(en) **Gira nurse call system 834 Plus**
Planning, installation, start-up, operation

Gira nurse call system 834 Plus
System manual

GIRA

1. Introduction

The Gira nurse call system 834 Plus is a wired call system with voice function that fulfils all of the requirements of the DIN VDE 0834 standard.

1.1 General notes

The technical data and specifications contained in this documentation may be changed without prior notification. The illustrations are likewise subject to change.

Subject to technical modifications!

Note: Up-to-date information is available on the Gira website.

As the system/device you have purchased is constantly being further developed and updated, information in this manual may no longer be up-to-date.

The latest product information is always available on the Gira website:

http://www.gira.de

Current software updates and documentation for your product are available at

http://www.download.gira.de

Note: Read the system manual and individual instructions.

Familiarise yourself with all the possibilities of this device and the entire call system. Please read the system manual and the instructions for the individual devices (where applicable) and take advantage of the online help information in the configuration software. You can find the system operating instructions as a PDF document (DE, EN, FR, NL) on the Gira download page at http://www.gira.de/service/download.

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1.2 System requirements

Operation of the Gira nurse call system 834 Plus requires own cables and own low voltage power supply (24 V DC).

Note: Emergency power supply.

According to DIN VDE 0834, emergency power supply must be ensured for specific application areas. The Gira power rectifier UPS Plus is suitable for decentral emergency power supply, Order No.: 2973 00.

1.3 Areas of application pursuant to DIN VDE 0834 (Intended use).

The Gira nurse call system 834 Plus is suitable for application areas specified in the DIN VDE 0834 standard such as hospitals, homes for the elderly and care homes etc.

The Gira nurse call system 834 Plus is used to signal emergency situations and alert personnel. Emergency situations are displayed via a red and/or white light in the room signal lights and/or via plain text in hallway displays, and in room and duty room terminals and Control 9 Plus duty room terminals (touch screen) acoustically as well as using buzzers (call forwarding). The display of the presence of care personnel is signalled via green and yellow light in the room signal lights. Communication of the care personnel with patients and communication among the care personnel is also possible via the integrated voice function.

Logging of care activities as required by the standard is via the system central control unit and ward control centre.

In general, a call system is comprised of the following elements:

Elements of a call system	Example
Call triggering elements (in part with voice function)	Call button, patient's hand-held device and pear button in diverse versions and functions as well as pull-cord button and pneumatic call button.
Call display elements (in part with voice function)	Room signal light, hallway display, room/duty room terminal, Control 9 Plus duty room terminal (touch panel) in diverse versions and functions.
Call-cancelling elements (in part with voice function)	Switch-off and presence button as well as room/duty room terminal, Control 9 Plus duty room terminal (touch panel) in diverse versions and functions.
Power supply elements	Power rectifier, with and without UPS.
Controlling and logging elements	System central control unit and ward control centre

Note: Electrician

Electrical devices may only be installed by a qualified electrician.

Important! No warranty in cases of improper use.

Gira assumes neither legal responsibility nor provides a guarantee for errors and damage of any kind as a result of improper use (1.3, page 8) and/or unprofessional installation of the Gira nurse call system 834 Plus. Please read 1.3, page 8 for the intended use.

Note: Planning based on the intended use.

The call system must be planned as a stand-alone device. DIN VDE 0834 is binding, including any other applicable regulations. Call systems may therefore only be planned by an expert call system planner. The operating range should be determined with the operator. Additional hospital construction regulations of the states must be considered, where applicable, along with other laws, regulations and standards.

Important! Connecting medical electrical equipment (MEE devices)

In accordance with Directive 93/42/EEC, the Gira nurse call system 834 Plus is not marketed by Gira as a medical device. If the Gira nurse call system 834 Plus is used as part of an MEE system, the requirements of DIN EN 60601-1-8 (VDE 0750-1-8) must be observed. Certification as an MEE system is the sole responsibility of the operator.

The operator is solely responsible for connecting medical products to the system interface (e.g. diagnosis socket). In such cases, the Gira call system becomes a part of the medical electrical system and can only be used for forwarding information in compliance with DIN EN 60601-1-8. It may **not** be used as part of a distributed alarm system in accordance with DIN EN 60601-1-8 because reliable transmission of signals (alarms) is not guaranteed. If the operator changes the intended purpose and uses the Gira nurse call system as part of a medical electrical system for forwarding alarms, it then becomes an in-house product according to Section 12 of the Medical Products Law. If the operator uses the Gira call system as part of a distributed alarm system as defined by DIN EN 60601-1-8, then the operator is not using the Gira call system for the intended purpose defined by Gira.

Important! A combination of devices from call systems of various manufacturers may not be used.

The system components of the Gira nurse call system 834 Plus are only to be used in the Gira nurse call system 834 Plus.

Important! Connecting external devices and systems

Gira assumes no liability for the external devices and systems connected to the system interface of the Gira nurse call system 834 Plus. The operator must ensure that the functions and the proper operation of the nurse call system 834 Plus are not affected by these devices and systems and that the DIN VDE 0834 is respected.

Mobile devices, such as DECT devices of a telecommunications system, are not components of the call system. Connection is made via the VOIP SIP interface of the nurse call system; the protocol RFC 3261 applies. In cases of special telephone system requirements, it is the responsibility of the operator to carry out suitable measures for the proper functioning of the Gira nurse call system 834 Plus.

Notes on the electromagnetic compatibility of a fixed installation

The operator of a fixed installation is responsible for the electromagnetic compatibility (EMC).

The Gira nurse call system devices comply with the EMC directive.

In accordance with section 4 of the EMVG (Law on the Electromagnetic Compatibility of Equipment), when installing and operating a call system, the operator must ensure that operation of the installation does not allow for impermissible electromagnetic interference or is not affected by such disturbances in its function.

The following guidelines and norms should be considered:

- Directive 2004_108_EC
- DIN VDE 0100-444
- Directive VDI 3551

If necessary, appropriate noise reduction measures should be taken. Depending on the nature of the disturbances line reactors, passive or active network filters, surge protectors or potential equalisation measures are used.

The need for cable shields depends on the local soil and the potential performance of the installation sites. In cases of critical potential differences appropriate measures must be taken.

The lines of the call system and the low-voltage installation must be installed in accordance with DIN 0834, point 6.2.10. Ideally, separate cable channels are used for signal and bus lines. Lines must intersect at a right angle.

2. Planning

2.1 Standards and regulations

Call systems belong to the category of safety systems and are traditionally known as "light call systems" or "nurse call systems".

Special regulations apply for installing, expanding, changing, operating and maintaining such systems.

As in nearly all technology sectors, there are also unified specifications for safety systems, the compliance with which represents a minimum standard for the performance profile and capability of a product. These specifications are usually documented in standards that represent the "general state of technology".

With the planning and installation of call systems, diverse regulations and legislation as well as standards must be taken into account.

In addition, accident prevention regulations of the municipal accident insurance association (GUVV) must also be observed.

Note: responsibility of the system operator.

With operation and maintenance of a call system, the specific standards and regulations must be observed.
The system operator is responsible for this.

2.2 General safety rules

Various regulations must be complied with in addition to VDE 0100/IEC 364-1. DIN VDE 0834 is the basis for installation, function, operation and maintenance of the Gira nurse call system 834 Plus. Special conditions in medical areas (DIN VDE 0100-710) and general rules for telecommunication technology also apply.

Note: observing further regulations.

During installation and according to installation and location, observing further regulations may be required.

According to DIN VDE 0834-1, call system devices must be set up so that they cannot be damaged or destroyed with proper use or through external effects, e.g. bed transport.

2.2.1 Electrical safety

As call systems are often operated in areas posing an increased risk to persons through electrically conductive connections with earth potential, electrical medical devices (patient environment) or other system parts, the stipulations of DIN EN 60601-1 (VDE 0750-1) (2 × MOPP) regarding electrical safety must be observed.

2.3 Basic system design

The Gira nurse call system 834 Plus is a light call system with voice functionality. It can be operated as a large system with a system central control unit (SSZ) and several ward control centres (SZ+) or as a small system with only one ward control centre.

	Small system (without SSZ+)	Large system (with SSZ+)
Wards	1	up to 26
Setup and configuration of organisational units	✓	✓
Software module connection to DECT telephone system Order No. 5994 00	-	✓
Software module connection to fire alarm system Order No. 5993 00	-	✓

The Gira nurse call system 834 Plus is hierarchically designed.
Three levels are physically differentiated:

– Room level (room bus)
– Ward level (ward bus, cable material must be 4 x 2 x 0.8 mm)
– System level (system bus, Ethernet at least CAT 5)

Note: voice communication.

To implement a call system with voice communication, duty-/room terminals must be planned at room level.

The "Functions" chapter describes in detail which devices are available for the nurse call system 834 Plus and which functions these fulfil.

The connection terminals of all system devices are colour-coded and correspond to the colouring of the recommended cable material (J-Y(St)-Y-) according to DIN VDE 0815.
In this way all devices can be connected without errors.

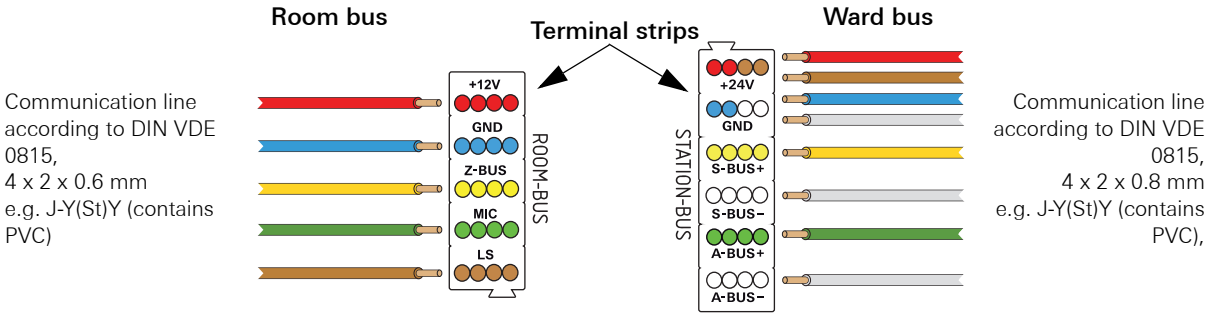


Fig. 2.1: Colour coding of the connection terminals and recommended cable material

Independent of the physical (bus) levels of the call system, so-called organisational units can be set up in which wards are grouped.

Organisational units may consist of one or several rooms and also complete wards.

Ward groups can be interconnected with complete wards or with other ward groups to form new organisational units. Chapter 2.9 Planning organisational units (grouping wards) on page 22 specifies how these are planned.

Explanations on colour-coding of the devices in the drawings and tables

System bus devices (nurse call system 834 Plus LAN - independent network)
Max. of 26 ward control centres in the large system

Ward bus devices
Max. 52 per ward

Room bus devices
Max. 16 per room

2.4 Small system overview

When using the nurse call system 834 Plus as a small system, the ward control centre serves as the central control element. Self-monitoring of the system (creation of log files) is automatic (as with large systems). Only one ward control centre can be operated in a small system. The use of further ward control centres or connection to an external system (fire alarm system (BMA), DECT, VoIP) is not possible.

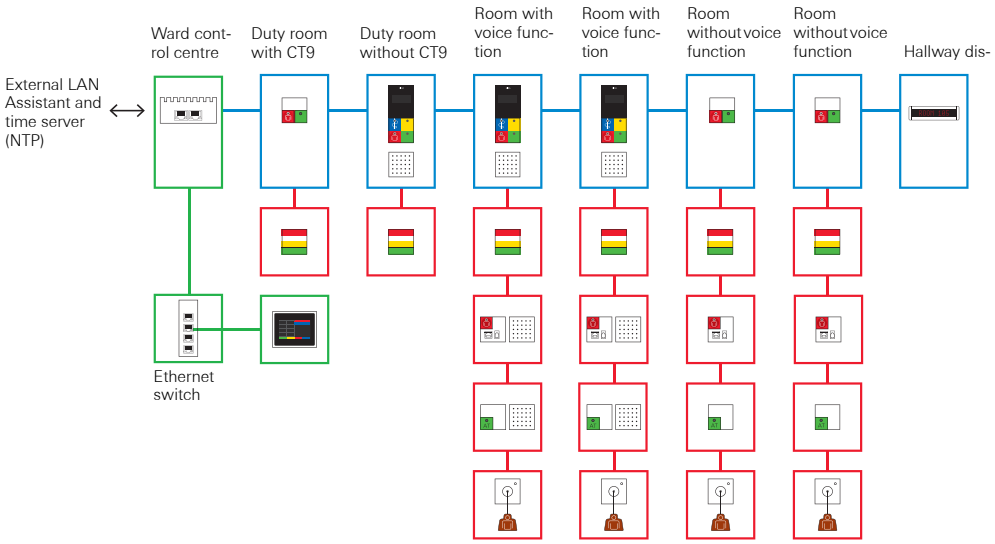


Fig. 2.2: Small system with a ward control centre, switch and Control 9 duty room terminal Plus

2.4.1 Properties and options with a small system

The ward control centre has two Ethernet connections that are designated differently. The Ethernet connection labelled "834 Plus LAN" is used for the call system network, and the "External LAN" Ethernet connection for connection of the configuration PC, for example.

The most important properties of the ward control centre:

– Control of the call system.

– Logging of call and presence activities.

– Self-logging of the system (error log).

– Connection option for the Control 9 duty room terminal Plus.

  The prerequisite for operating a Control 9 duty room terminal Plus in the system is an installed duty-/room terminal or room module.
  If only one Control 9 duty room terminal Plus is needed in a small system, the connection can be implemented directly via an Ethernet cable (CAT5 or higher) on the "834 Plus LAN" connection of the ward control centre.
  If several Control 9 duty room terminal Plus are needed in a small system, the connection is implemented via a switch with Ethernet cable (CAT5 or higher) (see Fig. 2.2) on the "External LAN" connection of the ward control centre.

– "834 Plus LAN" connection: Network connection for the call system.

– "External LAN" connection: Enables access to the system with the configuration assistant, or establishes connection to an external network (e.g. hospital network) or to the internet via e.g. an NTP server (time server).

– The configuration of the system is implemented with the so-called configuration assistant. This software is part of the ward control centre. Access to this is via a browser on the configuration PC.
  To access the configuration assistant, see chapter 4. Activation on page 61.

Note: power supply for a ward control centre

The devices of the nurse call system must be supplied with uninterruptible power supply. (See DIN VDE 0834-1).

2.5 Large system overview

When using the nurse call system 834 Plus as a large system, a system central control unit serves as the central control element (across wards). With this configuration, several wards are possible, and connection to external systems (fire alarm system (BMA), DECT, VoIP) and self-monitoring of the system (creation of log files) is automatic.

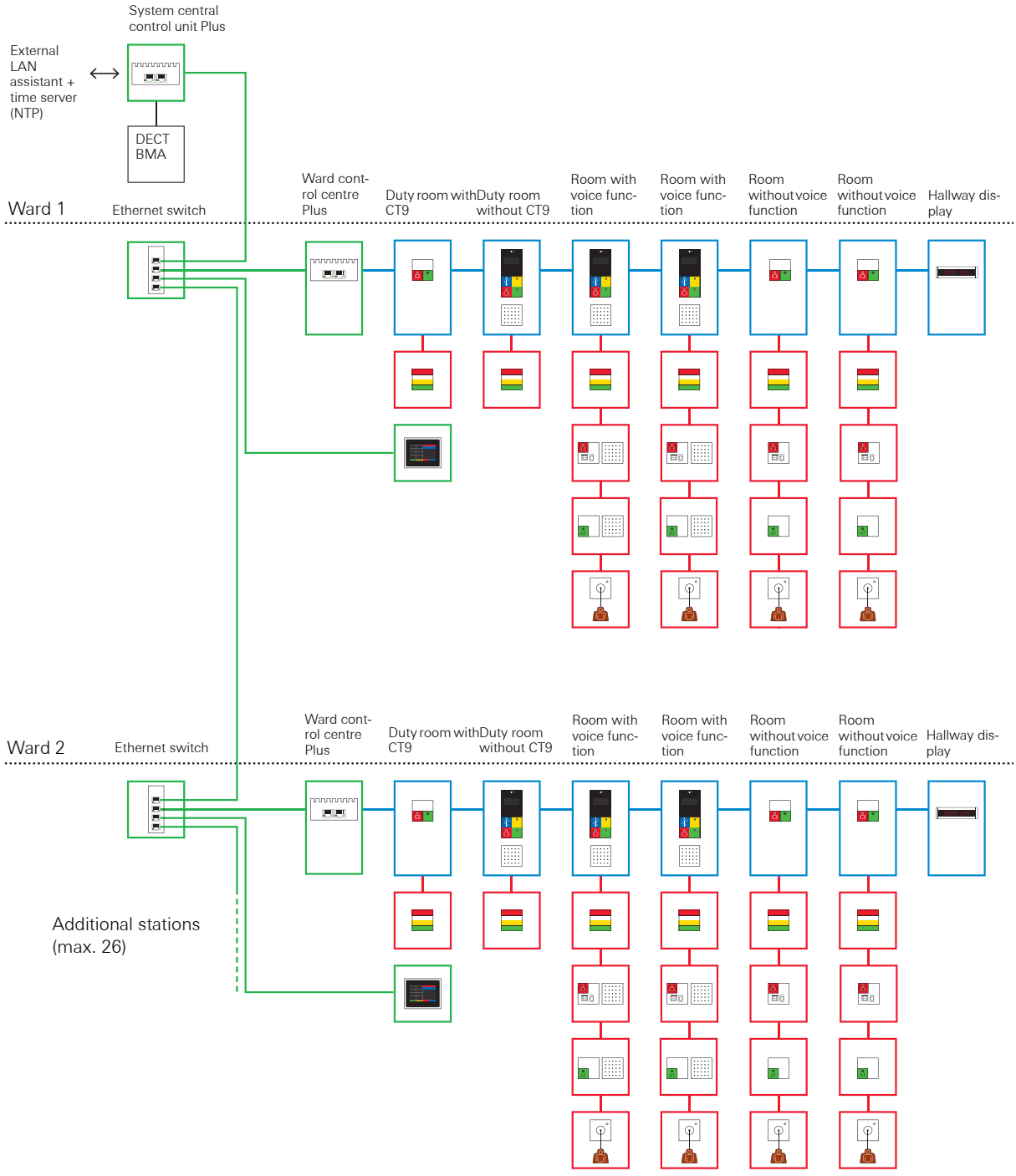


Fig. 2.3: Example of system design for a large system

2.5.1 Properties and options with a large system

On the system level of the large system, the ward control centres of the call system are connected with the higher-level system central control unit via the Ethernet switch(es) where applicable. The ward control centres and the system central control unit each have two Ethernet connections that are designated differently. The Ethernet connection designated "834 Plus LAN" is used for the call system network.

The most important properties of the system central control unit:

– Control of the call system.

– Logging of call and presence activities.

– Self-logging the call system (error log).

– Connection option for at least one, max. 26 ward control centres.
(We recommend: ensure own power supply for each ward).

– Connection option for Control 9 duty room terminal Plus via Ethernet switch.

  The prerequisite for operating a Control 9 duty room terminal Plus in the system is an installed duty-/room terminal or room module.
  If one or several Control 9 duty room terminal Plus are to be integrated, the connection is implemented via a switch with Ethernet cable (CAT 5 or higher) (see Fig. 2.2) on the "External LAN" connection of the system central control unit.

– Connections at system level are via Ethernet cable CAT 5 or higher, switches are applied where required.

– "834 Plus LAN" connection: Network connection for the call system.

– "External LAN" connection: Enables access to the system with the configuration assistant, or establishes connection to an external network (e.g. hospital network) or to the internet via e.g. an NTP server (time server).

– The configuration of the system is implemented with the so-called configuration assistant. This software is part of the system central control unit. Access to this is via a browser on the configuration PC.
  To access the configuration assistant, see chapter 4. Activation on page 61.

Note:
power supply of the system central control unit

The devices of the nurse call system must be supplied with uninterruptible power supply. (See DIN VDE 0834-1).

– Connection option for a fire alarm system (BMA)
(Optionally available software module, Order No.: 5993 00 is required).

– Connection option for a telephone system (DECT)
(Optionally available software module, Order No.: 5994 00 is required).

2.6 Planning of the wiring at room level

The central, controlling devices of a room are the room terminals, duty room terminals or room modules. These devices also serve as interfaces to the ward bus.

The devices of a room are interconnected via the room bus.

J-Y(St)Y 4 x 2 x 0.6 mm cables (or comparable) should be used.

Selection of cable material

When selecting cable material, the regulations and legislation valid at the location must be observed.
This concerns e.g. required halogen-free cable material.

With cable routing at room level, both wiring from device to device and star-shaped wiring is possible.

To prepare rooms for voice functionality, duty-/room terminals must be planned, as only these devices in combination with the voice module (included in scope of supply) offer voice functionality.

Power supply for the room devices is via the room bus line and is output from the duty-/room terminals or room modules.

The maximum cable length for the room bus is 40 m. Up to 16 room devices can be connected, not including duty-/room terminals or room modules.

2.7 Planning of the wiring at ward level

Devices at ward level such as ward control centre, duty room and room terminals or modules and surface-mounted and flush-mounted I/O modules or hallway displays are interconnected on the ward bus.

The duty-/room terminals have a display, a capacitive keypad and the option of connecting the voice module. The display can, for example, show the room number from which a call was triggered. Voice calls can be accepted and terminated or interconnections from wards and/or ward groups can be activated or deactivated. The duty room terminal differs from the room terminal by supplementary functions that are selected and called via the capacitive keypad below the display.

Cable material must be 4 x 2 x 0.8 mm (J-Y(St)Y or comparable). The ward bus is routed as a branch line, star-shaped wiring as with the room bus is not permissible.

A ward control centre serves as the central control unit for the ward and can be the interface between the ward bus and system bus.

Cable length with 24 V power supply (Gira power rectifier with or without UPS) in the ward bus can be a maximum of 200 m. For power supply, two wire pairs of the cable material specified above are used (red/blue and brown/white). See also 3.6 “Connecting the devices at room bus and ward bus level” on page 37 and "Overview of power supply" in the Installation chapter.

Note:
ensure power supply at the most remote point on the line.

Under the precondition of

– power rectifier (Order No.: 2972 00) or the Power rectifier UPS (Order No.: 2973 00) being used and

– in compliance with all notes on specified cable lengths, and

– with observance of the energy point table, see 2.8.1 Energy point table (Calculation of maximum number of devices per power supply unit) on page 20

at least 14 V voltage can always be measured at the most remote device.

The length of the bus line at ward level can be max. 1000 metres.

The ward control centre is always the first device on the ward bus. The terminating resistances of the bus lines (data and audio bus) are activated at the last device on the bus via a jumper (yellow jumper, included in scope of supply of the ward control centre).

2.8 System power supply

The nurse call system 834 Plus is operated with 24 V continuous current.

Important: Ensure uninterruptible power supply!

The devices of the nurse call system must be supplied with uninterruptible power supply. (See DIN VDE 0834-1).

If there is a central, uninterruptible power supply (230 V) in the building to be installed, then the power rectifier (Order No.: 2972 00) can be used without an integral uninterruptible power supply (UPS).

If a central UPS is not available, the power rectifier with UPS (Order No. 2973 00) must be used.

Note: provide circuit breaker with power supply units.

Connect a circuit breaker type D, max. 16 A upstream from the power supply unit.

2.8.1 Energy point table (Calculation of maximum number of devices per power supply unit)

With the help of the energy point table, the maximum number of devices that can be supplied from one power supply unit is calculated. The basis for this calculation are the energy points. The energy points are measured so that the factor of simultaneity is taken into account with system operation. The room devices are already included in the energy points of the duty room/room terminals and room modules. Only the devices directly connected to a power supply unit are considered in the table.

If one power supply unit is not sufficient for power supply of a ward, then further power supply units must be installed in the system if necessary.

Supplier	Item No.:	Points	Calculation example: Number of devices	Points
Power rectifier 24 V/5 A	2972 00	46	1	46
Power rectifier 24 V/5 A with UPS	2973 00	46		

End users	Initials	Points	Number of devices	Points
Duty room terminal	DZT+	2	1	2
Room terminal	ZT+	2	17	34
Room module	ZM+	1		
Hallway display, one-sided	FD+	2		
Hallway display two-sided	FDD+	3	1	3
I/O module ward bus surface-mounted Plus (8/8)	IOAP+	1	1	1
IOAP+ 1 I/O module ward bus flush-mounted Plus (2/2)	IOUP+	1	1	1
Ethernet switch	SW+	1	1	1
Ward control centre Plus	SZ+	4	1	4
System central control unit Plus	SSZ+	6		
Total energy points of connected devices				**46**

Important!
Do not connect more than 46 energy points per power supply.

If the limit of 46 points is exceeded then a further Gira power supply unit must be planned for.

2.8.2 Overvoltage protection

The safe operation of call systems assumes high power supply availability that may not be influenced by external factors. As such, measures for protection against excess voltage and lightning must be planned for in the system.

The aim of these measures must be to avoid disruptions to the operational functionality of the call system or destruction of the system by atmospheric overvoltages, indirect (capacitive and inductive couplings) and conditional direct effects (galvanic coupling) from thunderstorms. Significant improvements in operational reliability are achieved with specific lightning and overvoltage protection. A corresponding lighting protection and overvoltage protection concept is to be drawn up and implemented for this, whereby overvoltage protection devices must comply for use in telecommunication and signal-processing networks according to DIN EN 61643-21: 2002-03.

Conductors of the call system that leave the building must be equipped with overvoltage protection according to DIN VDE 0845 at their point of exit. This need not be implemented when a galvanic separation securely prevents the crossing of hazardous voltages.

2.8.3 Electromagnetic compatibility

In terms of electromagnetic compatibility (EMC), general conductor routing in the immediate vicinity of possible sources of interference is to be avoided. Despite compliance to all regulations and standards concerning EMC, in individual cases influencing may occur.

Important! Observe notes on cable routing

The notes on cable routing in Section 3.3 must be observed.

The notes on electromagnetic compatibility in Section 1.3 must be observed.

2.9 Planning organisational units (grouping wards)

At least one ward control centre is required for the setup and configuration of organisational units (ward groups). Up to 6 ward groups can be managed with one ward control centre.

It is possible to connect complete wards or parts of these (one or several rooms) with other wards or parts to form new organisational units. This connection can be permanent or flexible. The configuration of rooms into ward groups is carried out in the configuration assistant of the system central control unit or ward control centre.

Each device in the system has a unique identification number. In addition, plain names must be assigned for the duty-/room terminals and room modules. Here this is usually the room number.

Creating new organisational units (ward groups) is also important for the function of call forwarding and call display.

In the state of delivery of a system (with at least one ward control centre), all rooms belong to the same organisational unit.

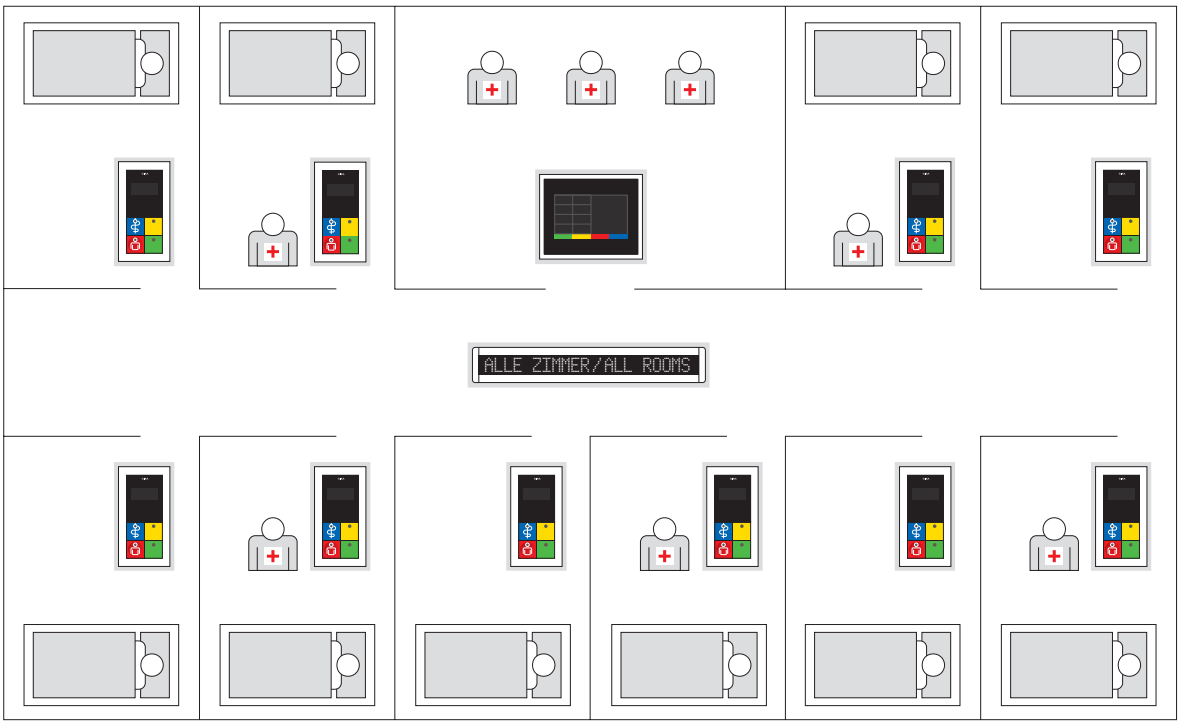


Fig. 2.4: Example for an ungrouped ward as an organisational unit

The following example shows a ward split into 3 organisational units. The grouping of wards into ward groups (own organisational units) is carried out in the configuration assistant, see 4.8 “Handling the configuration software Example: Configure organisational units” on page 76.

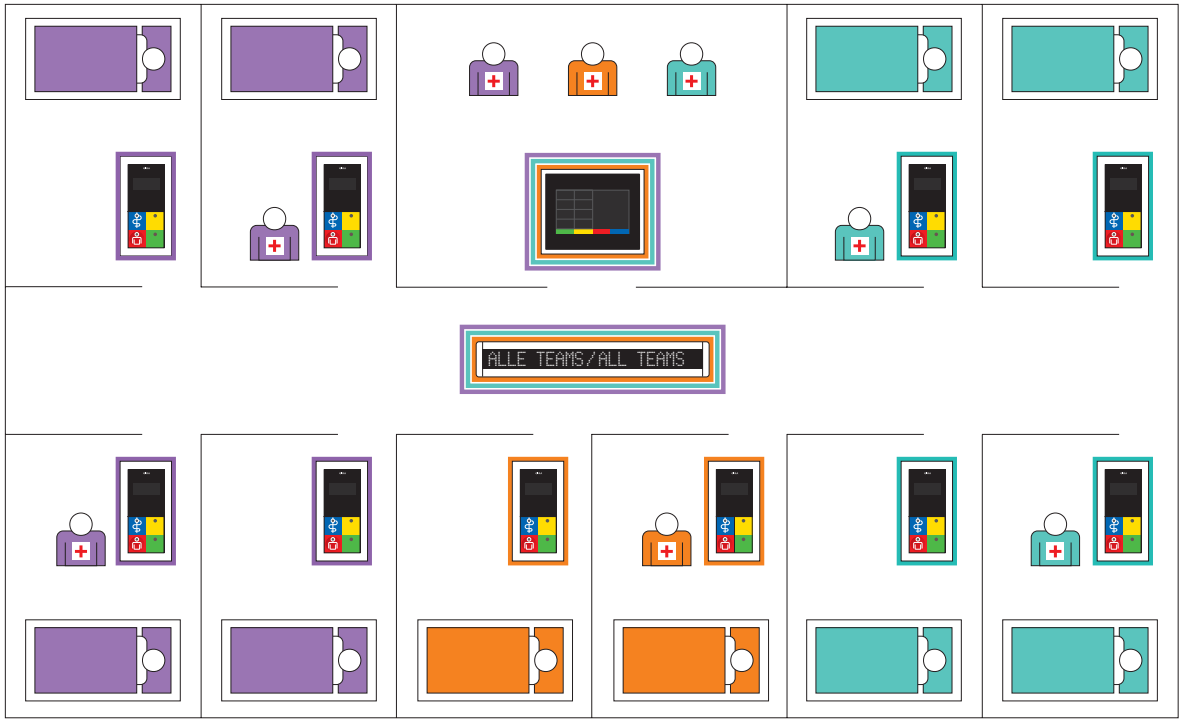


Fig. 2.5: Example of a ward with three organisational units

In relation to faults that may occur in a system, DIN VDE 0834-1 specifies:

– Larger call systems must be divided into independent sub-areas that cover a maximum of one ward. Faults in one of these sub-areas must not affect the other sub-areas.

Note: detailed information in the help section of the configuration assistant.

Please consult the help section of the configuration assistant for detailed measures for global configuration of duty times or interconnection of participating units and call types and for the display of presence and collective calls.

2.10 Examples of planning at room level

The maximum cable length for the room bus is 40 m. Up to 16 room devices can be connected.

2.10.1 Block diagram for a twin bed room without voice function

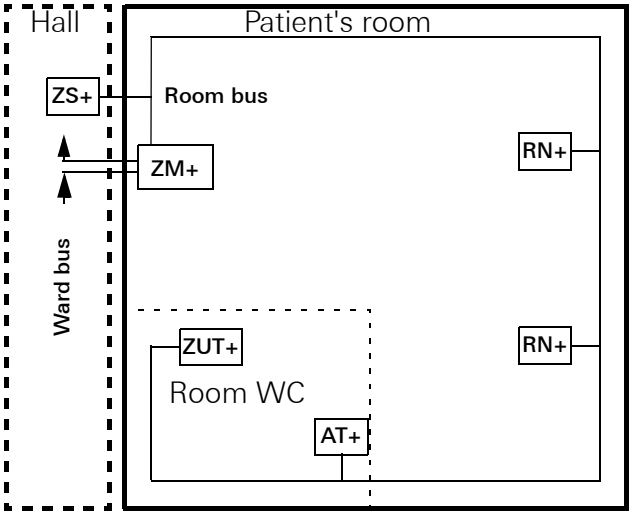


Fig. 2.6: Block diagram for a twin bed room without voice function

2.10.2 Block diagram for a twin bed room with voice function

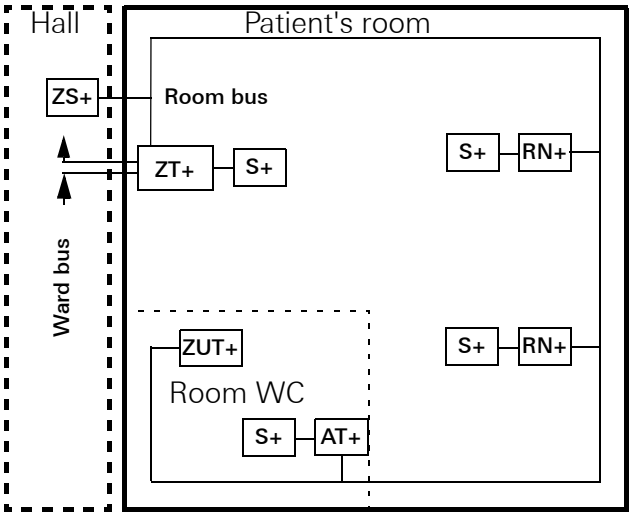


Fig. 2.7: Block diagram for a twin bed room with voice function

2.11 Example: Wiring of a twin bed room with voice function and WC area

Patient's rooms in care homes or hospitals are often twin-bed rooms with their own WC area (bathroom unit).

Next to the beds a call button with ancillary plug contact has usually been installed, to which a patient's hand-held device can be connected. This hand-held device enables not only normal call/emergency call triggering but also switching of the reading light or the room light.

The patient has voice communication when a voice module has been connected to the call button with ancillary plug contact or when a patient's hand-held device is connected via the ancillary plug contact. The latter makes direct voice communication possible by holding it to the mouth and ear like a telephone receiver.

Often in patient rooms there is a sitting area with table and chairs where a call button should also be installed.

A call button is normally found in the washbasin area of bathroom units.

A pull-cord button should be installed so that it can be pulled from the shower and/or toilet (not shown in the diagram). The length of the pull cord is dimensioned so that it can be easily reached by a patient lying on the ground. Next to the door in the WC area there is a switch-off button (possibly with voice module) to enable switching off a triggered call/emergency call directly on-site.

The system components of a room are connected to a room terminal or room module.

Triggered calls and presence are visually signalised via signal lights in the hallway next to or above the room door. The signal light is controlled via the room terminal or room module.

A call is signalled with a continuous red light, a WC call with continuous red and white light, an emergency call with a red flashing light, a WC emergency call with red and white flashing light.

Note: switching off WC calls.

A WC call/WC emergency call can only be switched off on-site (i.e. in the WC) according to DIN VDE 0834.

The presence of care personnel in a room is displayed with green and/or yellow continuous light in the room signal light.

Routing of the cable material for the room bus is as a branch line or star-shaped.

Connection of the devices to the room bus is via the colour-coded terminal strips to avoid mistakes. The operating voltage for the room devices is output by the duty-/room terminal or room module.

Flush-mounted 2-gang boxes are included with the duty room terminals and room terminals. A voice module with suitable flat ribbon cable is included in the scope of supply, and spacers to the flush-mounted 2-gang box of the terminals are also included.

We recommend installing the room module in deep flush-mounted boxes.

The room signal light is wired to the room bus.

2.11.1 Which devices are used where?

The following tables are intended as planning aids, showing which devices are used where.

Explanation for colour coding of devices

Room bus devices
Max. 16 per room

Ward bus devices
Max. 52 per ward

System bus devices (nurse call system 834 Plus LAN - independent network)
Max. of 26 ward control centres in the large system

Room

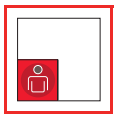
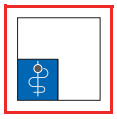
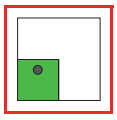
Fig.	Designation	Connection to	Installation site	Voice capability	Connection of patient's hand-held device
	Call button Plus (RT+) Oder No. 5900 ..	Room bus	- In the room - At the bed - In the WC	-	-
	Call button with ancillary plug contact Plus (RN+) Oder No. 5901 ..	Room bus	- In the room - At the bed	✓	✓
	Call and switch-off button Plus (RA+) Oder No. 5902 ..	Room bus	- In the WC	-	-
	Call and switch-off button with ancillary plug contact Plus (RAN+) Oder No. 5903 ..	Room bus	- In the room - At the bed	✓	✓
	Call and doctor alert button Plus (RAR+) Oder No. 5904 ..	Room bus	- In the room	-	-
	Doctor alert button Plus (AR+) Oder No. 5905 ..	Room bus	- In the room	-	-
	Call button with ancillary plug contact and DIA pin jack Plus (RND+) Oder No. 5906 ..	Room bus	- At the bed	✓	✓
	Presence button green Plus (AW1+) Oder No. 5908 ..	Room bus	- In the room	-	-

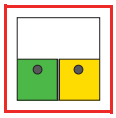
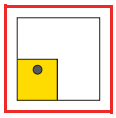
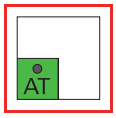
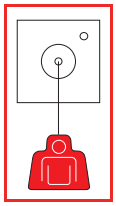
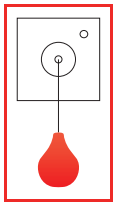
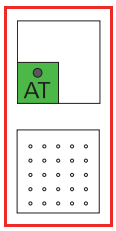
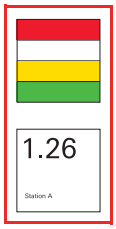
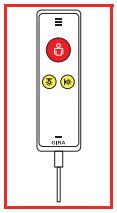
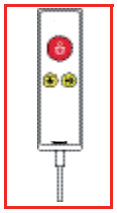
Fig.	Designation	Connection to	Installation site	Voice capability	Connection of patient's hand-held device
	Presence button green, yellow Plus (AW12+) Oder No. 5909 ..	Room bus	- In the room	-	-
	Presence button yellow Plus (AW2+) Oder No. 5910 ..	Room bus	- In the room	-	-
	Switch-off button Plus (AT+) Oder No. 5911 ..	Room bus	- In the WC	-	-
	Pull-cord button Plus (ZUT+) Oder No. 5912 ..	Room bus	- In the room: - At the bed - In the WC	-	-
	Pneumatic call button Plus (PRT+) Oder No. 5913 ..	Room bus	- In the room: - At the bed - In the WC	-	-
	Switch-off button with voice module Plus (ATS+) Oder No. 5918 .. (voice module included in scope of supply)	Room bus	- In the WC	✓	-
	Red, white, yellow and green room signal light Plus (ZS+) Oder No. 5944 ..	Room bus	Hallway: - Next to/over the room door	-	-
	Red, white, yellow and green room signal light with name plate Plus (ZSN+) Oder No. 5948 ..	Room bus	Hallway: - Next to the room door	-	-

Fig.	Designation	Connection to	Installation site	Voice capability	Connection of patient's hand-held device
	Room module with call and presence button (ZM+) Oder No. 5920 ..	Room bus Ward bus	Patient's room/ Duty room: - Next to the room door	-	-
	Room terminal with doctor alert and presence 2 Plus (ZT+) Oder No. 5925 .. (voice module included in scope of supply)	Room bus Ward bus	Patient's room: Next to the door	✓	-
	Duty room terminal with doctor alert and presence 2 Plus (DZT+) Oder No. 5929 .. (voice module included in scope of supply)	Room bus Ward bus	Duty room: Next to the door	✓	-
	Patient's hand-held device with voice function and 2 light buttons Order No. 5960 00	Ancillary plug contact	-	✓	
	Patient's hand-held with 2 light buttons Order No. 5957 00	Ancillary plug contact	-	-	

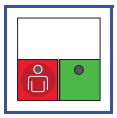
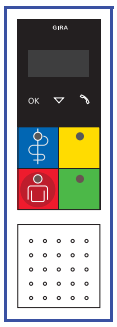
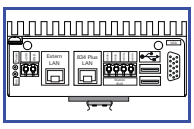
Note: Devices are pre-configured.

Typical WC devices:

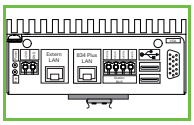
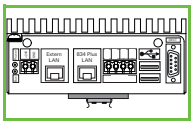
– Call and switch-off button Plus (Order No.: 5902 ..),
– Switch-off button Plus (Order No.: 5911 ..),
– Switch-off button with voice module Plus (Order No.: 5918 ..),
– Pull-cord button Plus (Order No.: 5912 ..),
– Pneumatic call button Plus (Call No.: 5913 ..)

are pre-configured for use in WC areas.

Ward level

Fig.	Designation	Connection to	Installation site	Voice capability
	Room module with call and presence button (ZM+) Oder No. 5920 ..	Room bus Ward bus	Patient's room/ Duty room: - Next to the door	-
	Room terminal with doctor alert and presence 2 Plus (ZT+) Oder No. 5925 .. (voice module included in scope of supply)	Room bus Ward bus	Patient's room: - Next to the door	✓
	Duty room terminal with doctor alert and presence 2 Plus (DZT+) Oder No. 5929 .. (voice module included in scope of supply)	Room bus Ward bus	Duty room: - Next to the door	✓
	Flush-mounted I/O module Plus (IOUP+) Order No. 5978 00	Ward bus	any	-
	Surface-mounted I/O module Plus (IOAP+) Order No. 5979 00	Ward bus	e.g. plant room of the ward	-
	Hallway display Plus (FD+) Order No. 5976 00	Ward bus	Ward hallway	-
	Hallway display two-sided Plus (FDD+) Order No. 5977 00	Ward bus	Ward hallway	-
	Ward control centre Plus (SZ+) Order No. 5973 00	Ward bus System bus	e.g. control cabinet	Only control of voice transmission.

System level

Fig.	Designation	Connection to	Application in large system	Application in small system
	Ward control centre Plus (SZ+) Order No. 5973 00	Ward bus System bus	✓	✓ Only as single device when no system central control unit is used.
	System central control unit (SSZ+) Order No. 5972 00	System bus	✓	-
	Control 9 duty room terminal Plus Order No. 5927 00	System bus	✓	✓
	Ethernet switch (SW+) Order No. 5985 00	System bus	✓	✓

3. Installation

With installation of the Gira nurse call system 834 Plus, attention must be paid to the applicable requirements of DIN VDE 0834, DIN VDE 0100 and further standards as well as statutory regulations.

Own wiring and own power supply is fundamentally required for the Gira nurse call system 834 Plus.

3.1 Recommended installation steps

The following procedure for installation is recommended:

– Routing of cable material for the room bus.

– Installation and connection of the room devices.

– Routing of cable material for the ward bus.

– Installation and connection of the duty/room terminals, room and I/O modules, and hallway displays.

– Routing of cable material (Cat.5) for the system bus (ethernet).

– Installation, connection and start-up of the ward control centre(s).

– Installation, connection and start-up of the system central control unit.

3.2 Using the ward plan

All devices have a double label attached to them, one of which can be removed. With flush-mounted devices these labels are on the support ring, otherwise on the device housing. Before a device is finally installed, the loose label should be removed and stuck onto the ward plan (www.gira.de) (see next page). This plan is very helpful later for setting up the system in the configuration assistant of the ward control centre or system central control unit.

The labels have the following information:

– Unique device ID in the form of: ID 23-45678; the first two digits identify the device type, the next five digits represent the individual serial number.

– Short device description

– Article No.

The ward plan should be "filled out" with the labels during installation to prepare the system documentation that must be handed over by the installation company to the operator, see 4.10 “System information” on page 78.

Filling out: stick removable device labels into the table and apply notes if required.

ID 12-345678 ZT+ 5925 .. Room 110	ID 23-45678 RT+ 5902 .. Bed 1	ID 34-56789 RT+ 5902 .. Bed F	ID 45-67890 RT+ 5902 ..	ID 56-78901 AT+ 5911 .. z. B. WC
Explanation: Room name (Each number may only occur in the system once)	Explanation: Room device at bed 1 (Bed marking 1)	Explanation: Room device at bed F (own bed marking F, for bed at window)	Explanation: Room device without bed marking	Explanation: Device in WC area

ID 98-76543 SZ+ 5973 .. **Central ward con-**		ID 98-76543 FD+ 5977 .. **Ward bus participants (hallway display, I/O module FM, I/O module SM)**						
ID 12-345678 ZT+ 5925 .. **Zimmer . . .**	ID 23-45678 RT+ 5902 .. z. B. Bett 1	z. B. Bett 2	z. B. Bett 3	z. B. Bett 4	. .	. .	. .	. .
DZT+ ZT+/ZM-ID	ID 56-78901 AT+ 5911 .. z. B. WC	z. B. WC	. .	. .	. .	. .	. .	. .
ID 12-345678 ZT+ 5925 .. **Zimmer . . .**	ID 23-45678 RT+ 5902 .. z. B. Bett 1	z. B. Bett 2	z. B. Bett 3	z. B. Bett 4	. .	. .	. .	. .
DZT+ ZT+/ZM-ID	ID 56-78901 AT+ 5911 .. z. B. WC	z. B. WC	. .	. .	. .	. .	. .	. .
ID 12-345678 ZT+ 5925 .. **Zimmer . . .**	ID 23-45678 RT+ 5902 .. z. B. Bett 1	z. B. Bett 2	z. B. Bett 3	z. B. Bett 4	. .	. .	. .	. .
DZT+ ZT+/ZM-ID	ID 56-78901 AT+ 5911 .. z. B. WC	z. B. WC	. .	. .	. .	. .	. .	. .
ID 12-345678 ZT+ 5925 .. **Zimmer . . .**	ID 23-45678 RT+ 5902 .. z. B. Bett 1	z. B. Bett 2	z. B. Bett 3	z. B. Bett 4	. .	. .	. .	. .
DZT+ ZT+/ZM-ID	ID 56-78901 AT+ 5911 .. z. B. WC	z. B. WC	. .	. .	. .	. .	. .	. .

3.3 Notes on cable routing

In general, as well as DIN VDE 0834, other standards, legislation and guidelines must be taken into account. Because legislation and regulations sometimes differ from state to state, it is not possible here to offer a complete overview. It must however be observed that in some states the use of cabling and installation material containing halogen is not permitted.

Cables for the nurse call system 834 Plus must not be routed with cables of other systems (with hazardous voltage) in common cables, tubes or installation channels. Circuits for safety purposes must be routed independently of other circuits. Electrical errors or modifications to the general power supply must not influence the operational safety of the call system.

The cable material of the call system must be routed with a minimum distance of 30 cm to 230 V~ cables. With shorter distances of less than 10 m, a distance of 10 cm suffices. Cable routing must be explicitly documented in the system documentation by the installation company.

Alternatively, separate cables in tubes or installation ducts with double or reinforced isolation in accordance with DIN EN 60950 can be routed. The isolation in such cases must withstand a test voltage of 4000 V effective value over a duration of one minute. The complex leakage current must not exceed 0.5 mA.

With installation of the cable network of the call system, fire protection requirements must be complied with, for example when the bus line is routed in escape and rescue routes (hallways).

Note: room and ward cable routing.

From the control unit of the room in a star configuration or from device to device (looping through).

The ward bus is routed from device to device, star-shaped wiring as with the room bus is not permissible.

3.4 Cable material

3.4.1 Type of cable material

Communication line is used according to DIN VDE 0815 with the designation:

– J-Y(St)Y ... (contains PVC)
– J-H(St)H ..., or J-2Y(St)H ... (halogen-free)

kommen.

Note: variable colour coding.

Colours of the individual wires differ according to cable material used!
If other cable material than that recommended is used, ensure that the same wire colours are always routed to the same connections throughout the complete call system.

When setting up the Gira nurse call system 834 Plus, 4 x 2 x 0.6 mm cable material should be used on the room level and 4 x 2 x 0.8 mm on the ward level. Special system cables (e. g. flat ribbon audio cable) are not required or are included with the devices.

On the system bus level, ethernet cable of at least Cat.5 must be used.

3.4.2 Cable lengths

If voltage drop is too large due to cable length and connected devices (see 2.8.1 “Energy point table (Calculation of maximum number of devices per power supply unit)” on page 20.) further power rectifiers must be installed (see 2.7 “Planning of the wiring at ward level” on page 18.).

Important: Do not connect power supply units in parallel.

A new voltage line must be installed for each further power supply unit in the system. Parallel switching of power supply units is not permissible!

Equipotential bonding between the power rectifiers must be ensured.

3.5 Notes on device installation

3.5.1 Installation heights for devices

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

– Components such as the call button or switch-off button at a height of 0.7 m to 1.5 m.

– With pull-cord buttons in bathroom units, specific requirements in DIN VDE 0100-710 must be adhered to.
  Pull-cord buttons must be fitted at least 20 cm above the highest possible position of the shower head.
  It must be possible for the pull cord to be reached by persons lying on the floor.

DIN 18040-1 and DIN 18040-2 "barrier-free construction" also stipulates that operating elements for wheelchair patients should be mounted to a height of 0.85 m.

Note: reef knot on the cord of pull-cord button.

The handle is to be secured with a reef knot on the pull cord.

3.5.2 Installation heights for signal lights and large displays

Components such as signal lights and large text displays should be installed at a height of 1.5 m to 2.2 m.

3.5.3 Installation conditions for control units, energy supply devices

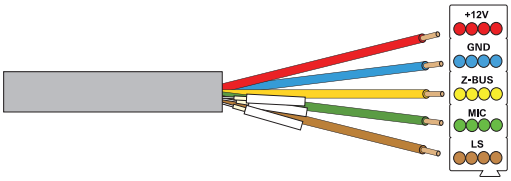
Central control devices such as system central control units, ward control centres, energy supply devices and other components without operating or signalling functions are intended for installation in switch cabinets, and must not be installed in patient's rooms. When installing in switch cabinets, heat loss must be dissipated if necessary with forced ventilation.

3.6 Connecting the devices at room bus and ward bus level

All devices have colour-coded terminal strips. The colour coding corresponds to the wire colours of the recommended cable material:
J-Y(St)Y 4 x 2x 0.8 mm at ward level and
J-Y(St)Y 4 x 2x 0.6 mm at room level
according to DIN VDE 0815.

3.6.1 Connecting devices in the room

All devices at room level have colour-coded terminals for connecting to the room bus.



Line to be used:

Communication line according to DIN VDE 0815
4 x 2 x 0.6 mm

e.g. J-Y(St)Y (contains PVC), white wires are not used here (bend away).

Or:

J-H(St)H or
J-2Y(St)H (halogen-free)

> have other colour coding and are twisted 4-fold.

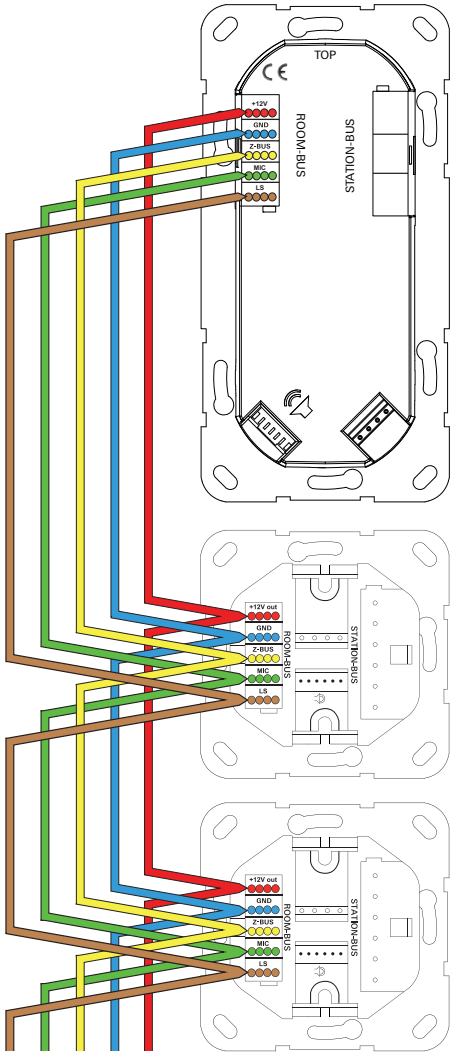
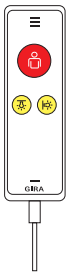


Fig. 3.8: Colour coding of J-Y(St)-Y cable material on the room bus

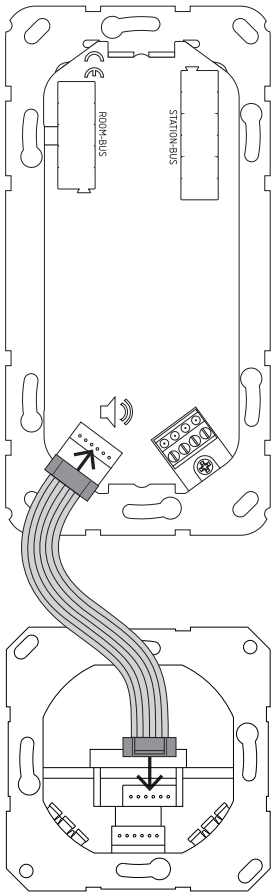
3.6.2 Connecting the voice-compatible components in the room

Fig.	Designation	Connection to	Installation site
	Voice module Plus (S+) Order No. 5990 .. (with 5918 .., 5925 .., 5929 .. included in scope of supply.)	Flat plug	Patient's room and duty room: in combination with 5901 .., 5903 .., 5906 ...
	Patient hand-held device (PHG+) Order No. 5960 ..	To ancillary plug contact of: 5901 .., 5903 .. or 5906 ..	Patient's room: - At the bed

3.6.3 Connecting the voice module

All voice-compatible devices can be installed with or without the voice function. If the voice function is desired, the device is connected with a voice module (audio flat ribbon cable included).

Connecting the voice module to the terminal:
5925 .. (ZT+)
5928 .. (DZT+)



Connecting the voice module to the room device:
5901 .. (RN+)
5903 .. (RAN+)
5906 .. (RND+)

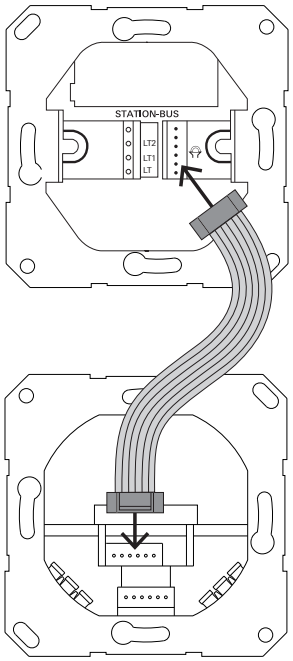


Fig. 3.9: Connection of the voice module 5990 .. via flat ribbon cable to a voice-compatible room device.

3.6.4 Connecting the patient hand-held device

All voice-compatible devices can be installed with or without the voice function. If the voice function is desired, the appropriate room device can be connected with the voice module via the included audio flat ribbon cable.

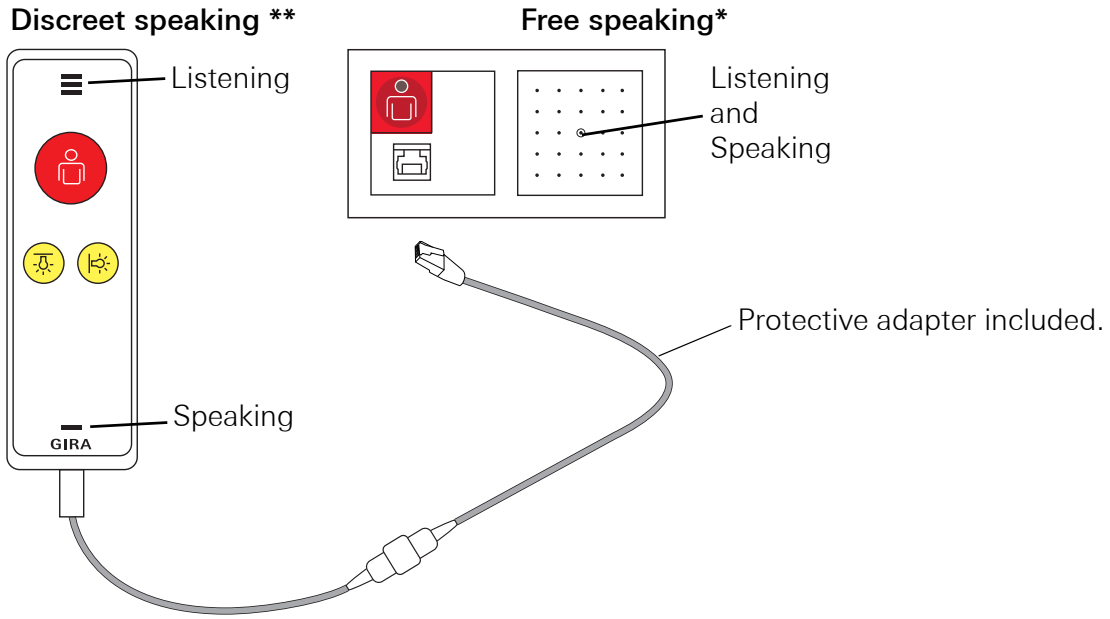


Fig. 3.10: Connection between the patient hand-held device and the room device with ancillary plug contact

The voice call

Voice calls occur when a call/emergency call has been triggered.

With the Gira nurse call system 834 Plus, two types of voice calls are differentiated:

– Free speaking* via voice module and patient hand-held device: following call triggering via pressing the red call button, free speaking and listening are possible.

– Discreet speaking** via the patient hand-held device: following call triggering via pressing the red call button on the patient hand-held device, free speaking is first possible. The "discreet speaking" function is only possible after the button on the patient hand-held device has been pressed twice. The patient hand-held device is held to the mouth and ear like a telephone receiver for discreet speaking and listening.

Connecting the patient hand-held device

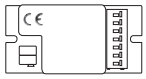
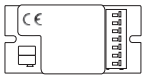
After connecting the patient hand-held device (PHG) via protective adapter to a room device with ancillary plug contact, a flashing LED requests pressing the call button once on the patient hand-held device. This process checks the functionality of the hand-held device (PHG test). This test does not trigger a call (see 4.14 “PHD test” on page 80.).

Plug removal

When the cable of the patient hand-held device is pulled out of the socket, a "plug removal call" occurs. This call must be confirmed by pressing the green button of a duty room/room terminal or room module for at least three seconds.

See the "Functions" chapter for further information.

3.6.5 Switching room lights

Fig.	Designation	Connection to	Installation site
	Impulse relay 1-pole Order No.: 2964 00	On 5901 .., 5903 .., 5906 ..., with 4-pole plug	between the room device with ancillary plug contact and consumer.
	Impulse relay 2-pole Order No.: 2965 00	On 5901 .., 5903 .., 5906 ..., with 4-pole plug	between the room device with ancillary plug contact and consumer.

The light at the bed and/or in the room can also be switched via the patient hand-held device as well as call triggering.

Coupling to the house electronics (e.g. light in the room and/or reading lamp at the bed) is via the 1- or 2-pole impulse relay. The terminals LT, LT1 and LT2 are zero-voltage.

Important: ensure spatial separation of cable material and devices.

Ensure distance between the 24 V DC and 230 V~ AC. Observe the regulations!

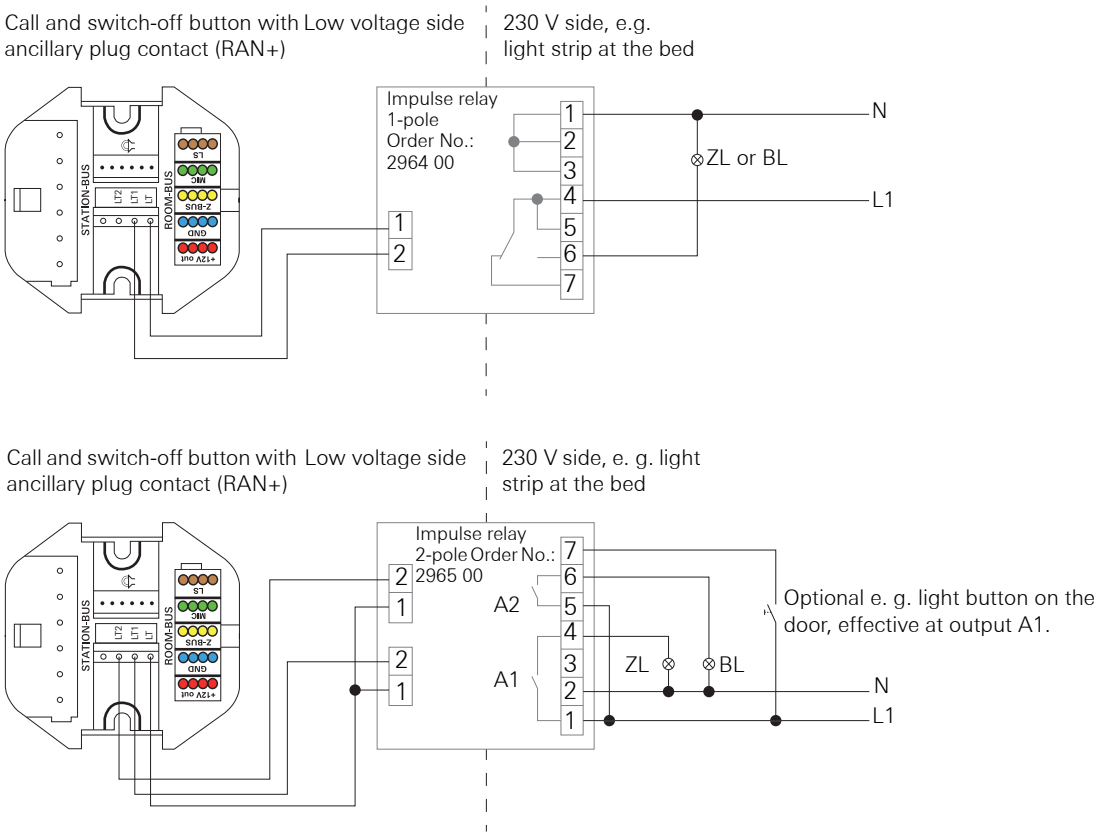


Fig. 3.11: Connection of room light (ZL) and/or bed light (BL)

3.6.6 Connection of diagnostic connection cable

Cable for connection of the zero-voltage contact of an external device with the call button with ancillary plug contact and diagnostic pin jack (nurse call system 834 Plus), Article No.: 5906 .., or call button with 2 diagnostic pin jacks (nurse call system 834 Plus), Article No.: 5907 ...

Important: cable must not come into contact with 230 V!

The diagnostic connection cable is only suitable for low voltage.

Important! Connecting medical electrical equipment (MEE devices)

The operator is solely responsible for connecting medical products to the diagnostics pin jack. In such cases, the Gira call system becomes a part of the medical electrical system and can only be used for forwarding information in compliance with DIN EN 60601-1-8. It may **not** be used as part of a distributed alarm system in accordance with DIN EN 60601-1-8 because reliable transmission of signals (alarms) is not guaranteed. If the operator changes the intended purpose and uses the call system as part of a medical electrical system forwarding alarms, it then becomes an in-house product according to Section 12 of the Medical Products Law. If the operator uses the Gira call system as part of a distributed alarm system as defined by DIN EN 60601-1-8, then the operator is not using the Gira call system for the intended purpose defined by Gira.

In the nurse call system 834 Plus, the zero-voltage contact of a device from other manufacturers can operate both as NC contact and NO contact. We recommend the "NC contact" wiring configuration.

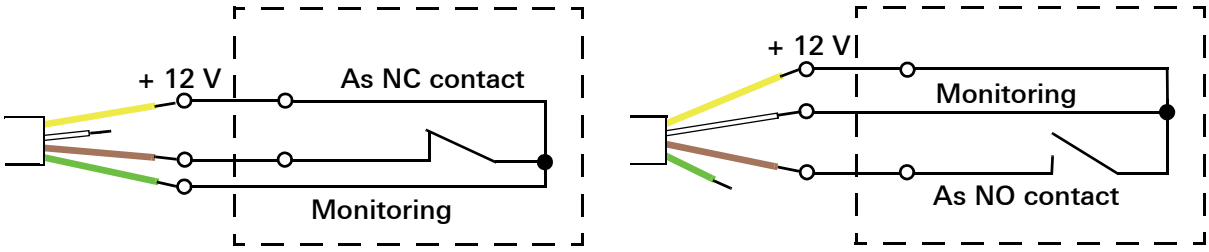


Fig. 3.12: Diagnostic connection cable

First connect the open end as shown, then insert the RJ11 plug of the connection cable into the diagnostic socket of the call button (5906.. or 5907..).

The call button with ancillary plug contact and diagnostic pin jack, Article No.: 5906 .. and the call button with 2 diagnostic pin jacks, Article No.: 5907 ..feature plug monitoring that triggers a call with missing plug contact.

3.6.7 Connection of pull-cord button Plus

Observe the special installation regulations with pull-cord buttons Plus (especially in damp rooms) (see Page 36). Connections of the pull-cord button as with the other room devices: wire colour to colour. White wires are not required.

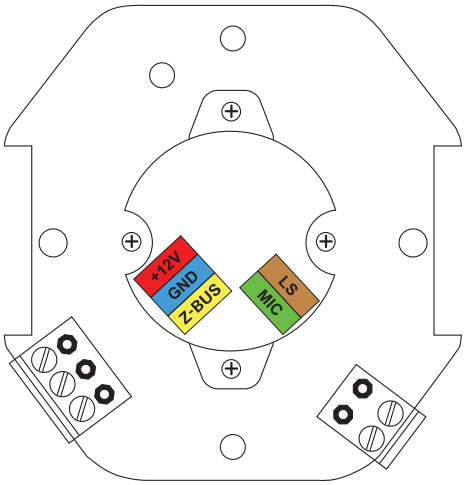


Fig. 3.13: Connections of the pull-cord button Plus

3.6.8 Connection of pneumatic button Plus

Observe the special installation regulations with pneumatic buttons Plus (especially in damp rooms).

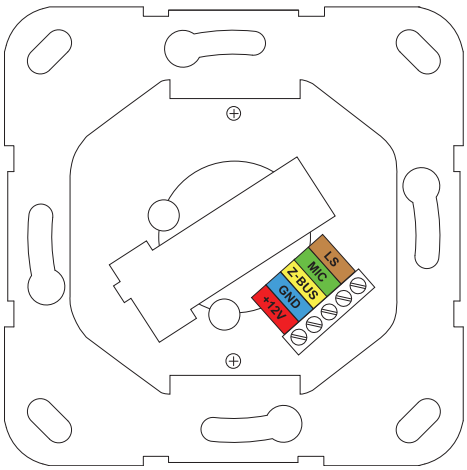


Fig. 3.14: Connections of the pneumatic button Plus

3.7 Connection of ward devices

Duty room terminals, room terminals and room modules have two colour-coded terminal strips: one for the room bus (5 terminals) and one for connection to the ward bus (6 terminals). Duty-/room terminals also have a connection option for the 6-pole flat ribbon cable of the voice module.

Note: Cable routing

Ensure secure cable routing according to DIN VDE 0100-444 and the requirements of Directive 2014/30/EU concerning electromagnetic compatibility.

The wires of the cable material can thus be correctly connected to the specific terminals in this way.

The terminal blocks themselves can only be attached in a specific position, thus also avoiding error.

The room module also has an audio socket, but the device only forwards the audio signal.

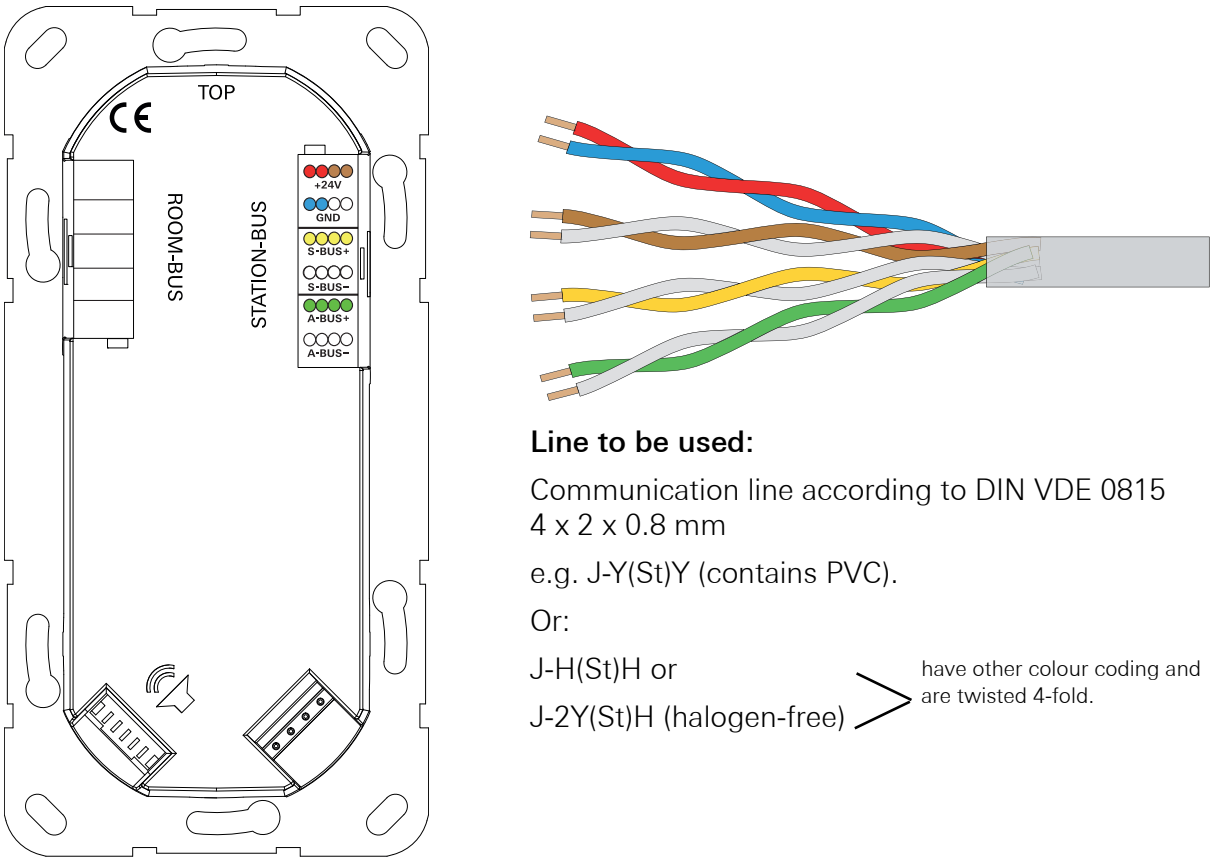
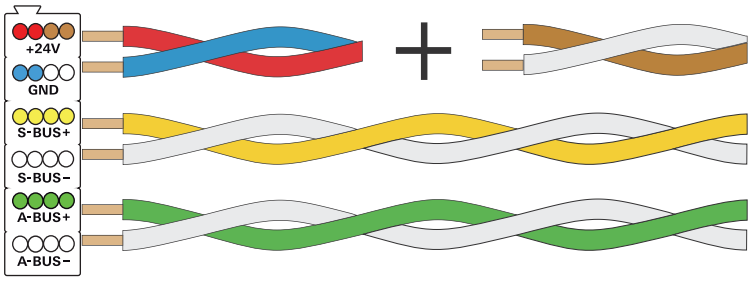


Fig. 3.15: Colour coding of J-Y(St)-Y cable material on the ward bus

3.7.1 Wiring of the ward bus terminal

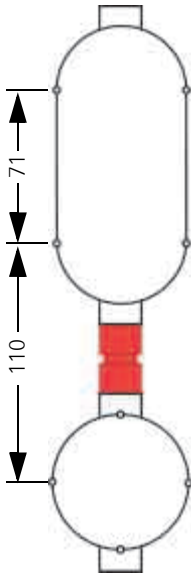
Wire pairs red/blue and brown/white are used for power supply (doubling of cross-section).



Both wire pairs yellow/white (data bus) and green/white (audio bus) must each be twisted in the complete system (twisted pair).

Fig. 3.16: Use of two wire pairs for doubling of cross-section with power supply

3.7.2 Mounting information for the room terminal and duty room terminal:



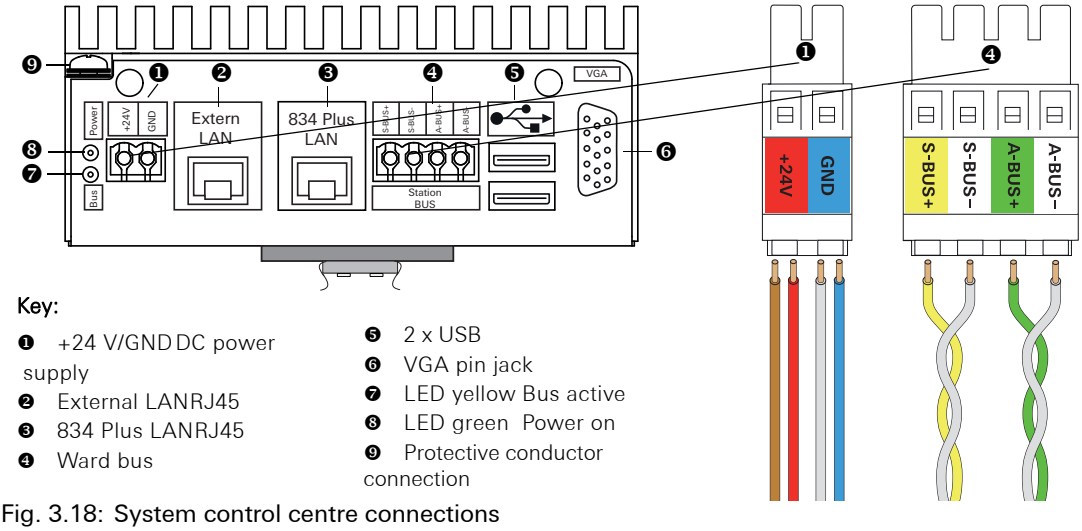
To ensure an optimal appearance, the distance between the terminal and the voice module should be implemented as shown. With the products ZT+ (Order No.: 5925 ..) and DZT+ (Order No. 5929: ..) flush-mounted boxes (1-gang and 2-gang) as well as a suitable spacer are included.

Fig. 3.17: Arrangement of the flush-mounted boxes and spacer for optimal device alignment

3.7.3 The ward control centre

The ward control centre Plus of the Gira nurse call system 834 Plus controls and regulates the devices connected to the ward bus, such as room terminals with and without voice module. Via the system bus (834 Plus LAN) the unit is connected (where applicable) to the system control centre ("large system" setting in the configuration assistent).

The Gira nurse call system 834 Plus can also be controlled and regulated from just a single ward control centre Plus without a system central control unit ("small system" setting in the configuration assistant).



Key:

❶ +24 V/GND DC power supply
❷ External LANRJ45
❸ 834 Plus LANRJ45
❹ Ward bus
❺ 2 x USB
❻ VGA pin jack
❼ LED yellow Bus active
❽ LED green Power on
❾ Protective conductor connection

Fig. 3.18: System control centre connections

3.8 Power supply of the system

The nurse call system 834 Plus is operated with 24 V continuous current.

Important: Ensure uninterruptible power supply!

The devices of the nurse call system must be supplied with uninterruptible power supply. (See DIN VDE 0834-1).

Important: Electrical safety

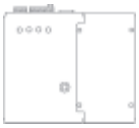
If equipment without safe separation is to be used in the patient environment, power rectifiers must be used according to EN 60601-1 (VDE 0750-1). Externally-connected devices must also meet the requirements of EN 60601-1 (VDE 0750-1) or be connected to the call system through a secure separation device such as a galvanic Ethernet separator.

Important: Cable routing

Cables for the nurse call system 834 Plus should be routed separately from low-voltage systems. Common cable ducts or channels are to be avoided in accordance with DIN VDE 0834.

If a central, uninterruptible power supply (230 V) is available in the building to be installed, then the power rectifiers (Order Nos.: 2972 00) can be used without integral uninterruptible power supply (UPS).
If a central UPS is not available, the power rectifier with UPS (Order No. 2973 00) must be used.

The following DC voltage supplies are available for the nurse call system 834 Plus:

Fig.	Designation	Description	Installation site
	Power rectifier Order No. 2972 00 for Order No.: 5973 00 and Order No.: 5972 00	According to EN 60950, Input: 230 V AC Output: 24 V DC/5 A	Plant room - Mounting in sub-distribution unit/ DIN top-hat rail
	Power rectifier with UPS Order No. 2973 00 for Order No.: 5973 00 and Order No.: 5972 00	According to EN 60950, Input: 230 V AC Output: 24 V DC/5 A	Plant room - Mounting in sub-distribution unit/ DIN top-hat rail

Provide circuit breaker!

Connect a circuit breaker type D, max. 16 A upstream from the power supply units 2972 00 and 2973 00.

3.8.1 Power rectifier with UPS, Order No.: 2973 00

3.8.2 Power rectifier with UPS, Order No.: 2973 00 for use with the system central control unit, Order No.: 5972 00 or the ward control centre, Order No.: 5973 00

Power supply unit with input voltage range of 115 V -15 % to 230 V +15 % AC. Output voltage 24V DC with uninterruptible power supply (UPS). If the mains input voltage drops, connected load is supplied interruption-free via the batteries. When the mains input voltage recovers the batteries are separated from the load and recharged via the internal charging unit.

The device is designed for 24-hour operation at rated output.

Self-diagnosis for monitoring of the batteries e.g. for protection of complete draining etc.

Various operating states (mains failure, battery warning, etc.) of the power rectifier can be signalled via the zero-voltage relay contacts.

The device features the following LED status displays:

1 red LED (battery warning): Lights up for approx. 2 minutes before the batteries are drained and the battery's deep discharge protection disconnects the load.

2 yellow LED (battery 2 mins): Lights up if the load is supplied by the batteries for approx. 2 minutes following a mains failure. The timer is reset every time mains power is restored.

3 green LED (power output): Voltage to the output terminals is supplied by the power supply unit or the batteries (UPS operation).

4 green LED (battery active): UPS operation, LED lights up during mains failure. Battery supplies power to the load.

5 Voltage selector switch on bottom of device.

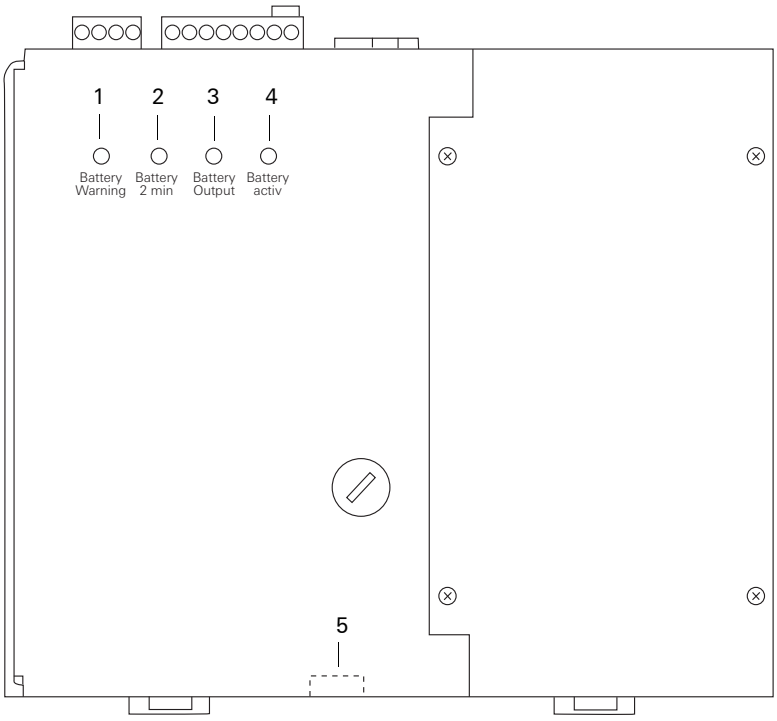


Fig. 3.19: Power rectifier with UPS device overview

Terminal designation:

1:	Switching off battery operation (Batt off), connecting a control voltage of DC +5 V to DC +24 V
2 to 4:	Output terminals DC 24 V
5, 6:	Indicator terminal (power supply), relay contact is opened in case of mains failure.
7, 8:	Indicator terminal (battery 2 min), relay contact is closed in case of mains failure for more than 2 minutes.
9, 10:	Indicator terminal (battery warning), relay contact is opened approx. 2 minutes before the batteries are drained and the battery's deep discharge protection disconnects the load.
11, 12:	Control terminal (UPS Release): Enable UPS operation. For release, a zero-voltage NO contact or a wire jumper must be closed between these terminals. The jumper voltage is approx. 1 mA.
13 to 15:	Mains connection.

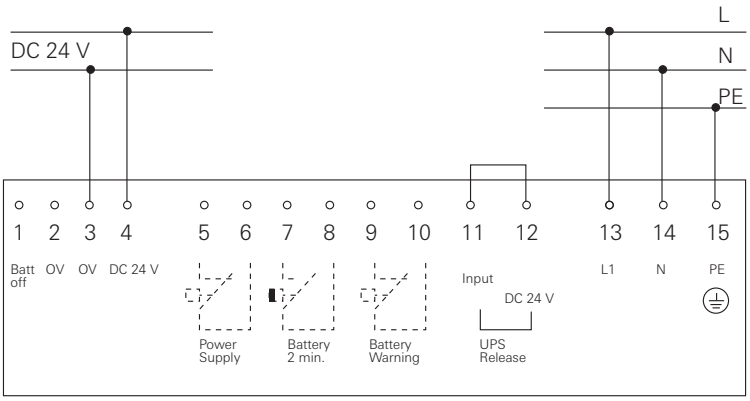


Fig. 3.20: Connections of power rectifier with UPS

Important!
Before connecting the mains voltage the correct position of the voltage selector switch on the bottom of device (Fig. 3.19) mus be checked.

- Set the voltage selector switch to the respective mains voltage of 115 V or 230 V using a screwdriver.
- Mounting the device on the mounting rail. The terminals must be on top. The power rectifier warms up during operation. Ensure sufficient heat dissipation.
- Connect power rectifier according to connection diagram (see Fig. 3.20).
- Connect wire jumper or zero-voltage NO contact between terminals 11 and 12.

Switching off system

To disconnect the output terminals of the power rectifier, the mains input voltage must be switched off and the release (control terminal UPS release) must be reset as the load will otherwise continue to be supplied by the battery until the deep discharge protection shut-off is activated.

Switching off mains input voltage.

Open connection between control terminals 11, 12. Remove wire jumper or press switch.

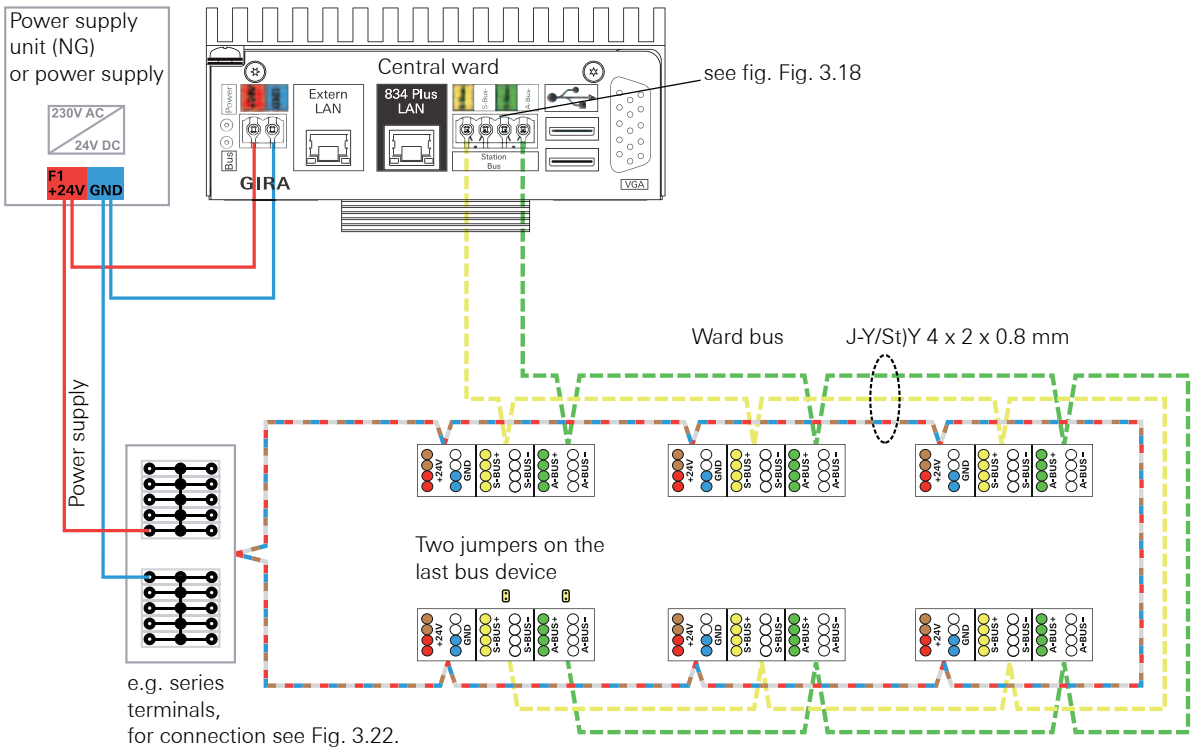
Replacing the battery

For replacing the battery, the device must be switched off and the battery cover removed by pulling it forwards after having removed the 4 screws. The replacement must be of identical type (2 x 12 V; 2.2 Ah). Using different manufacturers may lead to problems due to different connectors.

The new batteries must be inserted and wired accordingly, paying attention to the correct polarity of the batteries. Reversing the batteries' polarity may lead to destruction of the system!

Before assembly also check the battery fuse (5 A FK2).

3.8.3 Connecting the bus participants to power supply and bus line



Key:

Power supply: maximum 200 m per power supply unit. Close line in a ring configuration. 24 + (red and brown), GND (blue and white).

Ward bus: wire pair yellow and white. Max. 1,000 m/max. 52 ward bus participants.

Audio bus: wire pair green and white. Max. 1,000 m.

Fig. 3.21: Example of wiring diagram for connection of bus participants to ward bus and power supply

The bus lines (yellow/white and green/white) must be looped through from device to device. The ward control centre is always the start of the data bus. Branching is not permissible. The cable must not be connected in a ring configuration, in contrast to the power supply.

The last ward bus device must be equipped with two yellow jumpers (included with supply of the ward control centre) to activate the terminating resistances (120 Ω).

Measurement of terminating resistances in the system:

– All devices on the ward bus must be disconnected from the power supply.

– Measurement occurs between yellow and white (data bus) or green and white (audio bus).

– The result with applied jumpers:
  approx. 60 Ω with connected ward control centre
  approx. 120 Ω without connected ward control centre

3.8.4 Power supply (24 V wiring) for a ward

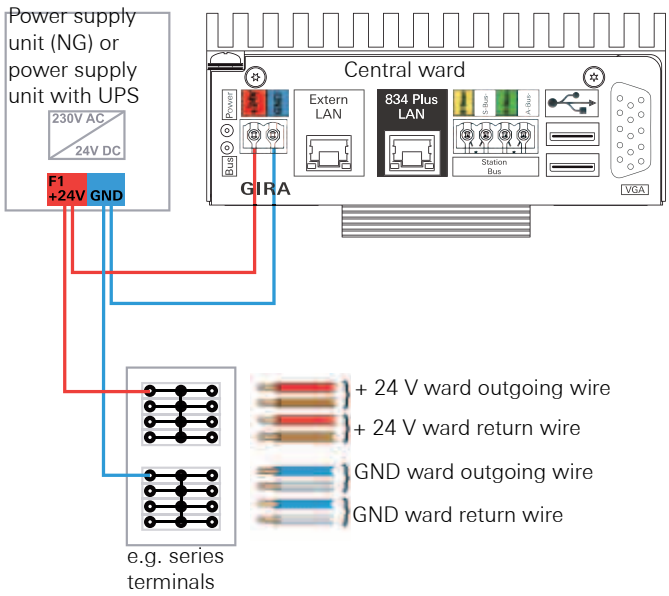


Fig. 3.22: Outgoing and return wire of power supply to series terminal

3.8.5 Equipotential bonding

All protective conductors (PE) connected with the call system must be connected to the same main potential equalisation of the building or the general power supply network. If this is not possible with extended call system networks, the circuits of the call system must be split into several galvanically isolated areas.

If several power rectifiers are used in a ward or in a large system with several wards, then equipotential bonding between the earth wires and the individual power rectifiers should be implemented (1.5 mm^2 recommended).

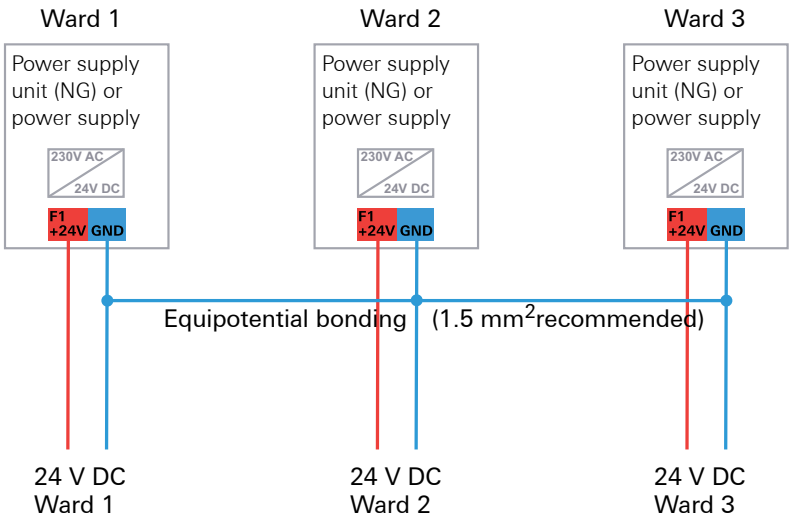
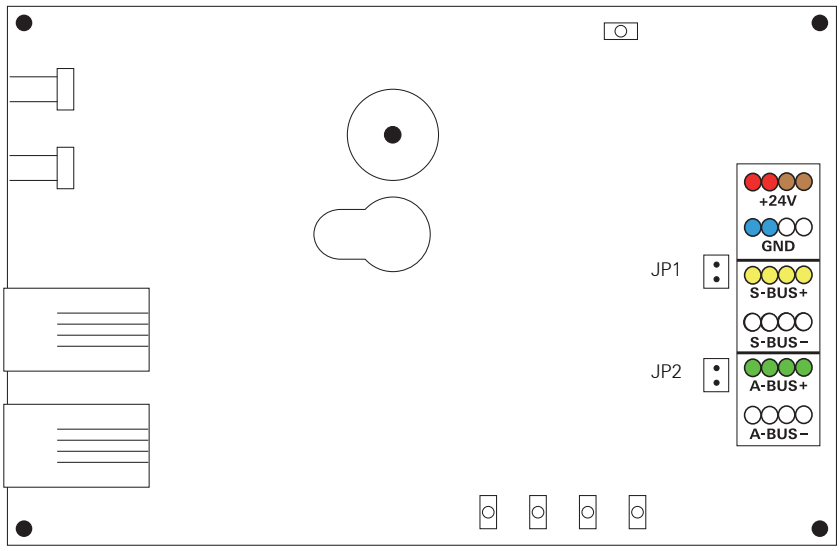


Fig. 3.23: Equipotential bonding between the power supply units of a system

3.9 Connecting further ward devices

3.9.1 Connection of hallway displays to the power supply and ward bus

Hallway displays can show call information in plain text. A one-sided display (Order No. 5976 00) or two-sided display (Order No. 5977 00) is available for the Gira nurse call system 834 Plus. Hallway displays are integrated onto the ward bus.



Key:

+24 V	Power supply (red/brown)	A bus -	Audio line (white)
GND	Earth (blue/white)	JP1	Terminating resistance Data line
S bus +	Data line (yellow)	JP2	Terminating resistance Audio line
S bus -	Data line (white)		
A bus +	Audio line (green)		

Fig. 3.24: Connection of the hallway display to the power supply and ward bus

3.9.2 Connection of I/O module flush-mounted Plus (2/2)

External voltages of 5-30 V AC/DC can be applied to both inputs as input signals, and these input voltages can differ.
Function of output: see device label.

Important: Connecting to systems from other manufacturers

It must be ensured that the proper functioning of the nurse call system 834 Plus is not affected during disturbances in systems from other manufacturers and that the requirements of EN 60601-1 are complied with. The other manufacturer's instructions must be observed.

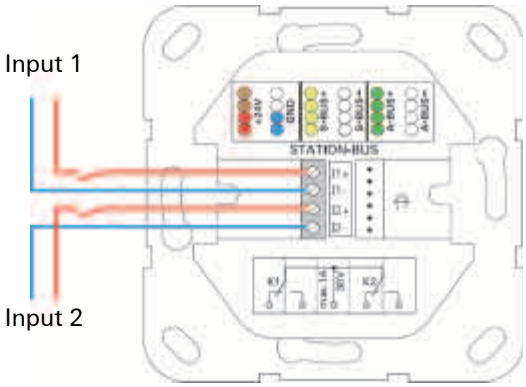


Fig. 3.25: I/O module 2-gang

3.9.3 Connection of I/O module surface-mounted Plus (8/8) to the ward bus

The 8 inputs of this module are split into two groups (input 1-4 and input 5-8). Each group of four inputs has a common reference point (COM 1-4 and COM 5-8). Voltages of 5-30 V AC/DC can be applied to the inputs.
External voltages and the integral output voltage of the module (+24 V out and GND out) can be connected.
Function of output: see device label.

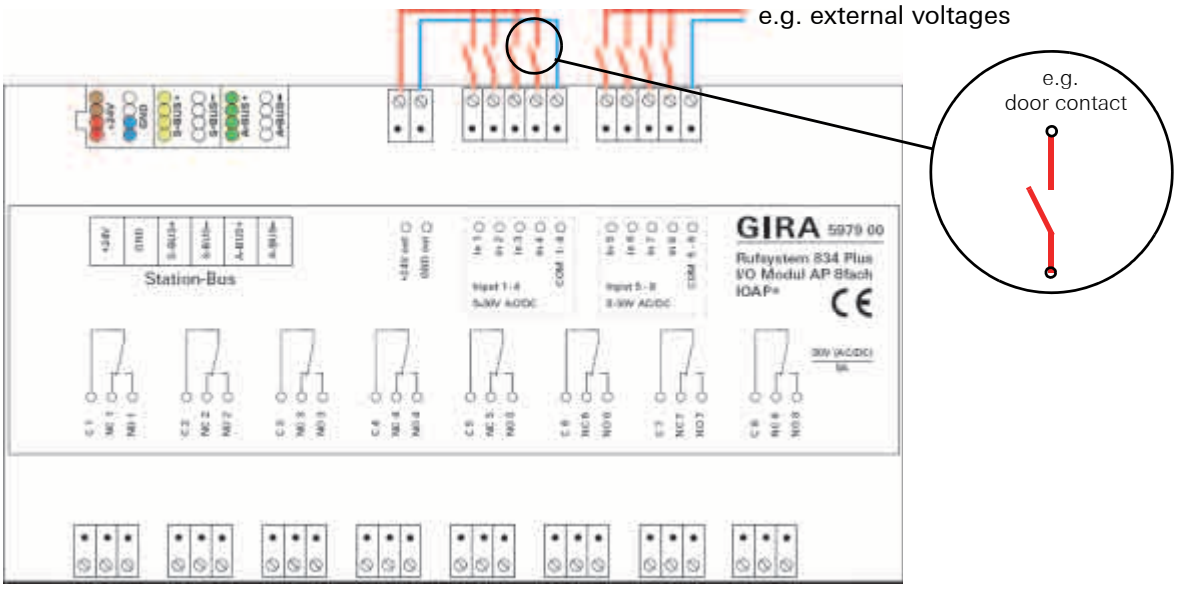


Fig. 3.26: I/O module 8-gang

Important: Ensure safe separation

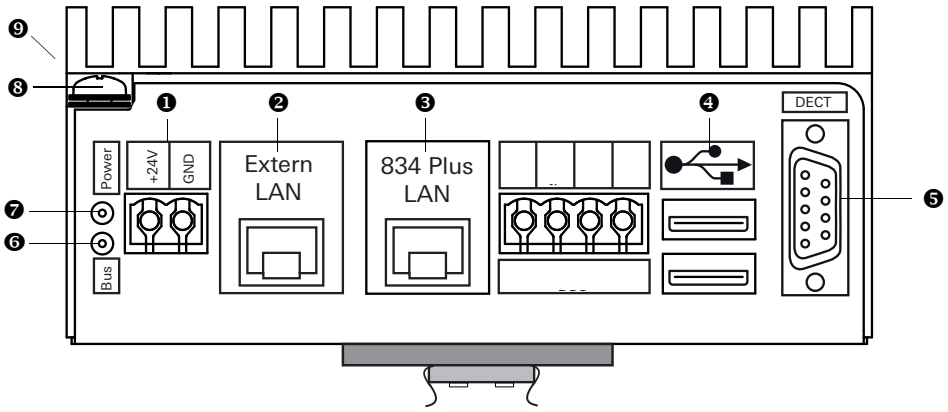
When connecting external systems to the system interface (e.g. DECT or BMA), ensure safe separation according to EN 60601-1.

3.10 The system central control unit

The central control unit for the complete system is the system central control unit (SSZ+). Ward control centres and Control 9 duty room terminals Plus are connected here via the system bus (ethernet) to the 834 Plus LAN connection.

Note: The system central control unit and ward control centre are not identical.

The interfaces and software used by the two units are different.



Key:

❶ +24 V	DC power supply	❺ DECT	RS 232
❷ External LAN	RJ45	❻ LED	Bus activity
❸ 834 Plus LAN	RJ45	❼ LED	Power On/Off
❹ 2 x USB	f. service purposes	❽ Connection	Protective conductor
		❾ No image	RS 232 (f. BMA) on the other side of the device

Fig. 3.27: Connections for the system control centre

All Gira call system devices existing in a Gira call system are automatically recognised; also applies for the removal and addition (exchange) of devices.

The configuration assistant is used for parameterisation, see 4.5 “Commissioning a large system” on page 69. and see 4.4 “Commissioning of small system” on page 66.

Note: connect the nurse call system 834 Plus to an existing network.

Before making network settings, coordinate with the relevant network administrator.

To connect the system control centre Plus to an existing (hospital) network, the "External LAN" connection can be configured in the configuration assistant via the menu item Administration/Set up network access (Fig. 3.27 (❷)).

Note: using a time server.

If the system control centre Plus is not connected to an external network (e. g. company or hospital network) via the "External LAN" connection, then the system time of the nurse call system 834 Plus cannot be automatically sourced via a time server (NTP server) on the internet.

3.11 Wiring of the system bus

The figures show connection of the network components as schematic diagrams. In reality the network lines are installed flush-mounted, for example, and the components interconnected via network connection boxes.

Important: Ensure safe separation

If required, ensure a safe separation of network cables by network isolators.

3.11.1 Schematic diagram of the system level for a small system

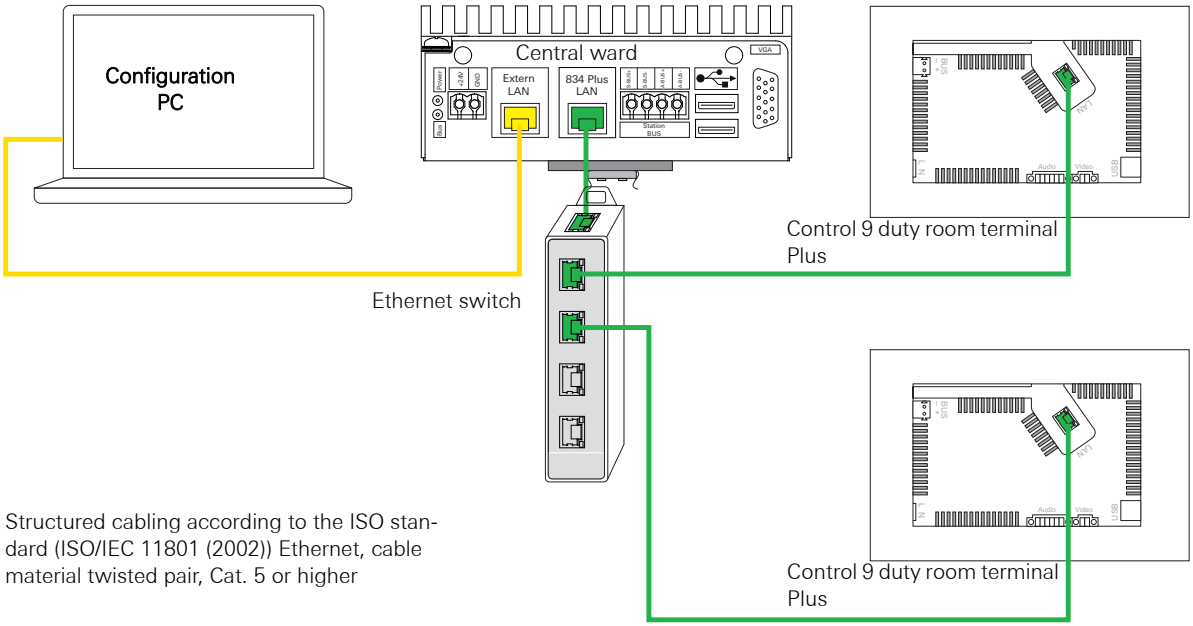
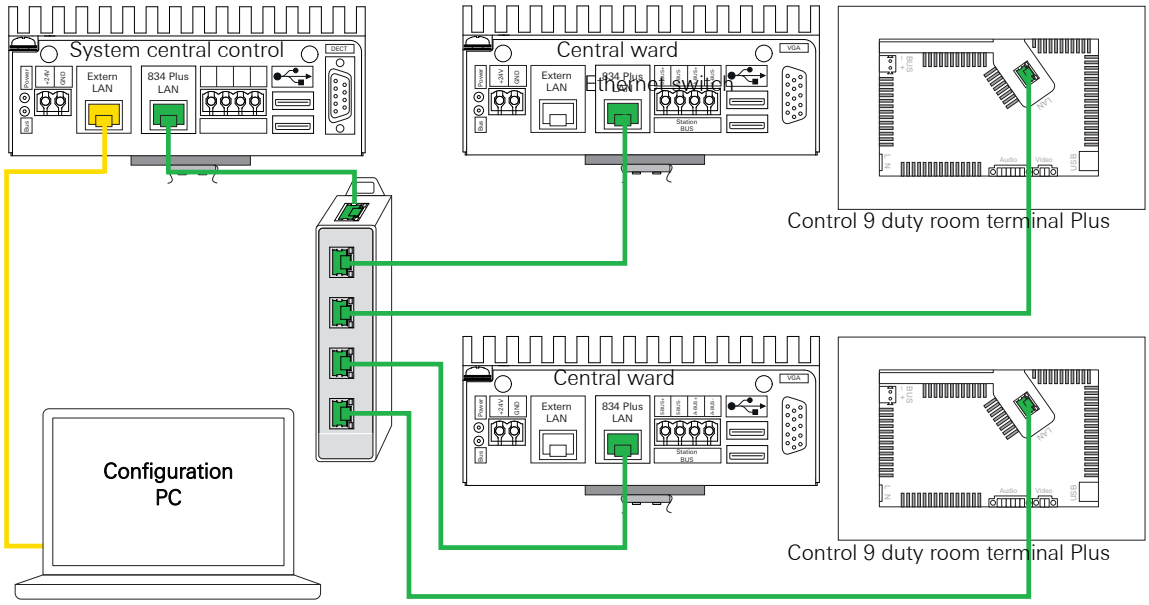


Fig. 3.28: Connection of network components at system level (small system)

3.11.2 Schematic diagram of the system level for a large system



Structured cabling according to the ISO standard (ISO/IEC 11801 (2002)) Ethernet, cable material twisted pair, cat. 5 or greater

Fig. 3.29: Connection of network components at system level (large system)

3.11.3 Summary of properties at system level

The system level (network level) of the Gira nurse call system 834 Plus features the following properties:

– Network topology corresponds to a "meshed topology".

– CSMA/CD is used as access process.

– Network technology is ethernet, structured cabling according to the ISO standard (ISO/IEC 11801 (2002)).

– Twisted pair cable of category 5, ideally category 6 or higher must be used.

– Connection elements (plugs and connection boxes) use RJ-45 connection technology.

– Network parameterisation is on the basis of TCP/IP.

4. Activation

Start-up is implemented with the aid of the configuration assistant (start-up software).

- Each device identifies itself with the next instance up in the system:
  - Room devices with the duty/room terminals and/or the room modules (room bus level).
  - Duty/room terminals and/or room modules with the ward control centres (ward bus level).
    In delivery state all duty/room terminals and/or room modules of a ward control centre belong to an organisational unit, all devices can intercommunicate.
    Point 4.8 explains how other organisational units are configured.
  - Ward control centres, hallway displays, switches and Control 9 Plus duty room terminals with the system central control unit (system bus level or Ethernet).

4.1 The prerequisite for starting up the Gira nurse call system Plus is that

– Room bus, ward bus and (where applicable) system bus are installed and ready for use.

Note: Configuration of a system.

First install all devices that belong to a system before beginning with the configuration. All installed devices in a system are automatically recognised.

– The terminating resistors must be set in the station bus.
  A ward control centre is the first device on the ward bus. With the last device on the bus, the terminating resistors of the data line and audio line must be activated with the jumpers (included in the scope of supply of the ward control centre).

– Power supply (Order No.: 2973 00, with UPS or Order No.: 2972 00) is installed and ready for operation.

Important! Power supply of the system!

Because neither the system central control unit Plus or the ward control centre Plus has a mains switch, the systems boot immediately after connection to the power supply. This process takes up to 60 seconds.

– Commissioning PC with Internet browser and LAN connection, as well as a network cable, are available.

  As an internet browser, Firefox from version 4 or Google Crome from version 11 is recommended.

Note: IP address range of the commissioning PC

Note that the IP address of your commissioning PC is between 192.168.0.1 and 192.168.0.254 (not 192.168.0.111) (subnet mask: 255.255.255.0).

4.2 Initial start-up

After switching on the system, all system devices register at a central control unit,

– with a small system at the ward control centre,

– with a large system at the system central control unit.

Note: the duration of the registering process may vary.

The registering process for devices in the system may require up to five minutes with a large system.

All devices are pre-configured so that for "standard operation" of a system, only the names for:

– ward,

– room, and possibly

– beds

need to be assigned.

4.2.1 Connected system devices are checked

After the system central control unit Plus and ward control centre Plus have been started in the selected system mode (small system/large system), all connected devices register at the central control unit.

During the registration process the LEDs (location/reassurance lights) flash in the push buttons/housings of the devices.

After the central unit has recognised the system devices, these are then automatically monitored.

The system devices can now be parameterised with the configuration assistant.

For the duty room/room terminals, a plain text name or a room number must be assigned.

Failed devices are immediately displayed in the system.

Subsequent integration of devices is possible at any time.

Note: Locating integrated devices.

Integrated devices can be located via the configuration assistant with the "identify device" function.
After carrying out this function, the LED in the button of the searched-for device flashes rapidly.
The flashing can be deactivated by pressing the "End identification" button.

4.2.2 Setting up a Gira Control 9 duty room terminal Plus

A room control unit (duty room/room terminal or room module) is required in the duty room for operating a duty room terminal CT9.

With the aid of the configuration assistant, the room control unit is linked to the Control 9 duty room terminal Plus. The devices are then functionally interconnected.

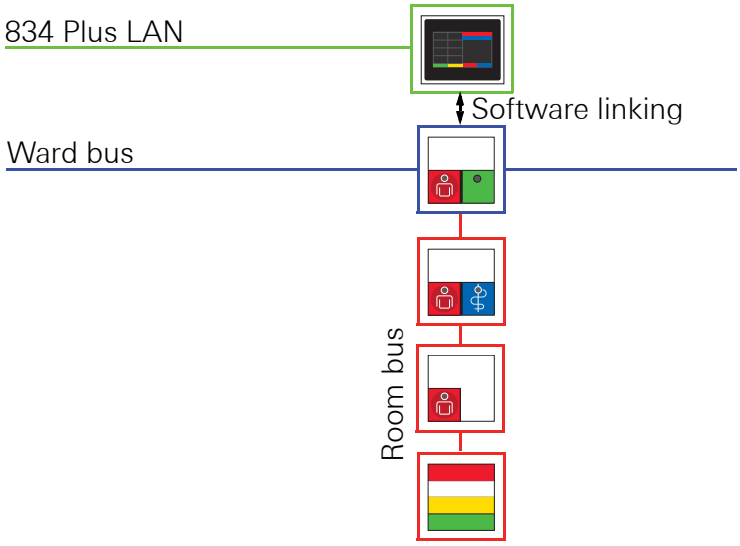


Fig. 4.1: Example of a room module as room control unit and CT9

For commissioning, proceed as follows:

1. Connect your commissioning PC via network cable to the connector "External LAN".
2. Open the internet browser on your commissioning PC. Enter the IP address: 192.168.0.111 in the address field of the Internet browser.

The log-in screen of the configuration assistant opens.

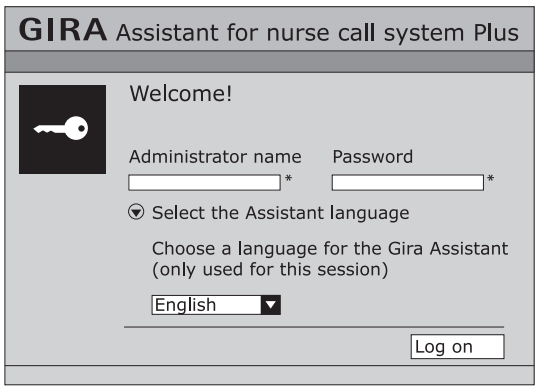


Fig. 4.2: Log-in screen of the Gira configuration assistant: Enter user name and password, language selection

1. Select the language in which you would like to launch the configuration assistant. The selected language applies only to the current session.
2. In the field Administrator Name, enter "admin" and in the Password field, "admin".
3. Click on "Log in".

User names and passwords

User	User name	Password
Administrator	admin	admin
Care personnel management (current messages and log files)	management	management
Care personnel (current messages)	nurse	nurse
Master password	see note	see note

Note: handling of user names and passwords

We recommend changing the user name and password after the first login.

Lost/forgotten log-in details:

Contact the Gira Service Center for instructions on how to proceed.

4.3 Large system or small system operating mode

Variation large system:

A large system consists of one system central control unit, at least one ward control centre, duty/room terminals and room modules, room devices, room signal lights, possibly hallway displays and I/O modules, and Ethernet switches.

Note: The system central control unit and ward control centres are pre-configured.

Each ward control centre is pre-configured for operation in a large system (with a system central control unit). If a ward control centre is operated as the only controlling device in a system, then the "small system" option must be selected in the configuration assistant.

Variation small system:

A small system consists of one ward control centre, duty/room terminals and room modules, room devices, room signal lights, possibly hallway display and I/O modules.

4.4 Commissioning of small system

Requirements:

– Room bus and ward bus are installed and ready for operation.

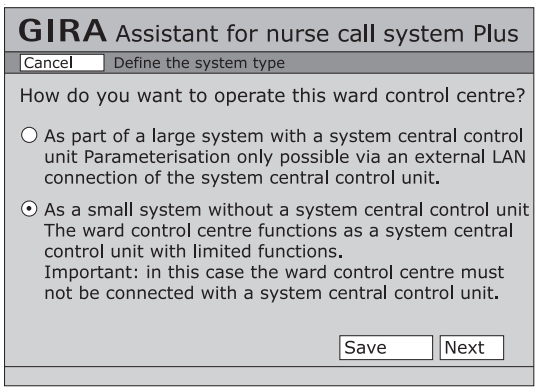


Fig. 4.3: Decision about system type: small system or large system

– All ward control centre(s) are preset as DHCP client(s). By selecting "Small system", a ward control centre is reconfigured as a DHCP server.
– A ward control centre is the first device on the ward bus. With the last device on the bus, the terminating resistance of the data line and audio line must be activated with the included jumpers.
– Connect the "External LAN" connection of the ward control centre Plus with the commissioning PC via the network cable.
– Start the internet browser on the commissioning PC. Enter the IP address 192.168.0.111 into the address bar of the internet browser and confirm with the "Enter" key.

The start screen of the configuration assistant opens (see 4.2).

– After entering the user name and password and after language selection (see4.2 and “User names and passwords” on page 64) click on "Log on".

The overview screen of the configuration assistant opens.

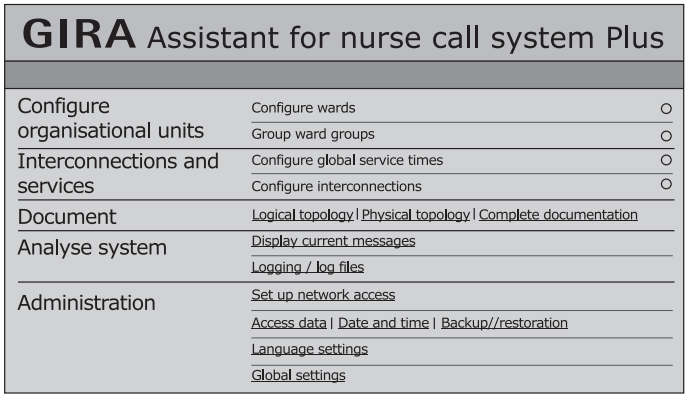


Fig. 4.4: Overview screen for configuring a small system

You can now carry out settings to the system.

Menu level 1	Menu level 2	Explanation
Configure organisational units.		
	Configure wards	Group wards (establish organisational units).
	Combine ward groups	Connect organisational units.
Interconnections and services		
	Configure global services	Duty (shift) times can be set up for the individual week days here.
	Configure interconnections	Interconnections can be automatically or manually controlled depending on the services.
Document		
	Logical topology	Graphic displays for giving to the system operator.
	Physical topology	
	Complete documentation	
Analyse system		
	Display current messages	Active calls, presences.
	Logging/log files	Possible to filter log entries according to events and to export logs.

Menu level 1	Menu level 2	Explanation
Administration		
	Set up network access	Configure external LAN. Configure 834 Plus LAN.
	Save/restore	Save or restore system settings.
	Access data	Change user and/or password
	Date and time	Set up manual setting or time server.
	Language settings	Settings affecting the voice functionality of the system.
	Global settings.	Settings for call types, presence and remote switch-off.
	Define system type.	Definition of large system or small system.

To find out more about the meaning of specific points, please use the on-screen help of the configuration assistant for detailed information.

4.5 Commissioning a large system

– Room bus, ward bus and system bus (834 Plus LAN) are installed and ready for use.

– The controlling devices on the system bus (834 Plus LAN) such as system central control unit and ward control centre(s) are pre-configured so that the system central control unit is preset as a DHCP server and the ward control centre(s) as DHCP client(s).

– The corresponding terminating resistors must be set on the station bus.
A ward control centre is the first device on the ward bus. With the last device on the bus, the terminating resistors of the data line and audio line must be activated with the jumpers (included in the scope of supply of the ward control centre).

– Connect the "External LAN" connection of the system central control unit Plus with the commissioning PC via the network cable.

– Start the internet browser on the commissioning PC. Enter the IP address 192.168.0.111 into the address bar of the internet browser and confirm with the "Enter" key.

The start screen of the configuration assistant opens (see 4.2).

– After entering the user name and password and after language selection (see4.2 and “User names and passwords” on page 64) click on "Log on".

The overview screen of the configuration assistant opens.

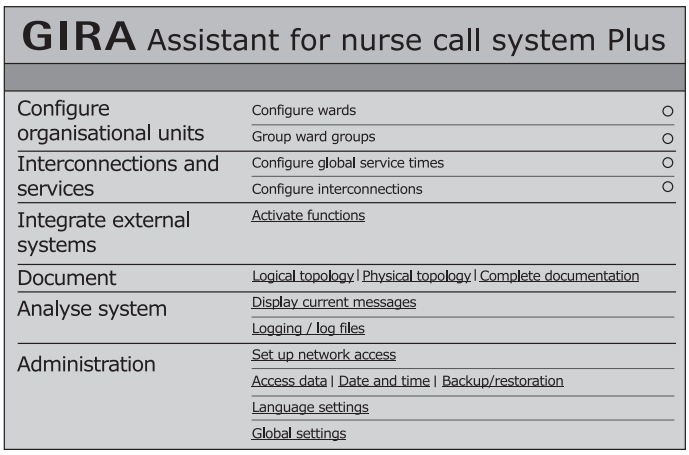


Fig. 4.5: Overview screen for configuring a large system

You can now carry out settings to the system.

Menu level 1	Menu level 2	Explanation
Configure organisational units.		
	Configure wards	Group wards (establish organisational units).
	Combine ward groups	Connect organisational units.
Interconnections and services		
	Configure global services	Duty (shift) times can be set up for the individual week days here.
	Configure interconnections	Interconnections can be automatically or manually controlled depending on the services.
Integrate external systems *	* This menu item is only displayed for configuration of a system central control unit.	
	Activate functions	Software modules such as DECT functionality, ELA connection.
Document		
	Logical topology	Graphic displays for giving to the system operator.
	Physical topology	
	Complete documentation	
Analyse system		
	Display current messages	Active calls, presences.
	Logging/log files	Possible to filter log entries according to events and to export logs.

Menu level 1	Menu level 2	Explanation
Administration		
	Set up network access	Configure external LAN. Configure 834 Plus LAN.
	Save/restore	Save or restore system settings.
	Access data	Change user and/or password
	Date and time	Set up manual setting or time server.
	Language settings	Settings affecting the voice functionality of the system.
	Global settings.	Settings for call types, presence and remote switch-off.

To find out more about the meaning of specific points, please use the on-screen help of the configuration assistant for detailed information

4.6 Network settings in the configuration assistant

After logging onto the configuration assistant of the system central control unit or ward control centre, call up a screen mask via Modify administration/network settings for changing network settings for the specific device.

Important:
Only modify the network settings when absolutely necessary!

The network interfaces of the call system are pre-configured so that the system can normally be started up without further changes.
Make sure to discuss required changes to the settings with the IT administrator of the system.

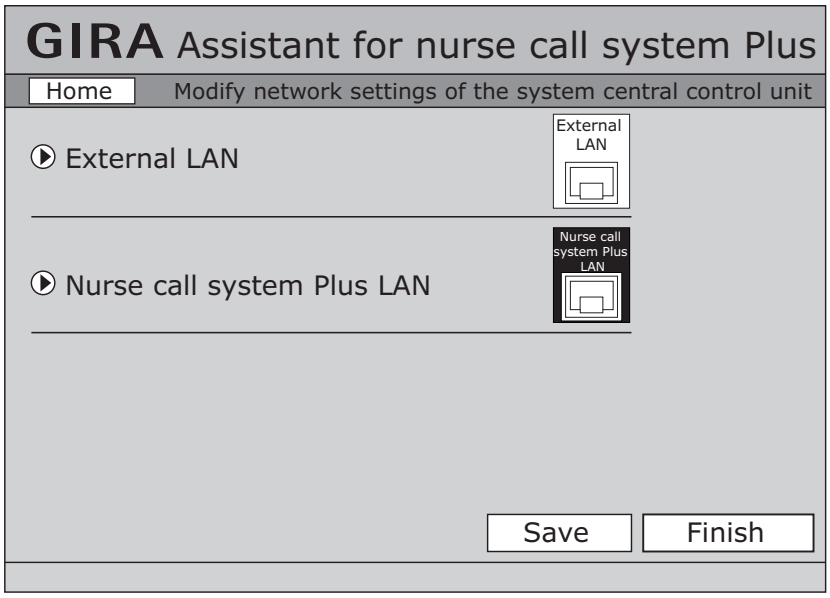


Fig. 4.6: Network settings in the configuration assistant

The Change network settings screen mask can be divided into two sections: External LAN and 834 Plus LAN.

4.6.1 "External LAN" network settings

Under External LAN the following can be set:

- Receive IP address automatically (via DHCP server): Select this option when the system central control unit or ward control centre is to be connected to an external LAN (via the External LAN connection) and should receive its IP address in the network automatically from there.
- Set IP address manually: Select this option when the system central control unit or ward control centre is to be connected to an external LAN or a commissioning PC (via the External LAN connection) and you need to manually assign the device a specific IP address. For this you have to know the IP address, the IP address of the subnet mask and the standard gateway in the external network. To get this data, contact the network administrator responsible for the external network if necessary. As standard, the system central control unit or ward control centre is set to the IP address 192.168.0.111 and the subnet mask to 255.255.255.0.

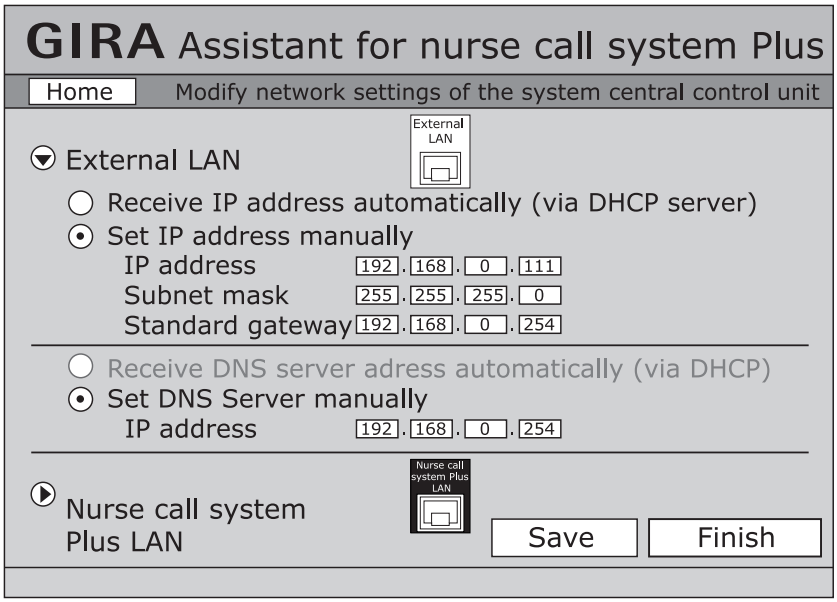


Fig. 4.7: "External LAN" network settings in the configuration assistant

4.6.2 "834 Plus LAN" network settings

Under 834 Plus LAN the following can be set:

- IP address: Enter an IP address with which the system central control unit or ward control centre is logged in on the system layer of the nurse call system 834 Plus. As standard the device is set to the IP address 192.168.0.111.
- Subnet mask: Specify a subnet mask with which the system central control unit or ward control centre is logged in on the system layer of the nurse call system 834 Plus. As standard the device is set to the subnet mask 255.255.255.0.
- Activate DHCP server: Only select this option when the ward control centre is used as a central control unit in a small system. This then automatically distributes the individual IP addresses to the devices connected to the system layer of the nurse call system 834 Plus.

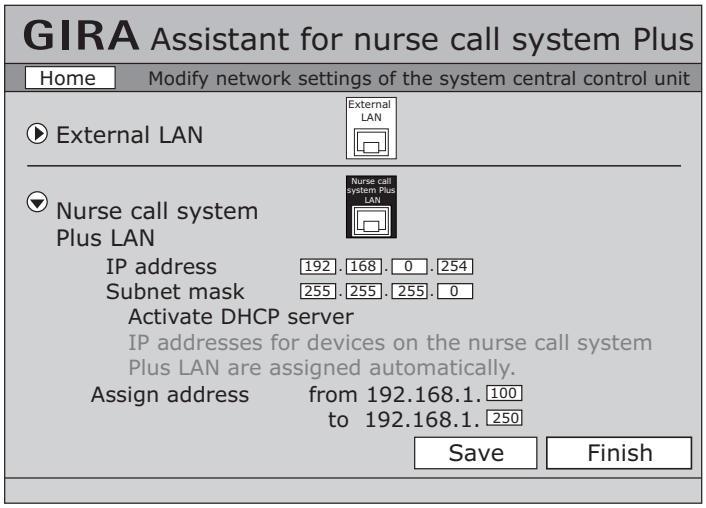


Fig. 4.8: "834 Plus LAN" network settings in the configuration assistant

4.7 Connection to external systems

For the system central control unit, software packages are offered to be purchased separately for connecting to

– DECT telephone systems (DECT = Digital Enhanced Cordless Telecommunications) via ESPA 4.4.4, Order No. 5994 00

– VoIP telephone systems (VoIP = Voice over IP), Order No. 5995 00

– Fire alarm systems (BMA) via ESPA 4.4.4, Order No. 5993 00

Important: Ensure safe separation

When connecting external systems to the system interface (e.g. DECT or BMA), ensure safe separation according to EN 60601-1.

The required hardware connections are on the front of the system central control unit and are designated correspondingly.

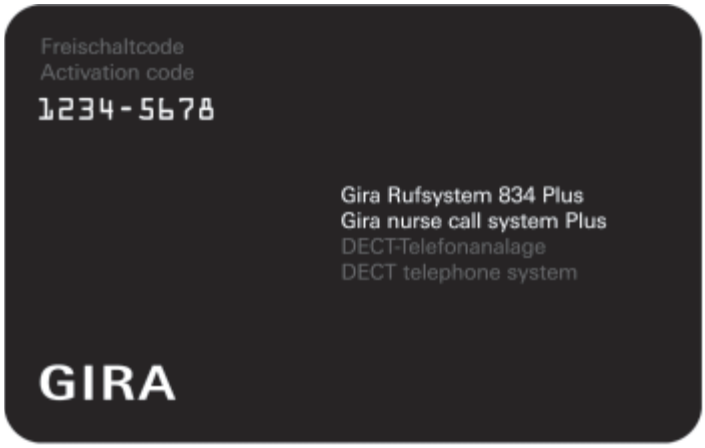


Fig. 4.9: Key card for enabling (e.g. a DECT telephone system)

The individual software packages are activated and configured with the configuration assistant (software) in the system central control unit.

Activation and configuration:

- Order one or several supplementary software packages via your sales partner.
- Gira sends you a key card for each software package (see Fig. 4.9).
- In the Configuration Assistant in the system central control unit, enter your name and the activation code specified on the key card.
- Data are saved to the system central control unit.
- The corresponding software package is now enabled, and can be called up in the configuration assistant of the system central control unit to be configured as desired.

4.8 Handling the configuration software Example: Configure organisational units

Handling of the software is shown with the example of the menu item *Configure organisational units -> Configure wards*.

The following example shows configuration of wards in a defined large system.

The circles at the end of a menu bar show whether a menu item has been processed. The circle is filled in if a menu item was processed.

After pressing the *Configure wards* button, you reach the overview for the connected ward control centres, consisting of three columns.

The ward control centres are listed in the left column.

A single click on one of the ward control centres displays information for the specific device.

A click on the tool symbol opens a further window with the option of grouping the ward into a maximum of 6 organisational units. Settings are confirmed with the "Save settings" button.

The ward list now shows the set-up of ward groups with the previously processed ward.

The central column shows a list of the devices of a ward (duty/room terminals and room modules, hallway displays etc.) connected to the ward control centre.

Next to the specific icons for the devices and ward groups, a "(plain-) name" should be assigned to corresponding devices in the correct text field.

The device ID and short device description can be seen above the device as further information.

Ward devices can be assigned to a ward group via drag & drop" if the ward is grouped.

One click on a ward device shows a list of connected room devices in the right-hand column.

Clicking on a room device gives you device ID, short description and the device location as information.

Three possibilities for the selection of the device location are set:

- In the room,
- At the bed,
- In the WC.

The location assignment of a room device is important, because a call button can be installed anywhere in the room, directly next to the bed or in the WC as well.

If you select the option "At the bed", you can assign a bed number which leads to a call being assigned to a specific bed and the bed number being displayed with a call.

If you select the option "In the WC", a call of the call button is displayed as a WC call with red and white light in the room signal light.

4.9 Interconnection of organisational units

It is possible to connect complete wards or parts of these (one or several rooms) with other wards or parts to form new organisational units. It is also possible to interconnect already established organisational units with further organisational units.

Interconnections can be implemented permanently, flexibly (time-controlled) or manually.

With interconnection of organisational units you can define the communication direction between the organisational units.
For example, you can define that communication from A to B and from B to A (i.e. both directions) is permissible. Only one direction can also be defined, e.g. only from A to B.

In addition, you can also define that only specific call types are forwarded, e.g. only doctor alerts.

You can find fundamental information about organisational units in chapter “Planning organisational units (grouping wards)” on page 22.

Further information on handling the configuration software can be found in the online help of the configuration assistant.

4.10 System information

The information from the ward plan showing which device is installed where is compared with the configuration assistant.

Fundamentally, the configuration assistant detects which devices have been installed. In order to securely assign the room devices, the information from the ward plan is used with the removed device labels.

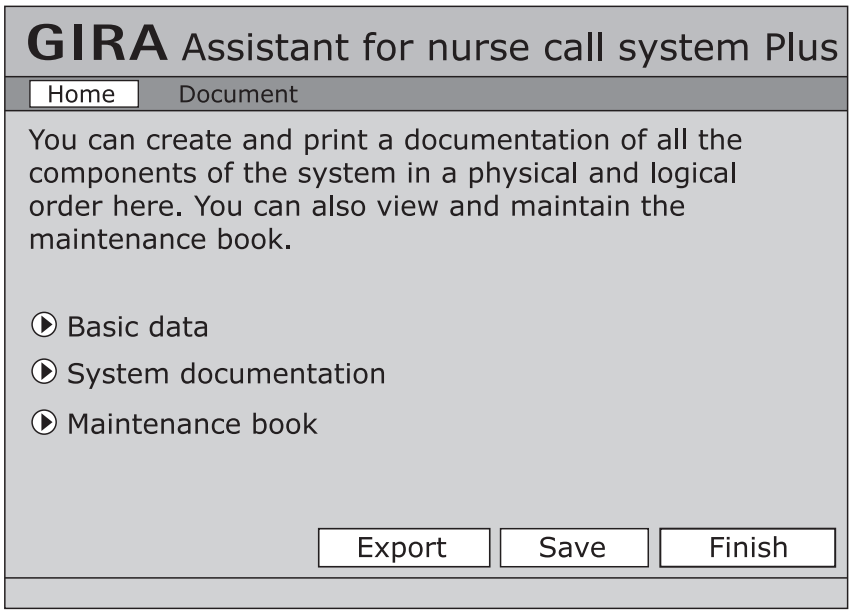


Fig. 4.10: System information

4.11 Behaviour in case of faults

4.11.1 How is a fault displayed?

System faults are signalled in the room signal light with a continuous red light (see Table 1, on page 86).

In the display of the (duty-) room terminal the following messages can appear:

- *"Removal"* if the patient's hand-held device or diagnostic connection cable is removed consciously or unconsciously, a call is signalled. The text message "Plug" appears in the displays of the duty room terminals and room terminals. In order to switch off such a call, the presence button on the room module or room terminal in the corresponding room must be pressed for approximately 3 seconds.
- *"Fault"* in case of wire fraction in the room or if a room device is defective or has been removed.
- *"Bus error"* in case of faults of the ward control centre or ward bus.
- *"Fault SSZ"* in case of faults of the system central control unit or in the nurse call system 834 Plus LAN.

4.11.2 How is a fault resolved?

Continuous red light in a room signal light can have 3 causes:

1. Call
   Press presence button once.
   If the room signal light still shows a continuous red light, then a plug removal or other fault may be the cause.
   Observe the messages in the display of the duty/room terminal!
2. Plug removal call (text in the display of a terminal)
   Press and hold the presence button for 3 seconds.
   If the room signal light still shows a continuous red light then another fault exists; this can be a defect in a device or a wire fraction in this room.

4.12 Removing devices

Devices not or no longer needed must be removed from the system in two different ways:

- Physically from the system: First remove the device from the system, observing the normal regulations and security rules.
- Remove from the configuration assistant using the software: Open the configuration assistant of the corresponding system central control unit (large system) or ward control centre (small system). Select the device previously removed physically from the system and click on the trash can symbol. Follow the instructions. Please see the help of the configuration assistant for more information.

4.13 Replacing defective devices

Defective devices in the system can be exchanged by firstly replacing them physically in the system with a new device.

If a single defective device is replaced with an identical one in the system, the system automatically transfers the configuration settings of the defective device to the new device. It only has to be then confirmed in the configuration assistant.

Note:
Adoption of the settings of the defective device.

This function is only available when a single device is replaced.

When replacing several devices, the new devices have to be newly configured in the configuration assistant of the corresponding system central control unit (large system) or ward control centre (small system).

- Select the new device in the configuration assistant.
- If required, assign a new name to the device and click on the spanner symbol.
- Follow the instructions in the software.

Please see the help of the configuration assistant for more information.

4.14 PHD test

The DIN VDE 0834 standard specifies that a "mobile hand-held device" such as a newly applied patient's hand-held device (pear button) must be function-tested. This occurs automatically in the system.

- The LED in the call button of the patient's hand-held device (PHD/pear button) flashes rapidly.
- Press the call button once to conclude the function test.

5. Function

5.1 Functional description

The nurse call system 834 Plus enables voice communication between the patient's room and the duty room, see 5.1.1 Voice communication (voice function) page 81.

For all devices with voice function, pressing the red call button activates hands-free voice transmission. If a patient's hand-held device is connected to an ancillary plug contact, "discreet speaking" (and listening) with the hand-held device is also possible if the call was triggered with the hand-held device. After a "voice call", see 5.2 Call types page 84 has been accepted by the care personnel, this call can be (standard-compliantly) switched off via remote switch-off.

If a red call button (with patient's hand-held device or a pull-cord button or pneumatic call button) is actuated, this triggers a call. The call is signalled with a reassurance light in the call button (or in the housing of the pull-cord button or the pneumatic call button) and at the same time via a red continuous light of the room signal light.

If a call is triggered in a bathroom unit/WC, this so-called WC call is displayed with a red and white continuous light in the room signal light.

In all the rooms in which presence is marked by pressing the green presence button, the triggered call of another room is signalled via a buzzer tone. This function is referred to as call forwarding. The presence is displayed with green and/or yellow continuous light in the presence button and in the room signal light.

An emergency call is triggered if the red call button (or a doctor alert button) is pressed when presence is marked. The emergency call is signalled by a red flashing light of a room signal light. The emergency call is also displayed via a reassurance light in the call button/patient's hand-held device (or in the housing of the pull-cord button or pneumatic call button).

Emergency calls are switched off with a switch-off button or with the presence button in the room in which the call was triggered.

Switching off a voice call is implemented via a switch-off button or presence button; remote switch-off is possible.

With larger systems where it may be necessary to establish organisational units, such as grouping together rooms from various wards or ensuring call forwarding outside of wards, at least one ward control centre is required.

Logging of the call and presence activities is implemented in the ward central control unit or system central control unit.

Following power failure, a triggered call is retained.

5.1.1 Voice communication (voice function)

The nurse call system 834 Plus fundamentally enables voice communication (voice calls) between various rooms (e.g. patient's room and duty room).
With the call forwarding function, a voice call is forwarded to other patient's rooms or (with appropriate configuration) to other organisational units.
Voice calls can be implemented when the required devices have been installed. These devices are:

- Call button with ancillary plug contact Plus (Order No.: 5901 ..) with connected voice module (Order No.: 5990 ..) and/or connected patient's hand-held device (Order No.: 5960 ..).

- Call and switch-off button with ancillary plug contact Plus (Order No.: 5903 ..) with connected voice module (Order No.: 5990 ..) and/or connected patient's hand-held device (Order No.: 5960 ..).
- Call button with ancillary plug contact and diagnostic pin jack Plus (Order No.: 5906 ..) with connected voice module (Order No.: 5990 ..) and/or connected patient's hand-held device (Order No.: 5960 ..).
- Switch-off button with voice module Plus (Order No.: 5918 ..) for bathroom unit areas.
- Room terminal Plus (Order No.: 5925 ..)
- Duty room terminal Plus (Order No.: 5929 ..)

5.1.2 Voice call

Voice calls occur when a call/emergency call has been triggered.
With the Gira nurse call system 834 Plus, two types of voice calls are distinguished:

1. Hands-free speaking via the voice module installed in a flush-mounted box
   If one of the two devices specified above has been installed with voice module in a patient's room (e.g. next to a bed), then hands-free speaking and listening is possible following call/emergency call triggering by pressing the red call button.
2. Discreet speaking via the patient's hand-held device
   If a device with ancillary plug contact has been installed in a patient's room (e.g. next to a bed), then initially hands-free speaking is possible after call/emergency call triggering via the patient's hand-held device, and following a further call triggering discreet speaking and listening. The patient's hand-held device is held to the mouth and ear like a telephone receiver for this.

If a voice connection is not possible because, for example, a call with higher priority is upcoming and/or the voice channel is occupied, this is displayed.

The actual call/emergency call is visually indicated via the room signal light and via the duty room terminal or duty room terminal CT 9.

Voice connections are automatically terminated after 30 seconds.

Relaying (toggling) or changing between several upcoming voice calls is not possible.

As soon as a voice call has been triggered via a device at a bed or in a room, this call is termed a pollable call. With such pollable calls, remote switch-off is permitted after query (speaking with the person calling).

5.1.3 Consoles for voice calls

The consoles must be equipped with one of the following devices:

- Room terminal Plus (Order No.: 5925 ..) with connected voice module (included in scope of supply of room terminal).
- Duty room terminal Plus with connected voice module (included in scope of supply of duty room terminal).
- Duty room terminal CT9 (microphone and loudspeaker integrated).
  To be able to use the Control 9 duty room terminal Plus, a duty room terminal or room module must be installed in the duty room.

5.1.4 Communication options of the duty room terminal

The duty room terminal has various methods for voice calls.

- A collective call goes to all voice-compatible rooms, or
- A collective call goes to all voice-compatible rooms with set presence, or
- Room call (only with duty room terminal Control 9 Plus), selection and talk-back with a single room

5.2 Call types

The Gira nurse call system 834 Plus enables voice communication between the patient's room and duty room, see 5.1.1 Voice communication (voice function) page 81.
The following generally applies:

- **Voice call (hands-free speaking/discreet speaking)**
  - After triggering a call by pressing a red call button on the device, hands-free speaking and listening via the voice module in the patient's room is possible.
  - After triggering a call by pressing the red call button on the patient's hand-held device, initially hands-free speaking is possible, and then with pressing pressing the red button for a second time, "discreet speaking" and listening becomes possible with the patient's hand-held device. The patient's hand-held device is held to the ear like a telephone receiver for this purpose.

  The call is displayed with a red reassurance light in the call button and red light in the room signal light (see table Call types: page 86). Voice communication is possible until the call is switched off. If a voice call cannot be established because, for example, calls with higher priority are upcoming or nobody accepts the voice call at a console, the call is terminated after 30 seconds. The call itself, however, is maintained and is indicated via the room signal light and the room/duty room terminal.
- **(Normal) call**

  Triggering a call by pressing a red call button.
  The (normal) call is displayed with a red reassurance light in the call button and red continuous light in the room signal light (see table Call types: page 86).
  Each bed must be assigned a unit for call triggering which the bedridden patient can reach comfortably and safely. The call button must be red and be designated with a unique symbol.
  An LED as a so-called location light is installed in the call button, pear button, patient's hand-held device, cover of the pull-cord button or the pneumatic call button for easy location in the dark.
  The incoming call has validity until it is dispensed by pressing a presence or switch-off button.
- **WC call**

  Call from a bathroom unit or from separate WC rooms or rooms with bathtub or shower.
  The WC call is displayed with a white continuous light (in addition to the red continuous light) in a room signal light.
  The incoming call has validity until it is dispensed by pressing a switch-off button on-site.
- **WC emergency call**

  When presence marking in a room with a WC area is switched on, emergency triggering is prepared because a WC emergency call is triggered if a red call button, pull-cord button or a pneumatic call button in the WC/bathroom area is actuated again. The WC emergency call is displayed with a red and white flashing light in a room signal light (see table Call types: page 86).
  The incoming call has validity until it is dispensed by pressing a switch-off button on-site.

- **Emergency call**
  Emergency call triggering is prepared by switching on presence marking in a room.
  Pressing the red call button again in the room triggers an emergency call.
  The emergency call is displayed with a red flashing light in a room signal light (see table Call types: page 86).
  The incoming emergency call has validity until it is dispensed by pressing a presence or switch-off button.
- **Alarm call/doctor alert**
  Doctor alert can be triggered with the doctor alert button only when Presence 1 or Presence 2 is set.
  Doctor alert is a call with its own signal for special purposes that may only switched off at the triggering location.
  The call triggering is for requesting special personnel, e.g. for calling doctors, but also for signalling special dangers e.g. fire or device failures.
  The incoming alarm/doctor alert has validity until it is dispensed by pressing a presence or switch-off button.
- **Diagnostic call/monitor call**
  Call from an electrical medical device according to the standard DIN EN 60601 (VDE 0750)
  This type of call also referred to as a monitor call must be made via separate plug and socket outlets (diagnostic connection cable, Order No.: 59xx 00). A diagnostic call is indicated by a continuous red light. The incoming diagnostic call has validity until it is cancelled by pressing a presence or switch-off button.
- **Room call (only originating from a Control 9 duty room terminal Plus)**
  A specific room can be selected and communicated with via the CT9 menu.
  Voice communication is only possible in one direction, from the Control 9 duty room terminal Plus to the selected room.
  Room calls are protected against eavesdropping, meaning replying is not possible.
  Replies from the room are only possible following a request by the care personnel via pressing a red call button (on the call button or patient's hand-held device) in the room.
- **Collective call (only originating from a Control 9 duty room terminal Plus)**
  An organisational unit (and therefore all rooms belonging to it) can be selected and communicated with via the menu of the CT9.
  Voice communication is only possible in one direction, from the Control 9 duty room terminal Plus to the selected organisational unit and its rooms.
- **Plug removal call**
  If the patient's hand-held device or diagnostic connection cable is removed consciously or unconsciously, a (normal) call is signalled. The text message "Plug" appears in the displays of the duty room terminals and room terminals. In order to switch off the call, the presence/switch-off button must be pressed for approximately 3 seconds.
- **Call forwarding buzzer signal**
  The call forwarding function is activated in each room in which presence is set. If a call/emergency call is triggered in another room (which belongs to the same organisational unit), a buzzer signal becomes audible in the room in which presence is set.

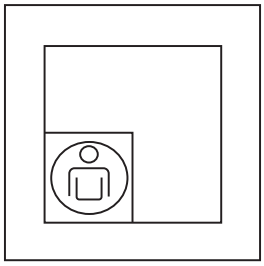
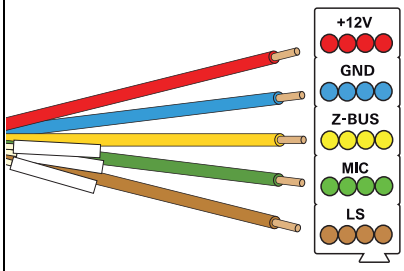
- **Signalling in case of fault**
  With device failures such as failure of the ward control centre or the system central control unit, the message "emergency mode" is shown with devices having displays. With a broken wire in a room, the message "Fault" appears.

Call type	Type and cycle sequence of the calls			
	Visual display		Colour	Acoustic signal
(Normal) call		Continuous light	Red	t_{on} =1 sec., Pause 10 ... 20 sec.
Emergency call		Flashing light long interval on/off approx. every 1.2 sec. ...		Tone sequence t_{on} / t_{off} = 1.2 sec.
Doctor alert		Flashing light short interval on/off approx. every 0.3 sec. ...		Tone sequence t_{on} / t_{off} = 0.3 sec.
diagnostic call		Continuous light		t_{on} =1 sec., Pause 10 ... 20 sec.
(WC) bathroom unit call		Continuous light	red and white	t_{on} =1 sec., Pause 5 ... 10 sec.
(WC) bathroom unit emergency call		Flashing light	red and white	Tone sequence t_{on} / t_{off} = 1.2 sec.
Presence 1		Continuous light	green	none
Presence 2		Continuous light	yellow	none
Signalling in case of fault		Continuous light	Red	none
Room call		none	none	Special signal (multi-tone gong)
Collective call		none	none	Special signal (multi-tone gong)

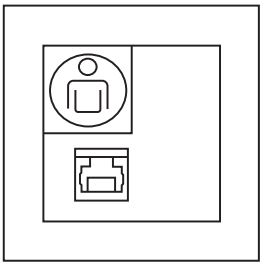
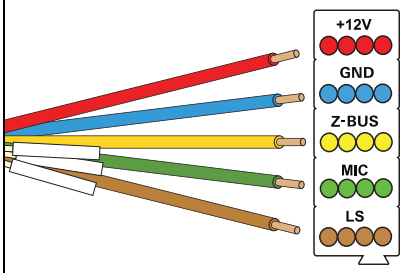
Table 1: Call types

5.3 Components of the nurse call system 834 Plus and their functions

5.3.1 Call button Plus

Order No. 5900 .. (RT+), call button Plus		
Connection to:	Room bus	
Note:	No connection option for voice module.	
Further information:	Description of call forwarding:Page 85.	
Device view	**Connections on rear of device**	
		
Triggering	**Display**	**Switch-off**
	Idle state: LED in red button lights up weakly (location light).	
Call: Press red button once.	**Call display:** LED in red button lights up. Red light in the room signal light lights up continuously. Buzzer signal for (normal) call in each room with marked presence (see table “Call types” on page 86).	**Call switch-off:** Press 1 x switch-off button or 1 x presence button (e.g. at the terminal).
Emergency call: Press 1 x red button when presence is marked.	**Emergency call display:** Red light in the room signal light flashes. Buzzer signal for emergency call in each room with marked presence (see table “Call types” on page 86).	**Switch off emergency call:** Press 1 x switch-off button or 1 x presence button (e.g. at the terminal).

5.3.2 Call button with ancillary plug contact Plus

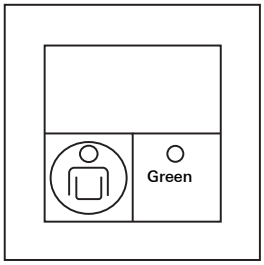
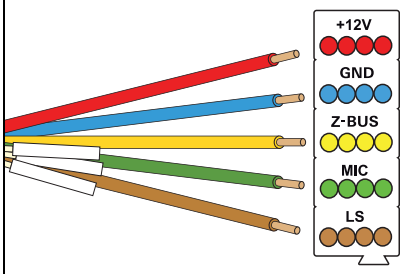
Order No. 5901 .. (RN+), call button with ancillary plug contact and connection option for voice module		
Connection to:	Room bus	
Connection of:	Patient's hand-held device, wireless set. Connection option for voice module. Connection for impulse relay see 3.6.5 Switching room lights page 40	
Note:	Connection of the patient's hand-held device is via a protective adapter (included in scope of supply), Order No. 2962 00.	
Further information:	Voice call, see 5.2 Call types page 84 and see 5.1.1 Voice communication (voice function) page 81. Description of plug removal call:Page 85. Description of call forwarding:Page 85.	
Device view	**Connections on rear of device**	
		
Triggering	**Display**	**Switch-off**
	Idle state: LED in red button lights up weakly (location light).	
Call: Press red button once. **Call via ancillary plug contact:** Press the red call button once on the patient's hand-held device. Press the call button once in the wireless module of the wireless set.	**Call display:** LED in red button lights up. Red light in the room signal light lights up continuously. Buzzer signal for (normal) call in each room with marked presence (see table “Call types” on page 86).	**Call switch-off:** Press the presence button once (on the terminal or module).

See next page for continuation of table

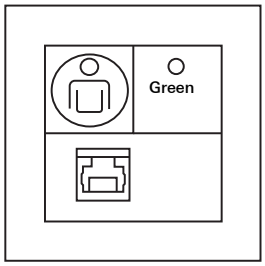
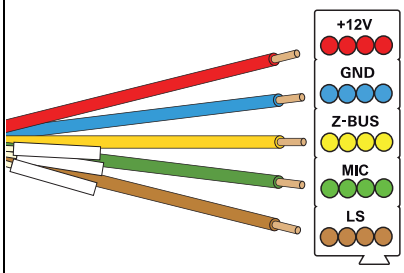
Continuation of table

"Hands-free speaking" voice call: Press the red call button once. **"Discreet speaking" voice call via the patient's hand-held device:** Press the red call button twice on the patient's hand-held device.	**Call display:** LED in red button lights up. Red light in the room signal light lights up continuously. Acoustic signal for incoming voice call at the duty room/ room terminals. Buzzer signal for (normal) call in each room with marked presence (see table “Call types” on page 86).	**Call switch-off:** Press the presence/switch-off button once (at the terminal or module). Remote switch-off of the voice call: After query, press the switch-off button once.
Emergency call: Press 1 x red button when presence is marked.	**Emergency call display:** LED in red button flashes. Red light in the room signal light flashes. Buzzer signal for emergency call in each room with marked presence (see table “Call types” on page 86).	**Switch off emergency call:** Press the presence button once (at the terminal or module).
Plug removal call: Removal of the plug for the patient's hand-held device or the wireless receiver with the wireless set. (Wire breakage is also monitored).	**Plug removal display:** LED in red button lights up. Red light in the room signal light lights up continuously. Buzzer signal for (normal) call in each room with marked presence (see table “Call types” on page 86).	**Plug removal switch-off:** Press and hold the presence button on the terminal or module approx. 3 seconds.

5.3.3 Call and switch-off button Plus

Order No. 5902 .. (RA+), call and switch-off button Plus		
Connection to:	Room bus	
Note:	No connection option for voice module.	
Further information:	Description of call forwarding:Page 85.	
Device view	**Connections on rear of device**	
		
Triggering	**Display**	**Switch-off**
	Idle state: LED in red button lights up weakly (location light).	
Call: Press red button once.	**Call display:** LED in red button lights up. Red light in the room signal light lights up continuously. Buzzer signal for (normal) call in each room with marked presence (see table “Call types” on page 86).	**Call switch-off:** Press green button once.
Emergency call: Press 1 x red button when presence is marked.	**Emergency call display:** Red light in the room signal light flashes. Buzzer signal for emergency call in each room with marked presence (see table “Call types” on page 86).	**Switch off emergency call:** Press green button once.

5.3.4 Call and switch-off button with ancillary plug contact Plus

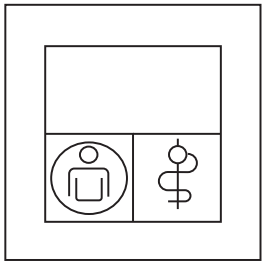
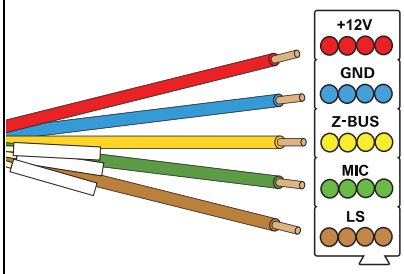
Order No. 5903 .. (RAN+), call and switch-off button with ancillary plug contact and connection option for voice module		
Connection to:	Room bus	
Connection of:	Patient's hand-held device, wireless set. Connection option for voice module. Connection for impulse relay see 3.6.5 Switching room lights page 40	
Note:	Connection of the patient's hand-held device is via a protective adapter (included in scope of supply), Order No. 2962 00.	
Further information:	Voice call, see 5.2 Call types page 84 and see 5.1.1 Voice communication (voice function) page 81. Description of plug removal call:Page 85. Description of call forwarding:Page 85.	
Device view	**Connections on rear of device**	
		
Triggering	**Display**	**Switch-off**
	Idle state: LED in red button lights up weakly (location light).	
Call: Press red button once. **Call via ancillary plug contact:** Press the red call button once on the patient's hand-held device. Press the call button once in the wireless module of the wireless set.	**Call display:** LED in red button lights up. Red light in the room signal light lights up continuously. Buzzer signal for (normal) call in each room with marked presence (see table “Call types” on page 86).	**Call switch-off:** Press the green button once or the presence button once (e.g. at the terminal).

See next page for continuation of table

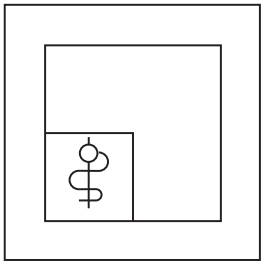
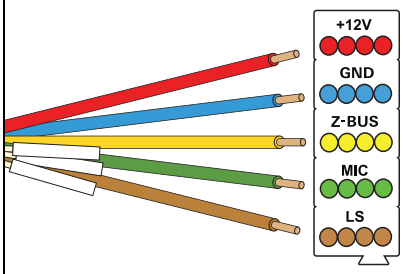
Continuation of table

"Hands-free speaking" voice call: Press the red call button once. **"Discreet speaking" voice call via the patient's hand-held device:** Press the red call button twice on the patient's hand-held device.	**Call display:** LED in red button lights up. Red light in the room signal light lights up continuously. Acoustic signal for incoming voice call at the duty room/ room terminals. Buzzer signal for (normal) call in each room with marked presence (see table “Call types” on page 86).	**Call switch-off:** Press the presence/switch-off button once (at the terminal or module). Remote switch-off of the voice call: After query, press the switch-off button once.
Emergency call: Press 1 x red button when presence is marked.	**Emergency call display:** LED in red button flashes. Red light in the room signal light flashes. Buzzer signal for emergency call in each room with marked presence (see table “Call types” on page 86).	**Switch off emergency call:** Press the green button once or the presence button once (e.g. at the terminal).
Plug removal call: Removal of the plug for the patient's hand-held device or the wireless receiver with the wireless set. (Wire breakage is also monitored).	**Plug removal display:** LED in red button lights up. Red light in the room signal light lights up continuously. Buzzer signal for (normal) call in each room with marked presence (see table “Call types” on page 86).	**Plug removal switch-off:** Press and hold the presence button on the terminal or module approx. 3 seconds.

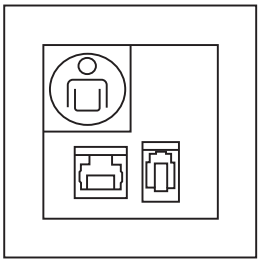
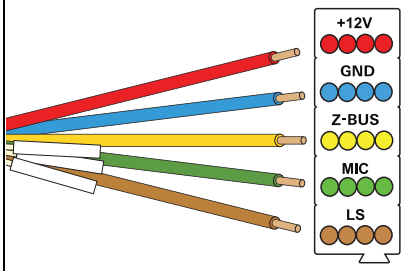
5.3.5 Call and doctor alert button Plus

Order No. 5904 .. (RAR+), call and doctor alert button Plus		
Connection to:	Room bus	
Note:	No connection option for voice module.	
Further information:	Call types: see 5.2 Call types page 84	
Device view	**Connections on rear of device**	
		
Triggering	**Display**	**Switch-off**
	Idle state: LED in red and blue button lights up weakly (location light).	
Call: Press red or blue button once (no presence marked).	**Call display:** LED in red button lights up. Red light in the room signal light lights up continuously. Buzzer signal for (normal) call in each room with marked presence (see table “Call types” on page 86).	**Call switch-off:** Press the presence button once (at the terminal).
Emergency call: Press 1 x red button when presence is marked.	**Emergency call display:** LED in red button flashes. Red light in the room signal light flashes. Buzzer signal for emergency call in each room with marked presence (see table “Call types” on page 86).	**Switch off emergency call:** Press the presence button once (at the terminal).
Doctor alert: Press the blue button once with marked presence.	**Display of doctor alert:** LED in the red and blue button flashes. Red light in the room signal light flashes quickly. Buzzer signal for doctor alert in each room with marked presence (see table “Call types” on page 86).	**Switch off doctor alert:** Press the presence button once (at the terminal).

5.3.6 Doc alert button Plus

Order No. 5905 .. (AR+), doctor alert button Plus		
Connection to:	Room bus	
Note:	No connection option for voice module.	
Further information:	Call types: see 5.2 Call types page 84	
Device view	**Connections on rear of device**	
		
Triggering	**Display**	**Switch-off**
	Idle state: LED in blue button lights up weakly (location light).	
Emergency call: Press the blue button once with marked presence.	**Emergency call display:** LED in blue button flashes. Red light in the room signal light flashes. Buzzer signal for emergency call in each room with marked presence (see table “Call types” on page 86).	**Switch off emergency call:** Press the presence button once (at the terminal).
Doctor alert: Press the blue button once with marked presence.	**Display of doctor alert:** LED in blue button flashes. Red light in the room signal light flashes quickly. Buzzer signal for doctor alert in each room with marked presence (see table “Call types” on page 86).	**Switch off doctor alert:** Press the presence button once (at the terminal).

5.3.7 Call button with ancillary plug contact and diagnostic socket Plus

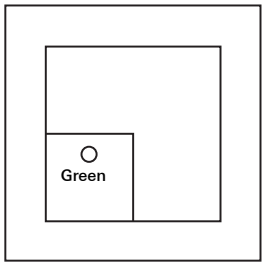
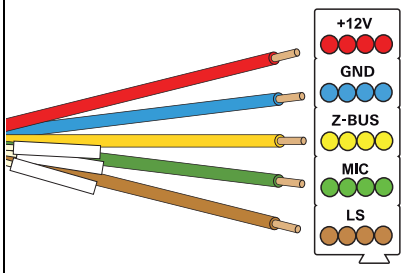
Order No. 5906 .. (RND+), call button with ancillary plug contact and diagnostic pin jack and connection option for voice module		
Connection to:	Room bus	
Connection of:	Patient's hand-held device, wireless set, medical device. Connection option for voice module. Connection for impulse relay see 3.6.5 Switching room lights page 40	
Note:	Connection of the patient's hand-held device is via a protective adapter (included in scope of supply), Order No. 2962 00. Connection of a medical device is via the diagnostic connection cable (RJ11 at one end, open end to NC contact of third-party device), Order No. 2961 00.	
Further information:	Voice call, see 5.2 Call types page 84 and see 5.1.1 Voice communication (voice function) page 81. Description of plug removal call: Page 85. Connection of medical device: see 3.6.6 Connection of diagnostic connection cable page 41.	
Device view	**Connections on rear of device**	
		
Triggering	**Display**	**Switch-off**
	Idle state: LED in red button lights up weakly (location light).	
Call: Press red button once. **Call via ancillary plug contact:** Press the red call button once on the patient's hand-held device. Press the call button once in the wireless module of the wireless set.	**Call display:** LED in red button lights up. Red light in the room signal light lights up continuously. Buzzer signal for (normal) call in each room with marked presence (see table “Call types” on page 86).	**Call switch-off:** Press the presence button once (e.g. on the terminal).

See next page for continuation of table

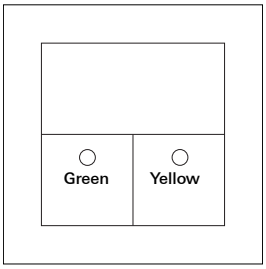
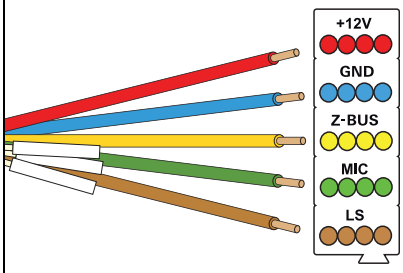
Continuation of table

"Hands-free speaking" voice call: Press the red call button once. **"Discreet speaking" voice call via the patient's hand-held device:** Press the red call button twice on the patient's hand-held device.	**Call display:** LED in red button lights up. Red light in the room signal light lights up continuously. Acoustic signal for incoming voice call at the duty room/ room terminals. Buzzer signal for (normal) call in each room with marked presence (see table “Call types” on page 86).	**Call switch-off:** Press the presence/switch-off button once (at the terminal or module). Remote switch-off of the voice call: After query, press the switch-off button once.
Emergency call: Press 1 x red button when presence is marked.	**Emergency call display:** LED in red button flashes. Red light in the room signal light flashes. Buzzer signal for emergency call in each room with marked presence (see table “Call types” on page 86).	**Switch off emergency call:** Press the presence button once (e.g. on the terminal).
Diagnostic call: Triggered via the the zero-voltage contact of a medical device.	**Display of diagnostic call:** Red light in the room signal light lights up continuously. Buzzer signal for diagnostic call in each room with marked presence (see table “Call types” on page 86).	**Switch off diagnostic call:** Press the presence button once (e.g. on the terminal).
Plug removal call: Removal of the plug for the patient's hand-held device or the wireless receiver with the wireless set. (Wire breakage is also monitored).	**Plug removal display:** LED in red button lights up. Red light in the room signal light lights up continuously. In the display of a duty room/ room terminal the following message appears: "Plug". Buzzer signal for (normal) call in each room with marked presence (see table “Call types” on page 86).	**Plug removal switch-off:** Press and hold the presence button for approx. 3 seconds.

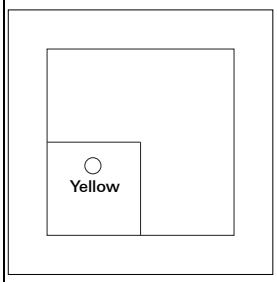
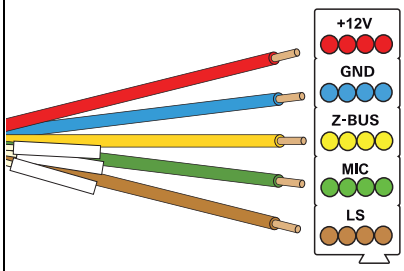
5.3.8 Presence button green Plus

Order No. 5908 .. (AW_1+), presence button green Plus		
Connection to:	Room bus	
Note:	No connection option for voice module.	
Further information:	Description of call forwarding:see • Call forwarding buzzer signal page 85.	
Device view	**Connections on rear of device**	
		
Triggering	**Display**	**Switch-off**
Mark presence: Press green button once. Acoustic call forwarding is prepared.	**Display presence/ call forwarding:** LED in green button lights up. Green light in the room signal light lights up continuously. Buzzer signal for (normal) call in each room with marked presence (see table “Call types” on page 86).	**Switch off presence:** Press green button once.

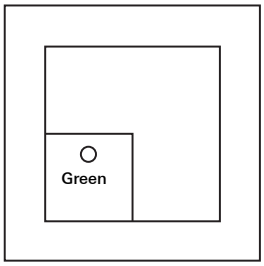
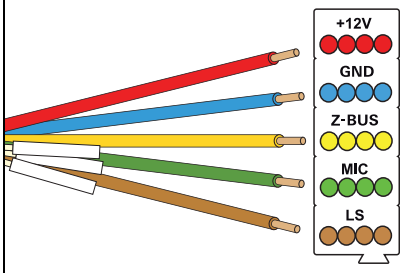
5.3.9 Presence button green, yellow Plus

Order No. 5909 .. (AW_12+), presence button green, yellow Plus		
Connection to:	Room bus	
Note:	No connection option for voice module.	
Further information:	Description of call forwarding:see • Call forwarding buzzer signal page 85.	
Device view	**Connections on rear of device**	
		
Triggering	**Display**	**Switch-off**
Mark presence 1: Press green button once. Acoustic call forwarding is prepared.	**Display presence 1/ call forwarding:** LED in green button lights up. Green light in the room signal light lights up continuously. Buzzer signal as acoustic call forwarding for normal and emergency call in each room with marked presence (see table “Call types” on page 86).	**Switch off presence 1:** Press green button once.
Mark presence 2: Press yellow button once. Acoustic call forwarding is prepared.	**Display presence 2/ call forwarding:** LED in yellow button lights up. Yellow light in the room signal light lights up continuously. Buzzer signal as acoustic call forwarding for normal and emergency call in each room with marked presence (see table “Call types” on page 86).	**Switch off presence 2:** Press yellow button once.

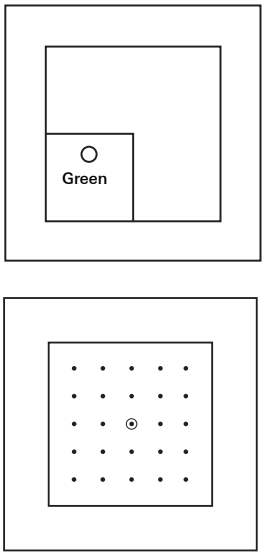
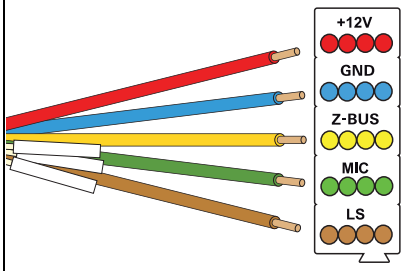
5.3.10 Presence button yellow Plus

Order No. 5909 .. (AW_12+), presence button green, yellow Plus		
Connection to:	Room bus	
Note:	No connection option for voice module.	
Further information:	Description of call forwarding:see • Call forwarding buzzer signal page 85.	
Device view	**Connections on rear of device**	
		
Triggering	**Display**	**Switch-off**
Mark presence 2: Press yellow button once. Acoustic call forwarding is prepared.	**Display presence 2/ call forwarding:** LED in yellow button lights up. Yellow light in the room signal light lights up continuously. Buzzer signal as acoustic call forwarding for normal and emergency call in each room with marked presence (see table “Call types” on page 86).	**Switch off presence 2:** Press yellow button once.

5.3.11 Switch-off button Plus

Order No. 5911 .. (AT+), switch-off button Plus		
Connection to:	Room bus	
Note:	For use in WC areas. No connection option for voice module.	
Further information:		
Device view	**Connections on rear of device**	
		
Triggering	**Display**	**Switch-off**
Call triggering via e.g. call button, pull-cord button, pneumatic call button.	Reassurance light lights up in all call triggering buttons. Red light in the room signal light lights up continuously. White light in the room signal light lights up continuously.	Press green button once (switch-off button).

5.3.12 Switch-off button with voice module Plus

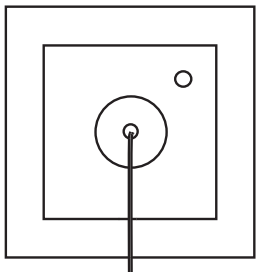
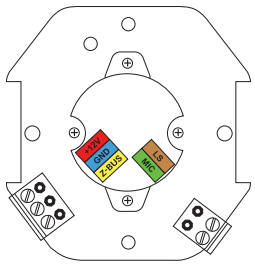
Order No. 5918 .. (ATS+), switch-off button with voice module Plus		
Connection to:	Room bus	
Connection of:	Connection option for voice module.	
Note:	For use in WC areas.	
Further information:		
Device view	**Connections on rear of device**	
		
Triggering	**Display**	**Switch-off**
	Idle state: LED in green button lights up weakly (location light).	
Call: Press red call button, pullcord button or pneumatic call button once. Press the call button once in the wireless module of the wireless set.	**Call display:** LED in green button lights up. Red light in the room signal light lights up continuously. White light in the room signal light lights up continuously. Buzzer signal for (normal) call in each room with marked presence (see table “Call types” on page 86).	**Call switch-off:** Press green button on switch-off button once.

See next page for continuation of table

Continuation of table

"Hands-free speaking" voice call: Press the red call button once.	**Call display:** LED in red button lights up. Red light in the room signal light lights up continuously. White light in the room signal light lights up continuously. Acoustic signal for incoming voice call at the duty room/ room terminals. Buzzer signal for (normal) call in each room with marked presence (see table “Call types” on page 86).	**Call switch-off:** Press green button on switch-off button once. Remote switch-off of the voice call: After query, press the switch-off button once.

5.3.13 Pull-cord button Plus

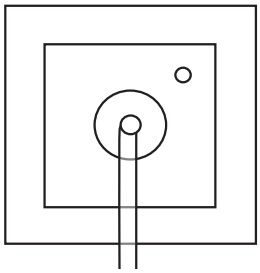
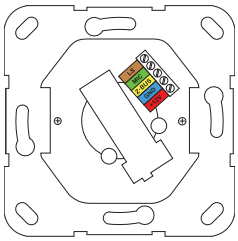
Order No. 5912 .. (ZUT+), pull-cord button Plus		
Connection to:	Room bus	
Note:	For use in bathroom/WC areas No connection option for voice module. The handle of the pull-cord button is to be secured with a reef knot on the pull cord.	
Further information:		
Device view	**Connections on rear of device**	
		
Triggering	**Display**	**Switch-off**
	Idle state: LED in housing of button lights up weakly (location light).	
Call/WC call: Pull on pull cord once.	**Call display:** Reassurance light lights up in the housing of the button. Red light in the room signal light lights up continuously. **WC call display:** Red and white lights in the room signal are lit continuously. Buzzer signal for (normal) call in each room with marked presence (see table “Call types” on page 86).	**Call switch-off:** Press the switch-off button on-site once (e.g. in the WC area).

See next page for continuation of table

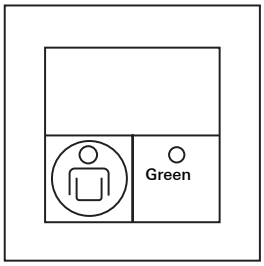
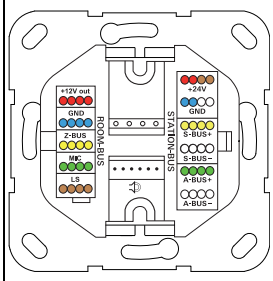
Continuation of table

Emergency call / WC emergency call: Pull the pull cord once with marked presence.	**Emergency call display:** Red light in the room signal light flashes. **WC emergency call display:** Red and white lights in the room signal light flash. Buzzer signal for emergency call in each room with marked presence (see table “Call types” on page 86).	**Switch off emergency call:** Press the switch-off button on-site once (e.g. in the WC area).

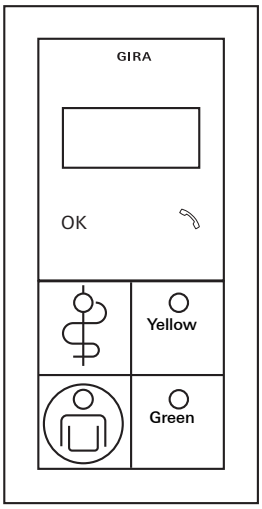
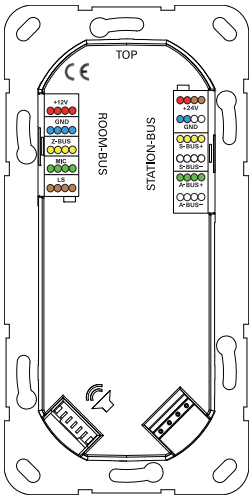
5.3.14 Pneumatic call button Plus

Order No. 5913 .. (PRT+), pneumatic call button Plus		
Connection to:	Room bus	
Note:	For use in bathroom/WC areas. No connection option for voice module.	
Further information:		
Device view	**Connections on rear of device**	
		
Triggering	**Display**	**Switch-off**
	Idle state: LED in housing of button lights up weakly (location light).	
WC call: Press the red rubber ball once.	**Call display:** Reassurance light lights up in the housing of the button. Red light in the room signal light lights up continuously. **WC call display:** White light in the room signal light lights up continuously. Buzzer signal for (normal) call in each room with marked presence (see table “Call types” on page 86).	**Call switch-off:** Press the switch-off button on-site once (e.g. in the WC area).
WC emergency call: Press the red rubber ball once with marked presence.	**Emergency call display:** Red light in the room signal light flashes. **WC emergency call display:** Red and white lights in the room signal light flash. Buzzer signal for emergency call in each room with marked presence (see table “Call types” on page 86).	**Switch off emergency call:** Press the switch-off button on-site once (e.g. in the WC area).

5.3.15 Room module with call and presence button Plus

Order No. 5920 .. (ZM+), room module with call and presence button Plus		
Connection to: Connection of:	Ward bus Room bus	
Note:	No connection option for voice module.	
Further information:	Description of call forwarding:Page 85.	
Device view	**Connections on rear of device**	
		
	Idle state: LED in red button lights up weakly (location light).	
Call: Press red button once.	**Call display:** LED in red button lights up. Red light in the room signal light lights up continuously. Buzzer signal for (normal) call in each room with marked presence (see table “Call types” on page 86).	**Call switch-off:** Press green button once.
Mark presence: Press green button once. Acoustic call forwarding is prepared.	**Display presence/ call forwarding:** LED in green button lights up. Green light in the room signal light lights up continuously.	**Switch off presence:** Press green button once.
Emergency call: Press 1 x red button when presence is marked.	**Emergency call display:** LED in red button flashes. Red light in the room signal light flashes. Buzzer signal for emergency call in each room with marked presence (see table “Call types” on page 86).	**Switch off emergency call:** Press green button once.

5.3.16 Room terminal, doctor alert and presence 2 Plus

Order No. 5925 .. (ZT+), room terminal, doctor alert, presence 2 and connection option for voice module		
Connection to:	Ward bus and room bus.	
Connection of:	Voice module (included in scope of supply).	
Note:	Capacitive buttons below the display for acceptance of voice calls and for selecting/deselecting further functions such as interconnection of ward groups, activation of services. Interconnection and grouping of wards and the setup of services are parameterised with the configuration assistant, see Page 76 and the online help of the software.	
Further information:	Voice call, see 5.2 Call types page 84 and see 5.1.1 Voice communication (voice function) page 81. Description of call forwarding:Page 85.	
Device view	**Connections on rear of device**	
		
	Idle state: LED in red and blue button lights up weakly (location light).	
Call: Press red button once or Press blue button once (no presence marked).	**Call display:** LED in red or blue button lights up. Red light in the room signal light lights up continuously. Display shows the room number of the person calling. Buzzer signal for (normal) call in each room with marked presence (see table “Call types” on page 86).	**Call switch-off:** Press green button once.

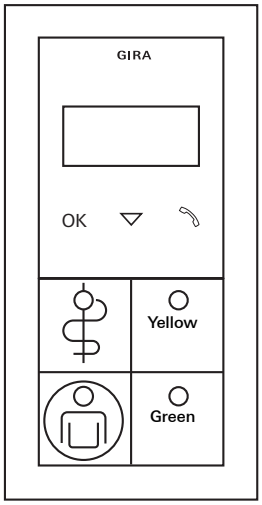
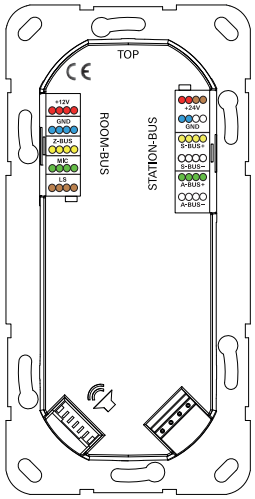
Accept voice call: Touch the receiver symbol on the glass surface.	**Call display:** LED in red button lights up. Red light in the room signal light lights up continuously. Display shows the room number of the person calling. Acoustic signal for incoming voice call at the duty room/ room terminals. Buzzer signal for (normal) call in each room with marked presence (see table “Call types” on page 86).	Remote switch-off of the voice call: After query, press the switch-off button at the terminal once. **Terminate voice call:** Touch the receiver symbol on the glass surface.
1. Mark presence: Press green button once. Acoustic call forwarding is prepared.	**1. Display presence:** LED in green button lights up. Green light in the room signal light lights up continuously.	**Switch off presence:** Press green or yellow button once.
2. Mark presence: Press yellow button once.	**2. Display presence:** LED in yellow button lights up. Yellow light in the room signal light lights up.	**2. Switch off presence:** Press yellow button once.

See next page for continuation of table

Continuation of table

Emergency call: Press 1 x red button when presence is marked.	**Emergency call display:** LED in red button flashes. Red light in the room signal light flashes. Display shows the room number of the person calling. Buzzer signal for emergency call in each room with marked presence (see table "Call types" on page 86). Display shows information for call forwarding with marked presence.	**Switch off emergency call:** Press green button once.
Doctor alert: Press the blue button once with marked presence.	**Display of doctor alert:** LEDs in the red and blue buttons flash. In the (duty) room terminal doctor alert or in the (duty) room terminal doctor alert and presence 2, the LEDs in the red and blue buttons flash. Display shows information for call forwarding with marked presence.	**Switch off doctor alert:** Press the green or yellow presence button once in the room in which the call was triggered.

5.3.17 Duty room terminal, doctor alert and presence 2 Plus

Order No. 5929 .. (DZT+), duty room terminal, doctor alert, presence 2 and connection option for voice module		
Connection to:	Ward bus and room bus.	
Connection of:	Voice module (included in scope of supply).	
Note:	Capacitive buttons below the display for acceptance of voice calls and for selecting/deselecting further functions such as interconnection of ward groups, collective calls etc. Only functions that concern the specific duty room terminal can be selected/deselected. If a service is selected or deselected at a duty room terminal in a ward control centre with several duty room terminals, for the period of selection the other duty room terminals are disabled. Interconnection and grouping of wards and the setup of services are parameterised in the system central control unit, see Page 76 and the online help of the software.	
Further information:	Description of call forwarding:Page 85.	
Device view	**Connections on rear of device**	
		
Triggering	**Display**	**Switch-off**
	Idle state: LED in red and blue button lights up weakly (location light).	

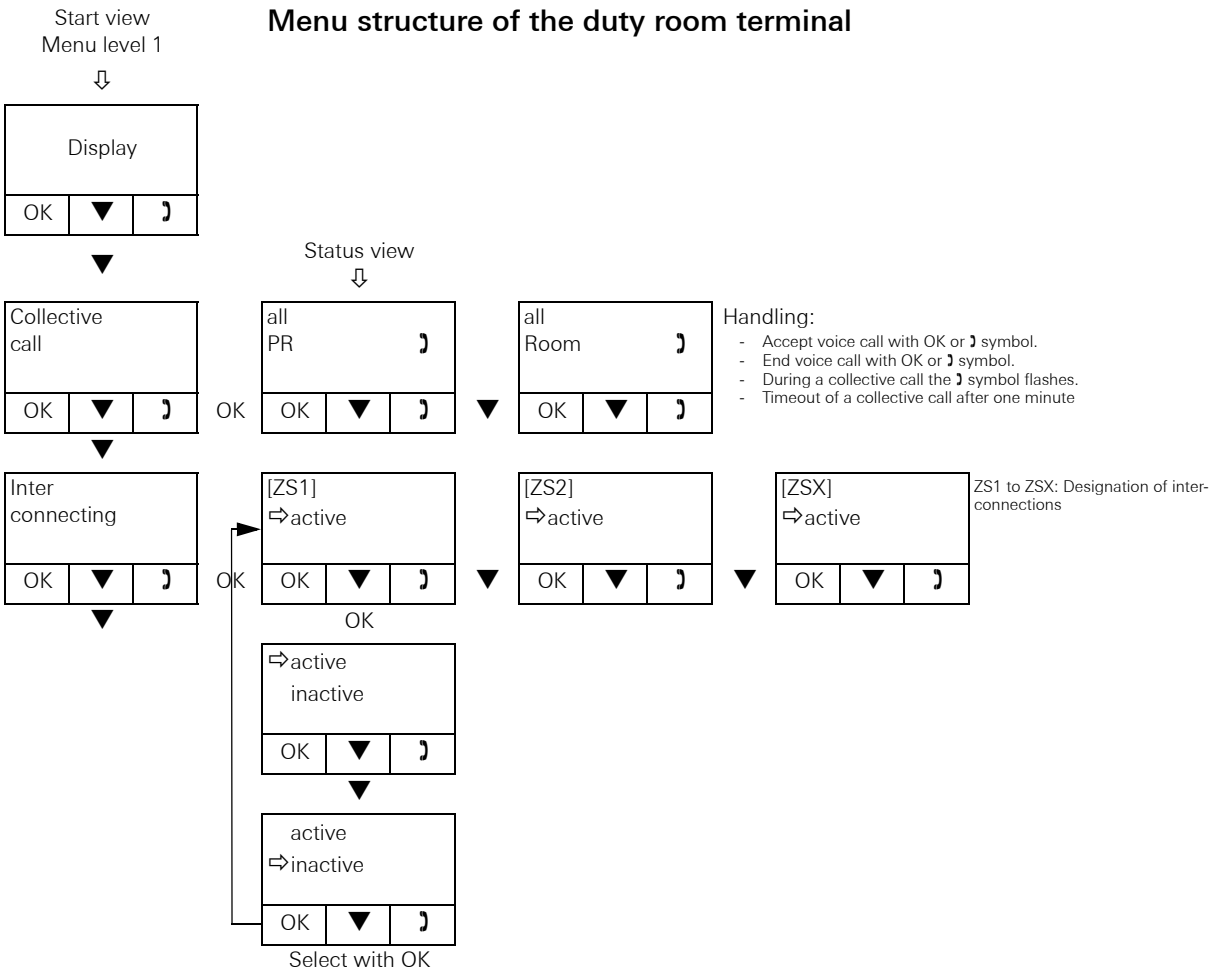
Call: Press red button once or Press blue button once (no presence marked).	**Call display:** LED in red or blue button lights up. Red light in the room signal light lights up continuously. Display shows the room number of the person calling. Buzzer signal for (normal) call in each room with marked presence (see table "Call types" on page 86).	**Call switch-off:** Press green button once.
Accept voice call: Touch the receiver symbol on the glass surface below the display.	**Call display:** LED in red button lights up. Red light in the room signal light lights up continuously. Display shows the room number of the person calling. Acoustic signal for incoming voice call at the duty room/ room terminals. Buzzer signal for (normal) call in each room with marked presence (see table "Call types" on page 86).	Remote switch-off of the voice call: After query, press the switch-off button at the terminal once. **Terminate voice call:** Touch the receiver symbol on the glass surface.
1. Mark presence: Press green button once. Acoustic call forwarding is prepared.	**1. Display presence:** LED in green button lights up. Green light in the room signal light lights up continuously.	**Switch off presence:** Press green or yellow button once.
2. Mark presence: Press yellow button once.	**2. Display presence:** LED in yellow button lights up. Yellow light in the room signal light lights up.	**2. Switch off presence:** Press yellow button once.

See next page for continuation of table

Continuation of table

Emergency call: Press 1 x red button when presence is marked.	**Emergency call display:** LED in red button flashes. Red light in the room signal light flashes. Display shows the room number of the person calling. Buzzer signal for emergency call in each room with marked presence (see table “Call types” on page 86). Display shows information for call forwarding with marked presence.	**Switch off emergency call:** Press green button once.
Doctor alert: Press the blue button once with marked presence.	**Display of doctor alert:** LEDs in the red and blue buttons flash. In the (duty) room terminal doctor alert or in the (duty) room terminal doctor alert and presence 2, the LEDs in the red and blue buttons flash. Display shows information for call forwarding with marked presence.	**Switch off doctor alert:** Press the green or yellow presence button once in the room in which the call was triggered.

Menu structure of the duty room terminal



5.3.18 Control 9 duty room terminal Plus

The duty room terminal CT9 (Order No. 5927 00, CT9+) is a display and operating terminal for the Gira nurse call system 834 Plus. It can be used in the duty room parallel to a conventional duty room terminal or room module, is connected to the system bus of the call system and assigned to a duty room terminal or room module.

System conditions are visualised via the software user interface of the duty room terminal CT9 Plus. Calls can be displayed and logged and voice calls can be accepted and triggered.

Device description

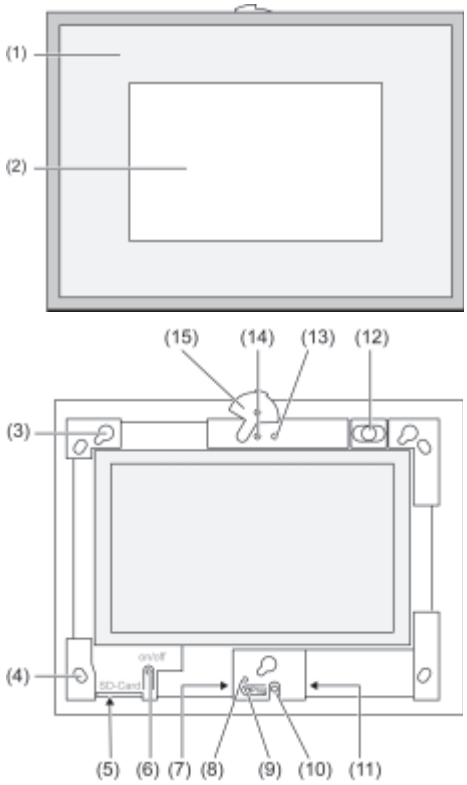


Fig. 5: Design frame with touch surface (above) and front view without design frame (below)

Operating and control elements on the front of the duty room terminal Control 9 Plus:

(1) Design frame

(2) Touch user interface

(3) Mount for the design frame

(4) Holes for wall mounting

(5) Slot for SD memory card

(6) On/off button

(7) Programming interface (for future applications)

(8) LED Prog. (for future applications)

(9) Prog. button (for future applications)

(10) Internal microphone

(11) USB connection

(12) Internal loudspeaker
(13) Camera operation indication (not with duty room terminal Control 9 Plus)
(14) Internal camera (not with duty room terminal Control 9 Plus)
(15) Plate for internal camera (not with duty room terminal Control 9 Plus)

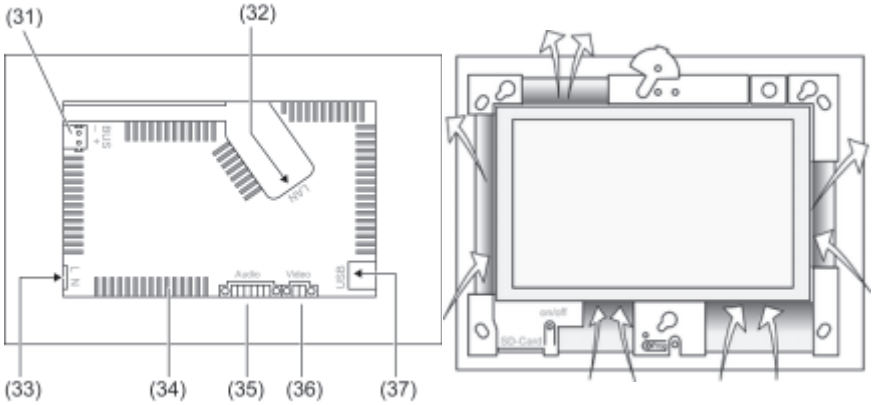


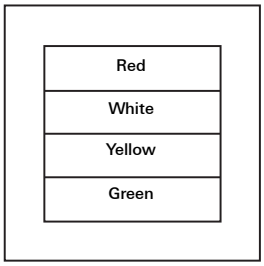
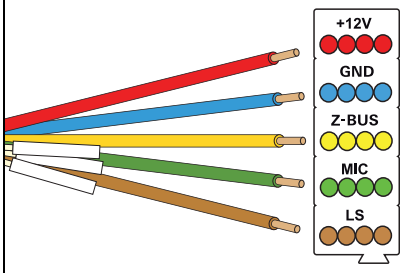
Fig. 6: Connections on rear (left) and front ventilation slots (right)

Rear connections of the duty room terminal Control 9 Plus:
(31) Connection for future expansion (not with duty room terminal Control 9 Plus)
(32) Ethernet connection
(33) Mains voltage connection
(34) Ventilation slots
(35) Connection for audio input and output (not with duty room terminal Control 9 Plus)
(36) Connection for analogue video input (not with duty room terminal Control 9 Plus)
(37) USB 2.0 connections

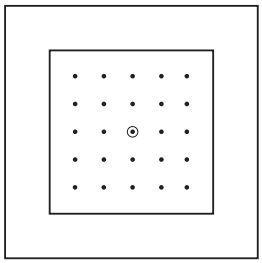
Note: observe the device operating instructions.

Please observe information on installation, start-up and functioning in the operating instructions for the duty room terminal Control 9 Plus enclosed with the device.

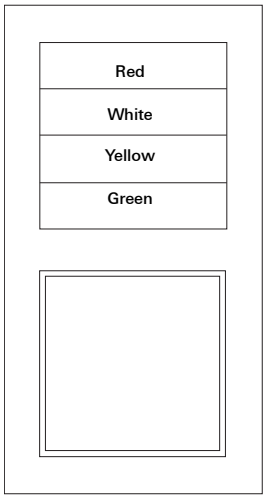
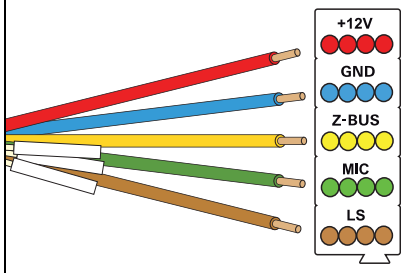
5.3.19 Red, white, yellow and green room signal light Plus

Order No. 5944 00 (ZS+), room signal light red, white, yellow, green		
Connection to:	Room bus	
Note:		
Further information:	Description of call forwarding:Page 85.	
Device view	**Connections on rear of device**	
		
	Display	
	Call display: Red light in the room signal light lights up continuously. **WC call display:** Red and white lights in the room signal are lit continuously. Buzzer signal for (normal) call in each room with marked presence (see table “Call types” on page 86).	
	1. Display presence: Green light in the room signal light lights up continuously.	
	2. Display presence: Yellow light in the room signal light lights up.	
	Emergency call display: Red light in the room signal light flashes. **WC emergency call display:** Red and white lights in the room signal light flash. Buzzer signal for emergency call in each room with marked presence (see table “Call types” on page 86).	

5.3.20 Voice module Plus

Order No. 5990 .. (S+), voice module Plus	
Connection to:	Wire audio bus (via included flat ribbon cable) of call button with ancillary plug contact Plus (Order No.: 5901 ..), call and switch-off button with ancillary plug contact Plus (Order No.: 5903 ..), call button with ancillary plug contact and diagnostic pin jack Plus (Order No.: 5906 ..), switch-off button with voice module Plus (Order No.: 5918 ..), duty room terminal Plus (Order No.: 5925 ..), duty room terminal Plus (Order No.: 5929 ..).
Note:	Audio flat ribbon cable is included with the voice module.
Further information:	
Device view	**Connections on rear of device**
	

5.3.21 Red, white, yellow, and green room signal light with name plate Plus.

Order No. 5948 00 (ZSN+), room signal light, red, white, yellow, green with name plate		
Connection to:	Room bus	
Note:		
Further information:	Description of call forwarding:Page 85.	
Device view	**Connections on rear of device**	
		
	Display	
	Call display: Red light in the room signal light lights up continuously. **WC call display:** Red and white lights in the room signal are lit continuously. Buzzer signal for (normal) call in each room with marked presence (see table “Call types” on page 86).	
	1. Display presence: Green light in the room signal light lights up continuously.	
	2. Display presence: Yellow light in the room signal light lights up.	

See next page for continuation of table

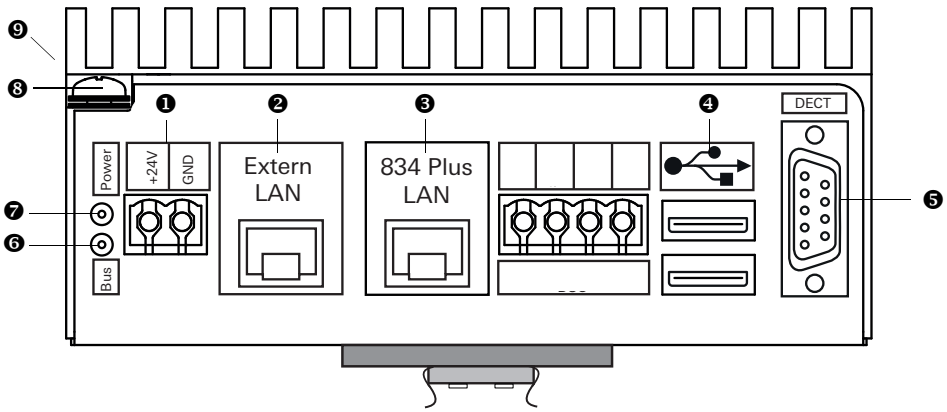
Continuation of table

	Emergency call display: Red light in the room signal light flashes. **WC emergency call display:** Red and white lights in the room signal light flash. Buzzer signal for emergency call in each room with marked presence (see table “Call types” on page 86).	

5.3.22 System central control unit Plus

Order No. 5972 00 (SSZ+), system central control unit Plus	
Connection to:	System bus (834 Plus LAN), Ethernet
Connection option for:	mouse and keyboard (USB), external LAN, LAN 834 Plus, DECT/PSA (RS 232), BMA (RS 232).
Note:	The system central control unit is supplied pre-configured. The enabling of special software modules e.g.connection of pager/DECT/fire alarm systems can be separately purchased (software module DECT, Order No.: 5994 00; software module BMA, Order No.: 5993 00.
Further information:	See the installation instructions for the system central control unit enclosed with the device See “The system central control unit” on page 57.

Device view and connections:



Legends:

❶ +24 V	DC power supply	❺ DECT	RS 232
❷ External LAN	RJ45	❻ LED	Bus activity
❸ 834 Plus LAN	RJ45	❼ LED	Power On/Off
❹ 2 x USB	f. service purposes	❽ Screw	Earth
		❾ No image	RS 232 (f. BMA) on the other side of the device

See next page for continuation of table

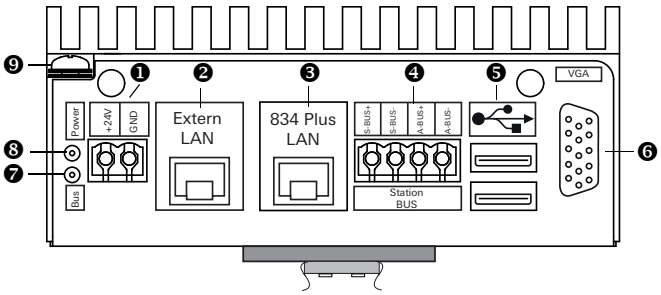
Continuation of table

Functions
The System Control Centre Plus manages and controls the complete Gira nurse call system 834 Plus. The device is connected to the ward control centres and to the Control 9 duty room terminal (where applicable) via the system bus (834 Plus LAN). All devices in the call system are automatically recognised. Devices can be subsequently added to or removed from the call system. The system central control unit Plus is immediately ready for use; additional settings can be made via the configuration software in the device. • Central configuration with start-up of a system, e.g. assignment of plain names for rooms. • Creation of organisational units, grouping ward(s), interconnecting (combining) ward groups. • Cross-ward diagnosis functions. • Control of visual and acoustic call processing. • Monitoring of connected devices and lines. • Call and presence logging on various levels: Ward, group, room

5.3.23 Ward control centre Plus

Order No. 5973 00 (SZ+), ward control centre Plus	
Connection to:	Station bus and system bus (834 Plus LAN)
Connection of:	VGA monitor, mouse and keyboard (USB), external LAN, LAN 834 Plus, ward bus.
Note:	Te ward control centre is supplied pre-configured.
Further information:	See installation instructions for ward control centre. See “The ward control centre” on page 45.

Device view and connections:



Legends:

❶ +24 V/GND DC power supply
❷ External LANRJ45
❸ 834 Plus LANRJ45
❹ Ward bus
❺ 2 x USB
❻ VGA pin jack
❼ LED yellow Bus active
❽ LED green Power on
❾ Protective conductor connection

See next page for continuation of table

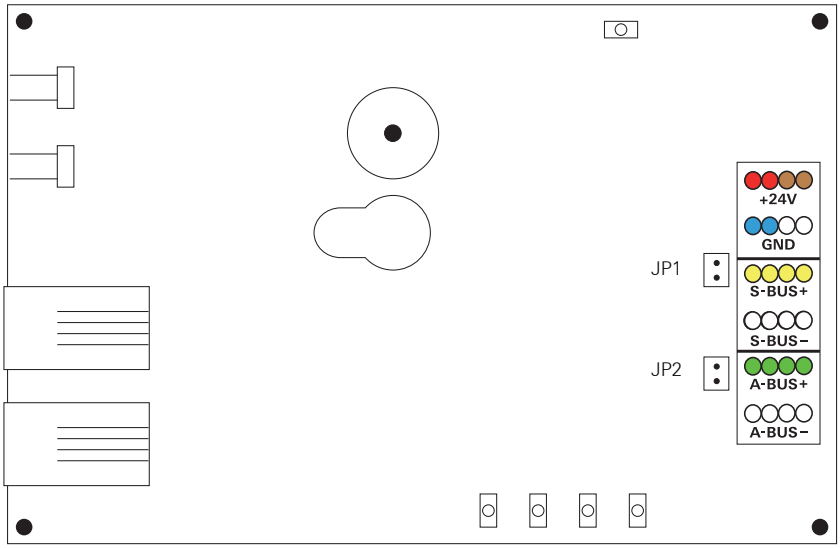
Continuation of table

Functions		
The ward control centre Plus of the Gira nurse call system 834 Plus controls and regulates the devices connected to the ward bus, such as room terminals with and without voice module. Via the system bus (834 Plus LAN) the unit is connected (where applicable) to the system control centre ("large system" setting in the configuration assistant). The Gira nurse call system 834 Plus can also be controlled and regulated from just a single ward control centre Plus without a system central control unit ("small system" setting in the configuration assistant). All devices in the system are automatically recognised. Devices can be subsequently added to or removed from the call system. The ward control centre Plus is immediately ready for use; additional settings can be made via the configuration assistant in the device. • Central configuration during start-up of smaller systems with only one ward control centre, e.g. assignment of plain names for rooms. • Creation of organisational units, dividing ward or interconnecting (combining) ward groups. • Control of visual and acoustic call processing. • Monitoring of connected devices and lines. • Call and presence logging on various levels: Ward, group, room		

5.3.24 Hallway displays

Order No. 5976 00 (FD+), hallway display one-sided Order No. 5977 00 (FDD+), hallway display two-sided	
Connection to:	Ward bus
Connection of:	
Note:	Control is according to the configuration in the configuration assistant of the system central control unit (large system) or the ward control centre (small system).
Further information:	See “Connection of hallway displays to the power supply and ward bus” on page 54.

Device view and connections:



Legends:

+24 V	Power supply (red/brown)	A bus -	Audio line (white)
GND	Earth (blue/white)	JP1	Terminating resistance Data line
S bus +	Data line (yellow)	JP2	Terminating resistance Audio line
S bus -	Data line (white)		
A bus +	Audio line (green)		

Functions		

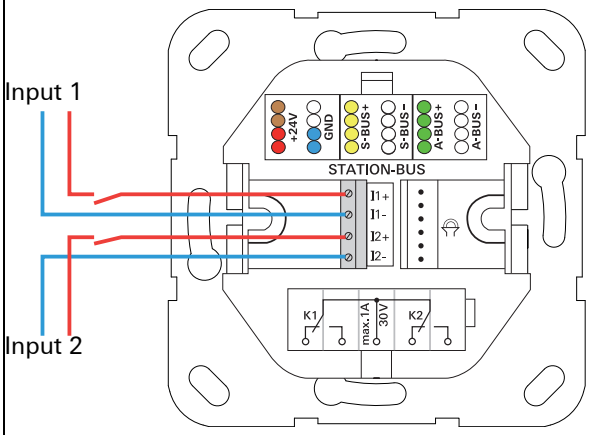
Hallway displays show call information in plain text.

Call display and time display are according to configuration in the configuration assistant.

5.3.25 I/O module flush-mounted Plus (2/2)

Order No. 5978 00 (IOUP+), I/O module flush-mounted ward bus Plus, 2 inputs/2 outputs	
Connection to:	Ward bus
Connection of:	The inputs are for connection of systems from other manufacturers and technical alarm messages (e.g. lift alarm, etc.) as well as external devices (e.g. lighting, other/older light call systems, etc.).
Note:	Control is according to the configuration in the configuration assistant of the system central control unit (large system) or the ward control centre (small system).
Further information:	See “Connection of I/O module flush-mounted Plus (2/2)” on page 55.

Device view and connections:



Functions		

The I/O module flush-mounted ward bus has 2 inputs and 2 outputs.

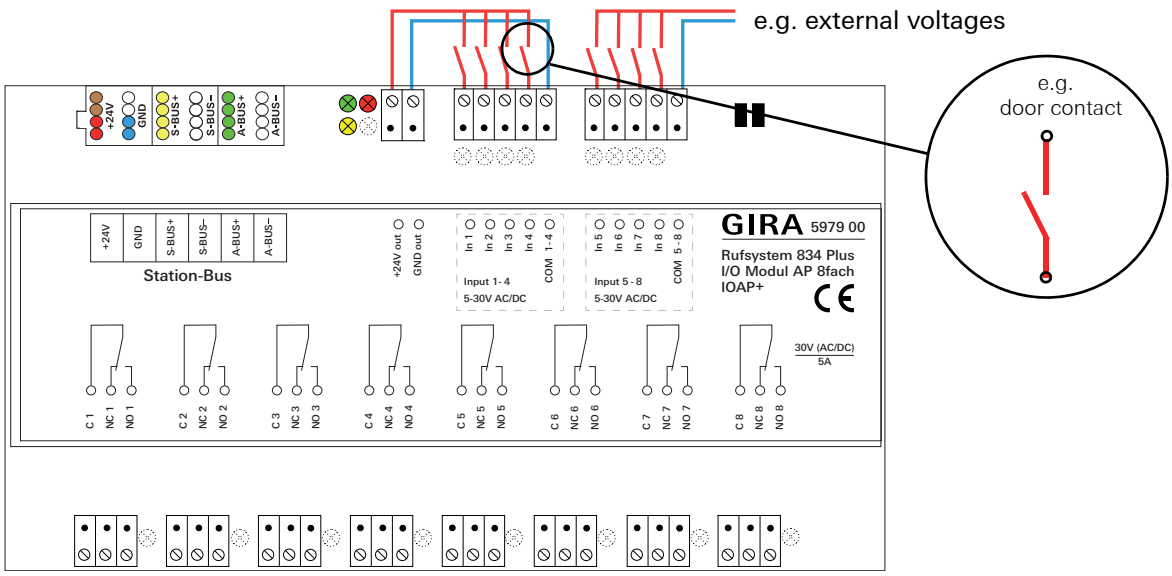
The inputs are for connection of systems from other manufacturers and technical alarm messages (e.g. fire alarm systems, lift alarms, emergency lighting, other/older light call systems, door bell etc.).

The outputs are used to switch external devices such as lamps, other/older light call systems, door magnets, horns etc.

5.3.26 I/O module surface-mounted Plus (8/8)

Order No. 5979 00 (IOAP+), I/O module surface-mounted ward bus Plus (DRA), 8 inputs/8 outputs	
Connection to:	Ward bus
Connection of:	The inputs are for connection of systems from other manufacturers and technical alarm messages (e.g. lift alarm, etc.) as well as external devices (e.g. lighting, other/older light call systems, etc.).
Note:	Series installation device (DRA), 8 HP. Control is according to configuration in the configuration assistant of the system central control unit (large system) or the ward control centre (small system).
Further information:	See “Connection of I/O module surface-mounted Plus (8/8) to the ward bus” on page 56.

Device view and connections:



Functions		

The I/O module surface-mounted ward bus has 8 inputs and 8 outputs.

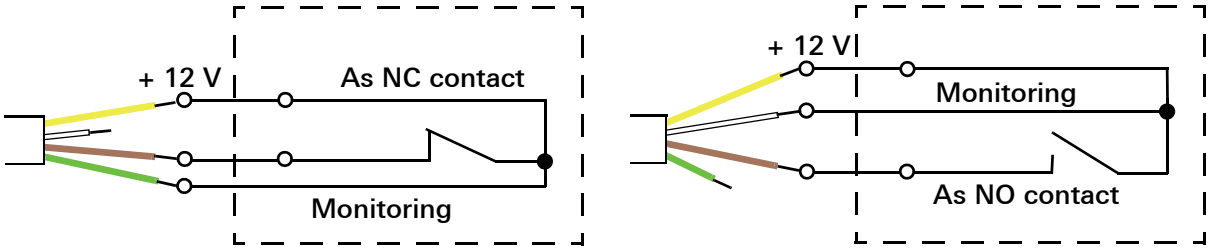
The inputs are for connection of systems from other manufacturers and technical alarm messages (e.g. fire alarm systems, lift alarms, emergency lighting, other/older light call systems, door bell etc.).

The outputs are used to switch external devices such as lamps, other/older light call systems, door magnets, horns etc.

5.3.27 Diagnostic connection cable, Order No. 2961 00 (abbreviation: DAK)

Cable for connection of the zero-voltage contact of a medical device with the call button with ancillary plug contact and diagnostic pin jack (nurse call system 834 Plus), Article No.: 5906 .., or call button with 2 diagnostic pin jacks (nurse call system 834 Plus), Article No.: 5907 ...

In the nurse call system 834 Plus, the zero-voltage contact of a device from other manufacturers can operate both as NC contact and NO contact. We recommend the "NC contact" wiring configuration.



First connect the open end as shown, then insert the RJ11 plug of the connection cable into the diagnostic socket of the call button (5906.. or 5907..).

The call button with ancillary plug contact and diagnostic pin jack, Article No.: 5906 .. and the call button with 2 diagnostic pin jacks, Article No.: 5907 ..feature plug monitoring that triggers a call with missing plug contact.

5.3.28 Ethernet switch, Order No.: 5985 00

Please observe the separate installation and operating instructions included with the device!

5.3.29 Power rectifier 24 V, 5 A, Order No. 2972 00

Please observe the separate installation and operating instructions included with the device!

5.3.30 Power rectifier 24 V, 5 A with UPS, Order No. 2973 00

Please observe the separate installation and operating instructions included with the device!

5.3.31 Wireless set, Order No. 2968 00 (abbreviation: FS)

Please observe the separate installation and operating instructions included with the device!

5.3.32 Impulse relay, Order No. 2964 00 (abbreviation: ST1)

Please observe the separate installation and operating instructions included with the device!

5.3.33 Impulse relay, Order No. 2965 00 (abbreviation: ST2)

Please observe the separate installation and operating instructions included with the device!

5.3.34 Battery replacement set, Order No. 2989 00 (abbreviation: BWS)

Please observe the separate installation and operating instructions included with the device!

5.3.35 Replacement terminals for devices in the room and ward bus, 5-gang terminal, Order No.: 5955 00, 6-gang terminal, Order No.: 5956 00

5-gang terminal for room bus, 6-gang terminal for ward bus, both with colour coding.

6. Questions and answers

Questions and answers regarding the call system 834 Plus are listed below.

Question:	Response:
Which cable material can be used?	At room level, J-Y(St)-Y 4x2x0.6 mm should be used. At ward level, J-Y(St)-Y 4x2x0.8 mm must be used. At system level, network cable of at least CAT5 is used.
How many devices can be connected to the room bus?	A maximum of 16 room devices such as call and switch-off buttons, call buttons with ancillary plug contact, pull-cord buttons, room signal lights etc. Duty/room terminals and room modules are not included here.
How many devices can be connected to the ward bus?	A maximum of 52 devices can be connected to the ward bus. The energy point table is used to calculate how many devices can be supplied with voltage from one power supply unit.
How many devices can be connected to the system bus?	A system central control unit can manage up to 26 ward control centres. The use of Control 9 Plus duty room terminals and switches does not affect this quantity.
What is the maximum cable length for a room bus?	40 metres.
What is the maximum cable length for the ward bus?	1000 metres.
What is the maximum cable length for the system bus (Local Area Network).	The maximum cable length depends on the cable material used (IEEE standard 802.3x). For example, with use of Cat.5 copper network cable, the maximum cable length per segment is 100 metres. The cable length can be expanded by using repeaters.

Question:	Response:
Are specific devices needed for voice communication?	At room level, call buttons with ancillary plug contact (Order No.:) or call buttons with ancillary plug contact (Order No.:) and diagnostic pin jack or call and switch-off buttons with ancillary plug contact (Order No.:) are required. In WC areas, a switch-off button with voice module (Order No.:) should be installed. A duty-/room terminal with voice module serves as interface from room bus to ward bus.
Does the room bus have to be closed with a terminating resistance?	No.
Does the ward bus have to be closed with a terminating resistance?	Yes, with the last device on the ward bus both the data line and audio bus have to be equipped with a terminating resistance (jumper included in scope of supply of ward control centre). The ward control centre is the first device on the ward bus.
What does the energy point table display?	The energy point table helps with the calculation of the number of ward bus participants that can be supplied with voltage from one power supply unit.
How many power supply units are required for a large system?	A maximum of 46 energy points per power supply unit must not be exceeded. Refer to the energy point table.
The display shows the message: *Bus Error.* What does that mean?	The device has no connection to the ward control centre. The ward control centre has possibly failed. The system cannot show plain text names. or The device/system is in emergency mode and a room device has failed. The room signal light shows a continuous red light.
The display shows the message: *Failure SSZ.* What does that mean?	The system central control unit or the connection to this has failed. The system is in emergency mode. The system cannot show plain text names.

Question:	Response:
The display shows the message: *Service.* What does that mean?	An error has occurred in the system but the system is still ready for operation. If a defective device is replaced, this error message is displayed until device replacement has been acknowledged in the configuration assistant.
What does emergency mode mean?	Basic functioning of the devices is ensured. Calls/emergency calls can be signalled and displayed.
The LEDs in the push buttons of the room devices flash - what does that mean?	The bus line has been interrupted. A room device is possibly defective. Or: The system is in configuration phase. When all devices are logged on in the next instance up, the flashing stops.
A device is defective in the system. What must be done?	Devices of the same type (same ID) can be exchanged without problems (plug & pay). After exchanging, the *Service* message appears in the system and remains until the replacement has been confirmed.
With the patient's hand-held device (PHD), the red LED in the call button flashes rapidly after the device has been connected to the ancillary plug contact. What does that mean?	The patient's hand-held device (PHD) requires a function test. For this, the red button of the device must be pressed within 30 seconds. If this does not happen, the device is ready for operation, but the error message *PHD-Test* is output.
An acoustic double signal can be heard in the patient's room, the room signal light shows a continuous red light, the display of the room terminal shows the message: *Removal*. What does that mean?	This acoustic signal signals a 'plug removal'. Either the plug of the patient's hand-held device or the plug of the diagnostic connection cable has been removed from the socket. A plug removal is also signalled in the display of the room terminal with the *Removal* message. This plug removal call can be deactivated by pressing and holding (longer than 3 secs.) the presence button of the room module or room terminal in the room in which plug removal has occurred.

Question:	Response:
With configuration of the system central control unit or ward control centre with a configuration PC with WINDOWS ® operating system the following situation occurs: After concluding the configuration of a system central control unit or ward control centre, the configuration computer is connected to another ward control centre or system central control unit (with identical IP address to the configuration PC). When accessing the start screen of the configuration assistant, the browser outputs an error message that the device has not been found. The assistant can only be used after several minutes or a restart of the configuration PC. Why is that?	All system central control units and ward control centres in delivery state have the same IP address for the external LAN. If several system central control units or ward control centres are configured sequentially with the same configuration PC with a WINDOWS® operating system, following configuration of the first unit the next one is not recognised or only recognised after some time. This is because the next unit to be configured has the same IP address but each device has a different MAC address. WINDOWS® has internally saved the connection of the IP address with the MAC address, and thus at first sends erroneous packages in the network. Changes are not immediately recognised by Windows. Remedy: Open the command window in WINDOWS® and use the command: arp -d to temporarily clean the WINDOWS® memory for network access. After this the device is located immediately and can be accessed.

7. Technical data

Installation of devices in 1 gang or 2 gang flush-mounted boxes (DIN 49073) or in flush-mounted housing.

System bus

Cable type	=	Ethernet cable of at least category 5 or higher

Ward bus

Cable type	=	Twisted communication line, cable material 4x2x0.8 mm (2 wire pairs for +24 V and GND for doubling of cross-section)
max. cable length of power supply	=	200 m
max. cable length of bus line	=	1000 m
max. number of bus participants	=	26 (see also the energy point table in the Planning chapter)
Type of cable routing	=	From device to device (**not** star-shaped)
terminating resistance required at last device on the bus	=	Activating terminating resistances with jumpers (supplied with ward control centre)

Room bus

Cable type	=	Twisted communication line, cable material 4x2x0.6 mm
max. cable length	=	40 m
max. number of devices in the room	=	16 (duty/room terminals and room modules not included)
Type of cable routing	=	From device to device or star-shaped

Power supply

Direct current 24 V (± 10%)

Power rectifier with UPS (Order No.: 2973 00)

Input (primary voltage)

Rated voltage:	115 V to 230 V
Mains frequency:	45 to 65 Hz
Rated current:	1.6 A at AC 115 V~ 0.8 A at AC 230 V~

Output (secondary voltage)

Output voltage in mains operation:	DC 24 V (+/- 1 %) SELV
Output voltage in battery operation:	DC 26.5 V - 19.5 V
Rated output current:	4.5 A
Charging current limitation:	typically 6 A DC
Output power:	110 W
Ripple at rated output current:	< 50 mV_{eff}
Battery capacity:	2.2 Ah
Charging current:	typically 220 mA
Backup power time at rated current:	typically 10 minutes

Mains voltage failure

Switching threshold for UPS operation:	typically AC 98 V~ / AC 190 V~
Switching threshold for mains operation:	typically AC 100 V~ / AC 200 V~

Battery voltage thresholds

Switching threshold for advance warning prior to battery shut-down:	typically 21.5 V
Switching threshold for deep discharge protection:	typically 19.5 V

Central ward control unit

Operating voltage:	24 V DC
Electricity consumption:	300 mA
Power consumption:	approx. 7.2 W
Ambient temperature:	-5 °C to +45 °C
Storage temperature:	-25 °C to +75 °C
Protection type:	IP 20
Connection terminals:	Ø to 1.5 mm^2
Installation:	on a DIN top hat rail

System central control unit

Operating voltage:	24 V DC
Electricity consumption:	300 mA
Power consumption:	approx. 7.2 W
Ambient temperature:	-5 °C to +45 °C
Protection type:	IP 20
Connection terminals:	Ø to 1.5 mm^2
Installation:	on a DIN top hat rail

7.1 Energy point table

With the help of the energy point table, the maximum number of devices that can be supplied from one power supply unit is calculated. The basis for this calculation are the energy points. The energy points are measured so that the factor of simultaneity is taken into account with system operation. The room devices are already included in the energy points of the duty room or room terminals and room modules. Only the devices directly connected to a power supply unit are considered in the table.

Supplier	Item No.:	Points
Power rectifier 24 V/5 A	2972 00	46
Power rectifier 24 V/5 A with UPS	2973 00	46

End users	Initials	Points
Duty room terminal	DZT+	2
Room terminal	ZT+	2
Room module	ZM+	1
Hallway display, one-sided	FD+	2
Hallway display two-sided	FDD+	3
I/O module ward bus surface-mounted Plus (8/8)	IOAP+	1
IOAP+ 1 I/O module ward bus flush-mounted Plus (2/2)	IOUP+	1
Ethernet switch	SW+	1
Ward control centre Plus	SZ+	4
System central control unit Plus	SSZ+	6

8. Warranty

The warranty is provided in accordance with statutory requirements via the retailer.

Please submit or send faulty devices postage paid and with an error description to your sales representative (retailer/installation company).

They will forward the devices to the Gira Service Center.

Notes:

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Version 2.0, 30/16

GIRA