bintec elmeg
Teldat Group Company

elmeg ICT

Installation guide
English

Declaration of conformity and CE mark

This device meets the requirements of the following EC directive R&TTE 6/1999/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.bintec-elmeg.com.

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.

Function descriptions included in this documentation which refer to software products of other manufacturers are based on the software used and valid at the date the documentation was prepared or published. The product and company names used in this documentation may be protected by trademarks.

Table of contents

Safety notes

Assembly instructions

Important notes for using the PABX system

- Unauthorized opening of the PABX and improper repairs may result in risk of injury for the user.
- Unplug the 230 V AC connector plug before removing the enclosure cover and working on the cable terminal bay. Replace the cover before reconnecting the 230 V AC connector.
- Do not expose the inside of the PABX to any liquids; This would pose a risk of electrical shock. If you expose the inside of the PABX to liquids the PABX can be destroyed.
- You should not connect or disconnect any lines during thunderstorms.
- Only terminals with SELV and/or which comply with ETS 300047 may be connected to the PABX system. This regulation is fulfilled when approved terminal devices are used as intended.
- Connect functional grounding (see page 9).
- The PABX is powered by a 230 V AC utility outlet. Ensure that the electrical installation (grounding outlet) for the PABX system (and for additional devices where required) is installed by a qualified electrician to prevent any risks of personal or material injury/damage! Where at all possible, provide a separate power circuit for the 230 V AC connection of your PABX system. This protects your PABX from short-circuits that may occur in other in-house equipment.
- We recommend installing an overload protection to protect your PABX against surge that can sometimes occur during thunderstorms. For further information please contact your local electrician.
- 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.
  Observe the storage and operation temperatures for the PABX listed in the technical specifications.

Installation

Installation procedure

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

If you are operating the ICT880rack in an environment with a high level of interference (e.g. in rooms with machines, lifts, printers etc.), you should protect every connected line with the fine protection module. In this case, it is absolutely essential that a functional earth is connected to the telecommunications system. Please observe the instructions given on the following pages:

Page 9 Functional grounding
Page 2 Rückseite
Page 11 Inside view of the elmeg ICT880-rack
Page 12 Connecting the cables
Page 27 Extensions of the ICT pabx-systems
Page 51 Note for installing the door terminal module into the ICT800rack

as well as the specific installation notes for the modules being used

Please observe the safety instructions.

- Select an installation location that is always freely accessible and is a maximum of 1.5 meters away from a 230 V AC outlet and the network termination (ISDN connection) of the service provider. Ensure that you can lift the PABX unit away from the wall at all times and that it is not boxed in by shelves or cabinets for example.
- 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 and that there are no concealed mains cables or other wiring at the drilling points you have selected.
- Drill the mounting holes at the marked positions (when using dowels, use a 6 mm masonry drill). 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.
- 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.
- Open the PABX system.
- Hang the PABX on the screws by inserting the screw heads into the rear panel mounting holes.
- Then secure the PABX by screwing the third screw into the bottom dowel. Attention! This screw is used for mounting and must be removed prior to commissioning.
- Install and connect functional grounding to the PABX using a 2.5mm 2 cable. This connection is required for use of overload protection modules (FSM).
- Install the jacks for the ISDN terminal devices and the analog terminal devices and then connect the PABX system to the jacks. Plug the terminal device connectors into the jacks.
- You can now configure your PABX system yourself by using a PC which can be attached to the »PC interface« or the internal ISDN port or the USB port.
  To configure your system via the internal ISDN connection, you must have an operational ISDN PC card in-

stalled in your PC. To configure your system via the PC port, connect the PC port on your PABX to the corresponding port on your PC using the PC connecting cord (RS232 or USB) supplied with the system.

- The mains plug for the network termination unit (NT) does not have to be plugged in in order for the telephone system to operate properly.

Note:
Do not connect the network termination unit to the PABX system yet! Ensure that your PABX system is in its initial state. If you are not sure, you should first reset your PABX. This is possible via configuration or via the reset procedure described in the operating instructions.

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!

- Connect the »S04: INT/EXT« (elmeg ICT 88 / 880) port to the network termination unit via the ISDN connecting cord.
- **Remove the third screw.**
- Close the enclosure.
- You can now use your telephone system.

Loss of power

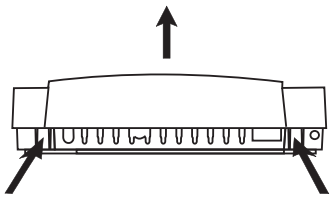
On loss of power (230 V AC power supply) the PABX is not operational, meaning that you can make neither internal nor external calls.Please use an emergency power supply (UPS) or a powerfail module in order to operate an ISDN phone with emergency power capabilities with your PABX. Any internal or external connections that were separated by a loss of power are not automatically restored on return of power.

The features configured using setup programming are unaffected by a loss of power.

Opening and closing the PABX

Unplug the connector plug before opening the PABX.

To open the PABX, press in on the two catches and lift the cover at the front until it comes free. It can then be easily lifted off. The terminal panel is then visible under the enclosure cover.
To close the PABX, insert the catches (on the back of the enclosure cover) into the openings in the PABX bottom part. Press down on the cover at the front until it catches.



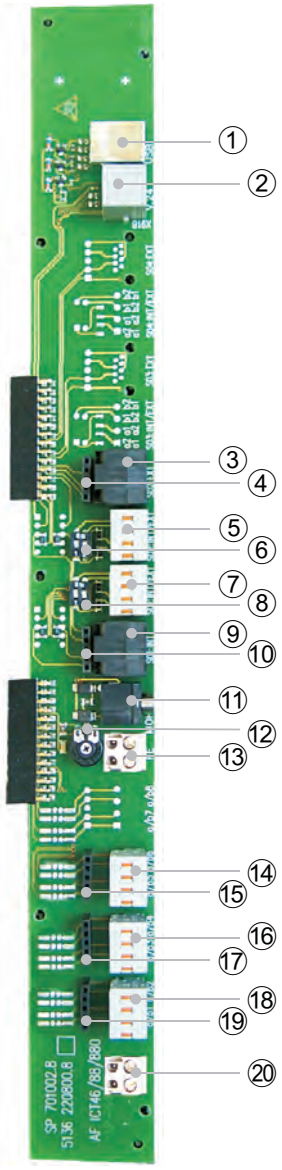
Installation ICT

elmeg ICT46 PABX system

Base model

- 2 ISDN connections, S01 switchable to internal or external
- Six analog connections
- One slot for a Smart Media Card
- 2 module slots (4 a/b II, 8 a/b, UP0, S01, S0 2, S0 4, DECT and VoIP-VPN Gateway)
- 2 Special slots (1xdoor phone, contacts, voice announcement, POTS and emergency supply module)

Patch panel of the elmeg ICT46



① USB port (see page 76)
② RS232 port (see page 76)
③ Jack for the external ISDN port S02: EXT
④ Jack for the S02 overload protection module (see page 34)
⑤ External ISDN connection S02: INT/EXT
⑥ Switch for the terminating resistors S02
⑦ Interner / External ISDN connection S01: INT/EXT (see page 73)
⑧ Switch for the terminating resistors S01
⑨ Jack for the internal ISDN port S01: INT
⑩ Jack for the overload protection module S01
⑪ Input for external music on hold with volume control (volume) (see page 75)
⑫ Volume setting for external music on hold
⑬ Functional grounding)
⑭ Connection for analog terminal devices 5 and 6 (a/b5 a/b6) (see page 74)
⑮ Jack for the overload protection module
⑯ Connection for analog terminal devices 3 and 4 (a/b3 a/b4)
⑰ Jack for the overload protection module
⑱ Connection for analog terminal devices 1 and 2 (a/b1 a/b2)
⑲ Jack for the overload protection module
⑳ 12V output = max. 50 mA

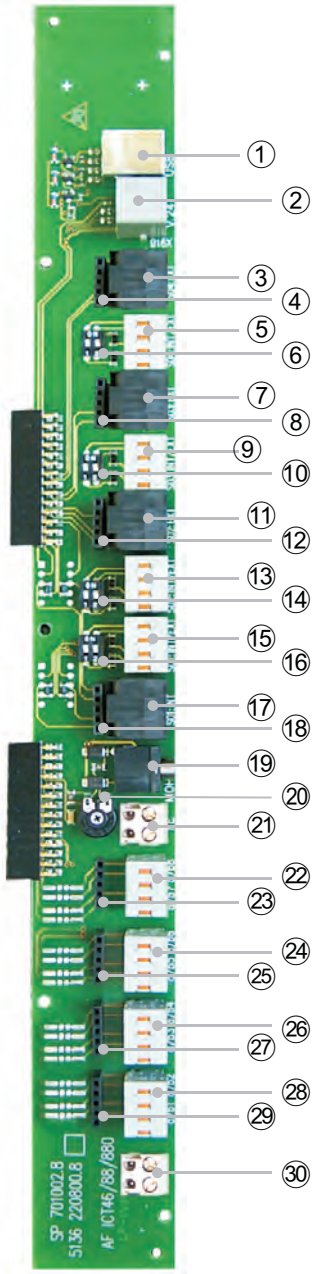
If you are operating the pabx- system in an environment with a high level of interference (e.g. in rooms with machines, lifts, printers etc.), you should protect every connected line with the fine protection module. In this case, it is absolutely essential that a functional earth is connected to the telecommunications system.

PABX elmeg ICT88 /880

Base model

- 4 switchable ISDN connections (internal / external)
- Eight analog connections
- One slot for a Smart Media Card
- 2 module slots (4 a/b II, 8 a/b, UP0, S01, S0 2, S0 4, DECT and VoIP-VPN Gateway)
- 2 Special slots (Door intercom device, contacts, voice announcement, S2m, POTS and emergency supply module)
- (only elmeg ICT880) Connector for the elmeg ICT880xt expansion module

Patch panel of the elmeg ICT88



① USB port (see page 76)
② RS232 port (see page 76)
③ Jack for the external ISDN port S04: EXT
④ Jack for the S04 overload protection module (see page 34)
⑤ Internal / External ISDN connection S04: INT/EXT (see page 73)
⑥ Switch for the terminating resistors S04
⑦ Jack for the external ISDN port S03: EXT
⑧ Jack for the overload protection module S03
⑨ Internal / external ISDN port S03: INT/EXT
⑩ Switch for the terminating resistors S03
⑪ Jack for the external ISDN port S02: EXT
⑫ Jack for the overload protection module S02
⑬ Internal / external ISDN port S02: INT/EXT
⑭ Switch for the terminating resistors S02
⑮ Internal / external ISDN port S01: INT/EXT
⑯ Switch for the terminating resistors S01
⑰ Jack for the internal ISDN port S01: INT
⑱ Jack for the overload protection module S0119
⑲ Input for external music on hold with volume control (volume) (see page 75)
⑳ Volume setting for external music on hold
㉑ Functional grounding
㉒ Connection for analog terminal devices 7 and 8 (a/b7 a/b8) (see page 74)
㉓ Jack for the overload protection module
㉔ Connection for analog terminal devices 5 and 6 (a/b5 a/b6)
㉕ Jack for the overload protection module
㉖ Connection for analog terminal devices 3 and 4 (a/b3 a/b4)
㉗ Jack for the overload protection module
㉘ Connection for analog terminal devices 1 and 2 (a/b1 a/b2)
㉙ Jack for the overload protection module
㉚ 12V output = max. 50 mA

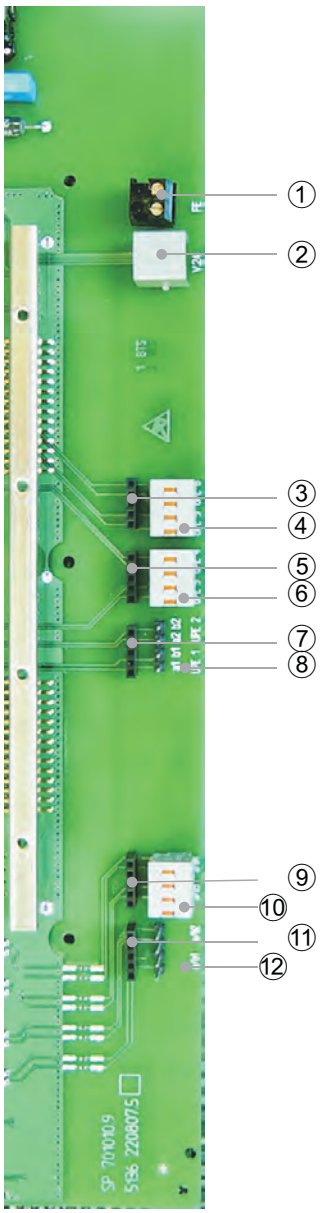
If you are operating the pabx- system in an environment with a high level of interference (e.g. in rooms with machines, lifts, printers etc.), you should protect every connected line with the fine protection module. In this case, it is absolutely essential that a functional earth is connected to the telecommunications system.

elmeg ICT880xt PABX system expansion module

Base model

- 6 internal UP0-connections
- Four analog connections
- 2 module slots (4 a/b II, 8 a/b, UP0, S01, S0 2, S0 4, DECT and VoIP-VPN Gateway)
- 2 Special slots (Door intercom device, contacts, voice announcement, and module emergency supply)
- Plug for connection to the elmeg ICT880 PABX system

Patch field on the elmeg ICT880xt expansion module

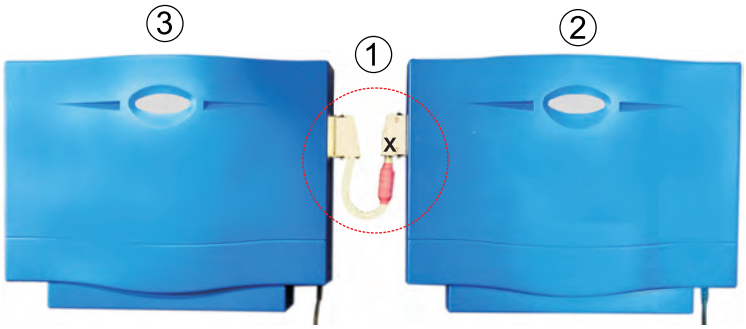


① Functional grounding
② RS232 port (function only available starting from software version 1.2)
③ Jack for the overload protection module (see page 34)
④ UP0-connection UP0 5 / UP0 6 (see page 77)
⑤ Jack for the overload protection module
⑥ UP0-Connection UP0 4 / UP0 3
⑦ Jack for the overload protection module
⑧ UP0-Connection UP0 2 / UP0 1
⑨ Jack for the overload protection module
⑩ Connection for analog terminal devices 3 and 4 (a/b3 a/b4) (see page 74)
⑪ Jack for the overload protection module
⑫ Connection for analog terminal devices 1 and 2 (a/b1 a/b2)

If you are operating the pabx- system in an environment with a high level of interference (e.g. in rooms with machines, lifts, printers etc.), you should protect every connected line with the fine protection module. In this case, it is absolutely essential that a functional earth is connected to the telecommunications system.

Linking the ICT880 and ICT880xt

You can expand the elmeg ICT880 PABX system by connecting it to the »elmeg ICT880xt expansion« module. More ports are then available for terminal devices, depending on the modules being used. Connection is made using the connecting cable supplied with the system.



① Connecting cable
② elmeg ICT880
③ elmeg ICT880xt

The filter that is marked with an »x« must point toward the elmeg ICT 880.

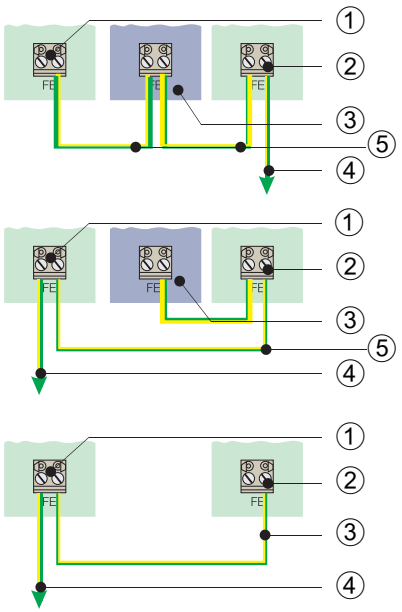
- First, mount the PABX system and the expansion module on the wall.
- Use the drilling template to ensure the correct lateral distance between the two systems.
- Install the elmeg ICT880 and elmeg ICT880xt as shown on Page 2.
-

Functional ground

As your PABX system is equipped with a functional grounding connection, a »ground« (waterpipe, heating system pipe or 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 .

Note:
If you use terminal devices that are linked with the PABX system via USB or RS232, you must install the functional grounding, as otherwise »hum loops« may be produced.

- The two functional ground connections (FE) for the system components must then be linked using a grounding cable with a cross section of 2.5 mm. Three possibilities are shown in the example below, two of which are in conjunction with the POTS module.



① Functional ground elmeg ICT880xt
② FE-Terminal elmeg ICT880
③ In this example: POTS-module
④ Link to the »Grounding circuit connection«)
⑤ Connection cable between the elmeg ICT880 and the elmeg ICT880xt

- The functional ground connection is then made using one of the two ground connections as described under Installation, page 1.
- After this has been done you can plug in the connecting cable to the PABX system and the expansion module. Ensure that the end of the cable marked “X” is facing the elmeg ICT880.
- You can then connect the terminal devices and the external lines.
- When the PABX system is ready for operation close the enclosure of the elmeg ICT880 and of the elmeg ICT880xt.

Connecting the 230VAC power supply

- To switch on the PABX system, both power plugs must be plugged into two separate outlets of **one** power circuit (duplex plug available as optional equipment).
- Always switch on the power supply for both systems, elmeg ICT880 and ICT880xt, at the same time.
- Never switch on the power supply for the elmeg ICT880 first, as otherwise the elmeg 880xt expansion module will not be recognized and can then not be used.

A system reset is performed if power supply to the elmeg ICT 880 or elmeg ICT880xt is interrupted and then restored. Both systems are then again ready for operation.

PABX elmeg ICT 880-rack / elmeg ICT880xt-rack

Front panels

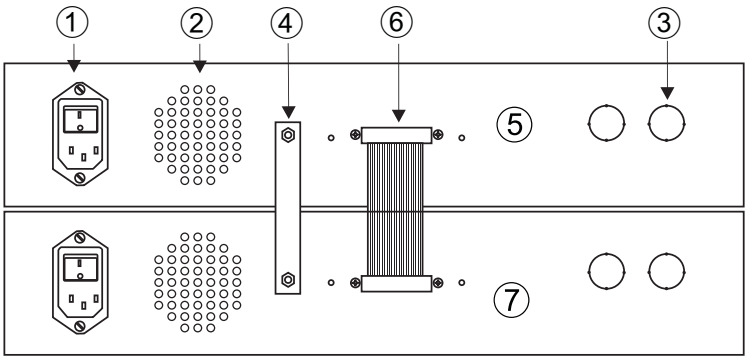
Two mounting angles are provided for rack mounting. Mount these angles to the ICT enclosure using the three screws (see figure below). The screws must be fitted with tooth lock washers.
The figure below shows the front panel of a fully equipped elmeg ICT 880-rack.

The figure below shows the front panel of a fully equipped elmeg ICT 008-rack.

The front panels are fastened with 6 screws to the enclosure. 4 screws at the front and 2 screws at the bottom.

Ready-made labels that you can apply to the appropriate locations on the front panel are included in the »accessory set for the rack module« (not included in the scope of supply for the system).

Back



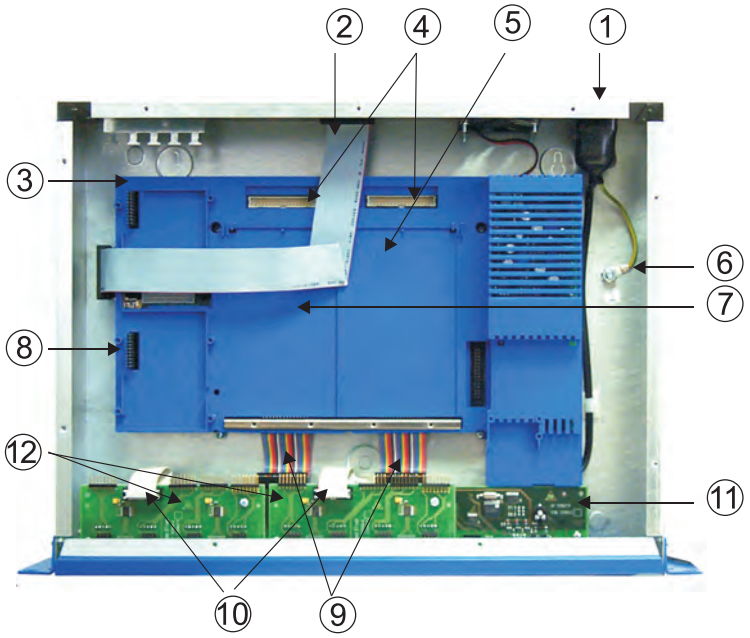
1. 1Three-pin power plug with switch
2. Fan protection grid
3. Cable entry, e. g. door terminal cable
4. Ground connection (M6) with metal lug
5. /7. ICT880-rack or ICT880xt-rack
6. Connecting cable

⚠ The protective earth connection has to be connected to the earthed rack via a protective conductor cable.

Unlike the elmeg ICT880-rack, the elmeg ICT 880xt-rack is equipped with a ground connection fitted with a metal lug. This lug serves as equipontential bond between the two systems. Use a 22.5mm grounding connector for connecting the system with the rack. You can arrange the two PABX system components any way you wish - at top or bottom.

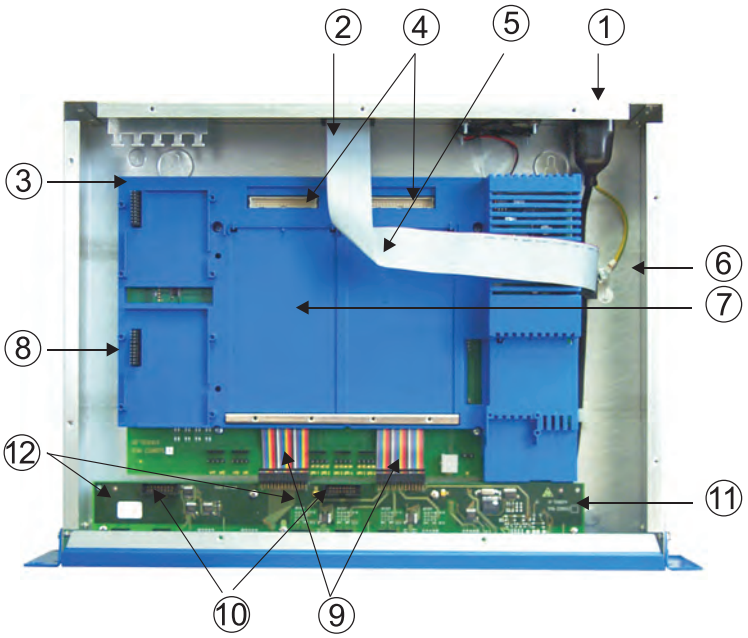
Note:
Ensure that the air outlet on the fan guard is not obstructed, by lines for example air flows from the inside toward the outside.

Inside view of the elmeg ICT 880-rack



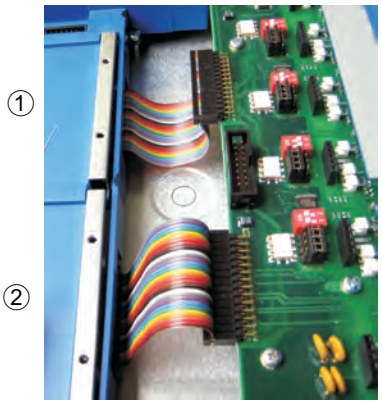
1. Fan
2. Connecting cable for expanding the elmeg ICT880xt-rack
3. Special slot 1 for router module door intercom device, contacts, voice announcement, emergency supply
4. Module connector
5. Module slot 2
6. Grounding connection at the enclosure
7. Module slot 1
8. Special slot 2 for router module door intercom device, voice announcement, contacts, POTS, emergency supply, S2m
9. Standard front-side pcb to motherboard cable. See also: »Connecting the cables« page 12
10. Standard front-side pcb to optional front-side pcb cable
11. Optional front-side pcb
12. Standard front-side pcb

Inside view of the elmeg ICT 880xt-rack



① Fan
② Connecting cable for expanding the elmeg ICT880xt-rack
③ Special slot 3 for router module door intercom device, contacts, voice announcement, emergency supply
④ Module connector
⑤ Module slot 5
⑥ Grounding connection at the enclosure
⑦ Module slot 4
⑧ Special slot 4 for router module door intercom device, voice announcement, contacts, emergency supply
⑨ Standard front-side pcb to motherboard cable. See also: »Connecting the cables« page 12
⑩ Standard front-side pcb

Assembling of the connection cable



① Correct assembling of the connection cable:
The ribbon cable points to the bottom of the device.
② Incorrect assembling of the connection cable:
The ribbon cable points upwards.

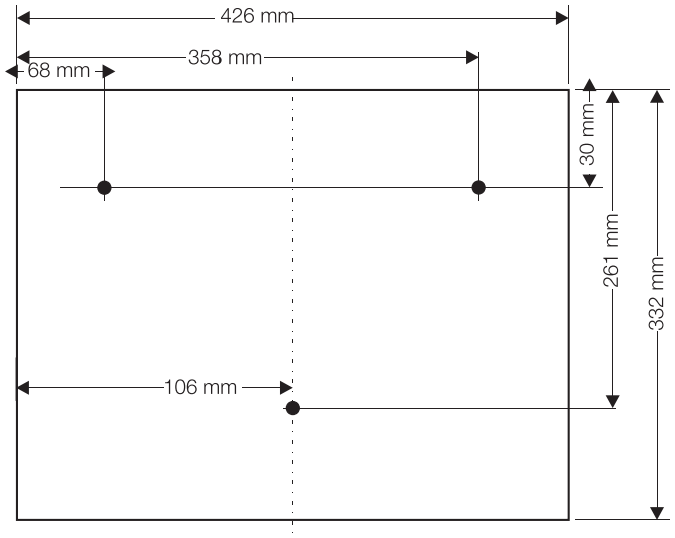
Wall mounting the elmeg ICT 880-rack

Where required (for example with already installed patch panels), the elmeg ICT880-rack can also be wall-mounted. In such a case, however, the elmeg ICT880xt-rack expansion can not be used. Maintain a space of 200 mm above and below the PABX system, for example to room ceiling, cabinets or floors. The pabx front panel points down.

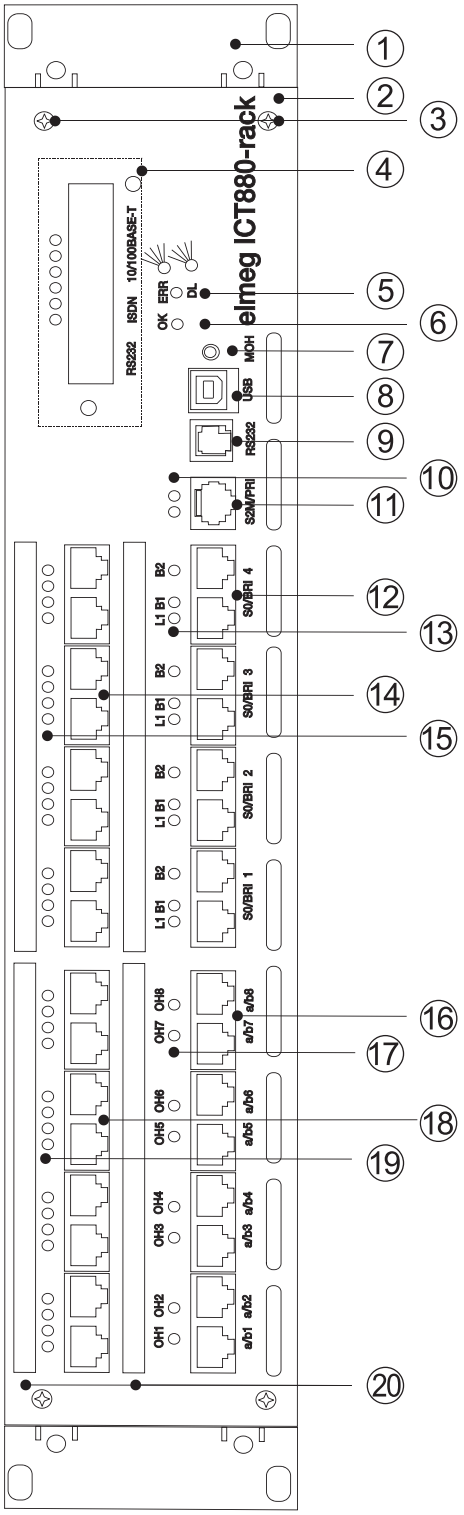
Table-top mounting

You can apply the 4 self-adhesive plastic feet pads provided with the system to the bottom of the devices when mounting the elmeg ICT880-rack and elmeg ICT880xt-rack on a table top. These pads prevent slipping and protect the table surface against scratches.

Spacing dimensions for the PABX



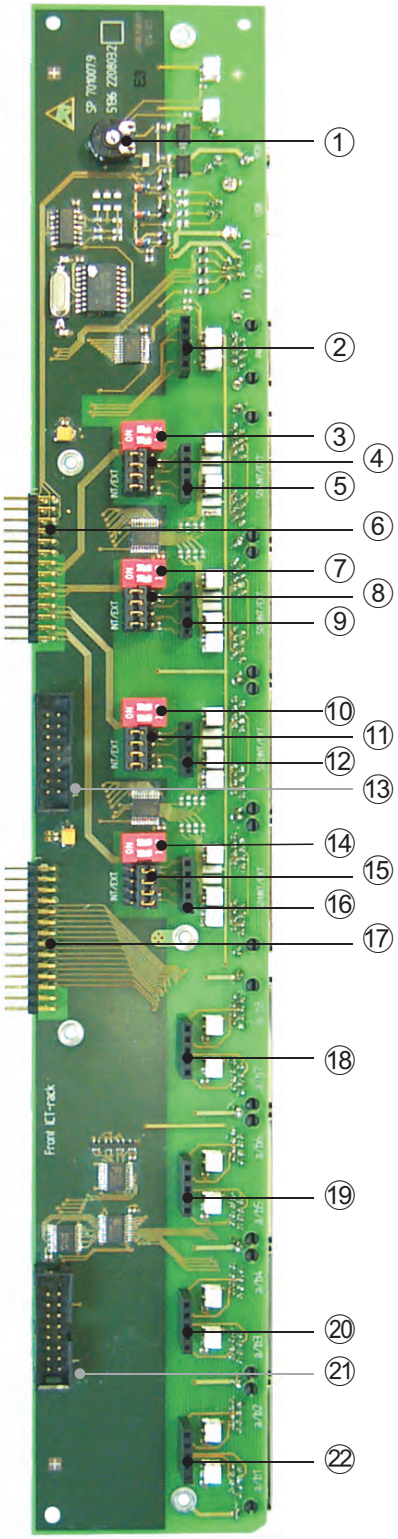
elmeg ICT880-rack connections and displays



① Mounting angle
② elmeg ICT880-rack front panel
③ Front plate fastening screws
④ Router inputs and connections (see page 23)
⑤ LED display (see page 85)
⑥ LED display
⑦ External MoH-connection (3. 5mm stereo jack, see page 75)
⑧ USB port (see page 76)
⑨ Serial RS232 port (see page 76)
⑩ LED display for the S2m- port
⑪ S2M connection
⑫ ISDN port 1...4 1...4 S0/BRI (see page 73)
⑬ LED display for the connection
⑭ Connections for modules a/b, S0, DECT and VoIP-VPN Gateway (UP0 see page 77)
⑮ LED displays for the connection
⑯ Analog connections a/b1...a/b8 (see page 74)
⑰ LED displays for the connection
⑱ Connections for modules (a/b, S0, UP0, DECT and VoIP-VPN Gateway)
⑲ LED displays for the connection
⑳ Marked label fields (see page 10)

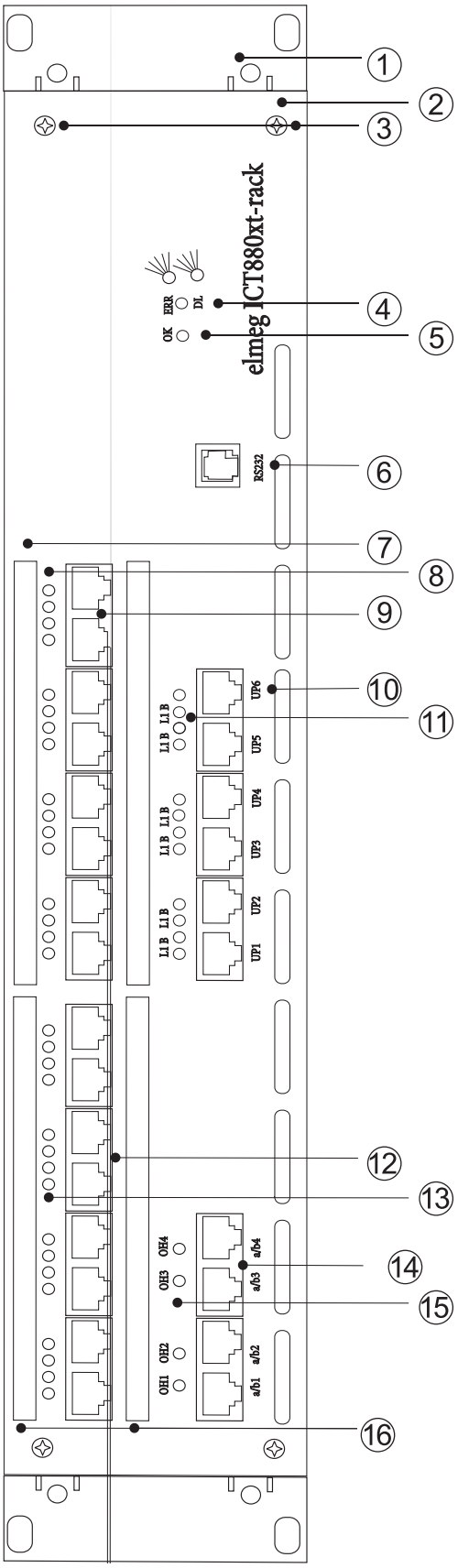
Standard front-side pcb

The »Standard front-side pcb« contains the connecting jacks and the LEDs. It is mounted on the bottom of the device on spacer bolts and is connected to the PABX system by two ribbon cables. Also located there are »jumper« that you can use to set the ISDN outputs (S0 / BRI= Basic Rate Interface) to »Internal« or »External«. Two RJ45 jacks are connected in parallel. Three LEDs display the current connection status (see page 85). An overload protection module can be mounted for each connection.



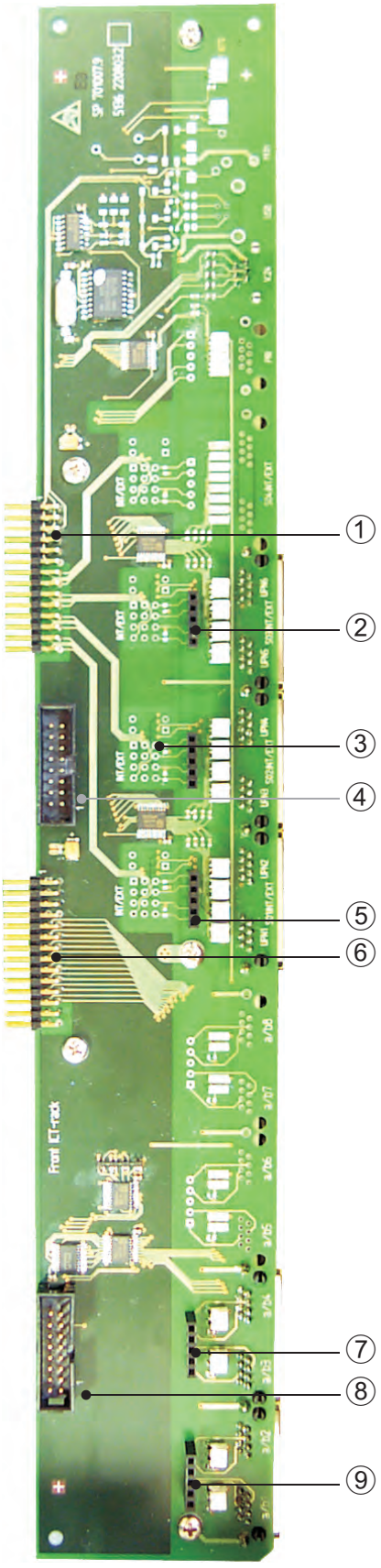
① Volume control for the external MoH-input
② Jack for the overload protection module (S2M/PRI)
③ Switch for the S0/BRI4 terminating resistors
④ External - internal switching for S0/BRI4
⑤ Jack for the S0/BRI4 overload protection module
⑥ Base module connector
⑦ Switch for the S0/BRI3 terminating resistors
⑧ External - internal switching for S0/BRI3
⑨ Jack for the S0/BRI3 overload protection module
⑩ Switch for the S0/BRI2 terminating resistors
⑪ External - internal switching for S0/BRI2
⑫ Jack for the S0/BRI2 overload protection module
⑬ Optional front-side pcb 2 connector
⑭ Switch for the S0/BRI1 terminating resistors
⑮ External - internal switching for S0/BRI1
⑯ Jack for the S0/BRI1 overload protection module
⑰ Base module connector
⑱ Jack for the a/b7 a/b8 overload protection module
⑲ Jack for the a/b5 a/b6 overload protection module
⑳ Jack for the a/b3 a/b4 overload protection module
㉑ Optional front-side pcb 1 connector
㉒ Jack for the a/b1 a/b2 overload protection module

elmeg ICT880xt-rack connections and displays



① Mounting angle
② elmeg ICT880-rack front panel
③ Front plate fastening screws
④ LED display (see page 85)
⑤ LED display
⑥ Serial interface RS232 (see page 76) (function only available starting from software version 1.2)
⑦ Marked label fields
⑧ LED display for the connection
⑨ Connections for modules a/b, S0, DECT and VoIP-VPN Gateway (UP0 see page 77)
⑩ UP0 1...6 connections
⑪ LED displays for the connection
⑫ Connections for modules (a/b, S0, UP0, DECT and VoIP-VPN Gateway)
⑬ LED displays for the connection
⑭ Analog connections a/b1...a/b4 (see page 74)
⑮ LED displays for the connection
⑯ Marked label fields

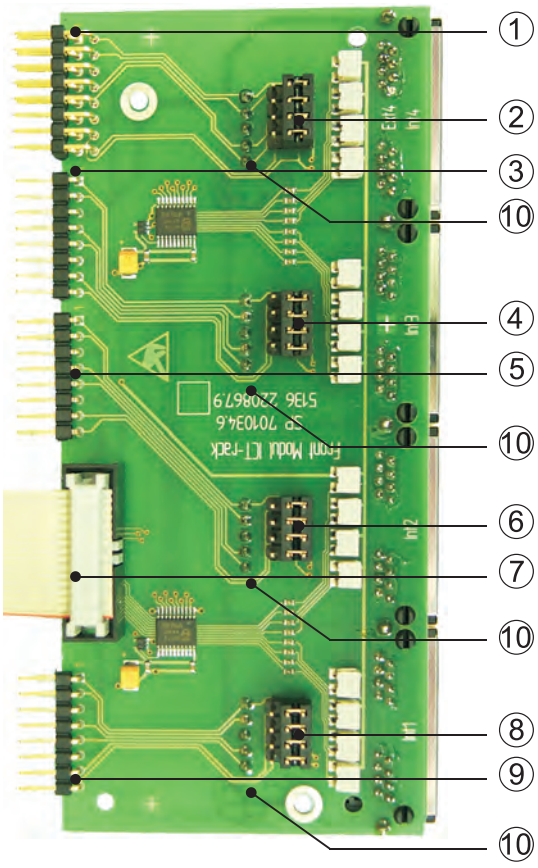
Standard front-side pcb for the elmeg ICt880xt-rack



① Base module connector
② Jack for the UP6 /UP5 overload protection module
③ Jack for the UP4 /UP3 overload protection module
④ Optional front-side pcb connector
⑤ Jack for the UP2 /UP1 overload protection module
⑥ Base module connector
⑦ Jack for the a/b4 a/b3 overload protection module
⑧ Optional front-side pcb connector
⑨ Jack for the a/b2 - a/b1 overload protection module

Optional front-side pcb

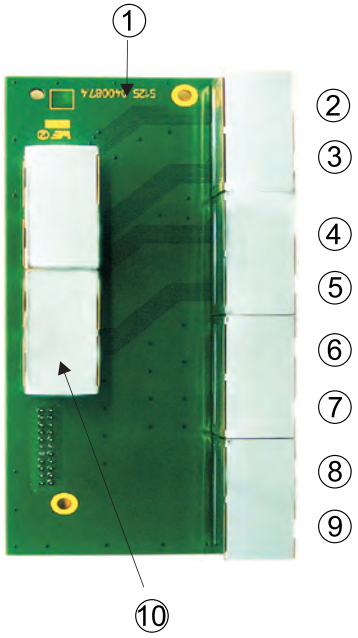
Two of these boards can be mounted in the elmeg ICT880-rack and the elmeg ICT880xt-rack. The »Optional front-side pcb« contains the connecting jacks and the LEDs. This is mounted on spacer bolts for the »Standard front-side pcb« and is connected to the PABX system modules and the front-side pcb via ribbon cables. Also located there are »jumpes« that you can use to set the output for either ISDN or a/b UPO. The settings for »Internal« or »External« ISDN are made on the S0-modules (see page). Three LEDs display the current connection status (see page 85). An overvoltage protection module can be mounted on the bottom of the optional front-side pcb for each connection.



① For module cable connectors (external ISDN, internal ISDN, a/b,DECT or UP0), please refer to page 21
② S0 / DECT, UP0 or a/b switching (see page 20)
③ Module cable connector (internal ISDN, a/b or DECT, UP0)
④ Switching S0 / DECT, UP0 or a/b
⑤ Module cable connector (internal ISDN, a/b or DECT, UP0)
⑥ Switching S0 / DECT, UP0 or a/b
⑦ Standard front-side pcb connector
⑧ Switching S0 / DECT, UP0 or a/b
⑨ Module cable connector (internal ISDN, a/b or DECT, UP0)

Patch panel for ICT-rack (Connection for VoIP-VPN-gateway)

One of these patch panels can be installed in the elmeg ICT880-rack or in the elmeg ICT880xt-rack. The »Patch panel for ICT-rack« contains the connecting jacks and the LEDs.It is mounted on spacer bolts for the »Board front base« and is connected to the PABX system module via Cat 5 connecting cables (supplied with system). The installation is disbribed on page .

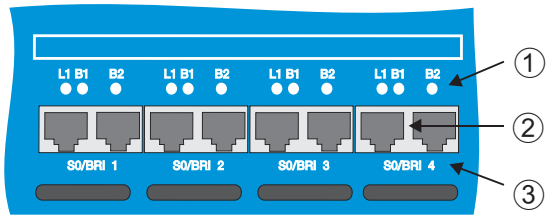


① Patch panel for ICT-rack (for intended connection; the ports can also be assigned in a different order)
② LAN1
③ LAN2
④ LAN3
⑤ WAN
⑥ Not used. Sealed with cover.
⑦ Not used. Sealed with cover.
⑧ Not used. Sealed with cover.
⑨ Not used. Sealed with cover.
⑩ Jacks VoIP-VPN Gateway

Jacks

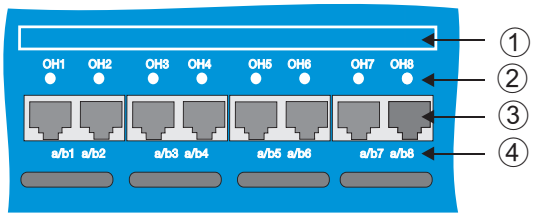
All connecting jacks required are located on the front panel.

ISDN connections (S0/BRI) on the base



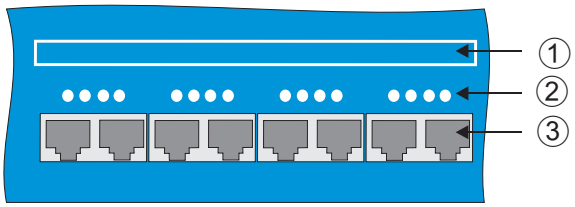
① LEDs
② ISDN jacks (two for each ISDN connection)
③ Connection designations

Analog connections (a/b1...a/b8) of the base



① Referenced field for attaching the label strip (see page 10)
② LEDs
③ Jacks (module-specific wiring)

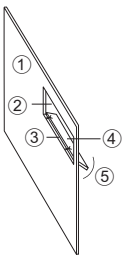
Module connection



① Referenced field for attaching the label strip (see page 10)
② LEDs
③ ISDN-jacks (one analog connection with each jack 3
④ Connection designations

Removing the covers form the elmeg ICT880-rack and elmeg ICT880xt-rack expansion

Recesses are provided in the front panel and backplane for the module connections. Just pop out the covers on these recesses. We recommend unscrewing the front panel before doing this. You can then carefully bend the cover inwards. Then carefully bend the cover back and forth to break it out. Smoothen any rough edges around the recess after popping out the cover. Fit the grommets provided with the system in the penetrations for the door terminal cables.



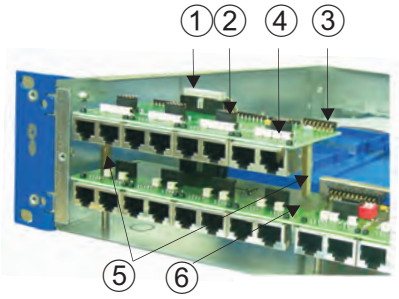
① Front panel
② Bend the panel inward.
③ rough edges from breaking out the panel
④ Cover
⑤ Here, bend the panel back and forth until you can remove the cover

Note:
Tip! If you bend the covers for the module connections inward by 90 o you can leave them like that and do not have to remove them.

Mounting the optional front-side pcb

The »Optional front-side pcb« contains the connecting jacks and the LEDs. This is mounted on spacer bolts for the »standard front-side pcb«. It is connected to the PABX system modules via a ribbon cable. Also located there are »jumpes« that you can use to set the output for either ISDN or a/b UPO. An overload protection module can be mounted for each connection.

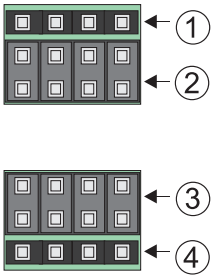
- For installation, first remove the corresponding two fastening screws that hold the standard front-side pcb.
- Screw the spacer bolts provided in the front module board package into these bore holes.
- Place the front module board on the spacer bolts and screw it in place using the two fastening screws.
- Plug the connecting cable provided with the system into the connector strip for the front base board and the front module board



① Standard front-side pcb connector
② S0 / UP0 or a/b switching
③ Dual-in-line terminal strip on the right
④ LEDs
⑤ Connecting bolt
⑥ Standard front-side pcb

Front-side pcb jumpers

The standard and optional front-side pcbs are each equipped with 4 jumpers for switching the mode of operation.



① Jumper field (free pin row)
② Jumper plugged in at the front (seen from the front panel)
③ Jumper plugged in at the rear (seen from the front panel)
④ Jumper field (free pin row)

Note:
You must remove the jumper to connect two-core hard-wired subscribers (a/b, UP0 and DECT-rfp). Some terminal devices or ports are equipped with special connectors or single cores.

Front-side pcb

Jumper at the front:

- Internal ISDN connection (both RJ45 jacks connected in parallel)

Jumper at the rear:

- External ISDN connection (both RJ45 jacks connected in parallel)

Optional front-side pcb

Jumper at the front:

- ISDN connection (both RJ45 jacks connected in parallel)

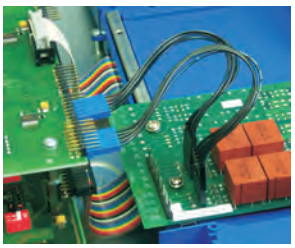
Jumper at the rear:

- UP0, elmeg DECT multicell or a/USB port (only the RJ45 jack on the right is connected)

Connection between the optional front-side pcb and the modules

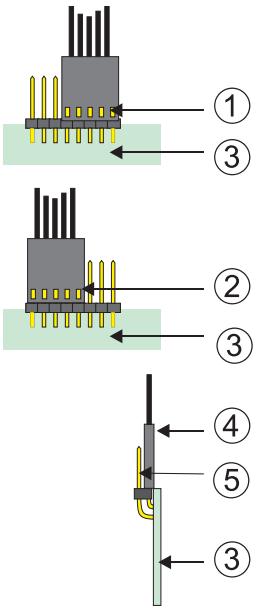
The connecting cables are included in the accessory set for the module rack. One end is a plug connector, the other a socket connector. Plug the plug connector into the jack for fine protection on each module, and the socket connector onto the connection for the front module board. The ribbon cable must be twisted 4 times(Module elmeg DECT multicell 3 ½ times) around its own axis. The right plug connector on the front module board has two rows for a module external ISDN connection. The two right plug connectors will have two rows in future versions of the board front module for adaptation to the 2 S0 V.2 module and 4 S0 V.2 module.

Note:
If you are using the second external ISDN port (S03) of a 4 S0 module V.2, you should turn the cable connectionon one of the existing front modules by 4 1/2 x turns. Connection is then the same as with an internal ISDN-port. To connect V.2 modules, proceed as described in section »4 - Double row... «



The illustration shows the connection of a 2S0 module to the double-row connector strip on the right side. S04 serves as the external, S03 as the internal ISDN port. For more information about the allocation of the connecting cables go to Page 89.

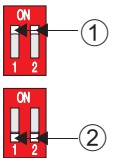
Connecting cable plugging directions



① Plugging direction (1) for internal ISDN connection (S01...S04 modules)
② Plugging direction (2) for UP0, elmeg DECT multicell or a/b connection (UP0, 4a/bII, 8a/b modules)
③ Optional front-side pcb
④ Double row plug connector. Bottom pins: Plugging direction (1) for external ISDN connection (S01...S04 modules)
⑤ Double row plug connector. Top pins:
- Plugging direction (1) for internal ISDN connection
- Plugging direction (2) for UP0, elmeg DECT multicell or a/b connection (UP0, 4a/bII, 8a/b modules)

Terminating resistors

The 100 Ohm terminating resistors mounted on the front base board for the internal and external ISDN connections are fitted with switches. The terminating resistors for the modules are controlled by the modules themselves.



① Terminating resistors ON
② Terminating resistors OFF

Attention! both switches (1) (2) must be set in the same way

Mount the patch panel for the ICT-rack (connection for VoIP-VPN Gateway)

① Fastening screw patch panel
② Patch panel module VoIP-VPN
③ Connecting cable (1of4)
④ Cable connector flat cable
⑤ Fastening screw patch panel
⑥ Module connector DSP
⑦ Fastening screw module VoIP-VPN
⑧ Jacks module VoIP-VPN
⑨ Fastening screw module VoIP-VPN
⑩ Cable connector flat cable

Installation procedure of module VoIP-VPN and patch panel

- It is important that you follow the installation sequence given here.
- Read the safety information in the supplement »Safety information« provided in the package.
- Remove the VoIP-VPN Gateway module, the connecting cable and the patch panel for the ICT-rack from of the package.
- Plug the connecting cable into the 4 jacks of the VoIP-VPN Gateway module.
- Install the VoIP-VPN Gateway module in the PABX system and screw it securely in place using the two fastening screws.
- Installing the patch panel as described on page20.
- Attach the connecting cable from the VoIP-VPN module to the patch panel as shown in the picture at the top.

Installation procedure of module DSP and Flat cable

① Ribbon cable connector (Pin1 and the red mark on the ribbon cable are located at this end)
② Flat cable
③ Ribbon cable connector on the VoIP-VPN Gateway module
④ Pin1 and the red mark on the ribbon cable are located at this end

- If you wish to use the DSP module here, install it as illustrated on page 50.
- Plug the ribbon cable into the connector of the VoIP-VPN Gateway module and of the patch panel as shown in the picture. Please note here that the two connector pins labeled 1 point toward the red mark on the ribbon cable.

Inserting the smart media card

You should decide whether you wish to install a Smart Media card before mounting the PABX system in a rack. Later installation of the card requires that you remove the unit from the rack and involves complicated disassembly of the PABX system:

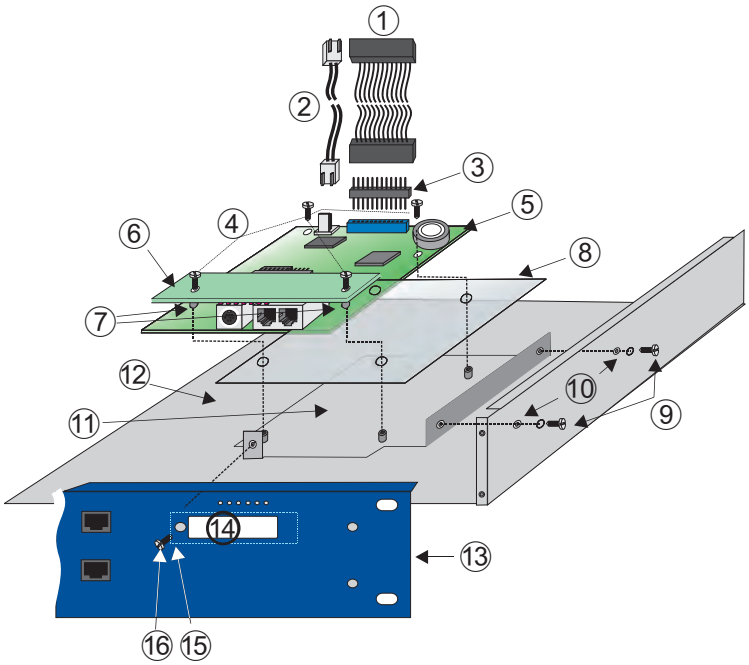
- Open the cover of your PABX system.
- Remove a possibly fitted router together with its mounting panel from the PABX.
- Remove all possibly fitted modules from the PABX.
- Remove the base protection cover.
- Plug the smart media card in or remove it from the slot.

Connecting the 230VAC power supply

- To switch on the PABX system, both power plugs must be plugged into two separate outlets of **one** power circuit.
- Always switch on the power supply for both systems, elmeg ICT880-rack and ICT880xt-rack, at the same time.
- Never switch on the power supply for the elmeg ICT880-rack first, as otherwise the elmeg 880xt-rack expansion module will not be recognized and can then not be used.
- A system reset is performed if power supply to the elmeg ICT 880-rack or the elmeg ICT880xt-rack is interrupted and then restored. Both systems are then again ready for operation.

Router

elmeg router module X1000 / X1200



① 12-pin flat connector
② 2-pin flat connector
③ Connector
④ Fastening screws, tallow-drop M3x8
⑤ elmeg Router X1000 or X1200
⑥ LED support
⑦ 2 spacers
⑧ LED support
⑨ Insulating foil
⑩ Fastening screws, tallow-drop M3x8.
⑪ 2 tooth lock washers
⑫ Mounting angle
⑬ elmeg ICT880-rack
⑭ Front panel
⑮ Router front cover
⑯ Fastening screw, tallow-drop M3x8

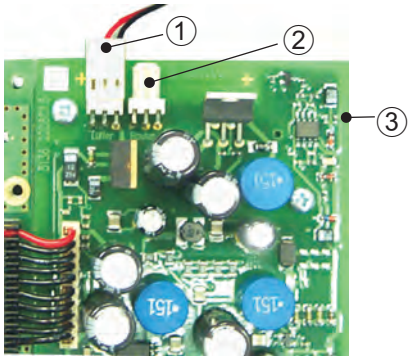
Further accessories

- 1 patch cord, blue, for connection of the router to the system's ISDN connection
- 1 patch cord, orange, for connection to the LAN
- 1 v. 24 connection cable
- 1 operating instructions
- 1brief description
- 1 license sheet (the authorization code for RVS Com is not valid for the elmeg X1000 router module)
- 1 CD containing elmeg CAPI Tools Professional, including 20 licenses (replaces the RVS Com described in the manual) and BinTec software tools
- 1 operating instructions for the elmeg CAPI-Tools

Installation of the module Router elmeg X1000 / X1200

Please observe the safety instructions in the PABX installation instructions!

- Remove inner base plate shell.
- Plug the two-pin »flat push-on connector« onto the free power supply connector.



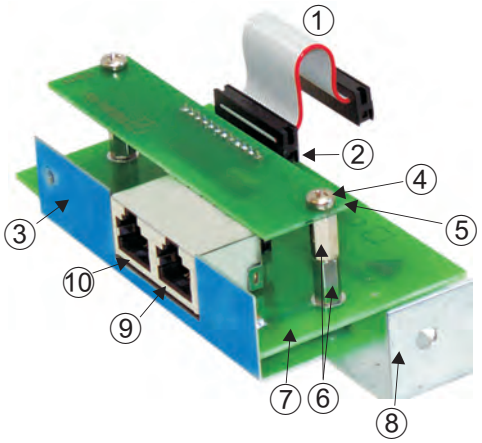
① Connection of the fan power supply
② Connection of the router power supply
③ Power supply on the base plate

- Mount the inner base plate shell.
- Remover cover »15« from the system's front panel (see information on page19).
- Mount the router mounting bracket »12« using screws »10« and the tooth lock washers »11« on the elmeg ICT880-rack frame »13«. The front screw is not required when installing the unit with angle brackets on the front panel.
- Attach the router mounting bracket to the front panel of the PABX using the screw »16.
- Place the insulating foil »9« on the router mounting bracket such that the four fastening bolts fit through the holes in the foil.
- Securely screw the router module onto the router mounting bracket using screws »4«.
- Mount the »LED support« »6«. To do this, screw the two stud bolts provided with the system into the two front bore holes of the router.
- Plug connector »3« into the jack on the router module.
- Plug the 12-pin flat push-on connector »1« onto connector »3«.
- Plug the free end of the flat push-on connector onto the connector of the LED support. Do not twist the flat push-on connector; route in parallel to the plug-in connector.
- Plug the free end of the flat push-on connector onto the corresponding plug of the LED support.
- You can now reassemble your PABX.

Installation of the Router patch panel

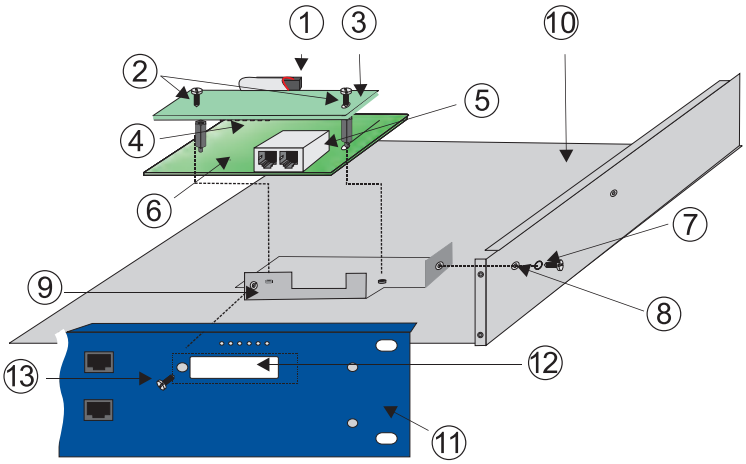
Please observe the safety instructions in the PABX installation instructions!

The Router connection module allows you to operate the Router module (see page 46) at a »rack-PABX system«. It is not intended for the elmeg X1000 / X1200 router modules. Mount the router as described on page 23.



1. Connecting cable
2. Jack on connection panel
3. Mounting bracket
4. Fastening screw
5. LED circuit board
6. Spacer
7. Terminal board
8. Mounting bracket
9. WAN
10. LAN

Installing the elmeg router module



1. Connecting cable
2. Fastening screws (2)
3. LED circuit board
4. Light emitting diodes
5. Jacks
6. Terminal board
7. Fastening screw with washer
8. Side mounting bore hole
9. Mounting bracket
10. Side panel
11. Front panel
12. Jack covers
13. Fastening screw

- Remover cover »15« from the system's front panel (see information on page19).
- Installing the router patch panel:
- Install the connecting boarde »6« with the spacers on the mounting bracket »9«. Plug the socket connector for the LED board into the plug connector on the terminal board.
  Use the screws "2" to securely tighten the LED board to the spacers.
  Plug the connecting cable (as shown in the diagram) into the plug-in connector on the terminal board.
  Use the screw "7" (with toothed washer) and screw "13" on the front panel to attach the router patch panel to the elmeg ICT880-rack frame"10".
- Plug the free end of the connecting cable into the opposite plug-in connector of the router.
- The connecting jack designation on the front panel corresponds to router terminals X1000 und X1200. Please tape over the designations with the labels »LAN WAN« included in the Router installation set.
- You can now reassemble your PABX.

PABX modules

Various modules can be used for the PABX systems (see table.) There are three fitting variants possible for the terminating resistors of S0 modules; with terminating resistors soldered in, without terminating resistors and with switchable terminating resistors. Check your module before assembly and install it as appropriate.

Please observe that only one module can be inserted into each available PABX slot. The functions described in these assembly instructions are based on the software status for the PABX systems valid at the time of printing. Some functions may not be supported with all modules or older versions of the software.

Extensions of the ICT PABX- system

	ICT 46	ICT 88	ICT 880	ICT880 xt
Analog ports	6	8	8	4
Fixed ISDN connections external	1	—	—	—
Switchable ISDN connections (internal / external	—	4	4	—
UP0-connections	—	—	—	6
Slot for smart media card	1	1	1	—
Module slots(4 a/b II, 8 a/b, 4UP0, S01, S0 2, S0 4 and DECT)	2	2	2	2
Module slots (8UP0)	1	1,2(*)	1, 2(*)	1
Module slots (8UP0) with 75 W power supply	1	2	2	1
(***) Module slots (VoIP-VPN Gateway)	1	1	1(°)	1(°)
Special slots for modules (door intercom units, announcement, contact, emergency power, POTS (°) starting from hardware version 03.04 and S2m . (**) S2m not in ICT 46.	1 (**)	2	2	2
Special slot for router module	1	1	1	—
(only elmeg ICT880) Expansion connector elmeg ICT880	—	—	1	1

* requires a 75 W power supply.

(***) not in conjunction with the Router module

(°) Only one module possible in the ICT, preferably installed in the ICT800xt expansion !

(°°) If at all possible, do not install this module in the expansion!

Installation of the modules

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 after a reset.

Note that the external ISDN connection is not recognized automatically when the system is switched on. You must configure this in the configuration.

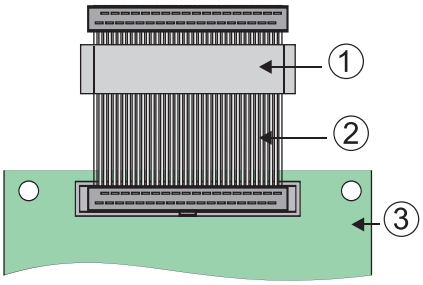
The designations (0, 1 and 2) are likewise used in the configuration and operation of the PABX (for example, call forwarding).

Note:
Unplug the 230 V AC plug. 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.

Note regarding module installation

This information does not apply to the Router module!

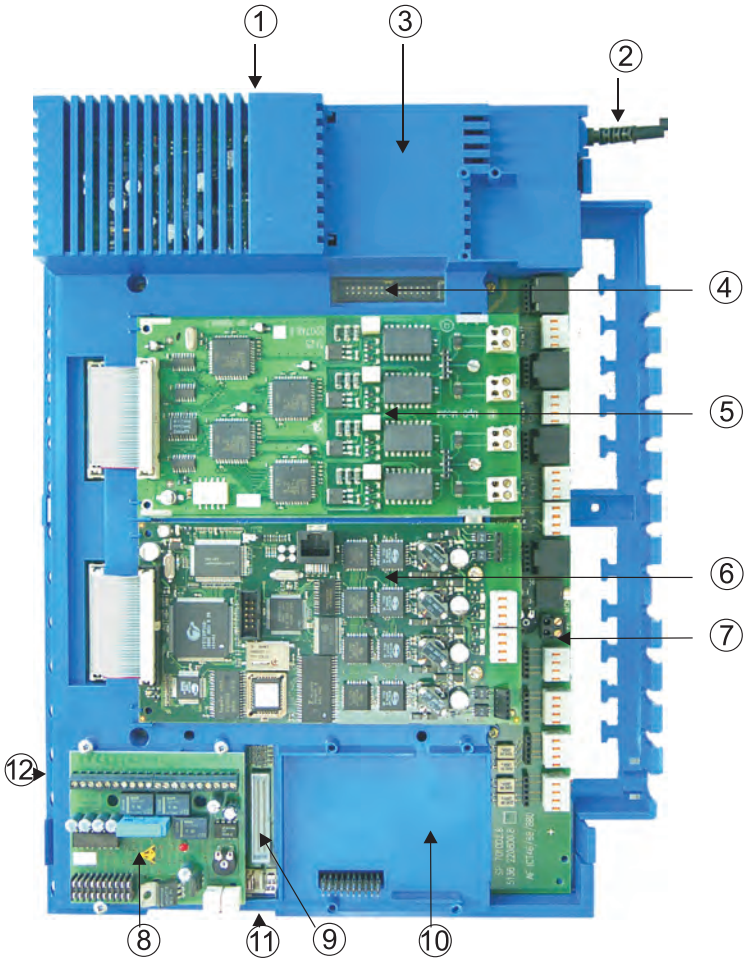
Remove any ferrite material from the flat cable when connecting the modules.



① Ferrite
② Flat cable
③ Module

Note:
Attention! Use caution during removal, as the ferrite may break off, producing sharp edges. Place the ribbon cable with the ferrite into the shipping bag for the module and then break up the ferrite by lightly hammering it. After that, you can carefully remove the ribbon cable and dispose of the rest of the ferrite in the bag.

Inside view of the elmeg ICT (in this example ICT880)



1. Expansion connector (xt)
2. Power supply cable
3. Special slot 5 for the router
4. Connector for router
5. Module slot 2
6. Module slot 1
7. Module 0
8. Special slot 1 for door intercom module 1, NSP, voice announcement
9. Connector for module S2m and POTS
10. Special slot 2 for door intercom module 2, NSP, POTS and contacts For elmeg ICT88 /ICT880 also with S2m and voice announcement
11. Expansion connector (xt)
12. Slot for smart media card

	elmeg ICT46, ICT88, ICT880, ICT880-rack	Expansion elmeg ICT880xt, ICT880xt-rack
2	Power supply cable	
3 **)	Special slot for router module **)	Not available
5	Module slot 2	Module slot 5
6	Module slot 1	Module slot 4
7	Base module 0	Base module 3
8	Special slot 1 base for door intercom module 1, contacts, NSP, voice announcement	Special slot 3 base for door intercom module 3, contacts, NSP, voice announcement
10 *)	Special slot 2 base for door intercom module 2, contacts, NSP,POTS, voice announcement or S2m *)	Special slot 4 base for door intercom module 4, contacts, NSP, voice announcement
12	Smart-media-Card	Not available

*) The module designation in the configuration for the s2m module is module » 6 «. .

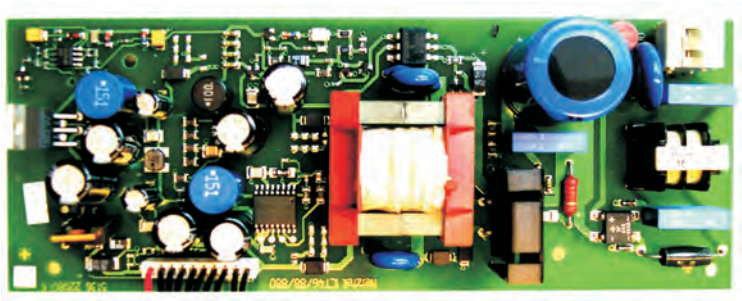
**) The module designation in the configuration for the Router module is module » 7 «.

Power supply ICT

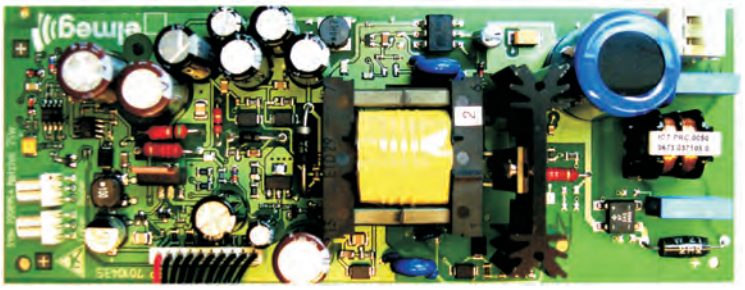
The PABX systems can be equipped with two different power supply units - 45 W or 75 W. The 45 W power supply unit is installed in all PABX systems up through serial number 9999. You must use the 75 W power pack if you wish to use two 8UP0 modules in the ICT 880 or ICT 880-rack. Starting from serial number 20000, all ICT PABX systems (ICT46... ICT880-rack, except for the 880xt expansion unit) will be delivered equipped with the 75 W power supply units. These power supply units are compatible and can be used and are interchangeable in all ICT PABX systems.

Note:
Only the 75 W power supply unit may be used when operating two 8UP0 modules!

45 Watt power supply unit $&~Rahmen M_3>



75 W power supply.

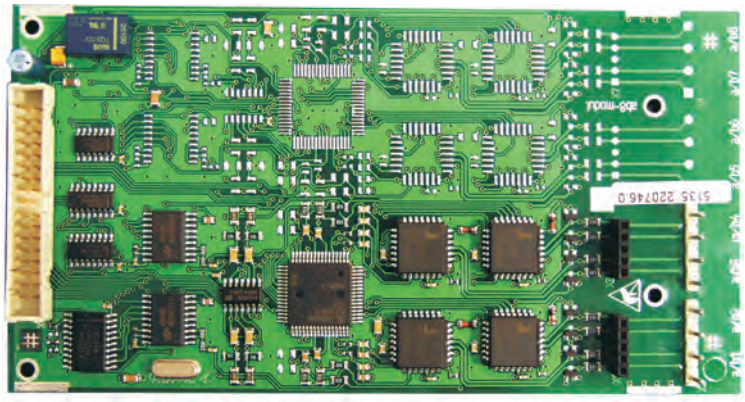


Modules a/b

4 ab II module

The 4 a/b II module contains four analog connections. Connection and programmeming are performed the same way as for the analog connections for the motherboard.

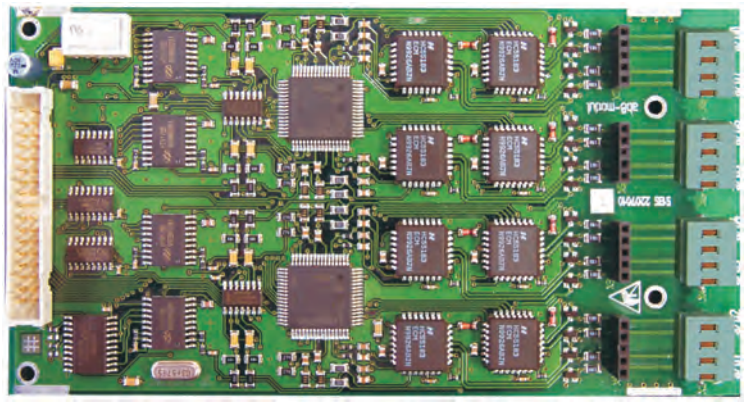
The 4 ab module is no longer supported by these PABX systems.



Module 8 a/b / Module 8 a/b V.2

Module 8 a/b and module 8 a/b V.2 each contain 8 analog connections. Connection and programmeming are performed the same way as for the analog connections for the motherboard. These modules differ only in the type of terminals that they have.

8 a/b module V.2 with new terminals



Modules S0

1 S0 / 2 S0 / 4 S0 Modules

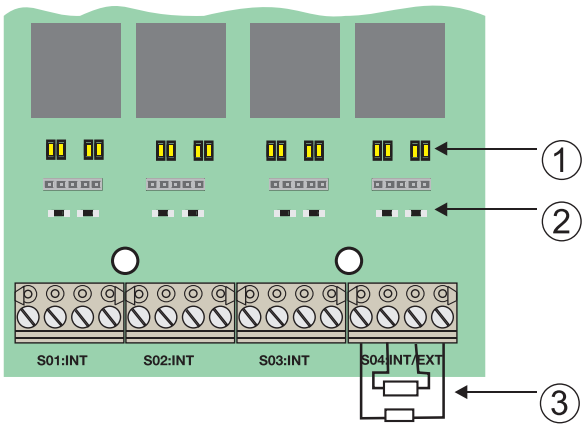
Examine your S0 modules prior to assembly!

The modules may not always be equipped with terminating resistors. There are three different variants supplied: with terminating resistors soldered in, without terminating resistors and with switchable terminating resistors. The locations of the terminating resistors are shown in the figure; in the example for the S04, when these are mounted on the pcb. The switchable terminating resistors are switched on/off using jumpers (jumpers inserted for ON).

You require terminating resistors in the modules:

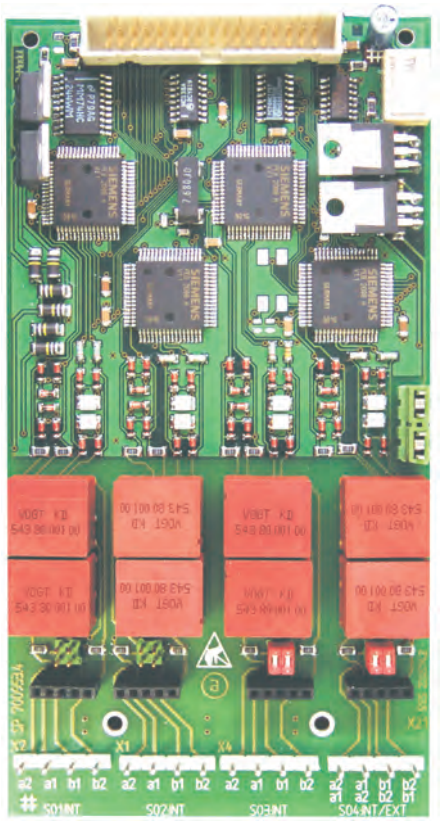
- When you connect an external connection directly with the external network termination.
- For point-to-point access moed.
- When the bus begins directly with the connection for the PABX.

You can connect the terminating resistors directly to the terminals as shown in the figure (if not already provided).



① switchable terminating resistors
② Terminating resistors
③ Fitted with terminating resistors if there are none on the module itself.

If the ISDN port S04 is to be used as an external ISDN connection, the jumper must be removed and this connection edited in programming.



4 S0 module: S01, S02, S03, S04 equipped
Module 2 S0: S03, S04 equipped
Module 1 S0: S04 equipped

Jumper for switching S04
mounted: Internal ISDN connection
open: External ISDN connection

Connector for deactivating the terminating resistors
Connector plugged in: The terminating resistors are active (in this example S03 and S04).
Observe the plugging direction of the slot.

Module 2 S0 V.2

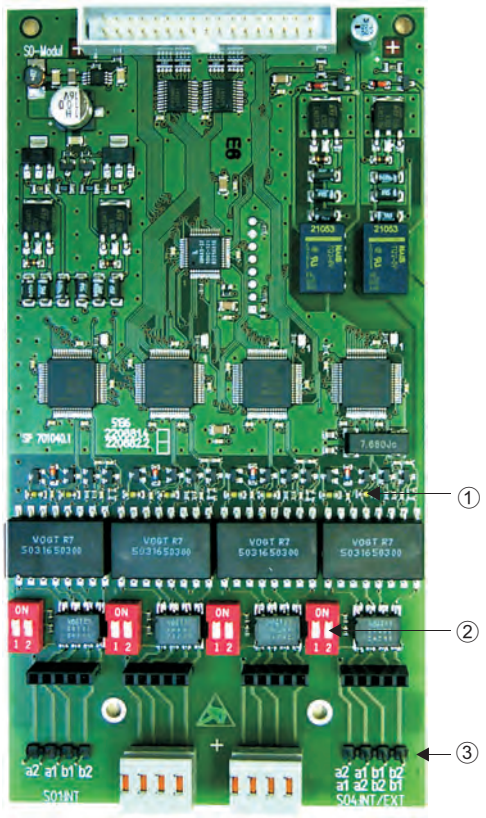
This module is equipped with two S0 ports, of which the S04 port can be configured as an internal or external ISDN port. The factory settings of all connections are activated as specified by the configuration. Use the configuration to switch to the external ISDN connection. A manual switching on the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

Note:
Be sure that for the configuration as an internal ISDN connection (with feed-in from 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.

Module 4 S0 V.2

This module is equipped with four S0 ports, of which the S04 port can be configured as an internal or external ISDN port. From firmware version 7.3 on, the S03 interface S03 can also be set for internal or external operation. 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.

Note:
Be sure that for the configuration as an internal ISDN connection (with feed-in from 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.



S0-module V.2 Connections 1...4 equipped(figure)
Module 2 S0 V.2 Connections 3...4 equipped

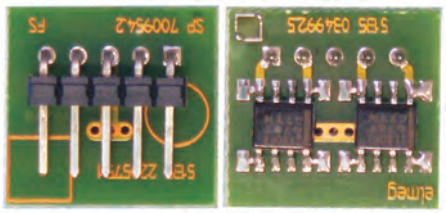
① LEDs (green)
② Switch for deactivating the terminating resistors
ON: The terminating resistors are active.
③ Terminals. Terminals for connections 1 and 4 removed.

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

Module overload protection (FSM)

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 terminals). It is imperative that you have functional grounding installed (min. 5,5 mm 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.
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.

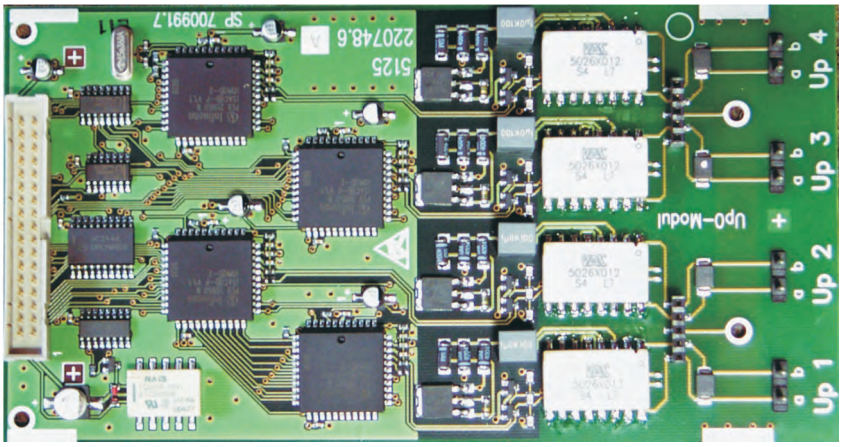


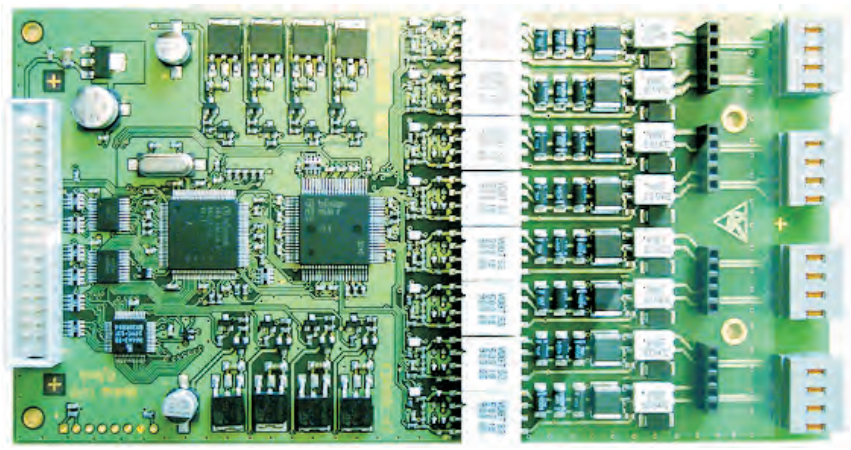
Modules UP0 / Converter

Module 4 UP0, module 8 Up0

You can use the Up0-module and the Up0/S0-converter to increase the range for an ISDN connection (minimum of 1,000 m with a wire diameter of 0. 6 mm), or to allow double use of an existing ISDN line. The 4 UP0 module is equipped with 4 (Up 1...Up 4), the 8 UP0 module with 8 UP0 ports (Up1...Up8). Each of these connections is connected in a 2-wire manner with the end point of the connection, respectively one UP0/S0-converter or one UP0-capable system telephone. As a result, two Up0- connections can be implemented over an existing 4-wire ISDN installation line. The two pictures show a 4 UP0 module (left) and an 8 UP0 module (right).

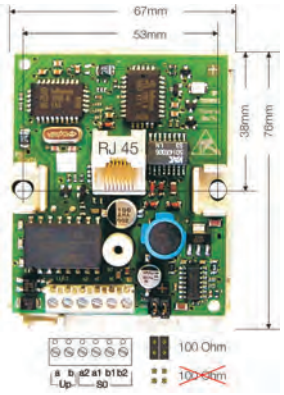
The 8UP0 module is equipped with eight LEDs for indicating connected UP0 terminal devices. The LEDs will not indicate a device when the UP0/S0 converter is connected without terminal devices. The figure above shows the 4 UP0-module and the figure below the 8 UP0-module.





Up0/S0-converter

A normal »internal bus« can be installed at each Up0/S0-converter. The system power on this bus can be up to 2 W. The Up0/S0-converter is designed for surface mounting. The Up0/S0-converter is fitted with two switchable terminating resistors. The Up0/S0-converter can only function properly when activated terminating resistors are located at both bus ends.



Direct plug-in to terminal device connection

If a terminal device is operated directly via the port at the RJ45 jack of the module, the two jumpers must be plugged in.

Connecting a »short passive bus«

Up to 12 ISDN jacks may be connected in series. You may connect up to 8 terminals, with each internal bus powering two terminals and the remaining six supplied from an external source (with a dedicated power supply unit). Two of the ISDN terminal devices can be in operation simultaneously (e.g., you can use two phones to telephone internally or externally simultaneously using one bus).

These two jumpers may only be inserted when the Up0/S0-converter is located at the beginning or at the end of the bus in the same manner as a PABX system.

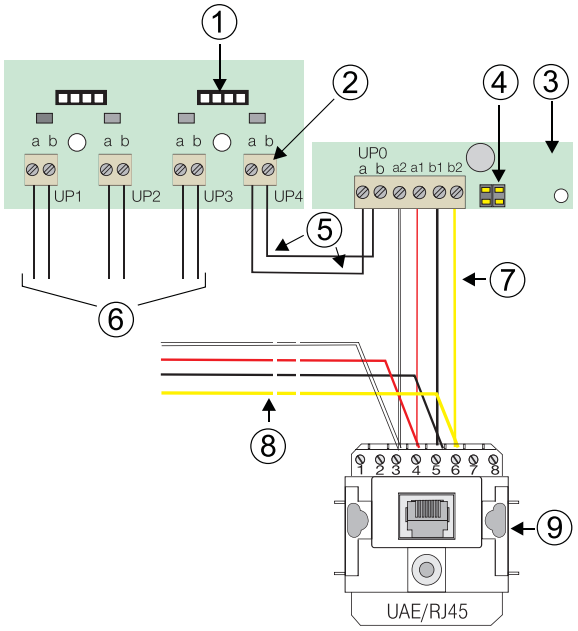
If the Up0/S0-converter is installed like a PABX in the bus, the jumpers may not be plugged in.

If the UP0/S0-converter is installed in the middle of the bus, do not route the two wires of the bus line together in an insulation piercing connecting terminal. In this case, first connect the two wires together (for example by soldering) and then connect only one wire to the insulation piercing connecting terminal.

The maximum input voltage for the UP0 / S0-converter must not exceed 42 VDC!

UP0 connection

Note:
The terminating resistors in the converter may only be removed if it is operated in a star-shaped connection. Terminating resistors must then be fitted to both ISDN jacks at the bus ends.



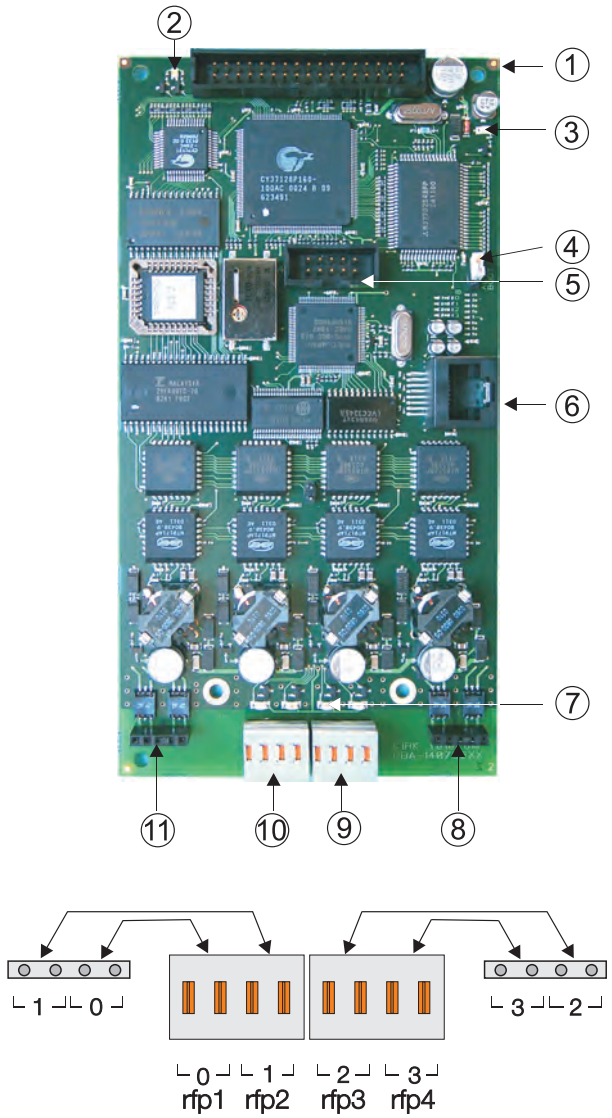
1. UP0 module
2. UP4-connection
3. UP0 / S0 converter
4. Connector for 2 x100 Ohm terminating resistors
5. Connection (UP4)
6. UP1...UP3 connections
7. ISDN bus connection
8. ISDN bus (terminating resistors must be fitted in the last jack)
9. ISDN jack

Module DECT

elmeg DECT multicell module (DECT 400 System)

Up to four »elmeg DECT rfps« (rfp = radio fixed t) with four independent speech channels each can be connected to the elmeg DECT multicell module. Power is supplied through the module itself. Connection to the U-interfaces 0...3 is implemented via a two-wire connection. the maximum range being limited to 2,000 meters.
Up to 40 DECT handsets can be operated at each »elmeg DECT multicell«. One module each can be operated in the pabx and in the extension (xt). Each of these two modules represents a system of its own. There is no direct link between the two modules; communication is ensured by the pabx system.

The connections can be protected against overvoltages by an optional »Overload Protection Module«. One »Overload Protection Module« each protecting 2 connections (0,1 and 2,3).



① »elmeg DECT multicell« module
② Status-LED
③ Operation-LED
④ No operation-specific function
⑤ No operation-specific function
⑥ No operation-specific function
⑦ 4 rfp-LED
⑧ Jack for the »Overload Protection Module«.
With »ICT-rack« Connection for the »front module« connecting cable
⑨ Connection (2, 3) for »elmeg DECT rfp« 3, 4
⑩ Connection (0, 3) for »elmeg DECT rfp« 1, 2
⑪ Jack for the »Overload Protection Module«.
With »ICT-rack« Connection for the »front module« connecting cable

Note:
If at all possible, do not install this module in the ICT800xt expansion!

LED functions

The »elmeg DECT multicell« module is equipped with 6 LEDs. One green LED each for the elmeg DECT rfp-ports, a two-colour LED for displaying the status and an LED for displaying the module's operating status.

LED on the module	off	lit	flashing	flickers
rfp green	No »elmeg DECT rfp« connected.	«elmeg DECT rfp connected«.	Runtime measure-ment	
Status-LED red	Error, not ready for operation.	Firmware download into the »elmeg DECT multicell« module	All B-channels busy.	During start-up, system is not con-figured. Handset enrolment not possible.
Status-LED green	Error, not ready for operation.	Both B-channels available.	One B-channel is busy	System ready con-figured. Logon pos-sible.
Operation-LED green			Module ready for operation.	

Note:
After reading the pabx data, the serial number of the connected »elmeg DECT multicell« module is equally read and displayed in the »DECT 400 Settings«.

Logging on the handsets at an elmeg DECT 400 system

After the »elmeg DECT multicell« module has been assembled and started, 8 DECT-subscribers are automatically configured. Loggin on a DECT-subscriber into the system must first have been enabled. Enabling is done with the help of the Professional Configurator or by entering a pabx-specific code. The handset is stored at the next available position of the »elmeg DECT multicell« module and the corresponding internal extension number is assigned to it.

If you wish to assign a specific internal extension number to that handset, store the handsets' serial number in the Professional Configurator at the desired position. Then proceed as described in the operating instructions. The handset is stored at the selected position and the corresponding internal extension number is assigned to it.

Note:
To enroll a handset, an unassigned DECT-subcriber must be available in the Professional Configurator.

Please observe the information given in the pabx manuals for the DECT 400 system.

elmeg DECT rfp

The »elmeg DECT rfp« is designed for being connected to the »elmeg DECT multicell« module. Up to 4 rfps can be connected to each module.

Positioning the »elmeg DECT rfp«

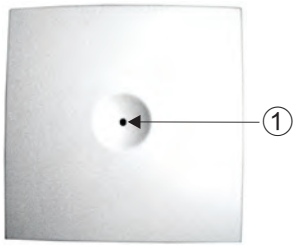
Find an appropriate place inside the building, where you want to install the »elmeg DECT rfp«. Please note that the range of the system can vary greatly, depending on the building in which the system is installed and on the construction materials used in the building. In most buildings you can assume an average range of around 30 meters. Install the rfp such that optimal coverage is provided in the main area of use (based on available channels.

If more than 4 channels are required you must install more than one »elmeg DECT rfp«. There must be a minimum distance of 5 meters between two rfps however. The devices should always be facing each other diagonally when installed in rooms.

There can be a distance of up to 2000 meters between the »elmeg DECT multicell« module and the »elmeg DECT rfp«. This distance does however require the use of wire with a cross section of 0.5 mm (diameter of 0.81 mm, AWG 20). The maximum distance is around 1,000 meters with wires having smaller cross sections, such as phone cable

y2x2x0,6. The module must be connected with the rfp via a »twisted pair« cable, for example Cat. 4 (e.g. phone cable y2x2x0.6) or Cat. 5. The »elmeg DECT rfp« does not require a dedicated power supply system, as it is fed via the connection with the module.

Note:
Instructions for calibrating the DECT system are provided in the appendix for the performance feature description .

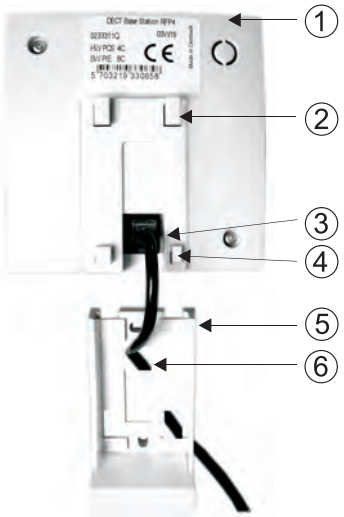


① LED

Installing the »elmeg DECT rfp«

Once you have selected a suitable location for the »elmeg DECT rfp« you can install the wall mounting unit. Place an RJ jack near the rfp, as connection is made using a 16-pin RJ12 connector. You can then use a patch cable to connect the jack and the rfp. Use the two middle prongs of the connector for this.

- Mark the two holes for the wall mounting unit on the wall.
- Drill the two mounting holes.
- Insert the RJ12 connecter through the wall mounting unit from behind and pull around 100 meters of the cable through toward the front.
- Mount the wall-mounting support.
- Plug the RJ12 connector into the »elmeg DECT rfp«. Carefully pull the cable through the wall mounting unit toward the outside while snapping the rfp into place in the wall mounting unit.



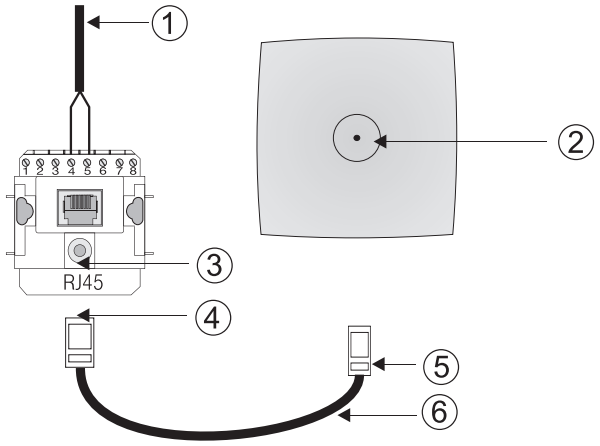
① »elmeg DECT rfp«
② Nose
③ RJ12 connection
④ Nose
⑤ Wall-mounting support
⑥ Opening for the connecting cable

Removing the »elmeg DECT rfp« from the wall-mounted holder:

Don't forget that the connecting cable is still plugged into the »elmeg DECT rfp«.

Use a screwdriver to carefully pry the wall mounting unit and the »elmeg DECT rfp« at. Then lift the »elmeg DECT rfp« out toward the top.

Carefully pull the connecting cable out until you can unplug the connector.



① Two-wire connecting cable (twisted pair).
② »elmeg DECT rfp«.
③ RJ45-jack (the two middle pins 4 and 5 are connected).
④ RJ45 connector
⑤ RJ 12 connector (6-pin)
⑥ Connecting cable (min. 2-wire)

LED functions

LED	off	lit	flashing
Activate.	»elmeg DECT rfp« not ready for operation.	For 5 seconds after power on.	When synchronizing with the »elmeg DECT multicell« module.
Operation.	—	Operating the »elmeg DECT rfp«.	flashing shortly while the connection is being set up.

Runtime measurement (cable delay measurement)

The cable between the »elmeg DECT multicell module« and the rfp must be measured and lengthened/shortened as required for »handover« between two »elmeg DECT rfp« units. Measurement is started using a code (phone procedure). All call connections for the »elmeg handsets« will be deleted while measurement is being performed. Depending on the number of rfps in use, the measuring period may take several minutes. The module is then reset.

Starting the runtime measurement

✱✱PIN96m

Enter **, the PIN and the code 96. Finally enter the slot »m« (1, 2, 4, 5) for the »elmeg DECT multicell module« in the pabx system.

Measurement started. The »rfp« LED flashes red (several minutes)

Measurement finished, data saved on the module. The »rfp« LED flashes green, the elmeg DECT multicell is being reset.

System ready for operation. The green »rfp« LED is lit,

Measurement of the radio range for the elmeg DECT system

Activating the measurement mode

Note:
For a full description of the measurement procedure, please refer to the appendix of this feature description.

The »elmeg DECT handset« must have been logged-on (see Operating instructions for »elmeg DECT handsets«).
You can switch to the measuring (test) mode using one of the following procedures.

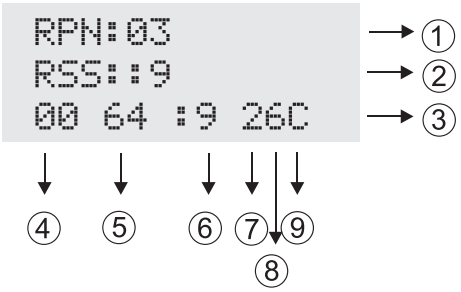
✱99989✱ Enter the code number and press OK to confirm.

or

✱99981✱ Enter the code number and press OK to confirm.

- The DECT handset is now in the measuring mode, but provides inaccurate values.
- Switch on the handset (lift headset). The following code is then shown in the display:

Display after measurment mode *99989*



① RPN: Number of the other »elmeg DECT rfp« (HEX)
② RSSI: Field strength for the »elmeg DECT rfp« shown above
③ Active »elmeg DECT rfp« with measurement values
④ Number of the »elmeg DECT rfp« (HEX) (00 in this example)
⑤ Q52-value (64 in this example)
⑥ RSSI field strength
⑦ Frequency
0 ... 9
⑧ Time slot 0 ... B
⑨ Type of handover
B: Bearer (field strength too low)

C: Connection
D: Idle (opposite terminal busy)

Display after measurement mode *99981*

① RPN: Number of the »elmeg DECT rfp« (HEX)
② Q52-value of the active »elmeg DECT rfp«
③ RSSI field strength

- You can carry out a »handover« between the »elmeg DECT rfp« units in the measuring mode *99989* using the key combination Menu and the # key.
- Measurement is canceled when you switch off the handset, or by holding down the »C« key for a few seconds.

Q52-value

The Q52 value is used to check the voice quality for communication between the »elmeg DECT rfp« and the handset. If this value attains <52 the handset will automatically search for a different, assigned »elmeg DECT rfp«.

RSSI

The RSSI value is a quantity used to express the field strength of the base station. The RSSI value is used to select the proper rfp or repeater. The handset selects the rfp or the repeater with the highest RSSI value.

elmeg DECT repeater II

Note:
You may only use the «elmeg DECT repeater II« for the elmeg DECT 400 system!

The elmeg DECT repeater II expands the coverage area of your system. A radio link exists between the »elmeg DECT rfp« and the »repeater II«. No cable connection is required. The repeater has the same look as the »elmeg DECT rfp) and is installed in the same manner. A plug-in power supply unit must be connected to provide power to the DECT repeater II. Connection is made as described for the »elmeg DECT rfp«.

Starting the »elmeg DECT repeater II«

LED Functions

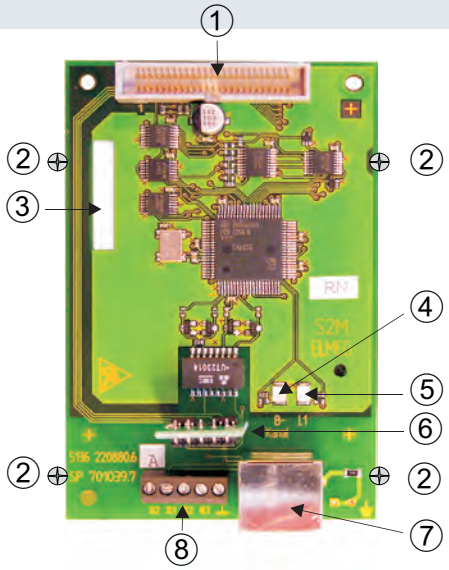
LED	off	lit	flashing
Switch the repeater ON.	repeater not ready for operation.	For 5 seconds after power on.	While synchronizing with the base station.
repeater operation.	—	Repeater operation.	flashing shortly while the connection is being set up.

Installation of the »elmeg DECT repeaters«

You must have the corresponding configuration software (KIRK tool) to install a repeater. Your CD ROM contains documentation with a corresponding description and tool.

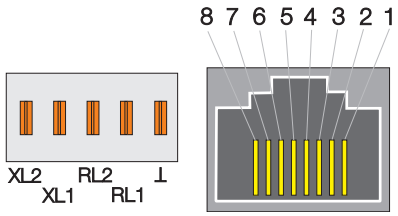
Module S2m (Primary multiplexer PRI)

Note:
The S2m module may only be operated when the fine protection module (FS) is plugged in.



① Connection for the connecting cable on the PABX system motherboard
② Fastening screw (1 of 4) in base module
③ Module plug-in connector without function
④ Red LED 2
⑤ Green LED 1
⑥ Jack with module overload protection (OP)
⑦ External connection (RJ 45)
⑧ External connection (fixed connection)

Connection designation module S2m



Connection designation module S2m		Different connection designations of network service providers			
RJ45 jack	Hardwired connection		UK= PRI : ISDN 30	Colt	
1	RL2 (-)	ab/a		Tx (1)	
2	RL1 (+)	ab/b		Tx (2)	
4	XL2 (-)	an/a		Rx (4)	
5	XL1 (+)	an/b		Rx (5)	
Screening	GND				

Primary multiplex port (S2m connection)

You can use a primary multiplexer port via module s2m at special slot 2 in the PABX system (not in expansion module). This port provides up to 30 B-channels for outgoing calls.

The S2M connection is considered the same as a point-to-point connection with special configuration options for configuration of the PABX system.

You can select one of three directional options for each B channel to enhance your overall accessibility. These settings apply only to the assignment of B channels by the PABX system (outgoing calls to external ties). Incoming calls are accepted regardless of the configured direction of the B channels in the PABX system.

Connection of module S2m

Note:
Please note when installing the moduleThe »**T**« terminal must be connected to the function ground terminal for the PABX system using a line with a minimum cross section of 2.5 mm2

External connection (RJ 45):

- Connection to the feed-in from the network service provider is made using the CAT.5 cable (2 meters) supplied with the system.
- A CAT. 5 cable with a maximum length of 10 meters can be used for grater distances.

External connection (fixed connection)

The maximum distance between the feed-in from the network service provider and the s2m module can be 10 meters.

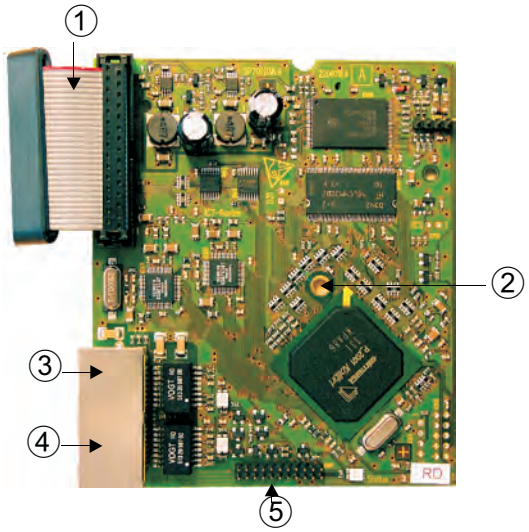
Installation of the S2m module in the ICT 880-rack PABX system.

Here, use the »S2m« connecting cable to effect a connection to jack »S2M/PRI« on the front panel. No other connection is required. The RJ45 jack, or the hard-wired connection on the s2m, is not used.

LED functions

LED 1 green	LED 2 Red	Significance
Off	Off	No function (e.g. Connector towards PABX not plugged in)
On	Off	S2m-Module in operation. No B channel assigned
On	On	At least one B-channel is busy
Off	flashes (4Hz)	Error in the net or in the exchange
Off	On	LOS loss of signal
Off	flickers	RAI: remote alarm indication. Signal error from S2m module to the modem

Router module



① Connection to motherboard (only the ferrite core connecting cable supplied with the system may be used
② Fixing holes
③ LAN-port
④ WAN port
⑤ Connection to the LED board for the router patch panel

Note:
You can not use the Router module together with the VoIP VPN Gateway module. The Router module will no longer be operable then.

The router module provides features for linking a PC to a LAN (Local area network) and enables high speed internet access using xDSL or ISDN. Required safety is provided by an implemented firewall in conjunction with NAT (network adress translation). The functions DHCP server and DNS proxy ensure that the scope of configuration, both for yourPABX system and your PC, is kept to a minimum . Internet access for all of the PCs connected to the router is provided via one single connection (SUA - single user account).

Ports of the PABX systems (WAN, LAN, USB)

You can link the PABX system router with another network, for example the Internet, via the WAN port. With a DSL port you can connect a DSL modem to this interface with an Ethernet (10BaseT) interface.

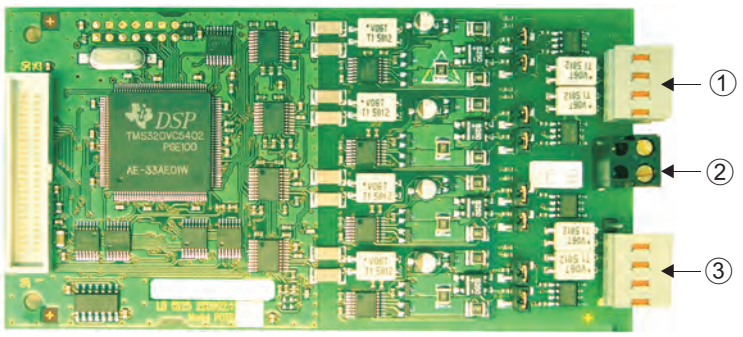
You can connect PCs to the PABX system for the local network (LAN) via Ethernet, Fast Ethernet or USB. At present, only Microsoft Windows operating systems are supported for connection of a PC to the PABX system via the USB port. You can connect devices to the LAN port of the Router module via Ethernet or Fast Ethernet, regardless of the operating system platform you are using (Linux, Mac OS, MS Windows, Palm-OST, etc.) or the device type (PC, Mac, PDA, Webpad). PCs connected in this manner form a network (LAN - Local Area Network). If you wish to connect several PCs you will need a hub or switch.

Installation

Screw the Router module into the slot marked “Special slot 5" (see page28) of the elmeg ICT 46 /88 /880/880-rack. You can not use the slot on the expansion module (xt) for this. If you install the Router module in an elmeg 880 rack please follow the installation instructions given on Page 25.

Modules POTS

4 POTS module, 2 POTS module



The picture shows the module 4 POTS.

① Connection a/b3, a/b4 (only module 4 POTS)

② Connection a/b1, a/b2 (Module 4 POTS, Module 2 POTS)

③

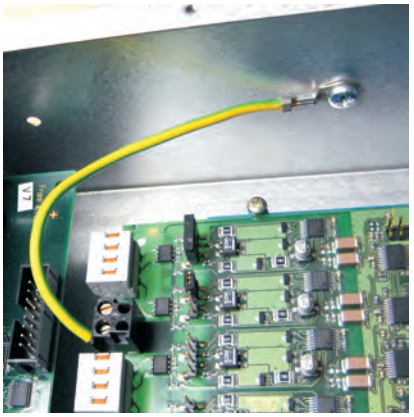
Note:
This module may only be run at special slot 2.

Note:
PABX systems from firmware version 1.5 can be run using this module. Older ICT46 PABX systems are not equipped with a plug-in connector at special slot 2. Therefore you must check in advance whether this module can be used in your PABX system.

Installation

It is essential that this module be connected to functional ground, as it is equipped with integrated fine overload protection. If functional ground has not already been connected to the PABX system, this must be done before starting the module (see Page 9).

Example for a functional ground connection in the ICT800rack



Features

- The POTS module comes equipped with four ports for operation at analog exchanges (HKZ / POTS).
- The pulse / DTMF dialing method can be switched in the configuration.
- Transfer of CLIP information can be configured for each port.

  A call is signaled at an analog terminal device only after all of the CLIP information has been completely transferred to the terminal device.
- A central switchover function allows the recognition of 16 or 12 Hz charge rate information.

  The rate information (charge pulse) to analog terminal devices is transmitted in accordance with the set configuration; rate information is transferred to ISDN terminal devices as currency amounts.
- End of dialing monitoring can be configured.

  The time function for monitoring for end of dialing activates the voice channel to the subscriber only after the set time has expired.
- Dial tone / Dial tone detection

  Tone recognition procedures are country-specific. For frequencies and cycles being tested please refer to page 91.
- Keypad functions.

  Internal keypad dialing is transformed to DTMF dialing to an external ty when connected via the POTS module ports. This function can not be used if the port is set to pulse dialing.

Note:
This setting has been optimized at the factory and should only be changed if explicitly required by the network service provider.

- GSM-Gateways can be connected
- SMS in the fixed-line network is possible with the module.

Module VoIP-VPN Gateway

The VoIP-VPN module enables Internet telephony by Voice over IP and provides secure data exchange via VPN. A description of the functions is given in the appendix to the documentation under«VoIP-VPN Gateway Module«.

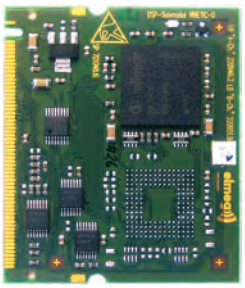
One (1) VoIP-VPN module per PABX system can be installed at a module slot 1/2 or 4/5 of the PABX system ICT 46, ICT88, ICT 880 or of the expansion unit. This module may not be used in allel with the Router module. The Router module is rendered non-functional in this case.

① Connector for flat cable
② Jumper
③ Expansion module M 4 DSP
④ Plug-in connectors (for testing)
⑤ Expansion module slot 1
⑥ Expansion module slot 1
⑦ LED LED 1
⑧ Connectors for LEDs on front panel of the ICT-rack version
⑨ Expansion module M 8 DSP
⑩ RJ 45 jacks WAN, LAN1... LAN3 with integrated LEDs.
⑪ RJ 45 Connection WAN
⑫ RJ 45 Connection LAN3
⑬ RJ 45 Connection LAN2
⑭ RJ 45 Connection LAN1

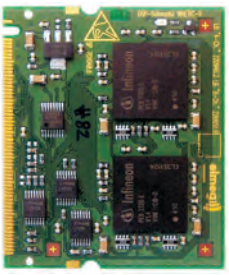
Note:
Only one module possible in the ICT, preferably to be installed in the ICT800xt expansion !

Modules M 4 DSP / M 8 DSP

These modules enable system, ISDN and analog phones to be used for VoIP. Connection to the SIP provider is also supported.



M 4 DSP module

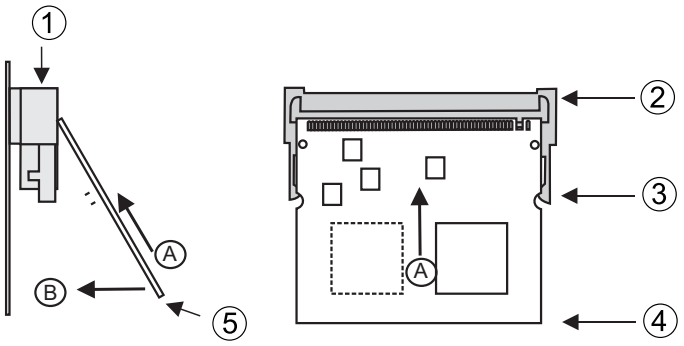


M 8 DSP module

M 30DSP module

Module installation DSP

As shown in the picture at the bottom, 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 it out in the opposite direction (A) shown here.



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

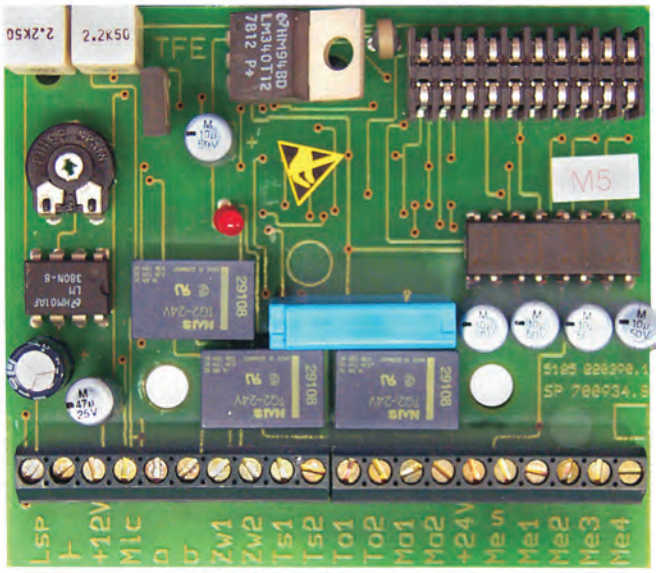
Function of the LEDs

LED 1 green	Significance
Off	Module not configured
Lit	Module ready for operation
Flashes	Error, the module is not ready for operation
LED in the RJ45 jacks	Significance
Green lit	Link (Connection)
Green flashing	Data transfer 10 / 100 Mbit/S
Yellow lit	Data transfer with 100 MBit/s
LED yellow not lit	Data transfer with 10 Mbit/s
All LEDs lit	Error – New module software not recognized
All LEDs flashing	Copying new module software
LED in the modules M 4 DSP / M 8 DSP	
Green lit	Operation
not lit	No power, or fault (unplug power connector)

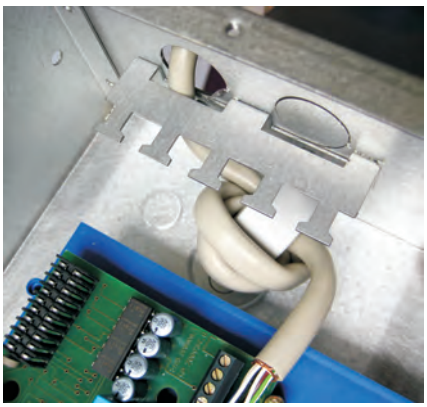
Note:
Module M30 DSP:This module may not be used in parallel with the M4 DSP/ M8 DSP module. The M4 DSP/ M8 DSP module is rendered non-functional in this case.

Door intercom module

If the installed door intercom module is used in a PABX, then analog connection 8 is not available for installed door intercom module 1 and analog connection 6 is not availoable for door intercom module.



Note for installing the door terminal module into the ICT800rack



If you are operating the pabx- system in an environment with a high level of interference (e.g. in rooms with machines, lifts, printers etc.), you should wind the connection line for the door terminal several times through a toroidal core. An example is shown in the figure on the left.

Connection of a door terminal module

Connection for door terminal module and external music on hold

The following connections can be used for a door terminal module or for external music on hold.

PABX	a/b6	a/b7	a/b8	a/b3	a/b4
	Base			Expansion	
elmeg ICT 46	—	MoH	Door terminal 1	—	—
elmeg ICT 88 / ICT880	Door terminal 2	MoH	Door terminal 1	door terminal 4	door terminal 3
elmeg ICT 880xt	door terminal 2	MoH	door terminal 1	door terminal 4	door terminal 3

Door intercom device (DID)

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

The door intercom module is plugged onto the PABX connector pins and secured with four screws. 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 installation lines should be fixed in the PABX using »cable binders«.

The door intercom module is not recognized automatically by the PABX; it must first be set during configuration.

Connections:

Speaker	Speaker connection	4-wire connection
T	GND (Ground)	
+12V	Microphone supply, 4-wire connection	
Mic	Microphone connection	
a and b	analog port (a + b) (according to FTZ 123 D 12)	
ZW1 und 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 for alarm inputs (DC or AC input)	
*Me1...Me4	Bell button inputs (AC or DC)	
Me4	Alarm input (DC and AC)	

*) requires firmware 1.2 or later

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 allel 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 each 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, a. 8, with a max. of 24 V (off-load voltage), may be used for all voltage sources connected to the PABX system.

Note:
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	2 km (ICT 46 100 meter)
	SPEAKER		Door phone	2 km (ICT 46 100 meter)
	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	2 km
	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.

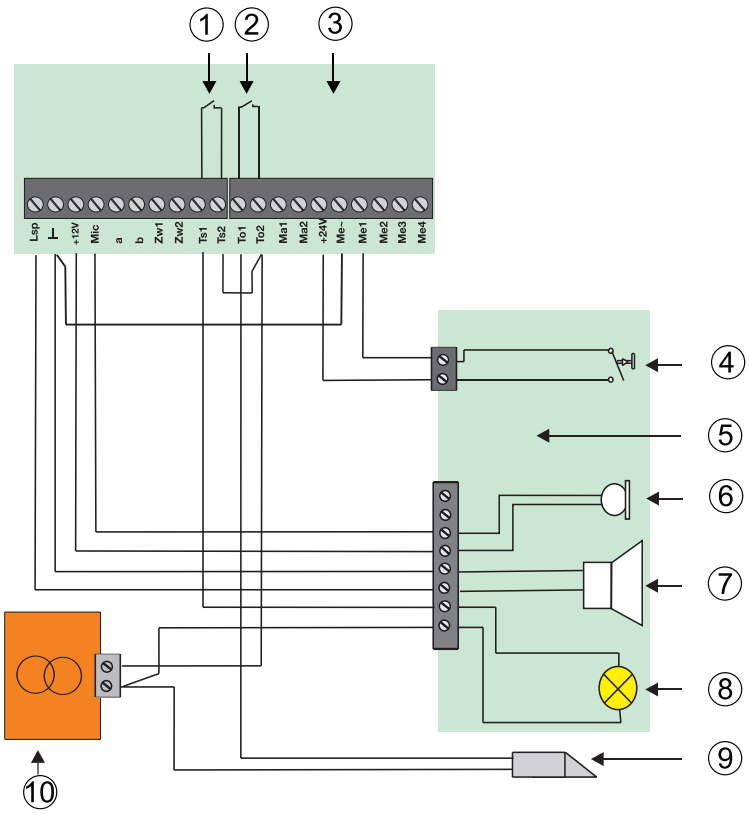
Contact designation	Door intercom module			
	Door terminal 1	Door terminal 2	door terminal 3	door terminal 4
MA1 / MA2	1	3	5	7
Zw1 / Zw2	2	4	6	8

Loading of contacts

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

Interfacing of a standard door phone unit

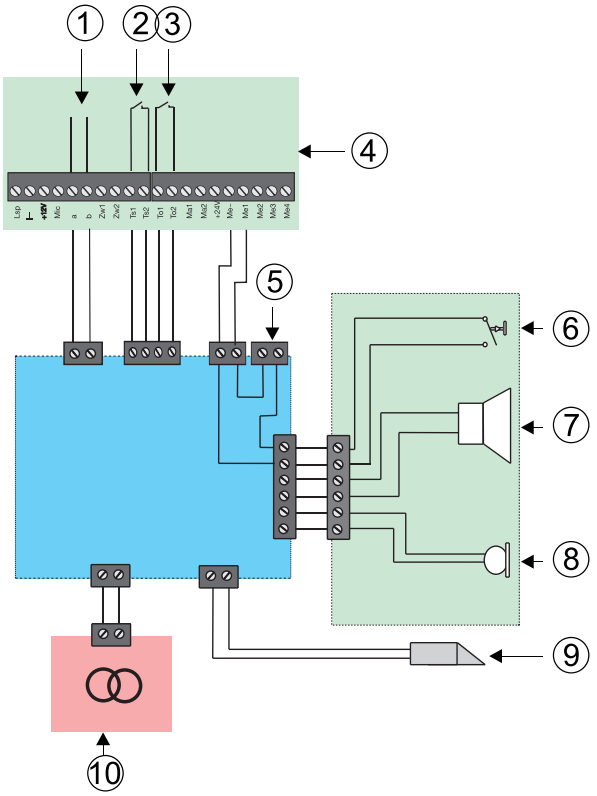
The figure below illustrates the connection of a door phone equipped with a microphone and speaker. No door intercom amplifier is required for this connection. The bell transformer is used only for the door opener and the operating signal lamp. The interface connections at the door phone and bell transformer 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 ty 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 V~)

Interfacing of a Interfacing of a door intercom moduledoor intercom feature moduleDoor intercom module according to FTZ guideline

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 ty 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 three 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

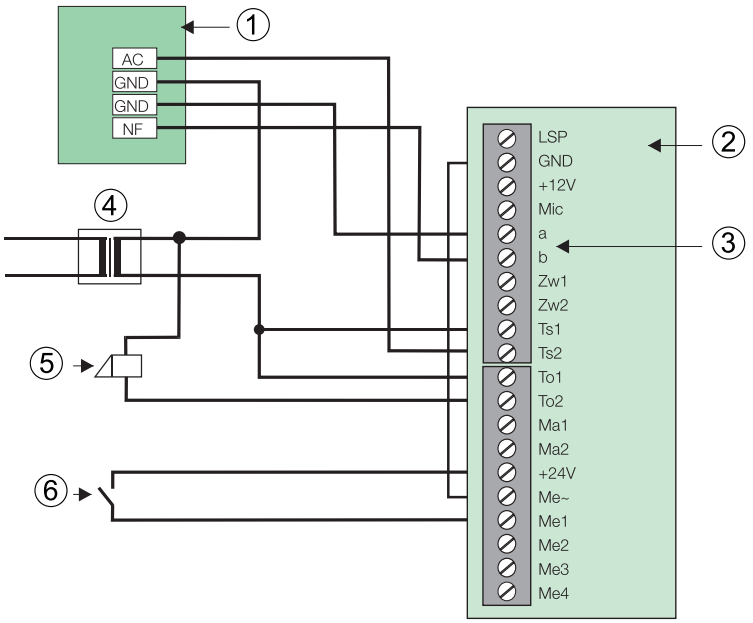
As defined in the configuration, a switching contact is actuated in the ringing cycle when a specific extension number is called from an external number. If a bell is connected to this switching contact, it will always ring when the corresponding MSN extension is called from an external number. This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

You can define up to 2 second bells or central bells for each door terminal. Only one second or central bell may be operated using the internal AC ringing voltage supply.

Information for ICT46

Please note that interfacing in accordance with FTZ123D12 is asymmetric for some door intercom units. In this case you must connect the a wire to GND instead of the b wire as shown in the examples in the »Door terminal applications

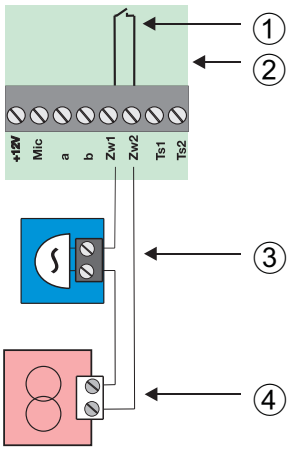
with elmeg ISDN PABX System). From serial number 5000 on, connect the door intercom unit again without changing the poles.



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.



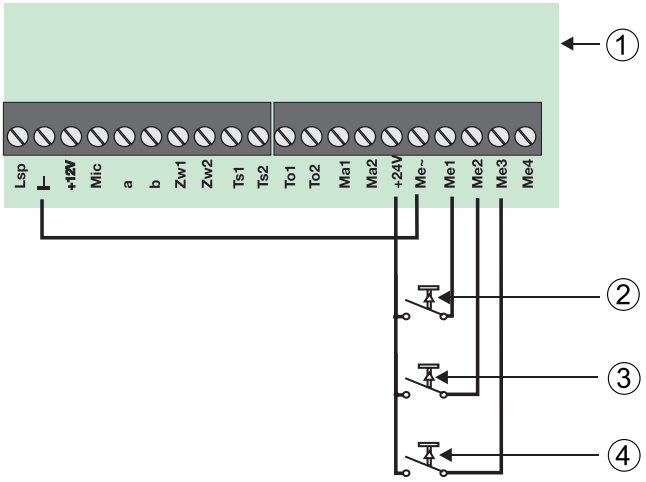
① Potential-free contact with the connections ZW1 and ZW2.
② Door intercom module.
③ Central or second bell.
④ Bell transformer with max. 24 VAC.

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

Only bell transformers in compliance with VDE 0551 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. A fourth bell button can be connected to Me4 starting froom firmware version 1.2.

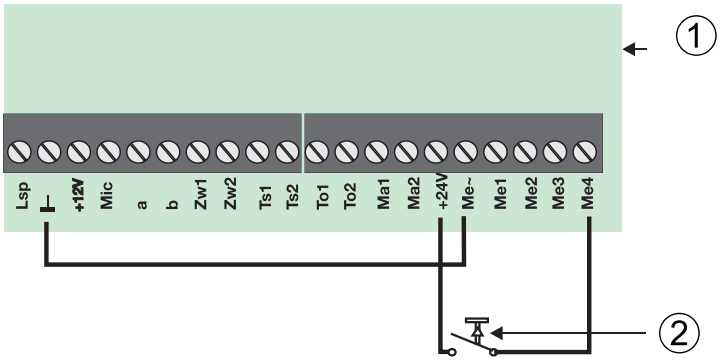


① Door intercom module.
② Doorbell 1.
③ Doorbell 2.
④ Doorbell 3.

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. The analog connections for the base module can be configured as alarm inputs (see page 75).

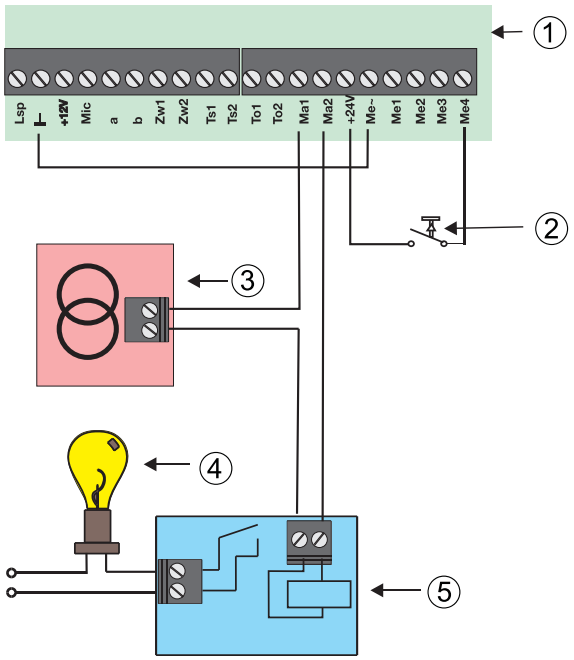


① Door intercom module
② External signal contact

Note:
Analog ports can be used as alarm inputs as well (see page 75).

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..

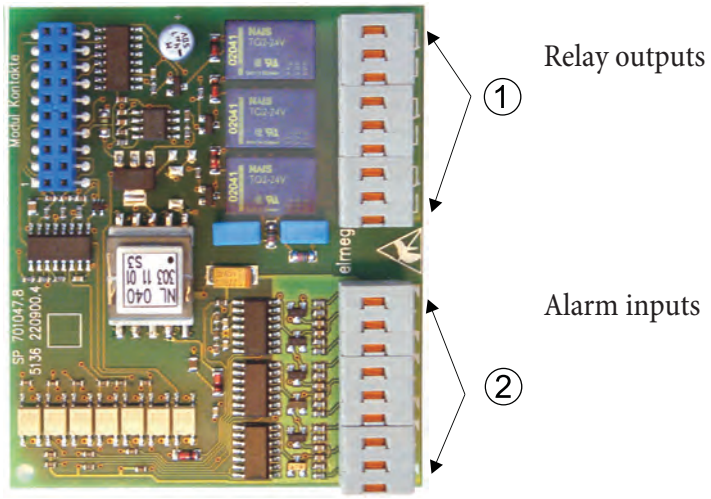


① Door intercom module.
② External signal contact.
③ Bell transformer with max. 24 VAC.
④ Controlled device (in this exemple a lamp).
⑤ Relais.

Contact module

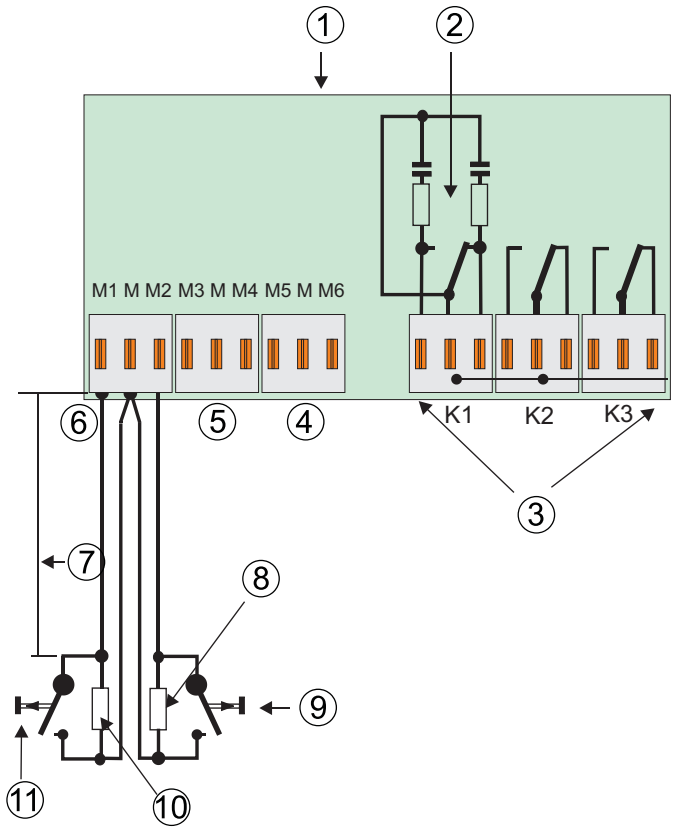
The switching contact module features 6 alarm inputs and 3 switching contact outputs. It is mounted in one of the special purpose slots. This module must be logged in to the configuration, as it is not recognized automatically.

- 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 allel 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.



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

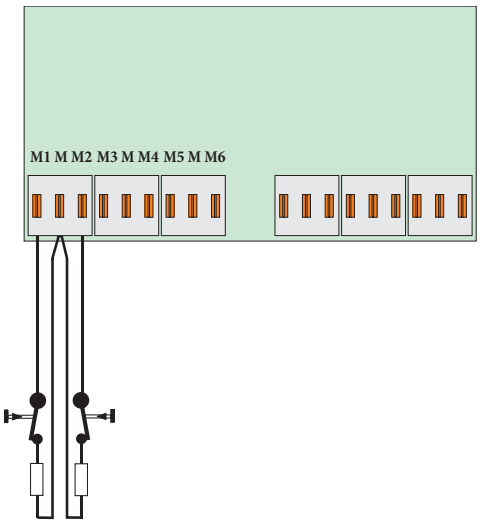
Connecting the alarm input via a make contact (make contact element).



① Switching contact module
② Interference suppression elements (100nF, 220 Ohm)
③ Terminals fot the relay contacts K1, K2, K3
④ Terminal for the alarm inputs M5, M6
⑤ Terminal for the alarm inputs M3, M4
⑥ Terminal for the alarm inputs M1, M2
⑦ Max. Cable length 100 m
Max. Resistance< 8 kOhm
⑧ Sensor resistance 4.7 kOhm +/- 10%
⑨ Sensor contact for connection M2 /M
⑩ Sensor resistance 4.7 kOhm +/- 10%
⑪ Sensor contact for connection M1 /M

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

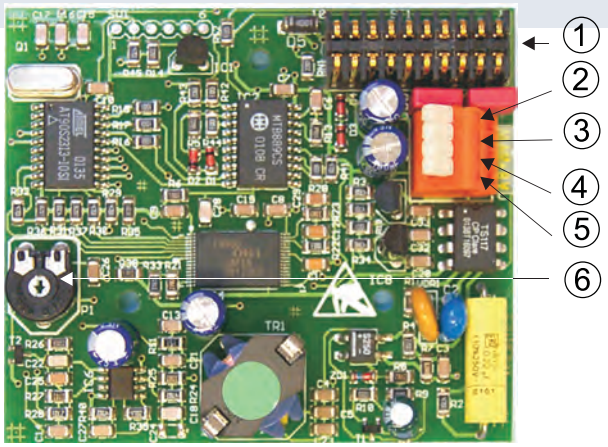
You can also use this circuit via a break contact element, as shown in the example below. A single alarm call is then made when the contact is opened (line disruption). After this the contact must be reliably closed again, as otherwise no further alarm calls will be possible.



Voice announcement module

Note:
You can install only one announcement module in the PABX.

Note:
This module is no longer available!



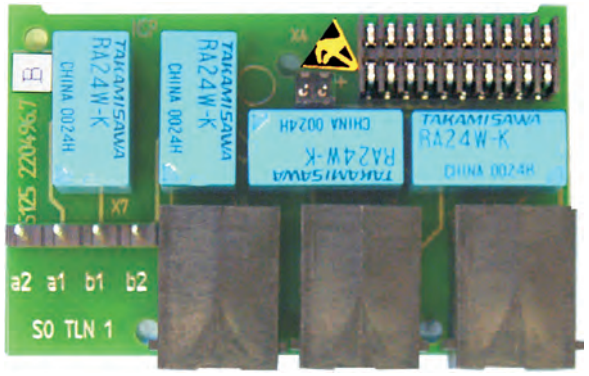
① Connector for connection to the door intercom module slot.
② 0 V
③ +20V
④ a
⑤ b
⑥ You can set the volume with this knob. To the left = reduce volume,
to the right = increase volume.

The feature »Voice announcement before answering« is implemented using the announcement module. With this module, a caller is first switched to the Announcement module, where he/she then hears an announcement message. The caller is then switched to another telephone. Please refer to the operating instructions for the voice announcement module for further information.

The announcement module is mounted in a special slot and is provided with power via the connections for this slot. Use either one of the analog ports a/b1. . . a/b8 for connecting. In the PC configuration for the PABX system you must configure the analog port as a telephone. For more details about configuring the Announcement module, refer to the operating instructions for that module.

Emergency supply module (Es)

Note:
This module can not be used in conjunction with the elmeg ICT880-rack and the elmeg ICT880xt-rack



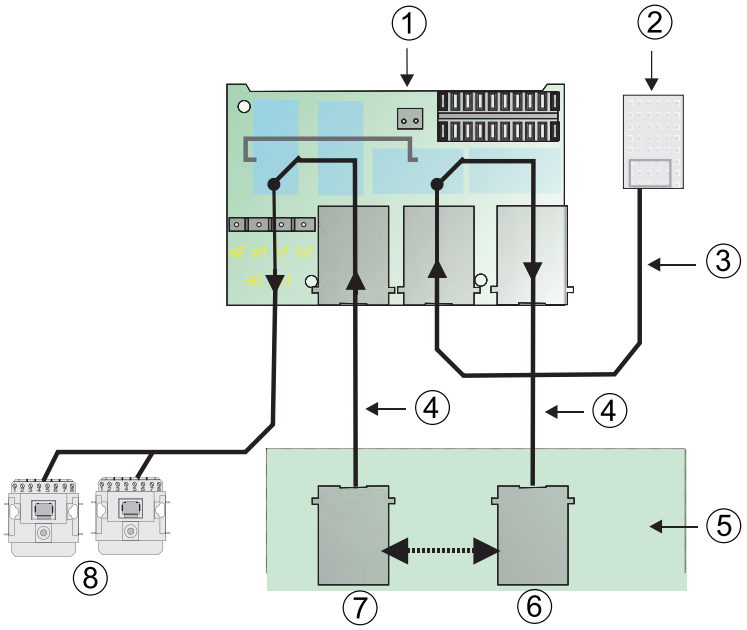
The powerfail feature module permits continued use of the PABX to make calls on loss of the 230 V AC power supply. The terminal with which you can make phone calls during power outages must also be equipped with an »emergency power« function.

Note:
You can install only one NSP in the PABX.

The emergency supply module is mounted in the provided special slot. Ensure that all of the contact pins are plugged into the socket connector and that they are not bent.

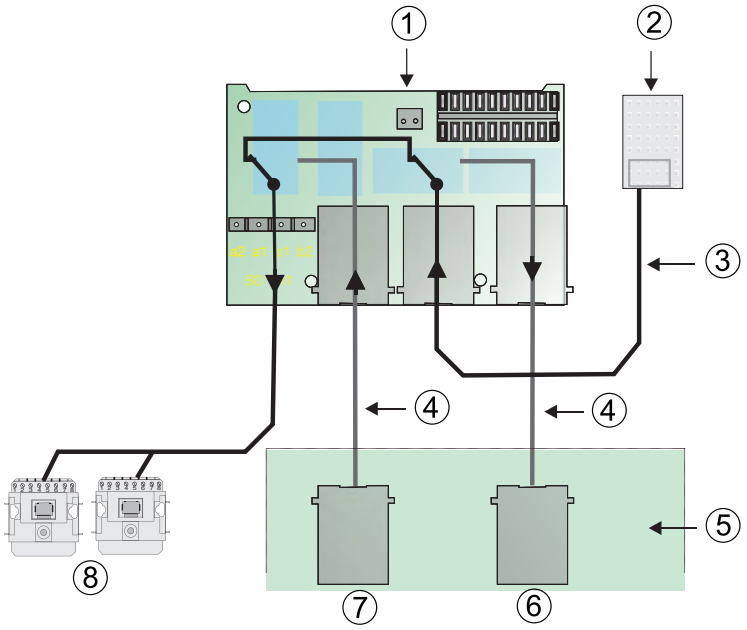
The external ISDN connection and the internal ISDN connection 1 (S01: INT) for emergency use are connected via the NSP. Interfacing of the external and internal ISDN connections is effected using the connecting cables supplied with the system. The figure shows the position of the relay contacts on the emergency supply module when the PABX is operating. On loss of power the contacts switch directly from the network termination unit to the internal ISDN bus.

PABX operating status



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.

Loss of power in the



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

Smart Media Card

Note:
Do not install or remove an SMC when the system is in operation, as this may result in a reset of the PABX system.

Music-on-hold melodies and voice announcements are stored on SMCs as company-specific WAV files. The card must be formatted properly and have a capacity greater than 4 MB.

The SMC can be inserted or removed while the system is in operation. However, it should not be inserted or removed while the PABX system is transferring data.

Please follow the instructions given on Page 23 to install an SMC in an elmeg ICT880-rack PABX system .

Note:
If you wish to expand memory space using a Smart Media Card (SMC), first export the WAV files from the PABX system and back them up. The SMC can then be installed and the WAV files transferred back to the PABX system; these are then written to the SMC.

Important information about using the SMC Adapter with the 256 / 512 xD card:

- 256 / 512 MB SMCs can be read by the ICT, but not formatted!
- Cards of this size can not be formatted using ICT / WINTOOLS, as this is not supported by the ICT.

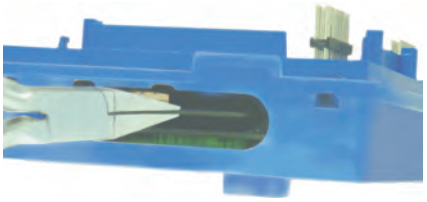
Cards of this size can be used despite this, however, when you follow the instructions given below:

- XD cards must be formatted for FAT using a card reader that supports this format.

Slot for Smart-Media Card

Insert the Smart-Media Card in the slot in the PABX so that the contacts on the card are facing downward and are at the back.

Use the appropriate tool for extracting the SMC (such as small flat-nose pliers). Carefully grip the SMC and pull it out of the slot.



SMC Adapter for XD Card

When inserting an SMC adapter with an xD card, proceed as follows:

Insert the SM/XD adapter with the XD card in the slot provided for this. The SM/XD adapter will come into contact with the PABX system housing when it is pushed into the receptacle, but it is not yet firmly in place. Carefully push the top of the adapter toward the back of the PABX system by about a further 1 mm. The adapter will then fit snugly in place, with proper contact.

You can then read out the configuration and the XD card will be recognized by WINTOOLS.

With rack PABX systems, remove the top panel of the PABX and slide the adapter into the slot until it catches firmly in place.

Installation

In this chapter, all PABX system ports are described regardless of the expansion of your PABX. The actual expansion will be described on the special pages for the respective PABX.

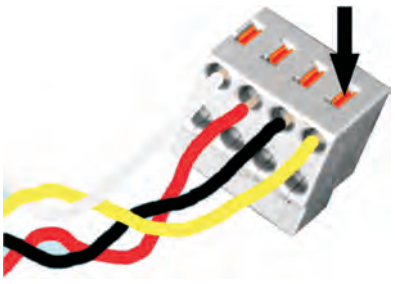
Terminals

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...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 wire ends must not be plugged into the terminals of the patch panel. It so, then removing them is no longer possible.



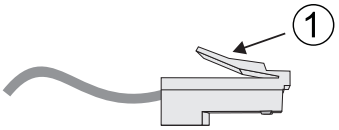
These terminals are used for the modules (4-pin), for functional ground (2-pin), and for the 12 V output = (2-pin).
The connection ensues via a screw-type terminal. The wire end to be inserted must be stripped of 6...7 mm of its insulation.
This figure shows a 4-pin model.

RJ45 connector

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.

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 UP0-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.

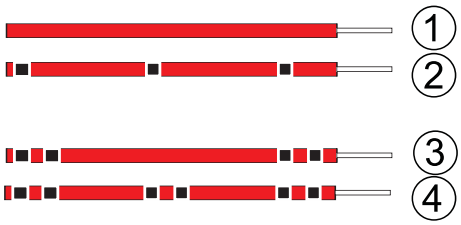
The lines are designated as follows:

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 cable is also available with more than 2 wire pairs.
Both wires of a pair are »twisted«.

1.Pair of wires:
① Red
② Black

2. Pair of wires:
③ White
④ Yellow

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



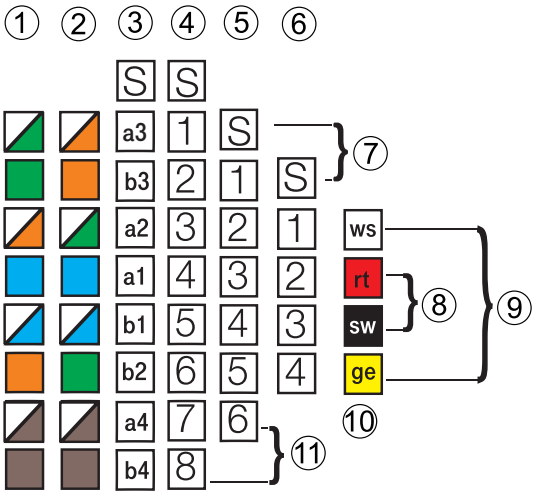
1.Pair of wires
① a1
② b1

2. Pair of wires
③ a2
④ b2

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 varioius jacks and the allocation of the wire pairs to the installation cable.



1 T568A:

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

2 T568B:

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

3 Wire designations.

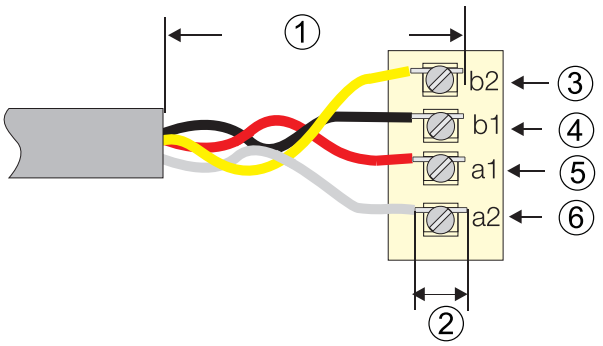
④ Terminal designations for UAE8 jack.
⑤ Terminal designations for UAE6 jacks.
⑥ Terminal designations for UAE4 jacks.
Screening (if available).
⑦ 3. Pair
⑧ 1.Pair (analog connections a/b).
⑨ 2. Pair.
⑩ Wire colors for telephone cables J-Y(St)Y2x2x0,6Lg.
⑪ 4. Pair.

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

Connection	Double wire designations	analog		ISDN			LAN
		2-wire	4-wire	S0	UP0	S2m	802. 310BaseT
1	3a						T+
2	3b						T-
3	2a		c	R+			R+
4	1a	a	a	T+	a		
5	1b	b	b	T-	b		
6	2b		d	R-			R-
7	4a						
8	4b						

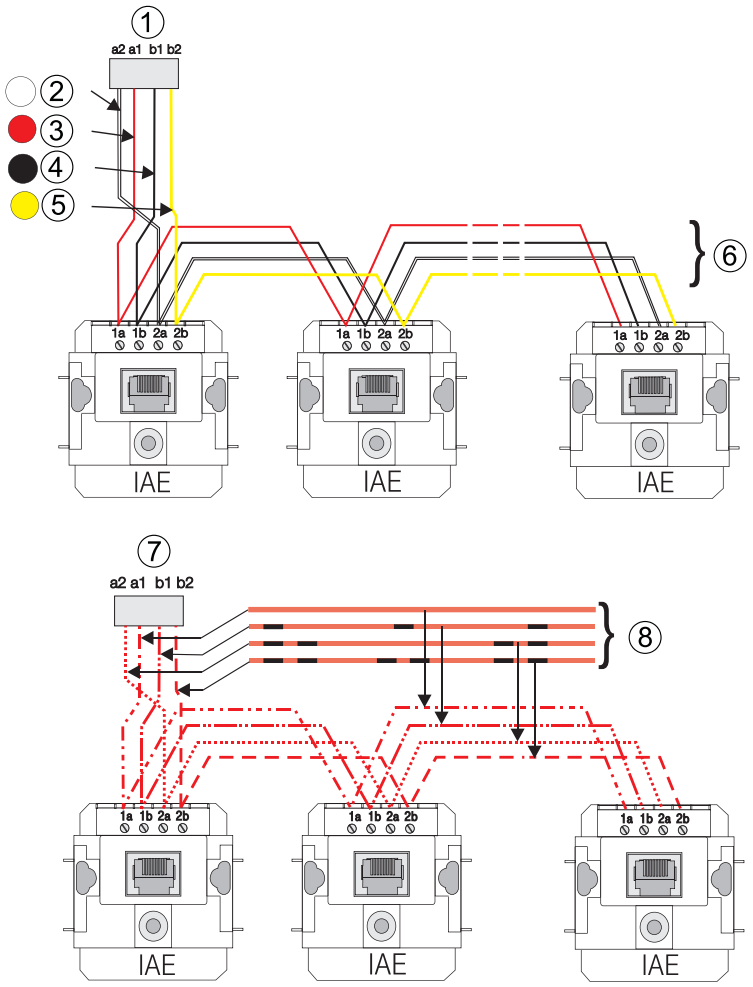
Fastening of the connecting lines

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.



① max. 100mm
② approx. 7mm
③ yellow
④ black
⑤ red
⑥ white

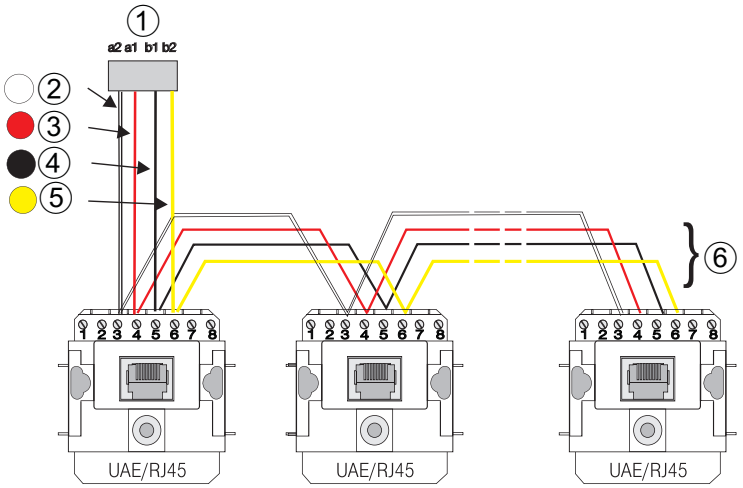
ISDN bus with IAE jacks

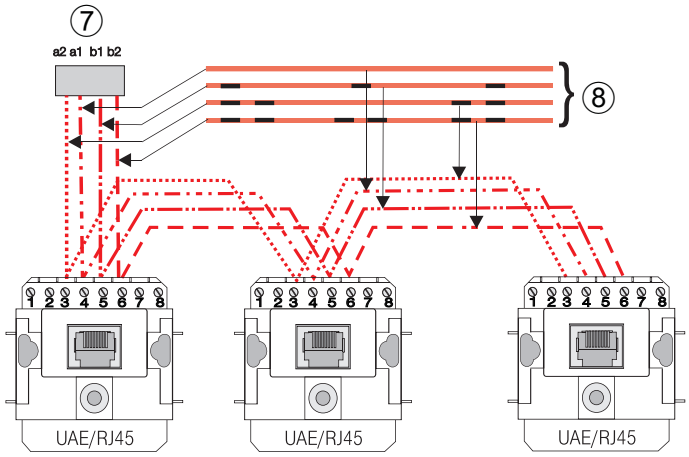


① Internal ISDN port of the PABX
② white
③ red
④ black
⑤ yellow
⑥ cable Y (St) y2x2x0.6
⑦ Internal ISDN port of the PABX
⑧ J-YY 0.6

Note:
Please mind the terminating resistors in the last jack.

ISDN bus with RJ45 (UAE) jacks





① Internal ISDN port of the PABX
② white
③ red
④ black
⑤ yellow
⑥ cable Y (St) y2x2x0.6
⑦ Internal ISDN port of the PABX
⑧ J-YY 0.6

Note:
Please mind the terminating resistors in the last jack.

Terminating resistors

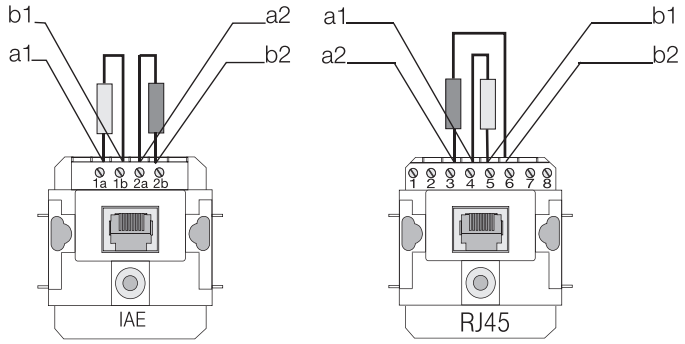
Note:
The terminating resistors on the cable terminal bay of the PABX are active when the switch is set to »ON«.

When connecting PABXs, modules and jacks, check whether the terminating resistors are fixed, switchable or installed at all. Read the sheets enclosed in the module packaging.

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.

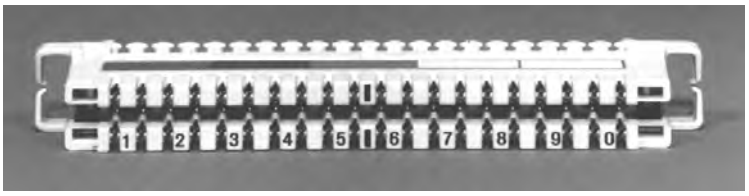
Note:
Terminating resistors must always be installed in both pairs of wires.

Note:
The different connections for the terminating resistors at RJ45 (UAE) and IAE jacks!

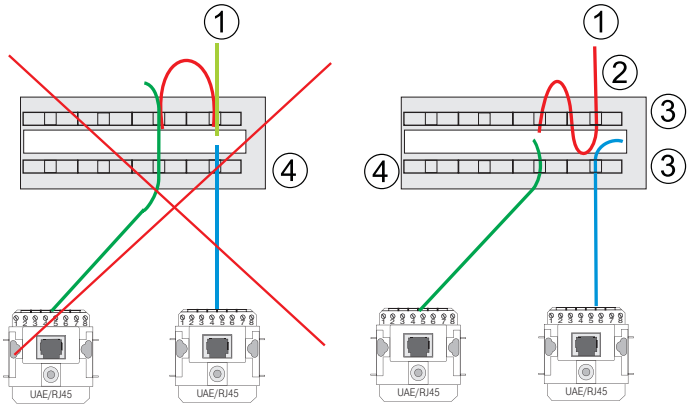


Piercing connecting terminals-Connections

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.



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.



1 Towards PABX
2 Interconnect these lines!
3 Piercing connecting terminals
4 LSA Plus strip

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 ISDN connections S02...S04 and the internal ISDN connection S01 (default state) 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 or external connection. You can also use »star-type wiring« for installing the PABX systems. For this, you can deactivate the internal terminators.

elmeg ICT880-rack, elmeg ICT880xt-rack

The catch on the ISDN connector points down. Switching from »Internal« to »External« is done with »Jumpers« (see page 19).

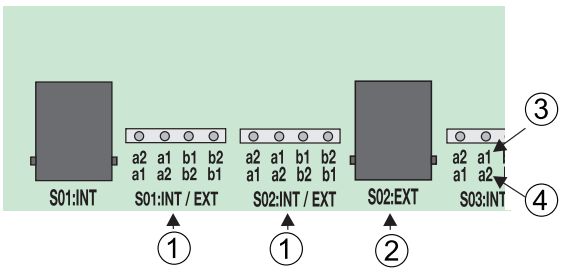
Internal / External ISDN port 1

This connection is provided with interfacing to an ISDN jack for the internal ISDN connection and hard-wired terminal blocks for the internal or external ISDN connection.

If the NSP module is applied, then this connection must be used as an internal ISDN connection since the connection cables delivered are only suitable for the ISDN connection jack.

External / internal ISDN connections 2, 3 and 4

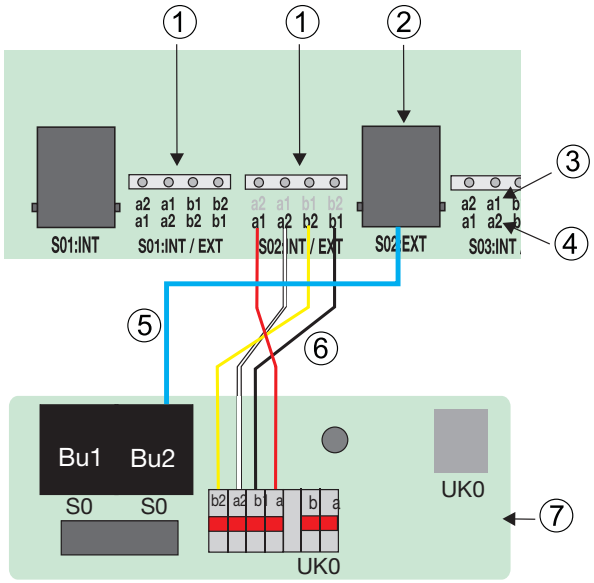
In the default state all ISDN connections are set to external. The ISDN connections 2, 3 and 4 can be switched from external to internal.



1 Hardwired connections (all terminals removed).
2 ISDN jack.
3 Internal connection assignments
4 External connection assignments

Connection NT- External ISDN connection of the PABX

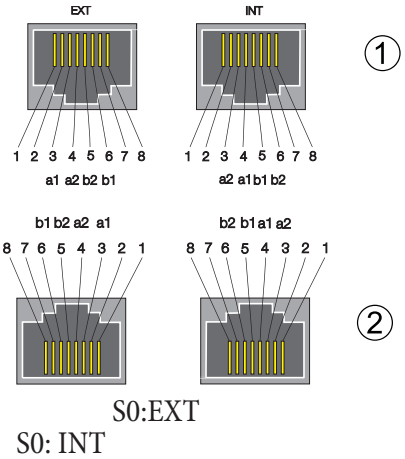
The PABX system must be hard-wired connected, as shown in the bottom picture, if you do not connect it to the NT using the ISDN connecting cord supplied with the system.



1. Hardwired connections (all terminals removed).
2. ISDN jack.
3. Internal connection assignments.
4. External connection assignments.
5. Connection via the ISDN connecting cord provided with the system.
6. Hardwired ISDN connection using the J-YY (2St) x2x0.6.
7. NT-Patch panel.

The figure below shows the different connection assignments for internal (INT) and external (EXT) ISDN jacks.

The connections 1,2 and 7,8 are not wired.



1. elmeg ICT880-rack, ICT880xt-rack. The catch on the ISDN connector points down (figure).
2. elmeg ICT46, ICT88, ICT 880. The catch on the ISDN connector points up.

Connection 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 »b«. The connection of each terminal device must always take place via one pair of wires.

International

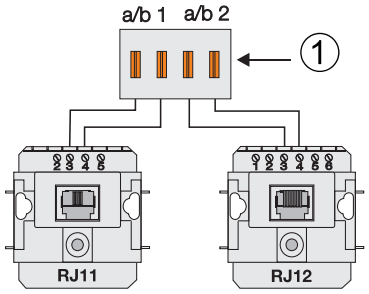
Connection with RJ-jacks:

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.

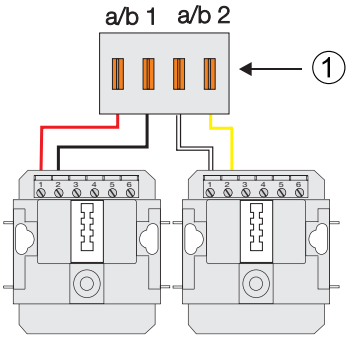


① Terminal

Germany

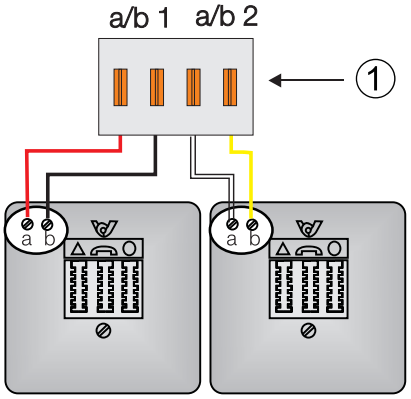
Analog terminal devices are connected using TAE jacks.

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.



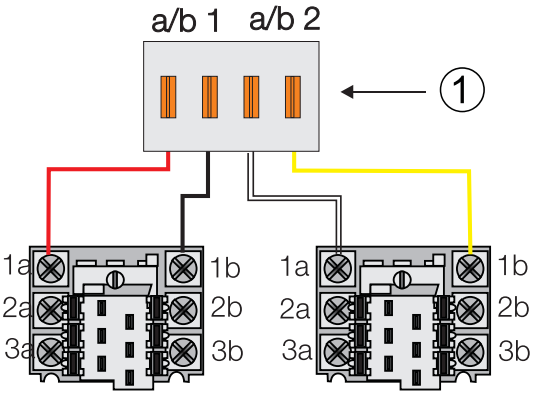
① Terminal

Austria



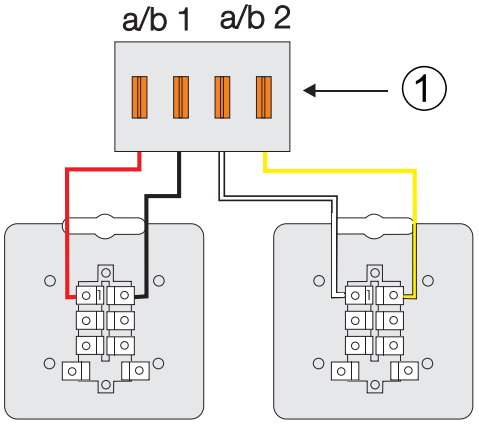
① Terminal

Switzerland



① Terminal

France



① Terminal

Analog inputs used as alarm input

The analog inputs of the base (module 0) can be configured as alarm inputs. The alarm inputs is active only with a current of at least 15 mA flowing from b1 to a1 for example. With a current of >8mA, no loop is detected and the alarm input is switched off.

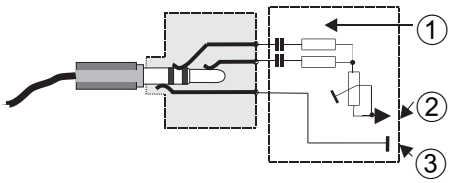
External music on hold (Musik on hold)

This product uses internal music on hold which does not require approval by GEMA (Society for Musical Performing Rights and Mechanical Reproduction Rights). This was confirmed by GEMA to ELMEG in the release certificate from the GEMA regional directorate in Hanover, Germany, dated January 16, 2000.

Note:
Ensure that any music you import does not have a third-party copyright (not subject to GEMA).

External music on hold can be fed into the PABX via a stereo jack. The 3. 5 mm stereo jack is not supplied with the PABX and must be purchased from a dealer. When configuring your PABX system, please check whether an analog port needs to be configured as »MoH input«. If so, then it is no longer to be used for telephony. For specifications on

the music on hold interface, please refer to the chapter »Technical data«. The volume of the externally played 'hold' music can be set via the »Volume« adjuster.



① Stereo plug with adaptor in the PABX.
② Input.
③ Gnd (grounding connection).

Note:
The analog connection 7 (MoH) is not applicable for telephony is external 'hold' music is used.

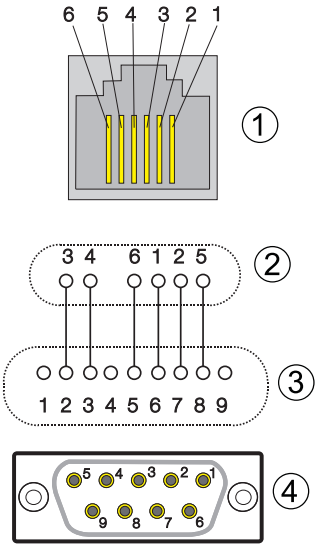
RS 232 port

The RS 232 port can be used for connecting a laptop, PC or a printer equipped with a serial port. Programming of the PABX via PC or laptop is performed via this port.

This RS232 port is not electrically isolated from the PABX ground. If the PC or printer is connected to the RS232 connection, then this should be operated over the same 230V line as the PABX.

All work on the RS 232 port may only be performed when the functional ground is properly activated. The devices to be connected to the jack (for example, PABX and printer) must first be turned off and separated from the 230 V~ network before the connection can be made!

Connections between the PABX and devices with RS232 port



① ② RJ 12 jack (6-pin)
③ ④ RS 232 jack (9-pin)

Pin-assignments for the connection cable's 9-pin jack

② RxD
③ TxD
⑤ GND
⑥ DSR
⑦ RTS
⑧ CTS

Note:
Only use the PC cable delivered with the system, as this is not a standard serial cable.

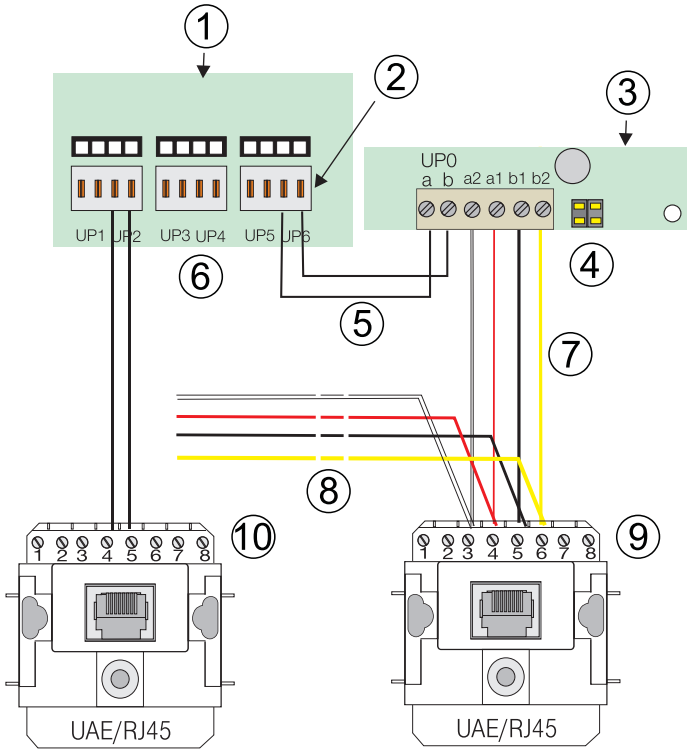
USB port

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

UP0-Connection elmeg ICT880xt / elmeg ICT880-rack

Connection to UPO is implemented via a two-wire connection. The figure shows the connection to an RJ45 jack and connection to the UP0- S0 converter. The package contains 4 UP0- S0-converters. You can connect system telephones compatible with the UPO connection, or in which UPO modules can be retrofitted, to the directly connected UPO jack.

Note:
The terminating resistors in the converter may only be removed if it is operated in a star-shaped connection. Terminating resistors must then be fitted to both ISDN jacks at the bus ends.



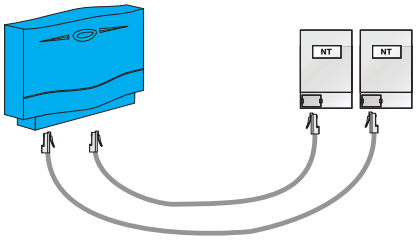
1. Patch field for elmeg ICT 880xt with UP01...6 ports.
2. UP6-connection (connected to a UP0 convertor
3. UP0 / S0 converter
4. Plug for 2 x100 Ohm terminating resistor (ISDN bus)
5. Connection (UP6)
6. UP1...UP6 connections
7. ISDN bus connection
8. ISDN bus (terminating resistors must be fitted in the last jack)
9. ISDN jack
10. UP0 jack (RJ45)

Note:
Please note that terminating resistors may not be used with UP0-ports!

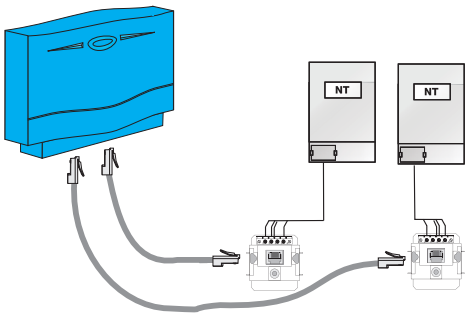
Connecting options for PABX systems

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

The following figures illustrate the three connecting options for the PABX to the external ISDN connection. Should numerous external ISDN-connections be used, then varying connection possibilities can be selected.



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

Use PC programming to switch the pabx configuration from »short passive bus« to »point-to-point« access.

Types of connection to internal ISDN ports

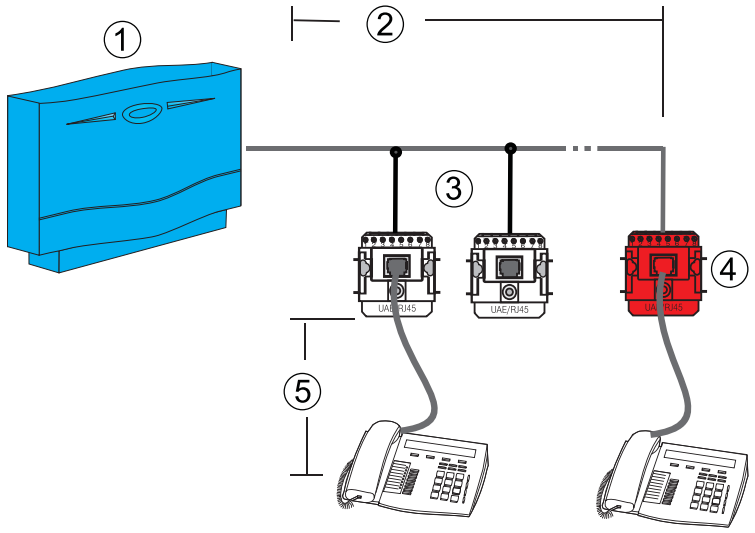
Three types of connections can be attached to the internal ISDN ports:

- the »short passive bus«, «,
- the »extended passive bus«,
- the »Point-to-point« connection.

In the default state, one internal ISDN connection is set for the »short passive bus«. The cable lengths apply to the cable J-Y(St)Y2x2x0.6. Greater ranges are possible using other cables.

»Short passive bus«

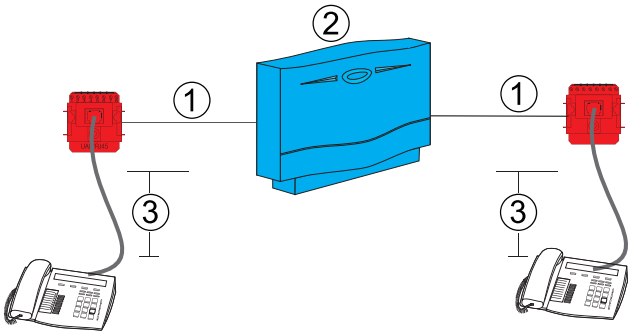
The »short passive bus« has a length of 120 meters. Up to 12 ISDN jacks may be connected in series. You can connect up to 8 terminal devices. Combined, internal terminal devices may have a maximum consumption of up to 2 W. Other terminal devices on the bus must have external power supply (with their own power supply units). Two of the ISDN terminal devices can be in operation simultaneously (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 lenght: 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. Connection cables for the terminal devices, max. 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. Connection cables for the terminal devices, max. 10 meters.

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

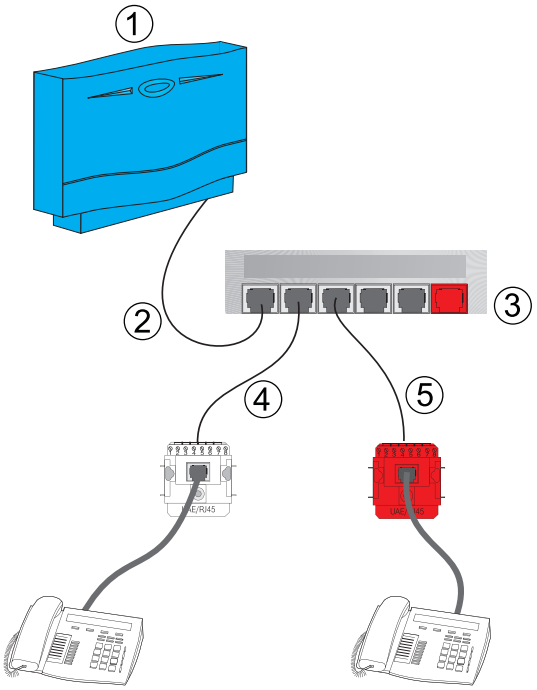
- Terminating resistors must be fitted to the jacks at both ends. The terminating resistors in the PABX system for the corresponding connection must be opened.

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 from the distribution point to the jack).

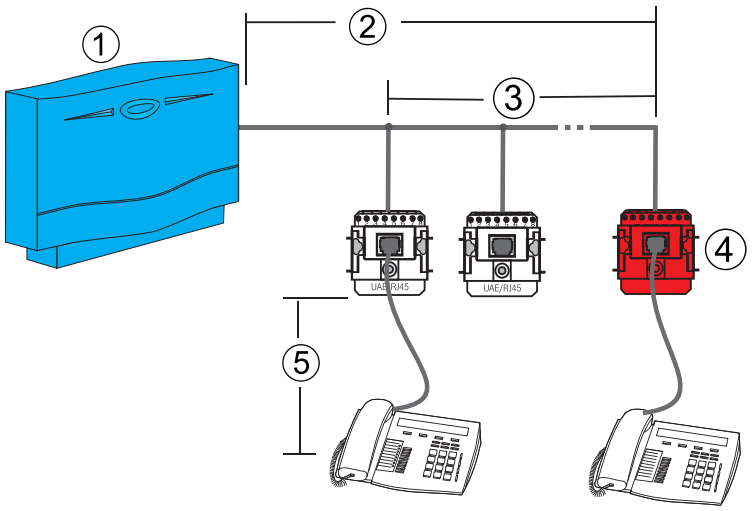


① PABX with active terminating resistors.
② Connection of the hub to the PABX (4-wire).
③ ISDN hub.
④ 8-wire line: 4 wires for the feed line and 4 for the return line.
⑤ Terminating resistors in the last ISDN jack.

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

»Extended passive bus

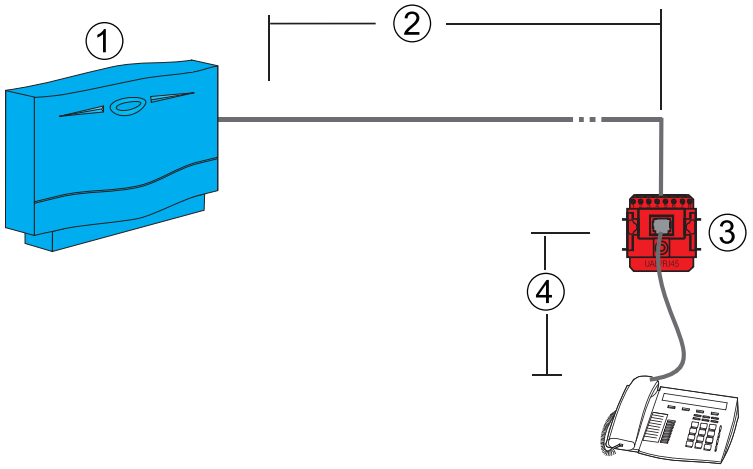
If the line length of the short passive bus is inadequate, an »expanded passive bus« can be used. It is at least 100 meters and at most 450 meters long. The terminating resistors must be installed in the jack located farthest away from the PABX. Going back from this jack (toward the PABX system) you can install a maximum of 12 jacks. You can, however, only install 4 terminals. Configuration is the same as for the »short passive bus«.



① PABX with active terminating resistors.
② Minimum bus length 100 meters, maximum length 450 meters.
③ Max. bus length 25 m. Up to 12 ISDN jacks.
④ Terminating resistors in the last ISDN jack.
⑤ A maximum of 4 ISDN terminal devices can be used. Connection cables for the terminal devices, max. 10 meters.

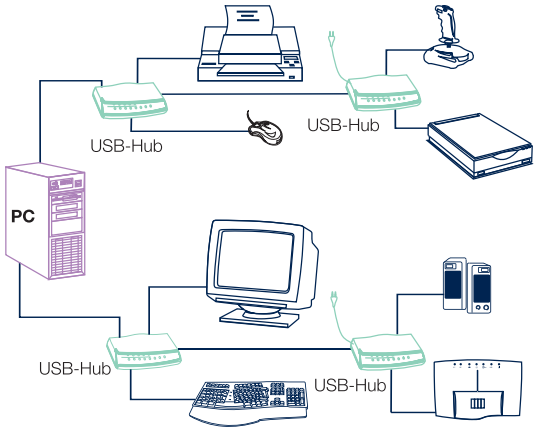
»Point-to-point«

This type of connection allows a distance of up to 600 m between one ISDN terminal and the PABX. This setting is made during PC programming. The terminating resistors must be installed in the ISDN jack. The wire diameter for the example used here is 0. 6 mm. The connection type is set in the configuration.



① PABX with active terminating resistors.
② Maximum cable length 600 meters.
③ Only one ISDN jack with terminating resistors.
④ One ISDN terminal device only can be used. Its connecting cable must not be longer than 10 meters.

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.

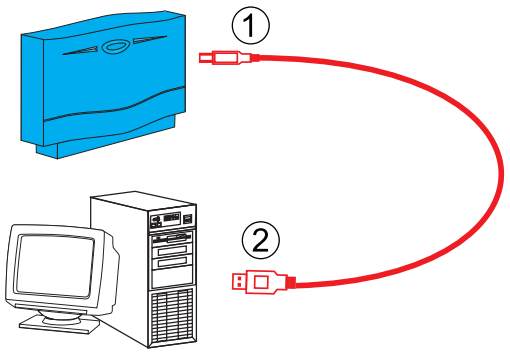
USB is equipped with a standardized API (Application Programming Interface) that is based on the Microsoft Win32 driver model (WDM).

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...). 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.).

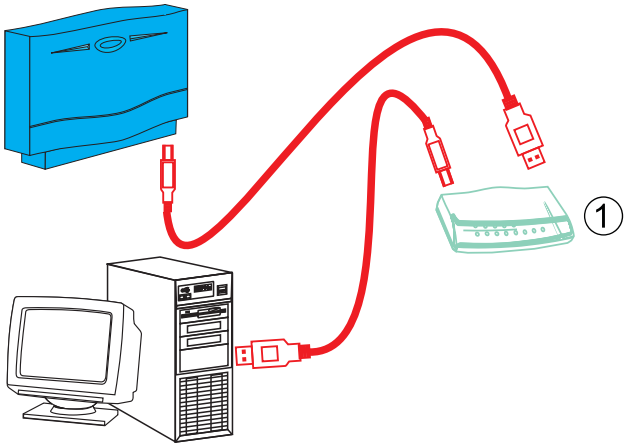
Connecting the PABX via USB to the PC

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



① USB connector (type B terminal device)
② USB connector (type A PC/hub)

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 terminals devices, including the PABX, to the hub. Use the USB cable supplied with the system.



① USB-Hub

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	green	white	black

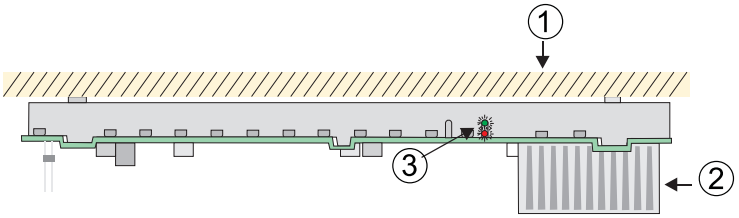
Commissioning

Intelligent Power Management

The PABX is equipped with an »Intelligent Power Management system« to protect it against overloading at the internal connections. In the event of an overload or short-circuit in the PABX system, the current for power supply to the terminal devices is interrupted at the modules. The green »Ready« indicator begins to flash. The PABX then attempts to re-activate the power supply at one second intervals until the cause for the overload (for example short-circuiting of several connections) has been eliminated.

LED functions of the PABX

The LEDs are located on the top of the PABX. This figure shows the location of the Ready indicator in an open, wall-mounted PABX.



① Installation wall.
② PABX.
③ LEDs.

Two LEDs for indication of proper functioning are located on the back of the PABX. These LEDs are located on the right side, under the cover and can be seen from the outside.

When the system is switched on, both LEDs are lit for 15...20 seconds. As soon as the system is operating, the red LED switches off. The green LED is lit, indicating that the system is ready.

Green LED	Red LED	PABX function
lit		PABX operating.
off		Hardware fault.
	lit	Fault indicator.
	flashing	New software downloading into PABX system.
are lit		System starting up (initialization) when switched on.
off		Hardware reset or PABX power supply failure.
flashing		Overload of an internal ISDN connection. The ISDN connection will be switched off within short by the Intelligent Power Management.
flashes	flashing	After a download, both these LES flash alternately until the pabx is reset.

elmeg ICT880-rack, elmeg ICT880xt-rack

When the system is switched on, all LEDs are activated one after the other. As soon as the system is operating, the red (ERROR) LED switches off. The green LED (OK) is lit, indicating that the system is ready.

Green LED OK	Red LED ERROR	PABX function
lit		PABX operating.
off		Hardware fault.
	lit	Fault indicator.
are lit		System starting up (initialization) when switched on.
off		Hardware reset or PABX power supply failure.
flashing		Overload of an internal ISDN connection. The ISDN connection will be switched off within short by the Intelligent Power Management.
flashing	flashing	After a download, both these LES flash alternately until the pabx is reset.

Red LED OH1...OH8	PABX function
lit	Loop current towards terminal device.
off	Terminal device has ended the call or no terminal device connected.

Green LED L1	Red LED B1	Red LED B2	PABX function
lit			At least one terminal device is connected to the bus (layer 1 active).
lit	lit		One B-channel is busy.
lit	lit	lit	Both B-channels are busy.

LEDs above the top connections

The function of the four LEDs depends on the PABX module that is connected.

Module 4 a/bII or 8 a/b:

No function assigned to the left (green) LED. The two red LEDs are assigned to the RJ45 jacks located below them. The functions for these LEDs correspond to those described for »OH1. . . OH8«.

Modules 1...4 1...4 S0:

The two red LEDs are assigned to the RJ45 jacks located below them. The functions for these LEDs correspond to those described for »L1, B1, B2«.

LEDs for the UP0 connections and the U-module

Green LED L1	Red LED B	PABX function
lit		At least one terminal device is connected to the bus (layer 1 active).
lit	flashing	One B-channel is busy.
lit	lit	Both B-channels are busy.

LEDs for the elmeg DECT multicell module

RFP 1...4	off	lit	flashing	flickers
	No »elmeg DECT rfp« connected.	«elmeg DECT rfp connected«.	Runtime measurement	

Light emitting diodes VoIP-VPN Gateway- module

LED above the RJ45-jacks	Significance
Green lit	Link (Connection)
Green flashing	Data transfer 10 / 100 Mbit/S
Yellow lit	Data transfer with 100 MBit/s
LED yellow not lit	Data transfer with 10 Mbit/s

LEDs for the router module

All LEDs light up simultaneously:

- Firmware module must be reloaded through the pabx.

All LED's are flashing simultaneously:

- Firmware copy process inside the pabx

Plastics enclosure

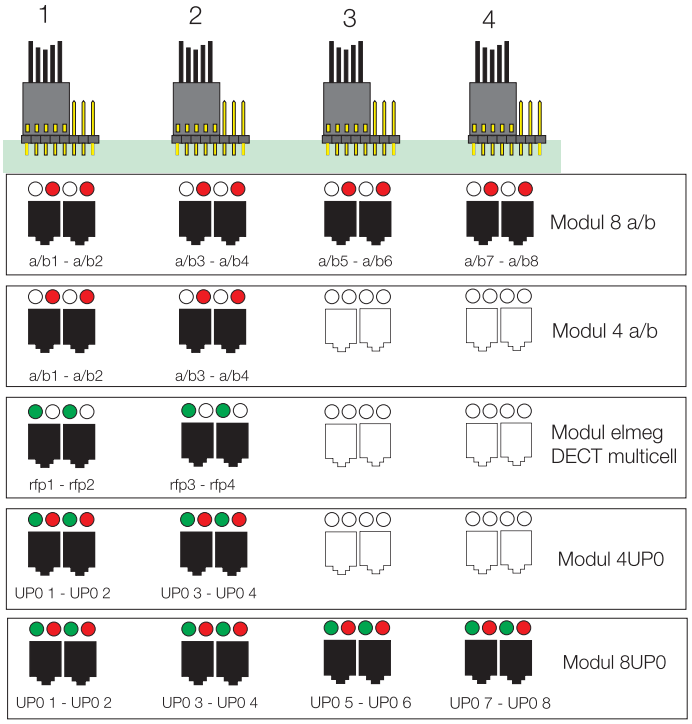
LED 1		LED 2		LED 3	
LAN-connection	Data traffic on the LAN	WAN connection	Data traffic on the WAN	Error	Operation
100 MBit/s green	100 MBit/s green flickering	100 MBit/s green	100 MBit/s green flickering	red	green
10 MBiit/s orange	10 MBit/s orange flickering	10 MBit/s orange	10 MBit/s orange flickering		

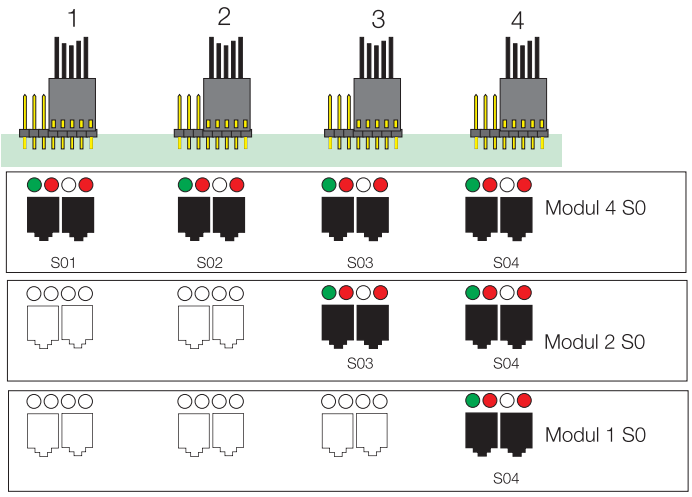
Rack enclosure

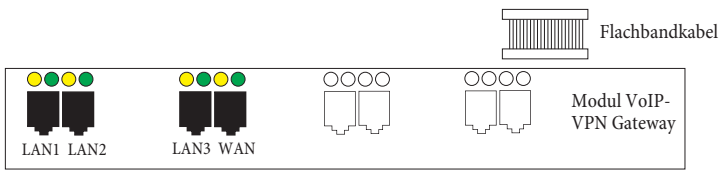
LED 1		LED 2		LED 3	LED 4	LED 5	LED 6
LAN-connection	LAN Data traffic	WAN connection	WAN Data traffic	CAPI connection	ISDN ISP connection	Error	Operation
green	green flickering	green	green flickering	green flashing	green flashing	red	green

Connection assignments front panel ICT-rack (Jacks and LEDs)

The following figure shows the assignments of front panel connections, LEDs and Rj45-jacks to the modules. The marked LEDs are assigned accordingly when the modules are connected to the pcb front module as shown in the diagram.







The arrangement of the plug-in connectors (1...4) corresponds to the assignment of the RJ45 jacks.

The coulor-coded LEDs are assigned to module functions (regardless of the assignment of the plug-in connectors).

The black RJ45 jacks are activated in the arrangement shown here.

1+ 2+ 3+ 4
8 a/b module
4S0-module
8Up0-module

1+ 2
4 a/b module (see page 21),
DECT multicell module,
4Up0-module

3+ 4
2 S0 module

4 1 S0 module

VoIP-VPN Gateway- module

Symbols, acoustic signals and calling cycles

Note:
Different terminal devices will not necessarily have the same dial tones, ringing signals or procedures for use.

Symbols used

	Lift up the handset of your telephone.
	This symbol indicates the call status. You have lifted the handset of your telephone.
	Replace the handset of your phone in the carriage, or the telephone is idle.
	Indicates signaling at a terminal device, for example your phone rings.
	You can dial the desired number.
1 ... 0 * #	One of these symbols indicates that you should dial the digit shown, or a certain character.
0 ... 9 *	These symbols indicate a selection of digits or characters from which you can choose the appropriate one.
	This symbol prompts you to select a certain digit or character.
R	Prompts you to press the flash key (signal key).
	Indicates that an acknowledgement signal can be heard in the handset.
	Indicates a conference call.
	This symbol indicates that a configuration is required. . Be sure to complete the »Initial programming« before entering codes.
#	When you enter the number for dialing via an SIP provider, dialing is not performed until around 5 seconds after the last digit has been entered. Dialing is performed immediately when you press the # key after entering the number. In this case, the terminal device must also be capable of dialing into the phone system with the #.

Internal acoustic signals of the PABX

The following tones describe signaling for the PABX when using telephones.

Internal dial tone for Switzerland

Internal dial tone.You will hear this dial tone after lifting the handset. This signal indicates that you can dial a number. After 40 seconds this signal changes to the busy signal; hang up the handset and then lift it up again. You will then hear again the internal dial tone.

Busy tone and negative acknowledgement signal

Busy tone. You will hear this signal, when the called external or internal extension is busy.
Negative acknowledgement signal. If you hear this tone, the selected function can not be used or the feature has not been configured or has been canceled.

Positive acknowledgement signal

The positive acknowledgement signal indicates that your input has been accepted.

Internal ringing signal

This signal indicates that the telephone of the external or internal extension is ringing.

Special dial tone

This signal indicates for instance that your phone has been set for call rerouting.

>External dial tone

Call waiting tone

Call waiting tone (with a/b-terminal devices only). This tone signals that an external party is calling you during an ongoing call. The call waiting signal is sounded for a maximum of. 30 seconds.

Alarm call tone

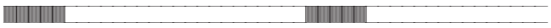
You will hear this tone when you accept an alarm call. You can programme the duration of the alarm call tone.
You will hear this tone instead of the dial tone when there is a new message present in the voice mail system.

Calling cycles of the PABX

The figures below show the duration of the calling cycles.

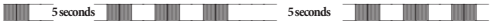
Internal call, completion of call on busy, internal recall

You are called either directly, or in an inquiry call by an internal user. When the CLIP feature has been installed, the subscriber will be called using the clock rate for external calls.
Call-back: You are called automatically when the party you attempted to call hangs up the handset for his/her phone.
Recall: You initiate an inquiry call, but replace the handset before dialing. The first call that is on hold is signaled by call-back.



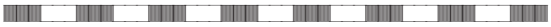
External call, external recall, call-back from the reserved ISDN connection

External call: You are called by an external party.
Recall: You initiate an inquiry call, but replace the handset before dialing. The first call that is on hold is signaled at your terminal device by call-back.
Call-back from the reserved ISDN connection: The noted external ISDN connection that was busy becomes available; this is signaled at your terminal device by a call-back.



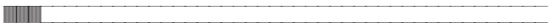
Door intercom call

Door entry phone call: When the bell button of the door entry phone is pressed, the telephones entered in the doorline call distribution list will ring for approximately one minute with this frequency.



Alarm call

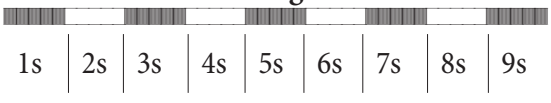
The analog telephones entered in the alarm call list will ring with this frequency. You can programmeme the length of the alarm call.



Communication data overflow

Communication data overflow: This signal indicates a communication data overflow at a system telephone. Depending on the system telephone type used, the caller list either displays the service number together with a message or the service number only.

Time intervals of the signals:



1s	2s	3s	4s	5s	6s	7s	8s	9s

Acoustic signals «DE, AT, BE, HU, PL, SL, GR»

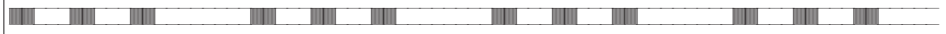
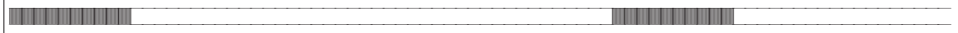
Acoustic signals	Frequency (Hz). Attenuation (dB)	**Cycle rate for sound / pauses (in milliseconds)** Example: 500, 500 ...
Dial tone	420 / -8	200, 300, 200, 300, 200, 800 ...
Special dial tone	320+420/ -8	200, 300, 200, 300, 200, 800 ...
Busy tone	420 / -8	200, 400 ...
Ringing signal	420 / -8	1000, 4000 ...
Call waiting tone	420 / -8	200, 300, 200, 1300 ...
Alarm call tone	420 /-8	100, 100...
Ack. signal	320+420/ -8	700
Neg. acknowledgement	320+420/ -8	300, 300, 300,300, 300

Acoustic signals «CH, DK, SW, NL, NO, IT»

Acoustic signals	Frequency (Hz). Attenuation (dB)	**Cycle rate for sound / pauses (in milliseconds)** Example: 500, 500 ...
Dial tone	440 / -14	Continous signal ...
Special dial tone	320+420/ -8	200, 300, 200, 300, 200, 800 ...
Busy tone	440 / -14	200, 400 ...
Ringing signal	440 / -14	1000, 4000 ...
Call waiting tone	420 / -8	200, 300, 200, 1300 ...

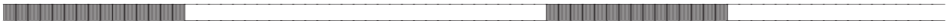
Alarm call tone	440 / -14	100, 100... 
Ack. signal	320+420/ -8	700 
Neg. ac-knowledge-ment	320+420/ -8	300, 300, 300,300, 300 

Acoustic signals «CS»

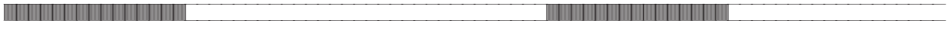
Acoustic signals	Frequency (Hz). Attenuation (dB)	**Cycle rate for sound / pauses (in milliseconds)** Example: 500, 500 ... 
Dial tone	440 / -14	Continous signal ... 
Special dial tone	320+420/ -8	200, 300, 200, 300, 200, 800 ... 
Busy tone	440 / -14	330, 330 ... 
Ringing sig-nal	440 / -14	1000, 4000 ... 
Call waiting tone	420 / -8	200, 300, 200, 1300 ... 
Alarm call tone	440 / -14	100, 100... 
Ack. signal	320+420/ -8	700 
Neg. ac-knowledge-ment	320+420/ -8	300, 300, 300,300, 300 

Acoustic signals «FR»

Acoustic signals	Frequency (Hz). Attenuation (dB)	**Cycle rate for sound / pauses (in milliseconds)** Example: 500, 500 ... 
Dial tone	425 / -14	Continous signal ... 

Special dial tone	320+420/ -8	200, 300, 200, 300, 200, 800 ... 
Busy tone	425/ -14	500, 500 ... 
Ringing signal	440 / -14	1500, 3500 ... 
Call waiting tone	420 / -8	200, 300, 200, 1300 ... 
Alarm call tone	425 / -14	100, 100... 
Ack. signal	320+420/ -8	700 
Neg. acknowledgement	320+420/ -8	300, 300, 300,300, 300 

Acoustic signals «ES»

Acoustic signals	Frequency (Hz). Attenuation (dB)	**Cycle rate for sound / pauses (in milliseconds)** Example: 500, 500 ... 
Dial tone	425 / -14	Continous signal ... 
Special dial tone	320+420/ -8	200, 300, 200, 300, 200, 800 ... 
Busy tone	425/ -14	200, 200 ... 
Ringing signal	440 / -14	1500, 3500 ... 
Call waiting tone	420 / -8	200, 300, 200, 1300 ... 
Alarm call tone	425 / -14	100, 100... 
Ack. signal	320+420/ -8	700 
Neg. acknowledgement	320+420/ -8	300, 300, 300,300, 300 

Acoustic signals «PT»

Acoustic signals	Frequency (Hz). Attenuation (dB)	**Cycle rate for sound / pauses (in milliseconds)** Example: 500, 500 ...
Dial tone	420 / -8	Continous signal
Special dial tone	320+420/ -8	200, 300, 200, 300, 200, 800 ...
Busy tone	420 / -8	500, 500 ...
Ringing signal	420 / -8	1000, 4000 ...
Call waiting tone	420 / -8	200, 300, 200, 1300 ...
Alarm call tone	420 /-8	100, 100...
Ack. signal	320+420/ -8	700
Neg. acknowledgement	320+420/ -8	300, 300, 300,300, 300...

Country-specific tones from the exchange

The dial tone detection process for POTS-module is based on the tones and cycles specified here. Different tones and cycles than specified here may possibly not be identified.

Acoustic signals from the exchange office in »DE«

Acoustic signals	Frequency (Hz).	**Sound / pause rate in milliseconds**
Dial tone	425	Continuous signal
Special dial tone	400+425	Continous signal
Busy tone	425	480, 480...

All lines busy	425	240, 240...

Acoustic signals from the exchange office in »AT«

Acoustic signals	Frequency (Hz).	**Sound / pause rate in milliseconds**
Dial tone	420 or 450	Continuous tone
Special dial tone	320+420	Continuous tone
Busy tone	450 or 450	400, 400... 300, 300...
All trunks busy	420 or 450	400, 400... 200, 200...

Acoustic signals from the exchange office in »BE«

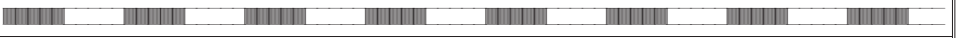
Acoustic signals	Frequency (Hz).	**Sound / pause rate in milliseconds**
Dial tone	425	Continuous tone
Special dial tone	425	1000, 250...
Busy tone	425	500, 500...
All trunks busy	425	400, 400... 167, 167...

Acoustic signals from the exchange office in »CS«

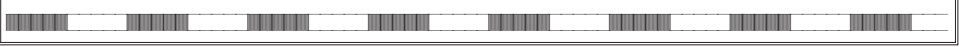
Acoustic signals	Frequency (Hz).	**Sound / pause rate in milliseconds**

Dial tone	425	330, 330, 660, 660... 
Busy tone	425	330, 330... 
All trunks busy	425	165, 165... 

Acoustic signals from the exchange office in »DK«

Acoustic signals	Frequency (Hz).	**Sound / pause rate in milliseconds**
Dial tone	425	Continuous tone 
Busy tone	425	250, 250...  500, 500... 
All trunks busy	425 or 425	250, 250...  200, 200... 

Acoustic signals from the exchange office in »FR«

Acoustic signals	Frequency (Hz).	**Sound / pause rate in milliseconds**
Dial tone	440	Continuous tone 
Busy tone	440	500, 500... 

Acoustic signals from the exchange office in »GR«

Acoustic signals	Frequency (Hz).	**Sound / pause rate in milliseconds**
Dial tone	425	200, 300, 700, 800... 

Special dial tone	400 / 425 or 425 / 450	200, 300 / 700, 800...
Busy tone	425	300, 300...
All trunks busy	425	150, 150...

Acoustic signals from the exchange office in »HU«

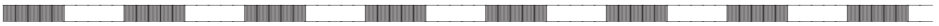
Acoustic signals	Frequency (Hz).	**Sound / pause rate in milliseconds**
Dial tone	425	Continuous tone
Special dial tone	350+375+400	Continuous tone
Busy tone	425	300, 300...
All trunks busy	425	300, 300...

Acoustic signals from the exchange office in »IT«

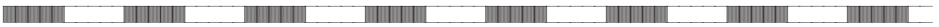
Acoustic signals	Frequency (Hz).	**Sound / pause rate in milliseconds**
Dial tone	425	200, 200, 600, 1000...
Special dial tone	425	Continuous tone
Busy tone	425	500, 500...
All trunks busy	425	200, 200...

Acoustic signals of the local exchange office »NL«

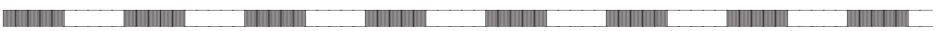
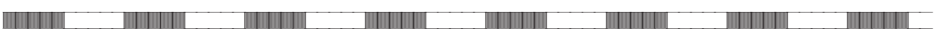
Acoustic signals	Frequency (Hz).	**Sound / pause rate in milliseconds**

Dial tone	425	Continuous tone 
Special dial tone	425	500, 50... 
Busy tone	425	500, 500... 
All trunks busy	425	250, 250... 

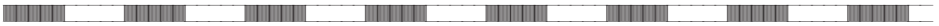
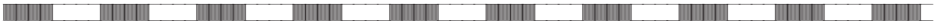
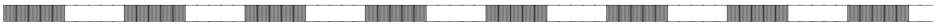
Acoustic signals of the local exchange office »NO«

Acoustic signals	Frequency (Hz).	**Sound / pause rate in milliseconds**
Dial tone	425	Continuous tone 
Special dial tone	470 / 425	400, 0 / 400, 0... 
Busy tone	425	500, 500... 
All trunks busy	425	200, 200... 

Acoustic signals of the local exchange office »PL«

Acoustic signals	Frequency (Hz).	**Sound / pause rate in milliseconds**
Dial tone	425	Continuous tone 
Special dial tone	425	975, 50... 
Busy tone	425	500, 500... 
All trunks busy	425	500, 500... 

Acoustic signals of the local exchange office »PT«

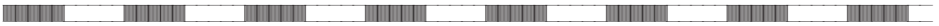
Acoustic signals	Frequency (Hz).	**Sound / pause rate in milliseconds**
Dial tone	425	Continuous tone 
Special dial tone	425	1000, 200... 
Busy tone	425 or 400	500, 500...  360, 360... 
All trunks busy	425	500, 500... 

Acoustic signals of the local exchange office »SI«

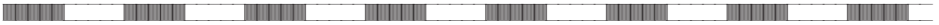
Acoustic signals	Frequency (Hz).	**Sound / pause rate in milliseconds**
Dial tone	425	200, 300, 700, 800... 
Busy tone	425	500, 500... 
All trunks busy	425	200, 200... 

Acoustic signals from the exchange office in »ES«

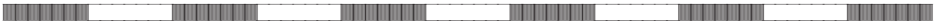
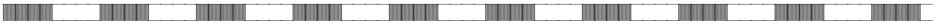
Acoustic signals	Frequency (Hz).	**Sound / pause rate in milliseconds**
Dial tone	425	Continuous tone 
Special dial tone	425 or 425	1000, 100...  500, 50... 

Busy tone	425 or 425	500, 500...  200, 200... 
All trunks busy	425 425	200, 200, 200, 200, 200, 600...  250, 250... 

Acoustic signals of the local exchange office »SE«

Acoustic signals	Frequency (Hz).	**Sound / pause rate in milliseconds**
Dial tone	425	Continuous tone 
Special dial tone	425	320, 20... 
Busy tone	425 or 425	500, 500...  250, 250... 
All trunks busy	425 425	250, 750...  200, 200... 

Acoustic signals of the local exchange office »UK«

Acoustic signals	Frequency (Hz).	**Sound / pause rate in milliseconds**
Dial tone	350+440	Continuous tone 
Special dial tone	350+440	750. 750... 
Busy tone	400	375, 375... 
All trunks busy	400	400, 350, 225, 525... 

Acoustic signals of the local exchange office »CH«

Acoustic signals	Frequency (Hz).	**Sound / pause rate in milliseconds**
Dial tone	425	Continuous tone 
Special dial tone	340+425	1100. 1100... 
Busy tone	425	500, 500... 
All trunks busy	425	200, 200... 

Initial startup

Make all necessary connections, including the 230 V AC power supply connection. When you switch on the 230 Vac power supply you may not interrupt the supply of power during the initialization phase of the PABX (up to 3 minutes!)

In its initial status, your PABX is set for point-to-point connection. In the initial state an external call is signaled at the ISDN terminal device with the specified numbers (MSN) 10 and 40.

If your PABX is connected to a point-to-multipoint connection after being reset to its initial status, you can be reached via the terminal devices entered for team 00. You can initiate external connections from any of the connected terminal devices. The telephone number transmitted is the number from the exchange office.

You must then assign the numbers to the internal terminal devices via configuration to ensure that the other connected telephones and terminal devices can all be reached by external parties.

Your PABX is equipped with an editable internal »Number plan«. The internal numbers (or MSN extensions) have default settings in the PABX's initial state. You can change these internal numbers as you require through configuration with the PC. Note that internal numbers can not be assigned more than one time. Consult the operating instructions for your ISDN terminal devices to find out how and with which settings the various features can be used.

If your ISDN terminal device has a caller list please note the following: The PABX does not place a »0« for acquisition of the external ISDN connection automatically in front of the number of the caller. You can edit this setting in the configuration. Your PABX supports the flash function for analog telephones. Therefore, never just briefly replace the handset, or use your hand to briefly press the »hook switch«, as otherwise the PABX will recognize this as a flash instead of you hanging up the handset.

Configuring the PABX using a PC

function

You can use the following ports for configuring your PABX:

- RS232 (V. 24) –port (with a PC or Laptop)
- USB port (with a PC or Laptop)
- LAN port (with a PC or Laptop)
- Internal ISDN connection or External ISDN connection (service access). For this access you require an ISDN card in your PC (Laptop).

Configuring the PABX requires the WIN-Tools programmes, as for example Professional Configurator, Telephone Directory Manager or Charge Manager.

Access to the configuration program of the PABX is divided into three authorization levels. Each of these authorization levels has a user name and a password (PIN). Every subscriber may only access or modify the PABX configuration program according to his or her authorization level.

The PABX checks the username and password when a subscriber establishes a connection to configure the system. Only the settings available based on the authorization level of the subscriber are then displayed in the configuration programme.

The following authorization levels are available for the PABX:

- **Service**
  The service technician or an authorized dealer can perform a complete PABX configuration programme. Unlimited permissions can also be set for the configuration access levels »Admin« and »User« by the service technician or dealer. When logged in as a Service user, you can change Admin and User passwords without actually knowing them. This authorization level has a predefined username and password (PIN), which can be modified, however.
  Authorization is carried out from an operational PABX system or »offline«. Offline« configuration applies an

existing configuration file (»*.elg oder .ict«) for the authorization process«). A PABX can be pre-configured for a customer and the configuration file can be transferred to the PABX at a later time.

- **Admin**
  This authorization level is intended for the daily administration and control of the PABX. Permissions for this access are specified by »Service«. The administrator (»Admin«) can assign permissions to one or several »Users«. The Admin can change User passwords without actually knowing them. This authorization level has a predefined username and password (PIN), which can be modified according to the assigned authorizations.
- **User**
  Each internal subscriber (»User«) of the PABX can receive permissions assigned by the »Admin,« for example, to modify subscriber-relevant settings. The user name of a »User« corresponds to the Login name assigned to an internal subscriber when configuring the PABX. An 8-digit password (PIN) can be assigned to internal subscribers in addition to the Login name. The user must read out the PABX system one time. The PIN is required for this. If Service has provided the user with an ».elg« or an »ict« file he/she can also open the configuration »offline«.

	Service		Admin	
	User name	Password (PIN)	User name	Password (PIN)
Default setting	Service	Service	Admin	Admin
Modified setting				
Modified setting				

Contact the hotline if you have forgotten your user name and password (PIN).

Note:
The PABX can be configured only by using one of the listed connections. For example, if you use a USB port to configure the PABX you cannot configure the system via a RS232 or ISDN port at the same time.
Please check the PC ISDN board for an assigned extension if you cannot establish a connection to the PABX when configuring via internal ISDN port. You have to enter the * key before the service number (for example »*55«) if there is no assigned extension but automatic line access is activated for a telephone connected to the internal ISDN bus.

You also cannot run any applications on the port selected for configuration while the port is being used to configure the system. For example, while configuring the system via a PC connection (USB or RS323), it is not possible to use additional features with this connection at the same time (for example hotel application or RS323 printer when configured to use the RS323 port). TAPI can be used while configuring the system via a PC connection if run on the same PC.
Configuration via an external ISDN connection is possible if the service access of the PABX is set up and activated. We strongly suggest changing both PINs when assigning permissions because this resets the PABX to the factory settings, which cancels all authorizations.

Configuration

In the PABX configuration, »Admin«, authorizations can be established via the Hotline or through the service (for example, specialist dealers). »Admin« can then assign to or block PABX system configuration permissions of individual »Users«.

Operation

The PABX checks the entered username and password (PIN) when a subscriber establishes a connection to configure the system. Only the settings available based on the authorization level of the subscriber are then displayed in the configuration program.

Service access
(remote configuration, remote maintenance, software downloads)

function

This feature enables you to have the PABX configured by your dealer's service centre or download the current software. The service department or the authorized dealer uses remote access to dial into the PABX.

You can trigger this function from an internal phone of your PABX or release your PABX for access by an external PC (for example your specialized dealer). To provide service access to the PABX you can establish a connection to the service center yourself or the service center dials into the PABX after the system has been released for remote access.

The service centre (for example your authorized dealer) can view and change the data of the PABX.

The service centre cannot view or change the PABX PIN 1. Your system may be reset to its initial status however.

The following is a description of the different options of a service connection.

Outgoing service call (access via 2 B channels)

You call the service center through your PABX from a phone that is authorized for launching a remote access connection. The service centre informs you about the remote access procedure and tells you the service number you have to dial for data communication. Switch over to inquiriy call, enter a specific code sequence followed by the telephone number for the service center. You will hear the acknowledgement signal when the data communication has been established. Press the R key. You are again connected with the service center and can tell them how you wish to have your system configured.

Note:
Please note that this type of remote access involves two connections to the service centre for which you will be charged. When you hang up the handset, both connections to the service centre are terminated.

Outgoing service call (access via 1 B channel)

You call the service center and tell the operator that you want a remote configuration of your system. The service centre informs you about the remote access procedure and tells you the service number you have to dial for data communication. When you have terminated the call, you can launch the remote access configuration from any authorized phone. When the data link has been established successfully you will hear the music on hold of your PABX.

Note:
That this type of remote access involves a connection to the service centre for which you will be charged. When you hang up the handset, the data communication link to the service centre is terminated.

Incoming service call

The service centre (for example your dealer) can log into the PABX, if it has been released for remote access. To enable your PABX for a service access, you have several options:

- A code number releases the PABX system for incoming service links. Release for remote access is effected for 30 minutes. During this period no further incoming data links are possible (for example data transfers via ISDN).
- You authorize three specific external telephone numbers for dialing in. Service access for these telephones numbers can be permanent or starting at a defined time for 30 minutes. When an external subscriber tries to log into the PABX, the system verifies the access authorization by comparing the number transferred by the service centre with the number you have entered.
- You can determine the time from which the PABX system is to be released for service access for 30 minutes. The service center can dial any telephone number of the PABX to dial into the system. The charges for this connection are on the service centre.

Note:
The PABX stores the date and time of the last configuration and service access.

Configuration

Outgoing service call

The PABX has to be configured for remote access for the incoming service connection of an initiating internal subscriber (telephone).

Incoming service call

You can specify the time at which service access to the PABX is possible. The PABX is then accessible for 30 minutes starting at the specified time. You can enter up to three telephone numbers for service access. Service access to the PABX for these telephones numbers can be set to permanent or for a specific time period.

Operation

Initiating an outgoing service call (access via 2 B channels)

	You call the service center. You call the service center. You are then connected with a service technician who explains the further procedure to you.
R	When requested by the technician you push the Recall flash button. You will hear the internal dial tone.
* 7 9	Dial this code.
2 4	Select the type of privileges you wish to grant for the service access: 2 : All services (for example configuration, charge processing, download, telephone directory etc.). 4 : Maintenance and diagnosis (requires a link with the manufacturer's hotline).
	Dial the number of the service centre (without line access digit for acquiring the external ISDN connection).
#	Finish input.
	Ack. signal.
	You are then re-connected with the service technician and can continue your call. If you initiate remote access using an ISDN telephone you will have to push the Recall flash button once again, depending on the terminal device being used.
	Both these connections with the service centre are ended when you hang up your handset.

Initiating an outgoing service call (access via 1 B channel)

	Lift up the handset of your phone. You will hear the internal dial tone.
* 7 9	Dial this code.
2 4	Select the type of privileges you wish to grant for the service access: 2 : All services (for example configuration, charge processing, download, telephone directory etc.). 4 : Maintenance and diagnosis (requires a link with the manufacturer's hotline)
	Dial the number of the service centre (without line access digit for acquiring the external ISDN connection).
#	Press the hash key when you have entered the number.
	You will hear the internal music on hold once a connection to the service center has been established. When the data have been transferred the service center will terminate the connection. You hear the busy signal.
	Replace the handset.

Releasing the PABX system for incoming service links

	Release for remote access is effected for 30 minutes.
	Lift up the handset of your phone. You will hear the internal dial tone.
* 7 8 2	Dial this code.
	Ack. signal

Replace the handset.

Releasing the PABX system for incoming service links (without subadress verification)

Release for remote access is effected for 30 minutes.

Lift up the handset of your phone. You will hear the internal dial tone.

#782 Dial this code.

Ack. signal

Replace the handset.

Ending an active, incoming service link

You can terminate a connection set up by the service centre using the following procedure.

Lift up the handset of your phone. You will hear the internal dial tone.

#792 Dial this code.

Ack. signal

Replace the handset.

Deleting authorization for remote service access

You can cancel a programmed release for incoming remote access any time you want. However, an existing connection to a service center is not terminated.

Lift up the handset of your phone. You will hear the internal dial tone.

#799 Dial this code.

Ack. signal

Replace the handset.

Default phone number plan

The factory setting of the PABX features 2-digit internal extensions. Two extensions per internal ISDN port are preconfigured. The internal service number entered is 55.

Base module 0							
S0 1	S0 2	S0 3	S0 4			a/b	
external 10, 11 *)	external (20, 21)	external (30, 31)	external (34, 35)			40...47	
Base module 1 (left slot)							
S0 / Up0 1	S0 / Up0 2	S0 / Up0 3	S0 / Up0 4	DECT multicell	VoIP-VPN Gateway	a/b	
60, 61	62, 63	64, 65	66, 67	60 ... 67	60	60...67	
8UP0 1	8UP0 2	8UP0 3	8UP0 4	8UP0 5	8UP0 6	8UP0 7	8UP0 8
60	61	62	63	64	65	66	67
Base module 2 (right slot)							
S0 / Up0 1	S0 / Up0 2	S0 / Up0 3	S0 / Up0 4	DECT multicell	VoIP-VPN Gateway	a/b	
70, 71	72, 73	74, 75	76, 77	70 ... 77	70	70...77	
8UP0 1	8UP0 2	8UP0 3	8UP0 4	8UP0 5	8UP0 6	8UP0 7	8UP0 8
70	71	72	73	74	75	76	77
Router module special slot 5							
14, 15, 16, 17, 24, 25, 26, 27							
Extension module 3							
Up0 1	Up0 2	Up0 3	Up0 4	Up0 5	Up0 6	a/b	
18, 19	28, 29	38, 39	48, 49	58, 59	68, 69	50...53	
Extension module 4 (left slot)							
S0 / Up0 1	S0 / Up0 2	S0 / Up0 3	S0 / Up0 4	DECT multicell	VoIP-VPN Gateway	a/b	
80, 81	82, 83	84, 85	86, 87	80 ... 87	80	80...87	
8UP0 1	8UP0 2	8UP0 3	8UP0 4	8UP0 5	8UP0 6	8UP0 7	8UP0 8
80	81	82	83	84	85	86	87
Extension module 5 (right slot)							
S0 / Up0 1	S0 / Up0 2	S0 / Up0 3	S0 / Up0 4	DECT multicell	VoIP-VPN Gateway	a/b	
90, 91	92, 93	94, 95	96, 97	90 ... 97	90	90...97	
8UP0 1	8UP0 2	8UP0 3	8UP0 4	8UP0 5	8UP0 6	8UP0 7	8UP0 8
90	91	92	93	94	95	96	97

Technical specifications for pabx systems

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

elmeg ICT 46 / ICT 88 / ICT880: Package contents

- 1 PABX unit
- 1 PC connection cord RS232
- 1 PC connection cord USB
- 2 S0- connecton cables (one cable with elmeg ICT46)
- Set of operating instructions
- 1 Assembly instructions
- Brief description for terminal devices
- 1 CD-ROM for configuration
- Bag with connector terminals (not applicable, if PABX comes fully equipped)
- Drilling template
- 3 dowels 3 screws

elmeg 880xt: Package contents

- 1 PABX expansion module elmeg 880xt
- Bag with connector terminals (not applicable, if PABX comes fully equipped)
- Drilling template
- 3 dowels 3 screws
- Connecting cable
- Twin jack
- 4 Up/S0-converters

Package contents for elmeg ICT880-rack

- 1 PABX unit
- 2 brackets, 6 fastening screws and 6 tooth lock washers
- 4 adhesive rubber feet
- 2 cable bushings
- 1 power supply cable with 3-pin power plug
- 1 S0 connection cable
- 1 USB connection cable
- 1 RS 232 (V. 24) connection cable

Package contents for the elmeg ICT880xt-rack

- 1 PABX with preassembled connection plate
- 2 brackets, 6 fastening screws and 6 tooth lock washers

- 4 adhesive rubber feet
- 2 cable bushings
- 1 power supply cable with 3-pin power plug
- 1 flat connection cable

ISDN connections:

External ISDN connection:	DSS1 protocol, point-to-multipoint access or point-to-point access
Internal ISDN connection:	DSS1 protocol, point-to-multipoint connection
ISDN interfaces:	S_{0} supply approx. 40 V-
Channel structure:	B+B+D
ISDN cable lengths with 0. 6 mm wire diameter:	
Short passive bus:	max. 120 meters long (up to 180 meters with CAT. 5 network cable).
Extended passive bus:	max. length of 450 meters
Point-to-point access	max. length of 600 meters

UP-Connections

UP_0Cabel lengths with 0.6 mm wire diameter:	1000 meters
System power:	2 W

Analog ports

Supply:	symmetrical, 25 mA at 600 ohms / ZR
Max. Length of telephone connection cables	0. 6 mm wire diameter = 2 km 0.4 mm wire diameter = 1 km
when using installation-grade cable:	
Dialing method:	DTMF or pulse dialing
DTMF dialing:	
Mark duration:	40 ms and 100 ms
Space duration:	80 ms

Tone recognition:	-10 dBm ... 0 dBm
Flash detection	100. . . 1000 ms, selectable
Ringing voltage:	Ueff >35 V~
Ringing frequency:	25/50 Hz ± 8% selectable

Door intercom module:

Speaker:	8 Ohm, approximately 2 Watts
Microphone:	Dynamic microphone, or Elektret microphone with built-in preamp.
Doorbell button:	Potential-free button
Contact T01/To2:	24V~ 3A / 24V- 3A
Contact Zw1/Zw2, Ts1/Ts2, Ma1/Ma2:	24V~ 1A / 24V- 1A

Switching contact module

contacts K1, K2, K3	24V~1A /24V- 1A
Alarm input M1...M6:	Dedicated, potential-free power supply
Max. length of line:	100 meters
Max. line resistance	8 kOhm
Mounted resistor for alarm contact:	4.7 kOhm +/- 10%

Voice announcement module

Storage capacity:	40 seconds per voice announcement. 2 default voice announcements already recorded
Dialing method:	Dtmf-dialing
Volume:	Adjustable via potentiometer
Analog port of the PABX:	a/b1 is configured as telephone for voice announcements

Module elmeg DECT multicell

Connections for base stations (elmeg DECT rfp)	4
Distance to the elmeg DECT rfp	max. 2 km (Wire diameter 0.8 mm »twistet pair«)

Module POTS

2 POTS:	2 analog connections
4 POTS:	Four analog connections
Dialing method:	IWV or DTMF
Transmitting CLIP information:	per connection adjustable
Transmission of the current charges:	per connection adjustable
Charge pulse:	12 kHz or 16 kHz, switchable from a central location
Tone recognition / Dialing delay:	1...5 seconds per connection adjustable
End-of-dialing monitoring time:	1...40 seconds adjustable

Interface for external music on hold:

Level:	max +10 dBm
Input resistance:	10 kOhm
Input to PABX:	via capacitor
Max. voltage at input:	1.7 Veff, 2. 4 Vs~

RS 232 interface

Access	RJ12 jack

USBs port

USB specification	1.1 compatible, self powered terminal
Speed rating	Full speed. Data transfer rate up to 12 Mbit/s
Output 12 Vdc (not with »rack«)	12 V= max. 25 mA

Mains connection

Mains voltage:	230 V~
Power consumption	

PABX	Power consumption	Primary fuse
with 45 W power supply	max. 50 VA	630 mA
with 75 W power supply	max. 110 VA	630 mA

elmeg ICT46 /elmeg ICT88 / ICT880 / ICT880xt

Protection class:	II
Lenth of power supply cable:	2pins, approx. 2 meters Flat Euro connector, according to DIN VDE 620
IDSN connection cord length:	approx. 2 meters
PABX dimensions	360 x 275 x 90 mm
PABX weight	2,8 kg
Temperature range:	5° c...40° c, max 85% humidity

elmeg ICT880-rack/elmeg 880xt-rack

Protection class:	I
Lenth of power supply cable:	3pin, approx. 2 meters
IDSN connection cord length:	approx. 2 meters
PABX dimensions	426 x 331 x 88 mm
PABX weight	4.5 kg
Temperature range:	5° c...50° c, max 85% humidity

System clock

Hardware clock with buffering via Goldcap:	Capacity approximately 3 hours

Index

F

G

I

J

K

L

M

N

O

P

Q

R

S

T

U

V

W

Y

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Installation guide
English