# Benutzerhandbuch
# elmeg hybird 300 / 600

## Installation guide

### Rechtlicher Hinweis

**Ziel und Zweck**

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# Inhaltsverzeichnis

# Kapitel 1  Safety instructions

> ⚠ **Achtung**
>
> All areas which can only be opened with tools are maintenance areas. Unauthorised opening of the device may be dangerous to the user.

- Condensation may form on or in the device during transitions from cold to warm temperatures. Please only remove the system from the packing materials once the authorised operating ambient temperature has been reached.

- Do not connect or disconnect any lines during a thunderstorm.

- The **elmeg hybird 300** / **elmeg hybird 600** may only be operated in dry rooms.

- Do not as sem ble the **elmeg hybird 300** / **elmeg hybird 600** in damp rooms or in are as subject to a risk of explosion.

- The installation cables may only be laid inside of buildings.

- In operation, the **elmeg hybird 300** must be mounted on a wall in the specified direction (see *Installation process* auf Seite 11).

- Only fit the connection cables to the appropriate connectors.

- Lay connecti on cables to prevent accidents.

- Avoid the following influences:

  - Direct sunlight

  - Heat sources (e.g. heating elements)

  - Electronic devices (e.g., audio equipment, office equipment or microwaves)

  - Penetration of humidity or liquids

  - Corrosive liquids or vapours

  - Heavy dust

- Only open those areas of the system specified in the installation instructions.

- Do not touch plug contacts with sharp, metallic or damp objects.

- Only use approved accessories.

- Only terminals that offer SELV (safety extra low voltage) and / or meet ETS 300047 may be connected to the **elmeg hybird 300** / **elmeg hybird 600**. Correct use of the permitted terminals meets these requirements.

- Clean the **elmeg hybird 300** / **elmeg hybird 600** only with a slightly dampened cloth.

> ⚠ **Achtung**
>
> The **elmeg hybird 300** must be connected to the functional earth before being initially brought into service. The functional earth must be connected to the equipotential bonding strip via a connecting line with a minimum of 2.5 mm$^2$.

## Mains connection (230V~mains)

- Installation of the electrical connection (shockproof socket) for the system (and any additional devices) must be performed by an authorised electrician to avoid damage to persons and property.

- The system is designed for connection to a functional earth; this must be connected before being brought into service.

  An »earth line« should be located in the vicinity of the assembly site (water line, heating line or the building installation's equipotential bonding strip). Connection to the system must occur via a connecting line of min. 2.5 mm$^2$.

- If possible, provide a separate electric circuit for the 230V connection of your system . If other household devices

short circuit, the system can then still operate.

* We recommend installation of surge protection for the system, to guard against the overvoltage that may occur during thunderstorms. Consult your electrician about this.

## Radio devices (e.g. DECT, Bluetooth, WLAN)

* Under certain circumstances, medical equipment may be influenced by operating radio devices. Therefore, please observe requirements imposed by local conditions.

## Power failure

* In the event of a power failure (230V~ mains voltage), the system cannot operate, thus preventing internal and external calling. When the power is restored after a failure, separate internal and external connections are not automatically reestablished. Performance features set up via configuration remain unaffected by the power failure.

# Kapitel 2  Description of module slots

The image below shows the module slots of the **elmeg hybird 300** / **elmeg hybird 600**, along with their designation.
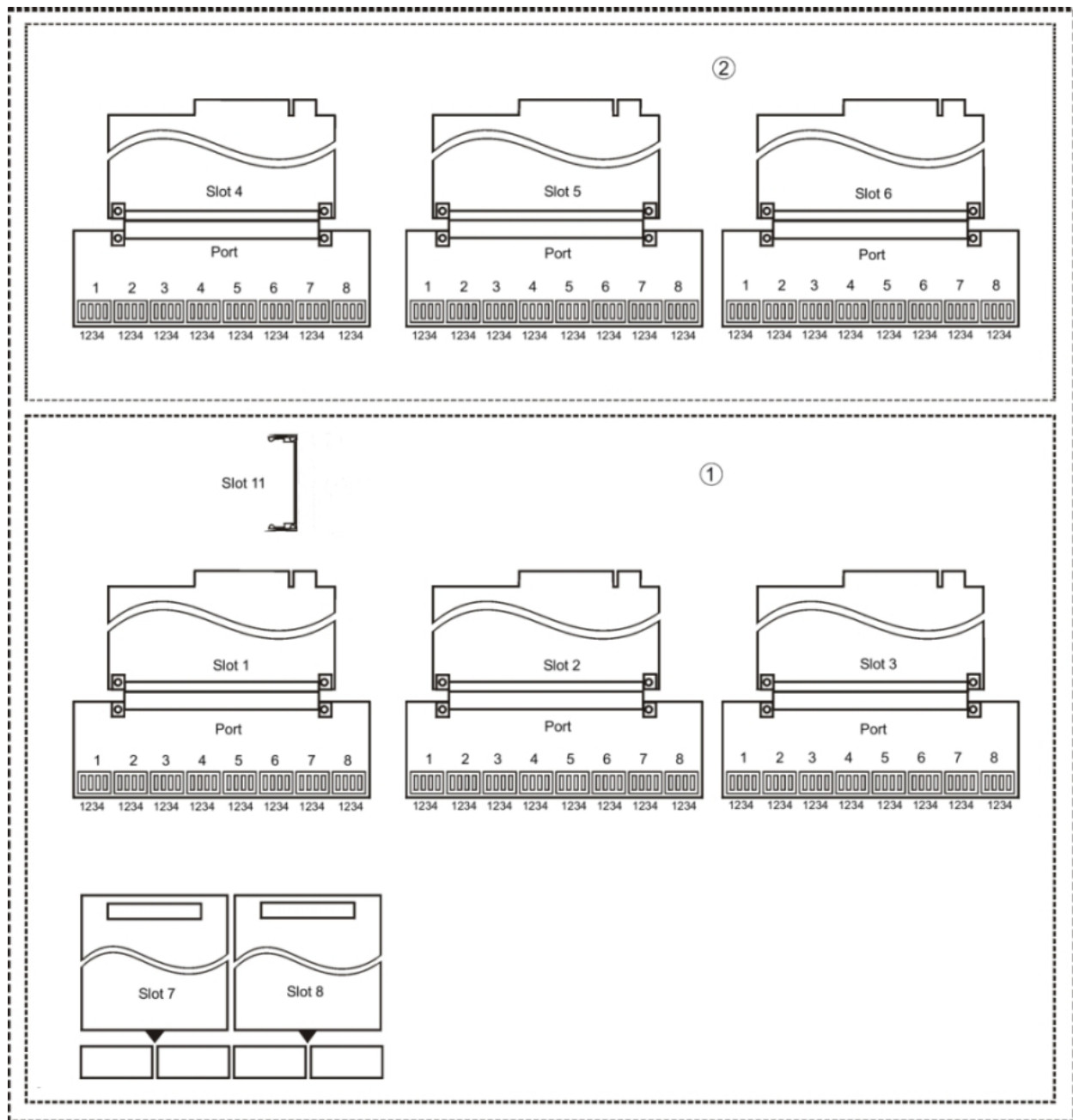


*Abb. 2: Module slots of **elmeg hybird 300** / **elmeg hybird 600***

①                      **elmeg hybird 300**

① and ②          **elmeg hybird 600**

## 2.1  Slot

Slot refers to the individual module slots (slot 1 - 11). For connection of the external lines, the modules in slots 1 - 3 each require one more module **Connection Module** (Port).

**Module slots 1 - 3**

The following modules can be inserted here:

- **M 16 FXS**
- **M 4 S/U + 6 FXS**
- **M 4 S/U + 4U**
- **M 8 FXS, M 8 FXS**

**Module slots 7 and 8**

The following module can be inserted here:

- **M 4 FXO**

**Module slot 11**

The following modules can be inserted here:

- **DSP** module 4fold
- **DSP** module 8fold
- **DSP** module 32fold

## 2.2  Port

Located on the **Connection module** (Port) are the RJ45 interfaces (1 - 8) or connecting terminals (1 - 8). The connecting terminals can be removed from the module. Connection to the terminals (a1 b1 a2 b2) conforms to the currently inserted module. You'll find a description of the **Connection module** in *Mounting modules* auf Seite 20.

# Kapitel 3  Base module interfaces



*Abb. 3: Base module interfaces*

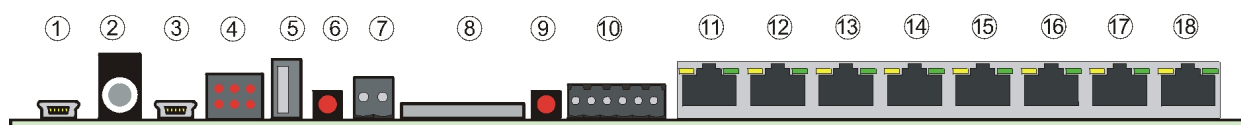| | | | | | |
|---|---|---|---|---|---|
| ① | Serial 1 | ⑦ | System GND terminal (functional earth) | ⑬ | ETH 1 |
| ② | Audio in / out | ⑧ | SD card | ⑭ | ETH 2 |
| ③ | Serial 2 | ⑨ | Reset | ⑮ | ETH 3 |
| ④ | **elmeg hybird 600** LED | ⑩ | Contacts | ⑯ | ETH 4 |
| ⑤ | USB | ⑪ | Contacts | ⑰ | ETH 5 |
| ⑥ | Maintenance | ⑫ | Option | ⑱ | Option |

## 3.1  Serial 1 / Serial 2 (RS 232 interface 1 and 2)

- The serial 1 interface is designed for connecting a laptop or a PC with serial interface for console applications.
- The serial 2 interface is designed for connecting a printer with serial interface for hotel applications (check-in / check-out).

The serial 1 / 2 interfaces are not galvanically isolated from the **elmeg hybird 300** / **elmeg hybird 600** mass. If PC's or printers are connected with the serial interfaces, these should be powered from the same 230V line as the **elmeg hybird 300** / **elmeg hybird 600**. Otherwise an equalising current may flow through the safety earth / service earth. This could lead to data transmission disruption.

Any work on serial 1 and 2 interfaces may only be performed in the presence of a properly connected functional earth. Devices to be linked via the interface (e.g. PC or printer) must be switched off and disconnected from the 230V~ power supply before the serial 1 and 2 interfaces are connected!

## 3.2  Mini USB interface assignment
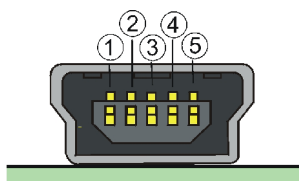


| | |
|---|---|
| ① | nc |
| ② | TxD |
| ③ | RxD |
| ④ | nc |

⑤          GND

## 3.3  Audio in / out

No function is currently assigned to this interface.

## 3.4  Functional earth (GND terminal)

The **elmeg hybird 300** / **elmeg hybird 600** requires a functional earth connection for safe operation. Hence, an »earth line« should be located in the vicinity of the assembly site (a water line or heating line connected to the potential equalisation line, or the building installation's equipotential bonding strip). Connection to the **elmeg hybird 300** should occur via a connecting line of at least 2.5 mm$^2$.

> **Hinweis**
>
> If terminals are connected to the safety earth or service earth (e.g. USB or serial interfaces), the functional earth connection should be as short as possible, as ground loops may otherwise ensue.

## 3.5  SD card

SD cards can not be formatted in the system.

The following data can be stored on the SD card:

* Audio files in "wave" format
* Music-on-hold files in "wave" format
* "Wave" files for voice applications

## 3.6  Reset

The **elmeg hybird 300** / **elmeg hybird 600** is rebooted by quickly pressing the key (ca. one second). Pressing the key is equivalent to interrupting the power supply. Saved data are preserved, but all connections interrupted.

If you press the reset key for ca. 30-40 seconds, the **elmeg hybird 300** / **elmeg hybird 600** will execute a factory reset. This means that the **elmeg hybird 300** / **elmeg hybird 600** is returned to its ex works state. The boot configuration is deleted and all passwords are reset. The reset is accomplished when the **elmeg hybird 300** / **elmeg hybird 600** returns to operating status after ca. 30 to 40 seconds, and the status LED returns to blinking.

## 3.7  Contacts (switch contacts)
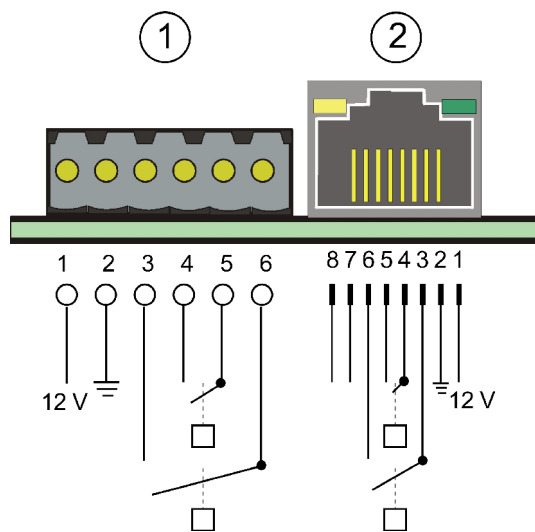


The **elmeg hybird 300** / **elmeg hybird 600** is equipped with two indepentend switch contacts. They can be used as on-off switch or momentary switch. The electric circuit is opened, closed or closed for a specific time.

These functions are controlled by entering key numbers in conected phones.

The switching time for the momentary switch can be set in the GUI.

| 1 | Switching voltage 10-13 V, max. 70 mA |
|---|---|
| 2 | Ground |
| 3 | Switch contact 2 |
| 4 | Switch contact 1 |
| 5 | Switch contact 1 |
| 6 | Switch contact 2 |
| 7 | - |
| 8 | - |

**Hinweis**

The switch contacts offer a switching capacity of 0.5A at <60V CD or 1.0A at <30V DC.

## 3.8  Option

No function is currently assigned to this interface!

## 3.9  ETH1 - ETH5

5 Ethernet interfaces

An Ethernet interface is a physical interface for connection to the local network or external networks.

Ethernet ports ETH1 to ETH4 are assigned to a single logical Ethernet interface in the ex works state.

Port ETH5 is assigned to logical Ethernet interface en1-4 and is not preconfigured.

To ensure your device can be reached, when splitting ports make sure that Ethernet interface en1-0 with the preconfigured IP address and netmask is assigned to a port that can be reached via Ethernet. If in doubt, perform the configuration using a serial connection via the Serial 1 interface.

> ☞ **Hinweis**
>
> LED functions ETH1 - ETH5 are located at *LED functions* auf Seite 41.

## 3.10  LED elmeg hybird 300

LED's of the **elmeg hybird 300** are located on the upper right corner of the housing.
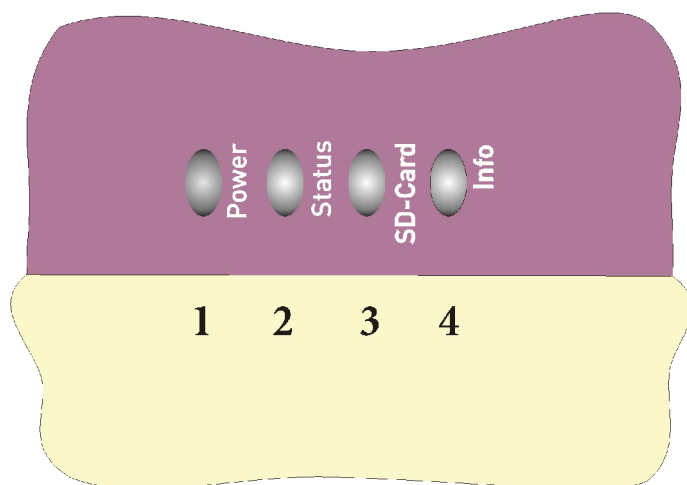


*Abb. 4: LED's of the* **elmeg hybird 300**

## 3.11  LED elmeg hybird 600
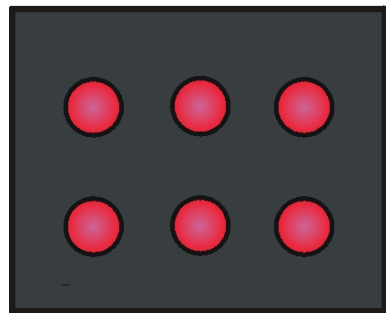


*Abb. 5: LED's of the* **elmeg hybird 600**

**Display of LED's 1 - 3**

| Feature | | LED pulse | LED | Function (see description) |
|---------|---------|-----------|-----|---------------------------|
| 1 | Power | — — — — | Flashes red | Power management |
|   |       |         | Glows green | Operating voltages present |
| 2 | State | — — — — | Flashes red | System messages present |
|   |       | — — — — | Flashes green | Operating status |
|   |       |         | Glows green | The **elmeg hybird 300** is initialised |

| 3 | SD card | - - — - - | Flickers green | Write / read data |
|---|---------|-----------|----------------|-------------------|
|   |         |           | Glows green | Memory card detected but no access |

Description of LED functions (**elmeg hybird 300** / **elmeg hybird 600**)

1            **Power management**

An overload has occurred on the system; e.g. overload at $S_0$ interface. The system attempts to return to normal operation after removal of the fault.

2            **System messages present**

Error message if, e.g. the SIP provider is not registered, or the client is not detected at the USB host.

**The system is initialised**

When switching to operating voltage, the LED blinks until the system is operative.

**Operating status**

The system is in normal operation; no errors detected.

3            **Memory card detected**

Memory card detected but no access.

**Write / read data**

Data are currently being written or read on the SD card.

# Kapitel 4  Interior view of the elmeg hybird 300
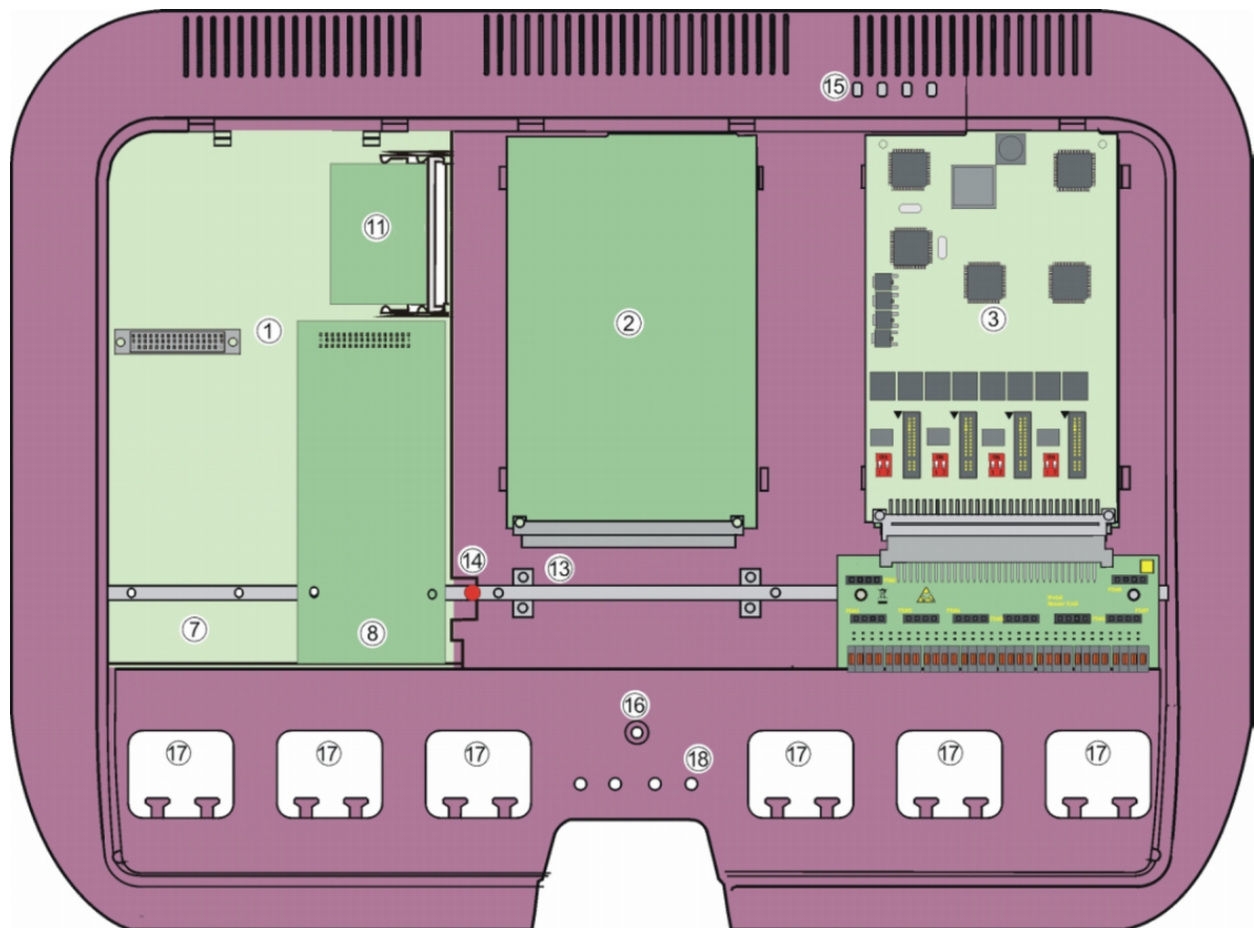
| | |
|---|---|
| ① | Module slot 1: Slot open, slots 7 - 11 visible beneath |
| ② | Module slot 2: Example shows inserted module |
| ③ | Module slot 3: Module **M 4 S/U + 6 FXS** with module **connection-clamp** (MC CL) (assembled) |
| ⑦ | Module slot 7 |
| ⑧ | Module slot 8: Example shows inserted module |
| ⑪ | Module slot 11: Example shows inserted module |
| ⑬ | Functional earth strip: It is linked with the system GND terminal. |
| ⑭ | Functional earth connecting screw: This bar links the functional earth strip with the functional earth strip of the cover for slot 1. They must always remain connected! |
| ⑮ | LED display (see *LED elmeg hybird 300* auf Seite 8) |
| ⑯ | Bore for fixation screw |
| ⑰ | Cable entry with clamp for cable tie |
| ⑱ | Bores for cable ties |

# Kapitel 5  Assembly of elmeg hybird 300

## 5.1  Installation process

This section describes the installation sequences.

> ⚠️ **Achtung**
>
> In operation, the **elmeg hybird 300** must be mounted on a wall in the specified direction (top, see image below).

(1)  Select an installation site no further than 1.5 metres from a 230V~ mains outlet and the NTBA (ISDN connection), as well as the network operator's DSL connection.

(2)  To prevent devices from interfering with each other, do not install the system close to electronics such as Hi-Fi systems, office equipment or microwave ovens.
  Do not install near heat sources, e.g. heating elements, or in damp rooms. Ambient temperature must remain between 5°C and 40°C.

(3)  Borehole spacing guidelines for wall mounting are indicated at the back of the system (4). In selecting an installation site, a minimum distance of the system from other objects of about 100 mm must be observed.
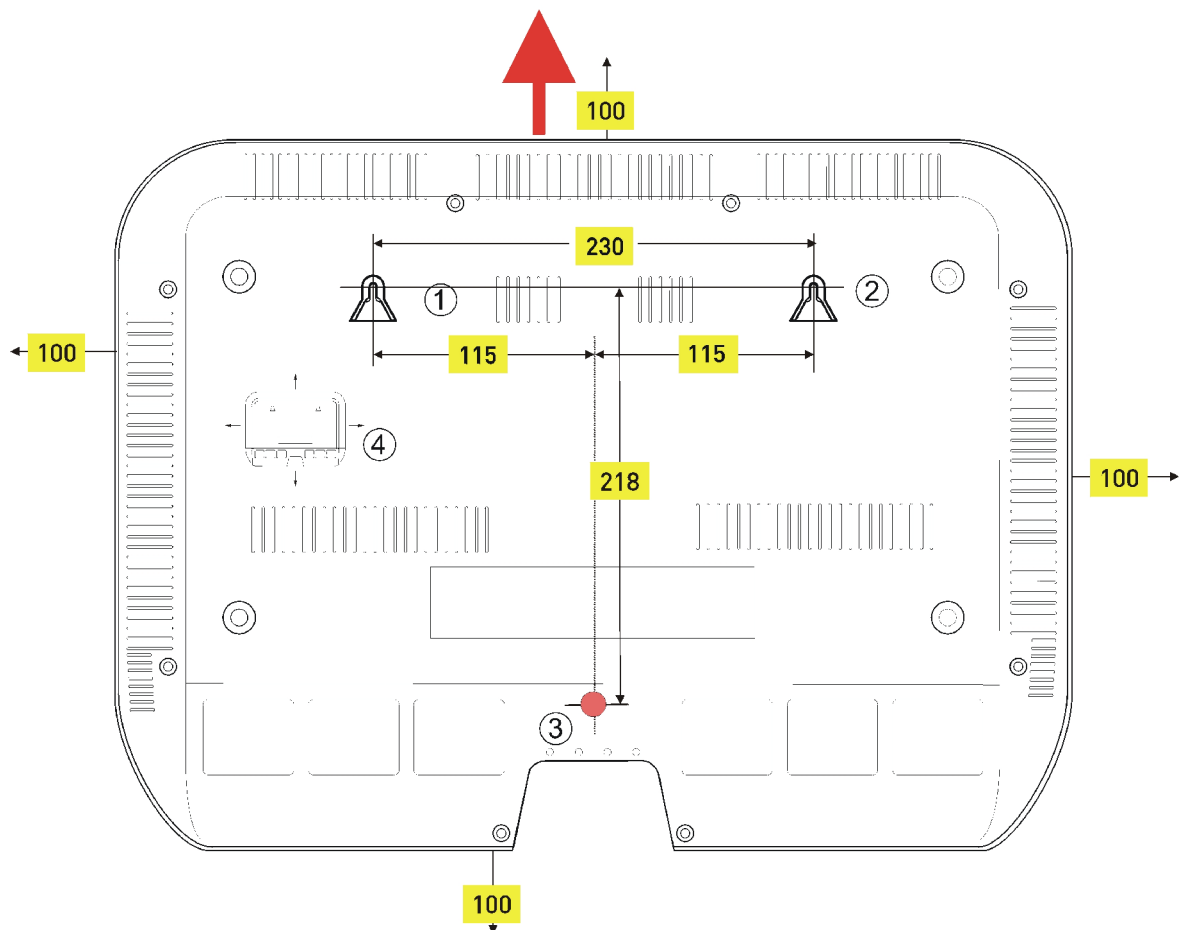


(4)  System fixation points must rest firmly on the wall. Make sure that no supply lines, cables and the like are present in marked borehole areas.

(5)  Drill the two upper fixation holes (1) and (2) at marked points. If mounting with 6 mm dowels, use a 6 mm masonry bit.

(6)  Insert the screws into both up per dowels in the wall so as to maintain a spacing of ca. 5 mm between screw head and wall.

(7)  **elmeg hybird 300** open:

**Achtung**

You may be electrostatically charged. Before opening the system, you must discharge yourself by touching an earthed conductive object (e.g. water pipe).
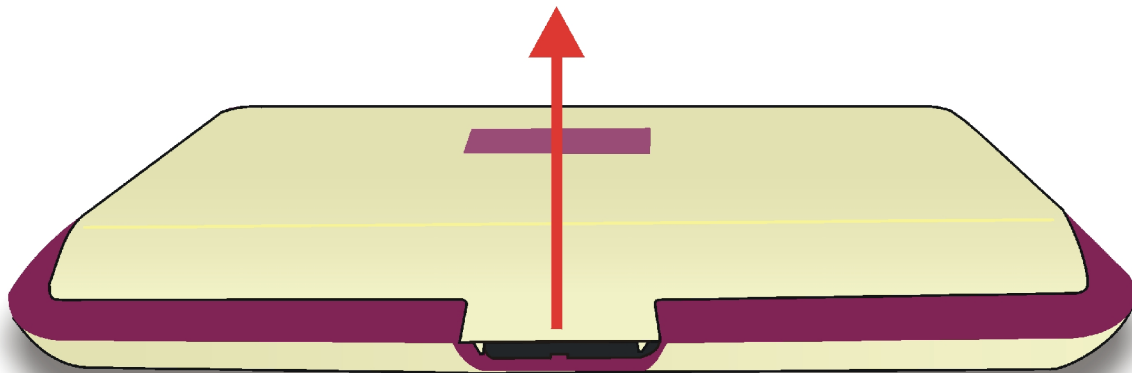
(8)    The system can be opened for mounting without tools. For this, pull the cover strap (identified in the picture by an arrow) upward in the direction of the arrow. The cover can now be removed. Inside the cover appears a diagram indicating the layout of the modules along with their designation (see *Description of module slots* auf Seite 3).

**Achtung**

All areas which can only be opened with tools are maintenance areas. Unauthorised opening of the device may be dangerous to the user.

(9)    Hang the system from above with rear mounts (1) and (2) into the screw heads. Next, check the system for level horizontal mounting, mark lower borehole (3) and drill.

(10)   Then tighten the system to the marked position with the third screw.

(11)   For configuration over the Ethernet, connect the PC's Ethernet interface with a system LAN interface using a Cat.6 or Cat.5 connecting cable. In basic setting ETH 5.

(12)   To close, insert the snap tabs (back of housing cover) into the tab opening at the base of the system housing, then press down on the front of the housing cover until it locks into place.

(13)   The system is now ready to operate.

# Kapitel 6  Mounting modules in the elmeg hybird 300

> ⚠ **Achtung**
>
> Do not extract or insert modules during operation!

Three different module types and their corresponding module slots have been designed for the **elmeg hybird 300** (see *Assembly of elmeg hybird 300* auf Seite 11).

(1)  With the **elmeg hybird 300**'s cover removed, you'll find the module slots 1 - 3 at the top of the **elmeg hybird 300**.

(2)  Module slots 7 - 8 are located under the module slot 1 cover. To open cover, see in structions at *Open module slot 1* auf Seite 14.

(3)  Module slot 11 is located under the module slot 1 cover. To open cover, see in structions at *Open module slot 1* auf Seite 14.
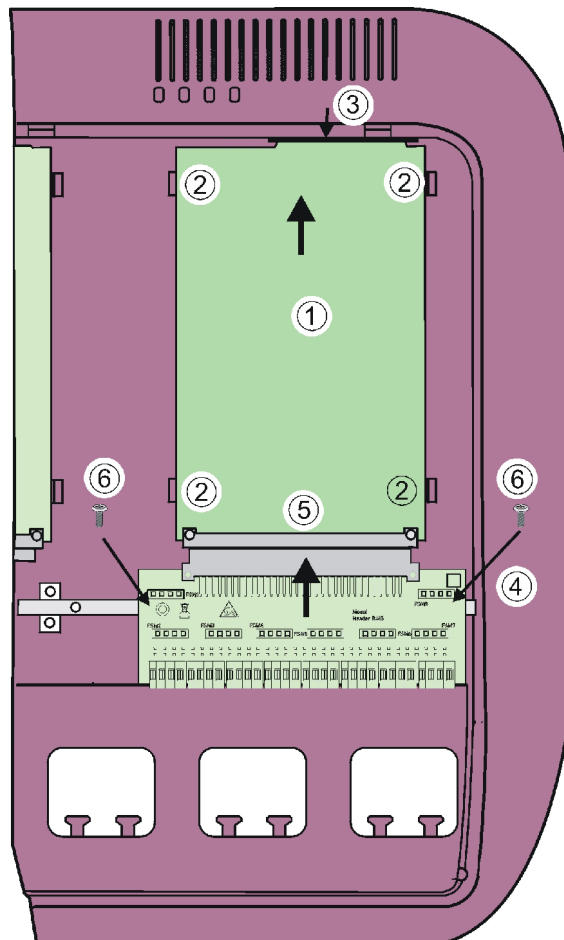
> ⚠ **Achtung**
>
> You may be electrostatically charged. Before opening the **elmeg hybird 300**, you must discharge yourself by touching an earthed conductive object (e.g. water pipe).

## 6.1  Mount modules for module slots 1 - 3

The image shows the example of module slot 3.



①      Module for slot 3

| | |
|---|---|
| ② | Lateral guide for modules |
| ③ | Module connection in the **elmeg hybird 300** housing |
| ④ | **Connection module** – In the example **MC CL** (see *Mounting modules* auf Seite 20). |
| ⑤ | Plug connection between module and **Connection module** |
| ⑥ | Fixation screws of the **Connection module** in the earth bar |

(1)   Place module on lateral guide (2).

(2)   Push in the direction of the arrow into module plug socket (3).

(3)   **Connection module** (4) (see *Mounting modules* auf Seite 20) push in the direction of the arrow into the connector of module (5).

(4)   Screw module onto earth bar (6).

> ⚠ **Achtung**
>
> Module **Connection module** must always be screwed onto the **elmeg hybird 300**'s earth bar.

## 6.2  Mount module for module slot 11

As pictured, the module is inserted into the plug base at an angle of ca. 45 degrees (A), then pushed down (B) until the plug snap tabs lock into the module. To remove the module, simultaneously press both tabs to ward the outside; the module snaps into the position shown at bottom of the image. It may then be extracted in the opposite direction (A).
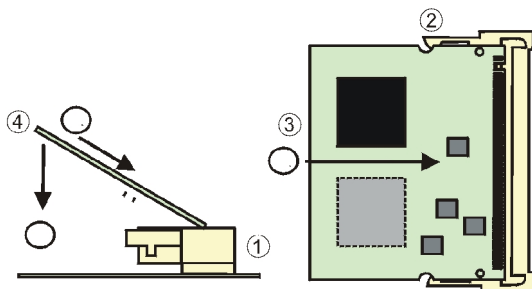


| | |
|---|---|
| ① | Plug base for module |
| ② | Plug base snap tab |
| ③ | Module |
| ④ | Insertion direction for module mounting |

## 6.3  Open module slot 1

Under module slot 1, you'll find the slots for modules 9 - 11 and the connections for the modules on slots 7 and 8.
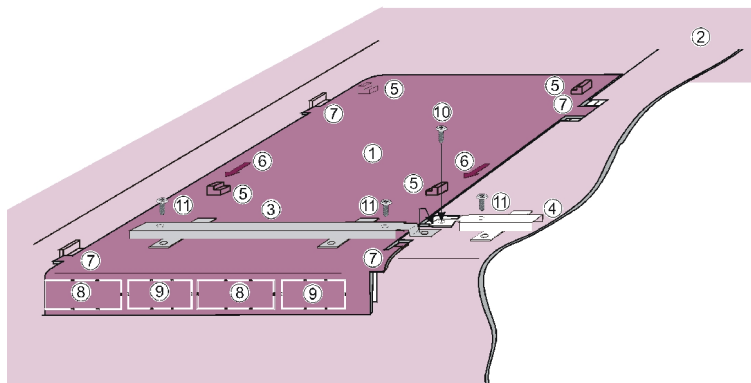
| | |
|---|---|
| ① | Cover for module slot 1 |
| ② | **elmeg hybird 300** |
| ③ | Functional earth strip of cover |
| ④ | **elmeg hybird 300** earth bar |
| ⑤ | Lateral guide for modules |
| ⑥ | Arrows for open direction |
| ⑦ | Catch for cover at tachment |
| ⑧ | Detachable cover for RJ45 connectors of modules in slots 7 and 8 |
| ⑨ | Detachable cover for terminal clamps of modules in slots 7 and 8 |
| ⑩ | Connection screw for the earth bars |
| ⑪ | Fixation screws for the **Connection module** (These screws are provided with the modules.) |

## 6.3.1 Opening the cover for module slot 1

(1) When switched on, turn off power supply.

(2) Remove screw (10).

(3) Pull off cover in the direction of the arrow (6) and lift off upward. In this, be careful not to bend the brackets at the ends of the earth bars (3) and (4).

## 6.3.2 Closing the cover for module slot 1

(1) Insert the cover into the catches for fixation (7) and push back, opposite to the direction of arrow (6) while lightly pressing the catches. Avoid bending the brackets on the earth bars.

(2) Insert screw (10) and firmly tighten.

(3) Restore power supply.

> ⚠️ **Achtung**
>
> The cover's earth bar must always be screwed together with the earth bar of the **elmeg hybird 300**.
> Only this will create a continuous functional earth connection!

### 6.3.3  Remove detachable cover for clamp connector (9) and RJ45 connector (8)

The desired covers are easily removed. Next, the broken-off fixation strips should be removed so that the modules' RJ45 connectors easily fit in the openings when mounting the covers.
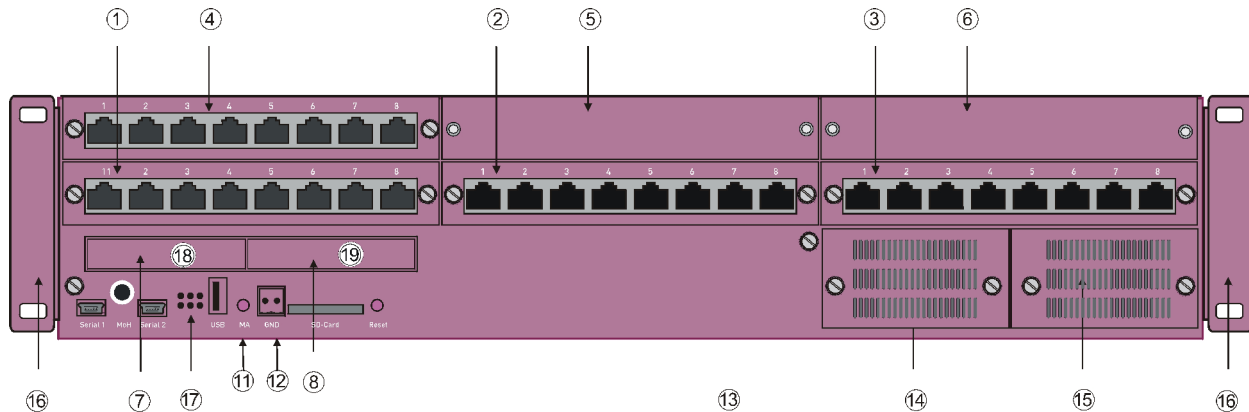
**Hinweis**

If connection of the modules is designed for clamp connectors, this should be done before closing the cover.

# Kapitel 7  Interfaces elmeg hybird 600

## 7.1  Frontal view



| | |
|---|---|
| ① | Module slot 1, with module **MC RJ45** |
| ② | Module slot 2, with module **MC RJ45** |
| ③ | Module slot 3, with module **MC RJ45** |
| ④ | Module slot 4, with module **MC RJ45** |
| ⑤ | Module slot 5, no module inserted, cover only |
| ⑥ | Module slot 6, no module inserted, cover only |
| ⑦ | Module slot 7: This module is mounted on the base module, as described at *Slot* auf Seite 3. |
| ⑬ | Base module |
| ⑭ | Module power supply 1 (always present) |
| ⑮ | Module power supply 2 (only in connection with modules on slot 4 - 6) |
| ⑯ | 19" angle |
| ⑰ | LED display (see *LED elmeg hybird 600* auf Seite 8) |
| ⑱ | Removable cover for connecting modules of slot 7 |
| ⑲ | Removable cover for connecting modules of slot 8 |

> **Hinweis**
>
> The covers for modules 1 - 6 are secured with Phillips head screws. The module drawers are secured with knurled screws.

## 7.2  Rear view
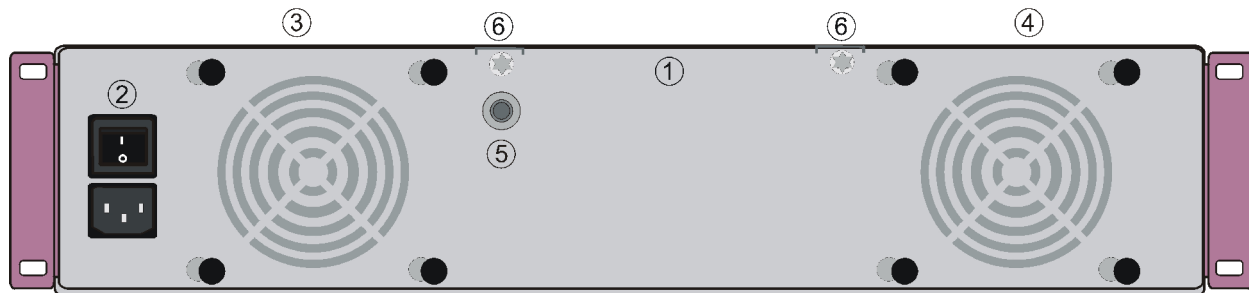


| ① | **elmeg hybird 600** back panel |
| ② | Low-heat device connector with on / off switch |
| ③ | Fan 1 |
| ④ | Fan 2 |
| ⑤ | Connection for functional earth (rack service earth) |
| ⑥ | Screws for opening of back panel |

## 7.3  Fan connection

After removal of back panel (see »rear view« image), the connectors for the fans become accessible on the rear PCB »backpane«. These connectors are designated as FAN1 to FAN4. Here, the first fan is connected to FAN1 and operated via power supply 1 (left slot). The second fan can be connected to FAN2 or FAN3. Both connection are switched parallel and are operated via power supply 2 (right slot).

> **Hinweis**
>
> With only mains unit 1 present, only fan 1 is in operation.
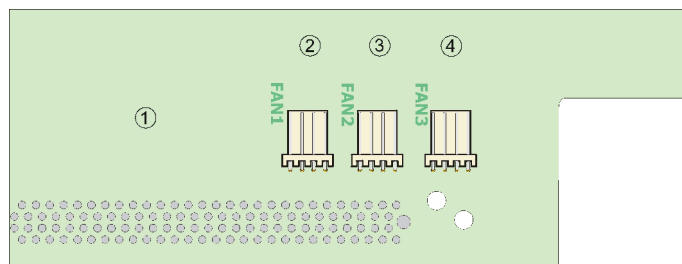


| ② | Connection fan 1 (FAN1) |
| ③ | Connection fan 2 (FAN2) |
| ④ | Connection fan 3 (FAN3) |

## 7.4  Functional earth connection

The **elmeg hybird 600** requires a functional earth connection for safe operation. Hence, an »earth line« should be located in the vicinity of the assembly site (a water line or heating line connected to the potential equalisation line, or the building installation's equipotential bonding strip). Connection to the system should occur via a connecting line of at least 2.5 mm$^2$.

---

☞ **Hinweis**

If terminals are connected to the safety earth or service earth (e.g. USB or serial interfaces), the functional earth connection should be as short as possible, as ground loops can otherwise ensue.

---

⚠ **Achtung**

All areas which can only be opened with tools are maintenance areas. Unauthorised opening of the device may be dangerous to the user.

---
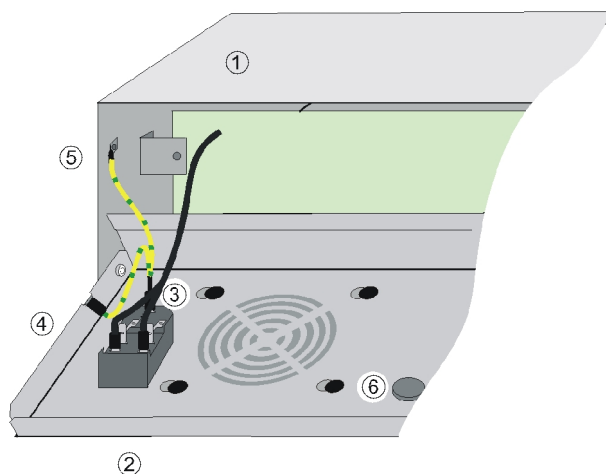


| | |
|---|---|
| ① | **elmeg hybird 600** |
| ② | Back panel pulled down |
| ③ | Safety earth connection of 230V~ connection unit |
| ④ | Connection of earth conductor and **elmeg hybird 600** functional earth |
| ⑤ | Connection of functional earth to the **elmeg hybird 600** |
| ⑥ | Functional earth connection (to back panel exterior) |

# Kapitel 8  Mounting modules

> ⚠ **Achtung**
>
> You may be electrostatically charged. Before opening the system, you must discharge yourself by touching an earthed conductive object (e.g. water pipe).

## 8.1  Mounting modules in mounting frame (elmeg hybird 600)

Insert the RJ45 terminal strip of module **MC RJ45** (2) from behind through the mounting frame opening (1) and secure with two screws to mounting frame (3). Next, insert the module (e.g. **M 4 S/U + 4U**) through the rear mounting frame opening and into the connector strip of module **MC RJ45**, then secure with the two screws (3) to the mounting frame.
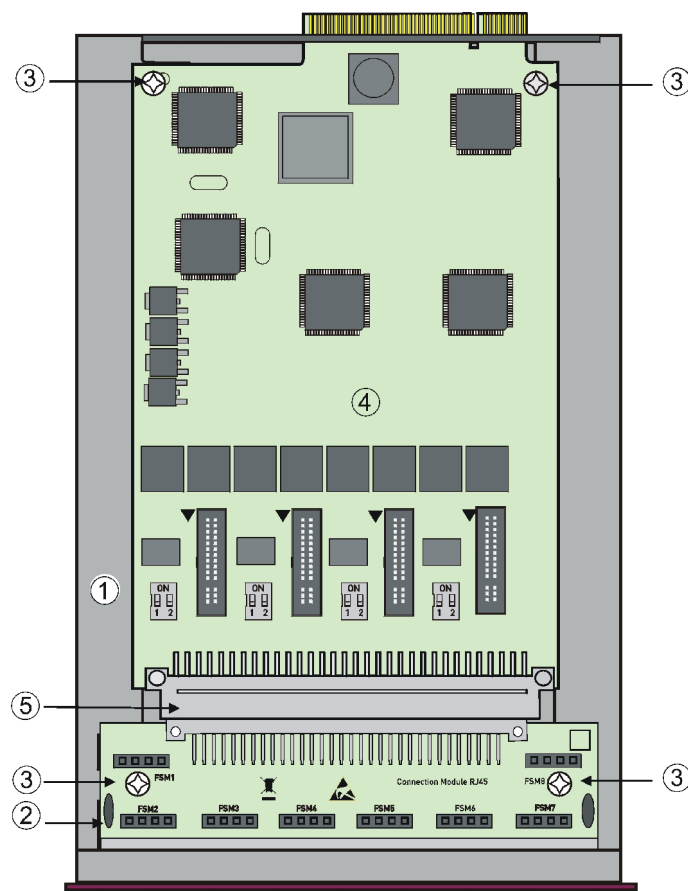


| | |
|---|---|
| ① | Mounting frame |
| ② | **MC RJ45** |
| ③ | 4 Fixation screws (scope of supply) |
| ④ | Module (example shown **M 4 S/U + 4U**) |
| ⑤ | Terminal connectors: Modules **RJ45** / **M 4 S/U + 4 U** |

## 8.2  Remove covers of the modules 7 and 8

> ☞ **Hinweis**
>
> Switch of the power supply of **elmeg hybird 600**. Remove the two knurled screws for fixation of the base module (see *Frontal view* auf Seite 17) and extract the mounting frame with the base module.

The recesses for the connections of the modules are prepared in the front plate of the basic module. By bending out the cover can be removed. The cover must be carefully bent inwards. Subsequently the cover can be snapped by gently bending back and forth. The resulting fracture edges should be trimmed. Thereby avoid, that metal shavings fall on the base module.
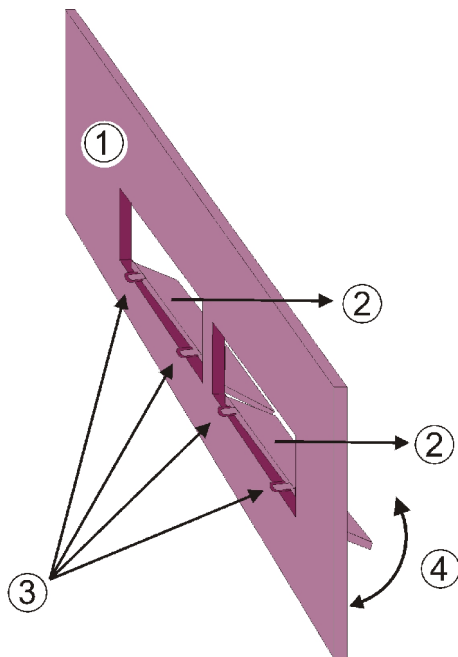


| ① | Front panel |
| ② | Push the sheet in this direction inwards. |
| ③ | Facture edge of the sheet |
| ④ | Cover |
| ⑤ | Bend the sheet back and forth, until the cover can be removed |

## 8.3  Mounting modules for module slots 7 - 8

The image shows an example for the module slot 8.
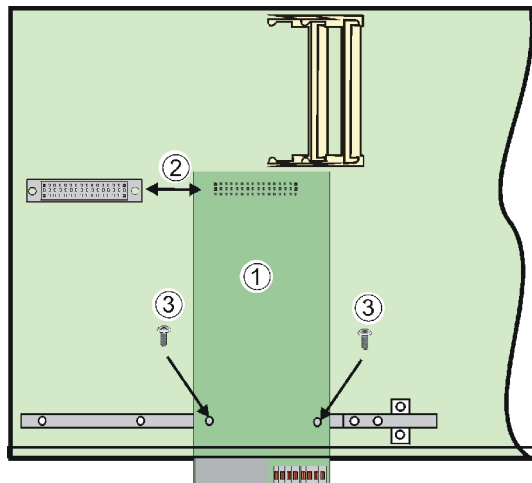
| ① | Module for slot 8 |
|---|---|
| ② | Module plug socket in the **elmeg hybird 300** housing |
| ③ | Module screws into the ground bus |

(1)  Plug module plug from above into the module plug socket (2) in the **elmeg hybird 300** basic module.

(2)  Screw the module into the ground bus (3).

> ⚠ **Achtung**
>
> The module must always be screwed into the **elmeg hybird 300** ground bus.

## 8.4  Mounting modules for module slot 11

For assembling see *Mount module for module slot 11* auf Seite 14 (**elmeg hybird 300**).

Module **MC RJ45** and module **MC CL** may be connected to modules of slots 1 - 3 as desired. Module **MC CL** is dedicated to the connection of installation lines. Connection to module **MC RJ45** is via RJ45 connector. This module features LED's for function display. The modules must absolutely be screwed onto the functional earth strip (see *Interior view of the elmeg hybird 300* auf Seite 10). Only this insures mechanical support of the modules and the protective action of module **FSM**.

### 8.4.1  Module connection clamp (MC CL)

The image displays module **MC CL** with inserted connecting terminals:
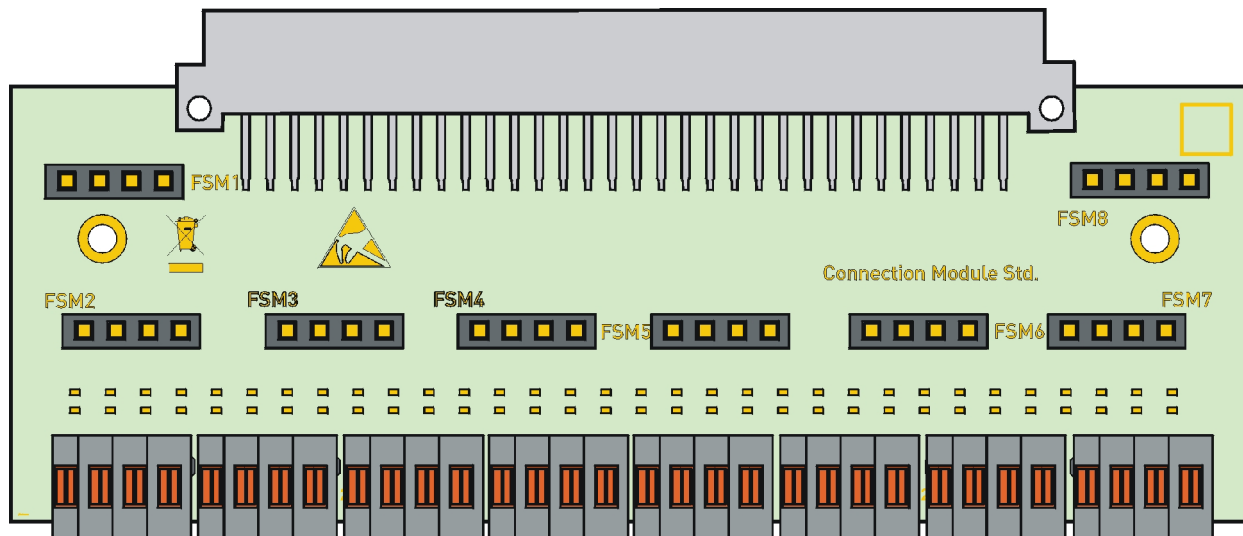
The sockets designated as »FSM 1-8« are designed for the **FSM surge protection modules** (see *Surge protection module (FSM)* auf Seite 45). The module does not have LED's.

The image displays module **MC CL** with removed connecting terminals:
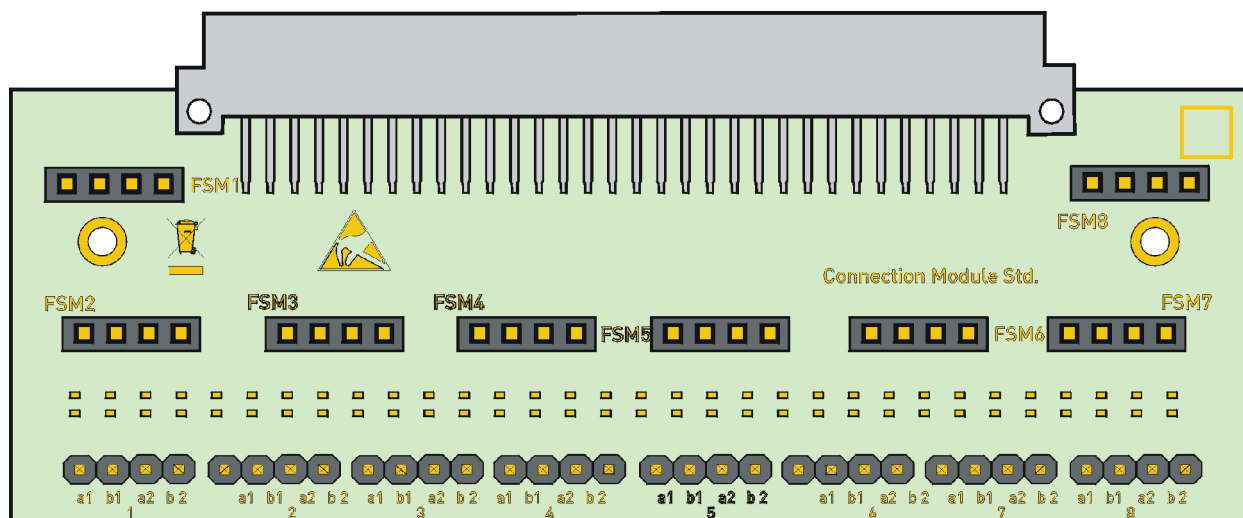


## 8.4.2  Module connection RJ45 (MC RJ45)

The image shows module **MC RJ45**:
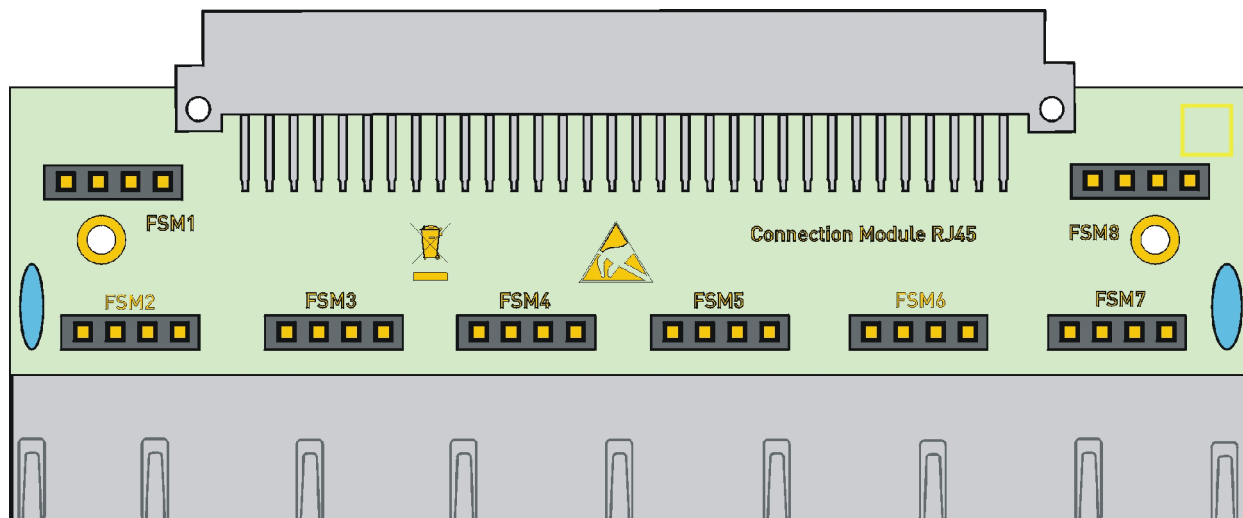


The sockets designated as »FSM 1-8« are destined for the **FSM surge protection modules** (see *Surge protection module (FSM)* auf Seite 45). LED's are featured in the module sockets for function display.

### 8.4.3  Assignment of connection terminals and RJ45 sockets
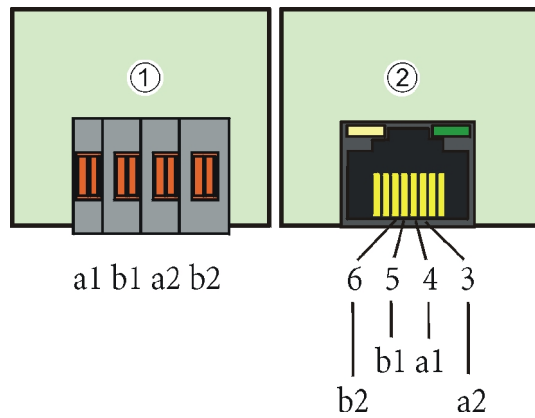


| ① | | Connection terminal module **MC CL**: The connection terminals are numbered from 1 to 8. Assignment: a1, b1, a2, b2 |
|---|---|---|
| ② | | Connection socket module **MC RJ45**: Assignment: 3 = a2, 4 = a1, 5 = b1, 6 = b2 |

#### 8.4.3.1  Connections

You'll find the connection description in the respective module.

| $S_0$-TE / $S_0$-NT | Module **MC CL**: | 1 = a1 |
|---|---|---|
| | | 2 = b1 |
| | | 3 = a2 |
| | | 4 = b2 |
| | Module **MC RJ45**: | 3 = a2 |
| | | 4 = a1 |
| | | 5 = b1 |
| | | 6 = b2 |
| $U_{pn}$ | Module **MC CL**: | 1 = a1 |
| | | 2 = b1 |
| | | 3 = nc |
| | | 4 = nc |
| | Module **MC RJ45**: | 3 = nc |
| | | 4 = a1 |
| | | 5 = b1 |
| | | 6 = nc |
| **FXS** | Module **MC CL**: | 1 = a1 |

| | | 2 = b1 |
|---|---|---|
| | | 3 = a9 |
| | | 4 = b9 |
| Module **MC RJ45**: | | 3 = a9 |
| | | 4 = a1 |
| | | 5 = b1 |
| | | 6 = b9 |

## 8.5  Y-Adapter FXS

Der **Y-Adapter FXO**  allows connection of two analogue terminals via RJ12 or RJ45 connectors to an RJ45 socket of modules **M 4 S/U + 6 FXS** and **M 16 FXS**. Adapter and connection cable are unshielded.

### 8.5.1  Assignment of the Y-Adapter FXS
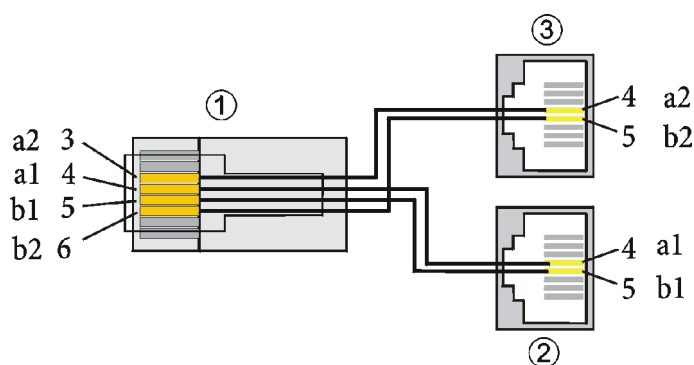


| (1) | RJ45 connector (ratchet lever on top) |
|---|---|
| (2) | Analogue terminal socket 1 |
| (3) | Analogue terminal socket 2 |

## 8.6  M 4 S/U + 4U

The module features four S / U interfaces, which can be configured as a $S_0$- or $U_{pn}$ connection. Four additional U interfaces are also available. The S interfaces can be configured as a $S_0$ connection internally (NT) or externally (TE). The physical switching from internal to external on the $S_0$ connection occurs only via the **coding plug** module. No configuration is specified ex works (see *Coding plug* auf Seite 42).

> ⚠ **Achtung**
>
> When configuring as internal (NT) $S_0$ interface (with BUS feeding), make sure that it is not connected to an external (TE) $S_0$ interface (the network provider's NT). Here, the opposing feeds could damage the devices.

> **Hinweis**
>
> For this, please follow the instructions of *Intelligent power management* auf Seite 45.

> **Hinweis**
>
> LED functions are located at *LED functions* auf Seite 41.
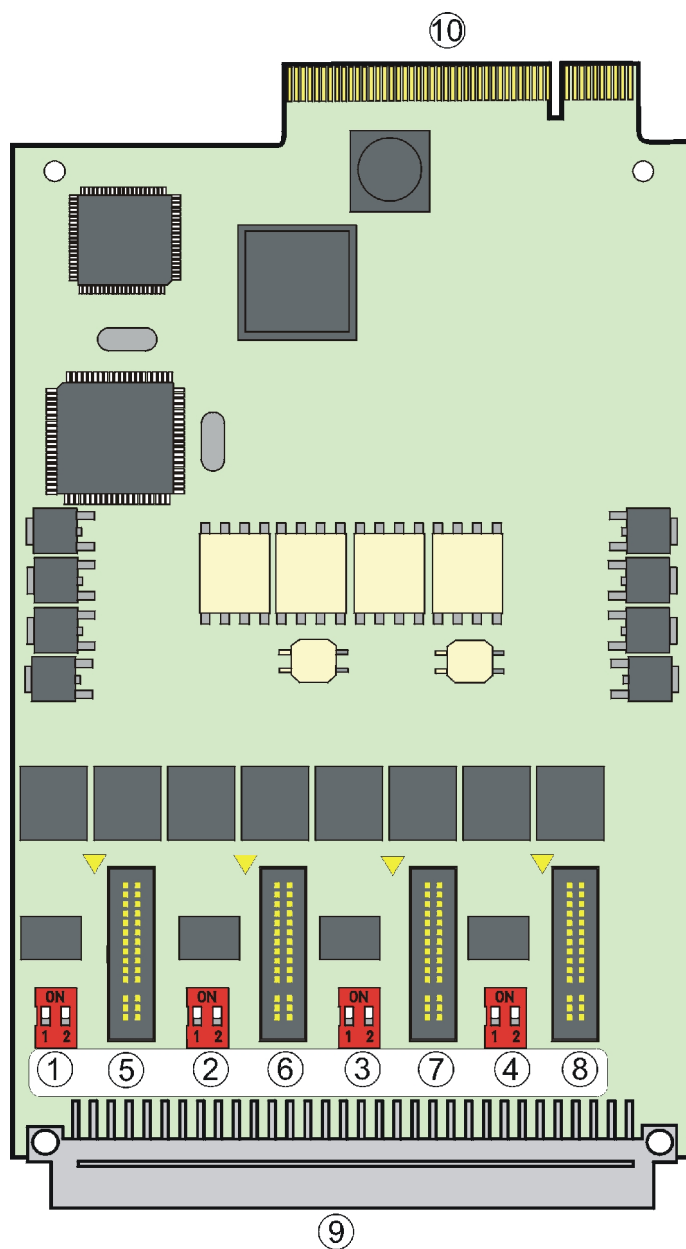


| ① to ④ | Switch for the $S_0$ (100 ohm termination) for S interfaces 1 - 4 |
| --- | --- |
| ⑤ | Socket for the **coding plug** (S/U-PORT1) |
| ⑥ | Socket for the **coding plug** (S/U-PORT2) |
| ⑦ | Socket for the **coding plug** (S/U-PORT3) |
| ⑧ | Socket for the **coding plug** (S/U-PORT4) |
| | The symbol (6) points to the upper corner of the **coding plug** (see *Coding plug* auf Seite 42). |

| (9) | Socket strip for connection of module **Connection module** (see *Frontal view* auf Seite 17). |
|---|---|
| (10) | Module connection |

### 8.6.1  Switch for the terminators

These switches allows the terminators for $S_0$ interfaces TE and NT to be turned on and off.

Terminators on the modules are required:

- If an external interface (TE) is directly connected to the external NTBA.
- If the bus starts directly on connection of the **elmeg hybird 300**.

### 8.6.2  Technical data, $S_0$ interfaces

| | |
|---|---|
| **TE (External $S_0$ interface):** | Protocol DSS1, point-to-multipoint or point-to-point connection |
| **NT (Internal $S_0$ interface):** | Protocol DSS1, point-to-multipoint connection |
| Maximum supply: | 2.5 W |
| Interfaces: | $S_0$ supply ca. 37.5 V - |
| Channel structure: | B + B + D |
| Line lengths: | for a 0.6 mm diameter |
| Short passive bus: | max. 120 metres (for network line CAT.5, up to 180 metres) |

### 8.6.3  Technical data, $U_{pn}$ interfaces

| | |
|---|---|
| $U_{pn}$ line lengths: | 1,000 metres |
| Wire diameter: | 0,6 mm |
| Maximum supply: | 2.5 W |

### 8.6.4  Interface assignment M 4 S/U + 4U

### 8.6.4.1  Module Connection module
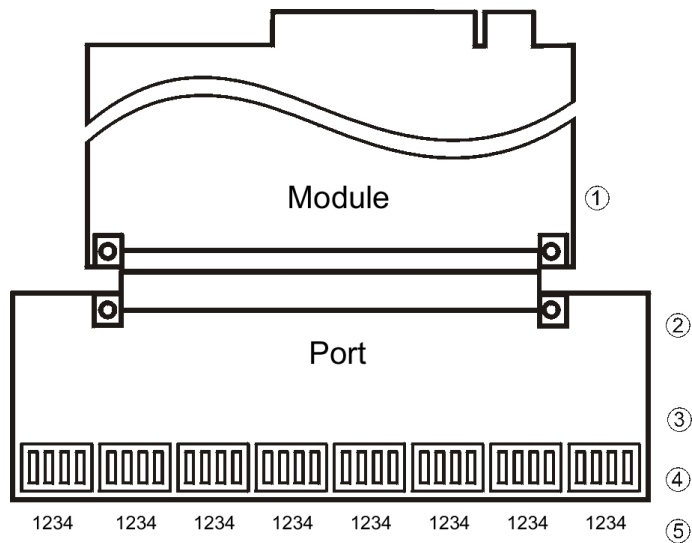


| (1) | Module **M 4 S/U + 4U** |
| --- | --- |
| (2) | **MC CL** |
| (3) | Port ID |
| (4) | The connecting terminal designation is located under the terminals. |
| (5) | Connecting terminal number |

| Connection terminal number | Connection terminal designation | Port ID | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | a1 | S/U | S/U | S/U | S/U | U | U | U | U |
| 2 | b1 | S/U | S/U | S/U | S/U | U | U | U | U |
| 3 | a2 | S | S | S | S | | | | |
| 4 | b2 | S | S | S | S | | | | |
| Port designation in the configuration | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

### 8.6.4.2 Module MC RJ45
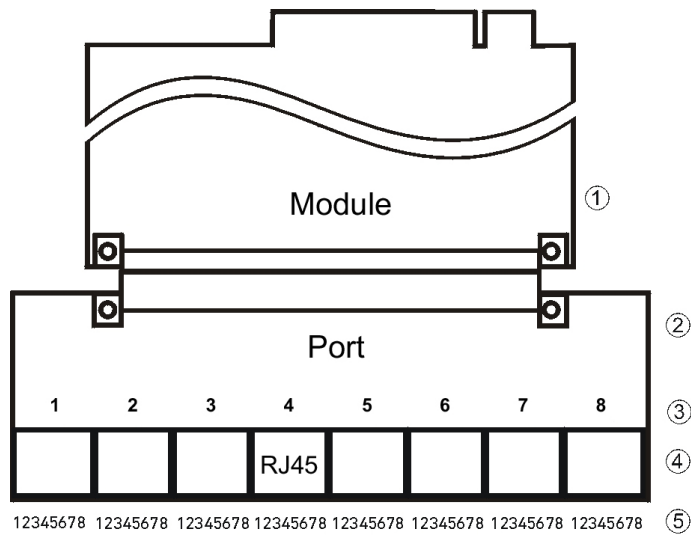


| ① | **M 4 S/U + 4U** |
| ② | **MC RJ45** |
| ③ | Port ID |
| ④ | RJ45 sockets |
| ⑤ | Interface contact number |

| RJ45 socket Connection | Connection- Feature | Port ID | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| 1 | | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | **a2** | S | S | S | S | | | | |
| 4 | **a1** | S/U | S/U | S/U | S/U | U | U | U | U |
| 5 | **b1** | S/U | S/U | S/U | S/U | U | | U | U |
| 6 | **b2** | S | S | S | S | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| **Port designation in the configuration** | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

## 8.7  M 4 S/U + 6 FXS

The module features four S / U interfaces, which can be configured as a $S_0$ or $U_{pn}$ connection. Additional 6 FXS interfaces are also available. The S interfaces can be configured as a $S_0$ connection internally (NT) or externally (TE). No configuration is specified ex works. The physical switching on the module occurs via the **coding plug** modules (see *Coding plug* auf Seite 42). The 6 FXS interfaces are intended for connection of analogue terminals (telephone, fax).

> ⚠️ **Achtung**
>
> When configuring as internal $S_0$ interface (with BUS feeding), make sure that this interface is not connected with an external $S_0$ interface (NT). Here, the opposing feeds could damage the devices.

Maximum supply for the internal $S_0$ connection is 2.5 W for each interface.

> 👉 **Hinweis**
>
> Here, please follow the instructions of *Intelligent power management* auf Seite 45.

> 👉 **Hinweis**
>
> LED functions are located at *LED functions* auf Seite 41.
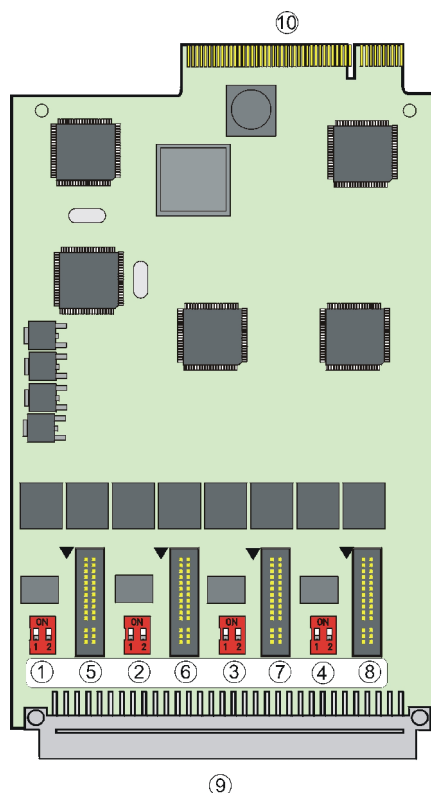


| ① to ④ | Switch for the $S_0$ terminators (100 ohm termination) for S interfaces 1 - 4 |
|---|---|
| ⑤ | Socket for the **coding plug** (S/U-PORT1) |
| ⑥ | Socket for the **coding plug** (S/U-PORT2) |
| ⑦ | Socket for the **coding plug** (S/U-PORT3) |

| (8) | Socket for the **coding plug** (S/U-PORT4) |
|---|---|
| | The symbol (6) points to the upper corner of the **coding plug** (see *Coding plug* auf Seite 42). |
| (9) | Socket strip for connection of module **Connection module** (see *Frontal view* auf Seite 17). |
| (10) | Module connection |

### 8.7.1  Switch for the terminators

These switches allows the terminators for $S_0$ interfaces TE and NT to be turned on and off.

Terminators on the modules are required:

- If an external interface (TE) is directly connected to the external NTBA.
- If the bus starts directly with connection of the system.

### 8.7.2  Technical data, $S_0$ interfaces

| | |
|---|---|
| **TE (External S0 interface):** | Protocol DSS1, point-to-multipoint or point-to-point connection |
| **NT (Internal $S_0$ iterface):** | Protocol DSS1, point-to-multipoint connection |
| Maximum supply: | 2.5 W |
| Interfaces: | $S_0$ supply ca. 37,5 V- |
| Channel structure: | B + B + D |
| Line lengths: | for a 0.6 mm diameter |
| Short passive bus: | max. 120 metres (for network line CAT.5, up to 180 metres) |

### 8.7.3  Technical data, $U_{pn}$ interfaces

| | |
|---|---|
| **$U_{pn}$ line lengths:** | 1,000 metres |
| Wire diameter: | 0.6 mm |
| Maximum supply: | 2.5 W |

### 8.7.4  Technical data, analogue interfaces (FXS)

| | |
|---|---|
| **Supply:** | symmetrical, 18 mA on 200 - 600 ohm |
| Max. line lengths to the analogue terminals on connection with installation line: | 1 km |
| **Dialling method:** | Multifrequency dialling or impulse dialling |
| Character duration: | 40 ms and 100 ms |
| Pause duration: | 80 ms |
| Tone recognition: | -10 dBm … 0 dBm |
| Flash recognition: | Adjustable, 100 … 1,000 ms |
| **Feeding voltage:** | 37.5 V |
| **Call voltage:** | $U_{eff} > 38$ V~ |
| **Call frequency:** | 25 / 50 Hz ± 8%, switchable |

### 8.7.5  Interface assignment M 4 S/U + 6 FXS

#### 8.7.5.1  Module Connection module



| ① | **M 4 S/U + 6 FXS** |
|---|---|
| ② | **MC CL** |
| ③ | Port ID |
| ④ | The connecting terminal designation is located under the terminals. |
| ⑤ | Connecting terminal number |

| Connection terminal | Connection terminal | Port ID |
|---|---|---|

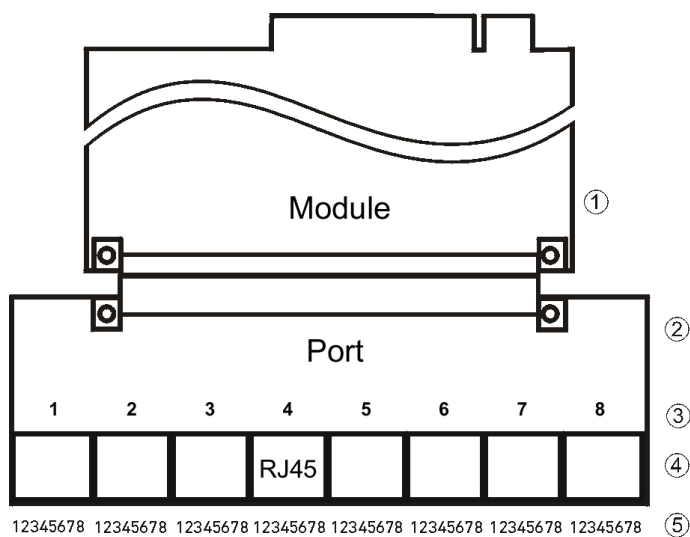| number | designation | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | a1 | S/U | S/U | S/U | S/U | FXS5 | FXS6 | FXS7 | FXS8 |
| 2 | b1 | S/U | S/U | S/U | S/U | FXS5 | FXS6 | FXS7 | FXS8 |
| 3 | a2 | S | S | S | S | FXS9 | FXS10 | | |
| 4 | b2 | S | S | S | S | FXS9 | FXS10 | | |
| Port designation in the configuration | | 1 | 2 | 3 | 4 | 5 / 9 | 6 /10 | 7 | 8 |

### 8.7.5.2  Module MC RJ45



| ① | **M 4 S/U + 6 FXS** |
|---|---|
| ② | **MC RJ45** |
| ③ | Port ID |
| ④ | RJ45 sockets |
| ⑤ | Interface contact number |

| RJ45 socket Connection | Connection- Feature | Port ID | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | a2 | S | S | S | S | FXS9 | FXS10 | | |
| 4 | a1 | S/U | S/U | S/U | S/U | FXS5 | FXS6 | FXS7 | FXS8 |
| 5 | b1 | S/U | S/U | S/U | S/U | FXS5 | FXS6 | FXS7 | FXS8 |

| 6 | b2 | S | S | S | S | FXS9 | FXS10 | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| **Port designation in the configuration** | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

## 8.8  M 8 FXS / M 16 FXS

Complete installation of a **elmeg hybird 300** with **M-8-FXS** and **M-16-FXS** modules allows a maximum traffic load of only 50%. Only 50% of a module's telephone receivers may be continuously lifted at the same time (permanent assignment).

- 8 analogue terminals can be connected to the **M 8 FXS** modules.
- 16 analogue terminals can be connected to the **M 16 FXS** modules.

---

**Hinweis**

LED functions are located at *LED functions* auf Seite 41.
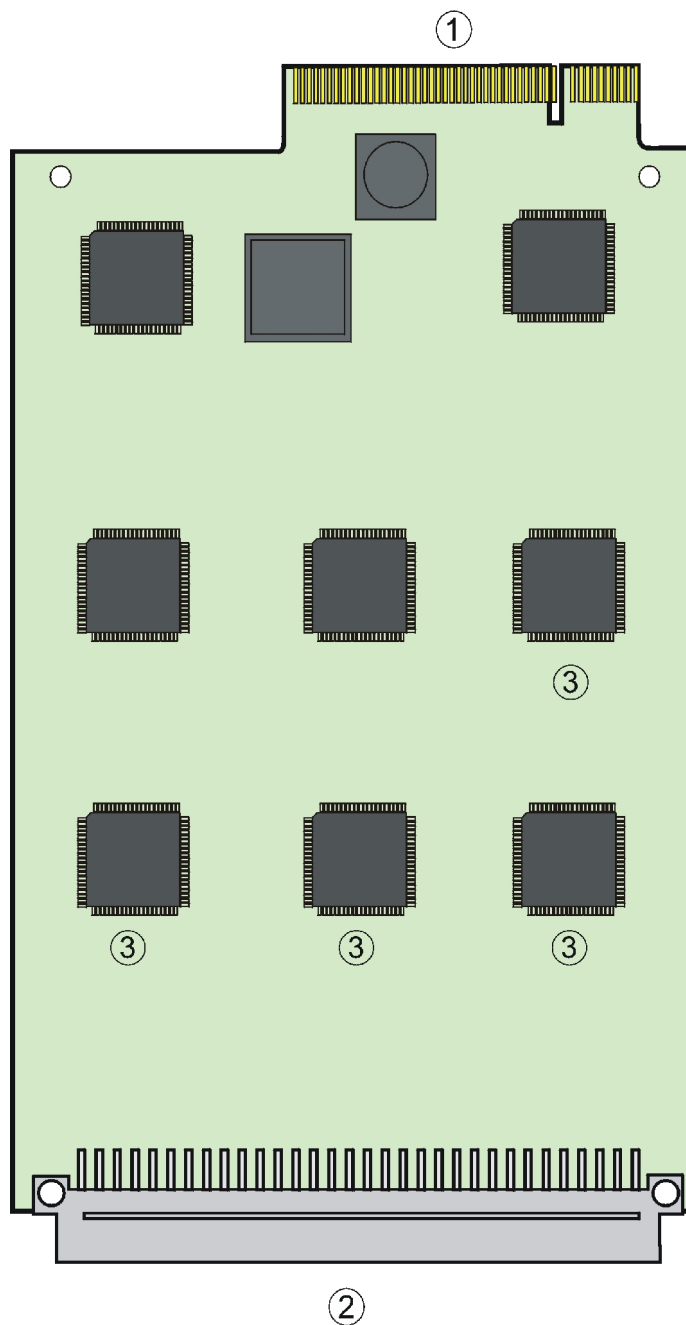
| | |
|---|---|
| ① | Module connection |
| ② | Socket strip for connection of module **Connection module** |
| ③ | Only when **M 16 FXS** present |

### 8.8.1 Technical data, analogue interfaces (FXS)

| | |
|---|---|
| **Supply:** | symmetrical, 18 mA on 200 - 600 ohm |
| Max. line lengths to the analogue terminals at interface with installation line: | 1 km |
| **Dialling method:** | Multifrequency dialling or impulse dialling |
| Character duration: | 40 ms and 100 ms |
| Pause duration: | 80 ms |
| Tone recognition: | -10 dBm … 0 dBm |
| Flash recognition: | Adjustable, 100 … 1,000 ms |
| **Feeding voltage:** | 37.5 V |
| **Call voltage:** | $U_{eff} > 38$ V~ |
| **Call frequency:** | 25 / 50 Hz ± 8%, switchable |

### 8.8.2 Interface assignment M 8 FXS / M 16 FXS

#### 8.8.2.1 Module MC CL
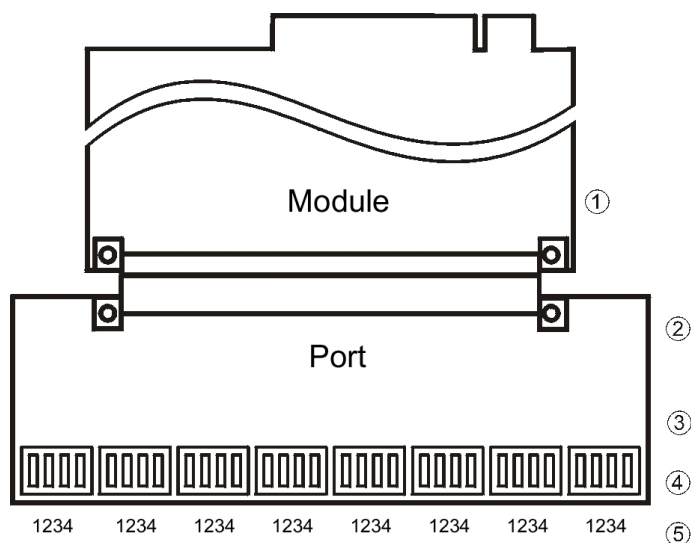


| | |
|---|---|
| ① | **M 8 FXS** / **M 16 FXS** |
| ② | **MC CL** |
| ③ | Port ID |
| ④ | The connecting terminal designation is located under the terminals. |
| ⑤ | Connecting terminal number |

| Connection terminal | Connection terminal | Port ID |
|---|---|---|

| number | designation | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | a1 | FXS1 | FXS2 | FXS3 | FXS4 | FXS5 | FXS6 | FXS7 | FXS8 |
| 2 | b1 | FXS1 | FXS2 | FXS3 | FXS4 | FXS5 | FXS6 | FXS7 | FXS8 |
| 3 | a2 | FXS9 | FXS10 | FXS11 | FXS12 | FXS13 | FXS14 | FXS15 | FXS16 |
| 4 | b2 | FXS9 | FXS10 | FXS11 | FXS12 | FXS13 | FXS14 | FXS15 | FXS16 |
| Port designation in the configuration | | 1 / 9 | 2 / 10 | 3 / 11 | 4 / 12 | 5 / 13 | 6 / 14 | 7 / 15 | 8 / 16 |

Interfaces 3 and 4 are not used for module **M 8 FXS**.

### 8.8.2.2  Module MC RJ45
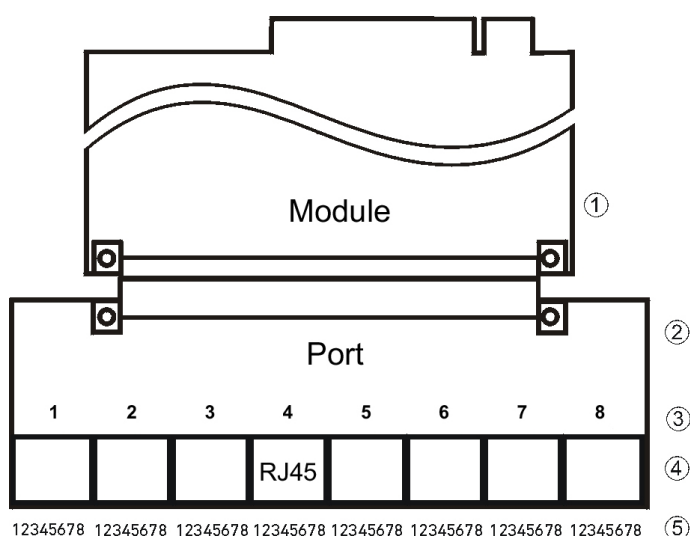


| ① | **M 8 FXS** / **M 16 FXS** |
|---|---|
| ② | **MC RJ45** |
| ③ | Port ID |
| ④ | RJ45 sockets |
| ⑤ | Interface contact number |

| RJ45 socket Connection | Connection- Feature | Port ID | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | a2 | FXS9 | FXS10 | FXS11 | FXS12 | FXS13 | FXS14 | FXS15 | FXS16 |
| 4 | a1 | FXS1 | FXS2 | FXS3 | FXS4 | FXS5 | FXS6 | FXS7 | FXS8 |

| 5 | **b1** | FXS1 | FXS2 | FXS3 | FXS4 | FXS5 | FXS6 | FXS7 | FXS8 |
|---|---|---|---|---|---|---|---|---|---|
| 6 | **b2** | FXS9 | FXS10 | FXS11 | FXS12 | FXS13 | FXS14 | FXS15 | FXS16 |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| **Port designation in the configuration** | | 1 / 9 | 2 / 10 | 3 / 11 | 4 / 12 | 5 / 13 | 6 / 14 | 7 / 15 | 8 / 16 |

Interfaces 3 and 6 are not used for module **M 8 FXS**.

## 8.9  M 4 FXO (POTS)

This module has to be necessarily connected to the functional earth.
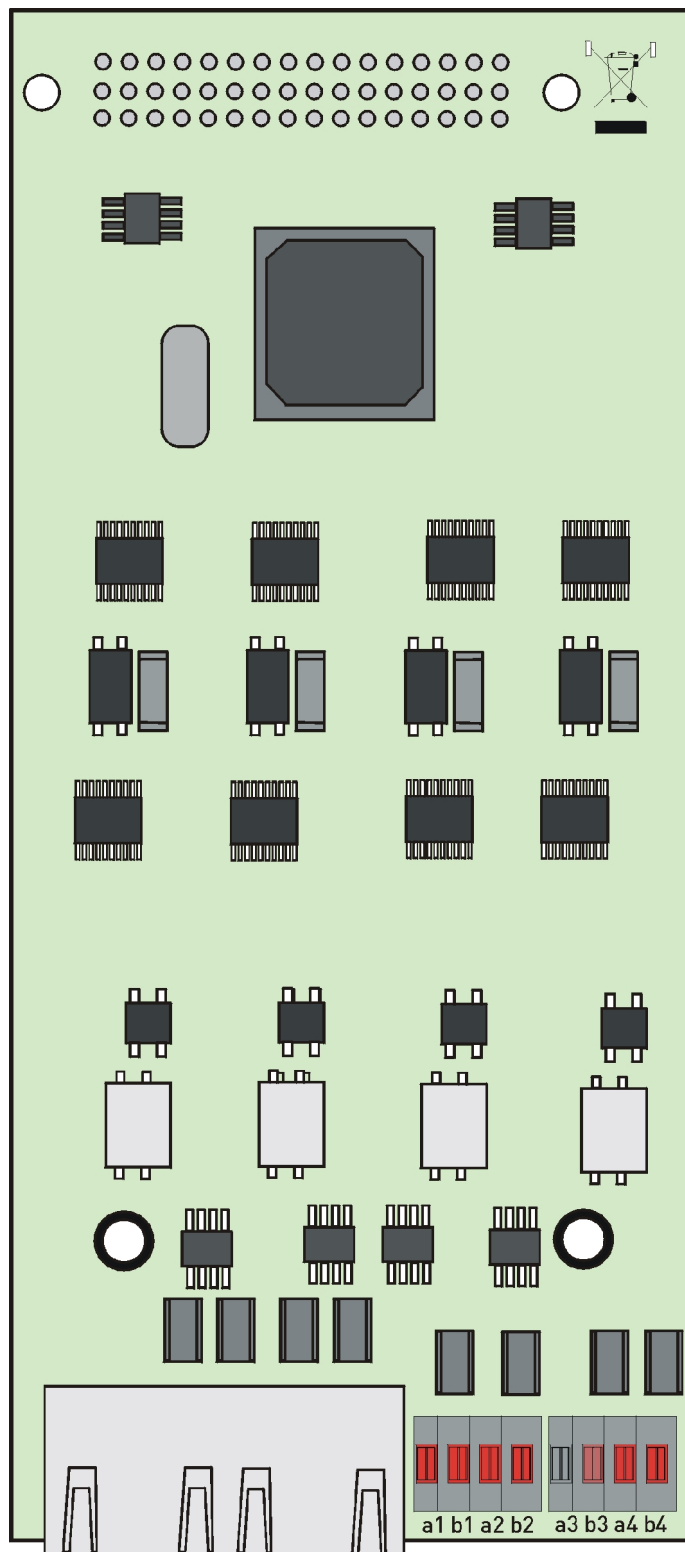
| | |
|---|---|
| ① | **M 4 FXO** |
| ② | RJ45 connector for a1, b1 and a3, b2 |
| ③ | RJ45 connector for a3, b3 and a4, b4 |
| ④ | Connection terminals a1, b1 - a4, b4 |
| ⑤ | Module connector to system |

Performance features:

- The module **M 4 FXO** has four connectors for use on analogue exchanges (HKZ / POTS).
- The IWV / MFV dialling method can be switched via the configuration.
- The transmission of CLIP information can be configured for each connector.

  The signalling of a call on an analogue terminal shall only happen if all CLIP information has been fully transmitted to the terminal.
- A central switch allows the detection of tariff information at either 16 kHz or 12 kHz.

  The sending of tariff information (charge pulse) to analogue terminals is done in line with the configuration, tariff information is transmitted to $S_0$ terminals in the currency amount.
- The dial-end monitoring can be configured.

  The time for monitoring the dial-end switches the voice channel to the extension only after the set time has elapsed.
- Dial tone detection

  The tones and frequencies are country-specific.
- Keypad functions

When there is a connection via the module **M 4 FXO** connectors, the internal keypad dial is converted externally by a MFC dial. If the connector is set to IWV then this function is not possible.

---

☞ **Hinweis**

The settings are adjusted optimally ex works. They should only be amended if the various network provider provisions make it necessary to do so.

---

- GSM gateways can be switched on.
- Fixed network SMS messages are possible via the module.

## 8.9.1  Interface assignment FXO

A connection terminal plug and a RJ45 socket are both available as outputs. Both outputs are connected in parallel.
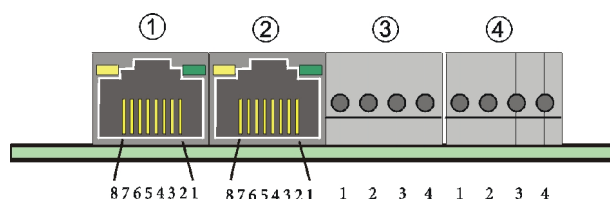


| ① | RJ45 Socket 1 |
| ② | RJ45 Socket 2 |
| ③ | Connecting terminal 1 |
| ④ | Connecting terminal 2 |

| RJ45 Socket 1 | | RJ45 Socket 2 | | Connecting terminal 1 | | Connecting terminal 2 | |
|---|---|---|---|---|---|---|---|
| Number. | Name | Number. | Name | Number. | Name | Number. | Name |
| 8 | A1 | 8 | A3 | 1 | A1 | 1 | A3 |
| 7 | B1 | 7 | B3 | 1 | A1 | 1 | A3 |

| 6 | nc | 6 | nc | 2 | B1 | 2 | B3 |
| 5 | nc | 5 | nc | 2 | B1 | 2 | B3 |
| 4 | nc | 4 | nc | 3 | A2 | 3 | A4 |
| 3 | nc | 3 | nc | 3 | A2 | 3 | A4 |
| 2 | A2 | 2 | A4 | 4 | B2 | 4 | B4 |
| 1 | B2 | 1 | B4 | 4 | B2 | 4 | B4 |

> **Hinweis**
>
> LED's in the RJ45 sockets have no function.

## 8.10  LED functions

**LED functions: ETH1 - ETH5 10Mbits**

| LED designation | LED colour | Function | Status | Display |
|---|---|---|---|---|
| ETH1 - ETH5 | Yellow | LAN | 10Mbits | On |
| | Green | LAN | 10Mbits | On |
| | Yellow | LAN | Data traffic | Flashes |
| | Green | LAN | Data traffic | Flashes |

**LED functions: ETH1 - ETH5 100Mbits**

| LED designation | LED colour | Function | Status | Display |
|---|---|---|---|---|
| ETH1 - ETH5 | Yellow | LAN | 100Mbits | On |
| | Green | | - | Off |
| | Yellow | LAN | Data traffic | Flashes |
| | Green | | - | Off |

**LED functions: ETH1 - ETH5 1Gbit**

| LED designation | LED colour | Function | Status | Display |
|---|---|---|---|---|
| ETH1 - ETH5 | Yellow | | - | Off |
| | Green | LAN | 1Gbit | On |
| | Yellow | - | - | Off |
| | Green | LAN | Data traffic | Flashes |

**LED functions: Internal S0 interface**

| LED designation | LED colour | Function | Status | Note |
|---|---|---|---|---|
| $S_0$ internal | Green | Layer 1 active | Glowing | Terminal switched on |
| | Green | Layer 1 inactive | Off | No terminal |

**LED functions: External S0 interface**

| LED designation | LED colour | Function | Status | Note |
|---|---|---|---|---|
| $S_0$ Extern | Green | Layer 1 active | Glowing | ISDN switched on |
| | Green | Layer 1 inactive | Off | No ISDN switched on |

**LED functions: Internal U interface**

| LED designation | LED colour | Function | Status | Note |
|---|---|---|---|---|
| U internal | Green | Layer 1 active | Glowing | Terminal switched on |
| | Green | Layer 1 inactive | Off | No terminal |

**LED functions: FXS interface**

| LED designation | LED colour | Function | Status | Hinweis |
|---|---|---|---|---|
| FXS 1 - 8 | Yellow | Loop current | Flashes | Terminal switched on |
| FXS 9 - 16 | Green | Loop current | Flashes | Terminal switched on |
| FXS 1 - 8 / FXS 9 - 16 | Green or yellow | No loop current | Off | Terminal switched off (Receiver replaced) |

## 8.11  Coding plug

Functions for interfaces U and S are set via the coding plug. Settings are made over the respective insertion direction of modules.
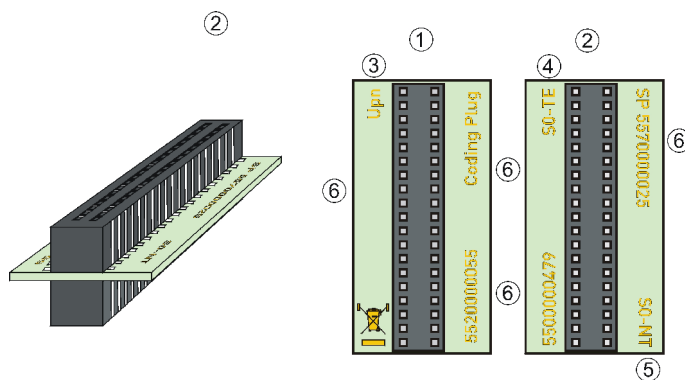


| | |
|---|---|
| (1) | Coding plug page 1 |
| (2) | Coding plug page 2 |
| (3) | $U_{pn}$ coding |
| (4) | $S_0$ coding $S_0$-TE ($S_0$ externally to connection with network operator's NT) |
| (5) | $S_0$ coding $S_0$-NT ($S_0$ internally to connection of $S_0$ terminals) |
| (6) | No function (production designations for the module) |

The following designations are located on side 1 of the coding plug:

**$U_{pn}$**                     The corresponding output on the **Connection module** is switched as U interface.

The following designations are located on side 2 of the coding plug:

**$S_0$-TE**                     The corresponding output on the **Connection module** is switched as external $S_0$ interface (TE).

**$S_0$-NT**                     The corresponding output on the **Connection module** is switched as internal $S_0$ interface (NT).

For adjustment, the label must point to mark (6) next to the socket strip on the module, readable from above. In the illustration above, for coding plug page 1 $U_{pn}$ is configured, for page 2 $S_0$-TE.

> **Hinweis**
>
> All insertion directions not described here are neutral; the system behaves as if the coding plug were not inserted.

## 8.12  Module Power supply unit (M PSU)

The module **Power supply unit** is an integral part of the **elmeg hybird 300**.

In the **elmeg hybird 600** the **Power supply unit** is a slide-in module. After disconnection of the power supply and removal of the two knurled screws from the **elmeg hybird 600**, this module may be extracted and replaced.

If one or more modules 4 - 6 are present in the **elmeg hybird 600**, a second power supply must be inserted, as these modules are only powered from the second power supply.

> ⚠ **Achtung**
>
> The **Power supply unit** module may only be extracted or inserted after the power has been cut.

### 8.12.1  Module mains unit 1/2

Mains unit 1 and mains unit 2 are identical in construction. They may be exchanged. The left mains unit inserted in the system must always be present as it supplies the base module, along with modules 1 - 3 and 7 - 11; the right inserted mains unit, only supplies modules 4 - 6.
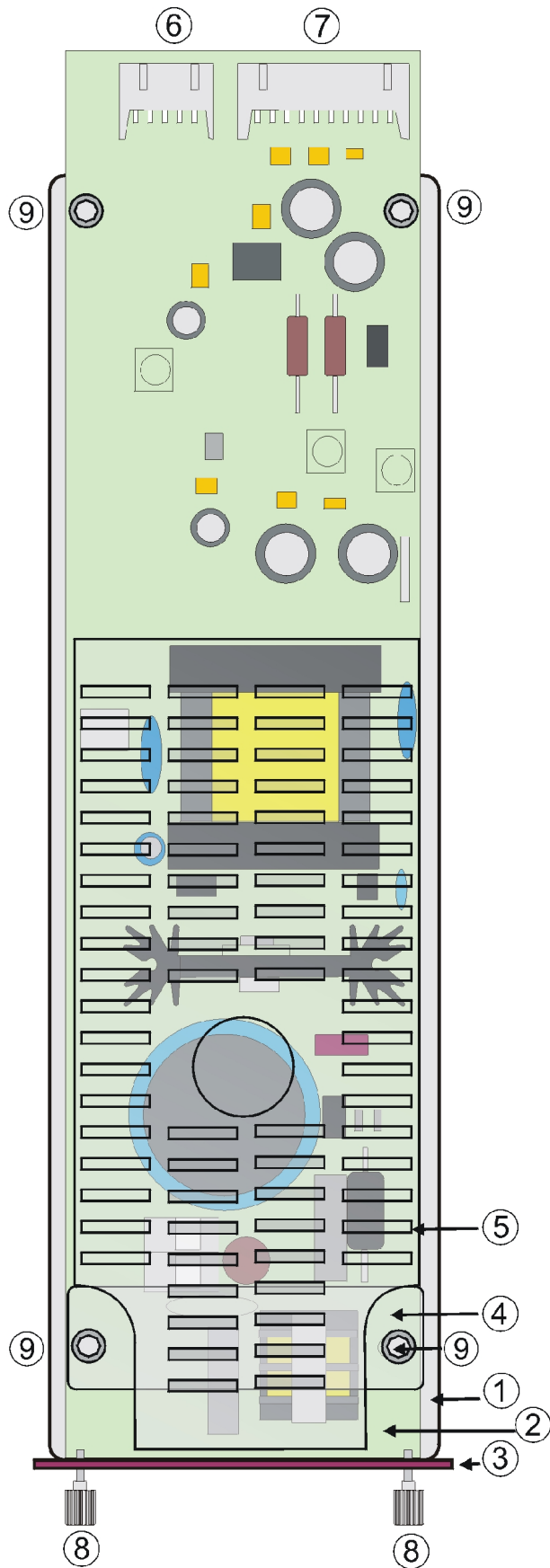
> ⚠ **Achtung**
>
> Before extracting and inserting mains units, the system power cord must be pulled.

> ☞ **Hinweis**
>
> The mains units are secured to the system with knurled screws. These knurled screws are components of the system rather than of the mains units. Hence, as a rule, mains unit are supplied without knurled screws.

| | |
|---|---|
| (1) | Mounting frame, mains unit |
| (2) | Assembly, mains unit |
| (3) | Front panel, mains unit (with mounting frame firmly at tached) |
| (4) | Safety cover for the mains voltage area |

| ⑤ | Safety sheeting on back of assembly |
| ⑥ | Connecting plug, mains voltage |
| ⑦ | Connecting plug for internal power supply |
| ⑧ | Knurled screws for module fixation |
| ⑨ | Screws (TORX) to attach mounting frame, assembly |

## 8.13  Intelligent power management

The system features »intelligent power management«, protecting it from overload on internal connections. In case of overload or a short circuit in the system, current to terminals is interrupted at the modules. The green ready-for-operation display begins to blink. At intervals of ca. one second, the system attempts to restore power until the overload cause (e.g. short circuit of several connections) is removed.

## 8.14  Surge protection module (FSM)
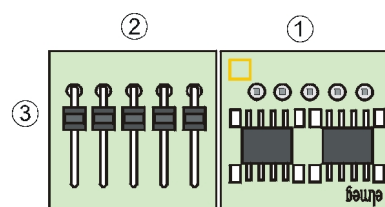


| ① | Module **FSM** Side 1 (above) |
| ② | Module **FSM** Side 2 (above) |
| ③ | Plugs |

The **FSM** module is designed for surge diversion to analogue or $S_0$ connection lines. Surge protection is required for each interface to be protected. Surges arising on the lines are discharged to the functional earth. Hence, you must imperatively install and connect the functional earth (min. 2.5 $mm^2$ wire), as protection is otherwise not present. The **FSM** module is plugged into the matching slots of the connection modules. The **FSM** is symmetrical in structure. It can be inserted in any direction.

The **FSM** is a one-time fuse, meaning that once a module has been removed, it must be replaced with a new module.

If a surge protection module is actuated by an overvoltage, this cause a short-circuit in the connection lines. If there is no tone when the receiver is picked up, the module should be checked. Before checking, disable the connection and the 230 V ~ power supply to the system.

> ⚠️ **Achtung**
>
> If the system is operated in a complex electromagnetic environment (e.g. at locations with machines, lifts, printers, etc.), every connected interface must be protected via the  **surge protection module** (FSM). Here again, it is imperative that a functional earth is connected to the system.

## 8.15  Module connections

> **Hinweis**
>
> When undertaking any work on **elmeg hybird 300** connections, first always shut off the power supply!

> ⚠ **Achtung**
>
> Switching of external and internal $S_0$ interfaces occurs only via configuration. Before switching, make sure that there is no external supply to the interfaces. Otherwise, you may damage the **elmeg hybird 300** output or the NT!

### 8.15.1  Connection of analogue FXS terminals

Analogue terminals are defined as, for example, telephones, multifunctional devices, fax machines in group 2/3 and answering machines connected to the conventional telephone network or to analogue interfaces of the **elmeg hybird 300**. The dialling process of these terminals is either the impulse dialling process or the multi-frequency dialling process. The **elmeg hybird 300** supports both processes. Certain functions of the **elmeg hybird 300**, however, can only be used via the flash function of the terminal. This flash function, in turn, is only available in the multi-frequency dialling process. Analogue terminals feature a 2-wire connection; connections to the terminals are marked as »a« and »b«. Connection of every terminal must always occur via a pair of wires.

#### 8.15.1.1  International

Connection is via RJ sockets:

| **RJ11** | This socket is 4-pole (2 - 5). Connection occurs at the terminals with designation 3 (a-wire) and 4 (b-wire). The connecting line plug is 6-pole. |
|---|---|
| **RJ12** | This socket is 6-pole (1 - 6). Connection occurs at the terminals with designation 3 (a-wire) and 4 (b-wire). The connecting line plug is 6-pole. |
| **RJ45** | This socket is 8-pole (1 - 8). Connection occurs at the terminals with designation 4 (a-wire) and 5 (b-wire). The connecting line plug is 8-pole. |

When selecting sockets, check whether the terminal connecting cable plug is 6- or 8-pole.
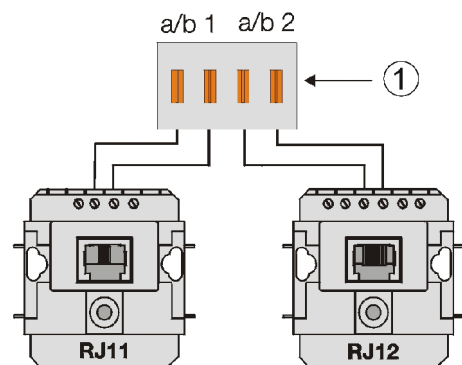


①       Connecting terminal

# Kapitel 9  System technical data

Check packing contents for completeness before beginning assembly.

- 1 System **elmeg hybird 300**
- 1 System **elmeg hybird 600**
- 1 Mountingkit **elmeg hybird 600**
- 2 CAT.5 connection cables
- 1 power supply cable with 3-pin power plug **elmeg hybird 600**
- 1 Documentation DVD
- **elmeg hybird 300**: 3 dowels and screws for each terminal 2-pole and 6-pole
- **elmeg hybird 600**: 1 terminal 6-pole

**ISDN connections:**

| | |
|---|---|
| External ISDN connection: | Protocol DSS1, point-to-multipoint or point-to-point connection |
| Internal ISDN connection: | Protocol DSS1, point-to-multipoint connection |
| ISDN interfaces: | Supply ca. 37.5 V - |
| Channel structure: | B + B + D |
| ISDN line lengths for 0.6 mm wire diameter: | max. 120 Meter (bei Netzwerk-Leitung CAT.5 bis zu 180 Meter) |

**Upn-Anschlüsse:**

| | |
|---|---|
| $U_{pn}$ line lengths for 0.6 mm wire diameter: | 1,000 metres |
| Maximum supply: | 2.5 W |

**Analogue interfaces:**

| | |
|---|---|
| Supply: | Symmetrical, 18 mA on 200 - 600 ohm |
| Max. line lengths to the telephones on connection with installation line: | 1 km |
| Dialling method: | Multifrequency dialling or impulse dialling |
| Character duration: | 40 ms und 100 ms |
| Pause duration: | 80 ms |
| Tone recognition: | -10 dBm ... 0 dBm |
| Flash recognition: | Adjustable, 100 … 1000 ms |
| Call voltage: | $U_{eff}$ > 38 V ~ |
| Call frequency: | 25 / 50 Hz ± 8%, switchable |

**USB interface:**

| | |
|---|---|
| USB-specification: | 1.1 compatible, self-powered terminal |
| Speed class: | Full Speed: Data transfer rate up to 12 Mbit/s |

**elmeg hybird 300:**

| | |
|---|---|
| Mains voltage: | 230 V ~ |
| Nominal output: | 12 W when idle: no module inserted; 50 W under load: 3 x 16 FXS inserted, 50% load (24 FXS switched on) |
| Fuse, primary : | 630 mA |
| Safety class: | II |
| Network-connecting cable: | 2-pole, ca. 2 metres euro flat conforming to DIN VDE 620 |
| System dimensions: | 500 x 370 x 75 mm |

| System weight: | 3.6 kg |
|---|---|
| Temperature range: | 5° - 40° C, max 85% atmospheric humidity |
| System clock: | Hardware clock with buffering over Goldcap: Storage time ca. 3 hours |

**elmeg hybird 600:**

| Mains voltage: | 230 V ~ |
|---|---|
| Nominal output, one mains device: | 12 W when idle: no module inserted; 80 W under load: 6 x 16 FXS inserted, 50% load (48 FXS switched on) |
| Fuse, primary : | 630 mA |
| Safety class: | I |
| Network-connecting cable: | 3-pole, ca. 2 metre low-heat device coupling DIN 49441 / DIN 49457 |
| System dimensions: | 440 x 292x 88 (2HE) mm |
| System weight: | 5.2 kg |
| Temperature range: | 5° - 40° C, max 85% atmospheric humidity |
| System clock: | Hardware clock with buffering over Goldcap: Storage time ca. 3 hours |

# Index