

**ZETTLER**<sup>®</sup>

TOTAL WALTHER GmbH • Feuerschutz und Sicherheit

Medical<sup>®</sup> 800  
adressable  
light call and  
communication  
system

System  
description  
223 983

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## SYSTEM DESCRIPTION ZETTLER® Medicall® 800

### 1 GENERAL

ZETTLER® Medicall® 800 is a universal light call system which allows light call systems according to DIN 41050 Part 1 and Part 2, and DIN VDE 0834 to be set up. Equipment with line monitoring can be used as standard to activate calls in the rooms. This means that the systems are suitable for field of application II according to DIN VDE 0834. If equipment without line monitoring is used, the system corresponds to field of application II according to DIN VDE 0834.

Through the use of the relevant equipment, both

- Systems without voice communications and
- Systems with voice communications

can be implemented

The system equipment meets current EMC regulations and complies with the limits defined by EN 50081 Part 1 VDE 0839 Part 81-1 (radiation) and EN 50082-2 VDE 0839 Part 82-2 (interference).

ZETTLER® Medicall® 800 is suitable for use in:

- hospitals
- rest and rehabilitation clinics
- homes for the elderly, nursing homes and similar institutions.

Thanks to the system's flexibility and open interfaces, it can be adapted in optimum fashion to the prevailing conditions of the establishment concerned. Examples include:

- interconnection with the fire alarm or intruder alarm system
- data exchange with the fault alarm system
- forwarding of information to a wireless paging system (PSA)
- forwarding of information to a telecommunications system
- forwarding of information to a DECT system
- interconnection with a data processing system

ZETTLER® Medicall® 800 is a light call system which requires no central control equipment for its standard functions. All units are designed as intelligent network components (referred to as "LON™ nodes"), which exchange data with one another via a bus. The protocol used, LONTALK™ from ECHELON™, with its accommodating address system comprising  $2^{64}$  addresses, offers an extremely high degree of flexibility and imposes virtually no logical limits on the permissible number of bus components.

The available address range can be used with existing equipment in the following manner:

- up to 250 sections
- every section display can monitor up to 65 bus components with LON™ nodes. These include:
  - room signal lights with electronics
  - room electronics without lights
  - displays in the user's own section
  - section displays for the remaining sections
  - central equipment with LON™ nodes (paging interface, LON interface, receivers for light control etc.)
  - corridor displays (output module)
  - any required distribution of rooms in the section among up to 5 nursing groups

- Each call is identified by the following alphanumeric information:
  - section and group designation (8-digit)
  - room designation (6-digit)
  - call type (6-digit)
  - additional 8-digit alphanumeric information for every call type in the room
- 8 versions of the section interconnection with up to 15 sections are possible.
- 4 versions of the group interconnection with up to 5 groups are possible on each section .

The characteristics, designations etc. of the equipment with LON™ nodes are defined via the bus with special installation tools; no special codes or settings are required on these components.

All equipment monitors itself and the data traffic on the bus. A multistage fail-safe system ensures on the one hand that faults are quickly identified and signalled, and, on the other hand, that call transmission and signalling are maintained in the unaffected system area.

☞ In developing the ZETTLER® Medicall® 800, special importance was attached to energy saving. By adopting a consistent approach to display features in designing the room signal light, it was possible to achieve at least the same degree of recognisability with 3W lamps as with the previous conventional 5W lamps. Similarly, the power consumption of the electronic system in the lamps, at 20 mA, is only 20 to 25 % of the previous values. For a section comprising 30 rooms, this means an energy saving of 500 kWh per annum.

## 2 SYSTEM DESIGN

See the overview illustrations in Fig. 1 and Fig. 2.

A ZETTLER® Medicall® 800 system comprises a number of different units with network nodes, which are interconnected via the bus. One main advantage of the system is that any unit can be connected at any position on the bus. As a result, there is often no need for the long lines which would otherwise be required to link up with peripheral equipment and systems, e.g. for connection with a PSA system.

The line material used for the bus is a normal screened installation cable J-Y(St)Y 4x2x0.8. One wire pair is used for data exchange, while two additional wire pairs are used for the power supply, which is provided in the form of a safety extra-low voltage (24 V DC). The fourth wire pair is used in systems with voice communications for voice traffic within the section. The bus extends over the entire system and is divided by repeaters (with or without electrical isolation) into individual segments, which do not necessarily have to be identical to a section. As a result of this division, the effects of physical interference, e.g. short circuits, are restricted to the affected segments and cannot impair the operation of the remaining system.

In systems with voice communications, an additional cable (J-Y(St)Y 4x2x0.6) is installed between the sections for multi-section voice traffic. This line is referred to in the system as the "audio section bus"

The following basic system units are used:

- room signal light with electronics
- room signal light without lights
- corridor display
- receiver for light control
- RS 232 interface module
- repeaters
- LON router
- LON radio clock node with external DCF77 receiver

- LON interface
- power supplies
- room equipment

In systems without voice communications, the following equipment is used to display and process calls:

- Universal display
- Display module S1
- Display module with buttons S2

In systems with voice communications, the following equipment is used to display and process calls and for voice traffic:

- Universal terminal with display
- Communications terminals in various forms
- Voice communications control unit

Peripheral room equipment allows calls to be activated in the rooms.

## **2.1 Basic equipment**

### **2.1.1 Room signal light with electronics**

Along with four lamp chambers (white/red/green/amber or other colour, depending on the application concerned), the room signal light contains all the control electronics for a room. The electronics perform the following tasks:

- Identification of the call and presence information available in the room
- Logical linking of this information and forwarding to the bus
- Monitoring of call lines in the room
- Lamp control
- Control of the buzzer for audible call forwarding
- Distributor for the room wiring
- Voice traffic control (in systems with voice communications)

### **2.1.2 Room electronics without lights**

The functions of the room electronics are the same as those of the room signal light with electronics as described above, but without the lights.

### **2.1.3 Corridor display**

The corridor display supplements the section, group and direction lights. It indicates calls and their origin in clear text; additional information can also be displayed as an option. In a central and easily recognisable arrangement, the corridor display can replace the section and group lights.

### **2.1.4 Receiver for light control**

This serves to control section, group and direction lights which provide additional information on the top-priority call in a section or nursing group and simplify the identification of the call location.

- section lights indicate the most important call in the section.
- group lights indicate the most important call in the nursing group.
- direction lights indicate the route to the call location.

The allocation of these signal lights to the rooms is maintained even in the case of interconnections.

### **2.1.5 RS 232 interface module**

A wireless radiopaging system (PSA) or DECT system can be activated via the RS 232 interface module. Ready-made software modules in the form of EPROMs are available for standard makes. Modules of this type can be produced for other systems if required. The ZETLON configuration tool is equipped with a high-performance PSA editor which allows the visual and audible signalling on the PSA receivers to be adapted to local conditions in a user-friendly manner. See also Section 5.

### **2.1.6 Repeaters**

Repeaters are used for signal regeneration where long buses are used. They are also used to divide the bus into individual segments, so that faults can be restricted to a defined area. Repeaters with optocouplers are available for electrically isolated connection of bus segments. These are particularly suitable for connecting remote system components, e.g. where several buildings are involved. They protect system equipment - if necessary in conjunction with additional overvoltage arresters - against damage due to lightning strikes or similar interference.

### **2.1.7 LON routers**

Routers operate in a similar fashion to repeaters, but also control data flow on the system bus in larger systems. They considerably increase system performance by relieving individual bus components of unnecessary data traffic load.

Normally, the system bus is divided up with routers into individual sections if more than 200 bus components with LON™ nodes are available.

### **2.1.8 LON radio clock nodes**

Through the use of a radio clock node, a precise clock time is made available to the entire system, derived from the DCF77 standard time transmitter.

### **2.1.9 LON interface**

A PC, which can also be used to configure the system, can be connected via the LON interface to the system bus.

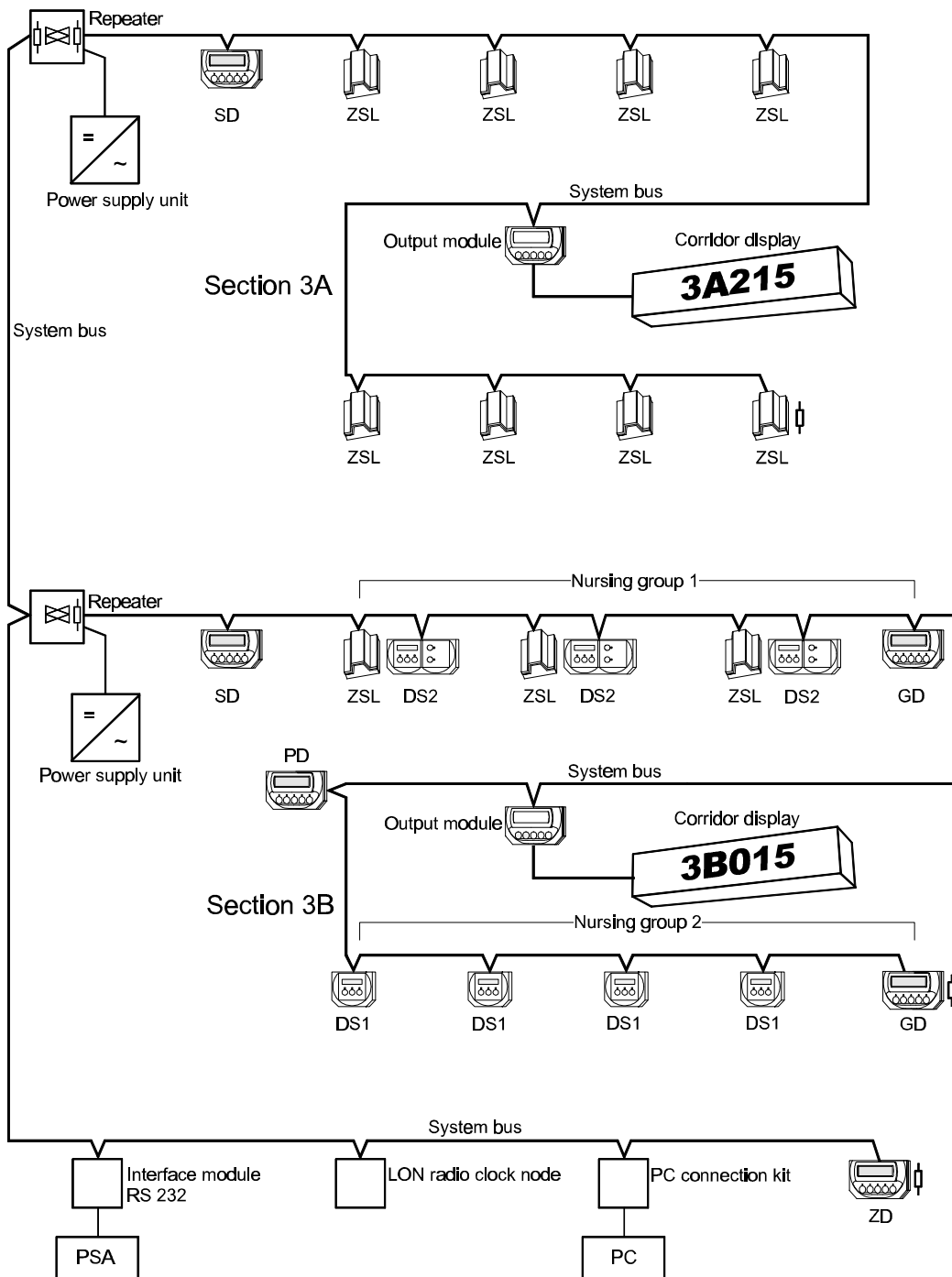
"medilog" software is used for event logging.

### **2.1.10 Power supply equipment**

The 24 V DC safety extra-low voltage (SELV) supplies primary-clocked 10A units with high efficiency and automatic short circuit current limitation. The units comply with EN 60950 VDE 0805 and are geared towards the specific requirements of light call systems.

Establishments with no back-up power supply can be provided with uninterruptible power supplies, which, depending on the batteries used, can bridge mains failure lasting between 20 minutes and 3 hours.

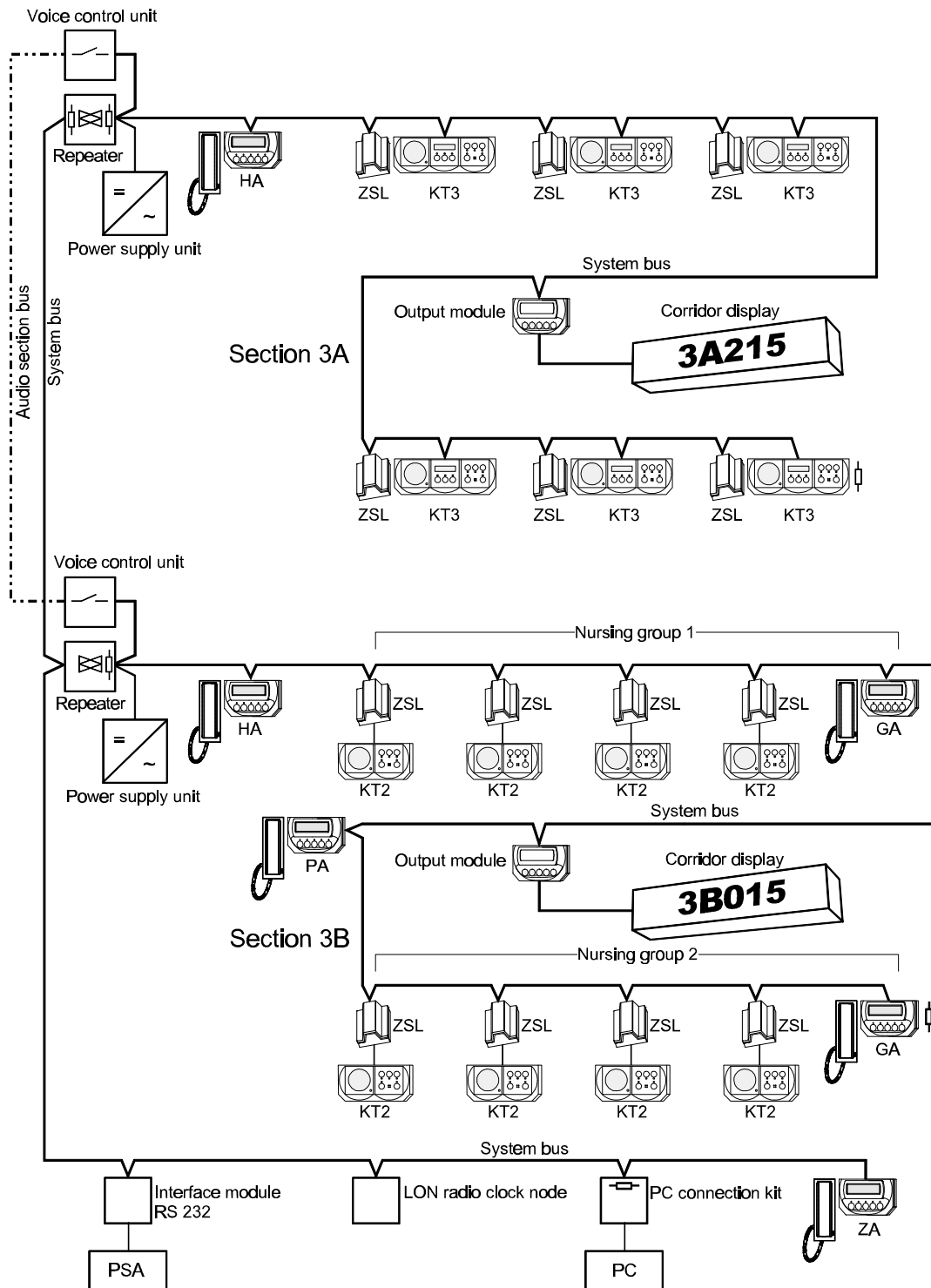
Section, nursing group and direction lights are normally operated on their own 24 V AC power supply. The safety extra-low voltage required here is provided by safety transformers according to VDE 0551.



**Explanation of symbols:**

- |    |   |     |  |
|----|---|-----|--|
| SD | Universal display as section display in the section duty room                     | ZSL | Room signal light with electronics (Room signal lights without electronics are not shown in this overview) |
| GD | Universal display as group display in the group duty room                         | DS1 | Display module S1  |
| PD | Universal display as parallel display in the section                              | DS2 | Display module with buttons S2   |
| ZD | Universal display as central display, e.g. for fault indication in the plant room | ↔   | End-of-line resistor   |

Fig. 1: Typical ZETTLER® Medicall® 800 system without voice communications



**Explanation of symbols:**

- HA Universal answering terminal as main answering terminal in the section duty room
- GA Universal answering terminal as group answering terminal in the group duty room
- PA Universal answering terminal as parallel answering terminal in the section
- ZA Universal answering terminal as central answering terminal, e.g. for resuscitation team for cardiac alarms or in hospital shop for service calls

- ZSL Room signal light with electronics
- KT2 Communications terminal with buttons S2
- KT3 Communications terminal with buttons /NA-LCD S3
- End-of-line resistor

Fig. 2: Typical ZETTLER® Medical® 800 system with voice communications

## **2.2 Equipment for systems without voice communications**

### **2.2.1 Universal display**

The universal display can be used for the following applications:

- Section display
- Group display
- Parallel display
- Central display

#### Section display

The section display is used to display all calls and other information from the section in the associated duty room. It manages call and presence messages and also other events in the section, e.g. messages and faults. It controls audible call forwarding to rooms with presence and determines what is displayed on the various display units such as the corridor display or section lights. The section also manages and monitors various functions above and beyond actual light call operation.

#### Group display

If a nursing group can be provided with its own duty room, the group display installed there indicates all calls from this nursing group. Various pre-programmed interconnections with other nursing groups and/or sections can be activated and deactivated via a function menu.

#### Central display

In the central display application, all required information can be displayed at a central point, for example, display of all faults on a central display in the plant room.

#### Parallel display

The parallel display is used as an additional display device for specific calls and information at any location within the system.

### **2.2.2 Display module S1**

The unit is provided for call display in patients' rooms and function rooms and is used in conjunction with a room signal light (with or without electronics). All calls from the section or nursing group are indicated on the display. If several calls are pending, the individual calls can be displayed in succession using a "Scroll button". Displayed calls can be stored. Two further buttons provide presence activation and call activation.

### **2.2.3 Display module with buttons S2**

The unit is provided for the same applications as the display module S1, but offers considerably simpler operation and is therefore also suitable for use as a group display.

## **2.3 Equipment for systems with voice communications**

### **2.3.1 Universal terminal with display**

The equipment comprises the universal display with function buttons and a speech device. The latter is designed as a telephone, and is available as either a wall-mounted or desktop unit (connection via plug/socket connector).

The universal terminal can be used for the following applications:

- Main answering
- Group answering
- Central answering
- Parallel answering

#### Main answering terminal

In systems with voice communications, the main answering terminal performs the same functions as the section display (see page 7). In addition, it serves as the central call answering terminal of the section with a speech facility. Activation of presences and announcements are further functions of the main answering terminal.

#### Group answering terminal

In this application, the unit performs the functions of a group display (see page 7) and at the same time serves as an answering terminal with a speech facility for the nursing group. As with the main answering terminal, announcements and presence activation are also possible here.

#### Central answering terminal

In this application, selective calls from the entire system are displayed and can be answered. Announcements and presence activation are possible in this case also.

Typical applications:

- Central display of faults in a plant room
- Display and answering of service calls in the hospital shop
- Display and answering of cardiac alarms for the resuscitation team

#### Parallel answering terminal

The parallel answering terminal provides an additional answering facility for the section or nursing group.

### 2.3.2 Communications terminals

For the voice link in the patients' rooms and function rooms, the communications terminals, which are available in 3 different versions, perform the following functions:

#### Communications terminal S2

This is used exclusively for voice communications and contains no operating or display components.

#### Communications terminal with buttons S2

The unit contains the components required for voice communications, plus 3 call buttons and 2 presence buttons which eliminate the need for a separate door combination.

#### Communications terminal with buttons/NA-LCD S3

Along with the voice communications components, this communications terminal contains a display and 3 function buttons ("Answer", "Store", "Scroll"). An additional operating module contains 3 call and 2 presence buttons. The terminal includes the Extension answering and Presence activation functions; it normally eliminates the need to install a separate door combination.

### 2.3.3 Voice control unit

One of these control units is required for every section. The unit is also needed for multi-section voice traffic and connects the sections involved to the "Audio section bus".

### 3 FUNCTIONS

ZETTLER® Medicall® 800 not only meets the minimum requirements of DIN 41050 Part 2 and VDE 0834, but also offers many user facilities which considerably simplify operation. The features described here relate to the default settings supplied as standard; they can, however, be modified in a variety of ways and adapted in line with the requirements of the establishment concerned during the commissioning stage or at any other subsequent time.

The functions, with the exception of those dependent on the voice facility, are virtually identical in systems with and without voice communications. Any variations are specifically highlighted.

#### 3.1 Presence marking

ZETTLER® Medicall® 800 offers two presence categories, which can be used to distinguish two staff groups, e.g. service staff and nursing staff.

Presence marking is activated on entering a room by pressing the appropriate button and is de-activated on leaving the room by pressing the same button once more.

Audible call forwarding is carried out exclusively in rooms with activated presence marking - in the case of WC calls in the patient's own room, too. Emergency calls can also normally be activated with activated presence marking only.

For this reason, and because the presence marking for the light call system offers the only means of identifying the location of nursing staff, conscientious use of the presence buttons is essential for correct system operation.

#### 3.2 Call activation

Calls are activated by pressing the call button on the call equipment, e.g. pear push, call combination, WC pull switch. The call activation is indicated to the user by the illuminated calling equipment reassurance light, which is allocated exclusively to the call activation location. This reassurance light flashes as soon as the call is stored; see Section 3.5.

Normally, an emergency call is activated when the call button is pressed with simultaneously activated presence marking. On some call buttons, call activation is possible only when presence is marked.

#### 3.3 Call types

ZETTLER® Medicall® 800 offers numerous different call types. Their number far exceeds the requirements of DIN 41050, Part 2, since experience has shown that some hospitals require additional call types. Thanks to the flexibility of the system, it is possible during commissioning to select the call types required by the establishment concerned from the wide range of available call types. If, during subsequent operation, the selection made turns out to be less than ideal, new call types can normally be specified at any time without modification, recoding or equipment replacement.

The standard call type configurations which are possible with ZETTLER® Medicall® 800 are listed below. They are available in systems with and without voice communications. The call types specified in DIN 41050 Part 2 indicated by an asterisk (★).

- **Telephone call ★**

If the telephone rings in the duty room of the section or nursing group, calls are forwarded to all rooms in the section or nursing group with activated presence marking.

Calls are switched via a telephone call relay. In ISDN systems, an analog extension or a telephone set with an additional ringer output is required for this purpose.

- **Staff call**

Staff call allows nursing staff to summon specific services, such as the transport or cleaning service. Special buttons, which are clearly marked as staff call buttons, are used to activate this feature, which is available only if presence marking is activated.
- **Service call**

Service call offers the patient the facility to summon persons who provide specific, non-medical services, e.g. the drinks service. The call is activated on a special call button.
- **Plug removed**

This call is automatically activated as soon as the plug for a call-activating unit (pear push) is accidentally removed. This call type is available only if equipment with corresponding electronics is used in the room.
- **Patient call ★**

This is the normal call provided for the patient, who can use it to summon assistance from medically qualified nursing staff. It is activated by pressing the red call buttons on the calling equipment.

Note on patient call: during commissioning, a higher priority can be assigned to individual locations; emergency calls are also possible here.
- **Infusion call**

Infusion call is activated by the signalling contact on specific medical equipment, e.g. infusion pumps. If presence marking is activated, the call is temporarily suppressed. This is not an emergency call.
- **WC call ★**

With this call, a patient in the bathroom or WC can summon medically qualified assistance. The call is activated on the calling equipment provided for this purpose.
- **Nurse emergency call ★**

With the nurse emergency call, nursing staff can summon assistance from additional medically qualified staff. The call can be activated on all patient call buttons, provided that presence marking is activated.
- **Diagnosis call**

This emergency call is automatically activated by the signalling contacts of medical equipment which monitors vital functions. If presence marking is activated, the call is temporarily suppressed.
- **WC emergency call**

With this emergency call, staff in the bathroom or WC can summon assistance from additional medically qualified staff in an emergency. The call is activated on the WC calling equipment, provided that presence marking is activated.
- **Doctor emergency call**

With this emergency call, nursing staff can alert the duty doctor in medical emergencies. The call is activated by pressing the call buttons specifically provided for that purpose and is possible with activated presence marking only.
- **Fire alarm**

The fire alarm is used in addition to the fire alarm system for directly alerting all nursing staff in the event of a fire. This call type should not and cannot replace a fire alarm system. However, by immediately and unambiguously informing nursing staff, it allows valuable minutes to be gained, which in some cases may save lives.

The call is automatically generated by the fire detectors in the rooms.

- **Cardiac alarm**

With this alarm call, nursing staff can alert the resuscitation team directly in life-threatening situations such as cardiac or respiratory arrest. The call is activated by pressing the call buttons specifically provided for that purpose and is independent of presence marking.

Generally in ZETTLER® Medicall® 800, any required designation can be assigned to any call, e.g. "Special call", "Special emergency call", "Assistance call". Any priority can be assigned to any call type.

### 3.4 Call cancellation

In systems without voice communications, calls can essentially be finally cancelled at the call location only. Calls can be stored, and faults and messages can be acknowledged on the displays. If they are not answered within a specific time, they are automatically repeated. The list of stored calls can be viewed at any time on the section display. Cardiac alarms cannot be stored.

In systems with voice communications, calls which are not emergency calls can be answered on all terminals and then finally cancelled or stored. Faults and messages can be acknowledged, whereas emergency calls can only be stored. Cardiac alarms cannot be stored.

A call is cancelled at the call location essentially by activating presence marking. However, the reassurance light on the call-activating unit remains lit up until presence marking is de-activated once more. This makes it easy to locate the calling patient in a room containing a number of beds.

There are, however, two special cases of call cancellation:

- If several calls have been activated simultaneously in one room, these calls are not cancelled immediately by activating presence marking, but rather the nurse is notified by an audible signal that several calls have been made in the room. When the presence button is pressed again, the signal tone is de-activated and all calls in the room are cancelled – but presence marking remains activated. Since the reassurance lights are illuminated only where a call has been activated, the calling patients can easily be located. When the presence marking has been de-activated, the reassurance lights also go out.
- The system can be configured so that WC calls can be cancelled on their own WC cancel panel only. Call cancellation with the presence button is then no longer possible.

### 3.5 Stored calls

Stored calls can be identified by the flashing green presence lamp on the room signal light and serve as a reminder to nursing staff. They are cancelled in the same way as normal calls by activating presence marking.

As soon as nursing staff activate call storage, this is indicated to the patient by the flashing reassurance light on the calling equipment. The patient can then be reassured that his call has been noticed and answered by staff.

### 3.6 Signalling of calls and presence messages

Calls are indicated visually on the room signal lights by a red light and on the section, group and direction lights by a white light. WC calls are also identified on the room signal light by a white light. Messages are presented in clear text on the displays, the main and parallel answering terminals and on the corridor displays.

Presence markings are indicated by a green or amber light on the room signal lights only. A table of presence markings can be called up on the group and section displays (in systems with voice communications on the main and parallel answering terminals).

Audible signalling is provided through call forwarding in all rooms with activated presence marking. The volume can be adjusted in three steps on the section displays, e.g. for day and night operation.

See Table 1 and Fig. 3 for signalling details.

	Call type	Visual signal <sup>*)</sup> (signal lights)	Audible signal (call forwarding)	Call cancellation
1	Telephone call	Continuous light <sup>**)</sup>	Information	Automatic
2	Staff call	Continuous light red	Normal call	Presence
3	Service call	Continuous light red	Normal call	Presence
4	Plug removed	Continuous light red	Normal call	Presence
5	Patient call	Continuous light red	Normal call	Presence
6	Infusion call	Continuous light red	Normal call	Automatic
7	WC call	Continuous light red + Continuous light white <sup>***)</sup>	Normal call	Presence (WC cancel panel)
8	Nurse emergency call	Flashing light 1 red	Emergency call	Presence
9	Diagnosis call	Flashing light 1 red	Emergency call	Automatic
10	WC emergency call	Flashing light 1 red + Continuous light white <sup>***)</sup>	Emergency call	Presence (WC cancel panel)
11	Doctor emergency call	Flashing light 1 red	Emergency call	Presence
12	Fire alarm	Flashing light 1 red	Emergency call	Presence
13	Cardiac alarm	Flashing light 2 red	Alarm call	Presence

Notes:

\*) Calls are indicated in red on the room signal lights only, otherwise white

\*\*\*) On the telephone call light only

\*\*\*) On the room signal light only

In systems with voice communications, calls 2 to 5 can also be cancelled on the terminals.

Table 1: Visual signalling and call cancellation

### 3.7 Signalling on the displays and answering terminals

Calls are indicated alphanumerically on the displays (in systems with voice communications). The following information is presented on two 16-character lines:

- call type
- section or group designation
- room designation (room number)
- call location in the room
- description for the call location in the room

If several calls are made simultaneously, the most important call is indicated in the first instance. The remaining calls are placed in a call list, which can be scrolled by pressing a button. Audible call forwarding is carried out with the same signals as in the rooms (Fig. 3). Presence messages, faults and other messages are placed in lists; these can also be scrolled in the same way as the call list.

On the corridor display, messages appear in concentrated form with up to 10 characters. In the standard configuration, 3 of these are used for the call type and 6 for the room designation. The allocation can be adapted if necessary to suit local requirements.

Call type / information	Audible signal	Visual signal
Call forwarding to own room		No visual signal
Information e.g. telephone call		Visual signal on the telephone light only
Normal call		Continuous light
Emergency call		Flashing light 1
Alarm call		Flashing light 2

Fig. 3: Audible and visual signal forms

### 3.8 Interconnections

Larger organisational units often have to be formed from sections and/or nursing groups at specific operating times. ZETTLER® Medical® 800 is extremely flexible for this purpose and, for each section display, it enables the configuration of 12 interconnection variants, which can be stored and activated individually as required. There are virtually no limits on the combinations involved so that, for example, any 2 sections can be combined to form one new nursing unit. This new nursing unit behaves in the same way as a single large section for call signalling and processing purposes. However, the original section and nursing group designations are indicated in the same way on the signal lights and displays, since changes could cause misunderstandings.

### 3.9 Additional functions in systems with voice communications

Systems with voice communications include the following additional features:

- Call answering

By lifting the handset on the universal answering terminals, a voice link is set up automatically to the caller, if a communications terminal with a voice facility is available at the call activation location. This normal call can then be either finally cancelled or stored. All other calls are automatically stored.

An extension answering facility is available on all communications terminals with NC-LCD buttons.

- Automatic disconnection

Every voice link is automatically disconnected after a specific definable time. This prevents the speech circuits from being blocked if someone forgets to replace the handset after answering a call or making an announcement.

- Calling a room with presence  
Every room with a communications terminal and activated presence can be called in a targeted manner.
- Announcements  
Announcements can be made from the terminals to specific sections or groups, or to all marked presences. During an announcement, a one-way voice link is set up to the room, and eavesdropping on the rooms is not possible.

## 4 FAIL-SAFE SYSTEM

The ZETTLER® Medicall® 800 fail-safe system operates on several levels. At the lowest level (Level 1), the room signal light is monitored. At level 2, all room signal lights and the remaining section displays are monitored by the section display and, finally, at the highest level (Level 3), the entire system is monitored.

### 4.1 Level 1

Every room signal light monitors itself, the room equipment connected to it and the data link to the section display.

If the link to the section display is interrupted or defective, the electronic system automatically switches to reduced mode and transmits its information directly to all contactable bus components in the section. In this way, a call continues to be signalled in the section, and only nursing group mode and interconnections are no longer active in this operating mode. If the data link to the other bus components is completely lost, the presence lamp begins to flash at the fault cadence, allowing the fault location to be quickly identified.

If calling equipment with line monitoring is used in the rooms, the room signal light continuously monitors all connected and programmed call lines. If a fault occurs, the reassurance light of the calling equipment concerned begins to flash; in addition, the fault is indicated on the level 1 and level 2 displays.

### 4.2 Level 2

Each section display monitors the rooms and group displays which are assigned to it. If the data link to one or more of these bus components is interrupted or defective, this is indicated on all section and group displays which are programmed for this purpose. Call line faults in the monitored rooms are also signalled.

In addition, the section displays monitor each other; a breakdown is indicated immediately on the other section displays. An external fault display can also be activated via the fault signal contact of the defective section display.

### 4.3 Level 3

In large systems, all system components can be monitored by a PC, on which the entire comprehensive system data are stored. The replacement of defective components, especially those which do not operate with the standard configuration, is thereby very effectively supported.

## 5 SYSTEM CONFIGURATION

Since the ZETTLER® Medicall® 800 units are equipped with intelligent network nodes, central control equipment to define system functionality is no longer required. Rather, all the characteristics of the equipment and the system are stored in the nodes themselves to ensure that the network is fail-safe.

The configuration of a ZETTLER® Medicall® 800 system entails two tasks:

- Definition of the characteristics of the rooms and other bus components (nodes)
- Installation and storage of these characteristics in the nodes

Some of the configuration data is already provided in a standard database in various versions and has only to be retrieved, whereas system-specific data must be entered manually. The system configuration can be performed independently of time and location using the "ZETLON Configuration Tool" software.

The characteristics defined in the first stage must be transferred onto the system from a PC via the LON interface during the installation process and stored in the nodes. The "NET\_INST Installation Tool" is used for this purpose.

The configuration data does not necessarily have to be transferred onto the system on the spot. This task can also be performed from a remote location via a modem. Remote system diagnosis can also be performed in the same way.

Note:

Simple light call operation according to VDE 0834 and DIN 41050 is possible even if the system is not configured. In this case, all calls are visually and audibly signalled on the room equipment and universal displays.



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