be replaced with a new one.

If a fine overload protection module is activated by excessive voltage, it creates a short-circuit in the connection lines. If you do not hear a dial tone after lifting the handset, have the module checked. Disconnect the external ISDN connection and the 230 V supply from the PABX prior to checking.

Door intercom device module

Plug the TFE module into the corresponding PABX system (slot 2) and fix it in place using the retaining clip. Ensure that all of the contact pins are plugged into the socket connector and that they are not bent. The door intercom module is connected in a fixed manner using installation lines. The door intercom module is not recognized automatically by the PABX; it must first be set during configuration.

When using the door intercom module, the analog a/b8 connection can no longer be used for connecting analog terminal devices..



For connection examples please refer to page 31.

Connections:

Speaker	Speaker connection	4-wire connection
T	GND (Ground)	
+12V	Microphone supply, 4-wire connection	
Mic	Microphone connection	
a and b	analog connection (a + b) (according to FTZ 123 D 12)	
ZW1 and ZW2	Potential-free contact 2	
Ts1 and Ts2	Potential free contact for activating the door intercom module	
To1 and To2	Potential free contact for activating a door opener relay	
Ma1 and Ma2	Potential-free contact 1	
+24V	24V= for the alarm inputs	
Me~	Common input of the messaging inputs (DC or AC input)	
*Me1...Me4	Bell button inputs (AC or DC)	

Me4	Alarm input (DC and AC)
-----	-------------------------

the door intercom module provides you with the following functions:

- Interfacing of a standard door phone unit with speaker and microphone, without preamps.
- Interfacing of a door intercom module according to FTZ guideline123D12.
- Interfacing of call signaling which is operated in parallel with the doorbell at the existing ringing system (dedicated call distribution is possible for each of the three or four bell button connections).
- Interfacing of a central alarm bell or second bell for direct or alternating voltage (Ma2/Ma1 and ZW2/ZW2).
- Interfacing of call signaling (door terminal call distribution) using buttons, without an additional external power supply.
- Use of two switching contacts for the door terminal module. These contacts can also be actuated externally (remote control) (Ma1/Ma2 and ZW1/ZW2).
- Indication of door opening function by a red LED on the door intercom module.
- Only safety transformers which comply with VDE 0551 and which come equipped with a safety extra-low voltage (SELV) as per VDE 0100 §8, with a max. of 24 V (off-load voltage), may be used for all voltage sources connected to the PABX system.

If you have any questions please contact your electrician or your specialized dealer. These transformers must be marked with the following symbols:



Note

Only bell transformers in compliance with VDE 0551 may be used.

Cable lengths for door terminal modules

The length of the connecting lines from the installed door intercom module to the entrance access telephone components (door intercom location, doorbell button or signal contact) is limited to the specifications in the chart. The connection line used here is J-Y (St) Y2xnx0.6. In this process, affiliated connections (a and b or Mic and +12 V) are always led to one pair of wires.

Module /component	Connection designation		Component	Cable length (0.6 mm)
Door intercom module	a/b		Door intercom amplifier	100 meters
	SPEAKER		Door phone	100 meters
	MIC			
	ZW1 /ZW2		Device to be switched	Depending on the switching current and the line resistance
	Ts1 / Ts2, To1 / To2			
	MA1 / MA2			
	ME~		Towards button /switch	100 meters
	ME1...ME4			
	GND, +12V and +24V		Please see second wire length (for example Mic, Lsp)	
Door opener	To1/ To2		To bell transformer via door intercom module	Depending on the switching current and the line resistance

Switching contacts

The relays with connections Ma1-Ma2 and Zw1-Zw2 of the door intercom module are used as switching contacts. This provides a maximum of 2 switching contacts per door terminal. The switching contacts can also be activated externally. The contact designations in the configuration are defined as shown in the following table.

Loading of contacts

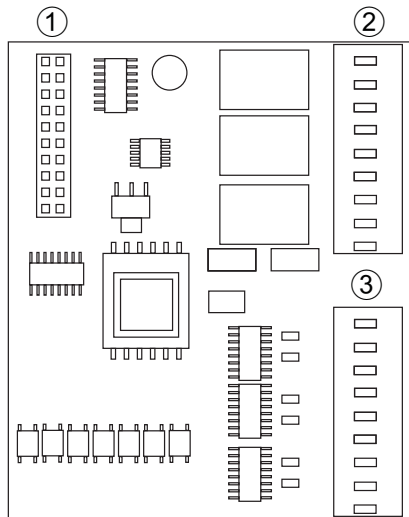
Contact T01/To2	24V =/~	3A
Contact Zw1/Zw2, Ts1/Ts2,	24V =/~	1A
Ma1/Ma2	24V =/~	1A

Contact module

The switching contact module features 6 alarm inputs and 3 switching contact outputs. This is installed in slot 2, the same as the TFE module. This module must be logged in to the configuration, as it is not recognized automatically.

- The alarm inputs are isolated to the PABX system and are equipped with a dedicated voltage source.
- The alarm inputs are connected via two wires (M1...M6) and the common port »M«. When idle, the two wires (for example M1 and M) must be terminated via 4.7 kOhm. This resistor must be connected directly parallel to the contact.
- Ports »M« are linked to one another; GND is for the sensor inputs.
- If the contact is closed, or the line interrupted, an alarm call is issued at the terminal devices for which this has been configured.
- The maximum length of the connecting line can be 100 meters, with a wire diameter of 0.6.
- Installation may only be conducted inside buildings.
- The contacts for relay outputs K1...K3 are switches and may only have a maximum load of up to 24V =/~ and 1A.

- Break and make contact for contact K1 are interference-suppressed via an RC combination. Take note of this circuit when you connect AF (for example music) via this contact.

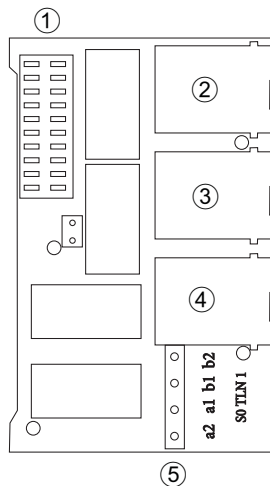


- ① PABX connector
- ② Relay outputs
- ③ Alarm inputs

Emergency supply module (Es)

Note

This module is only required when the external ISDN port on the SO2 module is also to be used for emergency power operation.



- ① PABX connector
- ② Connection to the external ISDN port of the PABX
- ③ Connection to the NT
- ④ Connection to the internal ISDN port of the PABX
- ⑤ S0 INT 1 connection for internal ISDN-bus

The powerfail feature module permits continued use of the PABX to make calls on loss of the 230 V AC power supply. The terminal with which you can make phone calls on loss of power must also be equipped with an »emergency power« function.

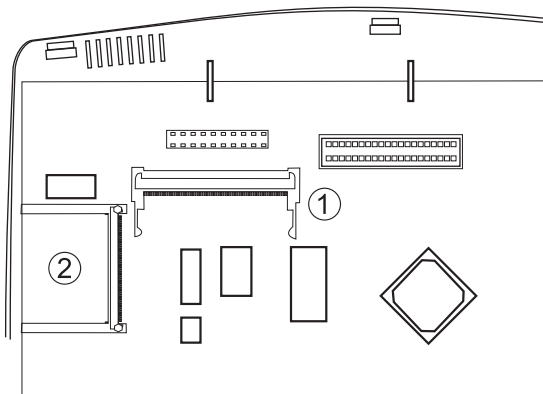
Plug the NSP module into slot 2. Ensure that all of the contact pins are plugged into the socket connector and that they are not bent.

The external ISDN port and the internal ISDN port for emergency power operation are connected via the NSP module. A connection example is given on Page 35.

Installation of the elmeg M4 DSP module

You must first open the inside enclosure cover for the PABX system to install the M4 DSP module. Before doing this, unplug the power plug and terminate all connections to the PABX system. Remove the »third attachment screw (bot-

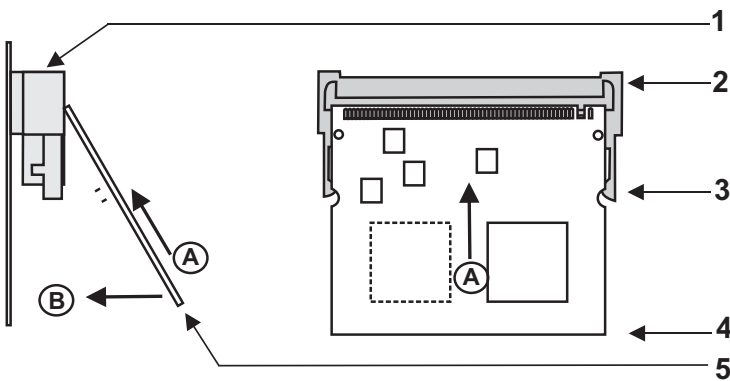
tom at center in front of patch panel) and take the PABX system off of the wall. There are six Philips screws on the back of the PABX system. Remove these screws and lift off the inside enclosure cover.



- ① Slot 3 for elmeg M4 DSP module
- ② Slot for the Compact Flash-Card (this connector is accessible from the outside)

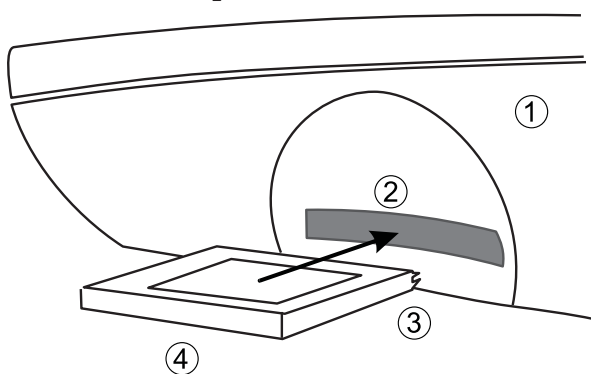
Installation of the module elmeg M4 DSP

This module must be plugged into slot 3. As shown in the figure, insert the module at an angle of about 45 degrees into the socket (A) and then press it down (B) until the catches of the connector lock in place in the module. To remove the module, press both catches out at the same time and the module will snap out to the position shown at the bottom of the picture. You can then take it out by pulling out against the direction (A) shown here.



- ① Module slot
- ② Module slot
- ③ Slot catch
- ④ Module
- ⑤ Plugging direction for the installation of the module

Installation of the Compact Flash-Card



- ① Left side of the PABX
- ② Opening for inserting the Compact Flash Card
- ③ Jacks in direction PABX, label of the Compact Flash Card shows up
- ④ Compact Flash-Card

A slot for the Compact Flash Card is located on the left side of the PABX system. To install the Compact Flash Card insert it into the opening and press it firmly into the socket in the PABX system. Refer to the operating instructions on the CD for the Voicebox about information regarding the size of the Compact Flash Cards that can be used.

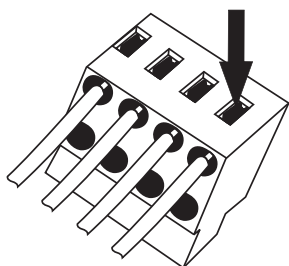
Installation

Terminals

Terminals can be removed from the pins of the cable terminal bay.

Note

In all work on the PABX system ports, you must first turn off the PABX electricity supply and put the external system ports out of operation!!



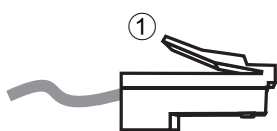
These terminals are for use with ISDN and analog connections. 2 wires can be connected to every connection. Wire diameters can range from 0.4 to 0.8 mm. The wire end to be inserted must be stripped of 6 to 7 mm of its insulation. The wires can be removed if pressure is applied with a screwdriver to the terminal bay area designated with an arrow and the wires are removed by pulling lightly.

Note

The RJ45 connectors are locked after being plugged into the ISDN jack to prevent them from being pulled out. The lever points up after being plugged into the PABX.

RJ45 connector

Plug the RJ45 connector into the ISDN jack until you hear an audible »Click«, indicating that it is securely locked in. To unlock press on the small lever on the RJ45 connector while pulling the connector out.



① Lever

Connecting leads

For the function of the PABX terminal devices, the installation lines are very important. Operational safety, disruption sensitivity and range are dependent upon the type of line and how it is laid. Please only use the prescribed types of lines and comply with the manufacturer's installation instructions for the jacks. To the extent that such is possible, you should use the connecting cord supplied. The lines for the PABX connections may not be laid out in the open as this represents a power overload danger as can occur during thunderstorms.

Line types for firm cabling

Installation-grade cable

This cable is sold in two-pair (4-wire) and multi-pair models. Both cables can be used shielded or unshielded. For the connection, one (analog connection) or two cable pairs (ISDN connection) must always be connected. The cable

pairs are »twisted« together or combined as »star-fours«. The individual designations of the wires are firmly allocated to wire defined designations. You must comply with this allocation without exception.

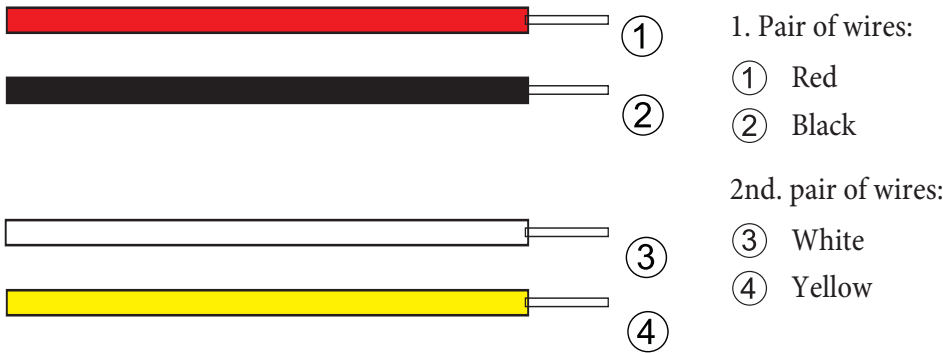
Note

Never use the additional shielding wire as an earth line.

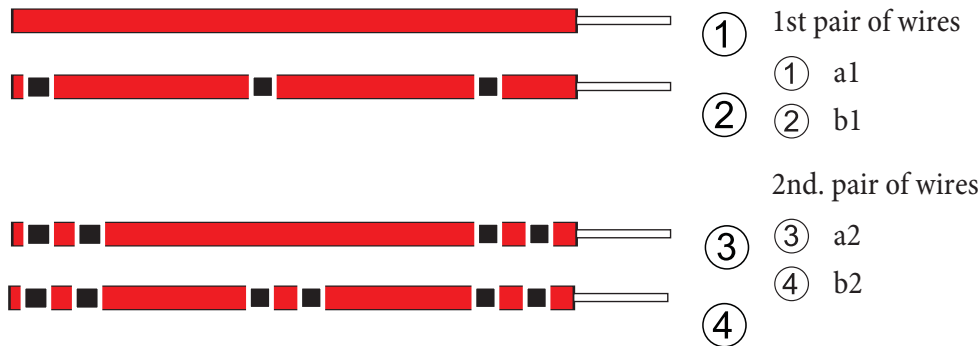
The lines are designated as follows:

J-Y(St) Y2x2x0,4: Installation line with plastic insulation, two pairs of wires with a copper cross-section of 0.4 square millimeters per wire. This line is also shielded and available with a copper cross-section of 0.6 square millimeters per wire. Additionally, the line is also available with more than 2 wire pairs.

Both wires of a pair are »twisted«.



J-YY 2x2x0,6: The four wires are stranded as »star fours«.



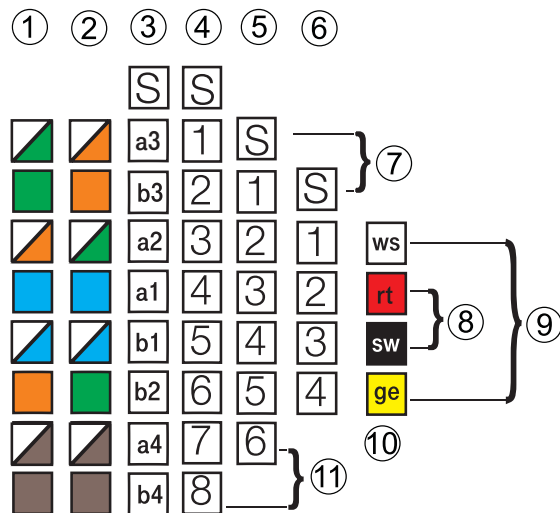
J-YY 0.6 designation, black rings on same colored wires (red, green, gray, yellow or white).

Cat. 5 cable

These lines are primarily used in PC network technology. With a corresponding connection, two ISDN connections can be installed over one line. In this process, the 1st and 2nd as well as the 3rd and 4th wire pairs are allocated to an ISDN port. Additionally, several analog connections can be installed, each pair-wise, via this line. The picture shows the connection of the CAT. 5 cable to the various jacks and the allocation of the wire pairs to the installation cable.

Wire designations.

- ④ Terminal designations for the UAE8 jack.
- ⑤ Terminal designations for UAE6 jacks.
- ⑥ Terminal designations for UAE4 jacks.
- Shielding (if available).
- ⑦ 3. pair
- ⑧ 1. st pair (analog connections a/b).
- ⑨ 2. pair.
- ⑩ Wire colors for telephone cables J-Y(St)Y2x2x0,6Lg.
- ⑪ 4. pair.



T568A:

- ① white/green
- ② green
- ③ white/orange
- ④ blue
- ⑤ white/blue
- ⑥ orange
- ⑦ white/brown
- ⑧ brown

T568B:

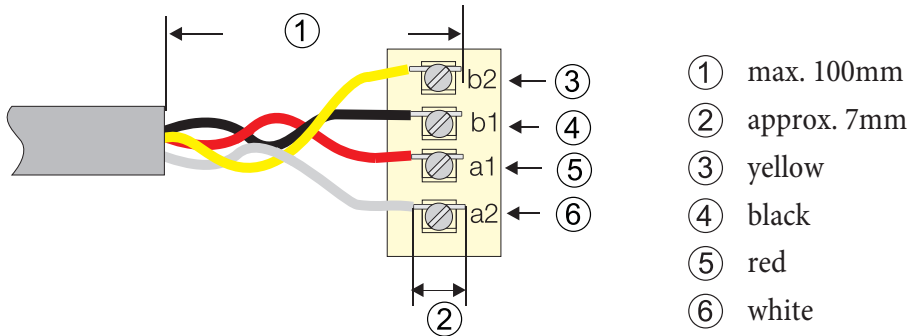
- white/orange
- orange
- white/green
- blue
- white/blue
- green
- white/brown
- brown

This table shows the different types of connections at an RJ45 or CAT. 5 jack.

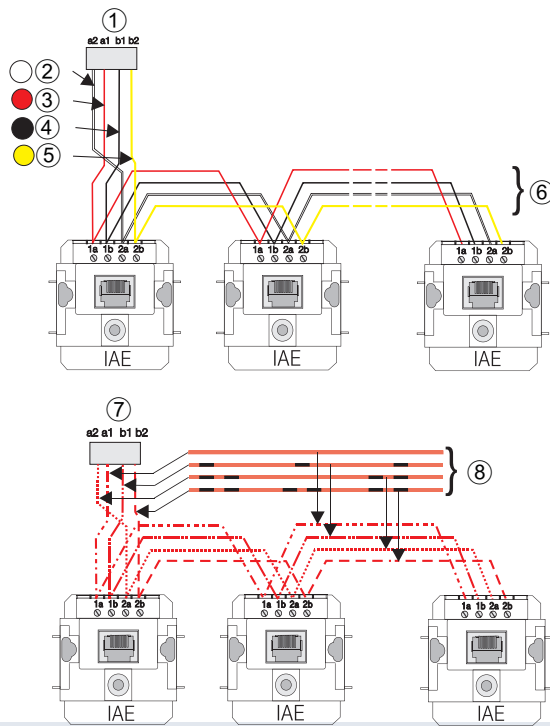
Access	Double wire designations	analog		ISDN			LAN
		2-wire	4-wire	S0	UP0	S2m	
1	3a					RL2	T+
2	3b					RL1	T-
3	2a		c	R+			R+
4	1a	a	a	T+	a	XL2	
5	1b	b	b	T-	b	XL1	
6	2b		d	R-			R-
7	4a						
8	4b						

Connecting the cables

Ensure that no more than 100 mm of the sheathing is removed from the lines and that the stranded or twisted wires are led to the terminal bays. The wire ends must be stripped of ca. 7mm of their insulation prior to attachment. Ensure during stripping of the insulation that the copper wires are not damaged or notched.



ISDN bus with IAE jacks

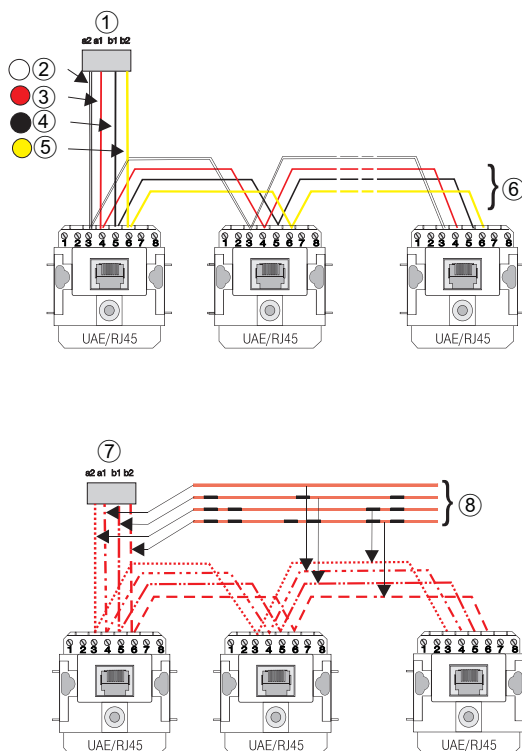


- ① Internal ISDN port of the PABX
- ② white
- ③ red
- ④ black
- ⑤ yellow
- ⑥ cable Y (St) y2x2x00.6
- ⑦ Internal ISDN port of the PABX
- ⑧ J-YY 0,6

Note

Please mind the terminating resistors in the last jack.

ISDN-bus with RJ45-jacks (UAE)



- ① Internal ISDN port of the PABX
- ② white
- ③ red
- ④ black
- ⑤ yellow
- ⑥ cable Y (St) y2x2x00.6
- ⑦ Internal ISDN port of the PABX
- ⑧ J-YY 0,6

Note

Please mind the terminating resistors in the last jack.

Terminating resistors

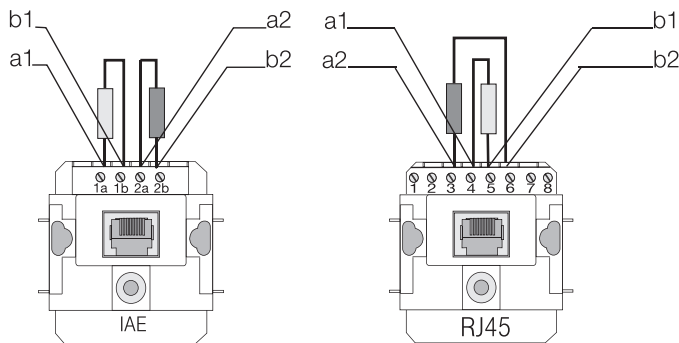
Note

The terminating resistors on the cable terminal bay of the PABX are active when the switch is set to »ON«.

With the terminating resistors, an ISDN bus (point to multi-point) or a point to point connection is made on both sides. In this process, the a and b wires of both pairs of wires over 100 Ohm resistors are connected to one another. As resistors, 100 Ohm resistors 0.25 Watts are suitable. They are connected with the line wires as depicted in the picture. Ready-to-use terminating resistors or ISDN adapters with integrated terminating resistors are available in stores.

Note

Terminating resistors must always be installed in both pairs of wires. Please note the different connections for the terminating resistors at RJ45 UAE and IAE jacks!

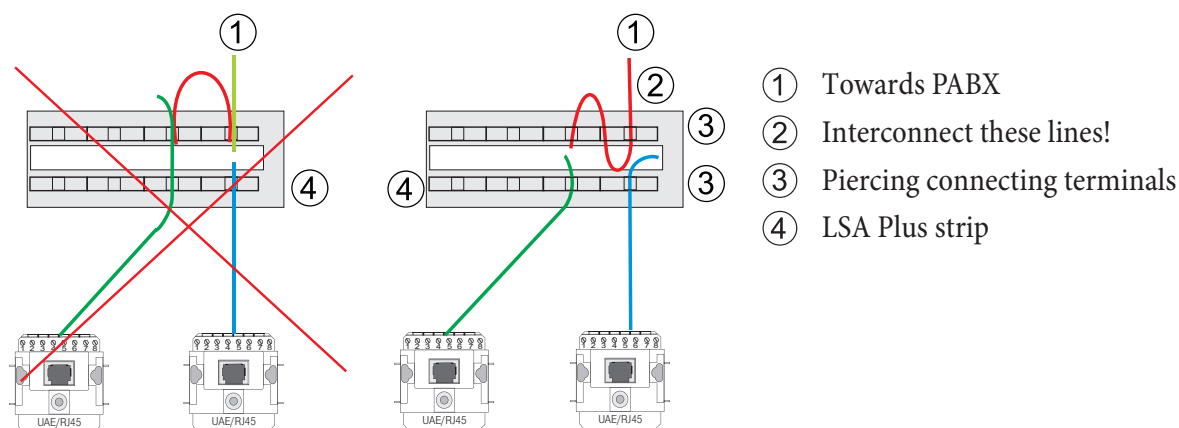


Piercing connecting terminals

You can also use an additional terminal patch (subdistribution or patch panel e.g. LSA Plus strip) between the PABX system and the ISDN jacks of your installation. With conventional terminals the insulation of the installation cable is removed and the cable clamped or screwed securely beneath the connecting strip. With piercing terminals you do not have to remove the insulation from the cable, as the terminals pierce or cut through the insulation and establish contact with the cable. When using piercing terminals, you will require a special installation tool.



Please note here that you can only connect one installation cable in each LSA Plus insulation piercing terminal, as otherwise there may not be proper contact of the wire.



Connections of the PABX

Note

Always switch off the power supply before working on the cable terminal bay!

Note

Attention! Switching the external and internal ISDN ports is carried out exclusively through configuration. You should check before switching the ports, that no external supply is connected to them. The PABX output or the network termination unit could otherwise be damaged!

The external and internal ISDN connections are routed to an 8-pin RJ45 jack (Western jack). The catch on the ISDN connector points up. The four middle pin connections (3,4,5,6) of the RJ45 jack are connected. Hardwiring terminals are provided for internal connection. You can also use »star-type wiring« for installing the PABX systems. For this, you can deactivate the internal terminators.

Connecting analog terminals

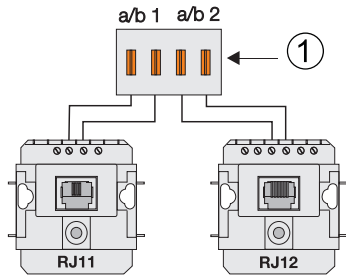
Analog terminals are, for example, telephones, multifunctional devices, fax machines of group 2/3 and call answering machines which can be connected to the conventional telephone network or to analog PABX systems. The calling method used for these terminals can be either pulse (PD) or multifrequency (DTMF). The PABX supports both these dialing methods. However, certain functions of the PABX can only be used via the Flash function of the terminal devices. This Flash function is only possible with DTMF dialing. The analog terminal devices are connected via 2-wires; the connections on the terminals are designated with »a« and »b«. The connection of each terminal device must always take place via one pair of wires.

International

Connection with RJ-jacks:

- **RJ11.** The jack has 4 contacts (2...5). Connection takes place to the terminals with the designation 3 (a-wire and 4 (b-wire). The connector of the connection cables has 6 contacts.
- **RJ12.** This jack has 6 contacts (1...6). Connection takes place to the terminals with the designation 3 (a-wire and 4 (b-wire). The connector of the connection cables has 6 contacts.
- **RJ45.** This jack has 8 contacts (1...8). Connection takes place to the terminals with the designation 4 (a-wire) and 5 (b-wire). The connector of the connection cable has 8 contacts.

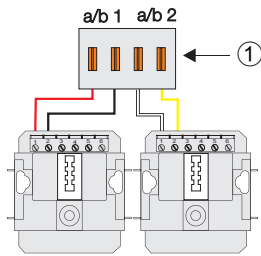
When selecting jacks, please check whether the connector of the connection cable for your terminal device has 6 or 8 contacts.



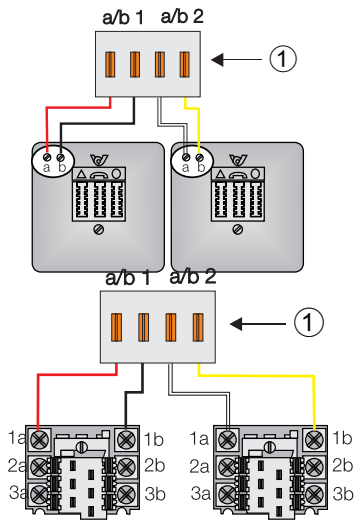
Germany

Analog terminal devices are connected using TAE-jacks.

Note that when using telephones, TAE jacks with code »F« for additional devices, such as Fax group 2/3 TAE jacks with the code »N« must be used. Ask your dealer about the coding for the connections when purchasing any jacks.

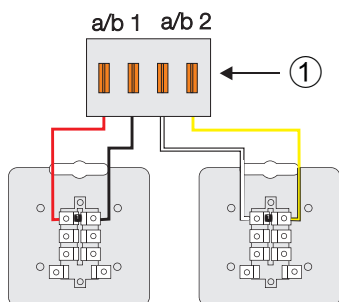


Austria



Switzerland

France



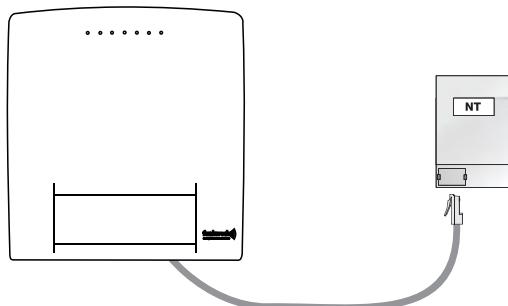
USB port

The PABX system is a full-speed USB terminal device with rates up to 12 MBit/s. Power is supplied to the USB port via the PABX system. The PABX system is a self-powered, category 1.1 full-speed terminal device

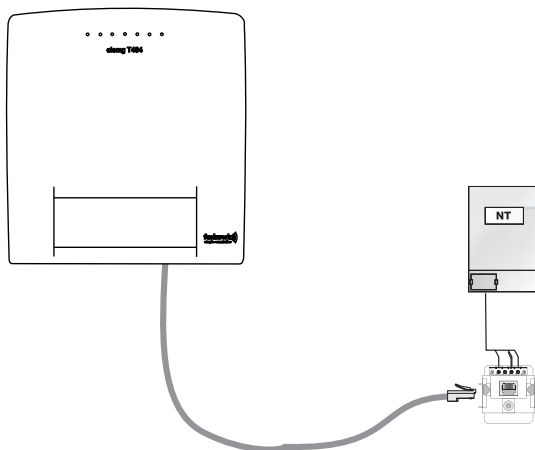
Connecting options for PABX systems

Connecting the PABX to the ISDN network of the network service provider

The following figures illustrate the connecting options for the PABX to the external ISDN connection.



Direct ISDN connection using the ISDN connecting cord supplied with the system at the network termination (NT). This connection option is possible with point-to-point and point-to-multipoint connections. The switches for the terminators in the PABX system must be closed.



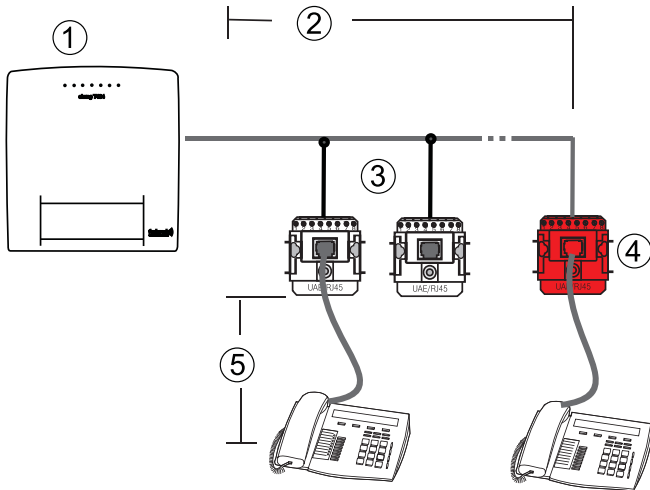
Connection to an ISDN jack installed downstream of the network termination. This connection option is possible with point-to-point and point-to-multipoint connections. Ensure proper connection of the terminating resistors in the PABX, the network termination and the jack.

Internal ISDN connection

»Short passive bus«

The internal ISDN connection of the pabx is set as a »Short passive bus«. The »short passive bus« has a length of 120 meters. Up to 12 ISDN jacks may be connected in series. You can connect up to 8 terminal devices. Combined, internal terminal devices may have a maximum consumption of up to 2 W. Other terminal devices on the bus must have external power supply (with their own power supply units). Two of the ISDN terminal devices can be in operation si-

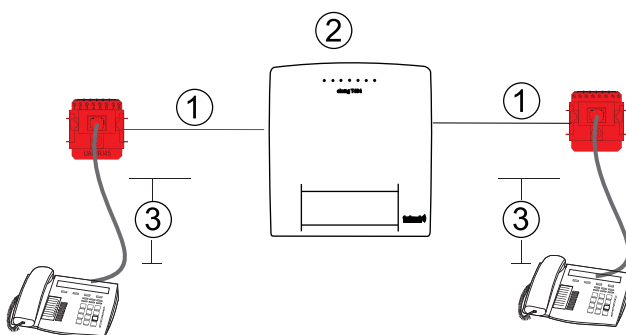
multaneously (e.g., you can use two phones to telephone internally or externally simultaneously using one bus). The 100 ohms terminating resistors must be connected to the last ISDN jack installed on the ISDN bus.



- ① PABX with active terminating resistors.
- ② Bus length: See connecting lines.
- ③ A maximum of 12 ISDN jacks on the bus.
- ④ Terminating resistors in the last ISDN jack.
- ⑤ A maximum of 8 ISDN terminal devices can be used. The length of connection cables for the terminal devices is restricted to 10 meters.

»Short passive bus«: Star-type wiring (structured wiring)

Star-type wiring is a special version of the »short passive bus«. Here, you can use the existing 4-wire installation for connecting ISDN terminal devices to an internal ISDN bus. Depending on the cables used, the distance between the two ISDN jacks for a star-type wiring configuration may not be greater than 120 m (up to 180 meters with CAT. 5 cables). Connect only one ISDN jack (also with 2 RJ45 jacks) to the two ends of the ISDN bus and plug the ISDN terminal devices directly into the jack.



- ① Right and left branch of a star-type wiring.
- ② PABX.
- ③ One ISDN terminal device only can be used. The length of connection cables for the terminal devices is restricted to 10 meters.

The branches of a star-type wiring are longer than 10 meters:

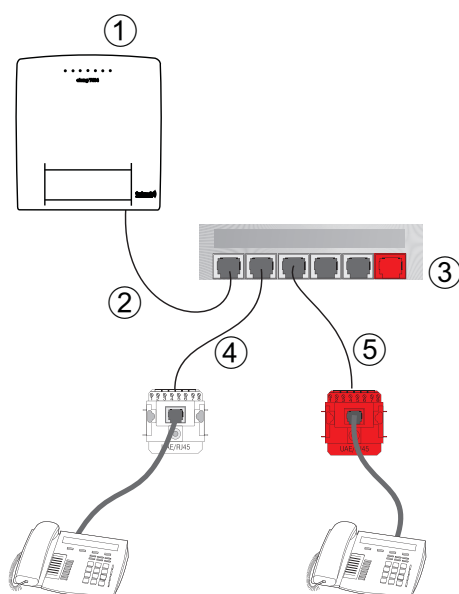
- Terminating resistors must be fitted to the jacks at both ends. The terminating resistors in the PABX system for the corresponding connection must be opened.

The branches of a star-type wiring are shorter than 10 meters:

- No terminating resistors required for the jacks at both ends. The switches for the terminators in the PABX system must then be closed.

»Short passive bus«: Star-shaped structured wiring

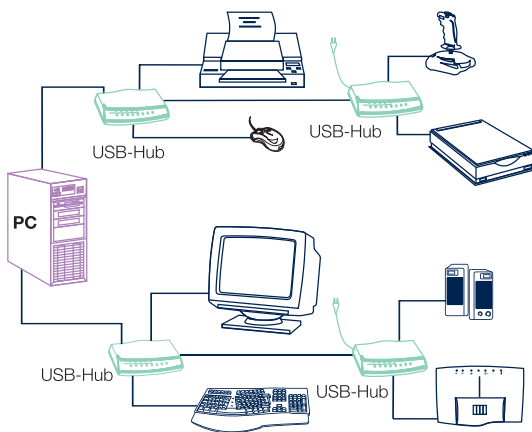
Structured wiring based on the existing installation in the building using 8-wire installation cable routed in a star shape from a central point. In order to use several terminal devices at one ISDN connection, this configuration should run as a bus from terminal to terminal. To take full advantage of the 8-wire building installation configuration, 4 wires are connected to each terminal device as feed lines and 4 as return lines. In this manner, a star-type ISDN bus is created. Coupling of the 4 forward and 4 return cores can be effected in the ISDN jack, or via a star adapter that can be plugged into the ISDN jack. The terminating resistors are either installed in the last ISDN jack or integrated into the ISDN star router. Since this installation also represents a »short passive bus«, the maximum total length may not exceed 120 meters (including forward and return lines).



- ① PABX with active terminating resistors.
- ② Connection of the hub to the PABX (4-wire).
- ③ ISDN hub.
- ④ 8-wire line: 4 wires for the feed line and 4 for the return line.
- ⑤ Terminating resistors in the last ISDN jack.

Some companies offer star routers with various expansion stages. Ensure that you observe any special features in the operating instructions of these devices.

USB port



General Information about USB (specification 1.1)

USB is the abbreviation for Universal Serial Bus. USB is a serial bus system that allows you to operate various types of devices at one port. This interface can supplement or replace various PC ports (serial, parallel, . . .) devices at one port.

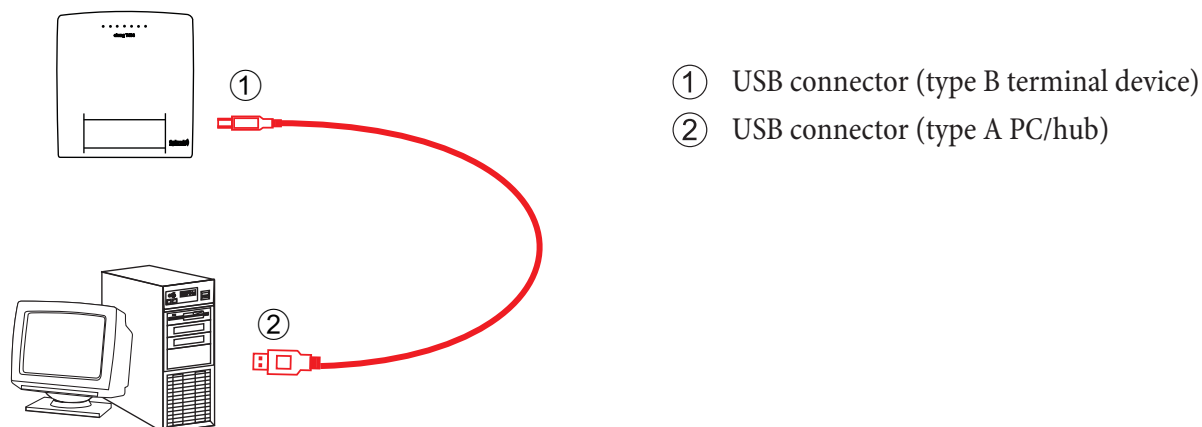
USB is equipped with a standardized API (Application Programming Interface) that is based on the Microsoft Win32 driver model (WDM).

In the past, if you wished to operate a new device on the standard ports of your PC, installation (unscrew PC, open it, insert card) and configuration procedures (set interrupts and addresses and eliminate any conflicts) were often difficult or complicated. To put a USB terminal device into operation all you have to do is plug it in to the USB port. The configuration of the terminal device is carried out automatically by Plug&Play-compatible operating system (for example Windows 98, ME, 2000). You then only have to insert the disk or CD containing the drivers for your device and install the appropriate drivers. You only need to restart your PC on the initial startup of the USB terminal device. With a Plug&Play operating system you can also unplug the connector of an installed terminal device from the USB and plug it back in while the PC is running. You do not need to restart your PC after this. The operating system automatically recognizes the terminal device that has been plugged in and then loads the required drivers.

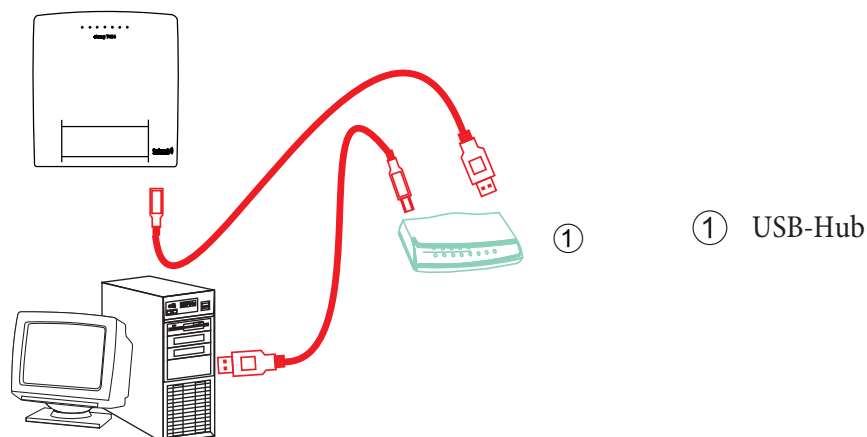
A standard connector and cabling system allows you to connect any type of terminal devices (such as keyboard, mouse, printer, scanner etc.) A distinction is made here between type A- and type B plugs. The different architecture of these connectors means that you can not confuse them. When installing a USB terminal device, plug Type A is connected to the sending device (your PC or a hub) and plug Type B into the receiving device (printer, scanner, telephone , etc.).

Connecting the PABX via USB to the PC

Connect the PABX to the USB port of your PC as shown in the figure. Use the USB cable supplied with the system.



You require a USB hub (USB distributor) if you wish to use several USB terminal devices at your PC. Connect the hub to the USB port of the PC. You can then connect other USB terminal devices, including the PABX, to the hub. Use the USB cable supplied with the system.



Note

Use the USB cord supplied with the system to connect the pabx to the PC, or to the hub. If you use a different USB cord, ensure that the distance between the pabx and the PC, or between the pabx and the hub, does not exceed five meters, depending on the type of cord you are using.

USB cables

Full Speed	Data line: Twisted pair (min. 28 AWG) shielded
	Power supply: non-twisted pair (min. AWG 28), also for shielding
	Maximum length 5 meters
	Connector: A and B connector
Low speed	Lines: 4 wires (min. AWG28). 2 each for power supply and data lines
	Maximum length. 3 meters
	Line always fixed to the device
	Connector: A connector at the free end

Cable length and type

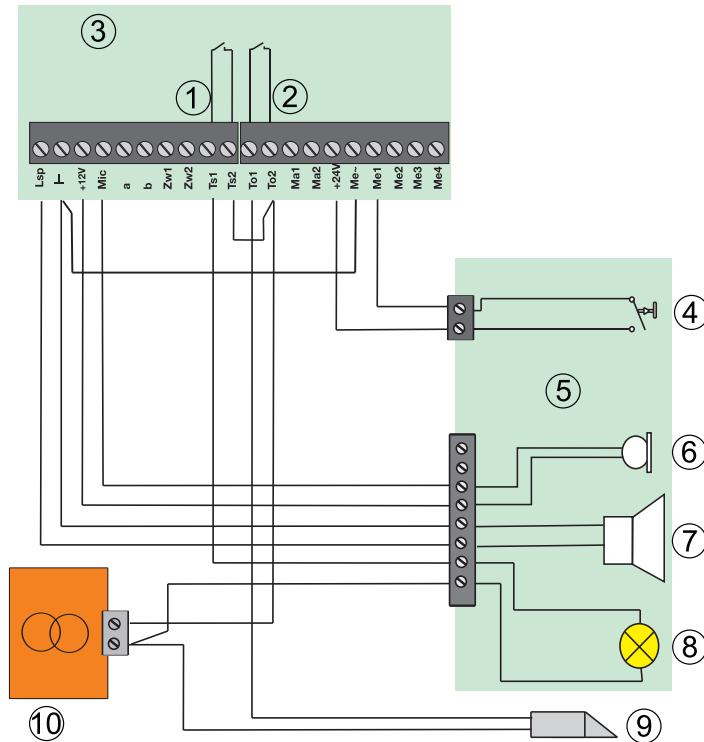
Line delay 30ns			
AWG	Resistance (Ohm/ meter)	max. length in meters	
28	0,232	0,81	
26	0,145	1,31	
24	0,091	2,08	
22	0,057	3,33	
20	0,036	5,00	
Colors			
VCC	Data+	Data-	Ground
red	grün	white	black

Installation examples

Door intercom module

Interfacing of a standard door phone unit

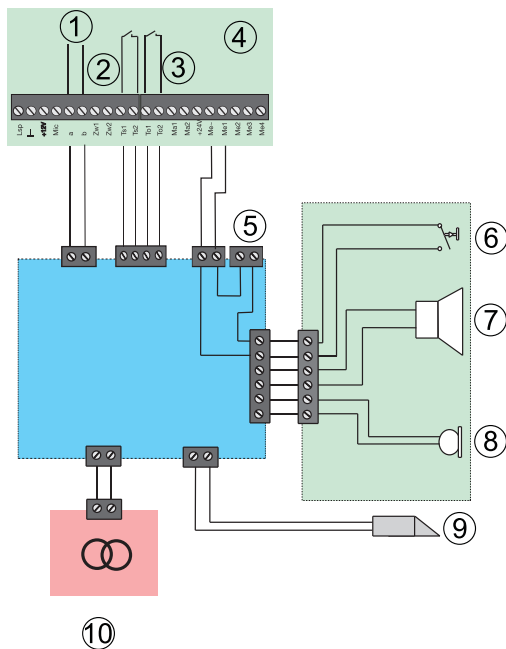
The figure below illustrates the connection of a door phone equipped with a microphone and speaker. No door intercom amplifier is required for this connection. The bell transformer is used only for the door opener and the operating signal lamp. The interface connections at the door phone and bell transformer should only be seen as examples. When the doorbell is rung, the call is signaled at all terminals entered in the door terminal call mode. If you configure an answering machine in the call mode, the party at the door will be able to hear the answering machine message.



- ① Contact for activating the door intercom amplifier (in this example an operating signal).
- ② Door opener contact.
- ③ Door intercom module.
- ④ Doorbell button.
- ⑤ Door phone.
- ⑥ Dynamic microphone, or Elektret microphone with built-in preamp.
- ⑦ Speaker.
- ⑧ Operating signal. In this case, this lamp will light up when the door intercom is activated.
- ⑨ Door opener
- ⑩ Bell transformer (max. 24 VAC)

Interfacing of a door intercom module according to FTZ guideline 123D12

The figure below illustrates the connection to the door intercom module of a door phone equipped with a microphone, a speaker and a power supply unit. This door opening unit module is designed in accordance with FTZ guideline 123 D12. Ask your dealer about this. Ensure that the doorbell button is connected potential-free. When the doorbell is rung, the call is signaled at all terminals entered in the door terminal call mode. If you have an answering machine entered there, for example, a party at the door will be able to hear the answering machine message.



- ① Analog speech channel a/b.
- ② Potential free contact for activating the door intercom module.
- ③ Potential-free contact for the door opener.
- ④ Door intercom module.
- ⑤ Power supply by the door intercom amplifier or by an external bell transformer (max. 12 VAC).
- ⑥ Doorbell button.
- ⑦ Speaker.
- ⑧ Microphone.
- ⑨ Door opener
- ⑩ Bell transformer (max. 24 VAC)

Interfacing of call signaling at the doorbell system

The figure below shows the connection of the door intercom module to an existing doorbell system. When the doorbell is rung, the call is signaled at all terminals entered in the door terminal call mode. You can connect up to four doorbell buttons and assign a door terminal call mode to each button. In this manner, when the doorbell button is pressed, only the phones assigned to that button will ring. If there are several doorbell buttons, the button pressed last will be signaled. Signaling of the button pressed first is terminated.

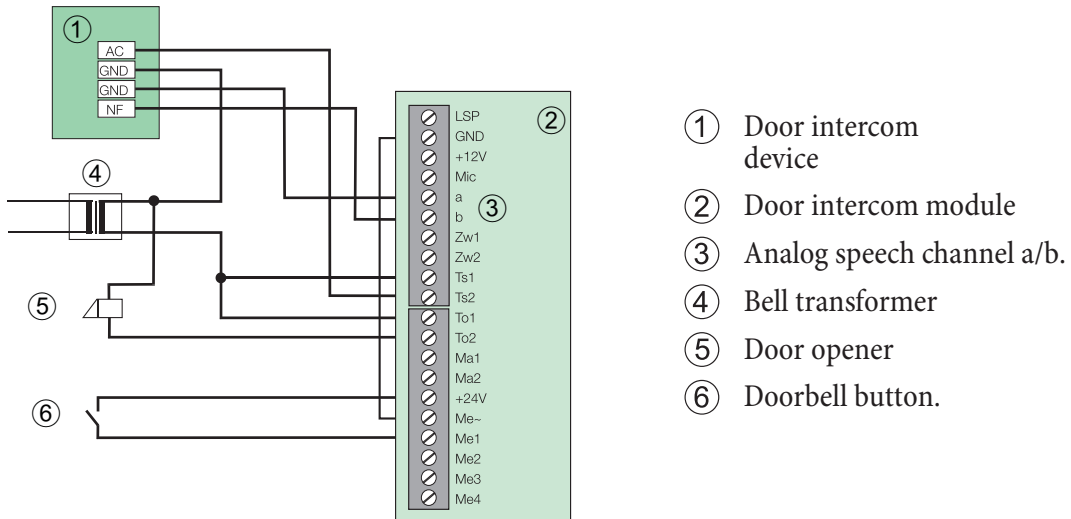
Second bell

As defined in the configuration, a switching contact is actuated in the ringing cycle when a specific terminal is called. If a bell is connected to this switching contact, it will ring when this terminal is called. This setup is designated second bell.

Central bell

As defined in the configuration, a switching contact is actuated in the ringing cycle when a specific extension number is called from an external number. If a bell is connected to this switching contact, it will always ring when the corresponding MSN extension is called from an external number. This setup is designated central bell.

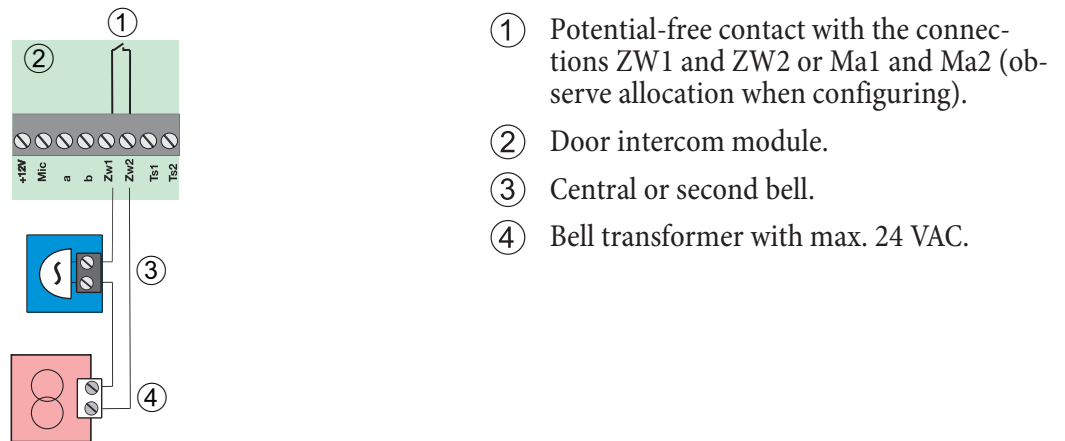
You can define up to 2 second bells or central bells for each door terminal.



- ① Door intercom device
- ② Door intercom module
- ③ Analog speech channel a/b.
- ④ Bell transformer
- ⑤ Door opener
- ⑥ Doorbell button.

Connection of the central or second bell

The connection setup below is an example of an AC current bell that is supplied from a bell transformer. If you connect a DC bell, use the appropriate power supply unit.



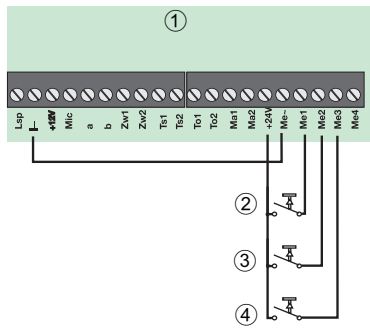
- ① Potential-free contact with the connections ZW1 and ZW2 or Ma1 and Ma2 (observe allocation when configuring).
- ② Door intercom module.
- ③ Central or second bell.
- ④ Bell transformer with max. 24 VAC.

Note
Only 1 central or second bell may be connected to Zw1/Zw2.

Only bell transformers in compliance with VDE0551 may be used. If you have any questions please contact your electrician or your specialized dealer.

Interfacing call signaling for terminal devices using buttons

If you wish to ring the terminal devices entered in the door terminal call mode by pressing a button, you can use the connection shown in the figure below. The circuit diagram shows three bell buttons.

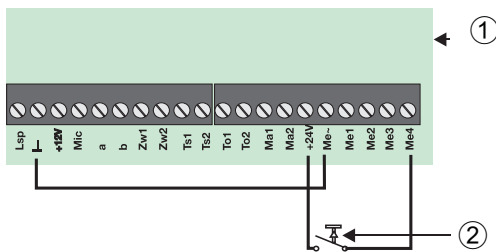


- ① Door intercom module.
- ② Doorbell 1.
- ③ Doorbell 2.
- ④ Doorbell 3.

Alarm input

Switching conditions for alarm input:

The maximum length of the line from each sensor up to the telephone system is 50 meters. Use shielded cables. Connect the shield to »ground« (e. g. water pipe). If at all possible, avoid laying cables in open, exposed areas, as there is a risk of damage to the PABX caused by excessive voltage (surges) during thunderstorms. The resistance at the alarm input may have a maximum of 1 kOhm when closed, and must have a minimum of 100 kohms when opened.

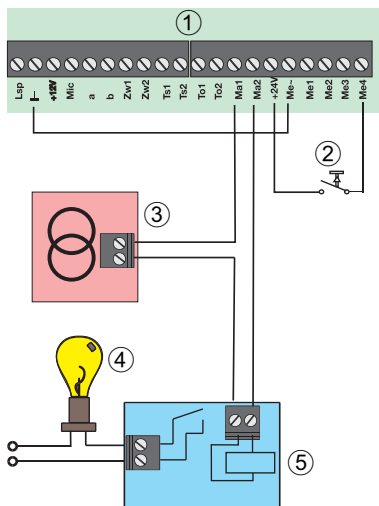


- ① Door intercom module
- ② External signal contact

Switching contact for remote relay control

This example is provided to illustrate how you can implement light and device control via your PABX. If the control is connected to the 230 V system, note that installation of the electrical connection for the additional devices must be carried out by a qualified electrician to ensure that there is no risk posed to persons or material!

The following example illustrates the control for a relay for switching a light. You can actuate the contact from the alarm input sensor or from the internal telephones. Please program the switching contact accordingly.



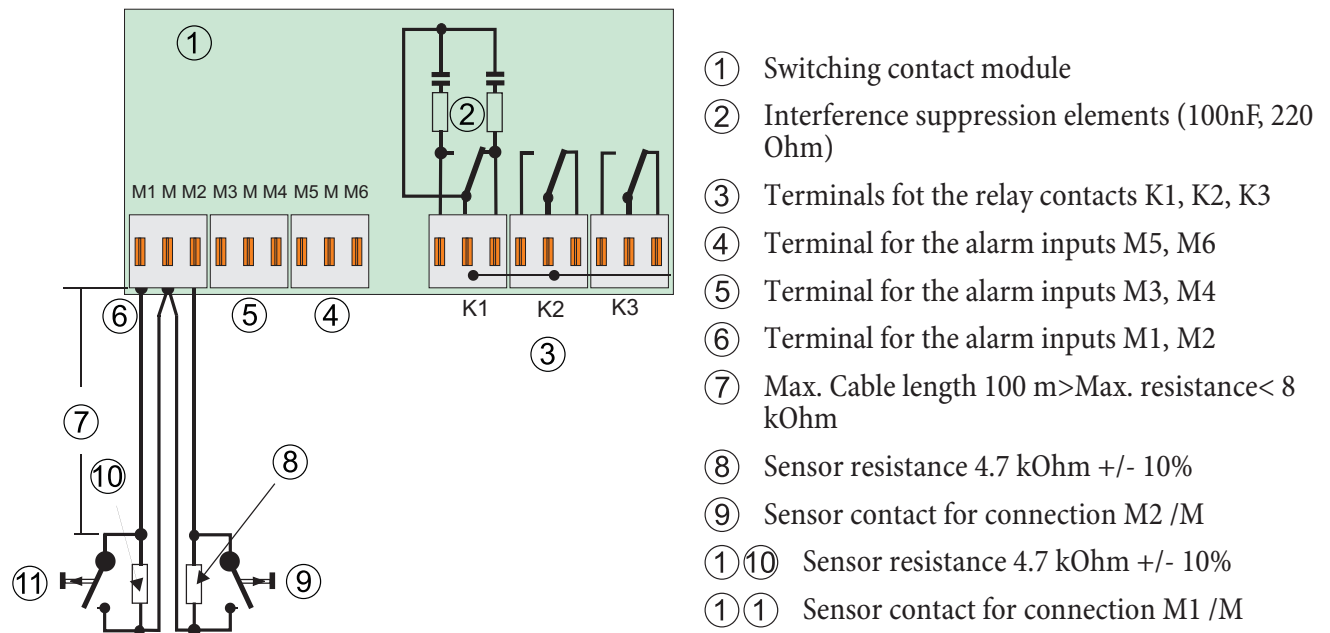
- ① Door intercom module.
- ② External signal contact.
- ③ Bell transformer with max. 24 VAC.
- ④ Controlled device (in this exemple a lamp).
- ⑤ Relais.

Contact module

Note
Be sure to connect 4.7 kOhm (e.g. in the bottom screen. M3...M6) to all unused alarm inputs to prevent any unne-

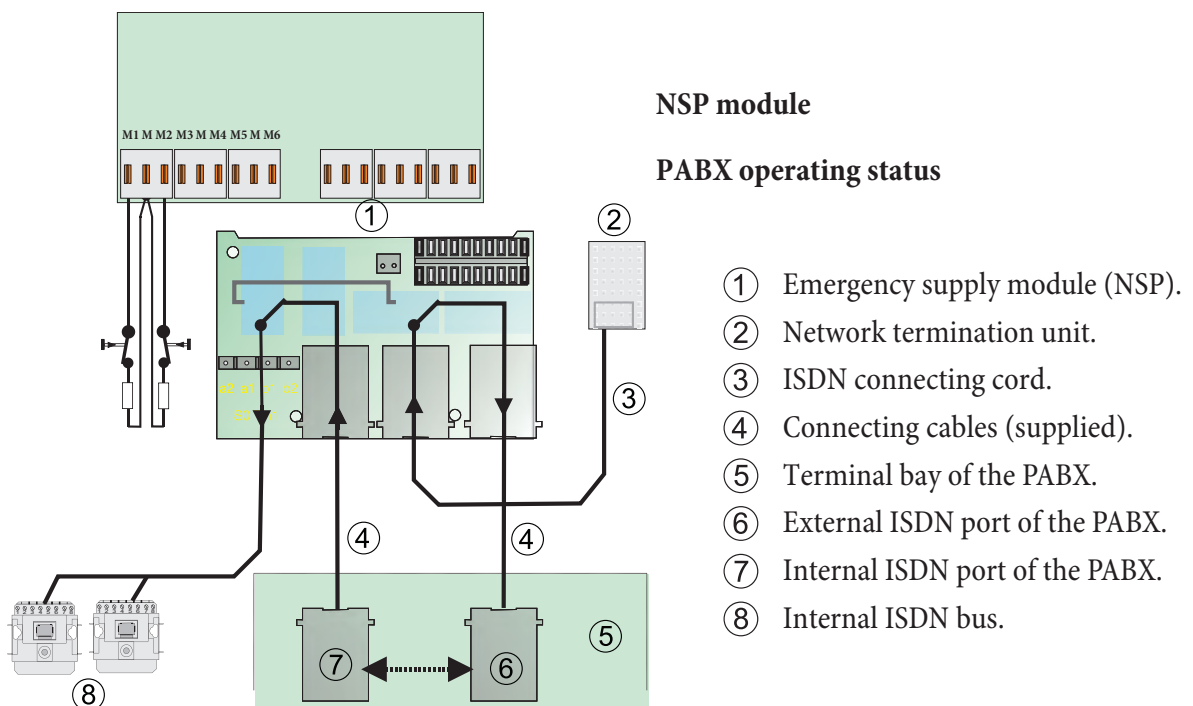
cessary fault messages.

Connecting the alarm input via a make contact (make contact element).

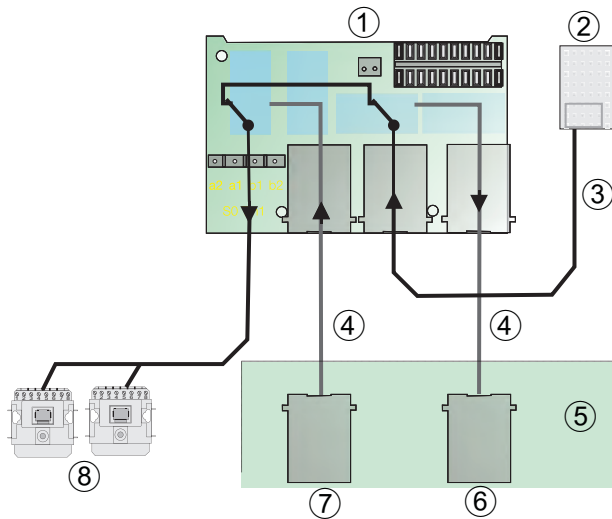


Connecting the alarm input via a break contact (break contact element)

You can also use this circuit via a break contact element, as shown in the example below. A single alarm call is then made when the contact is opened (line disruption). After this the contact must be reliably closed again, as otherwise no further alarm calls will be possible.



Loss of power in the PABX>



- ① Emergency supply module (NSP)
- ② Network termination unit.
- ③ ISDN connecting cord.
- ④ Connecting cables (supplied).
- ⑤ Terminal bay of the PABX.
- ⑥ External ISDN port of the PABX.
- ⑦ Internal ISDN port of the PABX.
- ⑧ Internal ISDN bus

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