ELSO MEDIOPT care®

Handbook

ELSO

by Schneider Electric

ELSO MEDIOPT care®

The no-worries package for patients and nursing staff.

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ELSO MEDIOPT care® – a good choice

The no-worries package for patients and nursing staff

Modern call and communication systems are essential in hospitals, nursing homes, retirement homes and rehabilitation facilities. ELSO MEDIOPT care® systems are also suitable for single rooms and small facilities, such as medical practices. Every module functions independently.

From simple call lights, through logging and call forwarding to pagers or DECT telephones, to room-specific intercoms, the ELSO MEDIOPT care® can be configured and extended to suit your needs. The components are of course fully compatible in their various levels of expansion.

ELSO MEDIOPT care® satisfies the DIN VDE 0834 standard for light signal call installations.

Large, clearly labelled call and cancel buttons that are easy for patients and nursing staff to operate. Indicators and displays in the nursing or doctor's rooms and in corridors indicate the location and type of the alarm triggered. This ensures short distances and fast personal assistance. MEDIOPT care® makes it easier to provide professional nursing care.

Basic system description

What is MEDIOPT care®?

MEDIOPT care® is an intelligent communications system for medical facilities. The computer controlled call system can be flexibly configured to optimally suit all areas of application. When combined with an appropriately designed UPS (uninterruptible power supply), MEDIOPT care® conforms to the DIN VDE 0834 standard for light-signal call installations and thus satisfies the highest demands for functionality, safety and operating convenience. The system is self-monitoring. All faults or failures are displayed (e.g. on the display of the room/duty room module).

What does the system consist of?

The system is a network of programmable call, pull and cancel buttons, with room indicator lights (3-lamp chambers), display units (corridor display, duty room unit and room display) for indicating events. The components communicate with each other via the room bus, station bus and across stations via the floor bus. The system voltage is provided on a per-station basis via power supplies. Optional logging printers, PCs or a DECT system (ESPA 4.4.4 protocol interface) can be connected at the station transfer points.

Method of operation

All calls triggered by buttons are indicated in colour by the room signal lights and alphanumerically on the display in the duty room, with room number and call type (e.g. bed call from bed 1 to bed 6). Corridor displays (single or double sided) can also be used for displaying calls. When room displays are used, these can show current call events via the call-forwarding system. When the room/duty room module is used in patient rooms, an alternating intercom system can be used to communicate with devices of the same type in other patient rooms, which makes the nursing process easier and optimises the distances travelled by the nursing staff. A DCF radio clock can be used to ensure that the correct time is always available in the system and this can also be displayed on the corridor displays.

Areas of application

MEDIOPT care® is a call system that can be used to call, locate or inform personnel.

Areas of application for this system as per DIN VDE 0834 are:

- Hospitals
- Old people's or pensioner's homes
- Nursing homes
- Forensic clinics
- Penal institutions

The DIN VDE 0834 standard describes a human environment in which a person summons help from staff.

Maximum system size

A maximum of 99 rooms can be supported by a single station and up to 59 stations can be connected together, resulting in a theoretical maximum system size of 5,841 rooms.

Notes on the legal applicability of standards

Standards are not usually binding for planners and installers, as long as the use of these is not prescribed by law. The use of a standard is initially a decision made by those responsible for the system. However, if a standard exists governing the protection of safety, health or life then this must be viewed as a binding, generally acknowledged rule of technology (BGH Az.: I ZR 234/89 as at 06.06.1991). This is used as a basis for examining situations in the event of damage or loss and for assessing questions of fault.

Simply combining the correct technical devices is not sufficient to satisfy the requirements of the standard. If the system is not installed and used in the organisational manner specified by the standard, and this was done intentionally or could have been foreseen, then the requirements of the standard have not been satisfied and the question of liability is raised.

Technical changes, errors and printing mistakes excepted

Minimum requirements as per DIN VDE 0834

The DIN VDE 0834 supports rapid technical progress by not explicitly specifying the technology to be used. However, it defines conditions for technical limits, for temporal and functional processes and for the human-system interface.

Key features of the DIN VDE 0834 standard:

- Every bed must have a call trigger mechanism that can be comfortably reached by patients confined to bed.
- Call buttons are basically always red, have a unique call symbol and must be easily recognisable in the dark.
- The triggering of a call must be visually recognisable in the immediate vicinity of the device used to trigger the call (reassurance light).
- All rooms frequented by the personnel to be reached must have manual or automatic presence switches and acoustic alarms for call forwarding.
- An emergency call for more personnel triggered by a person already providing assistance must automatically occur by activating the existing call buttons. This must be prepared for by marking the presence of personnel in this area.
- A room signal light capable of displaying at least the call (red) and the presence (green) must be installed outside every room. These displays must be clearly visible under ambient lighting conditions of 500 lux. A triggered call must be displayed within 1 s.
- Additional text displays in corridors must be clearly visible from 20 m under ambient light conditions between 5 lux and 500 lux.
- Visual and acoustic signals are uniquely defined so that mobile personnel can operate systems from different manufacturers without requiring instruction. Only constantly illuminated, slow-blinking and fast-blinking lights are permitted in a system. A maximum of three acoustic signals are also defined for call forwarding of calls, emergency calls and alarm calls. One additional acoustic signal is permitted for other purposes but this must be significantly different to the signals used for call forwarding.
- A maximum time span of 5 s is permitted between the triggering of a call and the notification of the personnel responsible.
- Marking the presence of personnel in the call area may also be used for cancelling the call.
- Rooms that cannot be seen from the place where the presence of personnel is indicated, e.g. wet rooms, must have a separate call cancel device.
- Call and operating devices must not be installed in the same enclosure as high voltage systems and these must be clearly recognisable as different systems.
- Call systems with intercoms must only permit remote cancelling of a call when voice communication has actually occurred. Calls where voice communication has not occurred must not be able to be remotely cancelled. However, the acoustic forwarding of such calls may be remotely cancelled when the visual indication remains active.
- The system power supply must not exceed a value of 30 V RMS for AC systems or 60 V for DC systems. This low voltage supply must not be used to supply other systems or devices. Exceptions to this are electronic impulse relay switches for controlling reading lamps and interfaces to call systems to other departments. These must be permanently connected and have their own overvoltage protection. Appropriate measures against impermissible voltage spikes must be taken on-site.
- All call systems must have an emergency power supply that comes into operation no later than 15 s after a power failure and which can keep the system running for at least one hour. Pending calls must be maintained active in the system for at least 30 s after a power failure.
- Transmission paths for other systems may not be used for the call system.
- Conversely, transmission paths of the call system may be used by foreign systems if all input and output signals use interfaces provided by, or approved by, the original manufacturer and only if faults in the foreign system cannot affect the call system.
- All protective grounds connected to the call system must be connected to the same main potential equalisation point. If this is not possible then the individual areas must be galvanically isolated from each other.
- Cables connecting buildings must be equipped with overvoltage protection at the exit points or be galvanically isolated from each other.

General

Term	Description	Planning notes
Area of application	The area of application is the correct area of use for a call system. The decisive factor here is how the system behaves when a fault occurs.	The call system must be planned as an independent system and VDE 0834 must be used as a binding basis for this. The area of application must be defined in collaboration with the operator. Additional hospital construction regulations for specific German Federal States may also need to be taken into account.
Area of application A	The call system is used to call for help and faults in the system represent a danger for the calling person(s).	The call system must recognise and indicate the presence of faults and must constantly monitor itself.
Area of application B	The call system is also used for triggering special emergency calls, e.g. for a reanimation team, or medical technical devices are connected to the system. Malfunctions represent a special danger for the person making the call. Call systems in penal institution always belong to area of application B.	The transmission paths, call cables and the system components essential for triggering calls must all be included in the monitoring system. A continuous supply of power for the system must be ensured through appropriate measured and calls must be stored for short periods of time in the case of in interruption to the power supply (e.g. mains power failure).
Systems without intercom features	Calls are visually and acoustically indicated and can only be cancelled from the calling location.	The planning process must define the types of call that are to be acquired and forwarded.
Systems with intercom features	Calls are visually and acoustically indicated, particular calls may only be remotely cancelled after speaking with the caller.	The call system rooms with an intercom and those without an intercom must also be defined in the planning process.
Station interconnection	Temporary extension of the call forwarding operation over multiple stations during low-load periods or in emergency situations.	The scope and location of the station interconnection must be defined and visual indicators must be planned for.
Station/Group	The smallest enclosed organisational and care area with the same range of responsibilities, whose messages can be combines and which can be reflected in the technical implementation of the system, e.g. supply area of a power supply, closed cabling system.	This area is defined by the structure of the building. It must be planned so that it can operate autonomously and can be integrated into the organisational areas.
Duty room	The place where the nursing staff are usually to be found when on duty.	The duty room usually contains a central display unit.
Patient room	A room in which one or more patients are cared for.	Devices for calling, cancelling and indicating the presence of persons (call forwarding) must be planned.

Technical changes, errors and printing mistakes excepted

Functions

Functions	Description	Planning notes
Call	Call by a person requiring help, with the aim of being visited by or speaking to the nursing staff.	Every bed must be assigned a device for triggering calls that is easily and safely reachable by the patients. The call button must be clearly marked (red symbol) and must be illuminated in the dark. The same idea applies to all rooms where patients can be found. The triggering of a call must be visually indicated by a reassurance light in the call button. Call buttons in wet rooms must be specially designed for this.
Presence	Marking of the presence of nursing personnel when they enter a room connected to the call system via a presence button.	In all rooms frequented by personnel that may be called, the presence of personnel must be marked by activation of the presence button. The presence button must be clearly marked (green symbol). The switching state of the device must be visually indicated in the device. The button should be mounted in the vicinity of the door.
Emergency call	Call made by a member of the nursing staff who then calls other nursing staff.	The emergency call trigger is prepared by switching the presence button. A call from this room then becomes an emergency call.
Queryable calls	Call from a device with intercom features at a bed or in a room.	Remote cancelling of calls in systems with intercom features is permitted after querying at the query location.
Non-queryable calls	Call from a device without intercom features. The calling location must be visited.	Calls without intercom features may not be remotely cancelled, call cancelling is only permitted when the answering of the call is monitored by the system.
Bed call	Call by patients via the call device at their bed, which can be selectively identified.	Malfunctions that can affect the triggering, transfer and indication of calls, e.g. removal of a plug, must be recognised and indicated.
WC call	Call from a wet room or toilet.	The area of protection must be taken into account.
Monitor call	An emergency call triggered by a monitoring device.	The number of required sockets per bed must be defined in collaboration with the operator.
Call forwarding	The forwarding of a call to the location where the nursing staff have indicated their presence. The call must be indicated at least acoustically. The call location and type can also be indicated. Queryable calls may be cancelled after speaking with the caller.	Call forwarding must always be provided.
Call cancelling	Ending of the call state by setting the presence marking via a cancel button, or via remote cancelling if this is permissible.	The individual mounting locations of the devices with the presence button and the cancel button (WC) must be defined.
Call query	Reaction to a call by establishing an intercom connection to the caller.	
Room-wise Intercom	The patient room has a central intercom for announcements and call queries.	The appropriate devices are to be selected in collaboration with the operator during the planning process.

Devices

Device	Description	Planning notes
Room module	Operating and communication unit in patient rooms and duty rooms	Room modules are usually used in all sick-rooms. They can contain indicator elements (lights), operating elements and displays. This are the central focus of installation, with connections for beds, upstream wet rooms and (if not already integrated) optical indicator elements (room signal lights).
Call button	Device for triggering a call with a reassurance light for checking that the call has been triggered. Structures: Call button, pull switch, pneumatic switch.	The call button must be labelled and illuminated in the dark.
Presence button	A device for marking the presence of personnel, preparing emergency calls, forwarding calls and cancelling calls in the rooms where they were triggered. Call positions in WCs or other ancillary rooms that cannot be seen from the location of the presence switch must be equipped with their own cancel button.	The cancel button can be planned as a separate device or as a control element in the room module.
Cancel button	Device for cancelling calls.	The cancel button, e.g. in WCs, only cancels the call. It provides no other functionality.
Pear switch	Simple version of a patient-operated device connected to a cord, with a simple call trigger and illuminated buttons.	The appropriate plug connection must be taken into account in the planning.
System socket	System socket at the patient‘s bed for connecting movable call devices.	The system socket can be mounted in a wall or in medical supply units (bed rails).
Room signal light	A lamp essential for every room with a call indicator (red) and presence indicator (green) (and optional white WC light), in the immediate vicinity of the associated room (entry door).	At every room having call devices, a room signal light with red (call) and green (presence) indicators must be installed in the corridor above/next to the entry door to the room. Additional (white) indicators for WC calls are also permitted.
Group signal light	A light assigned to a group of locations for collectively indicating calls from this group.	Indication of calls occurs under consideration of the call priorities in the same manner as with the room signal lights. Numeric or alphanumeric displays can be used instead of the group, nursing group and direction lights.
Duty room module	A device in the personnel duty room for displaying the call locations and for distinguishing between the different call types of a station.	A duty room module must be installed in the duty room of every station.

Technical changes, errors and printing mistakes excepted

Device	Description	Planning notes
Power supply	A device for ensuring the reliable, fail-safe supply of power to all call system devices.	Call system power supplies fed by the low voltage network must have their own circuits with own protection measures. An emergency power supply is required. This provides power to the call system no later than 15 s after a general power cut. Foreign system devices may not be connected to this power circuit.
Emergency power supply	A system for maintaining the internal low voltage network or for buffering the power supplies.	If a mains replacement system is not present then comparable measures must be taken (batteries).
Malfunction and dropout monitor	A system for acquiring cable faults and device dropouts that can represent a danger for callers. It must be ensured that faults in the call cables and device dropouts are immediate recognisable by the nursing personnel or other qualified persons so that appropriate corrective measures can be initiated.	Automatic forwarding of malfunctions and dropouts directly to the technical department is a good idea and should be included in the monitoring system.
Station bus	Cable connections within a station that unify all the connections required to operate a call system and (for example) connect all the room modules of a station.	The structure of the cable network is partially manufacturer-specific. The configuration of the call system must also be taken into account when conceiving the network.
Floor bus	Cables connecting multiple stations together.	The DIN VDE 0834 standard applies to the cabling network. The specified measures must be taken to avoid confusing these cables with the low voltage supply network and to avoid interference.
Room bus	Cable connections within a room that connect all devices in the room required for operating the system.	
PC communications interfaces	Manufacturer-specific interfaces between the call systems, PSA, DECT or telecommunications systems or logging computer	For satisfying organisational requirements, messages triggered in the call system (calls, emergency calls, alarm calls, diagnostic calls, malfunctions) can also be forwarded to an external communications system in accordance with the requirements of the DIN VDE 0834 standard. Based on experience, this requires timely clarification of the areas of responsibility and collaborative agreement on the type and scope of forwarding. Logging of events for external reports.

Mounting locations and installation heights

According to DIN VDE 0834 the call system devices must be installed at the following heights above the floor:

Operating devices (with or without indicator lights)
0.7 m to 1.5 m (e.g. call or cancel buttons)
For pull switches in wet rooms the special requirements of "barrier-free living" must be taken into account. For example, pull cords must be reachable by persons lying on the floor.

Operating devices with text displays
1.5 m to 1.8 m (e.g. terminals with a display)
The mounting location should be chosen so that the device is not subjected to direct sunlight.

Devices in installation units
1.6 m to 1.8 m (e.g. medical supply units)

Signal lights and large text displays
1.5 m to 2.2 m

Control units, power supply devices
Central control devices, power supply devices and other components without operating or signal functions may only be housed in dry rooms (maximum humidity of 75 % at approx. 18 °C), but not in patient rooms. They must be easily accessible at all times (accessway at least 60 cm wide). The heat dissipation must not be impeded. When installed in a switching cabinet, or similar enclosure, the dissipated heat may require forced ventilation.

Due the voltage drops across long cables, the power supply must be located as close as possible to the largest power consumer.

Other
Presence buttons and call devices must be mounted in positions that are easy to access and where they cannot be confused with other system devices.

Call system devices (presence buttons or call buttons) and the low voltage network (e.g. switches, sockets) must not be mounted under the same cover plate and must be distinctly different to avoid any possible confusion.

In WCs and wet rooms the special requirements of the DIN VDE 0100 standard must be observed. Only appropriate devices may be installed in these rooms. The special manufacturer's notes relating to special devices for installation in WCs and wet room areas must be observed. Pull switches or other devices in shower cubicles must be mounted at least 20 cm above the highest possible shower head position and the pull cord must hang no higher than 20 cm above the floor so that a person lying on the floor can reach the pull cord.

Room signal lights are a compulsory requirement, must be clearly associated with each room (as close as possible to the entry door) and must be clearly visible from a distance. All optical signal devices must be installed so that they are not impaired by external light sources. The users have a free choice of mounting room signal lights in design-oriented modules (e.g. door or name plates) as long as the specified parameters are satisfied.

Room signal lights represent the last level of safety and contribute to the recognition of emergencies even when technical or human failure or organisational mistakes cause calls to be lost. Organisational mistakes occur ever more frequently in old people's homes where the entire organisational structure is based soles on DECT systems without any additional safety mechanisms. Failure to install room signal lights represents gross negligence and incurs liability for unlimited damages.

Cables
Call system cables may not be laid together with high voltage cables in common cables, ducts or installation channels.

Call system cables and high voltage cables must have a minimum clearance of 30 cm. For short distances under 10 m, a clearance of 10 cm is regarded as acceptable. This must be documented and verified, with appropriate testing evidence (e.g. from a professional electrical engineer), in the audit documents provided by the installation company.

If these requirements cannot be met due to construction reasons then, for nominal voltages less than 250 V RMS, the conductor groups can be separated by a conductive shield. This must be integrated into the protection mechanisms of the high voltage system and must have a cross section typical for a protective earthing conductor.

Alternatively, separate cables can be laid in pipes or installation ducts with double or reinforced insulation as per DIN EN 60950. The insulation must withstand a test voltage for 4,000 V RMS for at least one minute. The complex leakage current must not exceed 0.5 mA.

Call system cables leaving the building must be equipped with overvoltage protection as per DIN VDE 0845 at the exit points . This is not required if a galvanic isolation point prevents dangerous voltages from entering the system.

With regard to electromagnetic compatibility (EMC), cable paths should generally avoid any possible sources of interference. This especially applies to transmission antennas (e.g. personnel search systems) and therapy devices. Despite conformance with all EMC standards and regulations, in certain cases mutual interference can occur without a clear indication of the party at fault.

The shield or open shield wire must be insulated up to the connection point, otherwise a risk of short circuits can exist.

All shielded cables for speech transfer should have the shields stripped as short as possible to maintain the best possible shielding.

Special attention must be paid to the installation of the power supply cables. Attention must be paid to the shortest possible cable paths, adequate cable cross-section and suitable safety measures when reducing the cable cross-section to prevent damage in the case of short-circuits.

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Any possible confusion with the cable for the high voltage system must be ruled out through an appropriate choice of cable colour and laying method.

Commissioning

Before commissioning the call system an acceptance test must be performed by qualified call system professionals in accordance with the DIN VDE 0834 guidelines. Partial sections of the call system may be subjected to acceptance tests as construction progresses. A qualified professional is a person possessing the necessary training and qualifications in order to install, test and certify a call system in accordance with the applicable standards.

Connection of foreign systems

The call system is an autonomous closed system and may not be connected using the transmission paths of other systems. Conversely, foreign system signals may be transferred using the call system transmission paths. Input and output coupling of these foreign signals may only occur via the system interfaces of the call system. These can be simple, potential-free contacts or complex data interfaces. These interfaces must be supplied or approved by the manufacturer of the call system. Malfunctions in the foreign system must never affect the operation of the call system.

Responsibilities of the operator of a call system

Operators of a call system in hospitals, nursing homes, nursing stations and similar institutions or penal institutions must themselves be a "trained person" as defined in DIN VDE 0834 or assign a trained person to operate the system.

The operator or person assigned is responsible for ensuring that the personnel, especially the nursing personnel, have sufficient knowledge of the tasks, functions and operation of the call system. Appropriate training must be regularly performed and repeated.

The operator or person assigned must also ensure that any signs of impairment in the constant operational readiness or irregularities in the function of the system are reported by the personnel and that inspections are performed.

The connection of foreign system devices (e.g. electrical medical devices) may only be performed by personnel especially trained for this. Pluggable devices for triggering calls, e.g. hand-held patient devices, must be checked for correct call triggering operation every time they are plugged in.

Malfunction and dropout messages

Functional irregularities, dropouts and malfunctions of individual call system components must be immediately reported to the system operator (or assigned person) by the personnel (especially the nursing staff), so that immediate repair and change measures can be initiated. All malfunctions must be continuously recorded by the operator or assigned person in an operating log that is always available at the system.

Operating log (see "Samples" appendix)

An operating book must be maintained and always available at the system, listing all malfunctions with information on the cause, the person reporting the fault and all necessary and performed repair and change measures taken.

Sample pages of an operating log are provided in the appendix to this document. The operating log allows the operator and assigned person to prove that they have satisfied their duty of care in operating the call system. Beyond this, it is also an important precondition for correct maintenance and fast, rational repair in the case of system malfunctions.

Responsibility for maintenance as per the recommendations of the ZVEI

The responsibility for maintenance lies with the operator of a call system. According to DIN VDE 0834, operators must ensure the correct, timely and professional maintenance of their call system. This responsibility can be transferred to a professional company. Attention should be paid to the necessary spare-parts logistics provided by and accessibility to an external company.

System inspection

Inspection of the system first requires an examination of the system operating log to find any existing faults. This is followed by a functional check of the installed devices and then a visual examination for mechanical damage.

Inspections should be performed at least quarterly after approximately the same time periods.

The following must be check for correct operation:

- call buttons and movable devices for triggering calls that are intended for use by patients or prisoners
- Signal lamps and acoustic alarms
- Power supplies, conformance to characteristic values

At least once a year the following devices must also be checked for correct operation:

- All other devices used for triggering calls, cancelling calls and presence registration
- All other indicator devices
- All devices for querying calls, including any intercom paths, loudness and speech comprehensibility

The inspection should also check for undocumented changes to the system.

Inspections performed and the results of these must also be documented in the system operating log by the technical professionals performing this work. This forms the basis of any repair work that may be required.

System maintenance

The system must be maintained according to the manufacturer's instructions but always at least once a year. This usually includes:

- Care and cleaning of system components, cleaning of ventilation slots
- Replacement of components with limited lifetimes (e.g. batteries)
- Reconfiguration and synchronisation of components and devices

Deviations from nominal values must be corrected. The maintained system components must then be tested and any remaining faults must be corrected. With software controlled systems, it is a good idea to update the software as part of the maintenance.

The maintenance performed and the results of this are to be individually recorded in the system operating log by the technical professionals performing the work.

Repairing the system

Repairing the system includes repair or exchange of the faulty system components followed by a function check of the repaired components including their interaction with the call system as a whole.

Patient room

General notes

Every room must have a room module. The room module represents the interface between the station bus and the room bus. The room module is the central unit of each room. Room modules are available in different versions:

- Room/Duty room module with call/cancel button and display (for use in duty rooms or rooms with intercom features) No. 735000
- Room module with call/cancel button and display (for use in patient rooms) No. 735020
- Room module with call/cancel button (for use in patient rooms) Art. 735030
- Room module with room signal light (for use in patient rooms) Art. 735040

The use of the respective room defines the types of call available to patients in the room. If this is a room containing patients confined to bed, or with limited mobility, then every bed in the room will have a corresponding patient button in the form of a pear switch (see figure 1).

For this reason, a system socket or call button with system socket for this type of pear switch is installed near to each bed. The basic version of the pear switch has a 2 m (optionally 5 m) connection cord. All call/pear switches have an integrated reassurance lamp for visual confirmation of calls.

Up to 6 bed calls, each with a maximum of 3 call positions, with individual identification, 6 room calls and a maximum of 6 WC call buttons can be implemented. In parallel to this, it is also possible to install a maximum of 8 monitor call buttons for medical monitoring units / foreign components in the room.

A call/cancel button with integrated acoustic alarm forwarding is located at the entrance to every room. When a call is triggered and the nurse enters the room, this button cancels the calls and also marks the presence of a nurse in the room. The green reminder light in the button also lights up.

The call/cancel button can be provided as a room module with call/cancel button or as a simple call/cancel button when a room module (e.g. room module with room signal light No. 735040) is already installed.

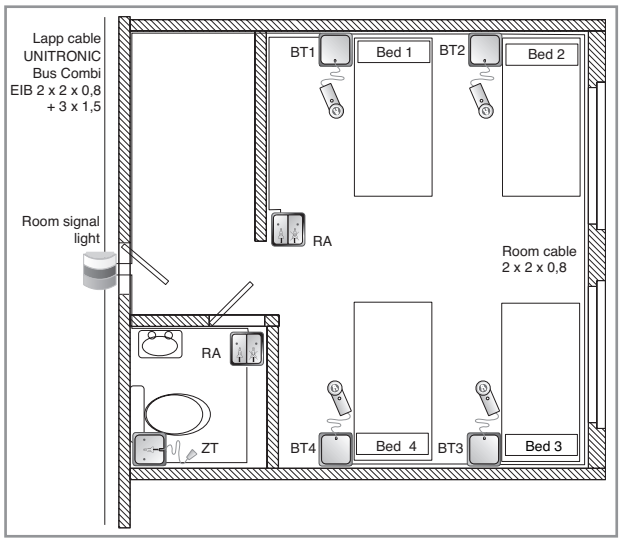


Figure 1, Patient room example

Room sanitary facilities (bathroom, toilet)

In most cases a room is assigned appropriate sanitary facilities. In this case, these facilities must also allow a call to be triggered. This can be achieved with an easily accessible call button or a pull switch.

According to the DIN 0834 standard, calls triggered from non-visible rooms can only be cancelled from the same room. This means that a call button and a cancel button (presence marking is not required) must be present in a toilet that can only be accessed via the room.

All buttons in the sanitary facilities are connected to the four-core room cabling.

Bathrooms or toilets located at a station without an associated patient room are to be handled as normal rooms. A cable of type JY (ST) Y 2x2x0.8 is the typical choice for room cabling.

General cabling

Every nursing station (e.g. floor) consists of a certain number of rooms or residential units. When planning a hospital or nursing home, the entire building is usually divided into these types of nursing station. A maximum of 99 rooms or residential units can be connected to each station. This type of station is usually cabled via the corridor. Foe example, sockets containing the station bus (incoming/outgoing) and the room bus can be located above the room door. In this case, the room module with room signal lights can be install over this socket and all corresponding cables can be connected to this module. In hospitals or nursing homes, lights showing the respective status each room are to be installed outside each room. 2-colour (preferably 3-colour) room signal lights, whose visual indicators conform to the DIN VDE 0834 standard, are available for this.

The room signal lights are usually installed above the room door to ensure clear assignment to each room and avoid any possible confusion.

When using room signal lights with door name plates, these can also be installed next to the room door. The following basic rule always applies: The room signal light is clearly and uniquely assigned to a particular room and is installed according to the local building conditions so that the associated room is always recognisable.

A duty room module is installed in the station room that shows the on-duty nursing staff what type of call has been triggered from which room.

The power supply and the station transfer point are installed in the subdivision belonging to the station. To ensure a well-structured cable layout, a ring cable covering all room modules and corridor displays must be installed from the distribution box.

This ring cable (data and voltage) must be a closed circuit to provide doubled data reliability in the case of cable breakage etc.

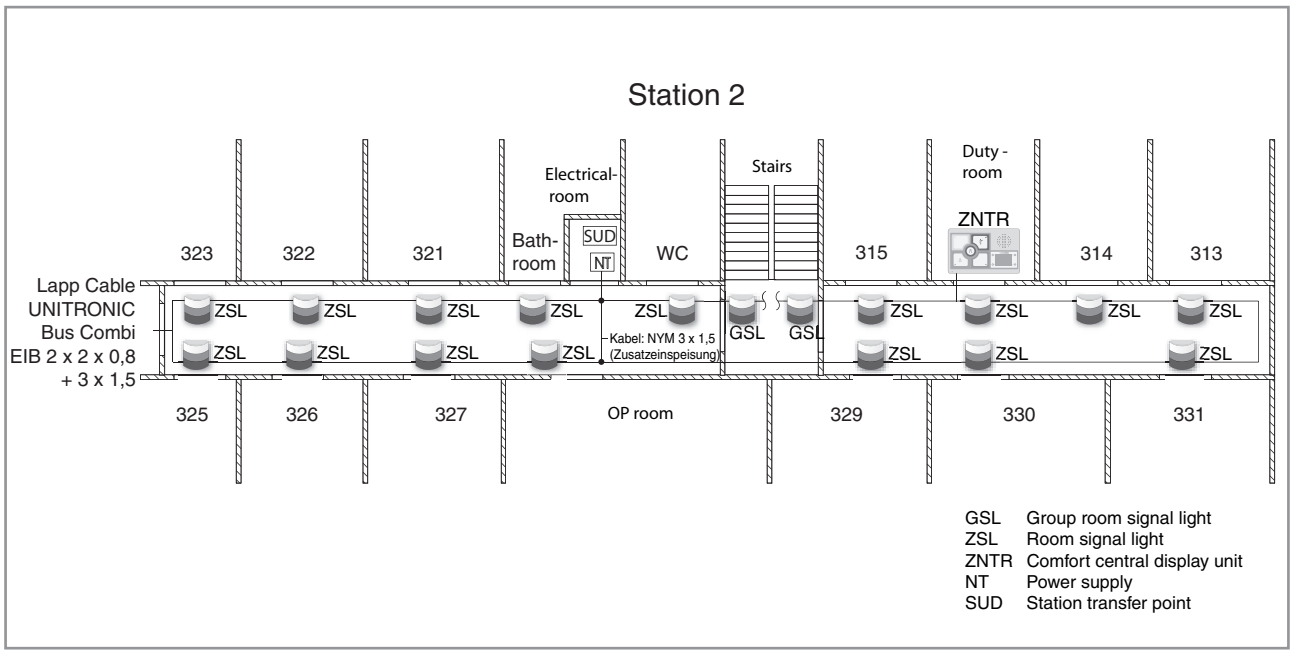


Figure 2, Station planning example

Station bus

All the room modules for the station must be connected to the station bus. Stub cables are to be avoided. The station bus should be laid as a ring cable. ELSO GmbH recommends closing the ring. This results in double data reliability. Please make absolutely sure that the conductors („a“, „b“, „+24VDC“ and „GND“) are not swapped. For the station bus, a cable (subsequently referred to as SYK=system cable) of type: Lapp Kabel UNITRONIC Bus Combi EIB 2x2x0.8 + 3x1.5, or equivalent quality, must be used. The shield must be connected to each of the GND terminals. To avoid short circuits at the device, the shield must be insulated. The data cables must not exceed a length of **500 m**.

For applications using a system cable (SYK) a distribution box (see figure 3) is required. This is provided in the scope of delivery (No. 735020, No. 735030, No. 735040) (-> Terminal with connection cable and fuse -> fine-wire fuse 250 V/0.25 A slow-blow).

The power supply cables of the SYK are connected to the +24 V and GND distribution box terminals. The red output cable of the distributor is connected to X2/Pin2 (+24 V) and the blue cable to X2/Pin1 (GND).

The supplied 2x2x0.8 cables are to be used for connecting to the station bus.

It is essential to ensure that a supply voltage of at least 22 VDC is present at all room modules. To ensure this, a cable of appropriate diameter must be laid. The number of terminal points that cause voltage loss must be kept to a minimum.

Recommendation

For up to 16 rooms using a closed ring, no additional power supply is usually necessary (see figure 4).

With more than 16 rooms, additional power supplies must be installed. An extra power supply is required for every additional 10 rooms (see figure 5).

Note! A termination resistor is required for the station bus if station transfer points are not used.

When using a call system in small environments (e.g. a single station) without a PC or Pager/DECT telephone a station transfer point is not absolutely necessary. However, in this case a termination resistor must be installed. This can be mounted, for example, in the duty room module. The resistor must have a value of 680 Ω and must be connected between:

Station bus „a“ to +24 VDC and station bus „b“ to GND.

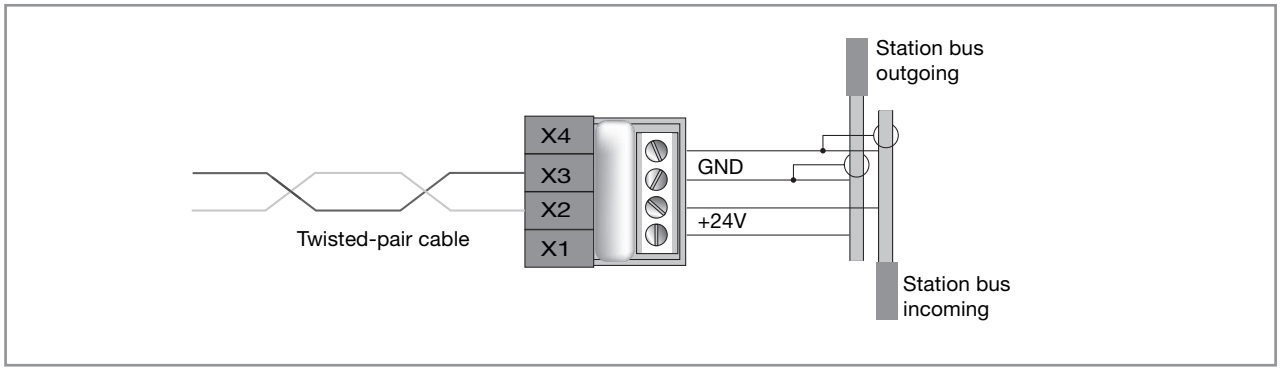


Figure 3, Station bus cabling, distribution box connection

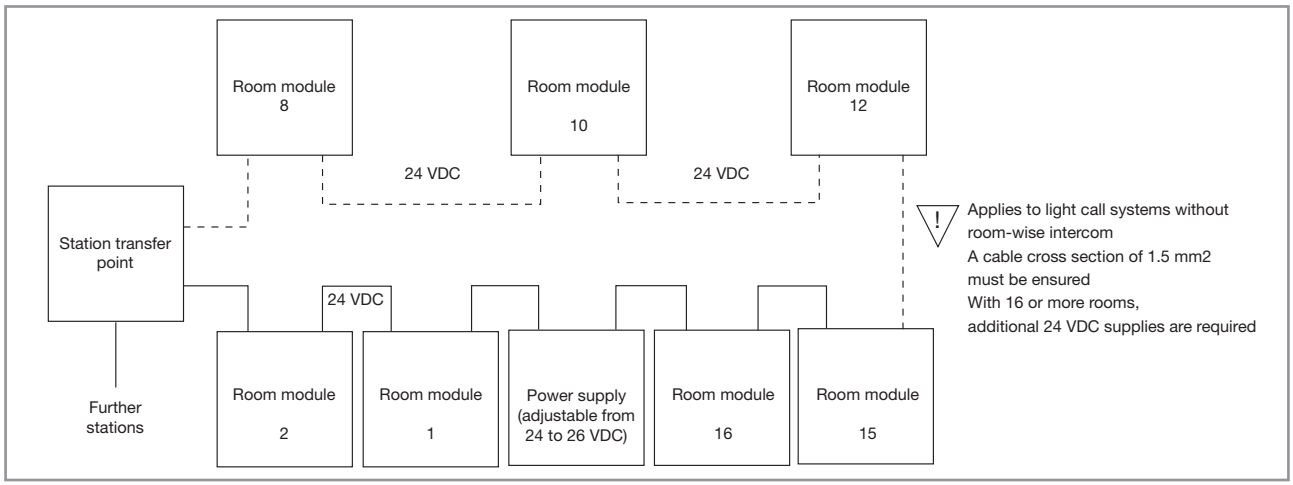


Figure 4, Power supply for a station

Technical changes, errors and printing mistakes excepted

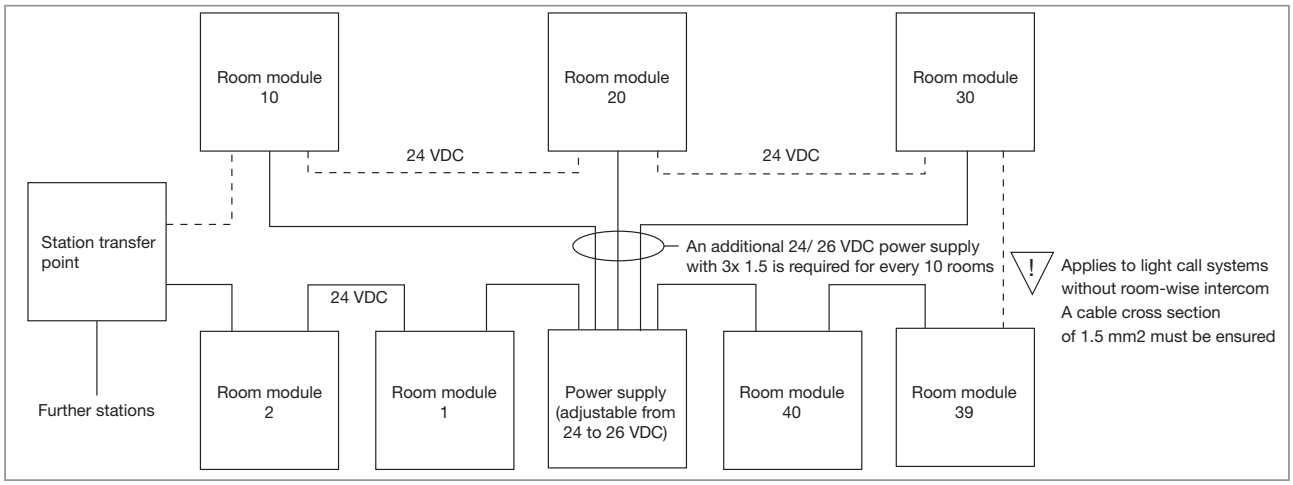


Figure 5, Station power supply using additional power supplies

Room bus

All light call system devices in a room are connected to the room bus. The room bus has 4 conductors.

„d“ = data
„t“ = clock
„+24“ = +24 VDC
„GND“ = Ground

These 4 conductors are to be connected to the terminals of the same designation on the room module (different versions possible) in exactly the manner shown here.

Connection can take place via a room bus in a star formation or a mixed formation.
The total cable length (sum of all cables) must not exceed **100 m**. A decisive factor is ensuring the provision of the required power supply.

A cable of type: JY (St) Y 2x2x0.8 must be used for the room bus.

The shield must be connected to the GND terminal of the respective room module. To avoid short circuits at the device, the shield must be insulated.

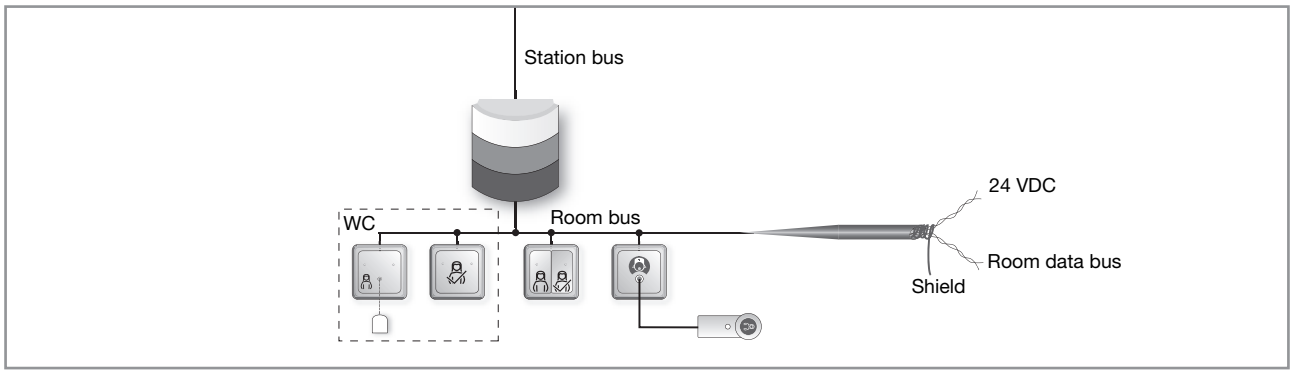


Figure 6, Room bus

Power supplies

The power supplies can be placed in any desired location. The power consumption of the system must be considered when choosing the power supplies. When several power supplies are used on each floor, these must all be connected together via „GND“. This is important in order to ensure a common reference voltage at the station an in the entire environment.

This means that all cross-station power supplies must be connected to each other via their GND terminals.

Note! Parallel connection of power supplies is not permitted. Only the connection of the GND terminals.

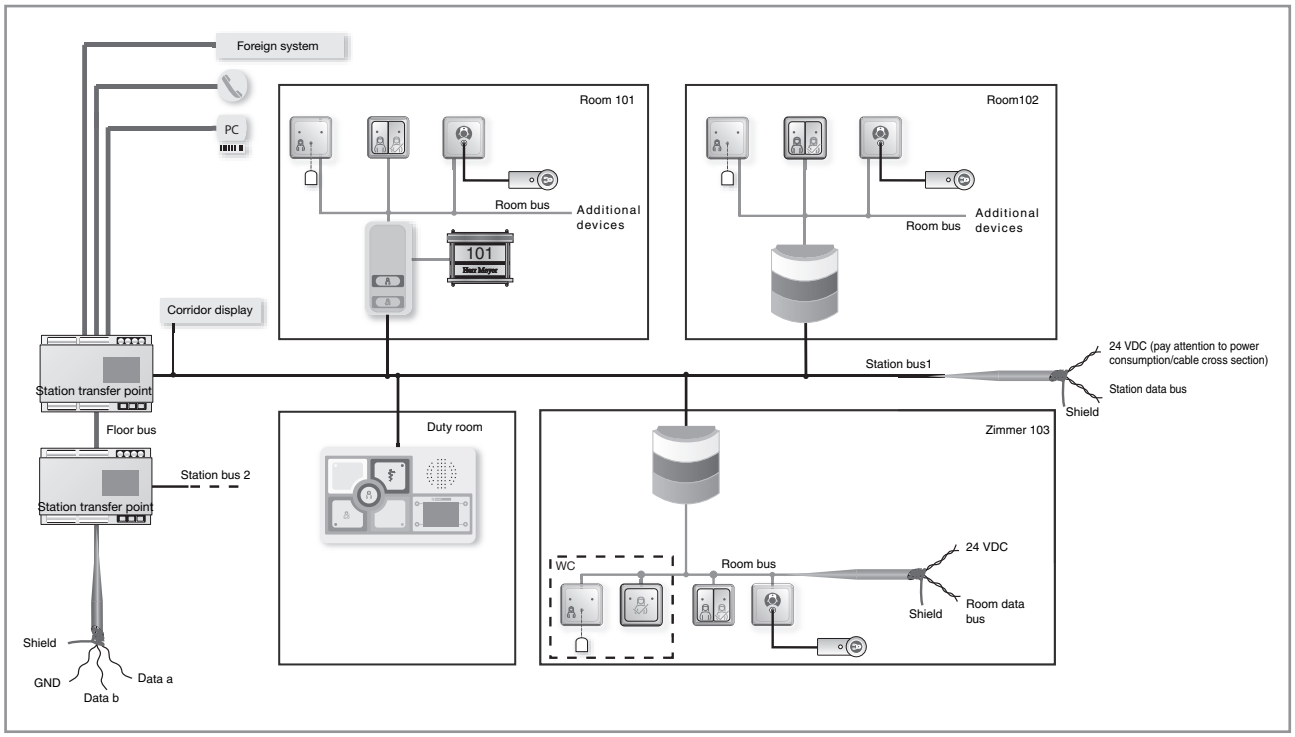


Figure 7, Cabling without intercom features

Room intercom

Room intercoms are implemented using the room/duty room module No. 735000 as the central speaking/listening unit in each room.

As can be seen in figure 8, additional conductors are required in the station bus and also in floor bus 4 in order to implement this. The data cables must not exceed a length of **500 m**. When using a room-wise intercom, an **additional** cable (4-core) must be used for connecting the speech channels. A separate cable of type: JY (ST) Y 2x2x0.8 must be used in order to reduce back-coupling effects.

After a call is triggered, this makes it possible to select the appropriate room and speak to the person triggering call. With this layout according to DIN VDE 0834 it is then permissible to cancel the triggered call without the nursing staff actually visiting the person calling. Call requests can be used instead of cancelling the call. This ensures that the nursing staff have first contact but must still visit the patient's room in order to finally cancel the call.

Call request

As a result of a call query, or for other reasons, it may be necessary for a nurse to visit a room. To do this, after the query (room based) or conversation with the patient (room-wise intercom) the call is ended at the room/duty room module with display not via the off button but rather via the nurse request button. As a result of this, the green presence light in the room signal light associated with the room and in the group signal lights (if present), as well as the green reminder LED in the call/cancel button of the corresponding room, blink until the call is answered.

The display on corridor displays is separately described in the section on corridor displays. The call request is cancelled by setting the respective presence in the room.

Note! Call requests can only be set via the room/duty room module with display.

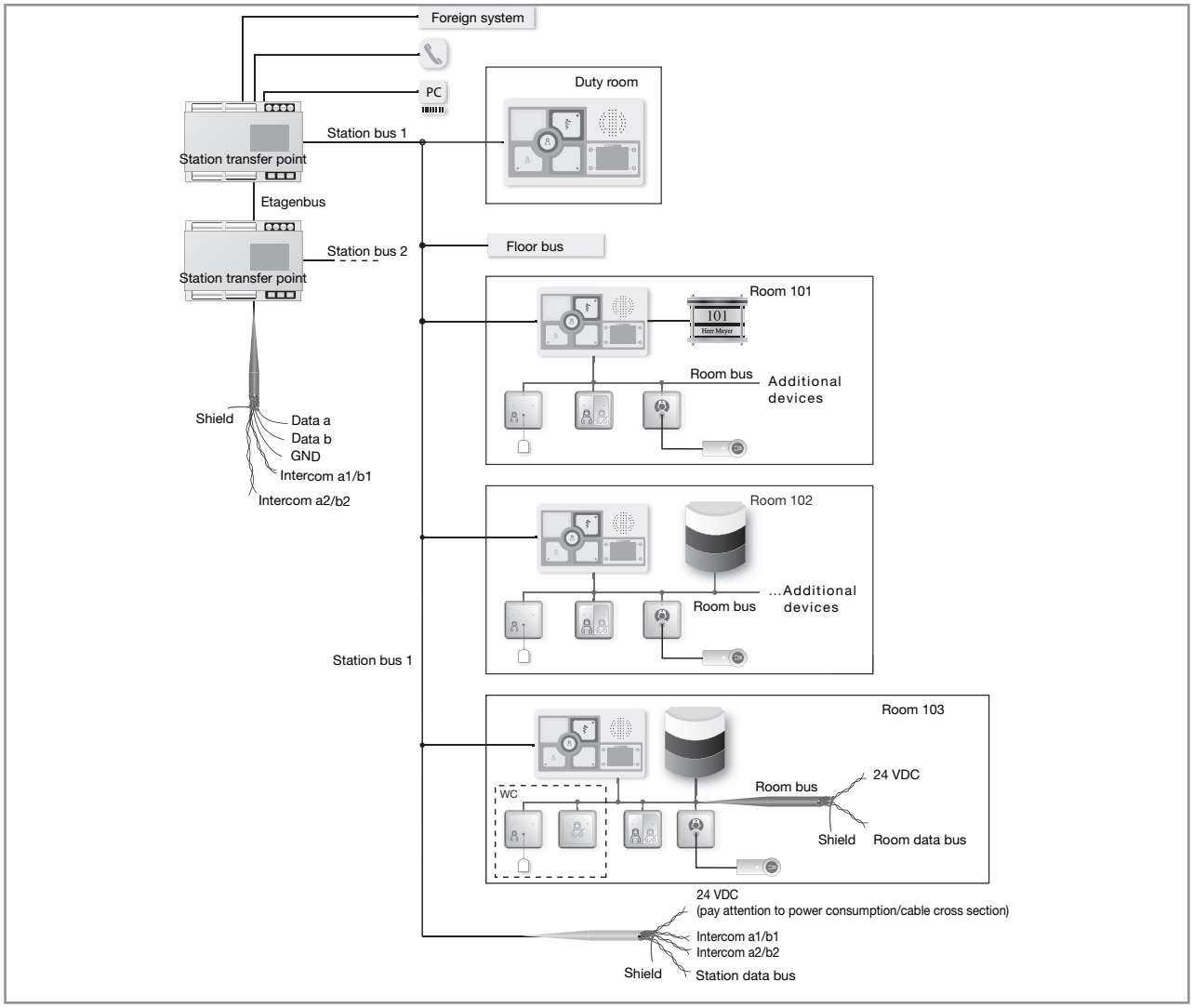


Figure 8, Cabling with intercom features

System monitoring

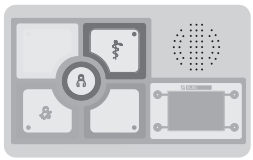
The room modules automatically recognise all devices connected to the room bus and constantly monitor these. If a device does not answer, then this is registered as a malfunction (S) with a room number on the duty room module display (No. 735000) when duty room presence is set.
Example: S24 (Malfunction in room 24)

The room modules are monitored by the station transfer point. If a room module does not answer then this is indicated as a dropout (A) on the duty room module display (No. 735000) when duty room presence is set.
Example: A24 (Dropout in room 24)

Note! After completing all room installations and programming all components in the room, a soft reset (see component description) must be performed at the room module (regardless of the module version). All components are then „learned“ at this point. Any subsequent changes that may occur (address changes, new components etc.) are then recognised as malfunctions.

Room/Duty room module with call/cancel button and display

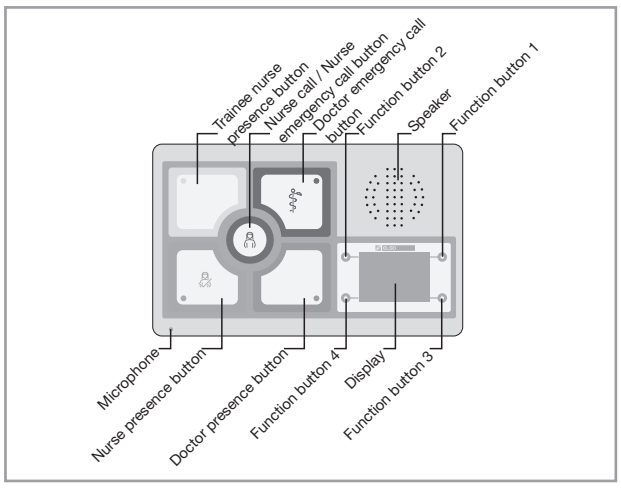
No. 735000



General notes

The room/duty room module represents the interface between the station bus and the room bus with all connected devices. All events in the room are acquired by the room module and sent to the station bus so that this information is available to the entire station. The room number and all other important room information is set at the room module, which then provides this information on the station bus via the room/duty room module. Room modules with the same address must never be connected to the station bus. Special care must therefore be taken when setting the room module addresses.

Warning, lethal danger!
The safety regulations of the DIN VDE 0105 standard must be followed. Only qualified electrical personnel may work on the devices. Always follow the state-specific regulations and guidelines. Failure to observe this can result in a danger of fire, electric shock or destruction of the device. In the case of 230 V cables in the vicinity, the applicable standards and guidelines relating to cable clearances must be noted and observed.



Call indication on the display

When the presence marker is set then the most important respective call is shown on the display. It makes no difference whether this call comes from the own station or, in duty mode (interconnection of several stations), from a different station. For calls having the same priority, the „oldest“ call in each case is displayed.

Instead of the rolling display of all calls, when multiple calls occur at the same time the display shows „More calls!“ (alternately with the call location of the most important call).

When using the „Duty room module“ a rolling call display can be selected in the parameter menu as an alternative to displaying only the most important call.

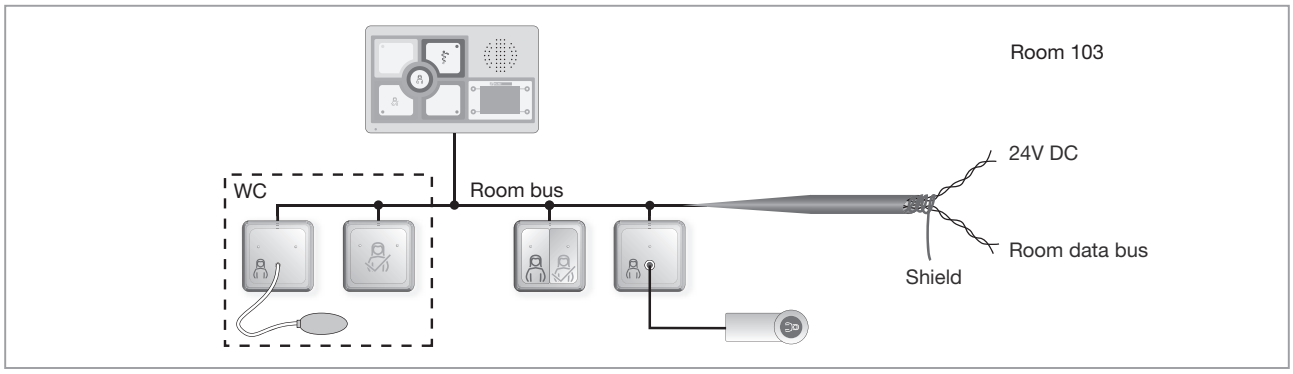
Note! Even when all existing calls are displayed in a rolling manner at the station, simultaneous calls from other stations only display the most important/oldest call in the call list.

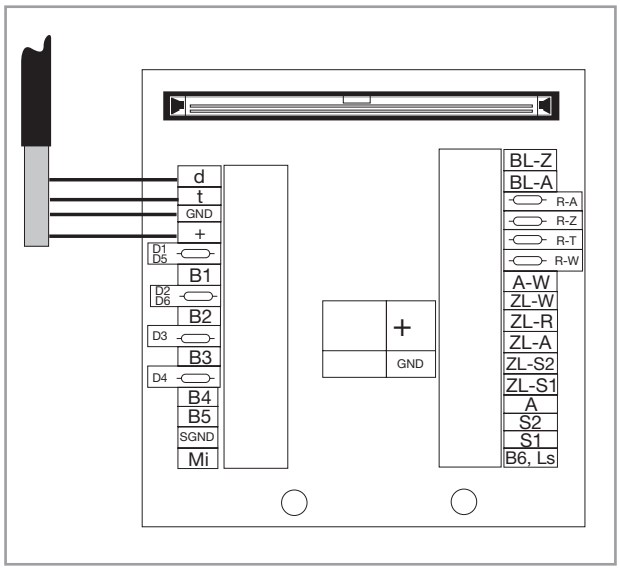
Room bus connection

All components in the room are to be connected to the room bus. It is essential to ensure that the conductors („t“, „d“, „+24VDC“ and „GND“) are not swapped.

The room bus can be connected in a star formation or a mixed formation. The cable length (sum of all cables) must not exceed **100 m**.

A cable of type: JY (St) Y 2x2x0.8 must be used for the room bus. The shield must be connected to each of the GND terminals. To avoid short circuits at the device, the shield must be insulated.

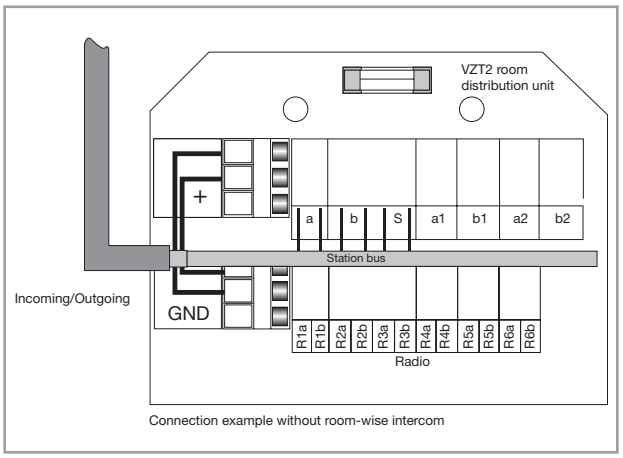




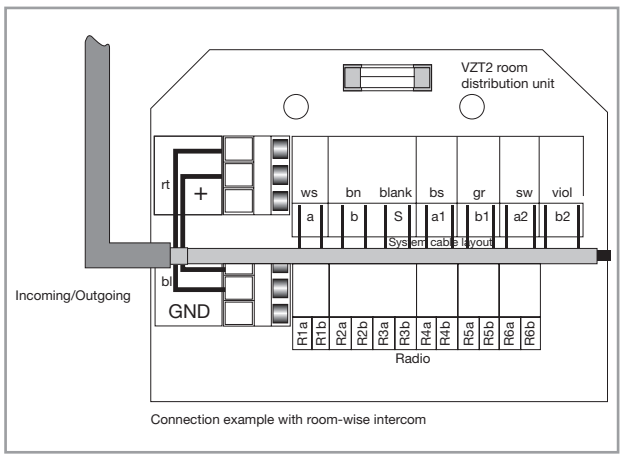
Station bus connection

All the room modules for the station must be connected to the station bus. Stub cables are to be avoided. The station bus should be laid as a ring cable. ELSO GmbH recommends closing the ring. This results in double data reliability. Please make absolutely sure that the conductors („a“, „b“, „+24VDC“ and „GND“) are not swapped. For the station bus, a cable (subsequently referred to as SYK=system cable) of type: Lapp Kabel UNITRONIC Bus Combi EIB 2x2x0.8 + 3x1.5, or equivalent quality, must be used. The shield must be connected to each of the GND terminals. To avoid short circuits at the device, the shield must be insulated.

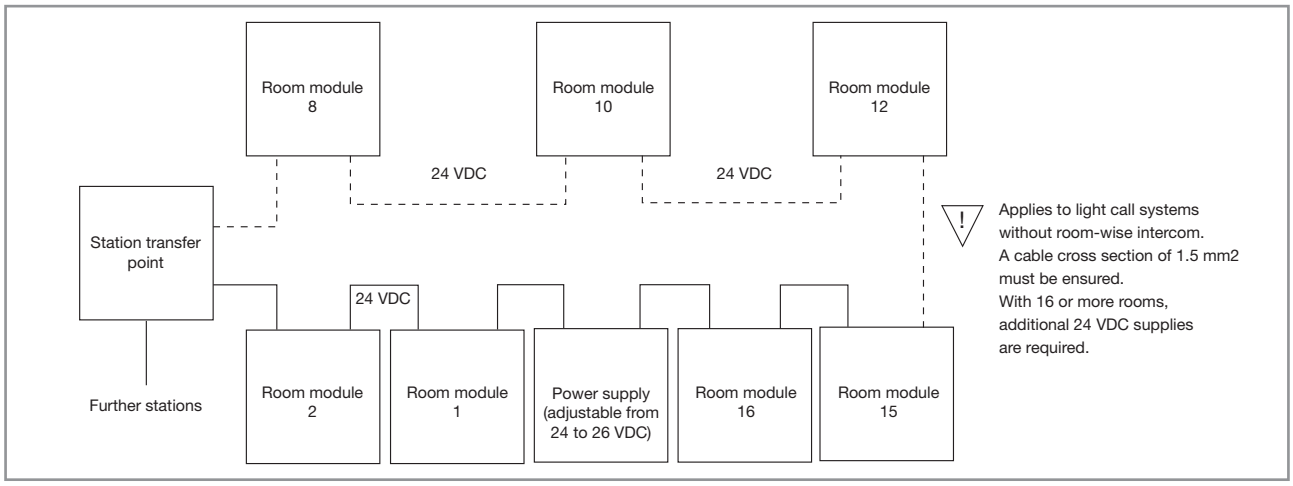
The data cables must not exceed a length of **500 m**.
When using a room-wise intercom, an **additional** cable (4-core) must be used for connecting the speech channels. A separate cable of type: JY (ST) Y 2x2x0.8 must be used in order to reduce back-coupling effects.

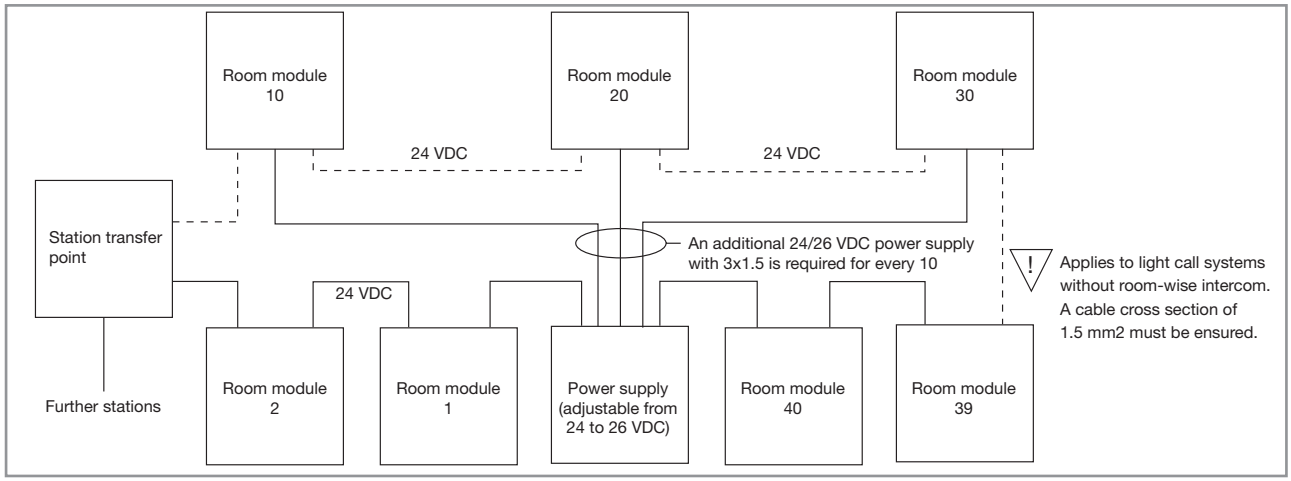


Connection example without room-wise intercom



Connection example with room-wise intercom





System monitoring

The room modules automatically recognise all devices connected to the room bus and constantly monitor these. If a device does not answer, then this is registered as a malfunction (S) with a room number on the duty room module display (No. 735000) when duty room presence is set.
Example: S24 (Malfunction in room 24)

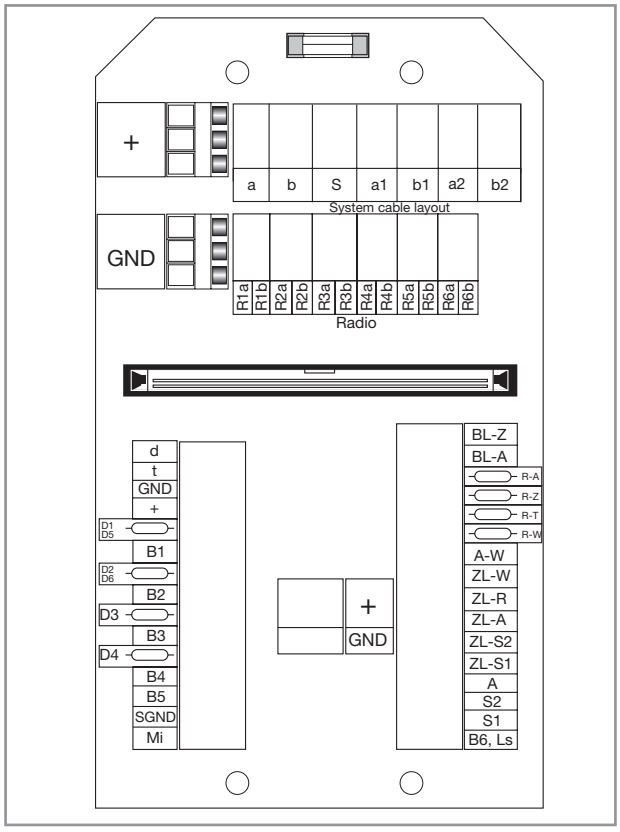
The room modules are monitored by the station transfer point. If a room module does not answer then this is indicated as a dropout (A) on the duty room module display (No. 735000) when duty room presence is set.
Example: A24 (Dropout in room 24)

Note! After completing all room installations and programming all components in the room, a soft reset (see component description) must be performed at the room module (regardless of the module version). All components are then „learned“ at this point. Any subsequent changes that may occur (address changes, new components etc.) are then recognised as malfunctions.

Overview of terminal assignments

Connection	Description
a and b	**Data cables**
S	**Shield cable**
a1 und b1	**Speech cables**
a2 und b2	**Speech cables**
+/GND	**24 VDC power supply**
R1a/R1b bis R6a/R6b	Radio cables
R5a/r5b und R6a/R6b	TV audio input
d	**Room bus data cable**
t	**Room bus clock cable**
D1/D5	Bed 1 or Bed 5 diagnostic call
B1	Bed 1 loudspeaker output
D2/D6	Bed 2 or Bed 6 diagnostic call
B2	Bed 2 loudspeaker output
D3	Bed 3 diagnostic call
B3	Bed 3 loudspeaker output
D4	Bed 4 diagnostic call
B4	Bed 4 loudspeaker output
B5	Bed 5 loudspeaker output
SGND	Bed bus speech GND
Mi	Room bus microphone cable
BL-Z	Room call reassurance light External room call button
BL-A	External reassurance light Doctor call button
R-A	External doctor call button input
R-Z	External room call button input
R-T	Telephone call circuit input
R-W	Call button (WC) input
A-W	Cancel button (WC) input

Connection	Description
ZL-W	**Room signal light output (WC call)**
ZL-R	**Room signal light output (room or bed call)**
ZL-A	**Room signal light output (doctor presence)**
ZL-S2	**Room signal light output (trainee nurse presence)**
ZL-S1	**Room signal light output (head nurse presence)**
A	External presence button input Doctor
S2	External presence button input Nurse 2
S1	External presence button input Nurse 1
B6, Ls	Bed 6 loudspeaker or room loudspeaker output



Malfunction display on room module with call/cancel button and display

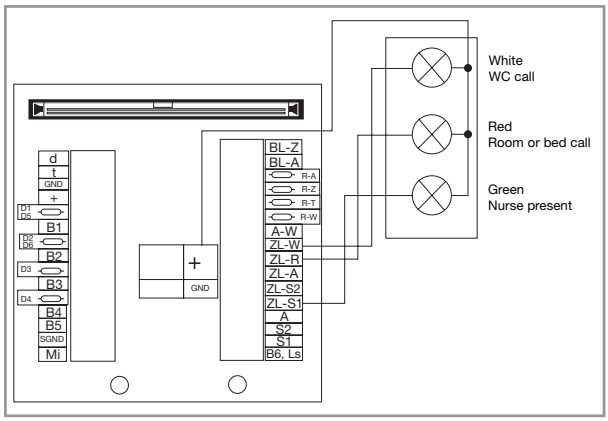
Display

- Bit malfunction in log is set
- When the nurse presence button is held pressed for longer than 5 s, the cause of the malfunction is shown on the display. If no malfunction exists then the message „No malfunction“ is displayed
- Holding the nurse presence button pressed for longer than 15 s causes a soft reset

Cancelling malfunctions: Correcting malfunctions

Connection of external room signal lights

External room signal lights (e.g. room signal lights, room signal lights with door name plate or other room signal lights) can be connected to the illustrated room module outputs. The outputs can be loaded to a maximum of 10 W (24 VDC/400 mA).



This connection example is intended as a reference case for the many different types of room signal lights and only illustrates the connection principle.

Programming of parameters via the menu

No presence markings may be set before the programming process can be started.

Calling up the parameter display

1. Press and hold the button at the upper right of the display (function button 1)
2. Then briefly press the button at the upper right of the display (function button 2)

The parameter menu is displayed but the entries **cannot** be changed.

Calling up the parameter menu for making changes

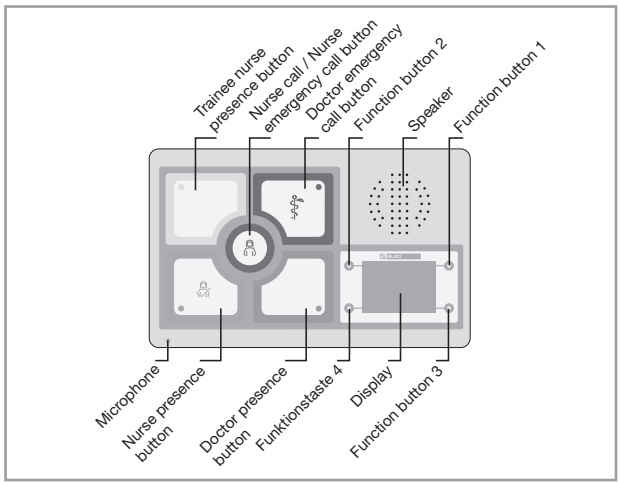
1. Press and hold the button at the lower left of the display (function button 4)
2. Then press and hold the button at the upper right of the display (function button 1) (1 – 2 can also be performed in reverse)
3. Then briefly press the button at the upper right of the display (function button 2)

The parameter menu is displayed and the entries **can** be changed. The functions of the buttons for changing values and navigating in the menu are shown in the corners of the display. **Or:** Briefly press the button on the rear side of the circuit board.

The button assignments during parameterisation are shown in the display. For the horizontal version these are:

- Upper left (function button 2)
  „+“: Increase value
- Lower left (function button 4)
  „-“: Reduce value
- Lower right (function button 3)
  „Next“: To next menu item
- Upper right (function button 1)
  „Back“: To previous menu item

If changes were made, then the query „Accept new values?“ is displayed at the end of the parameter menu. The new values are accepted via the **“Yes”** button. The **“No”** button discards the changes and then displays the query “Reset terminal?”. “Yes” then causes a restart and “No” exits the parameterisation without making any changes.



Light call behaviour while programming

During the programming process, the light call operation of the terminal continues largely unchanged.

The only limitation:

- Only acoustic call forwarding takes place, since the display and the query button are reserved for the programming process.

Especially the hand-held patient devices can still be used to their full extent and calls can still be triggered from these and external call buttons. Speech commands are implemented and announcements are received.

Programming menu

The default values for new devices are underlined. These also take effect when no correct values are found in memory.

Menu item	German display text	English display text	Values	Comment
Start parameter query	ZT4W-10 Einstellungen	ZT4W-10 Settings		For the program version. „W“ means horizontal installation.
Programming start	ZT4W-10 Programmierung	ZT4W-10 Programming		
Display contrast	Displaykontrast	Display contrast	144 - 175 - 223	144 - 175 - 223 The contrast is infinitely adjustable
Language for call display texts	Anzeigesprache:	Display language	German Italian English	German - Italian - English Language selection
Light call system selection	Systemauswahl?	System selection	Yes/No	Yes: The following menu items for making adjustments to suit various generations of system environment are offered for selection. No: The following menu items are skipped, already selected values remain saved and will take effect.
mp3 system expansions	Erweiterungen mp3 aktiv?	Extensions mp3 active?	Yes/No	Yes: Send extended protocol messages over the station cables, which allows the use of functional extensions such as cross-station call groups. **Warning: The other room modules in the station must be able to understand and process these extensions.** **Note! This setting must not be changed. The default setting of „No“ must be left as it is.**
Old, reduced mp protocol	Reduziertes mp-Prot.?	Reduced mp-prot.?	Yes/No	Yes: The „old“ reduced room module mp protocol is sent. This allows management of a maximum of 4 beds per room. Connecting bed 5 or bed 6 generates a malfunction message. If both entries are set to „Yes“ then the „mp3“ selection has priority. The extended protocol is sent. If both entries are set to „No“ then the current mp2 protocol is generated. **Note! This setting must not be changed. The default setting of „No“ must be left as it is.**
Bed device type	Bettgeraete BG2?	Patient handset BG2?	Yes/No	Yes: The BG2 is controlled. No: The BG3 is controlled. Both of these control devices are still in preparation and will be delivered later.
Address	Adresse	Own adress	0 – 121	0 (default value) / Standby operation – no transmission on the station bus / address 1 – 99 can be selected / addresses 100 – 121 are already assigned as special addresses –> not available
Direction arrow group	Richtungspfeilgruppe	Direction ind. group	0 – 15	0 (default value) / Group signal lights connected to the room bus of a room module are always active when a room module with the same direction arrow sends a call.

Menu item	German display text	English display text	Values	Comment
Call group	Rufgruppe Zimmer	Calling group Room	 0 – 15 0 – 127	Formation of call groups within the station: **Value range** **If „mp3 extensions active?“ = no If „mp3 extensions active?“ = yes** Call forwarding only occurs between rooms having the same call group number. Exceptions: • Calls from rooms in the call group 0 are displayed at all rooms. • Rooms in call group 0 display all calls from the station. • The station transfer point displays all station calls. **If call groups are not used then always set this value to 0.**
Cross-station room assignment	Zimmer zu ext. Station?	Assign room to ext. ward?	Yes/No	Only offered when „mp3 extensions active?“ = yes: Yes: The room is regarded by other rooms as not belonging to the station and calls from this room are not displayed. The main query MUST assign this room to another station. No: The behaviour within the station as described above applies. **Warning: This function is not currently supported.**
Call group overrun time	Zeit Ueberlauf Rufgruppe (s)	Calling group Timeout (sek)	0 – 240	Call group overrun time (in seconds): If a call has not been queried after the defined time, then the terminal changes the call message to call group 0, i.e. the call is then displayed in all station rooms where a nurse presence is marked. Value 0: No overrun time is set, the call group setting remains active for an unlimited time.
Special texts (as of version ZT4 – 14)	Sondertext ab Z-Adr. 100	special txt for adr. 100 ff	Yes/No	Yes: The texts selected at the appropriate inputs of the SUD and the addresses 50-59 of the SUD are displayed. This affects the addresses 100-119 (inputs) and station address 50-59. For text selection see the „SUD“ description. No: The addresses without texts are displayed.
Call display of most important call	Rufanzeige: wichtigster Ruf	Display calls: most important	Most important call / Auto call list	Most important call: Only the most important (highest priority) call or the oldest call is displayed, Auto call list: pending calls are scrolled
Duty room function	Dienstzimmerfkt aktiv nein	Duty room funct active no	Yes/No	Yes: Used as a duty room module. Any malfunctions are displayed when „Presence“ is marked. (displayed when no calls are pending) No: Factory setting: No malfunctions in the system are displayed. This setting is recommended when used as a room module.

Technical changes, errors and printing mistakes excepted

Programming menu

Menu item	German display text	English display text	Values	Comment
Monitor from room	Überwachung von Zimmer 0	Fault monitoring from room 0	0	Only active when the duty room function is set to „yes“. The setting defines the first room where monitoring is to begin. Range: 0 – 121 Factory setting „0“
Monitoring until room	Überwachung bis Zimmer 1	Fault monitoring to room 1	1	The setting defines the first room where monitoring is to end. Range: 0 – 121 Factory setting „1“ Recommendation: Entering 0.....1 causes the monitoring range to be automatically learnt (see following menu item) from the current installation.
Learn installation	jetzt lernen Stationszustand ist gelernt Menue beenden	Learn Ward status is stored Menue end		Only active when monitoring starts at room 0 (no fixed address assignment for monitoring). The learn process (upper left button on display) learns and stores all existing addresses. This learn process must be performed after installation and programming is completed. Subsequent changes (after the learn process) are recognised as malfunctions or dropouts. „Learning“ is confirmed on the display by: „Station state learnt“. Pressing the button at the lower left is the fastest way of reaching the end of the menu.
Doctor functions	Arztfunktionen aktiv	Doctors function active	Yes/No	No: All doctor functions are locked out
Nurse 2	Schwester 2 aktiv	Function nurse2 active	Yes/No	No: Functions for nurse 2 are locked out
WC call cancel	Abst.WC-Ruf mit Anwesenheit	Cancel WC-Call by presence	Yes/No	Yes: WC calls are also cancelled when the presence of a nurse is marked. No: WC calls are only cancelled via the WC cancel button.
Emergency call cancel when nurse is present	bei Notrufabs.: Anw. Ein	Cancel EM-call Set pres yes	Yes/No	No: Call is cancelled when the nurse button is pressed without presence marking
Function Nurse assistance call	Hilferuffunktion aktiv	Call for help active	Yes/No	Only offered when the doctor function is locked out. Yes: The doctor call button triggers the nurse call and the doctor presence button cancels the call. No: Nurse call function is locked out.
Sending of announcements	Senden Durchsage erlaubt	Send Announcem. possible	Yes/No	Yes: In quiescence mode (no call), pressing and holding the query button allows announcements to be made. When nurse presence is set: Nurse announcement. Without presence set: General announcement. No: Announcements cannot be sent.
Selection of special nurse functions	Sonderfunktionen Schwester	Special function nursing staff	Yes/No	Yes: The following menu items are sequentially offered for selection. No: The following menu items are skipped, all special functions are switched off = normal operation (any selections remain saved).

Programming menu

Menu item	German display text	English display text	Values	Comment
Doctor call display when nurse present	Arztrufe an Schwester	Call for doctor to nurse	Yes/<u>No</u>	Yes: Doctor calls are also displayed when nurse presence is marked. No: Normal operations – Doctor calls are only displayed when doctor presence is marked.
Send telephone calls	Telefonruf bei Schwester	Send tel.-call when pres.	Yes/<u>No</u>	Yes: If the R-T input is active then the telephone call is sent despite marked nurse presence. No: The telephone call is not sent when nurse presence is marked.
Nurse call request	Merken Schwester annehmen	Accept marking for nurse	<u>Yes</u>/No	Yes: Nurse call requests are accepted. No: Nurse call requests are ignored.
Receive announcements	Durchsagen hoeren	Recieve collect. announcement	<u>Yes</u>/No	Yes: General announcements are received. No: General announcements are not received
Receive nurse announcements	Schwesterdurchs. hoeren	Recieve staff announcement	<u>Yes</u>/No	Yes: Nurse announcements are received. No: Nurse announcements are not received
Trigger nurse emergency call when doctor is present	Bei Arztanwesen. S-Notruf	Em. Call when doctor pres.	Yes/<u>No</u>	Yes: When doctor presence is set, activating the room or bed call button triggers the corresponding nurse emergency call. No: When doctor presence is set, these call buttons trigger the corresponding normal nurse call.
Acoustic alarm damping	Daempfung Tongeber	Attenuation of Call tone	<u>0</u> – 2	The volume of the acoustic alarm can be reduced by a maximum of two levels from the standard volume. **Warning: The minimum volume specified by the standard must be maintained and must be checked.**
Special functions Call types	Sonderfunktionen Rufarten?	Special call-functions?	Yes/<u>No</u>	Yes: The following special functions for call types are offered for selection. No: The following special functions are skipped, already selected values remain saved and will take effect.
WC emergency call	WC-Ruf bei Anw. als Znotruf	WCCall emergency when pres.	Yes/<u>No</u>	Yes: When the WC call is triggered and nurse presence is set then this is signalled as a room emergency call No: Normal WC call, even when presence is set, display of the WC call at the own room terminal.
Telephone call trigger	Telefonruf aktiv	Telephone call active	<u>Yes</u>/No	Yes: The R-T input is evaluated as a telephone call input. No: The R-T input is not evaluated.
Level evaluation of the R-T input	Eing. R-T ohne Stoerpegel	Input R-T no fault det.	Yes/<u>No</u>	Yes: The level evaluation is done without a noise level, termination resistors are not required, a simple contact without termination can be connected. **Warning: This means that no cable monitoring for short circuits or breakage takes place.** No: The normal level evaluation takes place, with quiescent current monitoring for short circuits and breakage

Technical changes, errors and printing mistakes excepted

Menu item	German display text	English display text	Values	Comment
	Eing. R-T Ruhekontakt	Input R-T norm. closed	Yes/<u>No</u>	Only takes effect when „R-T input without noise level“ = yes was selected: Yes: A contact closed to +24 V is evaluated as the quiescent state, an open contact is evaluated as a call state (=normally closed contact). This means that a cable breakage is signalled as a call and a short circuit is not recognised. No: The unswitched open input is evaluated as the quiescent state, a contact closed to +24 V is evaluated as a call state (=normally open contact). This means that a short circuit is signalled as a call and a cable breakage is not recognised.
Telephone call display text	Anzeige Tel-ruf: *Auswahl aus:* Telefonruf externer Alarm Brandalarm	Disp. Tel.Call: *Auswahl aus:* Telephone call External Call Fire alarm		Selection of the text displayed for a telephone call.
Diagnostic inputs function	Dia-Eingaenge aendern	Change Dia-Input	Yes/<u>No</u>	Yes: The following points for using diagnostic call inputs as inputs for bed call buttons are offered. No: The following menu items are skipped, already selected values remain saved and will take effect.
D1	Eing. D1 als Ruf Bett 1	Input D1 as call B1	Yes/<u>No</u>	Yes: Input D1 is evaluated as the call button for bed 1 No: Input D1 is evaluated as a diagnostic input
D2	Eing. D2 als Ruf Bett 2	Input D2 as call B2	Yes/<u>No</u>	Yes: Input D2 is evaluated as the call button for bed 2 No: Input D2 is evaluated as a diagnostic input
D3	Eing. D3 als Ruf Bett 3	Input D3 as call B3	Yes/<u>No</u>	Yes: Input D3 is evaluated as the call button for bed 3 No: Input D3 is evaluated as a diagnostic input
D4	Eing. D4 als Ruf Bett 4	Input D4 as call B4	Yes/<u>No</u>	Yes: Input D4 is evaluated as the call button for bed 4 No: Input D4 is evaluated as a diagnostic input
	Eing. D4 als FRAGE-Taste	Input D4 as ENQUIRY	Yes/<u>No</u>	Only takes effect when „Input D4 as bed 4 call“ and „As QUERY button“ = no have been selected: Yes: A contact closed to +24 V is evaluated as the quiescent state, an open contact is evaluated as a call state (=normally closed contact). This means that a cable breakage is signalled as a call and a short circuit is not recognised. No: The unswitched open input is evaluated as the quiescent state, a contact closed to +24 V is evaluated as a call state (=normally open contact). This means that a short circuit is signalled as a call and a cable breakage is not recognised.

Menu item	German display text	English display text	Values	Comment
Level evaluation of input D4	Eing. D4 ohne Stoerpegel	Input D4 no fault det.	Yes/<u>No</u>	Only takes effect when „Input D4 as bed 4 call“ and „As QUERY button“ = no have been selected: Yes: The level evaluation is done without a noise level, termination resistors are not required, a simple contact without termination can be connected. **WARNING: This means that no cable monitoring for short circuits or breakage takes place.** No: Normal level monitoring takes place, with quiescent current monitoring for short circuits and cable breaks in diagnostic sockets.
	Eing. D4 Ruhekontakt	Input D4 norm. closed	Yes/<u>No</u>	Only takes effect when „Input D4 without noise level“ = yes was selected: Yes: A contact closed to +24 V is evaluated as the quiescent state, an open contact is evaluated as a call state (=normally closed contact). This means that a cable breakage is signalled as a call and a short circuit is not recognised. No: The unswitched open input is evaluated as the quiescent state, a contact closed to +24 V is evaluated as a call state (=normally open contact). This means that a short circuit is signalled as a call and a cable breakage is not recognised.
Special BG3 button	BG3 Sondertaste passiv	BG3 spec. func. button pas.	Yes/<u>No</u>	Yes: The special button is not evaluated by the room terminal. No: Normal special button operation: LED flashes, numbers can be entered.
Encashment function	Inkassofunktion aktiv	Charging funct. active	Yes/<u>No</u>	Yes: Encashment operation – Use of TV and telephone dependent on the encashment chip No: Operation without encashment function – TV and telephone are freely available.
Display of account information at BG (operating device)	BG Kontostands-anzeige	Show account on BG	<u>Yes</u>/No	Only if the encashment function is active: Yes: The BG display shows the account status when the chip is inserted. No: The BG display only shows the time and never the account status, even when the chip is inserted.
Special TV functions	TV-Funktionen	TV functions	Yes/<u>No</u>	Yes: The following special functions for TV operation are offered for selection. No: The following special functions are skipped, already selected values remain saved and will take effect.
TV free	TV kostenlos	TV free of charge	Yes/<u>No</u>	Only takes effect when „Encashment active“: Yes: The TV function is available free of charge despite encashment operation. No: TV operation only according to the specifications of the encashment chip.
External TV control	TV-Steuerung extern	TV control externally	Yes/<u>No</u>	Yes: The TV device is externally controlled. A control signal at the TVE terminal of the BAE3 indicates that the TV is switched on and switches on the TV sound for the BG. No: The TV is controlled by the room terminal via a TVE control unit.

Menu item	German display text	English display text	Values	Comment
External TV enable	TV-Freigabe extern	TV enable externally	Yes/<u>No</u>	Only when „External TV control“ = no Yes: TV operation is only available when an enable signal is present at the TVE terminal of the BAE3. No: Normal operation
TV button switches only the TV sound	TV-Tast schaltet nur Ton	TV button contr. sound only	Yes/<u>No</u>	Only when „External TV control“ = no Yes: The TV device is controlled by a foreign system. The control device TV button only switches on the TV sound. No: Normal operation
TV sound coupling	TV-Ton ueber BAE	TV audio input at BAE	Yes/<u>No</u>	Yes: The TV sound is coupled to terminals TVa/TVb of the BAE3. No: Normal operation – The TV sound is coupled to the terminals R6a/R6b (for TV1) or R5a/R5b (for TV2) of the VZT2.
Assignment of beds to TV2	TV2-Zuordnung zu Betten	Assign beds to TV2	Yes/<u>No</u>	Yes: For every bed (no. 1 to 6), the following item asks whether TV2 should be assigned to each bed. No: The assignment query for every bed is skipped. The previous assignments remain unchanged.
	Betten zu TV2: Bett 1	beds for TV2: bed 1	Yes/No	Only queried when „TV2 assignment“ = yes was selected: For bed 1 to bed 6 Yes: The bed is assigned TV2 (default: beds 4,5,6) No: The bed is assigned TV1 (default: beds 1,2,3)
Number of available TV channels	TV Kanalanzahl	Number of TV-channels	1 – 98	The entry of larger channel numbers at BG3 is denied. When using a BG3M for channel selection via the „P+“ or „P.“ buttons, this controls the wrap-around from the largest channel to channel 1 and vice-versa. Default: 32
Programming completion display	Neue Werte übernehmen	Save new settings		Accept via simultaneous pressing of the call and doctor call buttons. Deny by pressing the query button.
	Terminal ruecksetzen?	Terminal reset?		Appears when no values have been changed or changes have not been adopted. Simultaneous pressing of the call and doctor call buttons causes a restart. Appears for 3 s after cancelling without changes/restart.
Parameter query completion display	Einstellungen Ende	Settings end		Appears for 3 s at the end of the parameter query.

Call request

As a result of a call query, or for other reasons, it may be necessary for a nurse to visit a room. To do this, after the query (room based) or conversation with the patient (room-wise intercom) the call is ended at the room/duty room module with display not via the off button but rather via the nurse request button. As a result, the green presence lamp in the room signal light of the associated room **blinks** until the call has been completed and also the group signal lights (if present) and also the green reminder LED in the call cancel button of the corresponding room. The display on corridor displays is separately described in the section on corridor displays.

The call request is cancelled by setting the respective presence in the room.

Note! Call requests can only be set via the room/duty room module with display.

Setting the monitoring range in the menu

Display of room 01

Entry of the lowest room address on the station bus to be monitored.

Display of room 119

Entry of the highest room address on the station bus to be monitored.

If gaps exist in the programming (e.g. monitoring range of rooms 1 – 25) and room 20 does not exist, then room 20 is indicated as being missing.

When a fixed monitoring range is set then no „learn process“ is required.

Recommendation

Entering 0...0 causes the monitoring range to be automatically learned to suit the existing installation.

Learning the existing rooms of the own station

A monitoring range of 0...1 must have previously been entered in the parameter menu. All possible room addresses are initially included in the monitoring. All participants connected to the station bus have already sent for at least 10 s, i.e. they are connected and are supplied with power.

In this procedure all **existing** room addresses are learnt.

To finally save these learned room addressed it is necessary to perform a „learn“ using the following menu item. This action learns all existing room addresses and saves them in memory. The room addresses remain stored there until a new „learn“ is performed. The stored room addresses are still accessed after a power failure. Learning must not be repeated after a power failure.

The learn procedure can be started either via a button connected to an input of the station transfer point or via the menu of the room/duty room module (No. 735000). The results of the most recent learn procedure are stored in the station transfer point **and** the room/duty room module.

Consequences

Dropout/Malfunction monitoring only occurs for the learnt rooms. If additional rooms are integrated then, after installation and programming, another learn process is necessary.

Note! If the „Learn procedure“ is not performed, then after a power cut the SUD will automatically test all room addresses including the fixed address range (1 –121). All addresses that are not present are signalled as dropouts.

Conclusion

When setting a monitoring range of 0…X a „Learn procedure“ is absolutely necessary. Successful „learning“ is indicated by „Station state has been learnt“ on the display.

Software reset

Trigger

- Changing of parameters in the menu after confirming adoption of the new values
- Pressing the nurse presence button (lower left button on the room module) for longer than 15 s

Consequences

The room module performs a restart, all previous call, presence and call request information is deleted. The number of existing devices is re-learnt.

Behaviour after a power cut

When power is switched on again, the room module remains in standby mode for the first 5 s. After this waiting time, in which the operating voltage stabilises, the room module begins nor mal operation and the calls that existed before the operating voltage was switched off are once again sent or displayed. New calls cannot be set during the first 5 s after switching on the operating voltage.

Technical changes, errors and printing mistakes excepted

Technical data

General	
Temperature range	0 – 50 °C
Maximum current consumption (without connected external consumers such as room signal lights)	300 mA
Data preservation on power failure	10 years
Acoustic alarm loudness at 2 m	52 dBA (+/- 6 dBA)
Acoustic alarm frequency	600 Hz
Operating voltage (under load)	24 V (22 – 26 VDC tolerance)
Quiescent current consumption (all lights and LEDs off)	200 mA (+/- 10 mA tolerance)
Speech level on the wires a1/b1	1 V_{eff}
Speech level on the wires a2/b2	1 V_{eff}
Degree of protection	IP 20

Interfaces	
Station bus a/b	4800 baud
Room bus d/t B)	2400 baud

Outputs	
4 light outputs (ZL-x), short circuit protected	10 W
4 reassurance lights (BL-x), short circuit protected	20 mA
1 output for PA loudspeaker	0,5 W
Button inputs	
Quiescent current monitored button inputs	8
Termination resistor to +24 V for quiescent level	3.6 kΩ (+/- 10% tolerance)
Termination resistor to +24 for message level	1.8 kΩ (+/- 10% tolerance)

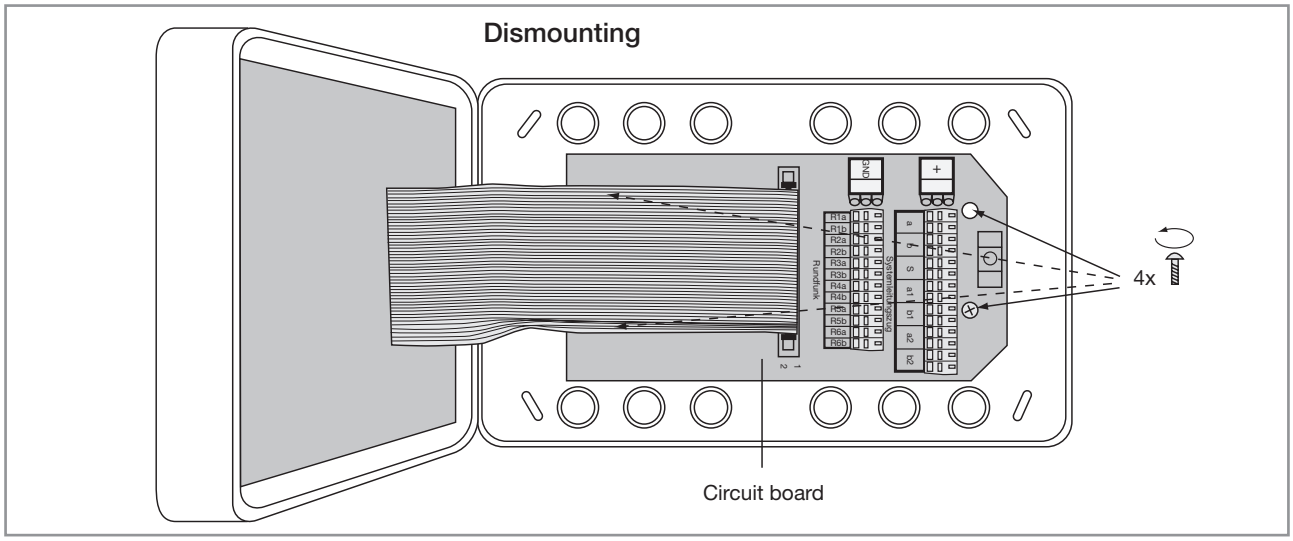
For calculating the quantity and capacity of the power supplies, the maximum current consumption of all devices connected to the power supply (room module, lights, call button, presence/cancel button, pull switch, peripheral devices, ...) must be added together.

The cable lengths must also be taken into account. Care must be taken to ensure that the supply voltage lies within the defined tolerances at all devices.

In-wall or hollow wall installation

Dismounting

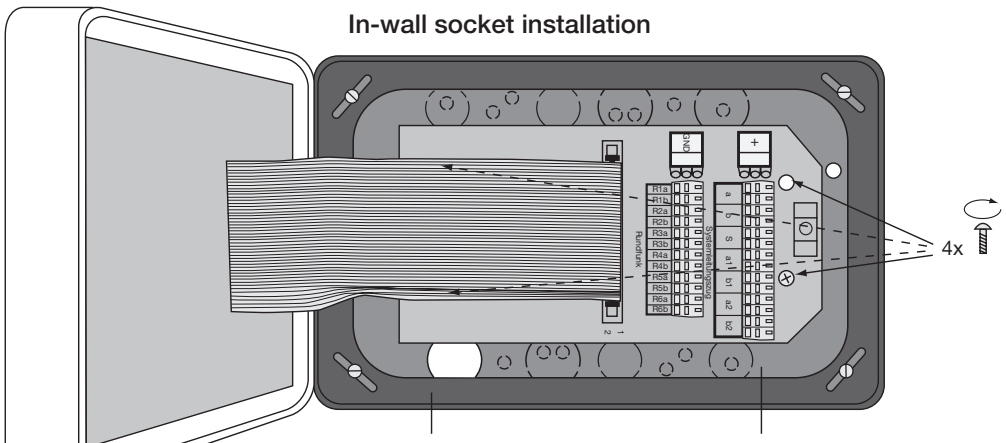
Release the 4 screws fastening the circuit board in the lower housing.



Installation

Insertion of the circuit board in the chosen "Kaiser" socket and then fastening with the previously remove screws. The hole positions in the base of the "Kaiser" socket are the same as those in the circuit board.

In-wall socket installation



In-wall mounting frame
(No. 735990)

"Kaiser" socket
(Hollow wall 9192-91)
(In-wall 1092-96)

Using the call system without a station transfer point

When using a call system in small environments (e.g. a single station) without a PC or Pager/DECT telephone a station transfer point is not absolutely necessary.

However, in this situation, termination resistors must be installed in the station bus:

This can be mounted, for example, in the duty room module. The resistors must have a value of 680 Ω and must be connected between

Station bus „a“ to 24 VDC and station bus „b“ to GND.

The resistors (2 pieces) are provided with delivery.

A similar situation applies to room-wise intercoms. If the required additional intercom module is not connected to the station transfer point or a station transfer point does not exist, then the individual speech channels must each be terminated with a resistor.

The resistor must have a value of 10 kΩ and be connected between

Speech cable „a1“ to GND,
Speech cable „a2“ to GND,
Speech cable „b1“ to GND and
Speech cable „b2“ to GND.

The resistors (4 pieces) are not provided in delivery.

Room module with call/cancel button and display

No. 735020

General notes

Das Zimmermodul stellt die Schnittstelle zwischen dem Stationsbus und dem Zimmerbus mit allen an diesen angeschlossenen Geräten dar. Alle Ereignisse im Zimmer werden durch das Zimmermodul erfasst und auf den Stationsbus gesendet, so dass die Informationen der gesamten Station zur Verfügung stehen. An dem Zimmermodul werden die Zimmernummer und alle weiteren, für das Zimmer wichtigen Informationen, eingestellt, mit denen sich das Zimmermodul auf dem Stationsbus meldet. Es darf nie mehr als ein Zimmermodul mit der gleichen Adresse auf dem Stationsbus angemeldet sein. Bei der Einstellung der Adressen ist deshalb mit besondererm Bedacht vorzugehen.

Warning, lethal danger!
The safety regulations of the DIN VDE 0105 standard must be followed. Only qualified electrical personnel may work on the devices. Always follow the state-specific regulations and guidelines. Failure to observe this can result in a danger of fire, electric shock or destruction of the device. In the case of 230 V cables in the vicinity, the applicable standards and guidelines relating to cable clearances must be noted and observed.

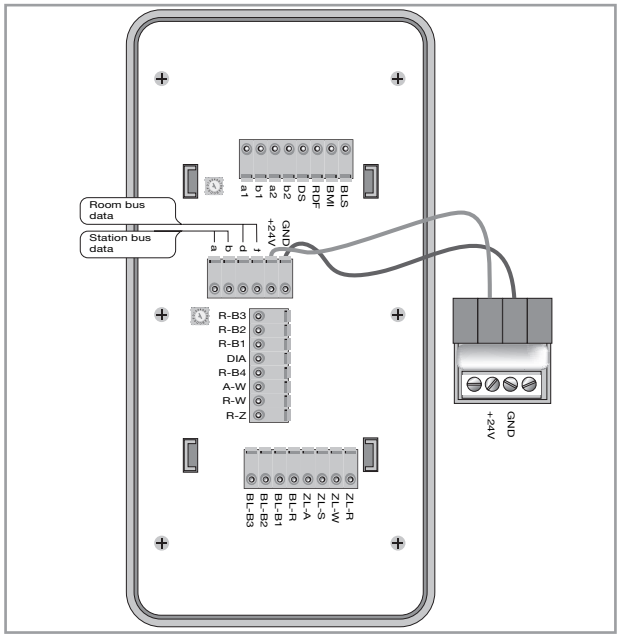
Call indication on the display

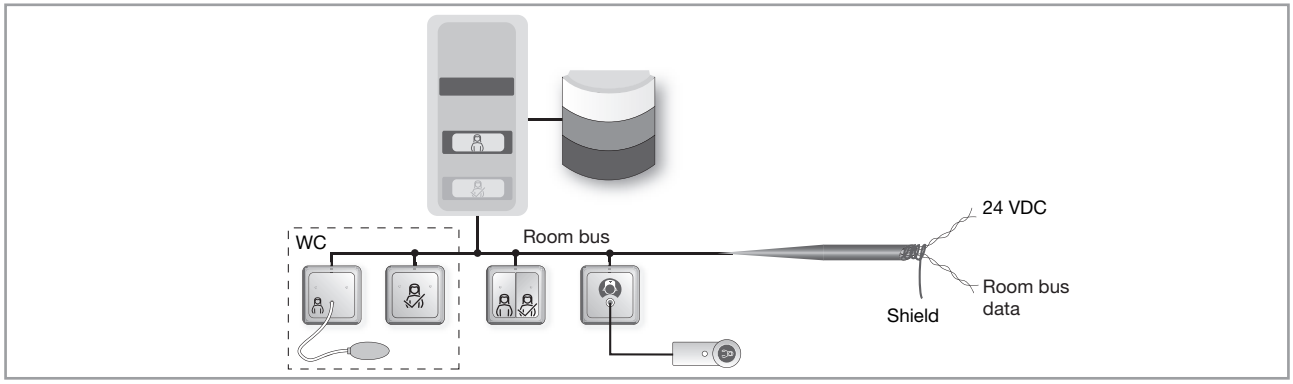
When the presence marker is set then the most important respective call is shown on the display. It makes no difference whether this call comes from the own station or, in duty mode (interconnection of several stations), from a different station.

For calls having the same priority, the „oldest“ call in each case is displayed. Instead of the rolling display of all calls, when multiple calls occur at the same time the display shows „More calls!“ (alternately with the call location of the most important call).

Room bus connection

All components in the room are to be connected to the room bus. It is essential to ensure that the conductors („t“, „d“, „+24VDC“ and „GND“) are not swapped. Connection can take place via a room bus in a star formation or a mixed formation. The cable length (sum of all cables) must not exceed **100 m**. A cable of type: JY (St) Y 2x2x0.8 must be used for the room bus. The shield must be connected to each of the GND terminals. To avoid short circuits at the device, the shield must be insulated.

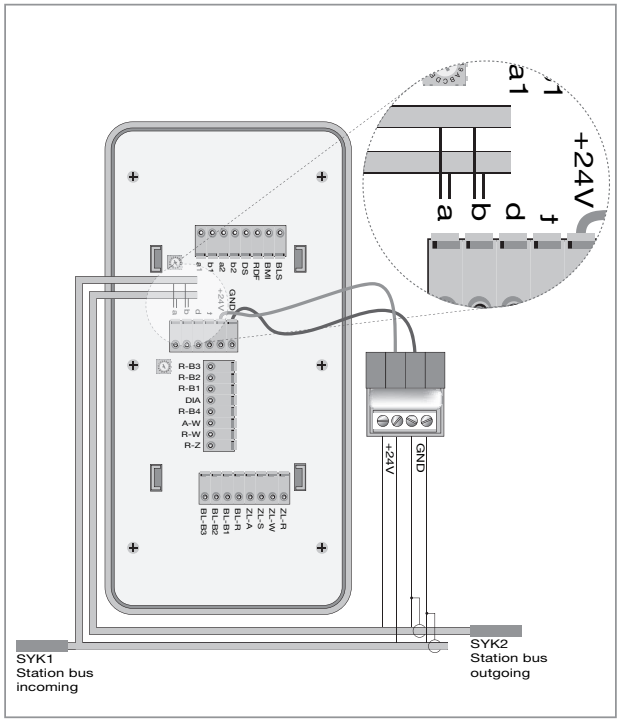


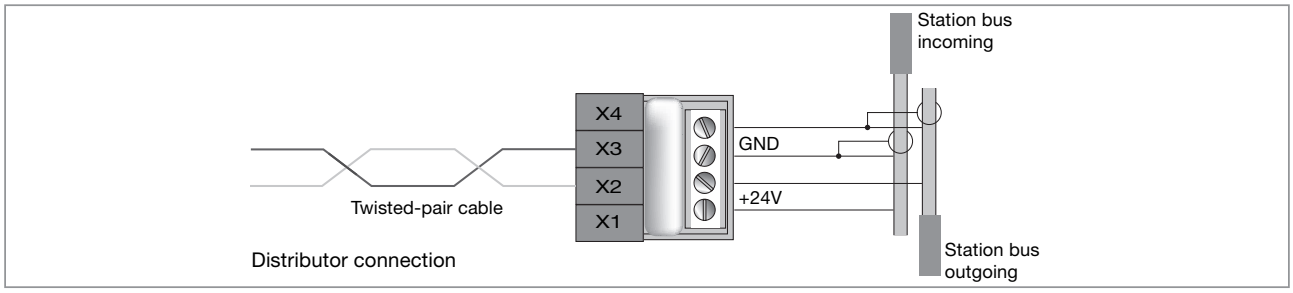


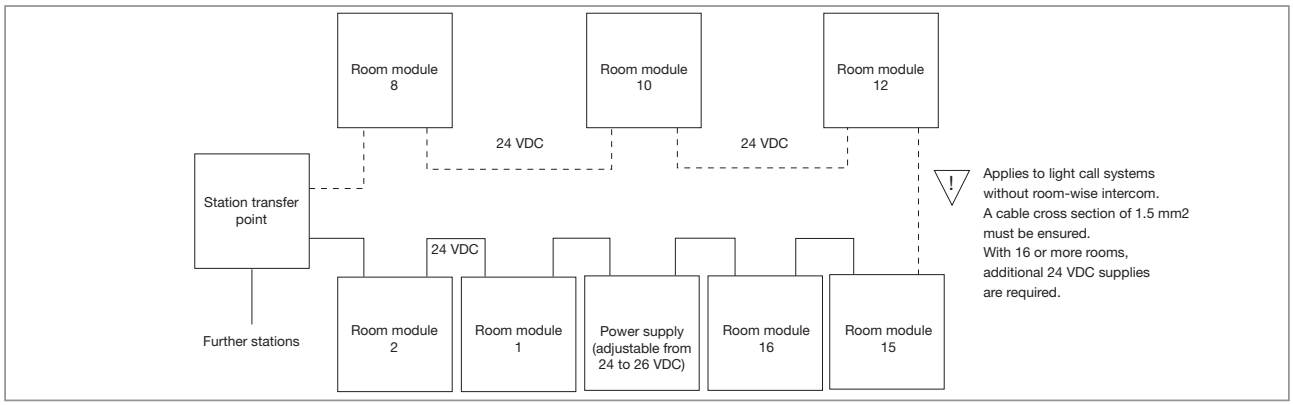
Station bus connection

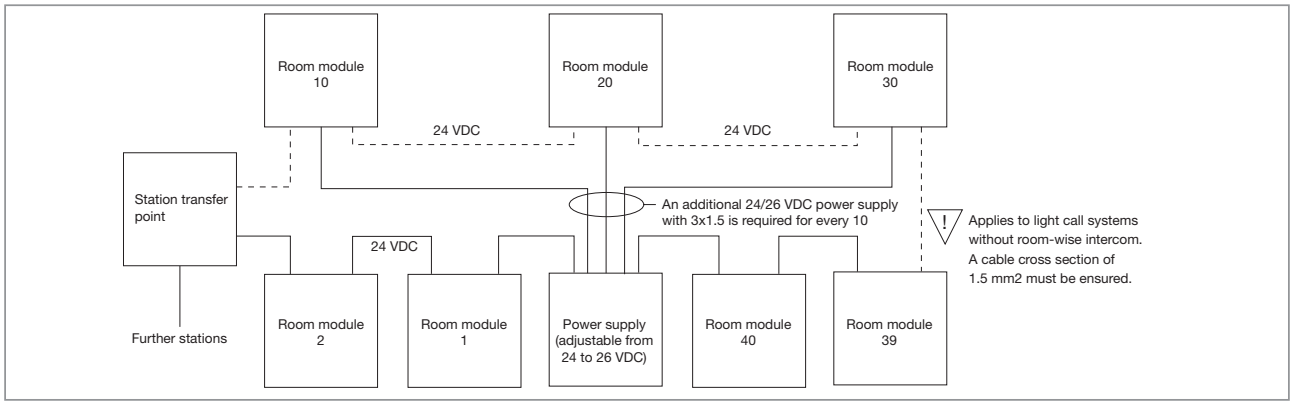
All the room modules for the station must be connected to the station bus. Stub cables are to be avoided. The station bus should be laid as a ring cable. ELSO GmbH recommends closing the ring. This results in double data reliability. Please make absolutely sure that the conductors („a“, „b“, „+24VDC“ and „GND“) are not swapped. For the station bus, a cable (subsequently referred to as SYK=system cable) of type: Lapp Kabel UNITRONIC Bus Combi EIB 2x2x0.8 + 3x1.5, or equivalent quality, must be used. The shield must be connected to each of the GND terminals. To avoid short circuits at the device, the shield must be insulated.

The data cables must not exceed a length of **500 m**.
For applications using a system cable (SYK) a distribution box (see figure) is required. This is provided with delivery (-> Terminals with connection cable and fuse -> fine-wire fuse 250V / 0.25 A slow-blow).
The power supply cables of the SYK are connected to the +24V and GND distribution box terminals. The red output cable of the distribution box is connected to X2/Pin2 (+24 V), the blue to X2/Pin1 (GND).
The supplied 2x2x0.8 cables are to be used for connecting to the station bus.









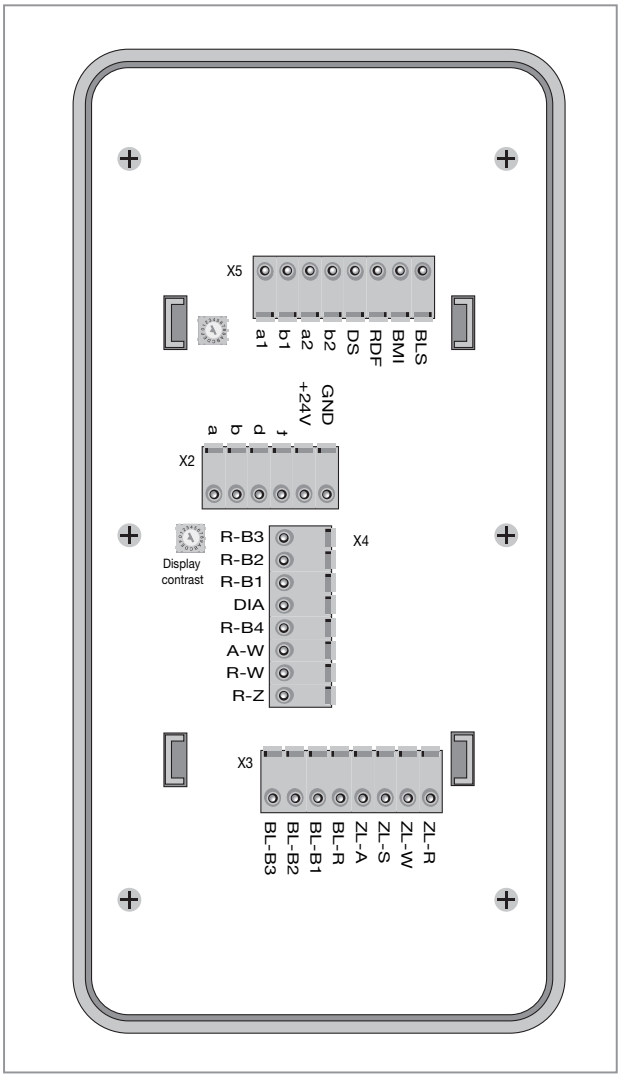
System monitoring

The room modules automatically recognise all devices connected to the room bus. The devices connected to the room bus are constantly monitored. If a device does not answer, then this is shown as a malfunction (S), with the room number, on the display of the station transfer point (No. 735200) and the duty room module (No. 735000).
Example: S24 (Malfunction in room 24)

The room modules are monitored by the station transfer point. If a room module does not answer, then this is shown as a drop-out (A) on the display of the station transfer point (No. 735200) and the duty room module (No. 735000) when presence is set.
Example: A24 (Dropout in room 24)

Overview of terminal assignments

Connection	Function	Description
X5 Language (Terminals for cable path continuation))	a1	Speech cable a1 for cable path continuation
	b1	Speech cable b1 for cable path continuation
	a2	Speech cable a2 for cable path continuation
	b2	Speech cable b2 for cable path continuation
	DS	Not used
	RDF	Not used
	BMI	Not used
	BMS	Not used
X2 Data	GND	Ground
	+24	+24 VDC supply
	t	Room bus t-cable
	d	Room bus d-cable
	b	Station bus b-cable
	a	Station bus a-cable
X4 Inputs	R-Z	Room call input
	R-W	Not used
	A-W	Not used
	D4 R-B4/S1	Not used
	Dia	Not used
	D1 R-B1/R-Tel	Not used
	D2 R-B2/R-W2	Not used
	D3 R-B3/A-W2	Not used
X3 Outputs	ZL-R	Room call light (red) output (24 VDC/10 W)
	ZL-W	WC call light (white) output (24 VDC/10 W)
	ZL-S	Nurse presence light (green) output (24 VDC/10 W)
	ZL-A	Doctor light output (24 VDC/ 10 W) acoustic alarm or other signal
	BL-R	Room call reassurance light (24 VDC/20 mA)
	BL-B1	Not used
	BL-B2	Not used
	BL-B3	Not used



Room call inputs (R-Z) → Malfunction display

The connectable external call cable (R-Z) can be used for connecting foreign devices. If it was activated in the main menu, this input is level monitored (see following table).

The four possible levels are interpreted differently depending on the application. Levels outside the quiescent or messaging range are signalled as malfunctions:

	Input level			
Input level	Short to GND	3,6 kΩ	1,8 kΩ	Short to +24 VDC
Assignment of the terminal voltage to level range	Less than 8.9 V	8.9 V to less than 13.0 V	13.0 V to less than 18.4 V	18,4 V to 24 V
Room call input R-Z	Malfunction	Quiescent state	Call	Malfunction

An output is available at terminal BL-T to provide acknowledgement of a successfully triggered room call via the R-Z input and, for example, a reassurance lamp (maximum load 24 VDC/20 mA) can be connected to this output.

Display

- Bit malfunction in log is set
- When the nurse presence button is held pressed for longer than 5 s, the cause of the malfunction is shown on the display. If no malfunction exists then the message “No malfunction” is displayed.
- If the nurse presence button is held pressed for longer than 15 s, then a software reset takes place (see software reset section).

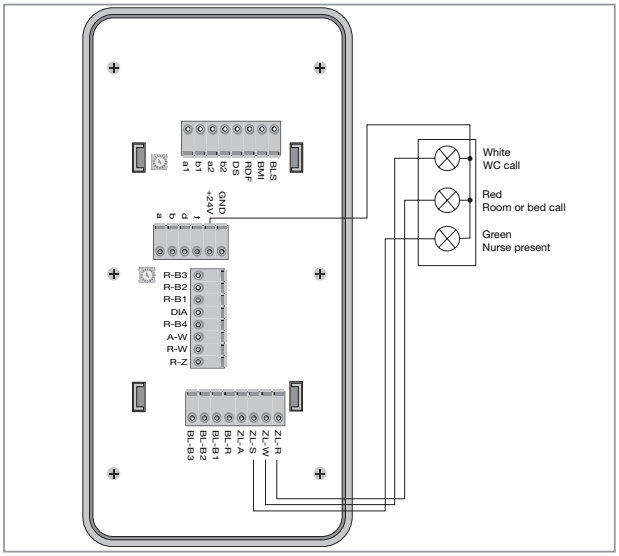
Malfunction cancelling

Correcting malfunctions

Connection of external room signal lights

External room signal lights (e.g. room signal lights, room signal lights with door name plate or other room signal lights) can be connected to the illustrated room module outputs. The outputs can be loaded to a maximum of 10 W (24 VDC/400 mA).

This connection example is intended as a reference case for the many different types of room signal lights and only illustrates the connection principle.



Programming of parameters via the menu

The light call parameters required for a special application can be set in the parameter menu. For example, the function of the buttons on the front panel, the own address (room address), group address and the function of the (call) inputs used. Unused inputs must always be deactivated, otherwise malfunctions will be signalled.

Standby mode/Default parameters

When first commissioning the room module this is set to an address of 0. With this address the room module is in standby mode; a corresponding message blinks on the display and no own messages are sent on the station bus, which means that the room module is not visible to the light call system. The remain values are set according to the information in the table (see following pages). These default values are loaded whenever and address of 0 is set for the room module is or when an EEPROM error is discovered while reading or writing the light call parameters.

Technical changes, errors and printing mistakes excepted

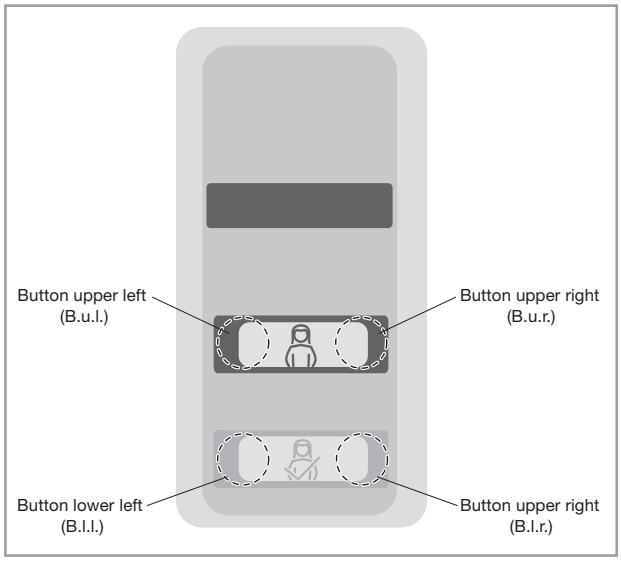
Begin programming

You can see a large green (presence) and a red (call) button surface on the front side. Microswitches are located to the left and right under the coloured surfaces (see figure). No presence markings may be set before the programming process can be started. Call button one (upper right button: B. u. r.) is first pressed and held (!), then call button two (Upper left button: B. u. l.) is pressed and held (!) and then, within 1- 3 s, the presence button (button lower right: B. l. r.) is briefly pressed (for less than 1 s). The call buttons can then be released.

The display appears

MZT4-nn Programmierung

If one of the buttons to be held is accidentally released too soon then the message “Programming cancelled” is displayed.



Function of the buttons in the programming menu

Briefly pressing (and releasing) the cancel button (B. l. r.) brings you to the next programming step. Pressing for longer than approx. 1 s brings you to the previous programming step. The parameter to be set and its current value are displayed. The call buttons (B. u. l.) and (B. u. r.) are used to change the parameters.

The call button (B. u. r.) increases the parameter value or moves forward in a selection list, the call button (B. u. l.) reduces the parameter value or moves backwards in a selection list. Pressing for longer than 1 s causes continuous incrementing of a value or continuous selection through a list.

Ending the programming

If parameters were changed during the programming procedure, after the last programming step the query **“Save new values?”** is displayed.

Briefly pressing the cancel button (B. l. r.) exists the programming procedure **without** saving any changed values.

Simultaneously pressing the call buttons (B. u. l. and B. u. r.) saves the new values in the EEPROM, the room module performs a restart and now runs using the new parameter values. **At this point any pending calls and call requests are deleted.**

The programming procedure can be cancelled at any point without saving any changed values by holding the cancel button (B. l. l.) pressed for 2 s. Programming is also cancelled when nothing is pressed for three minutes.

Light call behaviour while programming

During the programming process, the light call operation of the terminal continues largely unchanged.

Only limitations:

- The internal call button and the presence button are used for programming (devices connected to the room bus continue their normal operation).
- Only acoustic call forwarding takes place, since the display is reserved for the programming process.

All devices connected to the room bus continue their normal operation. After the programming process has begun, nurse presence can also be marked.

Programming menu

No presence may be marked. The parameter query is activated by pressing and holding the call button (B. u. r.) (for at least 1 s) and pressing the cancel button (B. l. r.) at the same time.

In a similar manner to the programming procedure, pressing the call button (B. u. r.) queries the current values of the individual parameters. However, changes cannot be made here.

After displaying the last parameter the message „Cancel programming“ is displayed. The parameter query is also cancelled when no buttons are pressed for 3 minutes or when the cancel button (B. l. l.) is pressed for approx. 1 s. The same limitations as above apply to the light call behaviour.

MZT4-nn
Einstellungen

Menu item	Display text	Values	Comment
	MZT4-nn, Settings		
Programming start	MZT4-nn, Programming		
Language	Language xxxx	German/ Slovene	Default: German
Adress	Adress nnn	0 – 121 (Default: 0)	**Addresses 1 - 99 are possible** 100 - 121 special addresses Address 0: Standby mode
Direction arrow group	Direction arrow group nn	0 – 15 (Default: 0)	Group signal lights connected to the room bus of a room module are always active when a room module with the same direction arrow sends a call.
Speech active	Speech active xxxx	Yes/No	Default: no
Call group number	Call group Room	0 – 15 (Default: 0)	If call groups are not planned, then always set this value to 0. There is call forwarding only in rooms with an identical call group.
Gen. announcement active	Listen to gen. announcements: xxxx	Yes/No	Default: Yes (please do not change) Comment: not used
Doctor call	Doctor functions Active: xxxx	Yes/No	Default: no
Function of internal buttons	Distress call funct. Active: xxxx	Yes/No	Can be selected only when doctor functions are not active
	IntEin R-Z as WC call: xxxx IntEin A-S as WC cancel: xxxx	Yes/No Yes/No	Default: no Can be selected only if R-Z is activated as WC call
	For emergency call cancel Presence on xxxx	Yes/No	Default: no Yes: After an emergency call, the presence button is pressed and the nurse creates the presence status. When leaving the room, she must press the cancel button once more. No: In an emergency call, the presence button is pressed and the nurse cancels the call = Nurse leaves the room.
	Call&ident cancel With A-W: xxxx	Yes/No	Can be selected only if A-S is activated as WC cancel
Nurse call functions	Listen to nurse announcement xxxx	Yes/No	Default: yes
	Cancel R-WC With S pres. xxxx	Yes/No	Default: yes Yes: there is no separate cancel button in the WC No: there is a separate cancel button in the WC
	WC call with pres. as emergency call xxxx	Yes/No	Default: no
	Telephone call active xxxx	Yes/No	Default: no

Technical changes, errors and printing mistakes excepted

Main menu	Display text	Values	Comment
	Telephone call with presence xxxx	Yes/No	Can be selected only when telephone call is actively selected
	Input R_T without noise level xxxx	Yes/<u>No</u>	Default: no
Assignment ext. Inputs	Ext. input call active xxxx	Yes/<u>No</u>	Default: no **Please do not change „no“**
	Input R-Z without noise level xxxx	Yes/<u>No</u>	Default: no **Please do not change „no“**
	Ext. input WC active xxxx	Yes/<u>No</u>	Default: no **Please do not change „no“**
	Ext. input A-W active xxxx	Yes/<u>No</u>	Default: no **Please do not change „no“**
	Ext. input DIA active xxxx Input DIA without noise level xxxx	Yes/<u>No</u> Yes/<u>No</u>	Default: no **Please do not change „no“** Default: no **Please do not change „no“**
	Input D1 as Call bed 1 xxx	<u>Not used</u> Call bed 1 Telephone call	Default: not used **Please do not change „not used“**
	Input D2 as Call bed 2 xxx	<u>Not used</u> Call bed 2 Call WC2	Default: not used **Please do not change „not used“**
	Input D3 as Call bed 3 xxx	<u>Not used</u> Call bed 3 WC2 cancel	Default: not used **Please do not change „not used“**
	Input D4 as Call bed 4 xxx	<u>Not used</u> Call bed 4 Presence S1	Default: not used **Please do not change „not used“**
Acoustic alarm output	Acoustic alarm output ZL-A	Yes/<u>No</u>	Default: no Output for external acoustic alarm/signalling
Special texts (from Version MZT4-23)	Sondertext ab Z-Adr. 100 xxx	Yes/<u>No</u>	Default: no Yes: The texts selected at the appropriate inputs of the SUD and the addresses 50-59 of the SUD are displayed. This affects the addresses 100-119 (inputs) and station address 50-59. For text selection see the „SUD“ description. No: The addresses without texts are displayed.
R-Z input (time-limited detection of contacts present at the room call input)	R-Z activation Start time xxx	00:00	Start time of contact detection Contacts are detected at the input R-Z and displayed as „call“ only in the time between the start and end time, e.g. in night operation when certain areas are not supposed to be entered or when a call is to be triggered upon entering/leaving.
	R-Z activation End time xxx	00:00	End time of contact detection
TV limit / room radio	Beds to TV2 From bed n	1 – 6	Default: 4
	Room radio from bed n	0 – 6	Default: 0 0: No room radio
Final display	Apply new values?		
	Cancel programming		

Important note! Fields with a grey background represent features that are in preparation. To avoid malfunctions, the default values must be left as they are unless a different setting is prescribed.

Call request

As a result of a call query, or for other reasons, it may be necessary for a nurse to visit a room. To do this, after the query (room based) or conversation with the patient (room-wise intercom) the call is ended at the room/duty room module with display not via the off button but rather via the nurse request button. As a result, the green presence light in the room signal light belonging to the room and also in the group signal lights (if present) and also the green reminder LED in the call/cancel button of the corresponding room all blink until the call is answered.
The display on corridor displays is separately described in the section on corridor displays. The call request is cancelled by setting the respective presence in the room.
Note! Call requests can only be set via the room/duty room module with display.

Software reset

Triggered by:
- Changing of parameters in the menu after confirming adoption of the new values.
- Pressing the cancel button (T. u. l.) for longer than 15 s.

Consequences
The room module performs a restart. All previous call, presence and call request information is deleted. The number of existing devices is re-learnt.

Behaviour after a power cut

When power is switched on again, the room module remains in standby mode for the first 5 s. After this waiting time, in which the operating voltage stabilises, the room module begins normal operation and the calls that existed before the operating voltage was switched off are once again sent or displayed. New calls cannot be set during the first 5 s after switching on the operating voltage.

Technical data

General	
Temperature range	0 – 50 °C
Maximum current consumption (without connected external consumers such as room signal lights)	120 mA
Data preservation (device settings) after a power failure	10 years
Acoustic alarm loudness at 2 m	52 dBA (+/- 6 dBA)
Acoustic alarm frequency	600 Hz
Operating voltage (under load)	24 V (22 – 26 VDC tolerance)
Quiescent current consumption (all lights and LEDs off)	80 mA (+/- 10 mA tolerance)
Speech level on the wires a1/b1	1 V_{eff}
Speech level on the wires a2/b2	1 V_{eff}
Fine-wire fuse in distributor	0.25 A/250 V slow-blow
Degree of protection IP 20	
Interfaces	
Station bus a/b	4800 baud
Room bus d/t B)	2400 baud
Outputs	
4 light outputs (ZL-x), short circuit protected at 24 VDC	400 mA per output
4 reassurance lights (BL-x), short circuit protected at 24 VDC	20 mA per output
1 output for PA loudspeaker at 24 VDC	0.5 W
Button inputs	
Quiescent current monitored button inputs	8
Termination resistor to +24 V for quiescent level	3.6 kΩ (+/- 10% tolerance)
Termination resistor to +24 V for message level	1.8 kΩ (+/- 10% tolerance)

For calculating the quantity and capacity of the power supplies, the maximum current consumption of all devices connected to the power supply (room module, lights, call button, presence/cancel button, pull switch, peripheral devices, ...) must be added together.

The cable lengths must also be taken into account. Care must be taken to ensure that the supply voltage lies within the defined tolerances at all devices.

Technical changes, errors and printing mistakes excepted

Room module with call/cancel button

No. 735030

General notes

The room module represents the interface between the station bus and the room bus with all the connected devices. All events in the room are acquired by the room module and sent to the station bus so that this information is available to the entire station. The room number and all other important room information sent on the station bus by the room module are set at the room module. Room modules with the same address must never be connected to the station bus. Special care must therefore be taken when setting the room module addresses.

Warning, lethal danger!
The safety regulations of the DIN VDE 0105 standard must be followed. Only qualified electrical personnel may work on the devices. Always follow the state-specific regulations and guidelines. Failure to observe this can result in a danger of fire, electric shock or destruction of the device. In the case of 230 V cables in the vicinity, the applicable standards and guidelines relating to cable clearances must be noted and observed.

DIP switch and programming

DIP switch S 1

No. 1-4 Group signal lights: All room modules with the same group address set here = binary number (0 – 15) form a range with the same collective display on the group signal lights. The group signal lights must be connected to the room bus. The settings are performed in the same way as the room address.

If groups are not to be used, then the DIP switches should be left in the factory settings = address 0 (1 – 4 set ON).

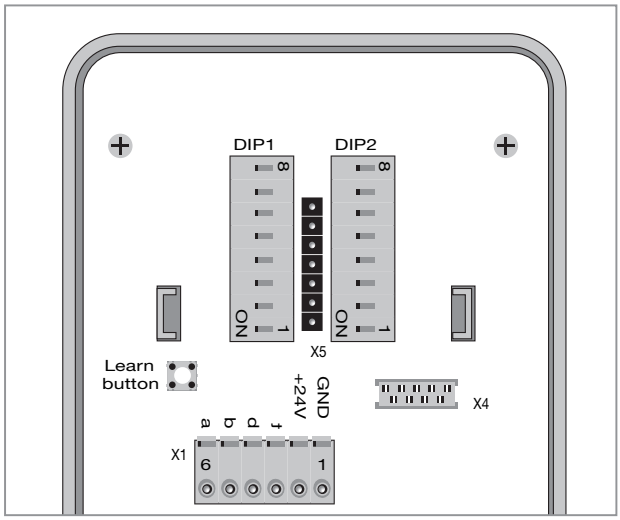
No. 5 ON: WC call cancel only possible via WC cancel button (factory setting)
OFF : also via the nurse presence button

Recommendation: OFF position

No. 6 Deletion of the call request
ON: Deletion of the call request is only possible via the nurse presence/cancel button **(factory setting)**
OFF : The call request can be deleted via the nurse presence/cancel button and also the WC cancel button.

No. 7 Not used
ON: **Factory setting, please do not change**

No. 8 Not used
ON: **Factory setting, please do not change**



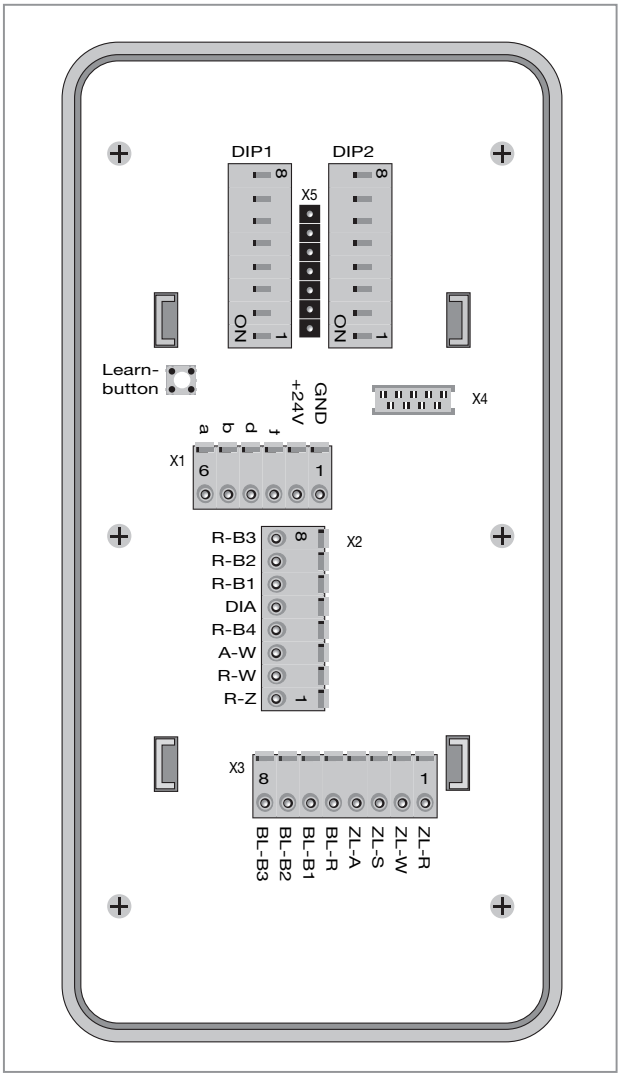
DIP switch S 2

No. 1-7 Address of the room module on the station bus (factory setting 1 – 7 = ON)
Binary number from 0 – 127 (1 ≙ 2^0 ..... 7 ≙ 2^6),
ON=0, OFF=1 **(for DIP switch table see page 95)**
Only addresses 0 – 99 are available per room.

No. 8 Not used
ON: **Factory setting, please do not change**

Overview of room module terminal assignments

Terminal	Pin	Function	Description
X1 Data	1	GND	Ground
	2	+24	+24 VDC supply
	3	t	Room bus t-cable
	4	d	Room bus d-cable
	5	b	Station bus b-cable
	6	a	Station bus a-cable
X2 Inputs	1	R-Z	Room call input
	2	R-W	Not used
	3	A-W	Not used
	4	S1	Not used
	5	Dia	Not used
	6	R-B1	Not used
	7	R-B2	Not used
	8	R-B3	Not used
X3 Outputs	1	ZL-R	Room call light (red) output (24 VDC/10 W)
	2	ZL-W	WC call light (white) output (24 VDC/10 W)
	3	ZL-S	Nurse presence light (green) output (24 VDC/10 W)
	4	ZL-A	Doctor light output (24 VDC/10 W) acoustic alarm or other signal
	5	BL-R	Room call reassurance lamp (24 VDC/20 mA)
	6	BL-B1	Not used
	7	BL-B2	Not used
	8	BL-B3	Not used



Level evaluation of the inputs

The connectable external call cable (R-Z) can be used for connecting foreign devices. This input is level monitored (see following table).

The four possible levels are interpreted differently depending on the application. Levels outside the quiescent or messaging range are signalled as malfunctions:

	Input level			
Input function	Short to GND	3.6 kΩ	1.8 kΩ	+24 V
Assignment of the terminal voltage to level range	Less than 8.9 V	8.9 V to less than 13.0 V	13.0 V to less than 18.4 V	18.4 V to 24 V
R-Z	Malfunction	Quiescent state	Call	Malfunction
* Without noise level	Quiescent state	Quiescent state	Call	Call

An output is available at terminal BL-R to provide acknowledgement of a successfully triggered room call via the R-Z input and, for example, a reassurance lamp (maximum load 24 VDC/20 mA) can be connected to this output.

Learning the inputs

Unconnected or unterminated call inputs generate a malfunction message. Unused input functions must therefore be deactivated. Double-pressing the „Learn“ button (two button presses within 0.5 s) causes the current state of the call inputs to be evaluated: Input functions with a „Null“ level are then deactivated*, only the inputs with a level unequal to the lowest level range remain active. This current state is saved in EEPROM and remains valid until the next learn procedure is started.

*Exceptions
The R-Z input function is not deactivated when a „Null“ level is present but rather operated without cable monitoring (alternative level evaluation „Without noise level“). After „Learning“ the used inputs the room module with call/cancel button performs a restart. All previous call, presence and call request information is deleted. The devices connected to the room bus are re-learnt.

Replacing a room module for servicing purposes

The connection terminals are pluggable to make replacement of a room module easier. Once power has been removed from the room module, and this has been pulled from the supporting ring, the terminal strips can be pulled from the pin strips.

Extreme care should be taken when doing this: The high contact forces present a danger of bending or damaging the pins.

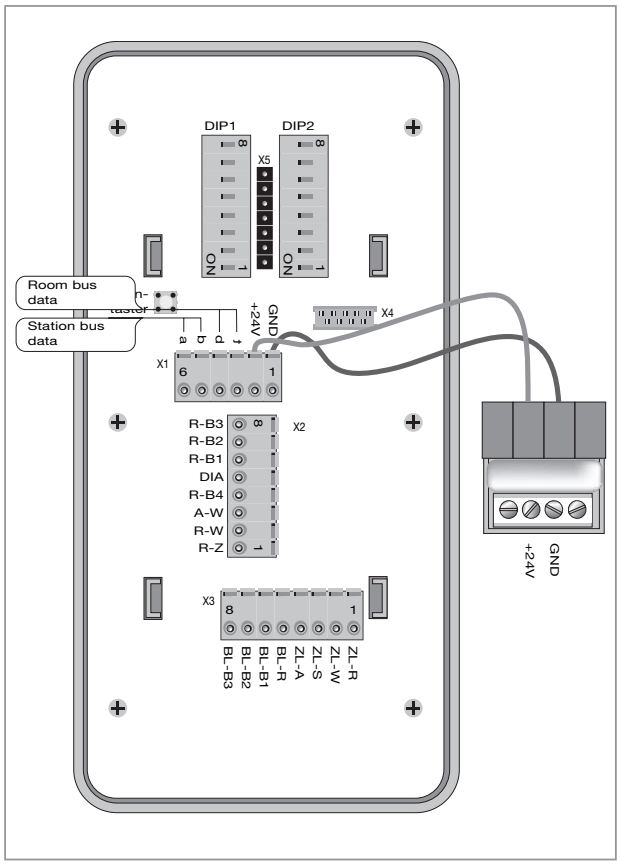
Room bus connection

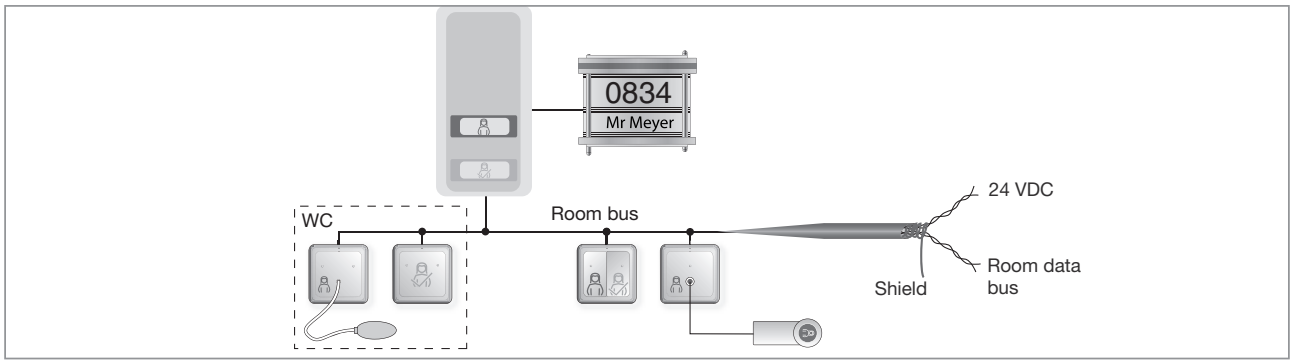
All components in the room are to be connected to the room bus. It is essential to ensure that the conductors („t“, „d“, „+24VDC“ and „GND“) are not swapped.

Connection can take place via a room bus in a star formation or a mixed formation.

The cable length (sum of all cables) must not exceed **100 m**.

A cable of type: JY (St) Y 2x2x0.8 must be used for the room bus. The shield must be connected to each of the GND terminals. To avoid short circuits at the device, the shield must be insulated.



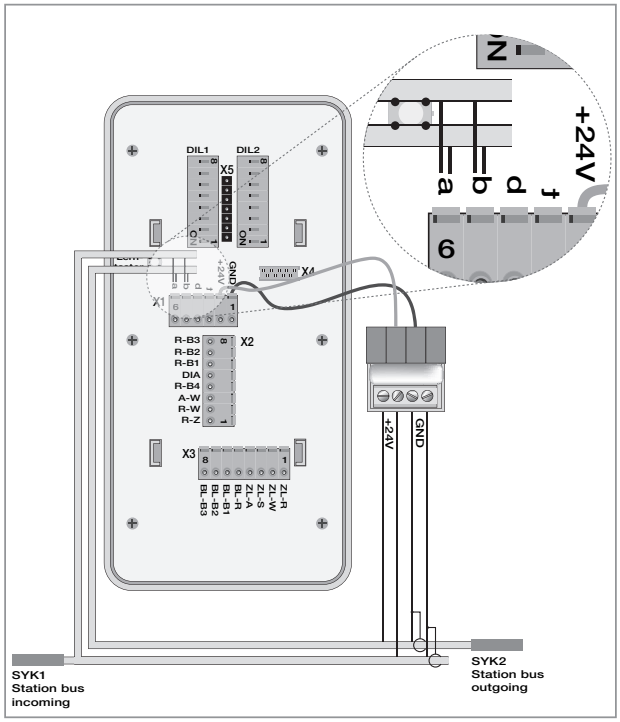


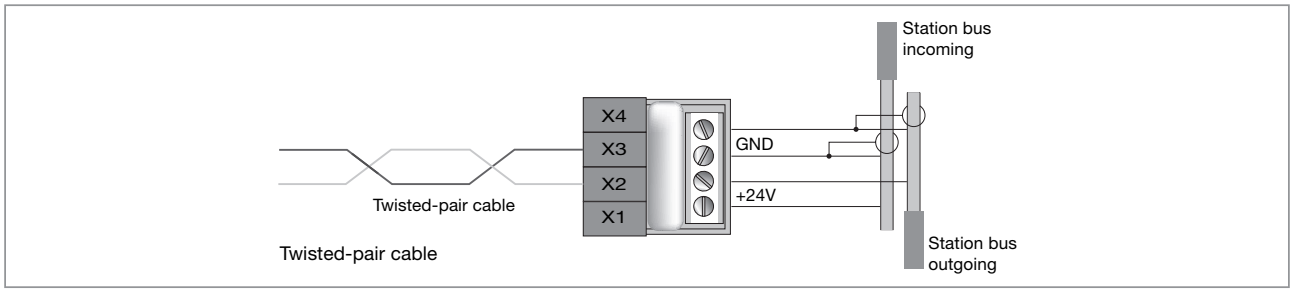
Station bus connection

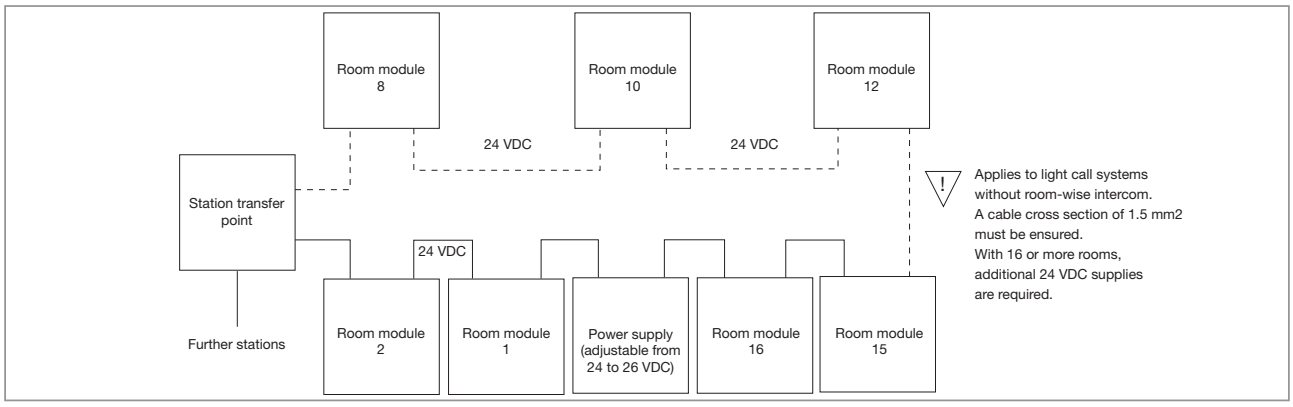
All the room modules for the station must be connected to the station bus. Stub cables are to be avoided. The station bus should be laid as a ring cable. ELSO GmbH recommends closing the ring. This results in double data reliability. Please make absolutely sure that the conductors („a“, „b“, „+24VDC“ and „GND“) are not swapped. For the station bus, a cable (subsequently referred to as SYK=system cable) of type: Lapp Kabel UNITRONIC Bus Combi EIB 2x2x0.8 + 3x1.5, or equivalent quality, must be used. The shield must be connected to each of the GND terminals. To avoid short circuits at the device, the shield must be insulated.

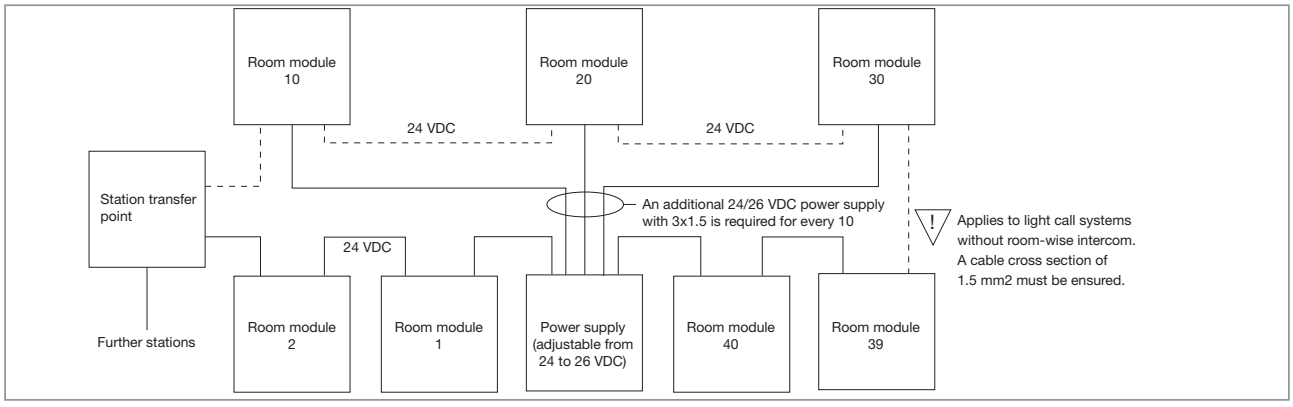
The data cables must not exceed a length of **500 m**.

For applications using a system cable (SYK) a distribution box (see distribution box figure) is required. This is provided with delivery (-> Terminals with connection cable and fuse -> fine-wire fuse 250V / 0.25 A slow-blow). The power supply cables of the SYK are connected to the +24 V and GND distribution box terminals. The red output cable of the distributor is connected to X1/Pin2 (+24 V), the blue to X1/Pin1 (GND). The supplied system cable 2x2x0.8 must be used for connecting to the station bus.









Malfunction display

Malfunctions are displayed at the station transfer point and, if activated, the duty room module. Malfunctions are displayed when the inputs have not been deactivated via the learn button or are not terminated with a 3.6 kΩ termination resistor. Another possible cause of a malfunction message is a faulty or unlearned device on the room bus.

Display

Bit fault set in log -> Shown on the station transfer point/duty room module display.

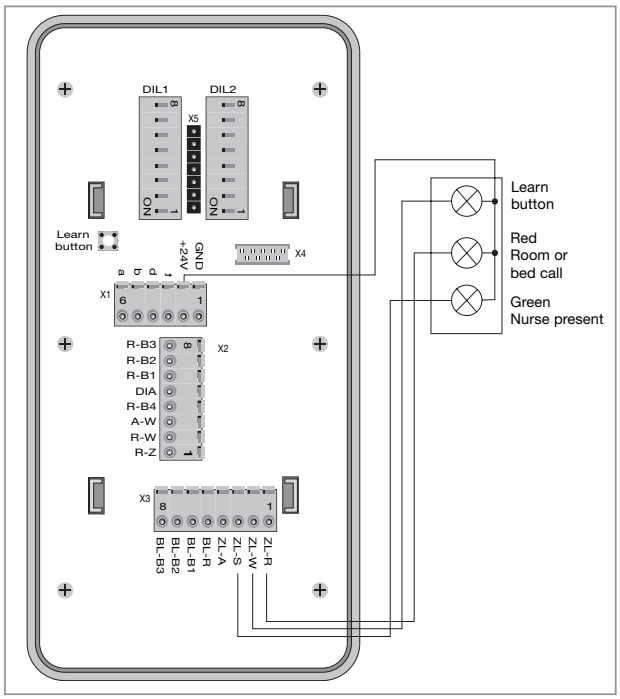
Malfunction cancelling

Correct malfunction -> check and establish the required level at the input -> Press the learn button to deactivate inputs or swap faulty devices on the room bus.

Connection of external room signal lights

External room signal lights (e.g. room signal lights, room signal lights with door name plate or other room signal lights) can be connected to the illustrated room module outputs. The outputs can be loaded to a maximum of 10 W (24 VDC/400 mA).

This connection example is intended as a reference case for the many different types of room signal lights and only illustrates the connection principle.



Call request

As a result of a call query, or for other reasons, it may be necessary for a nurse to visit a room. To do this, after the query (room based) or conversation with the patient (room-wise intercom) the call is ended at the room/duty room module with display not via the off button but rather via the nurse request button. As a result of this, the green presence light in the room signal light associated with the room and in the group signal lights (if present) **blink until the call is answered**, as well as the green reminder LED in the call/cancel button of the corresponding room. The display on corridor displays is separately described in the section on corridor displays. The call request is cancelled by setting the respective presence in the room.

Note! Call requests can only be set via the room/duty room module with display.

Software reset

Trigger

Changing of the DIP switch settings
Double-pressing the „Learn“ button

Consequences

The room module performs a restart. All previous call, presence and call request information is deleted. The number of existing devices is re-learnt.

System monitoring

The room modules automatically recognise all devices connected to the room bus. The devices connected to the room bus are constantly monitored. If a device does not answer, then this is shown as a malfunction (S), with the room number, on the display of the station transfer point (No. 735200) and the duty room module (No. 735000).
Example: S24 (Malfunction in room 24)

Display

Bit fault set in log -> Shown on the station transfer point/duty room module display.

The room modules are monitored by the station transfer point. If a room module does not answer, then this is shown as a drop-out (A) on the display of the station transfer point (No. 735200) and the duty room module (No. 735000) when presence is set.
Example: A24 (Dropout in room 24)

Behaviour after a power cut

When power is switched on again, the room module remains in standby mode for the first 5 s. After this waiting time, in which the operating voltage stabilises, the room module begins normal operation and the calls that existed before the operating voltage was switched off are once again sent or displayed. New calls cannot be set during the first 5 s after switching on the operating voltage.

Technical data

General values	
Temperature range	0 – 50 °C
Maximum current consumption (without connected external consumers such as room signal lights)	100 mA
Data preservation (device settings) after a power failure	10 years
Acoustic alarm loudness at 2 m	52 dbA (+/- 6 dbA)
Acoustic alarm frequency	600 Hz
Operating voltage (under load)	24 V (22 – 26 VDC tolerance)
Quiescent current consumption (all lights and LEDs off)	70 mA (+/- 10 mA tolerance)
Fine-wire fuse in distributor	0.25 A/250 V slow-blow
Degree of protection IP 20	

Interfaces	
Station bus a/b	4800 Baud
Room bus d/t B)	2400 Baud

Outputs	
4 light outputs (ZL-x), short circuit protected at 24 VDC	400 mA per output
4 reassurance lights (BL-x), short circuit protected at 24 VDC	20 mA per output

Button inputs	
Quiescent current monitored button inputs	8
Termination resistor to +24 for quiescent level	3.6 kΩ (+/- 10 % tolerance)
Termination resistor to +24 for message level	1.8 kΩ (+/- 10 % tolerance)

For calculating the quantity and capacity of the power supplies, the maximum current consumption of all devices connected to the power supply (room modules, lights, call button, presence/cancel button, pull switch, peripheral devices, ...) must be added together.

The cable lengths must also be taken into account. Care must be taken to ensure that the supply voltage lies within the defined tolerances at all devices.

Room module with room signal light

No. 735040

General notes

The room module represents the interface between the station bus and the room bus with all the connected devices. All events in the room are acquired by the room module and sent to the station bus so that this information is available to the entire station. The room number and all other important room information sent on the station bus by the room module are set at the room module. Room modules with the same address must never be connected to the station bus. Special care must therefore be taken when setting the room module addresses.

Warning, lethal danger!
The safety regulations of the DIN VDE 0105 standard must be followed. Only qualified electrical personnel may work on the devices. Always follow the state-specific regulations and guidelines. Failure to observe this can result in a danger of fire, electric shock or destruction of the device. In the case of 230 V cables in the vicinity, the applicable standards and guidelines relating to cable clearances must be noted and observed.

DIP switch and jumpers

Position of jumper X4

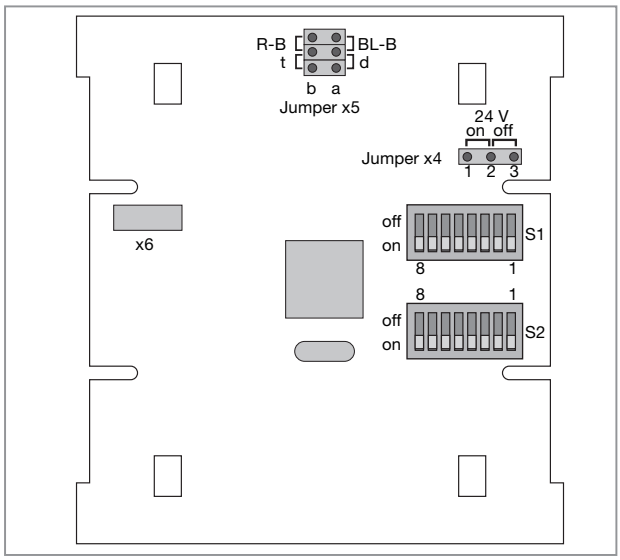
Left „ON“: (factory setting)
24 Volt supply switched on

Right „OFF“:
24 Volt supply for the room module and the entire room installation is switched off. This should always be switched over for servicing / de-installation purposes.

Settings for jumpers X5a and X5b

Down: Factory setting:
The two jumpers must connect terminals BL-B/d and R-B/t in order to connect devices via the room bus.

Up:
This jumper setting must not be selected -> Malfunction!



DIP switch S 1

No. 1 – 7 Address of the room module on the station bus (factory setting 1 – 7 = ON)
Binary number from 0 – 127 (1 ≙ 2^0 ..... 7 ≙ 2^6),
ON=0, OFF=1 **(for DIP switch table see page 95)**
Only addresses 0 – 99 are available per room.

No. 8 Not used
ON: **Factory setting, please do not change**

DIP switch S 2

No. 1 – 4 Group signal lights: All room modules with the same group address set here = binary number (0 – 15) form a range with the same collective display on the group signal lights. The group signal lights must be connected to the room bus. The settings are performed in the same way as the room address (see table on last page).

If groups are not to be used, then the DIP switches should be left in the factory settings = address 0 (1 – 4 set ON).

No. 5 if WC call function, No. 7=ON: WC call cancel
- ON: WC call cancel only possible via WC cancel button **(factory setting)**
- OFF : also via the nurse presence button

No. 6 if WC call function, No. 7=ON: -> Deletion of the call request
- ON: Deletion of the call request is only possible via the nurse presence/cancel button **(factory setting)**
- OFF : The call request can be deleted via the nurse presence/cancel button and also the WC cancel button. **Recommendation: OFF position**

No. 7 ON: WC call function on -> this switch position must be chosen **(factory setting)**
OFF : Not used

No. 8 Not used
ON: **Factory setting, please do not change**

Room module as group signal light -> Collective station display

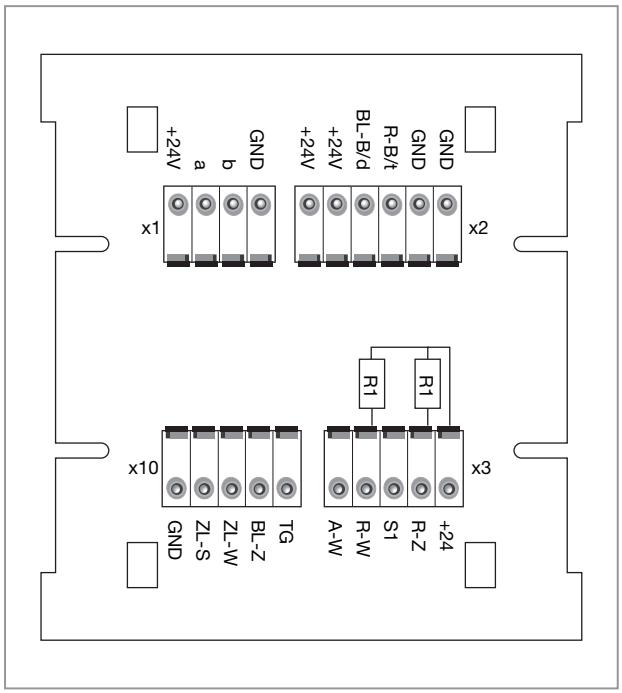
With the following settings the room module with room signal light functions as a group signal light that displays **all** calls for the **entire** station, regardless of which group addresses have been defined in the individual room modules.
1. The room address must be set to „0“ (DIP switch S1: No. 1 to 7 set to ON) -> No own protocol is generated on the station bus
2. Set the group address to „15“ (DIP switch S2: No. 1 to 4 set to OFF)

This DIP switch setting turns the room module into a station display. The most important call at the station is displayed at the room module. The output at terminal X10-1 is active. An acoustic alarm (maximum of 3 W) can be connected here.

If multiple groups are to be formed at the station, then proceed according to the description of DIP switch S2 (No. 1 – 4).

Overview of room module terminal assignments

Terminal	Pin	Function
X1 Station bus	1	+24 V
	2	a (data „a“ station bus)
	3	b (data „b“ station bus)
	4	GND
X2 Room bus	1	+24 V
	2	+24 V
	3	d, data room bus (terminal designation: BL-B/d)
	4	t, clock room bus (terminal designation: R-B/t)
	5	GND
	6	GND
X3 Inputs	1	+24 V
	2	R-Z, room call
	3	S1 not used
	4	R-W, not used
	5	A-W, not used
X10 Outputs	1	TG acoustic alarm, call forwarding
	2	BL-R, not used
	3	ZL-W, (white) WC call
	4	ZL-S, (green) nurse
	5	GND



Technical changes, errors and printing mistakes excepted

For quiescent current monitoring, all external call inputs (R-Z and R-W) must be terminated with a 3.6 kΩ termination resistor. **This terminator is installed at the factory and must not be removed.**

> **Important note!**
> Fields with a grey background represent features that are in preparation. To avoid malfunctions, these terminals must not be connected.

Level evaluation of the inputs

	Input level			
Input function	Short to GND	3.6 kΩ	1.8 kΩ	+24 V
Assignment of the terminal voltage to level range	Less than 8.9 V	8.9 V to less than 13.0 V	13.0 V to less than 18.4 V	18.4 V to 24 V
R-Z	Malfunction	Quiescent state	Call	Malfunction

Connection of external call buttons or contacts

For quiescent current monitoring of the call cables, all external call inputs must be terminated with a termination resistor having a value of 3.6 kΩ.

This termination resistor is installed at the factory and must not be removed.

Connection of unused call inputs

The unused external call inputs (R-Z, R-W) **must** be terminated using a 3.6 kΩ termination resistor to +24 V. If this is not done, then a malfunction message occurs.

This termination resistor is installed at the factory and must not be removed.

Malfunctions
The levels of the external call input are monitored (see table). Levels outside the quiescent or messaging range are signalled as malfunctions.

Display
Bit fault set in log -> Shown on the station transfer point/duty room module display

Malfunction cancelling
Correct malfunction -> Check and set the required input level -> Insert the resistor

Soft reset

Trigger
Changing the DIP switch (every switch position on every DIP switch)

Consequences
The room module performs a restart. All previous call, presence and call request information is deleted. The devices connected to the room bus are re-learnt.

System monitoring

The room modules automatically recognise all devices connected to the room bus. The devices connected to the room bus are constantly monitored. If a device does not answer, then this is shown as a malfunction (S), with the room number, on the display of the station transfer point (No. 735200) and the duty room module (No. 735000).
Example: S24 (Malfunction in room 24)

The room modules are monitored by the station transfer point. If a room module does not answer, then this is shown as a dropout (A) on the display of the station transfer point (No. 735200) and the duty room module (No. 735000).
Example: A24 (Dropout in room 24)

Replacing a room module for servicing purposes

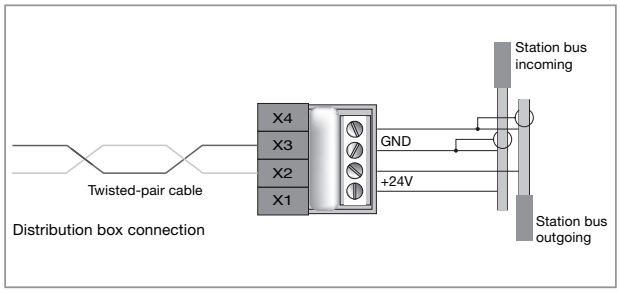
The power supply of the room module is interrupted by pull out the jumper at X4 (jumper can be parked to the right of X4). Once power has been removed from the module and the light chamber platform has been removed, the electronics can be removed from the mounting and the four pluggable terminal blocks on the rear side of the circuit board can be pulled from the pin strips. Extreme care must be taken when doing this: The high contact forces present a danger of bending or damaging the pins.

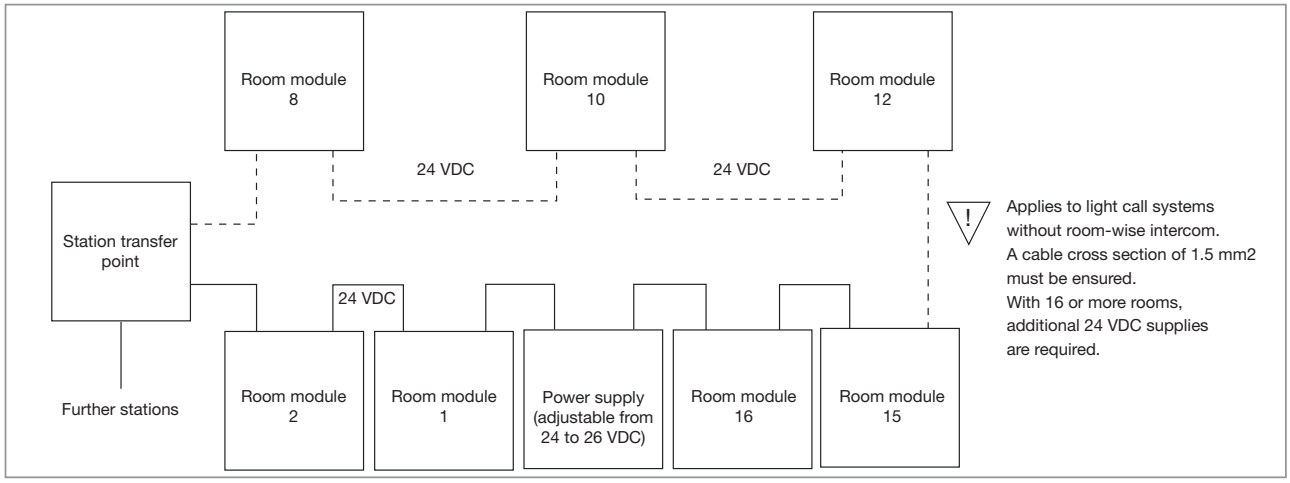
Station bus connection

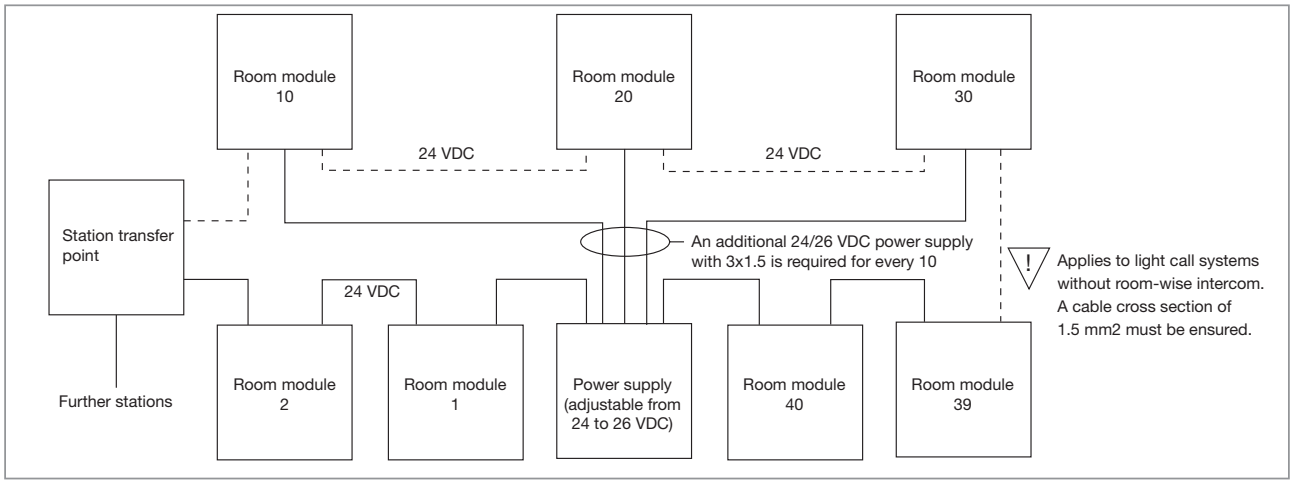
All the room modules for the station must be connected to the station bus. Stub cables are to be avoided. The station bus should be laid as a ring cable. ELSO GmbH recommends closing the ring. This results in double data reliability. Please make absolutely sure that the conductors („a“, „b“, „+24VDC“ and „GND“) are not swapped.

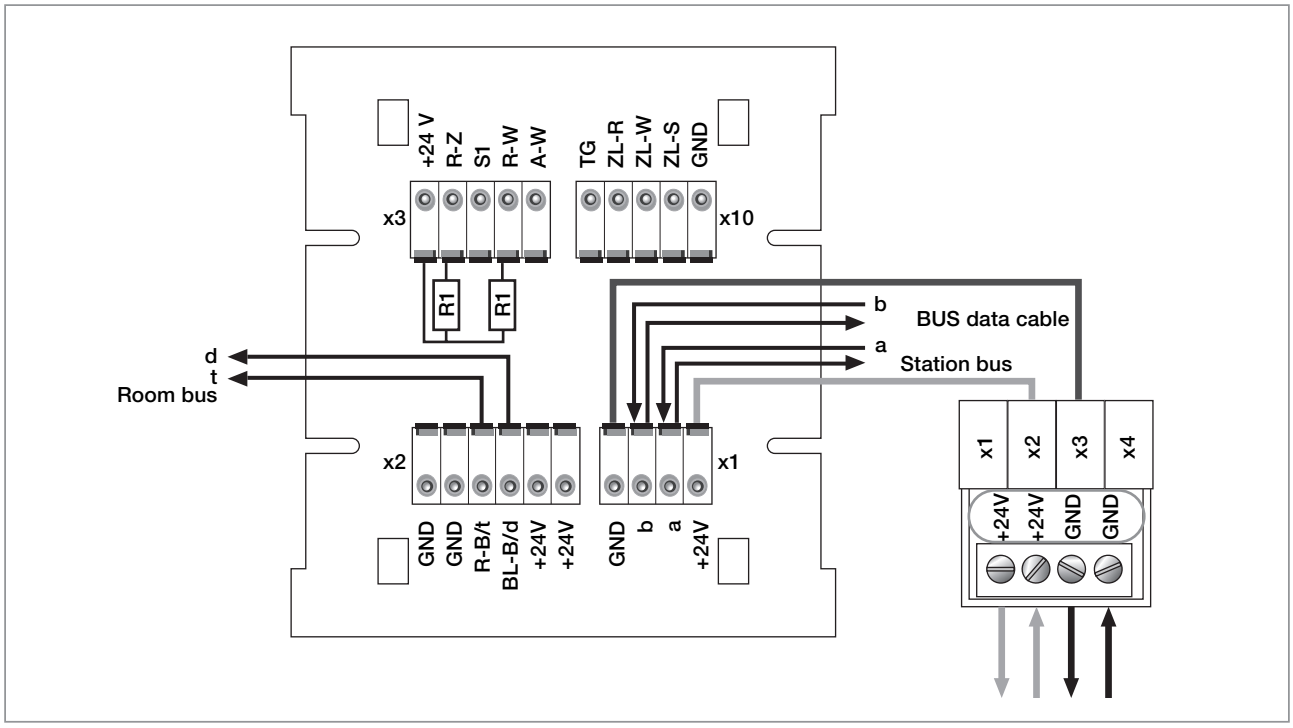
For the station bus, a cable (subsequently referred to as SYK=system cable) of type: Lapp Kabel UNITRONIC Bus Combi EIB 2x2x0.8 + 3x1.5, or equivalent quality, must be used. The shield must be connected to each of the GND terminals. To avoid short circuits at the device, the shield must be insulated. The data cables must not exceed a length of **500 m**.

For applications using a system cable (SYK) a distribution box (see figure) is required. This is provided with delivery (-> Terminals with connection cable and fuse -> fine-wire fuse 250V / 0.25 A slow-blow). The power supply cables of the SYK are connected to the +24 V and GND distribution box terminals. The red output cable of the distribution box is connected to X1/ Pin1 (+24 V), the blue to X1/Pin4 (GND). The supplied 2x2x0.8 cables are to be used for connecting to the station bus.









Room bus connection

All light call system devices in a room are connected to the room bus. The room bus has 4 conductors -> Terminal strip X2.

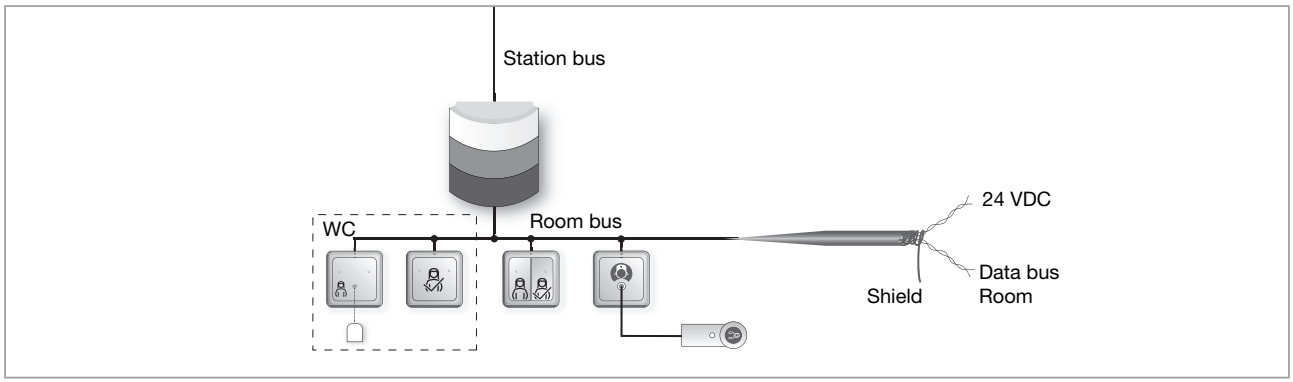
	“d” = data	**= “BL-B/d”**
„t“	**= clock**	**= „R-B/t“**
„+24“	**= +24 VDC**	**= „+24V“**
„GND“	**= Ground**	**= „GND“**

These 4 conductors are to be connected to the terminals of the same designation on the room module (terminal strip X2) in exactly the manner shown here.

The room bus can be connected in a star formation or a mixed formation. The cable length (sum of all cables) must not exceed **100 m**.

A cable of type: JY (St) Y 2x2x0.8 must be used for the room bus.

The shield is to be connected to the GND terminal of the room module. To avoid short circuits at the device, the shield must be insulated.

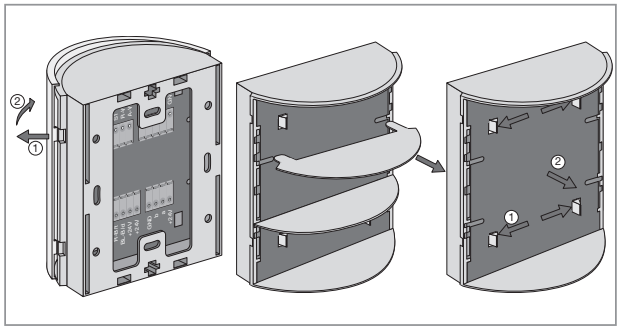


Behaviour after a power cut

When power is switched on again, the room module remains in standby mode for the first 5 s. After this waiting time, in which the operating voltage stabilises, the room module begins normal operation and the calls that existed before the operating voltage was switched off are once again sent or displayed. New calls cannot be set during the first 5 s after switching on the operating voltage.

Installation of room signal light

The room module with room signal light is supplied as a complete device. The room module must be dismantled for installation on a wall or in a socket and then reassembled after fastening. Installation: Screw the room signal light mounting onto the wall/into the socket. Plug the terminal blocks onto the pin strips on the circuit board and click the board into the lower part. Pay attention to the correct mounting direction of the board. Plug in the two light chamber platforms and plug the jumper into the ON position (see illustration at the start of this component description). The cover must be plugged onto the lower part.



Call request

As a result of a call query, or for other reasons, it may be necessary for a nurse to visit a room. To do this, after the query (room based) or conversation with the patient (room-wise intercom) the call is ended at the room/duty room module with display not via the off button but rather via the nurse request button. As a result, the green presence lamp in the room signal light of the associated room **blinks** until the call has been completed and also the group signal lights (if present) and also the green reminder LED in the call/cancel button of the corresponding room. The display on corridor displays is separately described in the section on corridor displays. The call request is cancelled by setting the respective presence in the room.

Note! Call requests can only be set via the room/duty room module with display.

Technical data

General values	
Temperature range	0 – 50 °C
Data preservation after power failure	10 years
Operating voltage (under load)	24 V (22 – 26 VDC tolerance)
Quiescent current consumption (all lights and LEDs off)	55 mA (+/- 10 mA tolerance)
Additional power requirement on quiescent current termination of all inputs	18 mA (+/- 10% tolerance)
Power requirement of an LED unit	40 mA (+/- 5% tolerance)
Fine-wire fuse in distributor	0.25 A/250 V slow-blow
Degree of protection	IP 20

Interfaces	
Station bus a/b	4800 baud
Room bus d/t B	2400 baud

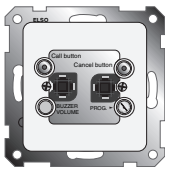
Outputs	
4 outputs for room and reassurance lights, short circuit protected	125 mA
1 output for acoustic alarm	125 mA

Inputs	
Button inputs (some quiescent current monitored)	4
Termination resistor to +24 V for quiescent level	3.6 kΩ (+/- 10% tolerance)
Termination resistor to +24 V for message level	1.8 kΩ (+/- 10% tolerance)

For calculating the quantity and capacity of the power supplies, the maximum current consumption of all devices connected to the power supply (room modules, lights, call button, presence/cancel button, pull switch, peripheral devices, ...) must be added together.

The cable lengths must also be taken into account. Care must be taken to ensure that the supply voltage lies within the defined tolerances at all devices.

Call/Presence/Cancel button insert



No. 735070

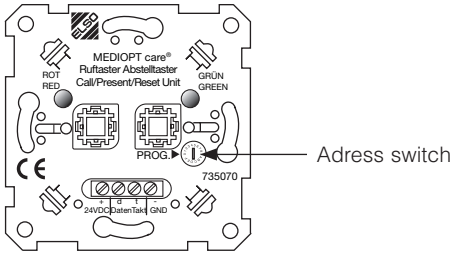
For ELSO FASHION/SCALA/RIVA/NOVIA

General notes

Each presence/cancel button can be assigned a maximum of one room number or be connected to a single room module. This is connected directly to the appropriate terminals of the room module or the room bus cables. Every presence/cancel button is assigned its own button number in the corresponding room (see following table). This button number defines the call type as a room call or WC call or activates/deactivates the acoustic call forwarding.

Warning, lethal danger!
The safety regulations of the DIN VDE 0105 standard must be followed. Only qualified electrical personnel may work on the devices. Always follow the state-specific regulations and guidelines. Failure to observe this can result in a danger of fire, electric shock or destruction of the device. In the case of 230 V cables in the vicinity, the applicable standards and guidelines relating to cable clearances must be noted and observed.

Connection notes:
- Diameter of conductors to be used: 0.8 mm
- The connections “d” = data and “t” = clock must never be swapped. This causes all devices in the room to malfunction. The same applies to the power cables.
- Protection type: IP 20



Address table

Address	Function
0	Room call 1 and presence S1 - 1 + acoustic call forwarding
1	Room call 2 and presence S1 - 2
2	Room call 3 and presence S1 - 3
3	Room call 4 and presence S1 - 4
4	Room call 5 and presence S1 - 5
5	Room call 6 and presence S1 - 6
6	
7	WC call 1 with cancel
8	WC call 2 with cancel
9	WC call 3 with cancel
A	WC call 4 with cancel
B	
C	
D	
E	

Programming is not required, only the address switch must be set. If the presence/cancel button is to be used for acoustic call forwarding then the address switch must be set to an address of „0“ (factory setting) and never changed. **This setting must be made at least once for each room in order to conform to the requirements of the DIN VDE 0834 standard.**

The address of the address switch must point to the arrow printed on the metal plate. The buttons must never be assigned duplicate addresses. In other words, the address „WC call cancel 1“ must only be assigned once per room. This also applies to all other cases. Failure to do this will result in system malfunctions.

All calls are summarised as a collective message for forwarding. The reassurance light only illuminates at the device from which the call was triggered.

All presence markings are summarised as a collective message for forwarding. The display of the presence occurs at all buttons simultaneously in parallel (when installed on a per-bed basis).

All presence buttons in a room have the same priority. That is, you can mark your presence in a room using one presence button and, when present, finally cancel the call from another presence button in the room. The WC call cancel simultaneously affects all triggered WC calls for the room. The acoustic alarm is only activated for devices having an address of 0. Adjustment/Setting of the address switch is indicated by blinking LEDs. The call/cancel button is only ready for operation when the LEDs no longer blink.

Collective message

Events of the same type (room call, bed call from bed 1, bed call from bed 2 etc..) are indicated as one event on the display, even multiple buttons were activated.
Example: Room 24 has 3 call buttons set to room call 1, room call 2 and room call 3. All 3 buttons are actuated. „Call room 24“ is shown on the display.

Room bus connection

All light call system devices in a room are connected to the room bus. The room bus has 4 conductors:

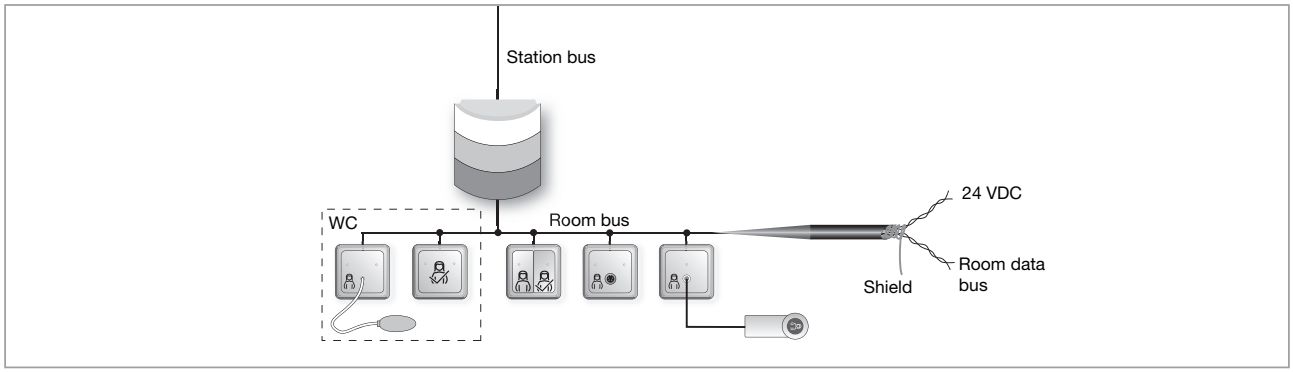
„d“ = data
„t“ = clock
„+24“ = +24 VDC
„GND“ = Ground

These 4 conductors are to be connected to the terminals of the same designation on the room module (different versions possible) in exactly the manner shown here.

The room bus can be connected in a star formation or a mixed formation. The cable length (sum of all cables) must not exceed **100 m**. A decisive factor is ensuring the provision of the required power supply.

A cable of type: JY (St) Y 2x2x0.8 must be used for the room bus.

The shield is to be connected to the GND terminal of the respective room module. To avoid short circuits at the device, the shield must be insulated.



Technical data

General values	
Power supply	24 VDC ±10 %
Current consumption	35 mA
Degree of protection	IP 20

For calculating the quantity and capacity of the power supplies, the maximum current consumption of all devices connected to the power supply (room module, lights, call button, presence/cancel button, pull switch, peripheral devices, ...) must be added together.

The cable lengths must also be taken into account. Care must be taken to ensure that the supply voltage lies within the defined tolerances at all devices.

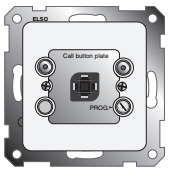
Planning aids/Rules for room installation

Notes and the corresponding tables are provided starting at page 96 of the technical appendix.

Presence/Cancel button insert

No. 735080

For ELSO FASHION/SCALA/RIVA/NOVIA

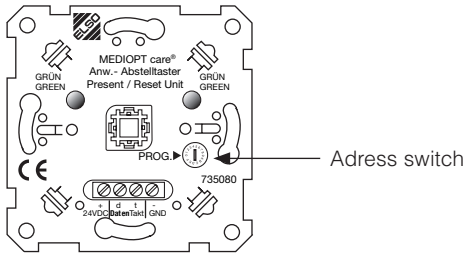


General notes

Each presence/cancel button can be assigned a maximum of one room number or be connected to a single room module. This is connected directly to the appropriate terminals of the room module or the room bus cables. Every presence/cancel button is assigned its own button number in the corresponding room (see following table). This button number defined the presence/call cancelling and activates/deactivates the acoustic call forwarding.

Warning, lethal danger!
The safety regulations of the DIN VDE 0105 standard must be followed. Only qualified electrical personnel may work on the devices. Always follow the state-specific regulations and guidelines. Failure to observe this can result in a danger of fire, electric shock or destruction of the device. In the case of 230 V cables in the vicinity, the applicable standards and guidelines relating to cable clearances must be noted and observed.

Connection notes:
- Diameter of conductors to be used: 0.8 mm
- The connections “d” = data and “t” = clock must never be swapped. This causes all devices in the room to malfunction. The same applies to the power cables.
- Protection type: IP 20



Address table

Address	Function
0	Presence S1 - 1 + acoustic call forwarding
1	Presence S1 - 2
2	Presence S1 - 3
3	Presence S1 - 4
4	Presence S1 - 5
5	Presence S1 - 6
6	Presence S1 - 7
7	
8	WC call cancel 1
9	WC call cancel 2
A	WC call cancel 3
B	WC call cancel 4
C	
D	
E	
F	

Programming is not required, only the address switch must be set. If the presence/cancel button is to be used for acoustic call forwarding then the address switch must be set to an address of „0“ and never changed. **This setting must be made at least once for each room in order to conform to the requirements of the DIN VDE 0834 standard.**

The address of the address switch must point to the arrow printed on the metal plate. The buttons must never be assigned duplicate addresses. In other words, the address „WC call cancel 1“ must only be assigned once per room. This also applies to all other cases. Failure to do this will result in system malfunctions.

All presence markings are summarised as a collective message for forwarding. The display of the presence occurs at all buttons simultaneously in parallel (when installed on a per-bed basis).

All presence buttons in a room have the same priority. That is, you can mark your presence in a room using one presence button and, when present, finally cancel the call from another presence button in the room. The WC call cancel simultaneously affects all triggered WC calls for the room. The acoustic alarm is only activated for devices having an address of 0. Adjustment/Setting of the address switch is indicated by blinking LEDs. The call/cancel button is only ready for operation when the LEDs no longer blink.

Collective message

Events of the same type (room call, bed call from bed 1, bed call from bed 2 etc..) are indicated as one event on the display, even multiple buttons were activated.
Example: Room 24 has 3 call buttons set to room call 1, room call 2 and room call 3. All 3 buttons are actuated. „Call room 24“ is shown on the display.

Room bus connection

All light call system devices in a room are connected to the room bus. The room bus has 4 conductors.

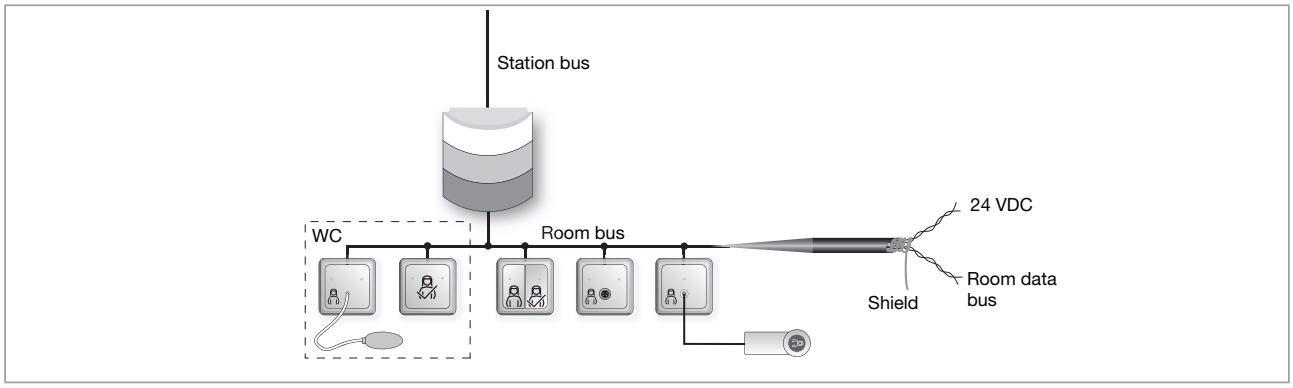
„d“ = data
„t“ = clock
„+24“ = +24 VDC
„GND“ = Ground

These 4 conductors are to be connected to the terminals of the same designation on the room module (different versions possible) in exactly the manner shown here.

The room bus can be connected in a star formation or a mixed formation. The cable length (sum of all cables) must not exceed **100 m**. A decisive factor is ensuring the provision of the required power supply.

A cable of type: JY (St) Y 2x2x0.8 must be used for the room bus.

The shield must be connected to the GND terminal of the respective room module. To avoid short circuits at the device, the shield must be insulated.



Technical data

General values	
Power supply	24 VDC ±10 %
Current consumption	35 mA
Degree of protection	IP 20

For calculating the quantity and capacity of the power supplies, the maximum current consumption of all devices connected to the power supply (room module, lights, call button, presence/cancel button, pull switch, peripheral devices, ...) must be added together.

The cable lengths must also be taken into account. Care must be taken to ensure that the supply voltage lies within the defined tolerances at all devices.

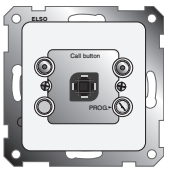
Planning aids/Rules for room installation

Notes and the corresponding tables are provided starting at page 96 of the technical appendix.

Call button insert

No. 735090

For ELSO FASHION/SCALA/RIVA/NOVIA

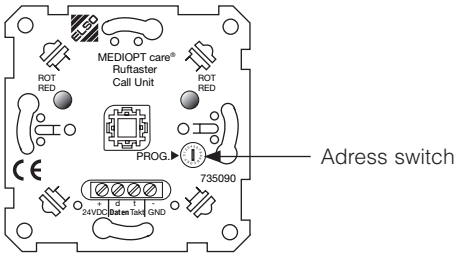


General notes

Each call button can be assigned a maximum of one room number or be connected to a single room module. This is connected directly to the appropriate terminals of the room module or the room bus cables. Every call button is assigned its own button number in the corresponding room (see following table). This button number defines the call type as a room call, bed call or WC call.

Warning, lethal danger!
The safety regulations of the DIN VDE 0105 standard must be followed. Only qualified electrical personnel may work on the devices. Always follow the state-specific regulations and guidelines. Failure to observe this can result in a danger of fire, electric shock or destruction of the device. In the case of 230 V cables in the vicinity, the applicable standards and guidelines relating to cable clearances must be noted and observed.

Connection notes:
- Diameter of conductors to be used: 0.8 mm
- The connections “d” = data and “t” = clock must never be swapped. This causes all devices in the room to malfunction. The same applies to the power cables.
- Protection type: IP 20



Address table

Address	Function
0	Room call 1
1	Room call 2
2	Room call 3
3	Room call 4
4	WC call 1
5	WC call 2
6	WC call 3
7	WC call 4
8	
9	
A	Bed call 1 – 3
B	Bed call 2 – 3
C	Bed call 3 – 3
D	Bed call 4 – 3
E	Bed call 5 – 3
F	Bed call 6 – 3

Programming is not required, only the address switch must be set. For example, if the call is to be indicated as bed call 1, then the address switch must be set to address „A“ and never changed.

The address of the address switch must point to the arrow printed on the metal plate. The buttons must never be assigned duplicate addresses. In other words, the address „WC call cancel 1“ must only be assigned once per room. This also applies to all other cases. Failure to do this will result in system malfunctions.

A bed can be assigned a maximum of 3 buttons but these must all have different addresses. However, a call button only provides one bed call sub-address „Bed no.-3. The system socket provides the additional sub-addresses bed call „Bed no.-1“ and bed call „Bed no.-2”. The pull switch and pneumatic button provide the additional sub-address bed call “Bed no.-1“.

Description of components

All calls except bed calls (separately indicated on the display with bed 1 to bed 6) are summarised as a collective message for forwarding (calls from the room or WC are shown as room calls or WC calls on the display without any further distinguishing information). The reassurance light only illuminates at the device from which the call was triggered.

Collective message

Events of the same type (room call, bed call from bed 1, bed call from bed 2 etc..) are indicated as one event on the display, even multiple buttons were activated.
Example: Room 24 has 3 call buttons set to room call 1, room call 2 and room call 3. All 3 buttons are actuated. „Call room 24“ is shown on the display.

Room bus connection

All light call system devices in a room are connected to the room bus. The room bus has 4 conductors.

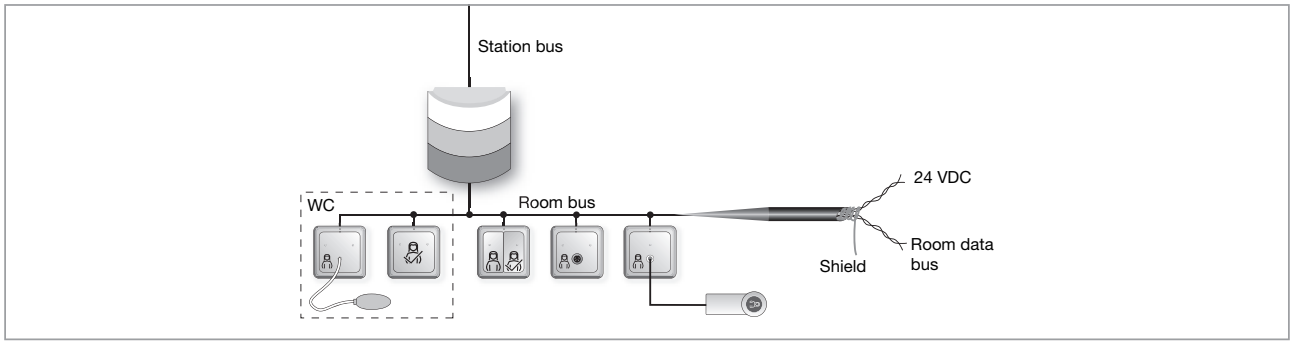
„d“ = data
„t“ = clock
„+24“ = +24 VDC
„GND“ = Ground

These 4 conductors are to be connected to the terminals of the same designation on the room module (different versions possible) in exactly the manner shown here.

The room bus can be connected in a star formation or a mixed formation. The cable length (sum of all cables) must not exceed **100 m**. A decisive factor is ensuring the provision of the required power supply.

A cable of type: JY (St) Y 2x2x0.8 must be used for the room bus.

The shield is to be connected to the GND terminal of the respective room module. To avoid short circuits at the device, the shield must be insulated.



Technical data

General values	
Power supply	24 VDC ±10 %
Current consumption	30 mA
Degree of protection	IP 20

For calculating the quantity and capacity of the power supplies, the maximum current consumption of all devices connected to the power supply (room module, lights, call button, presence/cancel button, pull switch, peripheral devices, ...) must be added together.

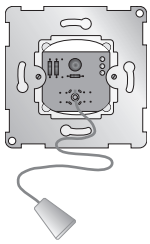
The cable lengths must also be taken into account. Care must be taken to ensure that the supply voltage lies within the defined tolerances at all devices.

Planning aids/Rules for room installation

Notes and the corresponding tables are provided starting at page 96 of the technical appendix.

Technical changes, errors and printing mistakes excepted

Pull-switch insert



No. 735100

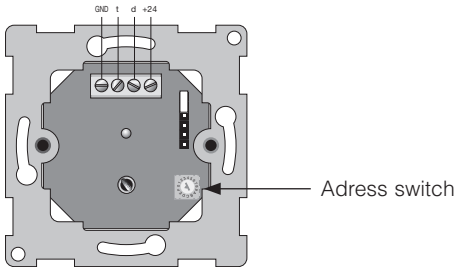
For ELSO FASHION/SCALA/RIVA/NOVIA

General notes

Each pull switch can be assigned a maximum of one room number or be connected to a single room module. This is connected directly to the appropriate terminals of the room module or the room bus cables. Every pull switch is assigned its own button number in the corresponding room (see following table). This button number defines the call type as a room call, bed call or WC call. The pull switch must be enhanced with an appropriate central plate. A 2 m pull cord and handle are provided with delivery.

Warning, lethal danger!
The safety regulations of the DIN VDE 0105 standard must be followed. Only qualified electrical personnel may work on the devices. Always follow the state-specific regulations and guidelines. Failure to observe this can result in a danger of fire, electric shock or destruction of the device. In the case of 230 V cables in the vicinity, the applicable standards and guidelines relating to cable clearances must be noted and observed.

Connection notes:
- Diameter of conductors to be used: 0.8 mm
- The connections “d” = data and “t” = clock must never be swapped. This causes all devices in the room to malfunction. The same applies to the power cables.
- The position of the jumper must not be changed.
- Protection type: IP 20



Address table

Address	Function
0	WC call 1
1	WC call 2
2	WC call 3
3	WC call 4
4	WC call 5
5	WC call 6
6	Bed call 1 – 1
7	Bed call 2 – 1
8	Bed call 3 – 1
9	Bed call 4 – 1
A	Bed call 5 – 1
B	Bed call 6 – 1
C	Room call 1
D	Room call 2
E	Room call 3
F	Room call 4

Programming is not required, only the address switch must be set. For example, if the call is to be indicated as bed call 1, then the address switch must be set to address „6“ and never changed.

When using the pull switch in a bathroom, we recommend leaving the address set to 0 (factory setting). This must be adjusted if multiple buttons are used in a bathroom.

The arrow on the address switch must point to the desired address.

A button address must never be assigned twice, i.e. the address „Room Call 2“ must only exist once per room. This also applies to all other cases. Failure to do this will result in system malfunctions.

All calls except bed calls (addresses 6 to B) are summarised as a collective message for forwarding. Calls from the WC (addresses 0 to 5) are shown on the display as WC call with room number, without further distinction. The same applies to room calls (addresses C to F). Bed calls are indicated on the display used with room number and bed number (1 to 6). The reassurance light only illuminates at the device from which the call was triggered.

Collective message

Events of the same type (room call, bed call from bed 1, bed call from bed 2 etc..) are indicated as one event on the display, even multiple buttons were activated.

Example: Room 24 has 3 call buttons set to room call 1, room call 2 and room call 3. All 3 buttons are actuated. „Call room 24“ is shown on the display.

Room bus connection

All light call system devices in a room are connected to the room bus. The room bus has 4 conductors.

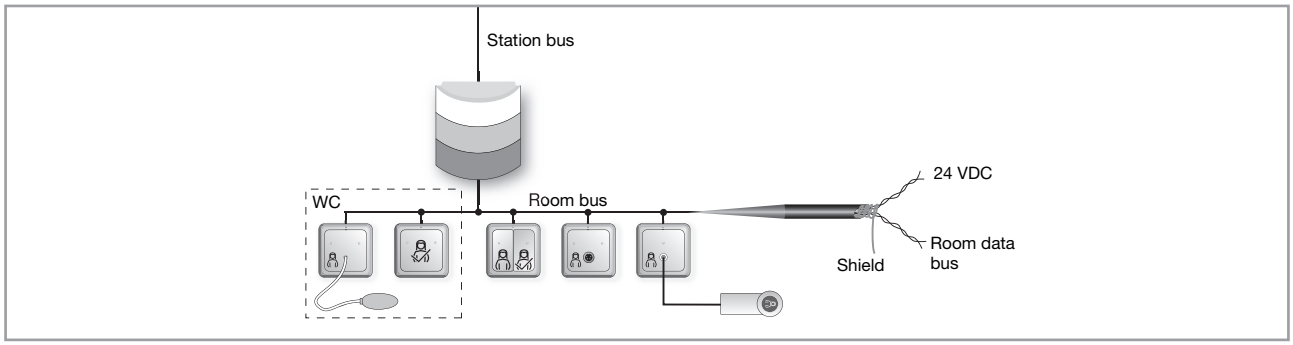
„d“ = data
„t“ = clock
„+24“ = +24 VDC
„GND“ = Ground

These 4 conductors are to be connected to the terminals of the same designation on the room module (different versions possible) in exactly the manner shown here.

The room bus can be connected in a star formation or a mixed formation. The cable length (sum of all cables) must not exceed **100 m**. A decisive factor is ensuring the provision of the required power supply.

A cable of type: JY (St) Y 2x2x0.8 must be used for the room bus.

The shield is to be connected to the GND terminal of the respective room module. To avoid short circuits at the device, the shield must be insulated.



Technical data

General values	
Power supply	24 VDC ±10 %
Current consumption	30 mA
Degree of protection	IP 20

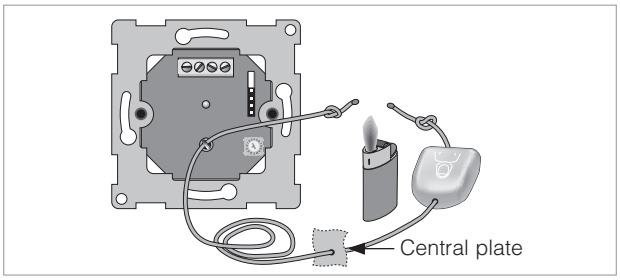
For calculating the quantity and capacity of the power supplies, the maximum current consumption of all devices connected to the power supply (room module, lights, call button, presence/cancel button, pull switch, peripheral devices, ...) must be added together.

The cable lengths must also be taken into account. Care must be taken to ensure that the supply voltage lies within the defined tolerances at all devices.

Installation

The pull cord must be threaded thorough the eye on the switch and then knotted at the end. The knot should heated without burning (e.g. with a lighter). The heat "welds" the knot and prevents it from coming undone. The same procedure should be followed at the handle at the other end of the pull cord after trimming the cord to suit the customer requirements (see diagram).

All occupational health and safety regulations must be observed when performing this work.



Call button with system socket

ELSO FASHION / SCALA / RIVA: Pearl white: No. 735120, Pure white: No. 735124;
ELSO JOY: Pearl white: No. 735190, Pure white: No. 735194;
ELSO NOVIA: Pure white: No. 735134

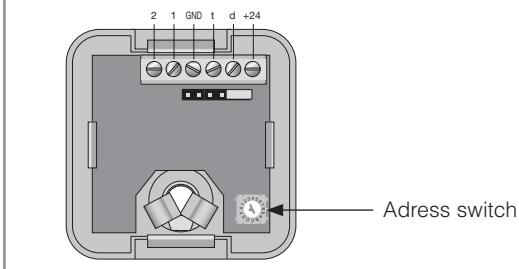
General notes

Each call button with system socket can be assigned a maximum of one room number or be connected to a single room module. This is connected directly to the appropriate terminals of the room module or the room bus cables. Every call button with system socket is assigned its own button number in the corresponding room (see following table). This button address defines the call type as a room call or bed call. Pear switches with or without light buttons can be connected to the system socket. The system socket has two outputs for switching external loads. These outputs are activated via the corresponding light switch on the pear switch.

Connection notes:

- Diameter of conductors to be used: 0.8 mm
- The connections “d” = data and “t” = clock must never be swapped. This causes all devices in the room to malfunction. The same applies to the power cables.
- Protection type: IP 20

Warning, lethal danger!
The safety regulations of the DIN VDE 0105 standard must be followed. Only qualified electrical personnel may work on the devices. Always follow the state-specific regulations and guidelines. Failure to observe this can result in a danger of fire, electric shock or destruction of the device. In the case of 230 V cables in the vicinity, the applicable standards and guidelines relating to cable clearances must be noted and observed.



Address table

Address	Function
0	
1	Bed call 1 – 1
2	Bed call 2 – 1
3	Bed call 3 – 1
4	Bed call 4 – 1
5	Bed call 5 – 1
6	Bed call 6 – 1
7	Room call 2
8	Room call 3
9	Room call 4
A	Bed call 1 – 2
B	Bed call 2 – 2
C	Bed call 3 – 2
D	Bed call 4 – 2
E	Bed call 5 – 2
F	Bed call 6 – 2

Programming is not required, only the address switch must be set. For example, if the call is to be indicated as bed call 1, then the address switch must be set to address „1“ and never changed.

The arrow on the address switch must point to the desired address.

A button address must never be assigned twice, i.e. the address „Room Call 2“ must only exist once per room. This also applies to all other cases. Failure to do this will result in system malfunctions.

A bed can be assigned a maximum of 3 buttons but these must all have different addresses. A call button with system socket provides two sub-addresses „-1“ and „-2“ (for example: „Bed call 1-1“ and „Bed call 1-2“).

Note
The call button also provides the sub-address „-3“ (for example: „Bed call 1-3“). The pull switch and pneumatic button also provide the sub-address „-1“ (for example: „Bed call 1-1“).

All calls except the bed calls (indicated on the display with beds 1 to 6) are summarised as a collective message for forwarding (calls from the room, e.g. addresses 7 to 9 are shown as a room call on the display with no further distinguishing information).

The reassurance light only illuminates at the device from which the call was triggered.

Adjustment/Setting of the address switch is indicated by a blinking LED. The device is not ready for operation until the LED no longer blinks.

Collective message

Events of the same type (room call, bed call from bed 1, bed call from bed 2 etc..) are indicated as one event on the display, even multiple buttons were activated.
Example: Room 24 has 3 call buttons set to room call 1, room call 2 and room call 3. All 3 buttons are actuated. „Call room 24“ is shown on the display.

Room bus connection

All light call system devices in a room are connected to the room bus. The room bus has 4 conductors.

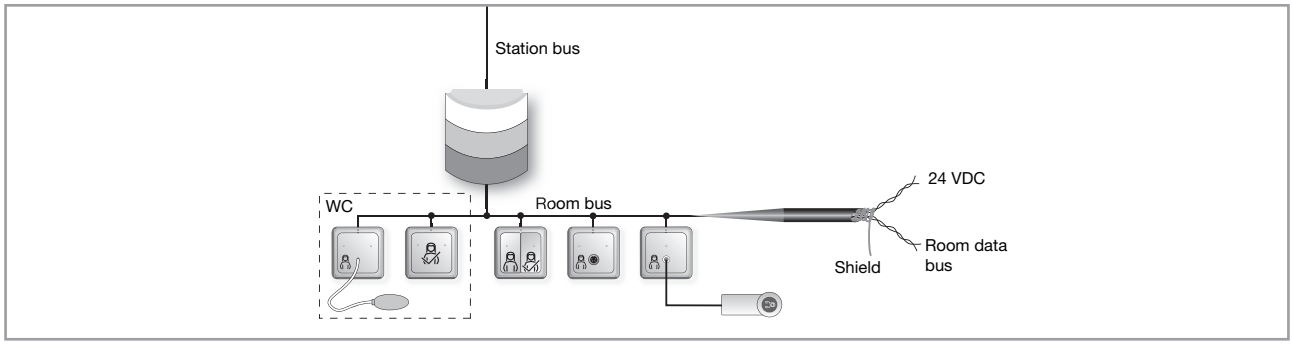
„d“ = data
„t“ = clock
„+24“ = +24 VDC
„GND“ = Ground

These 4 conductors are to be connected to the terminals of the same designation on the room module (different versions possible) in exactly the manner shown here.

The room bus can be connected in a star formation or a mixed formation. The cable length (sum of all cables) must not exceed **100 m**. A decisive factor is ensuring the provision of the required power supply.

A cable of type: JY (St) Y 2x2x0.8 must be used for the room bus.

The shield is to be connected to the GND terminal of the respective room module. To avoid short circuits at the device, the shield must be insulated.



Technical data

General values	
Power supply	24 VDC ±10 %
Current consumption	30 mA
Degree of protection	IP 20
Permissible output loading	maximum 24 VDC/0.2 A/cosφ=1

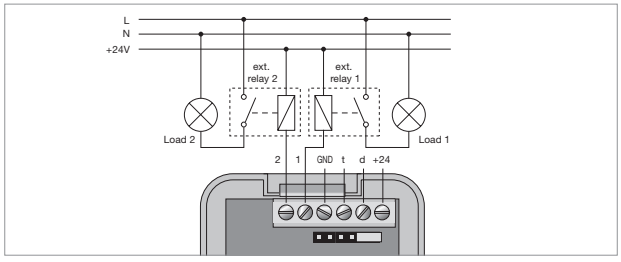
For calculating the quantity and capacity of the power supplies, the maximum current consumption of all devices connected to the power supply (room module, lights, call button, presence/cancel button, pull switch, peripheral devices, ...) must be added together.

The cable lengths must also be taken into account. Care must be taken to ensure that the supply voltage lies within the defined tolerances at all devices.

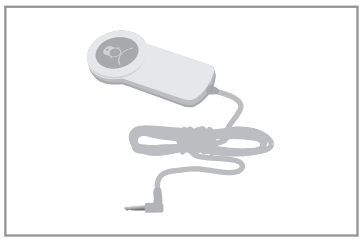
Connection example for outputs

The impulse relay switch is controlled using 24 VDC, which corresponds to the voltage present at the device.

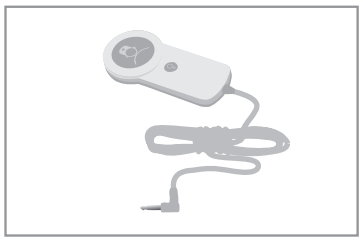
Since the impulse relay switch is used primarily in a patient environment, this must be chosen in accordance with the special requirements for medical systems as per the DIN EN 60601 standard.



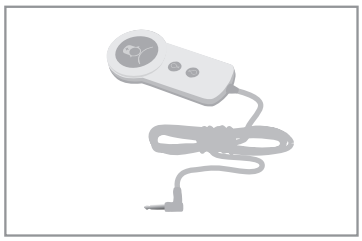
Description of components



Comfort pear switch, white No. 733480 with 2 m connection cable, reassuranc light, locating light, cable monitoring for pulled plug.



Comfort pear switch with 1 light button, white No. 733490, with 2 m connection cable, reassurance light, locating light, cable monitoring for pulled plug, 1 button for additional lighting function.

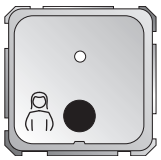


Comfort pear switch with 2 light buttons, white No. 733500, with 2 m connection cable, reassurance light, locating light, cable monitoring for pulled plug, 2 button for additional lighting functions.

		Comfort pear switch Art. 733480, 733485	**Comfort pear switch With 1 light button,** Art. 733490, 733495	**Comfort pear switch With 2 light buttons** Art. 733500
System socket	ELSO FAHION / RIVA / SCALA Art. 735160, 735164	●	○	○
	ELSO NOVIA Art. 735174	●	○	○
	ELSO JOY Art. 735180, 735184	●	○	○
Call button with system socket	ELSO FAHION / RIVA / SCALA Art. 735120, 735124	●	●	●
	ELSO NOVIA Art. 735134	●	●	●
	ELSO JOY Art. 735190, 735194	●	●	●

● Call button suitable for pear switch ○ Call button suitable for pear switch Limited functionality

System socket



ELSO FASHION / SCALA / RIVA: Pearl white: No. 735160, Pure white: No. 735164;
ELSO JOY: Pearl white: No. 735180, Pure white: No. 735184;
ELSO NOVIA: Pure white: No. 735174

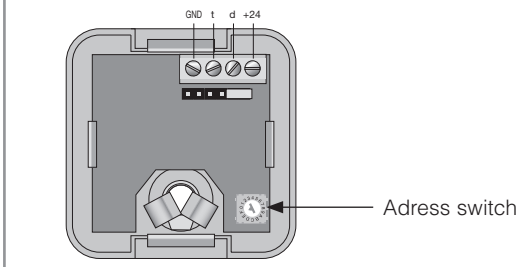
General notes

Each system socket can be assigned a maximum of one room number or be connected to a single room module. This is connected directly to the appropriate terminals of the room module or the room bus cables. Every system socket is assigned its own button number in the corresponding room (see following table). This button address defines the call type as a room call or bed call. Pear switches without light switches can be connected to the system socket.

Warning, lethal danger!
The safety regulations of the DIN VDE 0105 standard must be followed. Only qualified electrical personnel may work on the devices. Always follow the state-specific regulations and guidelines. Failure to observe this can result in a danger of fire, electric shock or destruction of the device. In the case of 230 V cables in the vicinity, the applicable standards and guidelines relating to cable clearances must be noted and observed.

Connection notes:

- Diameter of conductors to be used: 0.8 mm
- The connections “d” = data and “t” = clock must never be swapped. This causes all devices in the room to malfunction. The same applies to the power cables.
- Protection type: IP 20



Address table

Address	Function
0	
1	Bed call 1 – 1
2	Bed call 2 – 1
3	Bed call 3 – 1
4	Bed call 4 – 1
5	Bed call 5 – 1
6	Bed call 6 – 1
7	Room call 2
8	Room call 3
9	Room call 4
A	Bed call 1 – 2
B	Bed call 2 – 2
C	Bed call 3 – 2
D	Bed call 4 – 2
E	Bed call 5 – 2
F	Bed call 6 – 2

Programming is not required, only the address switch must be set. For example, if the call is to be indicated as bed call 1, then the address switch must be set to address „1“ and never changed.

The arrow on the address switch must point to the desired address.

A button address must never be assigned twice, i.e. the address „Room Call 2“ must only exist once per room. This also applies to all other cases. Failure to do this will result in system malfunctions.

A bed can be assigned a maximum of 3 buttons but these must all have different addresses. A system socket provides two sub addresses „-1“ and „-2“ (example: „Bed call 1 – 1“ and „Bed call 1 – 2“).

Note
The call button also provides the sub-address „-3“ (for example: „Bed call 1 – 3“). The pull switch and pneumatic button also provide the sub-address „-1“ (for example: „Bed call 1 – 1“).

Description of components

All calls except the bed calls (indicated on the display with beds 1 to 6) are summarised as a collective message for forwarding (calls from the room, e.g. addresses 7 to 9, are shown as a room call on the display with no further distinguishing information). The reassurance light only illuminates at the device from which the call was triggered.

Adjustment/Setting of the address switch is indicated by a blinking LED. The device is not ready for operation until the LED no longer blinks.

Collective message

Events of the same type (room call, bed call from bed 1, bed call from bed 2 etc..) are indicated as one event on the display, even multiple buttons were activated.
Example: Room 24 has 3 call buttons set to room call 1, room call 2 and room call 3. All 3 buttons are actuated. „Call room 24“ is shown on the display.

Room bus connection

All light call system devices in a room are connected to the room bus. The room bus has 4 conductors.

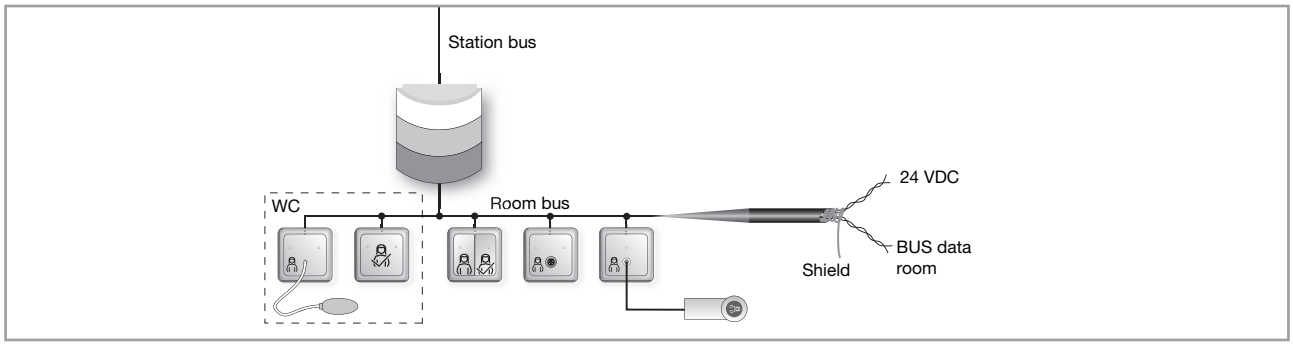
„d“ = data
„t“ = clock
„+24“ = +24 VDC
„GND“ = Ground

These 4 conductors are to be connected to the terminals of the same designation on the room module (different versions possible) in exactly the manner shown here.

The room bus can be connected in a star formation or a mixed formation. The cable length (sum of all cables) must not exceed **100 m**. A decisive factor is ensuring the provision of the required power supply.

A cable of type: JY (St) Y 2x2x0.8 must be used for the room bus.

The shield is to be connected to the GND terminal of the respective room module. To avoid short circuits at the device, the shield must be insulated.



Technical data

General values	
Power supply	24 VDC ±10 %
Current consumption	30 mA
Degree of protection	IP 20

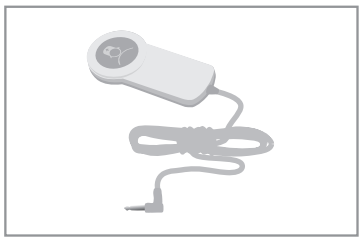
For calculating the quantity and capacity of the power supplies, the maximum current consumption of all devices connected to the power supply (room module, lights, call button, presence/cancel button, pull switch, peripheral devices, ...) must be added together.

The cable lengths must also be taken into account. Care must be taken to ensure that the supply voltage lies within the defined tolerances at all devices.

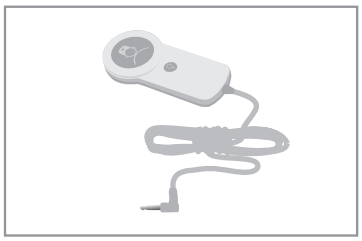
Planning aids/Rules for room installation

Notes and the corresponding tables are provided starting at page 96 of the technical appendix.

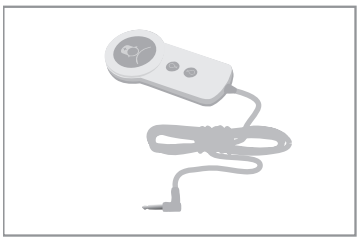
Description of components



Comfort pear switch, white No. 733480, with 2 m connection cable, reassurance light, locating light, cable monitoring for pulled plug.



Comfort pear switch with 1 light button, white No. 733490, with 2 m connection cable, reassurance light, locating light, cable monitoring for pulled plug, 1 button for additional lighting function.



Comfort pear switch with 2 light buttons, white No. 733500, with 2 m connection cable, reassurance light, locating light, cable monitoring for pulled plug, 2 buttons for additional lighting functions.

		Comfort pear switch Art. 733480, 733485	**Comfort pear switch With 1 light button,** Art. 733490, 733495	**Comfort pear switch With 2 light buttons** Art. 733500
System socket	ELSO FAHION / RIVA / SCALA Art. 735160, 735164	●	○	○
	ELSO NOVIA Art. 735174	●	○	○
	ELSO JOY Art. 735180, 735184	●	○	○
Call button with system socket	ELSO FAHION / RIVA / SCALA Art. 735120, 735124	●	●	●
	ELSO NOVIA Art. 735134	●	●	●
	ELSO JOY Art. 735190, 735194	●	●	●

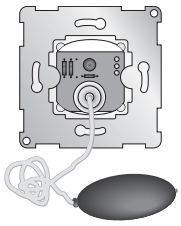
● Call button suitable for pear switch ○ Call button suitable for pear switch Limited functionality

Technical changes, errors and printing mistakes excepted

Pneumatic button insert

No. 735150

For ELSO FASHION/SCALA/RIVA/NOVIA

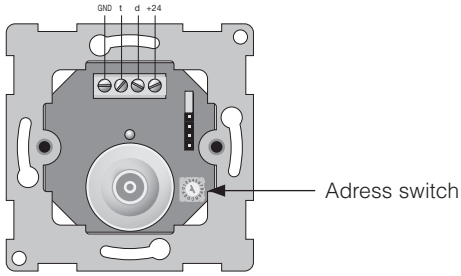


General notes

Each pneumatic button can be assigned a maximum of one room number or be connected to a single room module. This is connected directly to the appropriate terminals of the room module or the room bus cables. Every pneumatic button is assigned its own button number in the corresponding room (see following table). This button number defines the call type as a room call, bed call or WC call. The pneumatic button must be enhanced with an appropriate central plate. A 2 m air hose and a bellows are included in delivery.

Warning, lethal danger!
The safety regulations of the DIN VDE 0105 standard must be followed. Only qualified electrical personnel may work on the devices. Always follow the state-specific regulations and guidelines. Failure to observe this can result in a danger of fire, electric shock or destruction of the device. In the case of 230 V cables in the vicinity, the applicable standards and guidelines relating to cable clearances must be noted and observed.

Connection notes:
- Diameter of conductors to be used: 0.8 mm
- The connections “d” = data and “t” = clock must never be swapped. This causes all devices in the room to malfunction. The same applies to the power cables.
- The position of the jumper must not be changed.
- Protection type: IP 20



Address table

Address	Function
0	WC call 1
1	WC call 2
2	WC call 3
3	WC call 4
4	WC call 5
5	WC call 6
6	Bed call 1 – 1
7	Bed call 2 – 1
8	Bed call 3 – 1
9	Bed call 4 – 1
A	Bed call 5 – 1
B	Bed call 6 – 1
C	Room call 1
D	Room call 2
E	Room call 3
F	Room call 4

Programming is not required, only the address switch must be set. For example, if the call is to be indicated as bed call 1, then the address switch must be set to address „6“ and never changed.

When using the pneumatic button in a bathroom, we recommend leaving the address set to 0 (factory setting). This must be adjusted if multiple buttons are used in a bathroom.

The arrow on the address switch must point to the desired address.

A button address must never be assigned twice, i.e. the address „Room Call 2“ must only exist once per room. This also applies to all other cases. Failure to do this will result in system malfunctions. All calls except bed calls (addresses 6 to B) are summarised as a collective message for forwarding.

Calls from the WC (addresses 0 to 5) are shown on the display as WC call with room number, without further distinction. The same applies to room calls (addresses C to F). Bed calls are indicated on the display used with room number and bed number (1 to 6). The reassurance light only illuminates at the device from which the call was triggered.

Collective message
Events of the same type (room call, bed call from bed 1, bed call from bed 2 etc..) are indicated as one event on the display, even multiple buttons were activated.
Example: Room 24 has 3 call buttons set to room call 1, room call 2 and room call 3. All 3 buttons are actuated. „Call room 24“ is shown on the display.

Room bus connection

All light call system devices in a room are connected to the room bus. The room bus has 4 conductors.

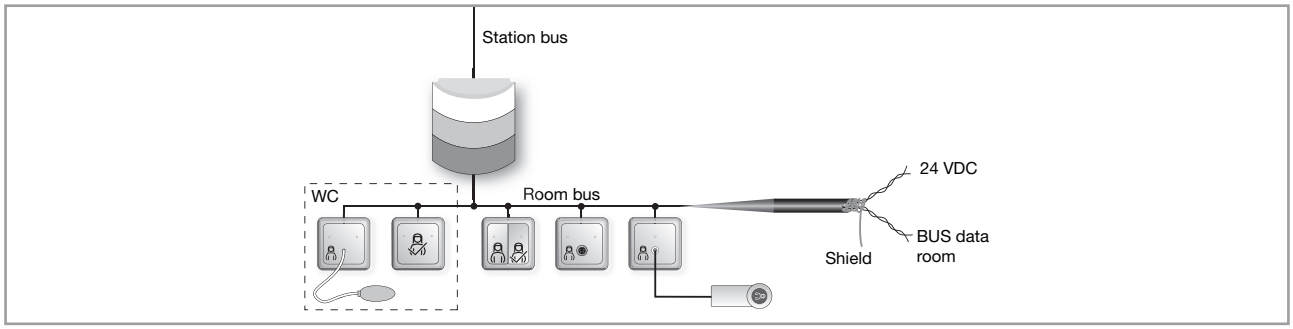
„d“ = data
„t“ = clock
„+24“ = +24 VDC
„GND“ = Ground

These 4 conductors are to be connected to the terminals of the same designation on the room module (different versions possible) in exactly the manner shown here.

The room bus can be connected in a star formation or a mixed formation. The cable length (sum of all cables) must not exceed **100 m**. A decisive factor is ensuring the provision of the required power supply.

A cable of type: JY (St) Y 2x2x0.8 must be used for the room bus.

The shield is to be connected to the GND terminal of the respective room module. To avoid short circuits at the device, the shield must be insulated.



Technical data

General values	
Power supply	24 VDC ±10 %
Current consumption	20 mA
Degree of protection	IP 20

For calculating the quantity and capacity of the power supplies, the maximum current consumption of all devices connected to the power supply (room module, lights, call button, presence/cancel button, pull switch, peripheral devices, ...) must be added together.

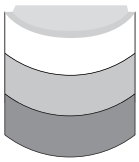
The cable lengths must also be taken into account. Care must be taken to ensure that the supply voltage lies within the defined tolerances at all devices.

Planning aids/Rules for room installation

Notes and the corresponding tables are provided starting at page 96 of the technical appendix.

Group signal light without room module

No. 735480



General notes

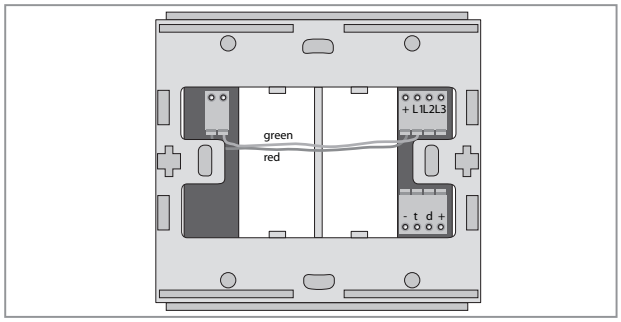
This group signal light is directly connected to the room bus and displays events corresponding to the group address defined in the room module connected to the room bus. The group signal light displays all room call and presence events having the same group address as the room module for the room bus to which the group signal light is connected.

A precondition for connecting this group signal light is the existence of a room module and corresponding room bus. This is connected directly to the appropriate terminals of the room module or the room bus cables. The group signal light does not have a programmable room bus address. No settings must be made in the group signal lights. The group signal light autonomously reacts to relevant signals and displays these.

Connection notes:

- Diameter of conductors to be used: 0.8 mm
- The connections “d” = data and “t” = clock must never be swapped. This causes all devices in the room to malfunction. The same applies to the power cables.
- Protection type: IP 20

Warning, lethal danger!
The safety regulations of the DIN VDE 0105 standard must be followed. Only qualified electrical personnel may work on the devices. Always follow the state-specific regulations and guidelines. Failure to observe this can result in a danger of fire, electric shock or destruction of the device. In the case of 230 V cables in the vicinity, the applicable standards and guidelines relating to cable clearances must be noted and observed.



Room bus connection

All light call system devices in a room are connected to the room bus. The room bus has 4 conductors.

„d“ = data
„t“ = clock
„+24“ = +24 VDC
„GND“ = Ground

These 4 conductors are to be connected to the terminals of the same designation on the room module (different versions possible) in exactly the manner shown here.

The room bus can be connected in a star formation or a mixed formation. It must be ensured that the cable length (sum of all cables) does not exceed **100 m**.

A cable of type: JY (St) Y 2x2x0.8 must be used for the room bus.

The shield is to be connected to the GND terminal of the respective room module. To avoid short circuits at the device, the shield must be insulated.

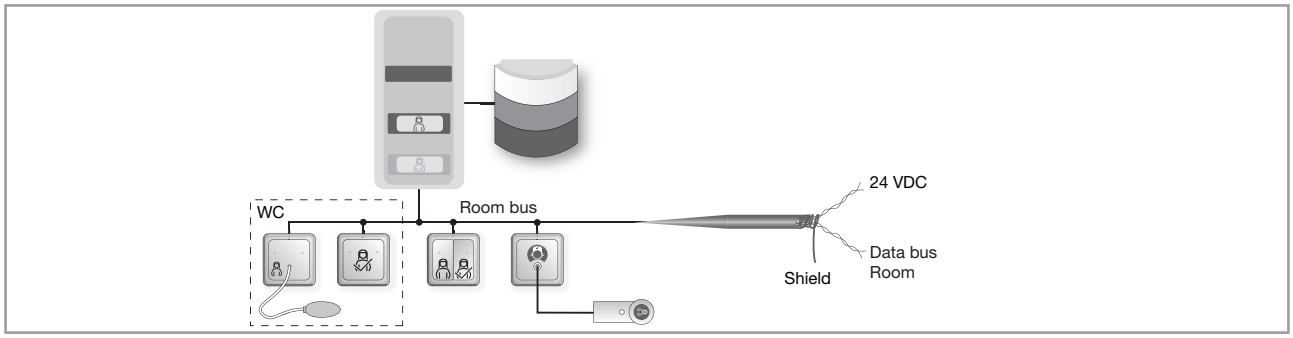
The group signal light be directly connected to the room module or the room bus. This applies to all room bus compatible devices.

DIP switch functions

Function				
	1	2	3	4
Group signal light	ON	ON	ON	ON
Room signal light	OFF	ON	ON	ON

Room signal light: The light is only active in the case of events on the room bus of the room to which it is connected.

Group signal lights: The light is active for all events on the room bus to which it is connected and all rooms having the same group address as the room to which the light is connected.



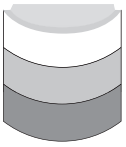
Technical data

General values	
Power supply	24 VDC ±10%
Current consumption	110 mA
Degree of protection	IP 20

For calculating the quantity and capacity of the power supplies, the maximum current consumption of all devices connected to the power supply (room module, lights, call button, presence/cancel button, pull switch, peripheral devices, ...) must be added together.

The cable lengths must also be taken into account. Care must be taken to ensure that the supply voltage lies within the defined tolerances at all devices.

Room signal light without room module



No. 735490

General notes

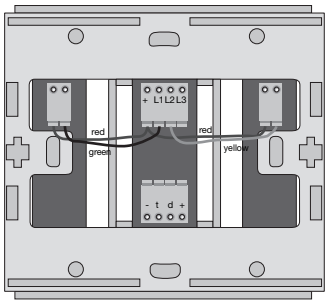
This room signal light is directly connected to the room bus and displays all room events for the room bus to which it is connected. The visual display conforms to DIN VDE 0834. A precondition for connecting this room signal light is the existence of a room module and corresponding room bus.

This is connected directly to the appropriate terminals of the room module or the room bus cables. The room signal light does not have a programmable room bus address. No settings are required for the room signal light. The room signal light autonomously reacts to relevant signals and displays these.

Connection notes:

- Diameter of conductors to be used: 0.8 mm
- The connections “d” = data and “t” = clock must never be swapped. This causes all devices in the room to malfunction. The same applies to the power cables.
- Protection type: IP 20

Warning, lethal danger!
The safety regulations of the DIN VDE 0105 standard must be followed. Only qualified electrical personnel may work on the devices. Always follow the state-specific regulations and guidelines. Failure to observe this can result in a danger of fire, electric shock or destruction of the device. In the case of 230 V cables in the vicinity, the applicable standards and guidelines relating to cable clearances must be noted and observed.



Room bus connection

All light call system devices in a room are connected to the room bus. The room bus has 4 conductors.

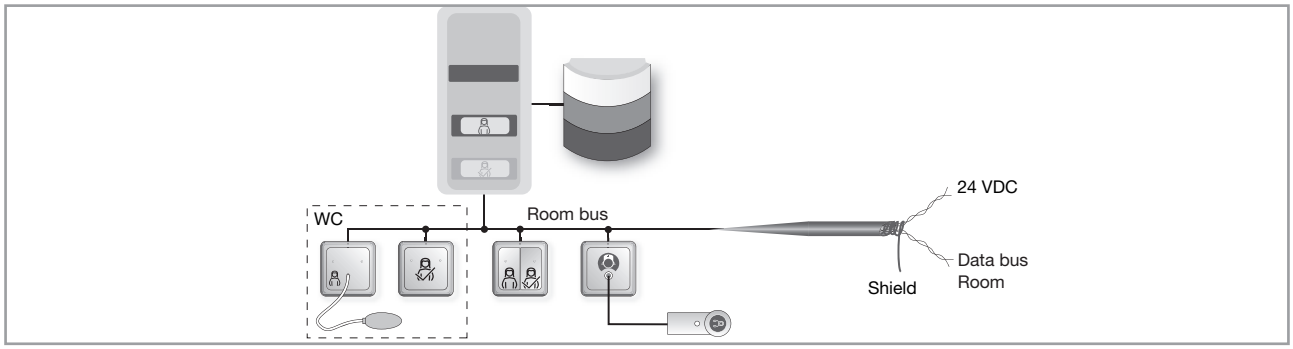
„d“ = data
„t“ = clock
„+24“ = +24 VDC
„GND“ = Ground

These 4 conductors are to be connected to the terminals of the same designation on the room module (different versions possible) in exactly the manner shown here.

Connection can take place via a room bus in a star formation or a mixed formation.
The total cable length (sum of all cables) must not exceed **100 m**.

A cable of type: JY (St) Y 2x2x0.8 must be used for the room bus.

The shield is to be connected to the GND terminal of the respective room module. To avoid short circuits at the device, the shield must be insulated.



The room signal light be directly connected to the room module or the room bus. This applies to all room bus compatible devices.

DIP switch functions

Function				
	1	2	3	4
Group signal light	ON	ON	ON	ON
Room signal light	OFF	ON	ON	ON

Room signal light: The light is only active in the case of events on the room bus of the room to which it is connected.

Group signal lights: The light is active for all events on the room bus to which it is connected and all rooms having the same group address as the room to which the light is connected.

Technical data

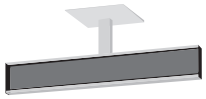
General values	
Power supply	24 VDC ±10%
Current consumption	160 mA
Degree of protection	IP 20

For calculating the quantity and capacity of the power supplies, the maximum current consumption of all devices connected to the power supply (room module, lights, call button, presence/cancel button, pull switch, peripheral devices, ...) must be added together.

The cable lengths must also be taken into account. Care must be taken to ensure that the supply voltage lies within the defined tolerances at all devices.

Single/Double sided corridor display

Nos. 735600/735610/735620/735630/735640



General notes

The corridor display (KDIS8 -> Corridor display 8 characters) is used for displaying calls and call requests in light call systems. The display is connected to the station bus and reports the information from station transfer points and room modules.

In the quiescent state (no calls or call request) the display shows the time. If a call or call request exists in the system then this is displayed. If multiple calls or call requests occur simultaneously then these are displayed alternately.

Warning, lethal danger!
The safety regulations of the DIN VDE 0105 standard must be followed. Only qualified electrical personnel may work on the devices. Always follow the state-specific regulations and guidelines.
Failure to observe this can result in a danger of fire, electric shock or destruction of the device.
In the case of 230 V cables in the vicinity, the applicable standards and guidelines relating to cable clearances must be noted and observed.

Call display

8 characters are available on the display for showing call information. The call type is displayed using 2 characters and the call location using 6 characters. The call location with station and room address is displayed as follows:

When special calls are triggered via the SUD (No. 735200) inputs, the station address is not displayed. These two characters are used for additional text display.

RR SS ZZZZ

RR: Call type
SS: Station address
ZZ: Room address

Priorities when displaying multiple calls

The language used for displaying the call type can be set via the DIP switch.

The different calls and call requests are combined into 3 different levels of urgency:

		Displayed as (program version KDIS8-XX)					
Level of urgency	Call type	German	Italian	Hungarian	Polish	English	Display type
1	Doctor call	A	M	O	L	M	Blinking
	Diagnostic call	D	D	D	D	D	Blinking
	WC call	W	W	W	W	W	Static
	Room emergency call	Z	S	S	P	R	Blinking
	Bed emergency call	B	L	B	M	B	Blinking
2	Room call	Z	S	S	P	R	Static
	Bed call	B	L	B	M	B	Static
	Telephone call	T	T	T	T	T	Static
3	Doctor call request	A→	M→	O→	L→	M→	Blinking
	S1 call request	S1→	I1→	N1→	S1→	N1→	Blinking
	S2 call request	S2→	I2→	N2→	S2→	N2→	Blinking
	Doctor call request, foreign station	←A	←M	←O	←VL	←M	Blinking
	S1 call request, foreign station	←S1	←I1	←N1	←S1	←N1	Blinking
	S2 call request, foreign station	←S2	←I2	←N2	←S2	←N2	Blinking

Technical changes, errors and printing mistakes excepted

If calls of urgency level 1 exist, then these are displayed alternately at approx. 5 s intervals. If no calls of urgency level 1 exist and one or more calls of urgency level 2 exist, then these are displayed alternately at approx. 5 s intervals. If no calls of urgency level 2 exist and one or more call requests exist, then these are displayed alternately at approx. 5 s intervals. If neither calls nor call requests exist, then the time is shown on the display. A DCF receiver must be integrated into the system in order to display the exact time.

Call request

As a result of a call query, or for other reasons, it may be necessary for a nurse to visit a room. To do this, after the query (room based) or conversation with the patient (room-wise intercom) the call is ended at the room/duty room module with display not via the off button but rather via the nurse request button. As a result, the green presence lamp in the room signal light of the associated room **blinks** until the call has been completed and also the group signal lights (if present) and also the green reminder LED in the call/cancel button of the corresponding room. The display on corridor displays is separately described on the previous page. The call request is cancelled by setting the respective presence in the room.

Note! Call requests can only be set via the room/duty room module with display.

Calls from other stations

The display of calls and call requests from foreign stations is limited because all the required information is not available on the station bus to which the corridor display is connected.

Call display

The most important call from all stations connected via group interconnection with the own station is displayed. If group interconnection is not activated then calls from foreign stations are not displayed. Group interconnection is activated at the station transfer points.
If calls from multiple foreign stations exist then the most important „foreign station“ call is displayed. With calls of the same priority from foreign stations, the first call to arrive is displayed.

Display of call requests

With call requests from foreign stations, the room number cannot be displayed because the required information is not available on the station bus. The station designation and the respective call request symbol are displayed. The call request from foreign stations that is actually displayed depends on whether the „Group light display all?“ menu item in the station transfer point was set to „Yes“ or „No“:

If „No“ was selected (recommended setting for operating with text displays) then the call requests from the stations connected to the own station via group interconnection are displayed. If group interconnection is not activated then calls from foreign stations are not displayed.
If „Yes“ was selected then, regardless of any existing group interconnection, the call requests from all stations in the entire building are displayed.

Acoustic call signals

Acoustic call signalling is activated via the control input at connection „C1“ („B/S“) of the VTDIS wall distribution unit.

Switch DIP 2 to OFF (display only the most important call as per the priority table):
If one or more calls exist in the station then the most important call as per the neighbouring priority table is acoustically signalled.

Switch DIP 2 to ON (cyclic display of all the most important calls):
If only WC calls at urgency level 1 exist, then every approx. 15 s an acoustic signal is emitted for approx. 1 s.
If at least one diagnostic, doctor or emergency call exists then an emergency signal is generated (0.5 s on, 0.5 s off).
If no level 1 calls exist and one or more level 2 calls, then every approx. 15 s an acoustic signal is emitted for approx. 1 s. If no level 1 or level 2 calls exist, then the acoustic alarm is silent.

Priority	Call type	Audio sequence
1 (highest)	Doctor call	0.5 s on, 0.5 s off
2	Diagnostic call	0.5 s on, 0.5 s off
3	WC call	1 s on, 14 s off
4	Room emergency call	0.5 s on, 0.5 s off
5	Bed emergency call	0.5 s on, 0.5 s off
6	Room call	1 s on, 14 s off
7	Bed call	1 s on, 14 s off
8	Telephone call	1 s on, 14 s off

Display of date and time

Precondition
The „Clock display“ option is activated at the DIP switch.

If no calls or call requests that should be displayed exist in the station, the display shows the time if the „Time“ option in the station transfer point is activated. After switching on the operating voltage, no time is displayed until the text display receives at least one valid time protocol on the floor bus. Once the time has been correctly received once, if the station transfer point drops out, an internal software clock continues displaying the time.

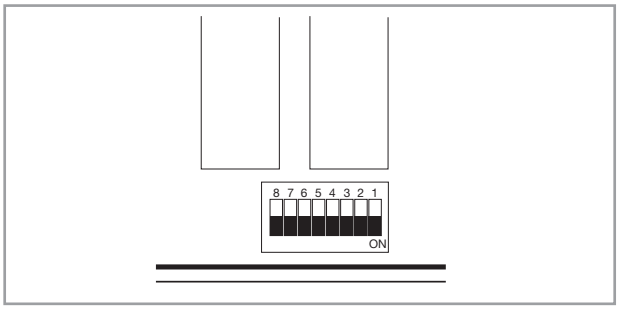
If the „Time“ option is not activated at the station transfer point then, after being switched off and on, the text display shows no time when in a quiescent state.
The time is displayed in the following format:

HH:MM

HH: Hours
MM: Minutes

DIP switch assignments

The housing panel on which the control module is mounted (no lights visible) is unscrewed and the filter disc is carefully slid approx. 20 cm out of the housing. The cover cardboard over the control module must then be removed to access the DIP switch.



DIP switch on the display control module

DIP switch

No. 1 ON: Display position: Control unit left
OFF : Display position: Control unit right

No. 2 ON: If multiple calls are present, these are displayed cyclically.
OFF : Only the most important call is displayed.

No. 3 ON: In centralised operation, the acoustic alarm remains silent for nurse calls.
OFF : The text display ignores centralised operation.

No. 4 ON: Individual tables are not sent.
OFF : Individual tables are sent using a special message.

No. 5, 6 Display language
ON, ON: German
ON, OFF: Italian
OFF, ON: Polish
OFF, OFF: English

No. 7 ON: Normal operation
OFF : The parameter block of the table is shown in the display (for servicing purposes).

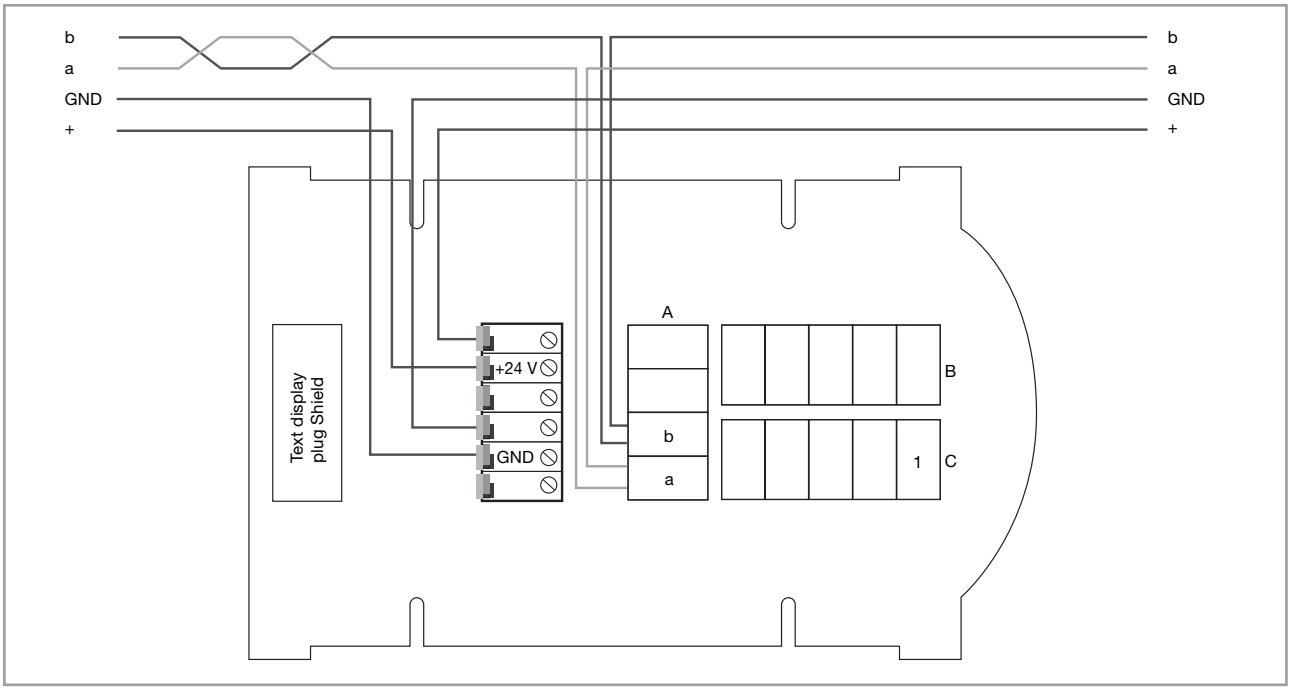
No. 8 ON: The clock is displayed in a quiescent state.
OFF : The display remains dark in a quiescent state.

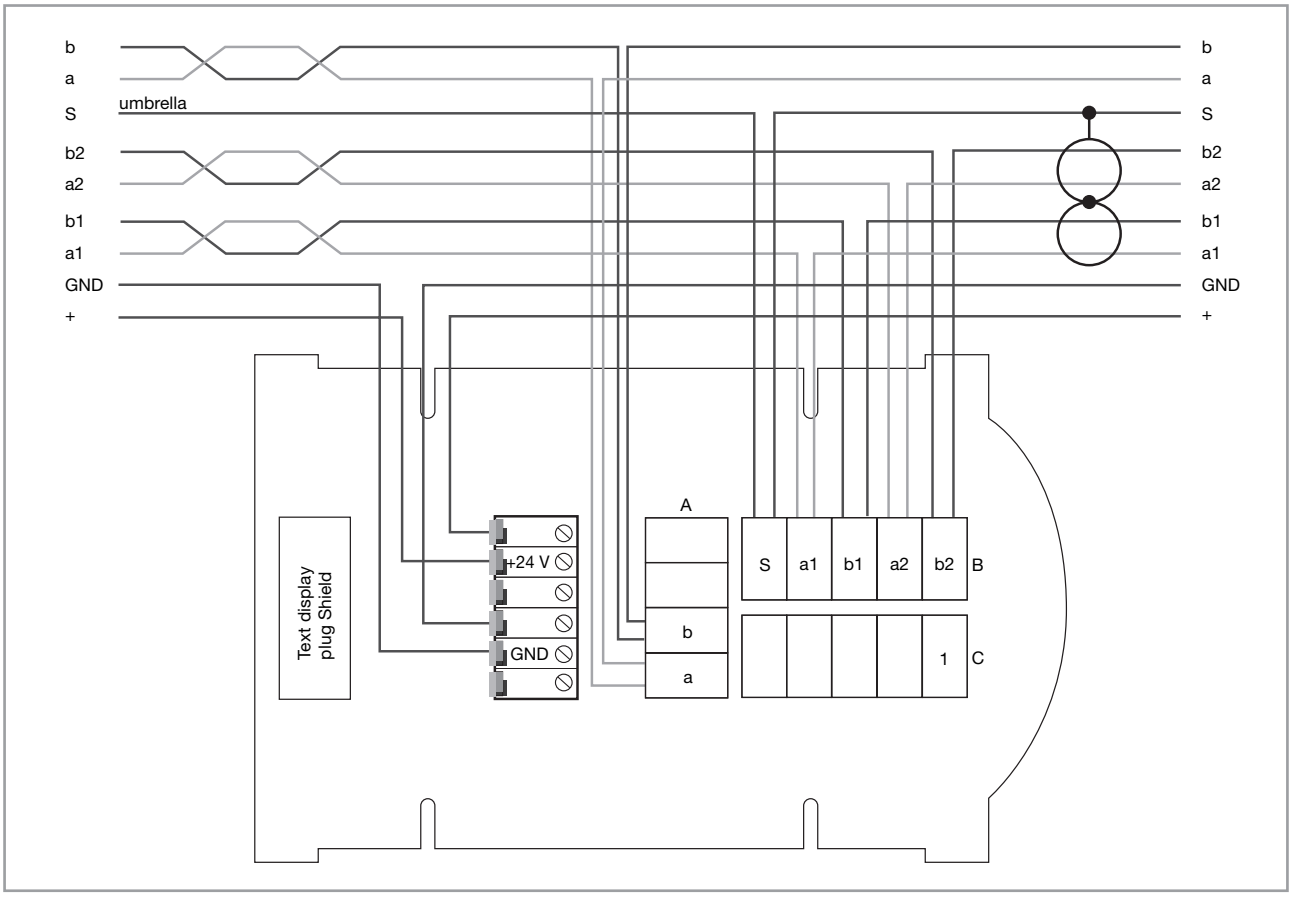
Technical changes, errors and printing mistakes excepted

Installation notes

The corridor display is connected to the connection unit via a 20-pin flat cable (provided in delivery). The corridor display must be connected to the **station bus**.

The pin assignments of the connection unit are provided in the following connection diagram:





The acoustic call alarm is activated via the control input at terminal C1 of the distribution unit (VTDIS -> text display distribution unit): A wire jumper must be connected between C1 and GND.

Technical data

General values	
Power supply	24 VDC ±10 %
Current consumption	160 mA
Degree of protection	IP 20

For calculating the quantity and capacity of the power supplies, the maximum current consumption of all devices connected to the power supply (room module, lights, call button, presence/cancel button, pull switch, peripheral devices, ...) must be added together.

The cable lengths must also be taken into account. Care must be taken to ensure that the supply voltage lies within the defined tolerances at all devices.

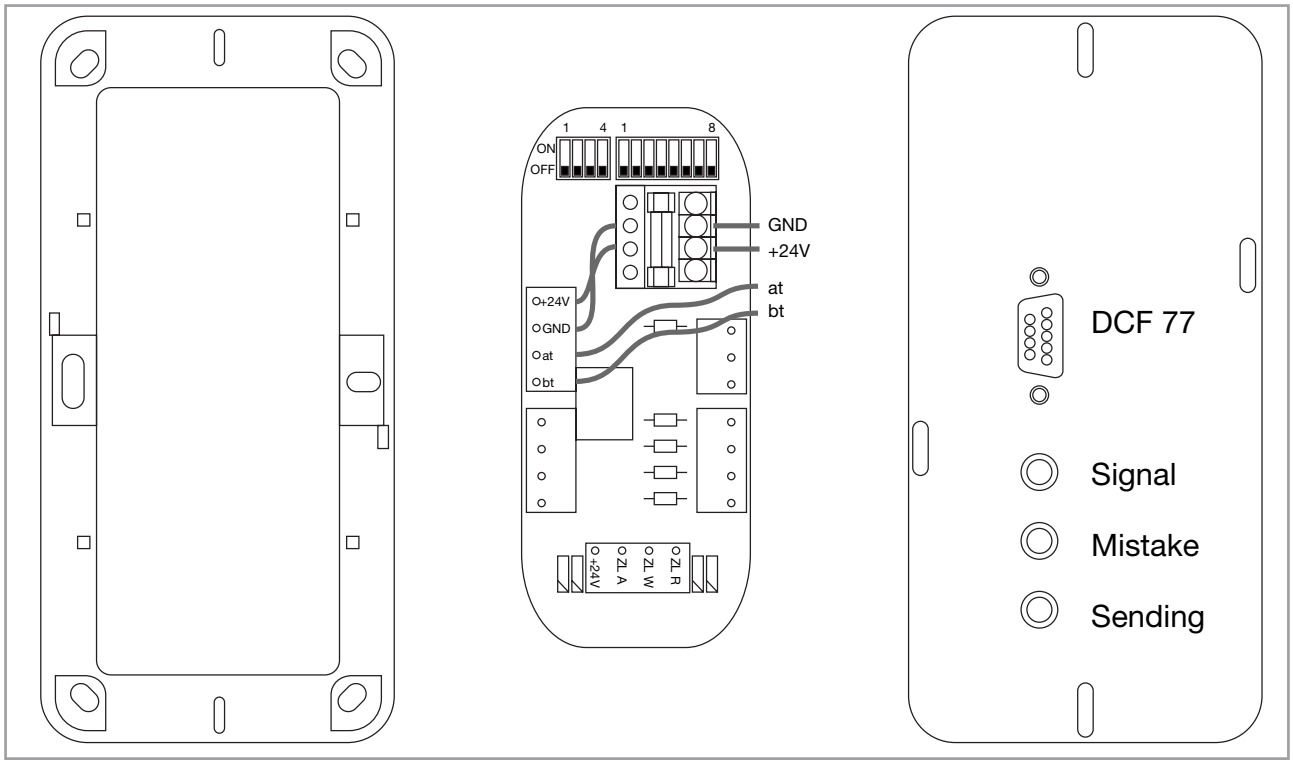
DCF receiver

No. 735290

General notes

The DCF radio clock interface receives information from the DCF77 timecode transmitter and decodes the time and date information. This data is sent via a data protocol on the floor bus and synchronises the time at the station transfer points. The DCF radio clock is connected to the floor bus.

Warning, lethal danger!
The safety regulations of the DIN VDE 0105 standard must be followed. Only qualified electrical personnel may work on the devices. Always follow the state-specific regulations and guidelines. Failure to observe this can result in a danger of fire, electric shock or destruction of the device. In the case of 230 V cables in the vicinity, the applicable standards and guidelines relating to cable clearances must be noted and observed.



Description of components

Scope of delivery:

- Circuit board, populated with SMD devices and a microcomputer
- Aluminium front plate, 160x80 mm with 9-pin connector for connecting the receiver module
- On-wall housing 160x80x40 mm
- DCF77 receiver module in weatherproof housing as per IP54, 4 meter connection cable with socket and fastening screws
- Connection distribution unit (-> Terminals with connection cable and fuse -> fine-wire fuse 250 V/0.25 A slow-blow).

Connection of the receiver module

The receiver module is connected to the device via the connection cable (9-pin Sub D socket). The plug connection must be screwed.

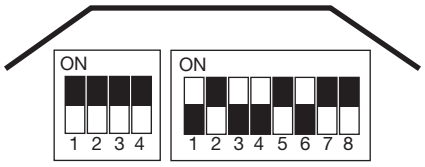
Connecting the light call system

The radio clock is connected to the floor bus via the data cables „at“ and „bt“. It is essential that the conductors („at“; „bt“; „+24VDC“ and „GND“) are not swapped.
Floor bus speech cables are not required. Power (24 VDC) is obtained from the nearest power supply. To connect the 24 VDC, the supplied connection distribution unit (-> Terminals with connection cable and fuse -> fine-wire fuse 250V / 0.25 A slow-blow) must be used.
A cable of type: JY (St) Y 2x2x0.8 (light call system without room-wise intercom) or a cable of type: JY (St) Y 4x2x0.8 (light call system with room-wise intercom) must be used for the floor bus. To avoid short circuits at the device, the shield must be insulated.

Setting the sender address

The radio clock occupies any desired station address (1 – 59), but this station must not actually exist in the system. Station numbers must never be duplicated. This free station address is set using switches 1 to 6 on the 8-way DIP switch. The remaining switches are not used.
Factory setting = station address 01.
DIP switch ON = logical 0
DIP switch OFF = logical 1

Contrary to usual system practice, only setting address 0 causes an internal reset. For all other addresses, the message is immediately sent using the new address.



Proposal: Address 45

See also the address table on page 95 of the technical appendix.

Alignment of the radio clock

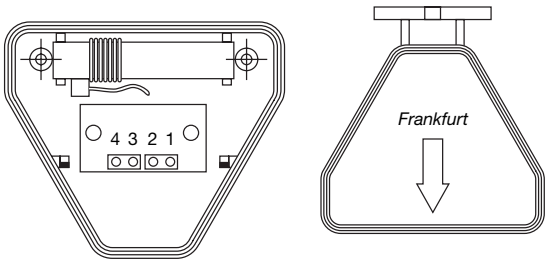
The receiver module must be aligned so that the yellow LED (Signal) blinks at one second intervals. If reception is poor then a better installation site must be found. The cable can be extended on a 1:1 basis (extension cable not provided in delivery). The arrow on the receiver should point towards Frankfurt/Main.

Fault-finding and checking
The LEDs on the front panel can be used for fault-finding and checking the interface. The meanings of these are described in the table on the following page.

Description of components

Colour	Designation	Function
Yellow	Signal	Must blink at one-second intervals when DCF receiver is connected. If this is not the case, a suitable location in the room/building must be found where the reception is ensured. **Note! The DCF receiver is to be mounted as high as possible. Screens that can influence signal quality (installation in cellar rooms, reinforced concrete, etc.) must be ruled out.**
Red	Error	Lights up when a faulty clock protocol has been received by the receiver module; goes out with the next correctly received protocol.
Green	Sent	If two error-free protocols have been received one minute apart, the LED lights up and the time and date are sent to the floor bus alternately. If no correct radio clock protocol has been received within 24 hours, then the sending of the time to the floor bus is cancelled and the LED goes out.

Terminal	Cable colours
1	Brown
2	Green
3	Yellow



1: Ground
2: +Operating voltage 5 ... 15 V-
3: DCF output

Technical data

General values	
Power supply	22 – 26 VDC
Current consumption	50 mA
DCF receiver degree of protection	IP 20
Active antenna degree of protection	IP 54
Connection distribution box	Fine-wire fuse 250 V/0.25 A slow-blow

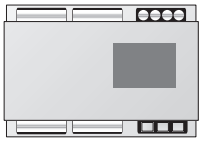
For calculating the quantity and capacity of the power supplies, the maximum current consumption of all devices connected to the power supply (room module, lights, call button, presence/cancel button, pull switch, peripheral devices, ...) must be added together.

The cable lengths must also be taken into account. Care must be taken to ensure that the supply voltage lies within the defined tolerances at all devices.

Technical changes, errors and printing mistakes excepted

Station transfer point

No. 735200



General notes

The station transfer point represents the interface between the station bus and the floor bus. It transfers the important station events and states to the floor bus and vice-versa, also the station messages from other stations into the own station as required.

The station transfer point has 8 inputs, 8 outputs and an RS485 interface that can be used for various applications.

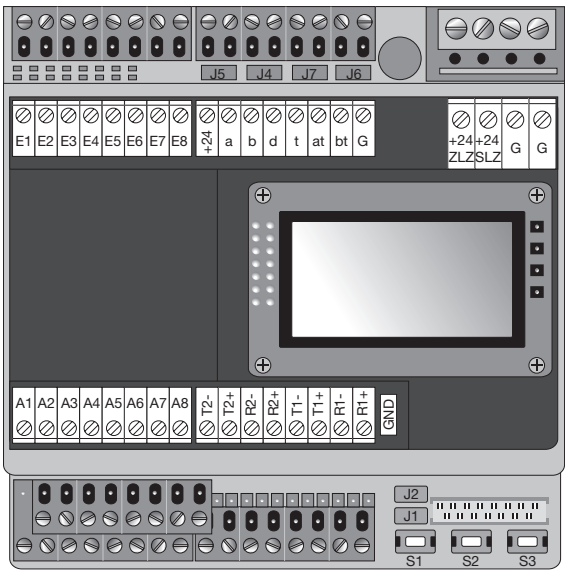
Warning, lethal danger!
The safety regulations of the DIN VDE 0105 standard must be followed. Only qualified electrical personnel may work on the devices. Always follow the state-specific regulations and guidelines. Failure to observe this can result in a danger of fire, electric shock or destruction of the device. In the case of 230 V cables in the vicinity, the applicable standards and guidelines relating to cable clearances must be noted and observed.

Overview of terminal assignments

Connection	Description
G	GND
G	GND
+24 SLZ	**+24 VDC Station bus (this terminal must be connected)**
+24 ZLZ	+24 VDC Floor bus (24 V exists here if connected to the SLZ)
G	GND
bt	„bt“ data (floor bus)
at	„at“ data (floor bus)
t	Room bus clock (not currently available)
d	Room bus data (not currently available)
b	„b“ data (station bus)
a	„a“ data (station bus)
+24	+24 VDC Floor bus (24 V exists here if connected to the SLZ)
Input E8	Input 8 relative to +24 (NO contact)
Input E7	Input 7 relative to +24 (NO contact)
Input E6	Input 6 relative to +24 (NO contact)
Input E5	Input 5 relative to +24 (NO contact)
Input E4	Input 4 relative to +24 (NO contact)
Input E3	Input 3 relative to +24 (NO contact)
Input E2	Input 2 relative to +24 (NO contact)
Input E1	Input 1 relative to +24 (NO contact)
Output A1	Output 1 relative to +24 (NO contact)
Output A2	Output 2 relative to +24 (NO contact)
Output A3	Output 3 relative to +24 (NO contact)
Output A4	Output 4 relative to +24 (NO contact)
Output A5	Output 5 relative to +24 (NO contact)
Output A6	Output 6 relative to +24 (NO contact)
Output A7	Output 7 relative to +24 (NO contact)
Output A8	Output 8 relative to +24 (NO contact)

Connection	Description
T2-	Not available
T2+	Not available
R2-	Not available
R2+	Not available
T1-	Connection to RS485/232 converter at terminal 4
T1+	Connection to RS485/232 converter at terminal 3
R1-	Connection to RS485/232 converter at terminal 2
R1+	Connection to RS485/232 converter at terminal 1

Important note! Fields with a grey background represent features that are in preparation. To avoid malfunctions, these terminals must not be connected.



S1 – S3: Programming buttons

Power supply connection

The system voltage 24 VDC (22 – 26 VDC) must be connected to the connection terminals labelled as +24 VSLZ.

Only then is the functionality ensured and +24 VDC is also available at the terminals labelled with „+24“.

Connection of station bus/floor bus

All the room modules for the station must be connected to the station bus. Stub cables are to be avoided. The station bus should be laid as a ring cable. ELSO GmbH recommends closing the ring. This results in double data reliability. Please make absolutely sure that the conductors („a“, „b“, „+24VDC“ and „GND“) are not swapped. For the station bus, a cable (subsequently referred to as SYK=system cable) of type: Lapp Kabel UNITRONIC Bus Combi EIB 2x2x0.8 + 3x1.5, or equivalent quality, must be used. The shield must be connected to each of the GND terminals. To avoid short circuits at the device, the shield must be insulated.

The data cables must not exceed a length of **500 m** (station bus).

The individual stations are connected via the station transfer points. The various station transfer points are connected to the floor bus. The floor bus has 3 conductors.

„at“ = at data
„bt“ = bt data
„GND“ = Ground

These 3 conductors are to be connected to the terminals of the same designation on the station transfer point.

Star or tree formation cabling is not permitted for the floor bus. Stub cables must also be avoided.
It must be ensured that the cable length does not exceed **300 m** (floor bus).

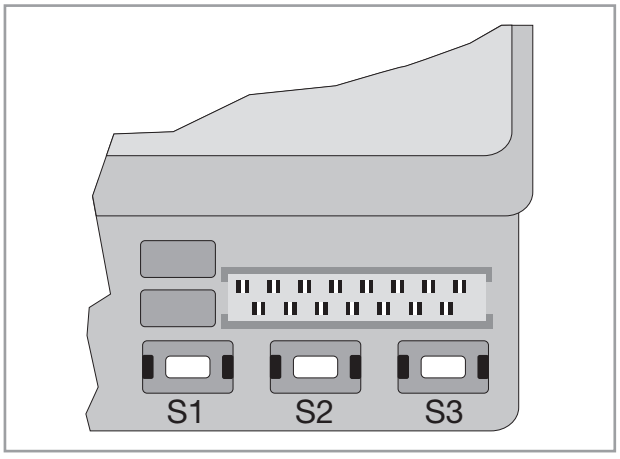
A cable of type: JY (St) Y 2x2x0.8 must be used for the room bus.

The shield must be connected to the „GND“ terminal at the respective station transfer points. To avoid short circuits at the device, the shield must be insulated.

Programming

You can only access the programming features after the initialisation period (approx. 5 s, display shows „Start.....“), after a restart or applying voltage.

The following steps must be performed to access the menu:
- Step 1: Press and hold button S3 (outer)
- Step 2: Then press and hold button S2
- Step 3: Then press and hold button S1
- Step 4: Now release button S3
- Step 5: Now release buttons S2 and S1



SUD xx.x
Program.

Pressing and releasing button S3 brings you to the next respective programming step. Pressing for longer than approx. 1 s brings you to the previous programming step. This allows you to navigate the menu in both directions. The menu shows the parameter to be set and its current value.

The values can be changed using buttons S1 and S2. Button S2 increases the value or moves to the next value in a selection list, button S1 reduces the value or moves to the previous value.

Pressing for longer than 1 s causes the value to continuously increase/decrease or forwards/backwards selection in a list.

Saving the set values:
- Step 1: Press and hold button S3 (outer)
- Step 2: Then briefly press button S2
- Step 3: Then release button S3

Technical changes, errors and printing mistakes excepted

Menu item	Value range/Parameter	Short description
Station address	1....59	Every station transfer point requires a unique (in the whole building) floor bus address.
Language selection	German, English	Selection of the menu language
Address (in the station)	1....121	Every station transfer point requires a unique (unique for the station) address on the station bus.
Group direction arrow	0....15	Group address for group signal lights on the station bus
Group formation Range: G1 Range: G2 Range: G3	 0....15 0....15 0....15	Definition of the groups (G1 – G3) (floor bus) and the corresponding duty area code (duty group) 0 – 15 for station interconnection
Group	None G1, G2, G3	General group formation for nurse calls
Automatic group formation	None G1, G2, G3	Group formation for call overruns (see overrun time)
Doctor group formation	None G1, G2, G3	Group formation for doctor calls
Night group	None G1, G2, G3	A group that is automatically interconnected daily at specified times. **Note! A DCF clock is essential for this. The defined times also affect the configuration of the PSA/DECT addresses.**
Night group on	00:00	Daily time at which the night interconnection starts. If the start time is larger than the end time, then the interconnection remains active past the end of the day and ends at the end time on the following day.
Night group off	00:00	Daily time at which the night interconnection ends.
Doctor function	Yes/No	Display of cross-station doctor calls
Overrun time for automatic group formation	0....240	After the defined time (N*10 s) all pending calls at all stations in the above selected groups are forwarded for automatic group formation. The set value is multiplied by 10 -> corresponds to time in seconds. A value of 0 means no automatic group formation in the case of call overrun.
Immediate AG for emergency calls	Yes/No	Automatic group formation occurs immediately for emergency calls.
Reset time for call state in centralised operation	0....180	After this time (N*10 s) in centralised operation, the system automatically switches to decentralised operation. The set value is multiplied by 10 -> corresponds to time in seconds. A value of 0 means that the system does not drop out of centralised operation.
Monitoring range First address Last address	 0....121 0....121	Rooms outside the monitoring range are not monitored. **Recommendation:** Entering 0...0 causes the monitoring range to be automatically learned to suit the existing installation. **Note! A „Learn process“ must be performed.**

Menu item	Value range/Parameter	Short description
Station switching	0....121	Only relevant with a fixed monitoring range: Rooms up to this address can log out of the monitoring system. **Recommendation:** Set to 0.
mp3 protocol	Yes/<u>No</u>	Not currently available. Must be set to „No“.
Detailed calls Available from version 04.7	Yes/<u>No</u>	Yes: Several high priority calls (e.g. WC calls) are forwarded to the floor bus and can be received by other stations. No: Only the first/most important call is forwarded to the floor bus. (see also table on page 90)
Speech active	Yes/<u>No</u>	Not currently available.
Group light all	Yes/<u>No</u>	Only affects the display of call requests on corridor displays. **Recommendation:** Do not change the factory setting of “No”.
Clock function	Yes/<u>No</u>	Clock Yes/No
Clock without DCF	Yes/<u>No</u>	Yes: Software clock active: Operation without DCF clock (time must be manually defined) or the clock continues operation if the DCF clock drops out. No: The system has a DCF clock.
New ZLZ	Yes/<u>No</u>	Not currently available.
Interface function „IF1“ „IF1 Fkt“	<u>„None”</u> „Prot.-IF“ „Printer“ „DECT/PSA“ „BZA“	Protocol selection No protocol on RS 485 PC protocol Printer protocol ESPA 4.4.4 protocol (specification on following pages) Not currently implemented.
Protocol interface: Output display texts „LIP – Displ“ „Msg.“	Yes/<u>No</u>	Affects only the protocol interface; additional output of printer text (only to be activated for test purposes); recommend setting in normal operation is „No“
Protocol interface: Output BZA commands „LIP BZA“ „Bef“	Yes/<u>No</u>	Not currently available.
PSA polling „PSA Poll-“ „Ing.“	<u>Yes</u>/No	Affects DECT/PSA polling for ESPA 4.4.4 Protocol; Cyclic querying of the PSA/DECT system Yes: Polling active (default)
PSA callback function „PSA call“ „back“	Yes/<u>No</u>	Affects DECT / PSA: Extended protocol for callback function of the DAKS server (call cancelling from the DECT system – requires station-wise coupled terminals for speech transmission). Currently under preparation

Menu item	Value range/Parameter	Short description
PSA call cancelling „PSA call“ „cancel“	Yes/<u>No</u>	Affects DECT / PSA: Only when callback function is active and call repetition=0. Yes: Call cancel is signalled No: Default Currently under preparation
PSA time record „PSA time“ „REC.“	Yes/<u>No</u>	Affects DECT/PSA protocol Yes: Light call system time is transferred.
PSA call repetition „PSA call“ „repeat“	<u>0</u>....15	Affects DECT / PSA: Repetition time in minutes; all active calls are re-sent cyclically according to the set time. 0: No repetition (default)
PSA night operation „Night operation“ „PSA“	Yes/<u>No</u>	Affects DECT / PSA Yes: With night interconnection events can be sent to other pager addresses (see table in DECT/PSA description).
Input functions E1 Fkt E2 Fkt E3 Fkt E4 Fkt E5 Fkt E6 Fkt E7 Fkt E8 Fkt „En Fkt“	0 „None“ 1 „Central“ 2 „Group1“ 3 „Group2“ 4 „Group3“ 5 „ZwEmpf A“ 6 „ZwEmpf S“ 7 „Lern Zim“ 8 „Ruf Prot“ 9 „Not Prot“ 10 „DIA Prot“ 11 „TEL Prot“	Any input can be assigned any available input function. Note: Activated call inputs (function 8...11) must each be assigned an address for a special protocol (see below)
Group button function	Yes/<u>No</u>	This defines whether the connection of the inputs for group interconnection is done with buttons or switches.
Output functions A1 Fkt A2 Fkt A3 Fkt A4 Fkt A5 Fkt A6 Fkt A7 Fkt A8 Fkt „An Fkt“	 „<u>None</u>” „Central“ „Group1“ „Group2“ „Group3“ „A/St“ „Ruf/Alrm“	Any output can be assigned any available output function. **Note! Outputs are not short circuit protected.**
Special protocol addresses E1 Prot E2 Prot E3 Prot E4 Prot E5 Prot E6 Prot E7 Prot E8 Prot „En Prot“ „ASW xxx“	<u>0</u>, 100....121	Every input can be assigned an address for the station bus. This protocol represents the state of the input(s) (according to the assigned call function(s), input functions 8...11). The addresses lie outside the range of the available room addresses. The alarm is active as long as a signal level is present at the input. Every selected address is assigned a fixed piece of text that is shown on the displays. For a description, see the following pages.

Setting the station address (address on the floor bus)

Entry of the station address on the floor bus. Every station transfer point requires a unique (in the whole building) floor bus address.
This must lie between 1 and 59.

Setting the address (address on the station bus)

Entry of a „Room address“ on the station bus. Every station transfer point requires a unique (unique for the station) address on the station bus.
This must lie between 1 and 99.

Group direction arrow

The station transfer point has the same rights on the station bus as the room modules. In this station transfer point menu item you can assign a group (group address 0 – 15) on the station bus. Call states triggered by the station transfer point can be displayed on the corresponding group signal lights, together with the states of all rooms in this group.

Group formation

With reduced staffing, separate stations can be interconnected. The call forwarding and the call querying then cover all room modules in a defined group.
A group is formed by the stations with the same settings for interconnection (G1, G2, G3) and duty area (0...15). This is different in each case for:

- Nurse calls (possibly different for day and night operation)
- Nurse calls in the case of call overruns (automatic group formation)
- Doctor calls (possibly different for day and night operation)

The group settings for nurses and doctors are made via the parameter menu. The group interconnection for doctors is permanent.

The group interconnection for nurse calls can be manually switched via a switch or button function while the system is running. To do this, the station transfer point inputs must be assigned appropriate functions and the inputs switched with switches or buttons.
Activation/Deactivation of these inputs connects/removes the defined group (G1, G2, G3 each with an assigned duty area) to/from the station.

Additional free cables must exist in the floor bus in order to connect the inputs to the (associated) station transfer points. This allows group interconnection to be done synchronously for several stations via a single switch. Note: Do not use buttons for this because activation/deactivation via buttons uses a toggle function, i.e. the first button push activates the interconnection and the second deactivates this. This means that you cannot be sure that different station transfer points interpret a single button push in the same way.

Appropriate functions can be assigned to the SUD outputs for displaying the respective currently active group interconnection for a station. When connected to a light display, possibly integrated into a switch/button module for group switching, the currently active interconnection can then be displayed.

Warning
Only calls whose room addresses lie in the monitoring range of the station transfer point are forwarded to other stations.

Group

The group membership for nurse calls entered here is always active as a basic setting, as long as another group is not switched by the call type, call overrun, night operation or a group switch. The events are forwarded in normal call forwarding operation to the stations with the same setting.

Activation of the group interconnection via a group switch is not required here (switching is however possible). A permanent group interconnection exists that cannot be removed.

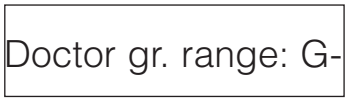
Automatic group formation

The automatic group formation for nurse calls is activated after the time set in the parameter menu when a pending call has not been processed within this time.

The group range in which automatic group formation should take place is also set in the parameter menu. See also overrun time for automatic group formation.

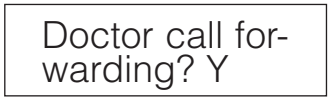
Doctor group formation

Entry of the group range for doctor calls on the floor bus. The group interconnection is permanent.



Doctor function

Activation of the cross-station doctor call forwarding.
This is coupled to the doctor group formation.



Overrun time for automatic group formation

In the case of a pending call, after the defined time the pending call (call has not been processed) is automatically forwarded to the stations with the same group address for call overruns and is displayed there.
The value to be set (N) represents a factor. This factor is multiplied by 10. The result corresponds to the time in seconds.

Example: Set value N=12 -> 12x10 s=120 s

An entry of 0 results in no automatic group formation.

The call forwarding is initiated by the station transfer point from whose station bus the call was triggered. That is, if different values were defined at different station transfer points then it will also take different periods of time before call is forwarded by the own station transfer point.

Example: Station1: SUD1 (AutoGroup 1, Duty Area 1)
N=2 -> The call is forwarded after 20 s.
Station2: SUD2 (AutoGroup 1, Duty Area 1)
N=3 -> The call is forwarded after 30 s.

For overruns, both station transfer points are assigned group 1 and the duty group 1. A pending call from station 1 is automatically forwarded to station 2 after 20 s. A call from station 2 is automatically forwarded to station 1 after 30 s.

Reset time for call state in centralised operation

In centralised operation (displays only occur in duty room -> in preparation) this value can be used to define the time after which (pending call was not processed) the system automatically switches to decentralised operation. That is, normal general call forwarding then takes place.

The value to be set (N) represents a factor. This factor is multiplied by 10. The result corresponds to the time in seconds.

Example: Set value N=12 -> 12x10 s=120 s

Setting the monitoring range

Entry of the lowest room address on the station bus to be monitored.

Display of Z01

Entry of the highest room address on the station bus to be monitored.

Display to Z119

If gaps exist in the room addressing then the missing addresses are signalled as dropouts. For example, if room 20 does not exist in the monitoring range of rooms 1 – 25, then room 20 is indicated as being missing.
When a fixed monitoring range is set then no „learn process“ is required.

Recommendation
Entering 0....0 allows an address range with gaps. The monitoring range must then be learnt according to the existing installation.

Learning the existing rooms of the own station

A monitoring range of 0...0 must have previously been entered in the parameter menu. All possible room addresses are initially included in the monitoring. To learn the existing room addresses it is necessary that all participants connected to the station bus have already sent for at least 10 s, i.e. they are connected and are supplied with power.

The learn process can be started either by a button press at an appropriately defined SUD input or via the menu of the room/duty room modules (No. 735000). To start learning via a button push, it is necessary to connect a button to one of the 8 existing inputs and define this to have the function „7“ (learn the rooms „Learn rooms“).

When learning, all rooms existing in the station or all rooms addresses visible to the SUD on the station bus are permanently saved in memory. In the case of a power cut and soft reset, the stored state is retained. If necessary, the learn process can be started anew, e.g. to learn newly installed room modules. The previously learned installation in memory is then overwritten.

Consequences
Dropout/Malfunction monitoring only occurs for the learnt rooms. If additional rooms are integrated then, after installation and programming, another learn process is necessary.

Note! If the “Learn process” is not performed, then after a power cut the SUD will automatically test all room addresses including the fixed address range (1 –121). All addresses that are not present are signalled as dropouts.

Conclusion
When setting a monitoring range of 0…0 a „Learn process“ is absolutely necessary.

Range for the station switching

This parameter is only relevant when a fixed, consecutive monitoring range has been selected. A range of 1...n (maximum n=121) was selected for the room module addresses here, within which a room module can log out from this station can occur without causing a malfunction or dropout. The room modules included in the station switching must always be assigned the first station address on the station bus.
If station switching is not required then a value of „0“ must be set (recommended).

Stat.sw. up to Z n

Grp-lamp all

This menu item only affects the display of call requests on corridor displays.

Yes: The call requests of the own and **all** existing stations are shown on the corridor displays. The display occurs via a collective message that a call request has been set at a station.

No: Only the call requests of the own and currently active interconnected stations are shown on the corridor displays.

Recommendation
Keep the factory setting of „No“.

Time and date function

The station transfer point allows the time and date to be made available to the system. The software clock integrated into the station transfer point automatically synchronises with the clocks in all station transfer points on the floor bus. This ensures that all clocks in the entire system show the same time. When the time is adjusted at any station transfer point then the clocks in all station transfer points are also automatically adjusted.
The time and date function can be switched on or off in the parameter menu. When the clock function is activated, the time and data can also be set in the parameter menu.

There are two ways of defining the time:
- Using a DCF radio clock, more accurate and more modern,
- Manually setting the time in the station transfer point (see following description).

When operating without a DCF radio clock (parameter setting), or when the DCF radio clock drops out, the time is automatically generated by the station transfer point (assuming that the time was previously known or has been manually set).

The station transfer point with the smallest station address sends the time protocol as a special message and this is used as a reference value for all other bus participants. In this case, this station transfer point assumes a „Master“ function for the time. If this SUD or its time protocol drops out, then this task is adopted by the station transfer point with the next address.

When the date and time is manually set (at any station transfer point), this manually entered time is automatically adopted by all other station transfer points. This means that the setting only needs to be made at one station transfer point.

Note! The time is not saved in the case of a power cut, i.e. with every complete power cut (all SUDs on the floor bus) the time must be manually re-entered at one of the station transfer points, if a DCF click is not present.

Setting the clock

The clock programming occurs directly after the programming menu.

Clock active? Y

This function activates the time function on the station bus and the floor bus.

If „Clock active? Y“ is selected, the processing method must then be selected.

Clock without DCF? N

Y: This selection activates the internal software clock of the SUD. The date and time must be manually entered as described below.

Note! No automatic switching between summer and winter time occurs. In addition to this, over time the clock must also be reset due to mains grid fluctuations etc. In the case of a power failure, the time is lost. If a DCF clock is used in this operating mode, the software clock only takes over the time functions when the radio clock drops out.

N: Precondition is the connection of a DCF 77 clock to the system. Since this method of timekeeping does not use an internal clock, neither date nor time must be manually entered. Using a DCF clock is definitely to be recommended, especially when using corridor displays or a protocol PC.

If the time is to be set directly in the station transfer point (no DCF clock present), the time must be programmed as follows:

- Step 1: Press and hold button S3 (outer)
- Step 2: Then press and hold button S2
- Step 3: Then press and hold button S1
- Step 4: Now release button S3
- Step 5: Now release buttons S2 and S1

SUD xx.x Program.

- Step 6: Buttons S1 and S2 should be pressed at the same time

A precondition for this is that the „Clock without DCF“ option was activated with „Y“ in the previous menu.

Time/date setting	Day nn ^^
1. Start display Time setting	2. Setting Weekday

xx.xx.xx ^^Date	xx:xx:xx ^^Time	Save Date/Time
3. Setting Date	4. Setting Time	5. Final display

Briefly pressing button S3 finishes the setting and switches to the next value. A longer press (>1 s) switches to the previous value. The S1 (-) and S 2 (+) buttons set the value.

Clock display in the mode: „Clock without DCF? N“

After a restart or a power cut, the station transfer point waits until repeated valid clock information is received on the floor bus. As long as this is not present, no clock protocol is generated in the own station. As soon as the clock transfer on the floor bus occurs without errors, the date and time is sent on the station bus.

Note! Even with error-free reception, a number of minutes may pass before the time is displayed.

Functions of the serial interface IF1

The RS485 serial interface designated as „IF1“ can be assigned one of the following functions:
- Logging interface for connection to a logging computer
- Printer interface for connecting a serial printer
- DECT/PSA interface for connecting a DECT or PSA system

For connecting a PC or DECT system an RS485 to RS232 interface converter is required. The cable length between the SUD and the interface converter must not exceed 250 m.

The interface converter for DECT including accessories must be separately ordered under the part number 735520 . When a protocol PC is ordered (No. 735510) the interface converter is included in the scope of delivery.

The functionality is described in detail below.

PC protocol (Prot IF)

Interface parameters:
- RS 485: 1200 Baud; 7 Bit; even parity; 2 Stopbit
- This protocol variant is only to be used with software provided by ELSO.

A small selection of events and their codes:

Event text of the printer interface	Description	Event code of the protocol interface
For all call/status messages, the following applies: Call triggered/State initiated: Call type „E2“ Call deleted/State reset: Call type „E1“		
Call information that is also sent to pager systems		
Calls		
Tel	Telephone call	110
	Special call 1	121
	Special call 2	122
R-Z	Room call	150
R-B1	Call bed 1	151
R-B2	Call bed 2	152
R-B3	Call bed 3	153

Printer protocol

Interface parameters:
- RS 485: 9600 Baud; 8 Bit; No parity; 1 Stopbit

The event text is output in the following structure:
dd.mm.yy hh:mm:ss; „Event message“-;-;-;<Station>;<Room>

Day. Month. Year Hour: Minute: Second; „Event message“-;-;-;<Station>;>Room>

DECT/PSA protocol ESPA 4.4.4

Interface parameters:

- RS 485: 1200 Baud; 7 Bit; even parity; 2 Stopbit

Device 1 = SUD – „Control Station“, controls the entire communication,
Device 2 = PSA/DECT system /(e.g. DAKS server)

Polling-Funktion	
<EOT> 2 <ENQ>	<EOT>
Polling the counterpart via the light call interface at 2 s intervals.	Answer form the counterpart- nothing to send.

If this polling does not occur for **m** seconds then the counterpart generates a malfunction message. If a response does not occur **5** times, then the SUD generates a malfunction message in the light call system.

Establishing connection	
<EOT> 1 <ENQ> 2 <ENQ>	<ACK>
Device 1 = SUD occupies the cable as the master and address the counterpart device 2	Answer from the counterpart – „I am ready“

If the counterpart does not answer then the light call interface repeats the attempt up to 5 times. On the 5th attempt, the event message is discarded without an ACK from the counterpart.
If the connection is established by receiving an ACK, then the light call interface sends the event message.

Receive acknowledgement of the counterpart to an event message
<ACK>
Answer from the counterpart – „I am ready“

Further messages are then sent or the connection is closed by the light call interface sending <EOT>. The polling function then continues.

Event messages				
<SOH> 1 <STX>	1<US>1200<RS>	**Optional:** T<US>yymmdd-hhmm<RS>	4<US>3<RS>	**Optional:** I<US>0029<RS>
Header Message type Type 1: „Call to Pager“	Data type 1 = Pager address **Data:** Pager address „XXXX“	Data type T = Date/Time **Data:** yymmdd = date hhmm = time	Data type 4 = Call Type (of the pager system) **Data:** 2 = Speech Call = queryable 3 = Standard Call = not queryable: 1 = Reset Call **Optional:** with callback function „22“ = Speech Call (instead of Standard Call)	Data type I = Call-Id **Data:** 4 digit consecutive number of the call message **Optional:** with callback function

Event messages				
Optional: E<US>Ess,zzzr <RS>	**Optional:** 3<US>n<RS> or 6<US>n<RS>	2<US>RUF St.01 Z.247	<ETX> BCC	
Data type E = Nurse Call Interface **Data:** ss = Station address zzz = room address r = call position within the room **Optional:** with callback function	Data type 3 = Beep coding **Data:** n= Audio sequence 0...9 Data type 6 = Priority **Data:** n = Priority 0...9 (not yet available)	Data type 2 = Display message	„end of text“ BCC = Checksum	

Selectable parameters

Polling active (default: yes)
Call repetition (0: none (default), 1...15 minutes)
Repetition interval
Time display (default: no)

Only relevant to speech function:

- Callback function active (default: no)
  (expansions as per DAKS-ESPA)
- Call cancelling (when callback function active and call repetition = 0) (default: no)

A 16 character standard string is sent as a display message:

R	U	F			S	t	.	s	s		Z	.	z	z	z

4 characters Event text — ss: Station — zzz: Room

Example: Call St.03 Z.023 for call station 3 room 23

The events are assigned (a maximum of) 4-character text. For bed calls the "n" is replaced with the bed number.

	Event	Display text
Always visible events	Doctor call	DOC
	Emergency call	EMER
	Call	CALL
	S1 call request	M-S1
	S2 call request	M-S2
	Doctor call request	M-A
	Malfunction/Dropout	A/St
A fine distinction between the call types is only possible when the call event is currently the most important event at the affected station or when the „Detailed call“ menu item is set to „Yes“.	Diagnostic call	DIA
	Nurse assistance room call	NZ
	Room emergency call	NOTZ
	Room call	RUFZ
	Emergency call from bed n	N-B*n*
	Call from bed n	R-B*n*
	WC call	WC
	Telephone call	TEL

Standard pager assignment

The assignment of the event messages to the receiver numbers occurs on a station and event dependent basis.

	Recipient numbers									
	0100	0101	0110	0120	0200	0201	0210	0220	...	...
Station	1				2					
from room	0:	0:	0:	0:	0:	0:	0:	0:		
to room	all	all	all	all	all	all	all	all		
Time control Active at night Inactive at night	Day 24 h	24 h	Night	24 h	Day 24 h	24 h	Night	24 h		
Doctor call		X				X				
Emergency call	X		X	X	X		X	X		
Call	X		X		X		X			
Request S1	X		X		X		X			
Request S2	X		X		X		X			
Indicate doctor		X				X				
Malfunction/Drop-out										
Diagnostic call	X		X	X	X		X	X		
Room/Bed 1 – 6	X		X		X		X			
WC call	X		X		X		X			
Telephone call	X		X		X		X			

Technical changes, errors and printing mistakes excepted

	Recipient numbers								
	6300	6301	6310	6320	6400	6401	6410	6420	9000
Station	63				all				all
from room	0:	0:	0:	0:	0:	0:	0:	0:	0:
to room	all	all	all	all	all	all	all	all	all
Time control Active at night Inactive at night	Day 24 h	24 h	Night	24 h	Day 24 h	24 h	Night	24 h	24 h
Doctor call		X				X			
Emergency call	X		X	X	X		X	X	
Call	X		X		X		X		
Request S1	X		X		X		X		
Request S2	X		X		X		X		
Indicate doctor		X				X			
Malfunction/Drop-out									X
Diagnostic call	X		X	X	X		X	X	
Room/Bed 1 – 6	X		X		X		X		
WC call	X		X		X		X		
Telephone call	X		X		X		X		

Input functions

8 analogue inputs are available. You can use the menu to assign the following functions to all 8 inputs. Depending on the assigned function, switched levels (S) or button impulses (T) are required.

Input	Function
0	No function
1	Centralisation of the station (S or T)
2	Interconnection of group 1 (S or T)
3	Interconnection of group 2 (S or T)
4	Interconnection of group 3 (S or T)
5	Compulsory reception for all (S)
6	Compulsory reception for nurse
7	Learning of the existing rooms for own station (as monitoring range) (T)
8	Call (S)
9	Emergency call (S)
10	Diagnostic call (S)
11	Telephone call (S)

For 1..0.4: Group formation/Centralisation

Switch function:
The function is activated as long as a message level is present and deactivated by a quiescent level. If tow of these inputs have a message level at the same time then the last activated function is active.

Button function:
Button functions for the group inputs can be activated in the parameter menu. Each button push (message level) then changes/inverts the state -> toggle function.
Example: 1. button push (group 1) -> Activation of G1, 2nd button push (group 1) -> Deactivation of interconnection.
However: When another group was activated in the meantime, the 2nd button push is regarded as a new activation.
Example: 1. button push (group 1) -> Activation of G1, button push (group 2) -> Activation of G2, 2nd button push (group 1) -> Activation of G1, 3rd button push (group 1) -> Deactivation of interconnection.

To 5, 6: Announcement

An announcement is active as long as a message level is present (only useful with a speech module).

To 7: Learn monitoring range

A brief button push causes the monitoring range to be re-determined or the room installation re-learned.

For 8...11: Call functions

Call state while a message level is present. States are displayed via additional protocols.

Input	Function	Quiescent level
	Closed to +24 V	Open
Switch function (S)	Activation of the corresponding state	Deactivation of the corresponding state
Button function (T)	Activation/Deactivation of the corresponding state alternately (toggling) or triggering of a function	None

Additional protocols

The analogue inputs can be assigned the station bus addresses 100 to 119. A room protocol is generated for every assigned address that shows the call state(s) of the associated inputs (when the call function is defined). Multiple inputs can be assigned the same address/protocol (the call states of the inputs are then "ORed". Every address is assigned a text that is shown on the displays (see following table). The text is displayed instead of the room number. This also applies to displays on pagers/DECT systems.

Address	Text
100	Fire
101	101
102	Radio
103	Door
104	Special
105	Mains
106	Gas
107	Oxygen
108	Technical
109	Malfunction

Address	Text
110	Visit
111	Lift
112	Stairs
113	Yard
114	Sauna
115	Bathroom
116	Gong
117	OP
118	Reception
119	Entry

Example:
- A door contact (NO contact) is connected to input 1.
- Input 1 receives the function "8" = call (menu setting)
- Input 1 receives the additional protocol 103 (menu setting)

Shown on the duty room display: "Call door"

Group button function

Buttons or switches can be used for manual group interconnection. These are connected to the inputs intended for this purpose. In this menu item you define whether the inputs with the assigned functions G1, G2, G3 and centralisation are connected to buttons or switches.

Select "Yes" in this menu item when buttons are connected.

Select "No" in this menu item when switches are connected.

Output functions

8 outputs are available. You can use the menu to assign the following functions to all 8 outputs:

Input	Function
1	Display active centralisation of the station
2	Display active interconnection of group 1
3	Display active interconnection of group 2
4	Display active interconnection of group 3
5	Dropout/Malfunction within the own station (on in quiescent state, off with malfunction/ dropout)
6	Call/Emergency call within the own station (static call display, blinking alarm)

Outputs	Value	Unit
8 light outputs, not short-circuit protected (maximum 125 mA/24 VDC)	3	W

Technical changes, errors and printing mistakes excepted

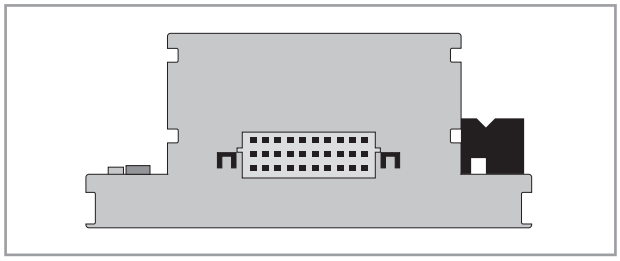
Connection to the RS 485/232 converter

T1- Terminal 4
T1+ Terminal 3
R1- Terminal 2
R1+ Terminal 1

(terminal designation at the converter; description on the rear side of the converter should be ignored)

Cross-floor, room-wise intercom

In order to implement a cross-floor, room-wise intercom, a speech expansion module (SUS) is required.
This is connected to the existing plug at the right of the station transfer point, as shown in the illustration. The expansion module should be available in the 1st quarter of 2009.



Connection example/Technical data

General values	
Temperature range	0 – 50 °C
Data preservation on power failure	10 years
Operating voltage	24 V (22 – 26 VDC)
Current consumption	100 mA (±10 mA)
Mounting on DIN rails	6 PLE
Degree of protection	IP20

Outputs	Value	Unit
8 light outputs **not short-circuit protected** (maximum 125 mA/24 VDC)	3	W

Inputs	Quantity
Button inputs	8

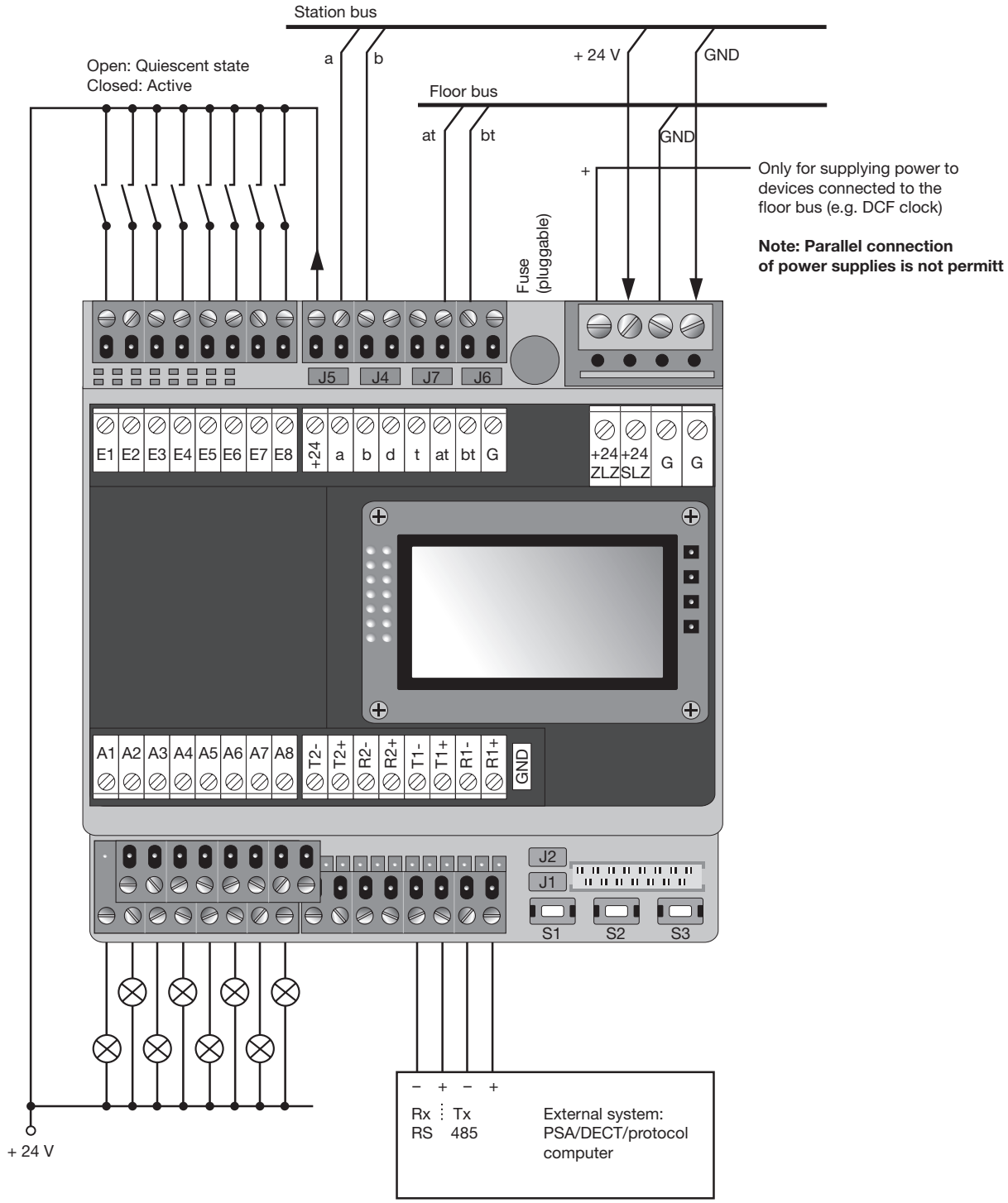
Jumper functions

J1/J2:
Connect the IF1 interface (R1- / R1+) with termination resistors and should not be removed.

J4/J5:
Connect the station bus data cables (a/b) with termination resistors and may not be removed, except when several station transfer points are connected to a station bus. in this case both jumpers should only be inserted at one station transfer point.

J6/J7:
Connect the data cables at/bt of the floor bus with termination resistors. Both of these jumpers must remain inserted at **one** station transfer point in the system. These must be removed from all other station transfer points.

The pulled jumpers can be "parked" in the jumper strip above the Rx/Tx (IF1, IF2) terminals so that they are not lost.


Station bus
a
b
+ 24 V
GND
Open: Quiescent state
Closed: Active
Floor bus
at
bt
GND
+
Only for supplying power to devices connected to the floor bus (e.g. DCF clock)
Note: Parallel connection of power supplies is not permitt
Fuse (pluggable)
J5
J4
J7
J6
E1 E2 E3 E4 E5 E6 E7 E8
+24 a b d t at bt G
+24 ZLZ
+24 SLZ
G
G
A1 A2 A3 A4 A5 A6 A7 A8
T2- T2+ R2- R2+ T1- T1+ R1- R1+
GND
J2
J1
S1
S2
S3
+ 24 V
– + – +
Rx ⋮ Tx
RS 485
External system:
PSA/DECT/protocol computer

Address table for DIP switch-

Nr.	1	2	3	4	5	6	7	8
1	**Off**	On	On	On	On	On	On	On
2	On	**Off**	On	On	On	On	On	On
3	**Off**	**Off**	On	On	On	On	On	On
4	On	On	**Off**	On	On	On	On	On
5	**Off**	On	**Off**	On	On	On	On	On
6	On	**Off**	**Off**	On	On	On	On	On
7	**Off**	**Off**	**Off**	On	On	On	On	On
8	On	On	On	**Off**	On	On	On	On
9	**Off**	On	On	**Off**	On	On	On	On
10	On	**Off**	On	**Off**	On	On	On	On
11	**Off**	**Off**	On	**Off**	On	On	On	On
12	On	On	**Off**	**Off**	On	On	On	On
13	**Off**	On	**Off**	**Off**	On	On	On	On
14	On	**Off**	**Off**	**Off**	On	On	On	On
15	**Off**	**Off**	**Off**	**Off**	On	On	On	On
16	On	On	On	On	**Off**	On	On	On
17	**Off**	On	On	On	**Off**	On	On	On
18	On	**Off**	On	On	**Off**	On	On	On
19	**Off**	**Off**	On	On	**Off**	On	On	On
20	On	On	**Off**	On	**Off**	On	On	On
21	**Off**	On	**Off**	On	**Off**	On	On	On
22	On	**Off**	**Off**	On	**Off**	On	On	On
23	**Off**	**Off**	**Off**	On	**Off**	On	On	On
24	On	On	On	**Off**	**Off**	On	On	On
25	**Off**	On	On	**Off**	**Off**	On	On	On
26	On	**Off**	On	**Off**	**Off**	On	On	On
27	**Off**	**Off**	On	**Off**	**Off**	On	On	On
28	On	On	**Off**	**Off**	**Off**	On	On	On
29	**Off**	On	**Off**	**Off**	**Off**	On	On	On
30	On	**Off**	**Off**	**Off**	**Off**	On	On	On
31	**Off**	**Off**	**Off**	**Off**	**Off**	On	On	On
32	On	On	On	On	On	**Off**	On	On
33	**Off**	On	On	On	On	**Off**	On	On
34	On	**Off**	On	On	On	**Off**	On	On
35	**Off**	**Off**	On	On	On	**Off**	On	On
36	On	On	**Off**	On	On	**Off**	On	On
37	**Off**	On	**Off**	On	On	**Off**	On	On
38	On	**Off**	**Off**	On	On	**Off**	On	On
39	**Off**	**Off**	**Off**	On	On	**Off**	On	On
40	On	On	On	**Off**	On	**Off**	On	On
41	**Off**	On	On	**Off**	On	**Off**	On	On
42	On	**Off**	On	**Off**	On	**Off**	On	On
43	**Off**	**Off**	On	**Off**	On	**Off**	On	On
44	On	On	**Off**	**Off**	On	**Off**	On	On
45	**Off**	On	**Off**	**Off**	On	**Off**	On	On
46	On	**Off**	**Off**	**Off**	On	**Off**	On	On
47	**Off**	**Off**	**Off**	**Off**	On	**Off**	On	On
48	On	On	On	On	**Off**	**Off**	On	On
49	**Off**	On	On	On	**Off**	**Off**	On	On
50	On	**Off**	On	On	**Off**	**Off**	On	On

Nr.	1	2	3	4	5	6	7	8
51	**Off**	**Off**	On	On	**Off**	**Off**	On	On
52	On	On	**Off**	On	**Off**	**Off**	On	On
53	**Off**	On	**Off**	On	**Off**	**Off**	On	On
54	On	**Off**	**Off**	On	**Off**	**Off**	On	On
55	**Off**	**Off**	**Off**	On	**Off**	**Off**	On	On
56	On	On	On	**Off**	**Off**	**Off**	On	On
57	**Off**	On	On	**Off**	**Off**	**Off**	On	On
58	On	**Off**	On	**Off**	**Off**	**Off**	On	On
59	**Off**	**Off**	On	**Off**	**Off**	**Off**	On	On
60	On	On	**Off**	**Off**	**Off**	**Off**	On	On
61	**Off**	On	**Off**	**Off**	**Off**	**Off**	On	On
62	On	**Off**	**Off**	**Off**	**Off**	**Off**	On	On
63	**Off**	**Off**	**Off**	**Off**	**Off**	**Off**	On	On
64	On	On	On	On	On	On	**Off**	On
65	**Off**	On	On	On	On	On	**Off**	On
66	On	**Off**	On	On	On	On	**Off**	On
67	**Off**	**Off**	On	On	On	On	**Off**	On
68	On	On	**Off**	On	On	On	**Off**	On
69	**Off**	On	**Off**	On	On	On	**Off**	On
70	On	**Off**	**Off**	On	On	On	**Off**	On
71	**Off**	**Off**	**Off**	On	On	On	**Off**	On
72	On	On	On	**Off**	On	On	**Off**	On
73	**Off**	On	On	**Off**	On	On	**Off**	On
74	On	**Off**	On	**Off**	On	On	**Off**	On
75	**Off**	**Off**	On	**Off**	On	On	**Off**	On
76	On	On	**Off**	**Off**	On	On	**Off**	On
77	**Off**	On	**Off**	**Off**	On	On	**Off**	On
78	On	**Off**	**Off**	**Off**	On	On	**Off**	On
79	**Off**	**Off**	**Off**	**Off**	On	On	**Off**	On
80	On	On	On	On	**Off**	On	**Off**	On
81	**Off**	On	On	On	**Off**	On	**Off**	On
82	On	**Off**	On	On	**Off**	On	**Off**	On
83	**Off**	**Off**	On	On	**Off**	On	**Off**	On
84	On	On	**Off**	On	**Off**	On	**Off**	On
85	**Off**	On	**Off**	On	**Off**	On	**Off**	On
86	On	**Off**	**Off**	On	**Off**	On	**Off**	On
87	**Off**	**Off**	**Off**	On	**Off**	On	**Off**	On
88	On	On	On	**Off**	**Off**	On	**Off**	On
89	**Off**	On	On	**Off**	**Off**	On	**Off**	On
90	On	**Off**	On	**Off**	**Off**	On	**Off**	On
91	**Off**	**Off**	On	**Off**	**Off**	On	**Off**	On
92	On	On	**Off**	**Off**	**Off**	On	**Off**	On
93	**Off**	On	**Off**	**Off**	**Off**	On	**Off**	On
94	On	**Off**	**Off**	**Off**	**Off**	On	**Off**	On
95	**Off**	**Off**	**Off**	**Off**	**Off**	On	**Off**	On
96	On	On	On	On	On	**Off**	**Off**	On
97	**Off**	On	On	On	On	**Off**	**Off**	On
98	On	**Off**	On	On	On	**Off**	**Off**	On
99	**Off**	**Off**	On	On	On	**Off**	**Off**	On

Planning aids/Rules for room installation

Each function row may only be occupied by a single device. Coloured fields may not be occupied.

Devices with double functions (call/cancel button) occupy two rows according to their associated definition (see switch settings).

Station bus	Room bus	Call button	Presence-/ Cancel button	Call/Presence-/ Cancel button	Pull-switch	Pneumatiktaster	Pneumatic central plate Function I	Pneumatic central plate Function II	System socket/ Call button with system soket
Room call	Room call 1		■				■	■	■
	Room call 2		■				■	■	
	Room call 3		■				■	■	
	Room call 4		■				■	■	
	Room call 5	■	■		■	■	■	■	■
	Room call 6	■	■		■	■	■	■	■
WC call	WC call 1		■				■	■	■
	WC call 2		■				■	■	■
	WC call 3		■				■	■	■
	WC call 4		■				■	■	■
	WC call 5	■	■	■			■	■	■
	WC call 6	■	■	■			■	■	■
	WC – A1	■			■	■	■	■	■
	WC – A2	■			■	■	■	■	■
	WC – A3	■			■	■	■	■	■
	WC – A4	■			■	■	■	■	■
Call bed 1	Bed call 1 – 1	■	■	■			■	■	
	Bed call 1 – 2	■	■	■	■	■	■	■	
	Bed call 1 – 3		■	■	■	■	■	■	■
Call bed 2	Bed call 2 – 1	■	■	■			■	■	
	Bed call 2 – 2	■	■	■	■	■	■	■	
	Bed call 2 – 3		■	■	■	■	■	■	■
Call bed 3	Bed call 3 – 1	■	■	■			■	■	
	Bed call 3 – 2	■	■	■	■	■	■	■	
	Bed call 3 – 3		■	■	■	■	■	■	■
Call bed 4	Bed call 4 – 1	■	■	■			■	■	
	Bed call 4 – 2	■	■	■	■	■	■	■	
	Bed call 4 – 3		■	■	■	■	■	■	■
Call bed 5	Bed call 5 – 1	■	■	■			■	■	
	Bed call 5 – 2	■	■	■	■	■	■	■	
	Bed call 5 – 3		■	■	■	■	■	■	■
Call bed 6	Bed call 6 – 1	■	■	■			■	■	
	Bed call 6 – 2	■	■	■	■	■	■	■	
	Bed call 6 – 3		■	■	■	■	■	■	■

Technical changes, errors and printing mistakes excepted

Station bus	Room bus	Call button	Presence-/ Cancel button	Call/Presence-/ Cancel button	Pull-switch	Pneumatiktaster	Pneumatic central plate Function I	Pneumatic central plate Function II	System socket/ Call button with system soket
Nurse I	S 1 – 1 +Acoustic	■			■	■	■	■	■
	Nurse 1 – 2	■			■	■	■	■	■
	Nurse 1 – 3	■			■	■	■	■	■
	Nurse 1 – 4	■			■	■	■	■	■
	Nurse 1 – 5	■			■	■	■	■	■
	Nurse 1 – 6	■			■	■	■	■	■
	Nurse 1 – 7	■		■	■	■	■	■	■
Diagnostic	Monitor 1	■	■	■	■	■		■	■
	Monitor 2	■	■	■	■	■		■	■
	Monitor 3	■	■	■	■	■		■	■
	Monitor 4	■	■	■	■	■		■	■
	Monitor 5	■	■	■	■	■		■	■
	Monitor 6	■	■	■	■	■		■	■
	Monitor 7	■	■	■	■	■		■	■
	Monitor 8	■	■	■	■	■		■	■
Special call I	Special 1 – 1	■	■	■	■	■	■		■
	Special 1 – 2	■	■	■	■	■	■		■
	Special 1 – 3	■	■	■	■	■	■		■
	Special 1 – 4	■	■	■	■	■	■		■
	Special 1 – 5	■	■	■	■	■	■		■
	Special 1 – 6	■	■	■	■	■	■		■
	Special 1 – 7	■	■	■	■	■	■		■
	Special 1 – 8	■	■	■	■	■	■		■
Special call II	Special 2 – 1	■	■	■	■	■	■		■
	Special 2 – 2	■	■	■	■	■	■		■
	Special 2 – 3	■	■	■	■	■	■		■
	Special 2 – 4	■	■	■	■	■	■		■
	Special 2 – 5	■	■	■	■	■	■		■
	Special 2 – 6	■	■	■	■	■	■		■
	Special 2 – 7	■	■	■	■	■	■		■
	Special 2 – 8	■	■	■	■	■	■		■

Sample operating log for call systems as per DIN VDE 0834

System location	
Name:	
Address:	
Telephone:	
Service modem telephone number:	

Operator	
Name:	
Address:	
Telephone:	

Trained person*	
Name:	
Address:	
Telephone:	
*If other people are trained, see appendix	

Installer	
Name:	
Address:	
Telephone:	

Maintainer	
Name:	
Address:	
Telephone:	

This sample is also available as a PDF document for downloading from our Internet site at:

www.elso.de → Products → Call systems → ELSO MEDIOPT care®

Technical changes, errors and printing mistakes excepted

Master data	
Manufacturer:	
Address of those responsible:	
Fax:	
Contact:	
Telephone:	

Hotline/Central reception	
Name:	
Address:	
Telephone:	

Installed system	
System:	
Year of manufacture:	
Call system version as per DIN/VDE 0834:	Yes/No
Call system maintenance as per DIN/VDE	Yes/No
Deviations:	
Type of service contract:	
No.:	
Number of stations:	
Number of rooms:	
Number of beds:	

Expansions	
System:	
Year of manufacture:	
Enhancements:	
Number of stations:	
Number of rooms:	
Number of beds:	

Call system commissioning log

1. The following system components were checked according to the manufacturer's service documents:
☐ Call buttons and movable devices for triggering calls
☐ All other operating devices such as presence buttons, cancel buttons etc.
☐ Signal lights and acoustic alarms
☐ All other display units
☐ All call query systems including any speech channels, volume, speech comprehensibility
☐ Interfaces to other systems not belonging to the call system
☐ Power supplies

2. The following system documentation was provided to the operator:
Location of the documents:
☐ System documentation with cable diagram, distributor connections, device list, etc.
☐ Installation and commissioning instructions
☐ Operating manuals
☐ Servicing instructions
☐ Configuration of the system

3. Instruction of the operator in the operation of the call system:
Date:
Repeated:

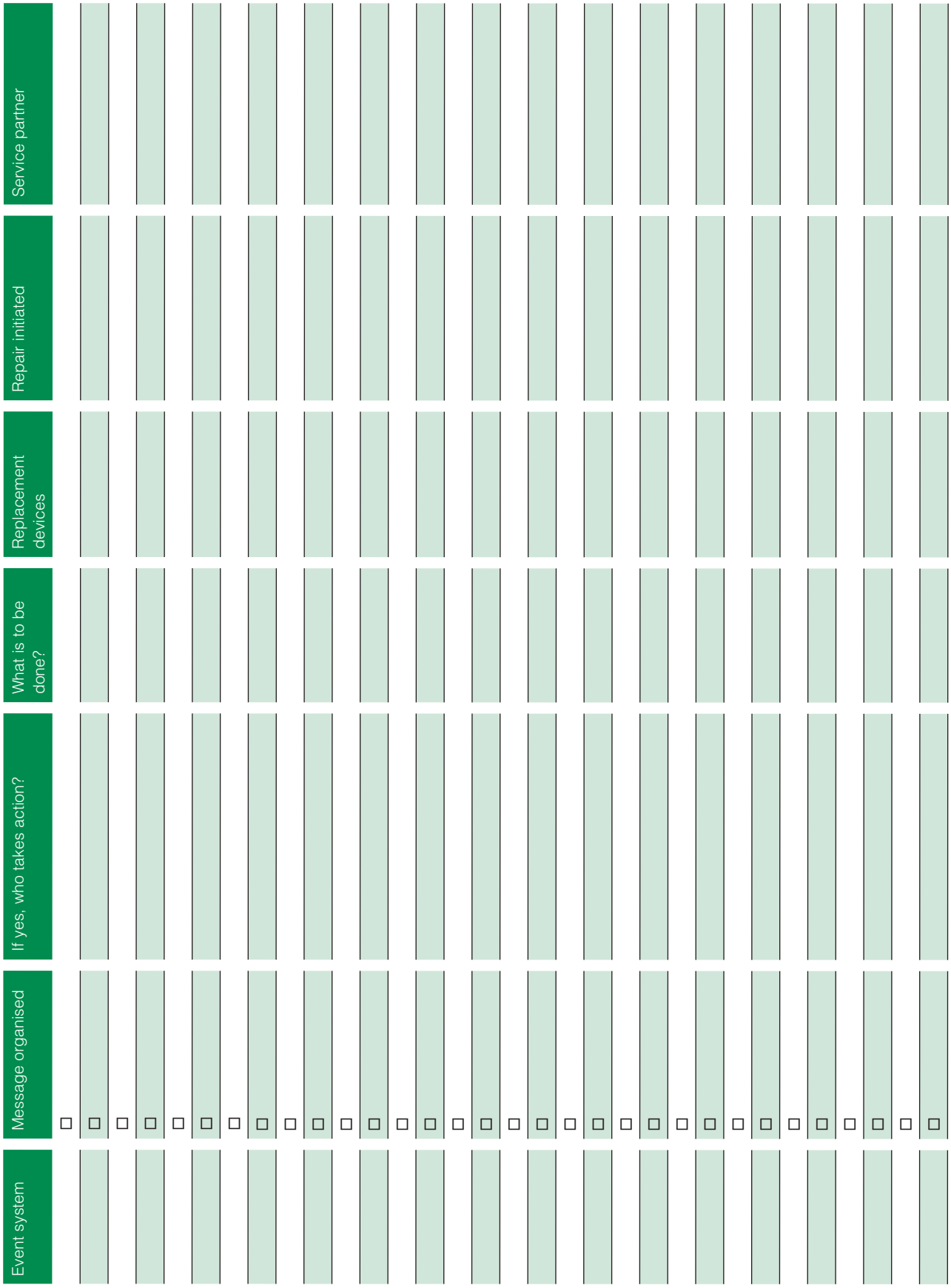
4. Acceptance performed on:			
Date:			
	Company	Name	Signature
Planner:			
Installer:			
Operator:			

Technical changes, errors and printing mistakes excepted

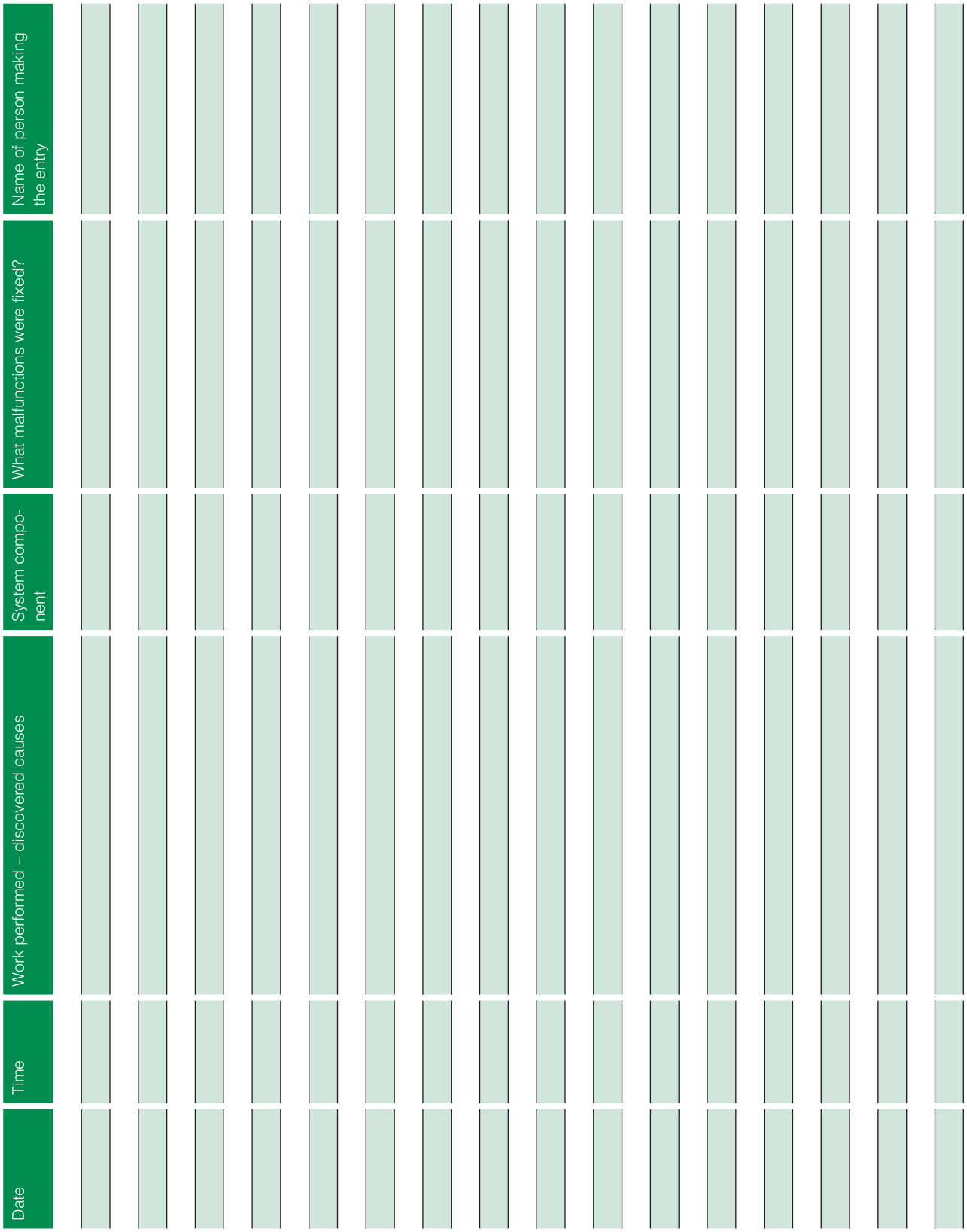
Malfunction messages

Date	Time	What were the symptoms of the fault? Type of malfunction	System component	Forwarded on	Completed on	Name of person making the entry

Message plan



Servicing – Inspection – Maintenance – Repair work



Notes

Sources:

Call system planning brochure
Central Association of the Electrical and Electronic Industry (ZVEI) e.V. Safety Systems Association

Planning example

No./Components	EG	1. OG	2. OG											Pieces	Current consumption 24 VPC	Single EUR	Total EUR
735000, Room/Duty room with RAT and display	1	1	1											3	X300 mA= 0,9 A		
735020, Room module with RAT and display															X120 mA		
735030, Room module with RAT		30	2 0											50	X100 mA= 5 A		
735040, Room signal light	13													13	X200 mA= 2,6 A		
735350, Designer room light, 3-way															X90 mA		
735360, Designer room light, 2-way															X60 mA		
735300, Designer room light, 3-way Comfort with door plate															X90 mA		
735310, Designer room light, 2-way Comfort with door plate															X60 mA		
735320, Designer room light, 2-way Comfort with door plate															X120 mA		
735370, Comfort with door plate																	
735330, Comfort with door plate Standard room signal light, 3-way		30												30	X90 mA= 2,7 A		
735340, Comfort with door plate Standard room signal light, 2-way															X60 mA		
733650, Standard room signal light																	
735370, Comfort with door plate Standard room signal light, 3-way															X90 mA		
735380, Comfort with door plate Standard room signal light, 2-way															X60 mA		
735390, Comfort with door plate																	
735490, Room signal light, 3-way															X160 mA		
735480, Group signal light, 2-way															X110 mA		
735090, Call button															X30 mA		
735070, Call/Cancel button	13													13	X35 mA= 0,445 A		
735070, Presence / Cancel button	13	30	20											63	X35 mA= 2,205 A		
735100, Pull-switch	13	30	20											63	X30 mA= 1,89 A		
735150, Pneumatic switch															X20 mA		
73348x, Comfort pear switch															-		
7339x, Comfort pear switch 1xlight															-		
733500, Comfort pear switch 2xlight															-		
73516x, system socket for pear switch															X30 mA		
735174, system socket for pear switch (2)															X30 mA		
73518x, system socket for pear switch (3)															X30 mA		
73512x, Call button with system socket (1)	13	30	20											63	X30 mA= 1,89 A		
735134, Call button with system socket (2)															X30 mA		
73519x, Call button with system socket (3)															X30 mA		
735140, Monitor button central plate															X20 mA		
735600, Corridor display, 1-sided, wall-mounting															X500mA		
735610, Corridor display, 1-sided, wall-mounting															X500 mA		
735620, Corridor display, 2-sided, wall-mounting															X1000 mA		
735630, Corridor display, ceiling, 1-sided															X500 mA		
735640, Corridor display, ceiling, 2-sided	1													1	X1000 mA= 1 A		
735290, DCF receiver				1										1	X50 mA= 0,05 A		
733450, Overvoltage protection module																	
735200, Station transfer point	1	1	1											3	X100 mA= 0,3 A		
735510, Single position PC, project-ready		1	1											2			
720960, 100 W power supply																	
735240, 200 W power supply	1		1											2			
735220, 310 W power supply		1												1			
730360, Radio receiver																	
730370, Hand transmitter																	
730390, Armband hand transmitter																	
73580x, Call button plate (1)																	
73584x, Call button plate (2)																	
735904, Call button plate (2)																	
73581x, Pull-switch central plate (1)	13	30	20											63			
735914, Pull-switch central plate (2)																	
73588x, Pull-switch central plate (3)																	
73583x, Pull-switch central plate (1)	13	30	20											63			
735934, Pull-switch central plate (1)																	
73589x, Pull-switch central plate (2)																	
73585x, Pneumatic central plate (1)																	
735854, Pneumatic central plate (2)																	
73594x, Pneumatic central plate (3)																	
73586x, Pneumatic central plate (1)																	
735964, Pneumatic central plate (2)																	
73582x, Call button plate (1)	13													13			
735924, Call button plate (2)																	
73587x, Call button plate (3)																	
Frame, 1-way	52	90	60											202			
Frame, 2-way																	
														Summe	18,99 A*		

x: Various colours
(1): for ELSO FASHION/SCALA/RIVA
(2): for ELSO NOVIA
(3): for ELSO JOY
SSD: SSD system socket
*: Ratings of the emergency power supply (uninterruptible power supply (UPS)) P=U x I -> P=24 VDC x x 18.99 A=455.76 W.
In the worst case the entire system has a power consumption of 455.76 W. The UPS used must provide this power for 1 h.

Planning assistance

No./Components	Number of rooms/Number of components													Pieces	Current consumption 24 VPC	Single EUR	Total EUR
735000, Room/Duty room with RAT and display															X300 mA		
735020, Room module with RAT and display															X120 mA		
735030, Room module with RAT															X100 mA		
735040, Room signal light															X200 mA		
735350, Designer room light, 3-way															X90 mA		
735360, Designer room light, 2-way															X60 mA		
735300, Designer room light, 3-way Comfort with door plate															X90 mA		
735310, Designer room light, 2-way Comfort with door plate															X60 mA		
735320, Designer room light, 2-way Comfort with door plate															X120 mA		
735370, Comfort with door plate																	
735330, Comfort with door plate Standard room signal light, 3-way															X90 mA		
735340, Comfort with door plate Standard room signal light, 2-way															X60 mA		
733650, Standard room signal light																	
735370, Comfort with door plate Standard room signal light, 3-way															X90 mA		
735380, Comfort with door plate Standard room signal light, 2-way															X60 mA		
735390, Comfort with door plate																	
735490, Room signal light, 3-way															X160 mA		
735480, Group signal light, 2-way															X110 mA		
735090, Call button															X30 mA		
735070, Call/Cancel button															X35 mA		
735070, Presence / Cancel button															X35 mA		
735100, Pull-switch															X30 mA		
735150, Pneumatic switch															X20 mA		
73348x, Comfort pear switch															-		
7339x, Comfort pear switch 1xlight															-		
733500, Comfort pear switch 2xlight															-		
73516x, system socket for pear switch															X30 mA		
735174, system socket for pear switch (2)															X30 mA		
73518x, system socket for pear switch (3)															X30 mA		
73512x, Call button with system socket (1)															X30 mA		
735134, Call button with system socket (2)															X30 mA		
73519x, Call button with system socket (3)															X30 mA		
735140, Monitor button central plate															X20 mA		
735600, Corridor display, 1-sided, wall-mounting															X500mA		
735610, Corridor display, 1-sided, wall-mounting															X500 mA		
735620, Corridor display, 2-sided, wall-mounting															X1000 mA		
735630, Corridor display, ceiling, 1-sided															X500 mA		
735640, Corridor display, ceiling, 2-sided															X1000 mA		
735290, DCF receiver															X50 mA		
733450, Overvoltage protection module																	
735200, Station transfer point															X100 mA		
735510, Single position PC, project-ready																	
720960, 100 W power supply																	
735240, 200 W power supply																	
735220, 310 W power supply																	
730360, Radio receiver																	
730370, Hand transmitter																	
730390, Armband hand transmitter																	
73580x, Call button plate (1)																	
73584x, Call button plate (2)																	
735904, Call button plate (2)																	
73581x, Pull-switch central plate (1)																	
735914, Pull-switch central plate (2)																	
73588x, Pull-switch central plate (3)																	
73583x, Pull-switch central plate (1)																	
735934, Pull-switch central plate (1)																	
73589x, Pull-switch central plate (2)																	
73585x, Pneumatic central plate (1)																	
735854, Pneumatic central plate (2)																	
73594x, Pneumatic central plate (3)																	
73586x, Pneumatic central plate (1)																	
735964, Pneumatic central plate (2)																	
73582x, Call button plate (1)																	
735924, Call button plate (2)																	
73587x, Call button plate (3)																	
Frame, 1-way																	
Frame, 2-way																	

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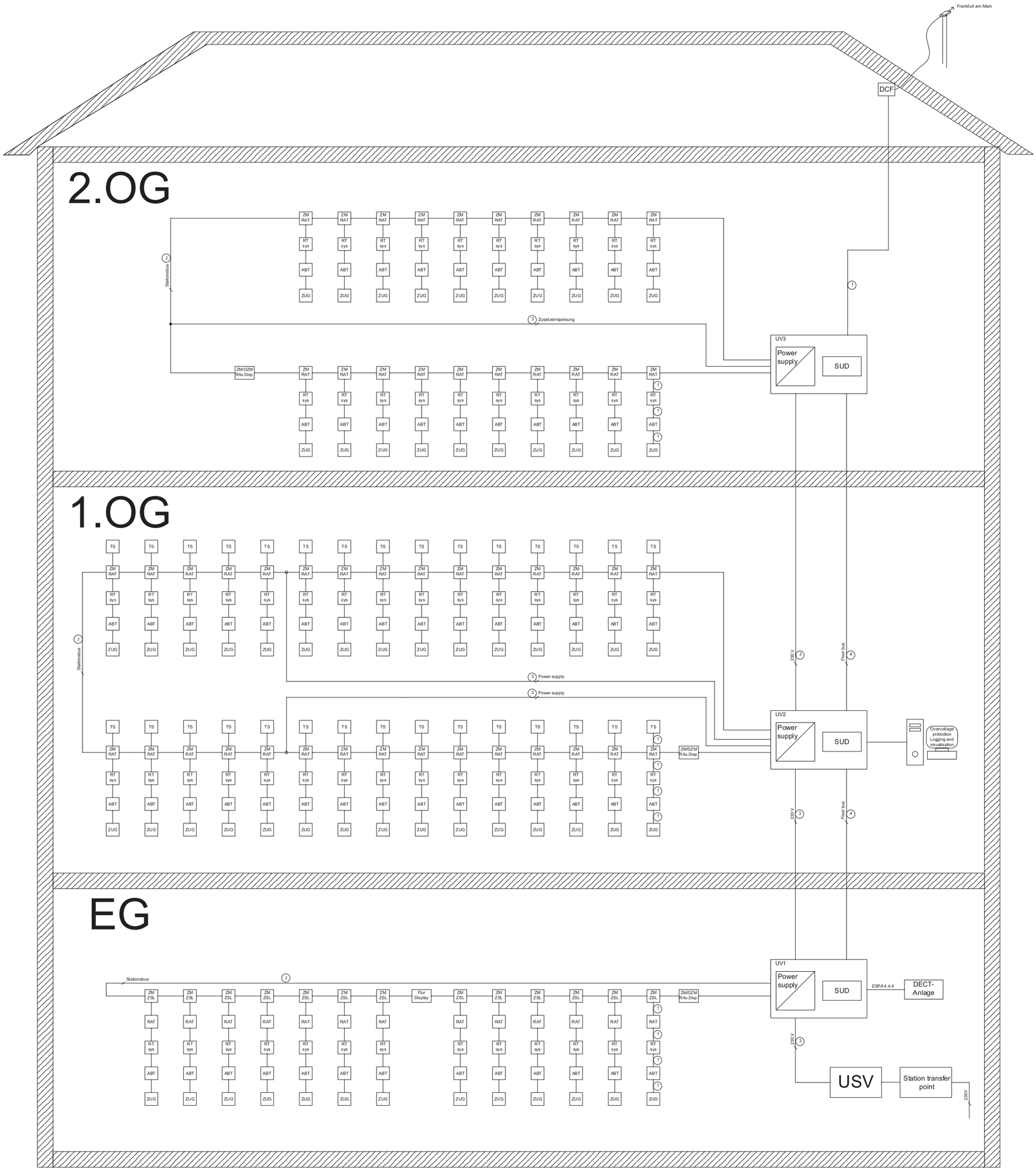

1. JY (St) Y 2 x 2 x 0,8qmm
2. JY (St) Y 2 x 2 x 0,8qmm+NYM 3x1,5qmm
3. NYM 3 x 1,5qmm
4. JY (St) Y 4 x 2 x 0,8

- Corridor Display RAu.Disp. — Room / Duty room module with call cancel button and display
- DCF — DCF radio receiver
- TS — Door plate with room signal light
- ZM ZSL — Door plate with room signal light
- ZM RAT — Call button with system socket for pear switch
- RAT — Presence cancel button
- RT sys — Call button with system socket for pear switch
- ABT — Presence cancel button
- ZUG — Pull-switch
- Flur Display — Flurdisplay
- Power supply — 24V power supply
- SUD — Station transfer point
- USV — Uninterruptible power supply
- 230V

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