

# **Flamenco<sup>IP</sup>** Planning Manual

The next generation for perfect communication



The manual was prepared with due care, and all details were checked for their correctness. However, we cannot assume any responsibility form possible discrepancies or incomplete information.

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# 2. Performance features

# 2.1 General description

Flamenco<sup>IP</sup> is a universally usable communication platform for modern organisation of care. It fulfils all requirements of a nurse call system according to the German standard DIN VDE 0834 and can be integrated into existing IT infrastructures easily and flexibly. The system is designed for use in hospitals, old-age homes and nursing homes, as well as comparable facilities.

Flamenco<sup>IP</sup> combines the functions of a modern nurse call system with the possibilities of state-of-the-art telecommunications and smart data networking using existing infrastructures. For this purpose, it takes advantage of the technical possibilities of modern IT infrastructures, supporting almost every kind of organisational form: Centralised or decentralised, functional care or primary nursing.

Flamenco<sup>IP</sup> offers the freedom of an efficient design of care processes. The unique separation of physical infrastructure and organisational combination of room permits the largest possible scope in system design and later use.

Based on independently functioning technology, permanent self-monitoring and intelligent networking, the solution offers the highest degree of functional safety.

Everyday-practical products and easy handling guarantee the highest degree of efficient support in everyday care. The system is supplemented by extensive interfaces and integration possibilities of external systems.

Flamenco<sup>IP</sup> can be extremely easily tailored to individual demands and configured according to the requirements.

An additional feature is excellent voice quality based on state-of-the-art digital signal processing.

The Flamenco<sup>IP</sup> system represents a state-of-the-art, flexible communication instrument that can be adapted to the concerns of the organisation of modern care. Even in case of complex integration with other systems, the nurse call system remains an autonomous unit.

All parts of such a complex system structure can be maintained or modernised separately from and independently of each other or replaced by other state-of-the-art solutions. This guarantees high functional safety and prevents a mutual influencing of the subsystems. In case the IP network, television system, PBX or other interfaces fail, the function of the nurse call system remains autonomous.

# 2.2 Purpose

## 2.2.1 Nurse call system

Flamenco<sup>IP</sup> nurse call systems are used to call helpers by triggering and displaying calls. A risk for callers or third parties is characteristic of nurse call systems If calls are not detected or signalled in case of a fault.

Flamenco<sup>IP</sup> nurse call systems are intended for use in hospitals, nursing homes, care wards, old-age or senior citizen homes, rehabilitation facilities and all comparable facilities.

# 2.2.2 Distributed information system

Flamenco<sup>IP</sup> is not a medical product. In combination with active medical products for diagnosis and therapy, however, it can be part of an electrical medical system. Active medical products for diagnosis and therapy can be connected to the Flamenco<sup>IP</sup> nurse call system for the forwarding of information. This is a distributed information system.

The transmission of information and alarms through such a distributed information system is not securely guaranteed. With this application, the alarm system of the electrical medical device must not be deactivated under any circumstances. The user cannot assume that alarm signals are transmitted. He or she must therefore remain in the acoustic vicinity of the electrical medical device (monitor).

#### **Risk analysis**

If the owner decides to combine the nurse call system and electrical medical devices in a distributed information system, a technical documentation with risk management in regard to the distributed transmission of information and behaviour in case of a fault must be created. The owner must document how the system was planned and installed, how to use it according to its intended purpose and how to service it in a project documentation. In particular, the owner must set down that the system is to be operated as a distributed information system.

The safety features of the nurse call system according to DIN VDE 0834, for example the monitoring of all devices within 30 seconds and the call signalling within 5 seconds, simplify the analysis. If the alarms are forwarded to other system sections that are not compliant with DIN VDE 0834, these sections must be analysed separately.

## 2.2.3 Transmission paths

Under defined boundary conditions, the use of transmission paths of other systems are permitted according to standard DIN VDE 0834:2016-6.

The use of the transmission paths of the nurse call system for other services is also possible. Tunstall defines and provides the interfaces.

A mutual influencing of the connected systems must be excluded. Each organisational group must continue to work autonomously in case of a fault.

# 2.3 Planning the nurse call system

Nurse call systems must be planned by expert nurse call system planners only. Tunstall GmbH offers training in which this qualification can be obtained.

Before planning a nurse call system, all safety-related details must be defined by the owner and the expert planner of the nurse call system. The minimum details are as follows:

- Functional features of the nurse call system
- Power source for safety purposes
- Responsibility for failure signalling
- Implementation of the electrical safety

The expert planner must plan the nurse call system according to the owner's requirements, the structural conditions and the valid regulations. The planning of the nurse call system must be documented in such a way that the installer of the nurse call system can set it up according to standard.

# 2.4 Sample ward

The following page shows a sample ward.

### 2.4.1 Legend





Fig. 1: Sample ward

# 2.5 System limits

#### 2.5.1 Nurse call system

The maximum size of a Flamenco<sup>IP</sup> nurse call system is limited by the maximum number of installable IP-SystemManager control units. For each nurse call system, a maximum of 63 IP-SystemManagers can be installed, consisting of:

- 1 IP-SystemManager per ward
- 1 IP-SystemManager with operating mode "System"
- 1 IP-SystemManager per ManagementCenter
- 1 IP-SystemManager per connected electrical medical system
- 1 IP-SystemManager per connected fire alarm system



The spatial expansion of the nurse call system is limited by the expansion of the IP network that connects the IP-SystemManager control units to each other.

A maximum of 8 nurse call systems can be connected to one ManagementCenter.

#### 2.5.2 Speech connections

Only one speech connection can be active at each ward at one time.

The number of possible simultaneous cross-ward voice connections results from the number of wards in the nurse call system divided by 2.

The number of possible simultaneous speech connections at the Management-Center is physically limited to one since there is only one speech unit.

An announcement can be transmitted to all connected rooms at the same time.

#### 2.5.3 Ward

One OSYnet group bus is connected to one IP-SystemManager for the control of a ward. A maximum of 110 bus users can be connected to this group bus.

Of the 110 bus users, no more than 55 of them shall be room terminals (superordinate term for all types of room controllers). That means no more than 55 rooms may be connected to a group bus. The requirement of DIN VDE 0834-1:2016-06 that an organisational group (= ward) comprises all rooms that can be managed by at least one person is decisive. The precise number of rooms must therefore be determined by the owner of the nurse call system.

The following devices are group bus users on the OSYnet group bus:

#### Room terminals

- ComTerminal Flamenco (77 0510 00, 77 0511 00)
- RoomTerminal Flamenco (77 0520 00, 77 0521 00)

ControlTerminal Flamenco (77 0550 00, 77 0555 00, 77 0551 00)

#### Ward consoles ComStation

- ComStation<sup>CT</sup> Flamenco (77 0606 00)
- ComStation<sup>T</sup> Flamenco (77 0606 20)
- ComStation<sup>BUS-C</sup> (77 0605 50)
- ComStation<sup>PC</sup> (77 0602 00)

#### **Corridor displays**

- Corridor display Alpha 16 (77 0150 00)
- Corridor display Alpha 16, double-sided (77 0160 00)

#### **OSYlink modules**

- OSYlink-Door entry speaker (77 0801 00) for connecting 1 door entry speaker (77 0350 00)
- OSYlink-Group lamp (77 0802 00) for connecting 4 direction lamps (77 0111 02) or group lamps (77 011x 02) for 4 wards
- OSYlink-Universal (77 0803 00) with 8 inputs and 6 outputs for connecting external devices
- OSYlink-Announcement L (77 0804 00) for connecting 5 loudspeakers with announcement interface (05 0024 01)
- OSYlink AS-CCS (77 0870 00) (+ devices of a legacy system connected to OSYlink AS-CCS)
- OSYlink AS-L200 (77 0872 00) (+ devices of a legacy system connected to OSYlink AS-L200)

The maximum cable length of the OSYnet group bus amounts to 700 m. When an OSYnet-Gateway (77 4001 00) is used, the maximum cable length is increased to 1,400 m.

The cable length between the IP-SystemManager and the next active IP network component (e.g., switch) may not exceed 90 m.

The IP-SystemManager must be installed at the beginning or end of the group bus.

## ComStation<sup>PC</sup>, ManagementCenter<sup>PC</sup>, Call recording Flamenco

When PrimusGlobal+ is used in the nurse call system, i.e. for ComStation<sup>PC</sup> console (77 0602 00), ManagementCenter<sup>PC</sup> central console (77 0610 00), call recording Flamenco, complete set (50 1027 00) or PrimusGlobal module Building Services (45 1400 00), an additional system limit must be observed: with these software solutions, a maximum of 99 locations can be configured per ward. If you have any questions, please contact Tunstall GmbH.

#### 2.5.4 Room

The RAN room bus that networks the devices in the room to each other is connected to the room terminal (i.e., ComTerminal, RoomTerminal or ControlTerminal).

The total length of all RAN lines connected to a terminal may not exceed 50 m.

A maximum of 30 RAN users can be connected to a RAN room bus. RAN users are as follows:

#### **Connection sockets**

- Connection socket with call switch, bedhead unit (70 0171 50)
- Connection socket with call switch (70 0171 60...)
- Connection socket combi (70 0424 00, 70 0424 50)
- Connection socket combi, bedhead unit (70 0434 00, 70 0434 50)

#### Room lamps

- Room lamp, 3 sections (77 0170 00, 77 0171 00, 77 0175 00)
- Room lamp cardiac alarm, WC (77 0170 01, 77 0175 01)
- Room lamp, 4 sections (77 0170 10, 77 0171 10, 77 0175 10)

#### Switches

- Call switch (77 0211 00..., 77 0211 01...)
- Staff presence switch (77 0212 00...)
- Cancel switch/WC (77 0213 00...)
- Cardiac alarm switch (77 0214 00...)
- Pull cord call switch (77 0215 00..., 77 0215 01...)
- Pneumatic call switch (77 0216 00..., 77 0216 01...)
- Call switch/WC with cancel switch (77 0217 00...)
- Call switch with privacy switch (77 0218 00...)
- Staff presence combination with call tone (77 0219 00...)

#### **RAN** interfaces

- IR TV control module universal (77 0360 11)
- RAN interface (77 0840 00)
- RAN interface universal (70 0848 00)
- RAN interface with speech (77 0880 00)

A maximum of 6 bed can be identified as call locations for each room.

#### 2.5.5 Configuration possibilities for the organisation of care

- 32 ward couplings can be defined for each nurse call system.
- 8 shifts can be defined for each ward. Each shift can consist of 8 zones.

# 2.6 Climatic conditions

The nurse call system is suitable for operation under the following conditions:

## 2.6.1 Ambient temperature

+5 °C through +40 °C (+ 55 °C in medical supply units).

## 2.6.2 Relative humidity

Devices for patient rooms, staff rooms and recreation rooms

Up to 85% relative humidity (no condensation).

#### Devices for bathrooms and wet cells

Up to 95% relative humidity (condensation possible).

Pull cord call switches can occasionally be exposed to dripping water.

# 2.7 Technical standards

Close observe the following standards which are applicable to nurse call systems:

- DIN VDE 0834-1: 2016-06, Call systems in hospitals, nursing homes and similar institutions - Part 1: Requirements for equipment, erection and operation
- DIN VDE 0834-2, Call systems in hospitals, nursing homes and similar institutions - Part 2: - Environmental conditions and electromagnetic compatibility
- DIN EN 60601-1:2013-12, Medical electrical equipment Part 1: General requirements for basic safety and essential performance
- DIN EN 60601-1-8:2014-04, Medical electrical equipment Part 1-8: General requirements for basic safety and essential performance Collateral Standard: General requirements, tests and guidance for alarm systems in medical electrical equipment and medical electrical systems
- DIN EN 60669-2-2:2007-05, Switches for household and similar fixed electrical installations - Part 2-2: Particular requirements - Electromagnetic remote-control switches (RCS)
- DIN EN 62368-1:2016-05, Audio/video, information and communication technology equipment - Part 1: Safety requirements
- DIN EN 80001-1:2011-11, Application of risk management for IT-networks incorporating medical devices Part 1: Roles, responsibilities and activities
- DIN EN ISO 11197:2016-08, Medical supply units
- DIN VDE 0100-200:2006-06, Low-voltage installations Part 200: Definitions
- DIN VDE 0100-410:2007-06, Low-voltage electrical installations Part 4-41: Protection for safety - Protection against electric shock
- DIN VDE 0100-560:2013-10, Low-voltage electrical installations Part 5-56: Selection and erection of electrical equipment - Safety services

# 3. Functions

# 3.1 Presence message

The staff presence message is a substantial prerequisite for the correct and smooth operation of the system. Staff presence switches are fitted at the entrance area of all rooms where medical staff may be.

When entering the room the staff presence switch is activated, and it is deactivated when leaving the room.

#### 3.1.1 Activated staff presence

- signals the current where-about of staff.
- acknowledges a fresh call in the room.
- prepares the room to receive forwarded calls.
- prepares the room for raising emergency calls. i.e. rooms with active staff presence switches enjoy higher priority in signalling.
- prepares the room for raising a cardiac alarm. Pressing a blue alarm button only raises a cardiac alarm, if staff presence is activated.
- deletes the privacy status in the patient room.

Answered or acknowledged calls are cancelled by deactivating the presence switch (Exceptions: WC call, WC Emergency call).

## 3.1.2 Presence 1 and 2

Flamenco<sup>IP</sup> systems provide presence buttons for two staff groups:

- Presence 1 (green button): Nursing staff 1
- Presence 2 (yellow button): Nursing staff 2 or doctor

#### 3.1.3 Presence buttons

Large-surface presence buttons are provided in the following devices:

- ComTerminal Flamenco (77 0510 00, 77 0511 00)
- RoomTerminal Flamenco (77 0520 00, 77 0521 00)
- Staff presence switch (77 0212 00...)
- Staff presence combination with call tone (77 0219 00...)



- **1** Presence button for staff 1, green
- 2 Presence button for staff 2, yellow
- 3 Reminder light for staff presence 1, green
- 4 Reminder light for staff presence 2, yellow

Fig. 2: Devices with presence buttons

## 3.1.4 Indication of presence states

Integrated reminder lights come on when staff presence is active.

Coloured lights in the room lamp indicate activated presence:

- Presence 1: green
- Presence 2: yellow

At the display devices and call handling consoles the presence of the two different staff groups is separately indicated.

# 3.2 Call types and call categories

A call for help is raised by patients, staff or automatically through sensors. Depending on the call event there are different call types which are subdivided into call categories, i.e. priorities. Allocation of call categories is acc. to DIN VDE 0834-1, however categories may be changed to suit a specific project.

Call category	Call type	Call event	
Calls (low priority)	Call	A patient has raised a call, or the plug of a call device was pulled off the socket (Disconnection call).	
	WC call	A patient has raised a call from the WC.	
	Door call	The call button at a door entry speaker was pressed ("Ringing") as request for entry.	
Emergency calls	Emergency call 1	Staff 1 (Nursing staff) has raised a call, i.e. a call was raised while Presence 1 was active.	
(medium pri- ority) Emergency Sta call 2 Sta wh		Staff 2 (acc. to project understanding: Doctor or Staff 2) has raised a call, i.e. a call was raised while Presence 2 was active.	
	WC emer- gency call	Staff has raised a call from the WC, i.e. with the Presence activated, a call was raised from the WC.	
Telephone Autor call active		Automatically raised call when a telephone is active in the staff duty room.	
	Diagnostic call	A medical monitoring device has raised a call. This may be a device which automatically raises a call when upper or lower monitored values are exceeded, e.g. an Infusomat.	
		Warning! This call type acts only as supplemen- tary information for acoustic indication on the electrical medical device. The user cannot rely on this information (distributed information sys- tem).	
Alarms (high priority)	Cardiac alarm	Staff has pressed a special alarm button to call for assistance, e.g. a re-animation team.	

Tab. 1: Call categories and call types

# 3.2.1 Disconnection call

All patient devices which are connected by plug and socket will raise a disconnection call when the connection is released. The resultant call is signalled as the call type "call".

While staff presence is active, a disconnection call will be indicated at the optical display at the room lamp only. However, this call will not be signalled to a call handling console. Reason: With staff presence in the room, there must be a possibility to disconnect or exchange patient devices without raising a call.

# 3.2.2 Call escalation

Call escalation defines which call is displayed at which device and at what time. This ensures that every call is forwarded to the responsible location. The process for call escalation can be configured (Software SystemOrganizer).

# 3.3 Optical signalling

# 3.3.1 Signalling in a room

#### Location light

Call buttons have location lights, i.e. a visual assistance for finding the call button in the dark.

#### **Reassurance light**

Reassurance lights at the call device indicate that a call was raised from this button and to provide a reassurance for the patient. The reassurance light will stay on also after activating the staff presence in the room. This way, staff can quickly recognise the call location in the room.

#### **Reminder light**

Presence buttons and cancel buttons have reminder lights to show that the particular button must be reset.

# 3.3.2 Room lamps

77 0171 00	77 0170 00	Light section	indicates:
		Red	Call category (call, emer- gency call, alarm)
		Green	Presence 1
C 105		Yellow	Presence 2

77 0171 10	77 0170 10	Light section	indicates:
		Red	Call category (call, emer- gency call, alarm)
		Green	Presence 1
C 105		Yellow	Presence 2
		White	WC call, WC emergency call

77 0170 01	Light section	indicates:
	Blue	Cardiac alarm
	White	WC call, WC emergency call

Room lamp 77 0170 01 is suitable as amendment to the room lamps 77 0170 00 and 77 0171 00 to indicate calls from the WC and cardiac alarms particularly.

Event	Colour	Fresh call	Answered call	
Call category: call	Red	Flashing	On	
WC call	Red + White <sup>1</sup> )	Flashing	On	
Emergency call	Red	Rapid flashing	On	
WC emergency call	Red + White <sup>1</sup> )	Rapid flashing	On	
Cardiac alarm	Red + Blue <sup>2</sup> )	Flickering	On	
Presence 1	Green			
Presence 2	Yellow			
<sup>1</sup> ) only with room lamps 77 0170 01, 77 0171 10, 77 0170 10. <sup>2</sup> ) only with room lamp 77 0170 01.				

Tab. 2: Signalling at room lamps



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**Note!** When more than one call is active, the highest category call is indicated. Fresh calls within a call category are indicated before answered calls

**Note!** Where a differentiation between fresh and answered calls on the room lamp is not desired, this function can be switched off on the room lamp using a DIP switch. However, this type of signalling is not recommended by Tunstall.

## 3.3.3 Room lamp universal without RAN connection

The following room lamp is not connected to the RAN room bus. It is for universal use. In the Flamenco<sup>IP</sup> system it is used together with ComStation<sup>PC</sup> or ComStation-BUS-C\_

Room lamp universal 77 0182 10	Light section	indicates
	Green	Presence, ComStation is in use.

# 3.3.4 Group lamps and direction lamps

Group lamps in the corridor indicate the calls from another ward when the other ward is coupled with this ward (ward coupling).

Direction lamps in the corridor show arrows to indicate the call location. These lamps are installed at junctions or where orientation could be difficult.

The allocation of rooms to group or direction lamps can be freely configured. The type of signalling can also be configured. Configuration is realised using the Software SystemOrganizer. The following summary describes standard settings for signalling

Direction lamp 77 0111 02		
	Red	The arrow shows the direc-
	Green	For signalling see below.

Group lamp 77 0112 02		
	Red	For signalling see below.
	Green	
22	Calls from anoth	ner ward during ward coupling.

Light section	Rapid flashing (0.3 s / 0.3 s)	Slow flashing (1 s / 1 s)	Steady light
Red	Alarm (fresh or answered)	Emergency call (fresh or answered)	Call (fresh or answered)
Green	-	The call displayed in the red field is an answered call. No staff is present in the assigned rooms.	Staff is present in at least one of the assigned rooms.

Tab. 3: Signalling at group lamps and direction lamps

#### **Collective display**

Red light section: When more than one call is active, the call category of the highest priority call is indicated: Alarm > Emergency call > Call.

# 3.3.5 Corridor display Alpha 16

At the corridor display Alpha 16 (single-sided version: 77 0150 00, double-sided version: 77 0160 00) call type and room number of the call location are indicated with alphanumerics.

The display can show 16 characters. Longer messages are shown as ticker.

Additionally the calls are signalled acoustically. Different call tones are allocated to each of the three call categories. Using the software SystemOrganizer the call tone volume can be set separately for every ward to "soft", "medium" or "loud".

DISPLAY	
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When several calls are active, the highest priority call is indicated. As an option it can be configured that all calls are indicated again and again in a rolling manner (Software SystemOrganizer).

Clock time is the standby indication.

# 3.4 Consoles

Call handling consoles, or consoles for short, are primarily designed for the displaying and handling of calls. For this, Flamenco<sup>IP</sup> provides a line of consoles to cater for diverse demands. The programme covers the following categories.

Category	Application
Ward console	Ward consoles are used for handling calls in a ward. Ward consoles in the Flamenco <sup>IP</sup> system are called <b>ComStation</b> . These ComStations are available in sev- eral versions.
Mobile console	Mobile consoles are <b>cordless telephones (DECT,</b> <b>WLAN, or GSM)</b> used for call handling. They can be used in support of the other consoles. As staff can carry a cordless phone along, calls can be forwarded directly to the responsible nursing staff.
Central consoles	A central console is a console where normally calls from all wards or from several houses are handled. The central consoles for the Flamenco <sup>IP</sup> system are referred to as <b>ManagementCenter<sup>PC</sup></b> .
Call forwarding point	Call forwarding points are devices used to answer for- warded calls in the rooms. With <b>Flamenco<sup>IP</sup></b> systems these are ComTerminals.

Tab. 4: Consoles

# 3.4.1 Ward console: ComStation

# ComStation<sup>BUS-C</sup>



ComStation<sup>BUS-C</sup> (77 0605 50) The ComStation<sup>BUS-C</sup> is designed or answering and handling calls and to support nursing service. The ComStation<sup>BUS-C</sup> is equipped with microphone, loudspeaker and handset for speech communication. The ComStation<sup>BUS-C</sup> is operated using select and navigation keys, supported by a colour display. System messages and additional information can be displayed as well.

#### **ComStation**<sup>PC</sup>



ComStation<sup>PC</sup> (77 0602 00) The ComStation<sup>PC</sup> is a PC workstation with speech unit. Calls and presence states are presented in a ward planview. This ensures the quick identification of locations.

Calls and Emergency calls are shown in Red, Alarms in Blue, Presence 1 in Green, and Presence 2 in Yellow. The call categories are presented with special flashing sequences, i.e. Calls - slow flashing; Emergency calls - quick flashing; Alarms - rapid flashing. In addition, call categories are also presented with special acoustic signals. As soon as a call is answered, the call type is indicated.

## ComStation<sup>CT</sup> Flamenco



ComStation<sup>CT</sup> Flamenco (77 0606 00)

A ComStation<sup>CT</sup> Flamenco is the simplest type of a ward console. When presence is active, calls are signalled via an acoustic tone generator, and there are different signals for each of the three call categories. The display will show call type and call location. When two or more calls are present, the highest priority call is indicated.

## 3.4.2 Mobile console: Cordless telephone (DECT, WLAN, GSM)



The display will show call type and call location. A speech connection will be established to the call location. Other features of the mobile console depend on the type of cordless telephone used and on the type of PBX.

The mobile consoles are not part of the nurse call system. They are part of a PBX which is coupled to the nurse call system.

For this application a special software is installed on the IP-SystemManager with operating mode "System": Function module UMS/A (76 0740 01) for Ascom systems or function module UMS/T (76 0740 10) for Tetronik systems. Other connections possible on request.

# 3.4.3 Central console: ManagementCenter



(77 0610 00)

The ManagementCenter<sup>PC</sup> is a PC workstation with speech unit.

Calls and presence states are indicated in the same manner as at the ComStation  $^{\rm PC}$  - with the addition that several wards are presented.

# 3.4.4 Call forwarding point: ComTerminal Flamenco



ComTerminal Flamenco (77 0510 00)

When presence is active the display in the ComTerminal Flamenco shows call type and location of the forwarded call. In addition, there are the acoustic signals, i.e. different signals for each call category.

The call tone volume can be configured using the SystemOrganizer software.

# 3.5 Call handling

# 3.5.1 Raising a call



Patient handset (74 0747 00)

Calls are raised activating a specially marked call button. Call buttons at Tunstall devices are Red, showing a clear symbol. Exception: Cardiac Alarm (Blue button).

Call buttons are integrated in ComTerminal Flamenco, RoomTerminal Flamenco, patient handset, and pear push switches. But they are also available as call switches.

Optional devices include pull cord and pneumatic switch.

Product	Call trigger	Person	Call type
Patient handset	Red call button	Patient	Call with bed identification
Pear push switch	Red call button	Patient	Call with bed identification
ComTerminal RoomTerminal Call button	Red call button	Staff	Emergency call <sup>1</sup> ) + Call
ComTerminal RoomTerminal Alarm button	Blue alarm button <sup>1</sup> )	Staff	Cardiac alarm <sup>1</sup> )
Call switch in the room	Red call button, pull cord, pneumatic activa-tion	Patient, Staff	Call Emergency call <sup>1</sup> )
Cardiac alarm switch in the room	Blue alarm button <sup>1</sup> )	Staff	Alarm <sup>1</sup> )
Call switch/WC	Red WC call button, pull cord, pneumatic activa- tion	Patient, Staff	WC call WC emergency call <sup>1</sup> )
Connection cable for call devices	For example the con- tact of a medical electri- cal device	Automati- cally	Emergency call
<sup>1</sup> ) Prerequisite: Presence is activated.			

Tab. 5: Call devices

# 3.5.2 Accepting a call

A raised call is first acknowledged or answered.

#### Call acknowledging

Accepting a call without establishing a speech communication is called 'acknowledging'. This is effected at the call location by activating the presence status. Or this is effected in another room to which the call has been forwarded. Using the following devices forwarded calls can be remotely acknowledged: RoomTerminal Flamenco, ComStation<sup>T</sup> Flamenco, ComTerminal Flamenco, and all consoles.

#### **Call answering**

Accepting a call by way of a speech connection is called 'answering a call'. Devices for answering a call are designated as consoles: Ward console (ComStation), Central console (ManagementCenter), Mobile console (cordless telephone), Call forwarding point (ComTerminal).

## 3.5.3 Speech

After answering a call there is a speech communication between the console and the call location.

## 3.5.4 Call cancelling

When the person seeking assistance has been satisfactorily handled, the call must be cancelled.

#### Call cancelling at the call location

Calls can be cancelled at the call location. Prerequisite: Staff must have acknowledged or answered the call first.

Call cancelling at the call location is automatically effected by de-activating the presence button. WC calls and WC Emergency calls must normally be cancelled by activating a special WC cancel button.

#### Remote call cancelling from the console

Specific call types (Standard: Call type: calls) can be remotely cancelled from the console after a speech communication was established.

Call type	Cancelling method
Call	At the call location automatically by de-activating the presence or remote cancelling from console after a speech was established to the call location.
WC call	Pressing the grey WC cancel button.
Door call	A door call is cancelled as a remote function from the console, after a speech connection was established to the call location.

Tab. 6: Cancelling of different call types

Call type	Cancelling method
Telephone call	A telephone call is automatically cancelled when no telephone call is present. Manual cancellation is not possible
WC emergency call	Pressing the grey WC cancel button.
Emergency call 1	De-activating the presence at the call location.
Emergency call 2	De-activating the presence at the call location.
Diagnostic call	Deleting the call at the initiating device plus de-activat- ing the presence.
Cardiac alarm	De-activating the presence at the call location.

Tab. 6: Cancelling of different call types

#### 3.5.5 Call forwarding

Call forwarding is the forwarding of calls to rooms where staff have activated their presence.

At the ComTerminal and the RoomTerminal, forwarded calls are signalled both in the display and by acoustic signal with call type and call location shown in the display. There is a different call tone for each call category.

The cancel switch/WC (77 0213 00...), the call switch/WC with cancel switch (77 0217 00...) and the staff presence combination with call tone (77 0219 00...) issue an acoustic signal. There is a different call tone for each call category.

Forwarded calls can be answered via the ComTerminal (call forwarding point). If speech communication to the call location was established, the forwarded call may be cancelled from the ComTerminal remotely.

Forwarded calls with speech possibility can be acknowledged via the ComTerminal or the RoomTerminal. But, they cannot be cancelled remotely.

# 3.6 Speech communication

## 3.6.1 Speech devices at consoles

### ComStation<sup>BUS-C</sup>, ComStation<sup>PC</sup> and ManagementCenter<sup>PC</sup>

Speaking in the hands-free mode or - for more discretion - by using the hand-held receiver.

## ComStation<sup>CT</sup> Flamenco

Free speaking via microphone and loudspeaker.

#### Cordless telephones (DECT, WLAN, GSM)

These units are normal telephones, and as such, communication is the same as with any conventional telephone connection.

## 3.6.2 Speech devices in a room

#### Speaking per room

Free speaking via microphone and loudspeaker in the ComTerminals.

#### Speaking per bed

Each bed has its own speech device (Patient handset). Speech communication either free or more discretely with reduced volume.

#### Non-system patient device

Aside from using Tunstall's Patient handset, bedside speech communication can also be effected with other make patient devices, e.g. with a patient telephone. In this case, communication features are determined by this particular device.

## 3.6.3 **Privacy function**

The system features an automatically controlled privacy function. This ensures unauthorised eavesdropping of persons.

To cater for specific situations, the privacy function can be disabled. This can be carried out automatically or manually. The status of the privacy function depends on:

- Situation (call, presence status)
- Setting of privacy button at the ComTerminal or at separate switch with privacy button
- Room type "children's room" (set at ComTerminal and in SystemOrganizer)

#### **Privacy function principle**



#### 3.6.4 Announcements

Announcements can be initiated from ward consoles ComStation and the central console ManagementCenter<sup>PC</sup>.

Announcements are transmitted to ComTerminals, patients handsets, corridor displays, and loudspeakers with announcement interface (e.g. in corridors or outside areas.)

An announcement interrupts radio / TV programmes at the patient handset. Announcements can be preceded by a preparatory tone or by a prepared text (to be configured).

# ComStation<sup>BUS-C</sup>

Announcements to the own ward can be initiated from the ComStation<sup>BUS-C</sup>:

Type of announcement	Locations to transmit the announcement to
Ward announcement	All rooms.
Staff announcement	All rooms where staff is present. Optional any Presence, Presence 1, or Presence 2.

Tab. 7: Types of announcement using ComStation<sup>BUS-C</sup>

#### **ComStation**<sup>PC</sup>

Announcements to the own ward can be initiated from the ComStation<sup>PC</sup>:

Type of announcement	Locations to transmit the announcement to
Ward announcement	All rooms.
Staff announcement	All rooms where staff is present. Optional any Presence, Presence 1, or Presence 2.
Area announcement (free selectable area)	Selected rooms.
Area announcement (defined area)	Defined area selected from a list.
Multiple line	Several rooms. From rooms where privacy is off an answer can be received.

Tab. 8: Types of announcement using ComStation<sup>PC</sup>

### **ManagementCenter**<sup>PC</sup>

Announcements to all assigned wards can be initiated from the ManagementCenter-PC:

Type of announcement	Locations to transmit the announcement to
General announcement	All rooms.
Staff announcement	All rooms where staff is present. Optional any Presence, Presence 1, or Presence 2.
Ward announcement	All rooms of a ward.
Ward staff announcement	All rooms of a ward where staff is present. Optional any Presence, Presence 1, or Pres- ence 2.
Area announcement (free selectable area)	Selected rooms or wards.
Area announcement (defined area)	Defined area selected from a list.
Multiple line	Several rooms. From rooms where privacy is off an answer can be received.

Tab. 9: Types of announcement using ManagementCenter<sup>PC</sup>

Defined rooms can be excluded from the announcement, e.g. rooms with a ward console ComStation, operating theatres (configuration in SystemOrganizer).

Automatic announcements can be activated. In this case, prepared text messages are transmitted to the configured areas. The activation is effected from ward consoles ComStation<sup>PC</sup> or central consoles ManagementCenter<sup>PC</sup>.

# 3.7 Rooms without speech communication

It is possible to integrate rooms without speech communication into the nurse call system. Instead of ComTerminal Flamenco these rooms are equipped with RoomTerminal Flamenco or ControlTerminal Flamenco. The room periphery which is connected to the ComTerminal Flamenco can be connected to the RoomTerminal or ControlTerminal as well.

### 3.7.1 RoomTerminal Flamenco



RoomTerminal Flamenco (77 0520 00)

The RoomTerminal Flamenco is a complete replacement for the ComTerminal Flamenco but without speech communication.

When staff presence is active forwarded calls are displayed in the RoomTerminal's display. Call type and call location are displayed. Additionally the forwarded calls are acoustically signalled via a tone. The call tone differs for the three call categories.

The call tone volume can be configured in the SystemOrganizer software.

# 3.7.2 ControlTerminal Flamenco

The ControlTerminal Flamenco (77 0550 00) has no keys. But therefore it includes a room lamp with 4 sections. As an option it is available with an integrated label field for room designation: ControlTerminal with doorplate (77 0551 00).

77 0551 00	77 0550 00	Light section	indicates:
	Red	Call category (call, emer- gency call, alarm)	
	C 105	Green	Presence 1
C 105		Yellow	Presence 2
	White	WC call, WC emergency call	

The signalling of the ControlTerminals equals to the room lamps 77 0170 10 and 77 0171 10, table 2 on page 20.
# 4. Interfaces

Flamenco<sup>IP</sup> expands its scope of functions through the use of other systems. Profit from these synergy effects. Combine the best individual solutions and products into a powerful, cost-efficient communication concept. Flamenco<sup>IP</sup> offers interfaces in the room and ward and centralised interfaces in the nurse call system.

## 4.1 Interfaces in the room

### 4.1.1 Lighting control

The patient handset (74 0747 00) is equipped with 2 light switches to switch the reading light or room light. The pear push switch with call and light switch provides one switch to switch the light. For information on selecting the light relays refer to chapter 17. "Light control" on page 207.

#### 4.1.2 Entertainment/television

The patient handset (74 0747 00) can transmit entertainment and TV sound through the integrated loudspeaker or connected headphones. The open sound is switched off when the headphone cord is inserted.

Up to 5 installed entertainment programmes are connected via connection socket combi or connection socket combi, bedhead unit. Switching on/off, programme selection and setting the volume can be performed using the buttons of the patient handset.

The IR TV control module universal (77 0360 11) enables the control of a television (e.g., from Samsung, Philips or LG). The TV sound is transmitted to the patient handset. Switching off, programme selection and setting the volume can be performed using the buttons of the patient handset.

The TV audio amplifier (77 0365 00) enables the transmission of the sound of any television (with headphone jack) via the patient handset. In the case of this application, the TV is not controlled with the patient handset.

Tunstall itself offers televisions (Hospital LED TV, professional) that can be controlled by the patient handset in connection with the RAN interface (77 0840 00). The TV sound is transmitted through the patient handset. Switching on/off, programme selection and setting the volume can be performed using the buttons of the patient handset.

### 4.1.3 Call devices

In addition to the wired call devices, wireless call devices can also be used. Radio receiver T (Z 00 8202 33) can be connected to the connection sockets in the socket of the pear push switch. Radio receiver-T UP (Z 00 8202 35) is flush-mounted and connected to the nurse call system via the RAN interface (77 0840 00). Both radio receivers receives the signals of the radio trigger MyAmie (P68007/02), fall detector iVi (P68005/47) and other radio transmitters from the Tunstall Telecare portfolio.

Note: The radio transmission is not monitored. The radio transmitters must therefore be used only as additional call devices in connection with the nurse call system.

The RAN interface (77 0840 00) is available for the connection of system-external call devices. In addition to triggering the "Call", "Alarm" or "WC Call" call type, this interface provides the location light and reassurance light function, as well as a bed identification function.

#### 4.1.4 Patient devices

At the patient bed, the control devices of other manufacturers can be used instead of the patient handset. Patient telephones with an integrated call switch for nurse call, for example, are suitable for this purpose. The connection of the call switch and telephone speech channel can take place in the room using the RAN interface with speech (77 0880 00). For example, the models GS, 3, 4, 5 and IP of the MediSET patient terminal from Siemens can be used. The selection of another third-party device must be coordinated with Tunstall GmbH.

## 4.2 Interfaces at the ward

### 4.2.1 OSYlink-Universal



The interface OSYlink-Universal (77 0803 00) is available as an interface for the connection of external systems and/or technical equipment to the group bus (OSYnet).

OSYlink-Universal (77 0803 00)

#### Inputs and outputs

- 4 monitored inputs:
  - 2x Call
  - Emergency call
  - Cardiac alarm (code blue)
- 1 input: collective announcement (all wards)
- 1 input: collective announcement (all presences)
- 1 input "Initiate call" and 1 associated input "Cancel call"
- 4 solid state outputs, configurable. Factory setting:
   2x Call
  - Emergency call
  - Cardiac alarm (code blue)
- 1 solid state output, can be configured
- 1 output with location light function (functionally associated to the call inputs)
- 2 potential free outputs, configurable (change-over contact, voltage source selectable by jumper)

The outputs are configured centrally using the SystemOrganizer.

### 4.2.2 Connection of legacy systems

Flamenco<sup>IP</sup> provides the option of connecting wards with legacy systems manufactured by Tunstall GmbH to the Flamenco<sup>IP</sup> nurse call system. For this purpose, the ward bus of the legacy system is connected to the Flamenco<sup>IP</sup> nurse call system through an OSYlink AS interface module. OSYlink AS is intended for installation into ward distributors or installation rooms. Two different OSYlink AS interface modules are available:

OSYlink AS I	Connect-able legacy systems		
OSYlink AS-CCS (77 0870 00)	<ul> <li>EccoLine with speech</li> <li>NewLine C201</li> <li>NewLine</li> <li>CCS 2000 G</li> <li>CCS 1080 G</li> <li>CCS 1080 W</li> </ul>		
OSYlink AS-L200 77 0872 00)	<ul><li>EccoLine L200</li><li>NewLine L200</li></ul>		

Tab. 10: Modules for the connection of legacy systems

#### **OSYlink AS-CCS**

OSYlink AS-CCS converts the data and speech signals of the ComTerminals of the legacy system into compatible signals for the Flamenco<sup>IP</sup> system. In this way, it is possible to operate individual wards with legacy technology together and compatibly in a Flamenco<sup>IP</sup> system environment. For connecting a half-duplex speech system additionally a speech amplifier with the power supply unit is required. This component was generally already part of the legacy system.

#### OSYlink AS-L200

OSYlink AS-L200 converts the data signals of the room terminals and L200 universal interfaces of the legacy system into compatible signals for the Flamenco<sup>IP</sup> system. In this way, it is possible to operate individual wards with legacy technology together and compatibly in a Flamenco<sup>IP</sup> system environment.

## 4.3 Centralised interfaces of the nurse call system

#### 4.3.1 Radio paging system, DECT without speech

Radio paging systems or DECT telephone systems can be connected to the nurse call system. The protocol is based on ESPA 4.4.4. Pending call messages from the nurse call system can be forwarded to nursing staff equipped with pagers or DECT telephones.

The factory settings of the ESPA interface are as follows: 1200 baud, 7 bits, even parity, 2 stop bits. Format: <event identifier> <space> <ward name> <space> <room name> <space>.

#### 4.3.2 Telephony

The telephony infrastructure of the hospital can also be used for voice communication with the nurse call system. The telephone user will not notice the difference in the speech channel.

Even if an external device does not work because the PBX has failed, the Flamenco<sup>IP</sup> nurse call system guarantees that an existing call is displayed within the nurse call system.

#### 4.3.3 Hospital information system

For the support of the nursing staff, patient data can be displayed during call processing – this data is then retrieved from the hospital information system. The data is displayed in the PrimusGlobal+ software. The system driver HL7 establishes the connection between the hospital information system and the PrimusGlobal+ software family. Defined data fields are retrieved from the HL7 data record and are available for further display on the ManagementCenter<sup>PC</sup>. The desired information is selected in close coordination with the customer. The support of various transfer protocols and transmission methods is possible.

#### 4.3.4 Fire alarm system

Defined information from the fire alarm system can be retrieved by the Flamenco<sup>IP</sup> nurse call system and provided there for further display and processing. The definition of the desired information and prioritisation is established in close coordination with the customer.

# 5. Organisational modes

The Flamenco<sup>IP</sup> nurse call system can be adapted to a hospital's care organisation. Independent from the installation, the system can support various modes of a care organisation. Organisational changes can be realised without the need for additional installation or for structural changes.

## 5.1 Ward operating mode

The ward operating mode is the traditional way of method for the handling of nurse calls. All calls within a ward will reach the responsible staff either directly at a ward console ComStation at the nurse station or at their respective present location (call forwarding).



#### **1 – 6** Wards 1 – 6

#### Fig. 3: Ward operating mode

The ward operating mode is the ideal method for call handling when function care is the care solution that is realised for the ward. In functional nursing all care jobs are allocated and handled by all of the ward staff. Each nurse will handle tasks (functions) for all patients in the ward.

## 5.2 Ward coupling

During periods of low activity, two or more wards which are operated in ward mode can be organisationally coupled. In Flamenco<sup>IP</sup> nurse call systems, this is realised with the 'ward coupling' function. All calls and presence states of the coupled wards are displayed at the consoles of all coupled wards or forwarded to rooms with active presence states, respectively.

The coupling of specific wards is pre-defined by the technical staff using the software SystemOrganizer. Nursing staff will activate the applicable ward coupling at the ComStation as required.



- **1 6** Ward 1 6
- **1+2** Ward 1 is coupled with ward 2
- **3 + 4** Ward 3 is coupled with ward 4
- **5 + 6** Ward 5 is coupled with ward 6

Fig. 4: Ward coupling

## 5.3 Central call handling

In the central call handling mode, all calls of all wards are directed exclusively to a superior central console, a ManagementCenter, answered from this central console and from here, all further measures are initiated. The central console Management-Center is suitable to act as the sole console position in a house. The central call handling mode may also be realised as a temporary measure, only, e.g. during night time, or in a mode where individual wards operate in a decentralised mode from time to time.

Aside from patient rooms and function rooms, all rooms where staff or patients may dwell must be incorporated into the system. To fully exploit the possibilities of the ManagementCenter all additional functional areas should also be integrated in the system (administration, X-ray, pharmacy, etc.).



Fig. 5: Central call handling

The central call handling mode is perfectly suitable when several hospitals are interconnected. In this case, one ManagementCenter is responsible for all interconnected buildings.

## 5.4 Zone nursing

In the case of 'zone nursing' the ward is divided into structural sections commensurate with the building architecture. Nursing staff is organised in teams, and each team is responsible for a certain zone. Suitable consoles for zone nursing are ward consoles ComStation. Call forwarding is also prepared for within the zone.



Fig. 6: Zone nursing

#### 5.4.1 Shifts

Depending on the day of the week or on the clock time, it may be necessary to change zone allocations. For instance, two zones of daytime operations may be joined to create a single zone for the night time. With Flamenco<sup>IP</sup> nurse call systems this change to the nursing situation is be realised by way of shift allocation.

The software SystemOrganizer is the tool to set up work shifts and to compose the zones for the respective shift. At the ComStation, nursing staff can change the nurse call system from one shift mode to another shift mode, i.e. day shift volume and night shift volume.

# 6. Configuration / SystemOrganizer



#### Fig. 7: SystemOrganizer (77 0750 00)

The SystemOrganizer software is the planning and configuration tool for the Flamenco<sup>IP</sup> system. It provides the user interface to the system control units IP-SystemManager and enables the complete parameter setting for the nurse call system.

The access is password protected by several user levels. Herewith is ensured, that each user group (planning office, care management...) can only make the settings, which are important for him/her.

Right from the planning stage the SystemOrganizer is used to enter the project structures of buildings, wards and rooms. All parameters can be modified every time to adapt to the respective needs.

By using the data from the beginning of the planning over the whole life cycle of the system it will never be necessary to enter data twice. All data can be copied, saved and readout from the nurse call system. Herewith it is ensured, that every time the valid data are used.

## 6.1 Requirements

- Microsoft Windows 10 (32 bit, 64 bit), Windows 7 (32 bit, 64 bit)
- 10/100 Mbit LAN access
- System training "SystemOrganizer"

## 6.2 System planning

Construction of the basic structure of buildings, wards, rooms

- Plan view presentation
- Screen shot directly from the screen
- Import of existing graphics
- Various pre-set room types
- Free allocation of room numbers and designations
- Printable survey of buildings, wards, rooms

## 6.3 Configuration

- Country-specific settings
- Setting date and time
- Assignment of physical addresses for rooms and peripherals
- Designations and room numbers for rooms, wards, buildings, etc.
- Setting call types and system messages
- Signalling options e.g. tone and flash-signal sequences
- Parameters for call handling e.g. call types, call categories
- Defining announcement areas
- Organisational assignment of rooms (locations) to wards, shifts, etc.
- Defining ward couplings
- Parameter setting for escalation procedures for call handling
- Administration of interfaces to external systems
- Administration of cordless telephony devices
- Setting all system parameters including the administration of integrated networks and IP addresses

# 7. Room types

The following requirements on the room equipment must be fulfilled:

- All rooms and areas inside buildings in which patients are present must have a call device, e.g., in patient rooms, recreations rooms, treatment rooms and waiting areas.
- A call device must exist at every bed.
- A room lamp must be present outside of every room with call possibility.
- All rooms in which the staff shall be available must have a presence button.
- In bathrooms or other rooms that cannot be viewed from the presence button, the call must not be cancelled using the presence button. A cancel switch/WC is to be provided in this case.

To simplify planning, frequently used room types are explained on the following pages using equipment examples.

# 7.1 Patient room

## 7.1.1 Patient room with speech



Per room					
	ComTerminal Flamenco	77 0510 00			
	Room lamp for display of all call types and presence states: e.g. Room lamp, 3 sections optional with individual indication for WC call / WC emergency call: e.g. Room lamp, 4 sections				
Per bed					
	Connection socket combi <i>or</i> Connection socket combi, bedhead unit	70 0424 00 70 0434 00			
888.	Patient handset	74 0747 00			
In WC roor	n				
	If additional display for WC call / WC emergency call is desired, e.g. as direction indicator in front of the WC: Room lamp cardiac alarm, WC	77 0170 01			
	WC cancel button to cancel WC calls / WC emergency calls e.g. Cancel switch/WC	77 0213 00			
	A nurse call device must be within reach from washbasin, WC, shower, bathtub; selection: Call switch/WC Pull cord call switch/WC Pneumatic call switch/WC	77 0211 01 77 0215 01 77 0216 01			
In corner s	eating unit (option)				
	Call device, e.g. Call switch	77 0211 00			

For required back boxes and connectors refer to page 69. For cable legend see page 72.





Per room				
	<i>Optional:</i> ControlTerminal Flamenco ControlTerminal with doorplate Flamenco	77 0550 00 77 0551 00		
	ControlTerminal installation kit	77 0960 00		
	ControlTerminal ConfigSet (only one is required per nurse call system)	77 0920 00		
	Staff presence combination with call tone	77 0219 00		
Per bed				
	Connection socket with call switch <i>or</i> Connection socket with call switch, bedhead unit			
	<i>Optional:</i> Pear push switch incl. call and light switch, 2 m connection cable Pear push switch incl. call and light switch, 4 m connection cable Pear push switch incl. 2 call switches, 2 m connection cable Pear push switch incl. 2 call switches, 4 m connection cable	70 0710 00 70 0710 01 70 0711 00 70 0711 01		
In WC roor	n			
	WC cancel button to cancel WC calls / WC emergency calls e.g. Cancel switch/WC	77 0213 00		
	A nurse call device must be within reach from washbasin, WC, shower, bathtub; selection: Call switch/WC Pull cord call switch/WC Pneumatic call switch/WC	77 0211 01 77 0215 01 77 0216 01		
In corner seating unit (option)				
	Call device, e.g. Call switch	77 0211 00		

For required back boxes and connectors refer to page 69. For cable legend see page 72.



## 7.1.3 Patient room without speech, with RoomTerminal

Per room					
	RoomTerminal Flamenco	77 0520 00			
	Room lamp for display of all call types and presence states: e.g. Room lamp, 3 sections optional with individual indication for WC call / WC emergency call: e.g. Room lamp, 4 sections				
Per bed					
	Connection socket with call switch <i>or</i> Connection socket with call switch, bedhead unit	70 0171 60 70 0171 50			
	Optional: Pear push switch incl. call and light switch, 2 m connection cable Pear push switch incl. call and light switch, 4 m connection cable Pear push switch incl. 2 call switches, 2 m connection cable Pear push switch incl. 2 call switches, 4 m connection cable				
In WC roor	n				
	If additional display for WC call / WC emergency call is desired, e.g. as direction lamp in front of the WC: Room lamp cardiac alarm, WC	77 0170 01			
	WC cancel button to cancel WC calls / WC emergency calls e.g. Cancel switch/WC	77 0213 00			
	A nurse call device must be within reach from washbasin, WC, shower, bathtub; selection: Call switch/WC Pull cord call switch/WC Pneumatic call switch/WC	77 0211 01 77 0215 01 77 0216 01			
In corner seating unit (option)					
	Call device, e.g. Call switch	77 0211 00			

For required back boxes and connectors refer to page 69. For cable legend see page 72.

### 7.1.4 Patient room: Blinds control



In combination with RAN interface universal (70 0848 00) an external actuator can be controlled with the patient handset (74 0747 00) connected to a connection socket combi (70 0424 00) or to a connection socket combi, bedhead unit (70 0434 00), e.g. for blinds upwards and downwards. Maximum contact load: 60 mA / 24 V.

Note: If this function is used, the patient handset and the connection socket cannot be used for control of entertainment programs!

### 7.1.5 Patient room: TV control

#### Standard TV set: Tone transmission & TV control with patient handset



Connection socket combi (70 0424 00) and Connection socket combi, bedhead unit (70 0434 00), allow in connection with IR TV control module universal (77 0360 11) the control and tone transmission of standard TV sets using Patient handsets (74 0747 00).

The IR TV control module universal (77 0360 11) supports a variety of standard TV set (e.g. TV sets from Samsung, Philips, and LG). The TV control is based on infrared signals.

## 7.1.6 Patient room: TV tone transmission



#### Standard TV set: Tone transmission via patient handset

Connection socket combi (70 0425 00 or 70 0424 00) and Connection socket combi, bedhead unit (70 0435 00 or 70 0434 00) allow in connection with TV audio amplifier (77 0365 00) the tone transmission of standard TV sets to Patient handsets (74 0747 00).

Note! The TV is not controlled using the Patient handset.

## 7.1.7 Patient room: TV control

#### Hospital LED TV, professional



Connection socket combi (70 0424 00) and Connection socket combi, bedhead unit (70 0434 00) allow TV control in combination with Patient handset (74 0747 00) and the RAN interface (77 0840 00). TV sets are available in different sizes.

One TV installation kit (74 7002 56/15) is required per project for the programming.

The TV sets are prepared for standard VESA wall mounts.

Three different wall mounts can be ordered from Tunstall (74 7002 80, 74 7002 81, 74 7002 82).



## 7.1.8 Patient room: Separate shower and WC

Separate call cancelling for each cubicle; collective room lamp (77 0170 00) in corridor and separate room lamps (77 0170 01) in room (channel encoding) with additional display for each cubicle. Maximum of 7 channels for each ComTerminal.

Channel numbers 1 - 6 can be used as bed numbers 1 - 6.



# 7.2 Function room

Per room					
	ComTerminal Flamenco	77 0510 00			
	Room lamp for display of all call types and presence states: e.g. Room lamp, 3 sections	77 0170 00			

For required back boxes and connectors refer to page 69. For cable legend see page 72.

# 7.3 Ward bathroom

## 7.3.1 Ward bathroom with speech, with ComTerminal



Per room		
	ComTerminal Flamenco	77 0510 00
	Room lamp for display of all call types and presence states: e.g. Room lamp, 3 sections	77 0170 00
For each b	ath / WC	
	Pull cord call switch, suitable for shower, WC Call switch, suitable for washbasin Pneumatic call switch, suitable for bath tubs	77 0215 00 77 0211 00 77 0216 00



## 7.3.2 Ward bathroom without speech, with ControlTerminal

Per room				
	Optional: ControlTerminal Flamenco ControlTerminal with doorplate Flamenco	77 0550 00 77 0551 00		
	ControlTerminal installation kit	77 0960 00		
	ControlTerminal ConfigSet (only one is required per nurse call system)	77 0920 00		
	Staff presence combination with call tone	77 0219 00		
For each bath / WC				
	Pull cord call switch, suitable for shower, WC Call switch, suitable for washbasin Pneumatic call switch, suitable for bath tubs	77 0215 00 77 0211 00 77 0216 00		

## 7.4 Nurse station

# 7.4.1 Ward console ComStation<sup>BUS-C</sup>



Per room				
	ComStation <sup>BUS-C</sup>	77 0605 50		
	Connection socket ComStation	77 0452 30		
	Room lamp universal, 2 sections	77 0182 10		



# 7.4.2 Ward console ComStation<sup>CT</sup> Flamenco

Per room	Per room				
	ComStation <sup>CT</sup> Flamenco	77 0606 00			
•	Connection socket ComStation	77 0452 30			
	Room lamp for display of all call types and presence states: e.g. Room lamp, 3 sections	77 0170 00			

For required back boxes and connectors refer to page 69. For cable legend see page 72.

# 7.4.3 Ward console ComStation<sup>PC</sup>



Per room				
	ComStation <sup>PC</sup>	77 0602 00		
	Connection socket ComStation <sup>PC</sup>	77 0452 60		
	Room lamp universal, 2 sections	77 0182 10		
	PrimusGlobal <sup>+</sup> System set-up & configuration	77 0790 00		
	PrimusGlobal <sup>+</sup> Project data up to 36 rooms, block graphics or layout graphics	77 0790 01 77 0790 02		



## 7.4.4 Nurse station without speech, ComStation<sup>T</sup> Flamenco

Per room				
	ComStation <sup>T</sup> Flamenco	77 0606 20		
· ·	Connection socket ComStation	74 0452 30		
	Room lamp for display of all call types and presence states: e.g. Room lamp, 3 sections	77 0170 00		

For required back boxes and connectors refer to page 69. For cable legend see page 72.

# 7.5 Corridor



# 7.6 Back boxes, connectors

		Back boxes					
		solid wall		partition wall		Connector	
			1-gang 17 0100 00	2 -gang 17 0410 00	1-gang 17 5100 00	2-gang 17 5400 00	70 0807 00
	77 0211 00 = A, C, F	Call switch	•		•		•
	77 0211 01 = A, C, F	Call switch/WC	•		•		•
	77 0212 00 = A, C, F	Staff presence switch	•		•		•
	77 0213 00 = A, C, F	Cancel switch/WC	•		•		•
	77 0214 00 = A, C, F	Cardiac alarm switch	•				•
	77 0215 00 = A, C, F	Pull cord call switch	•		•		•
	77 0215 01 = A, C, F	Pull cord call switch/WC	•				•
	77 0216 00 = A, C, F	Pneumatic call switch	•				•
	77 0216 01 = A, C, F	Pneumatic call switch/ WC	•		•		•
	77 0217 00 = A, C, F	Call switch/WC with can- cel switch	•		•		•
	77 0218 00 = A, C, F	Call switch with privacy switch	•				•
	77 0219 00 = A, C, F	Staff presence combina- tion with call tone	•		•		•
	70 0171 60 = A, C, F	Connection socket with call switch	•			•	00 0211 37 + cable: 50 0308 02
	70 0171 50	Connection socket with call switch, bedhead unit	built-i unit	in med	lical su	pply	00 0211 37 + cable: 50 0308 02

				Back			
			solid wall		partition wall		Connector
			1-gang 17 0100 00	2 -gang 17 0410 00	1-gang 17 5100 00	2-gang 17 5400 00	70 0807 00
	70 0424 00 70 0425 00	Connection socket combi		•		•	
	70 0424 50 70 0425 50	Connection socket combi, TVL		•		•	
æ	70 0434 00 70 0435 00	Connection socket combi, bedhead unit	built-in medical supply unit				cable: 50 0308 02
	70 0434 50 70 0435 50	Connection socket combi, bedhead unit, TVL					cable: 50 0308 02
	74 0452 30	Connection socket Com- Station		•		•	
	74 0452 60A	Connection socket Com- Station <sup>PC</sup>		•		•	
	77 0510 00	ComTerminal Flamenco		•		•	
	77 0520 00	RoomTerminal Fla- menco		•		•	
	77 0550 00	ControlTerminal Fla- menco		•		•	77 0960 00
	77 0551 00	ControlTerminal with doorplate Flamenco		•		•	77 0960 00
	77 0111 02	Direction lamp	•		•		
-A2- -A1-	77 0112 02	Group lamp, 2 groups	•		٠		
	77 0113 02	Group lamp, 3 groups	•		٠		
	77 0114 02	Group lamp, 4 groups	•		•		
				Back	boxes		
--	------------	---	----------------------	-----------------------	----------------------	----------------------	------------
			SO Wa	lid all	part wa	ition all	Connector
			1-gang 17 0100 00	2 -gang 17 0410 00	1-gang 17 5100 00	2-gang 17 5400 00	70 0807 00
	77 0170 00	Room lamp, 3 sections	•		•		•
	77 0170 01	Room lamp Alarm, WC	•		•		•
	77 0170 10	Room lamp, 4 sections	•		•		•
	77 0171 00	Room lamp, 3 sections, with doorplate	•		•		•
	77 0171 10	Room lamp, 4 sections, with doorplate	•		•		•
	77 0175 00	Room lamp, 3 sections, glass decor	•		•		•
	77 0175 01	Room lamp cardiac alarm, WC, glass decor	•		•		•
	77 0175 10	Room lamp, 4 sections, glass decor	•		•		•
	77 0182 10	Room lamp universal, 2 sections	•		•		70 0807 07
	77 0185 20	Room lamp universal, 2 sections, glass decor	•		•		70 0807 07
	77 4000 00	OSYnet-Y-Repeater- Opto					77 0950 00

#### 7.7 Cable legend

To simplify the handling of installation plans, Tunstall GmbH has introduced an expanded cable legend. The cables are organised according to their application areas. Relevant types of cables are allocated to specific application areas. These are minimum requirements.

Marking	Designation	Cable type
la	General cables	IY(ST)Y 2x2x0.8
la2	General cables	IY(ST)Y 2x2x0.6
la3	General cables	IY(ST)Y 3x2x0.6
la4	General cables	IY(ST)Y 4x2x0.6
la5	General cables	IY(ST)Y 4x2x0.8
OSYnet	OSYnet group bus	Recommended cables: CAT7 (22 AWG) with diameter = 0.64 mm IY(ST)Y 4x2x0.8 with diameter = 0.8 mm Optional cables: CAT5 (23 AWG) with diameter = 0.57 mm CAT6 (23 AWG) with diameter = 0.57 mm CAT7 (23 AWG) with diameter = 0.57 mm IY(ST)Y 4x2x0.6 with diameter = 0.6 mm
le	Entertainment cables	2x IYY per channel or similar cables (1 double wire required for each programme)
In	RAN room bus	IY(ST)Y 2x2x0.8
lpwr	Power cable	NYM 2x2.5 mm <sup>2</sup> Attention! Instead of the marking "Ipwr" the older marking "Ip" is used in other docu- ments for the power cable.
ls	Speech line plus RAN room bus	2x IY(ST)Y 2x2x0.8

Tab. 11: Cable legend

# 8. Product overview

## 8.1 Signal lamps, corridor displays

Functions	Order No.
<ul> <li>Room lamp, 3 sections</li> <li>Signal lamp with three light sections for visual signalling of all call types and presence states (2 staff groups).</li> <li>LED red: all call types</li> <li>LED green: presence 1</li> <li>LED yellow: presence 2</li> <li>Connection to room bus (RAN)</li> <li>Dimensions (HxWxD): 110 x 150 x 40 mm</li> </ul>	77 0170 00
Room lamp, 3 sections, with doorplate as 77 0170 00, but additionally with label field for room designation. Dimensions (HxWxD): 190 x 150 x 40 mm Label field (HxW): approx. 70 x 92 mm	77 0171 00
Room lamp, 3 sections glass decor as 77 0170 00, but with decorative glass frame. Dimensions (HxWxD): 110 x 150 x 40 mm	77 0175 00

Functions	Order No.	
Room lamp cardiac alarm, WC	77 0170 01	
Signal lamp with three light sections as sup- plement to room lamp 77 0170 00 or 77 0171 00 for visual signalling of cardiac alarm and WC calls.		
LED blue: cardiac alarm		
LED blue: cardiac alarm		and the second second
<ul> <li>LED white: WC call</li> <li>Connection to room hus (RAN)</li> </ul>		
= Connection to room bus (RAN) Dimensions (HxWxD): 110 x 150 x 40 mm		
Boom Jamp Alarm WC	77 0175 01	
glass decor	11 0110 01	
as 77 0170 01, but as supplement to room lamp 77 0175 00.		
Dimensions (HxWxD): 110 x 150 x 40 mm		
		Contraction of the local division of the loc
Room lamp, 4 sections	77 0170 10	
Signal lamp with four light sections for visual signalling of all call types and presence states (2 staff groups) and for WC call as single indication.		
LED red: calls		
LED green: presence 1		
LED yellow: presence 2		
<ul> <li>Connection to room bus (RAN)</li> </ul>		
Dimensions (HxWxD): 110 x 150 x 40 mm		
Room lamp, 4 sections, with doorplate	77 0171 10	
······		
as 77 0170 10, but additionally with label field for room designation.		
Dimensions (HxWxD): 190 x 150 x 40 mm Label field (HxW): approx. 70 x 92 mm		Exected 100 Patient Room

Functions	Order No.	
Room lamp, 4 sections glass decor	77 0175 10	
as 77 0170 10, but with decorative glass frame.		
Dimensions (HxWxD): 110 x 150 x 40 mm		
Room lamp universal, 2 sections	77 0182 10	
Signal lamp with two light sections for visual signalling of staff presence 1 and telephone calls as individual indication.		
No connection to room bus (RAN).		
For use e.g. in combination with ComStation <sup>BUS-C</sup> or ComStation <sup>PC</sup> .		
<ul><li>LED green: presence 1</li><li>LED white: telephone call</li></ul>		
Dimensions (HxWxD): 110 x 150 x 40 mm		
Room lamp universal, 2 sections glass decor	77 0185 20	
as 77 0182 10, but with decorative glass frame.		
Dimensions (HxWxD): 110 x 150 x 40 mm		
Doorplate universal	77 0189 00	
Doorplate without light sections, for room designation. <i>Dimensions (HxWxD): 110 x 150 x 40 mm Label field (HxW): approx. 70 x 92 mm</i>		Exercite 100 Patient Room

Fu	nctions	Order No.	
Di	rection lamp	77 0111 02	
Dis	splay of directions to calls.		
	LED module red		
	LED module green		
	Arrows to customer specifications.		
	Connection to OSYlink-Group lamp (77 0802 00).		
Diı	mensions (HxWxD): 80 x 86 x 70 mm		
Gr	oup lamp, 2 groups	77 0112 02	
Gr wit rec	oup-related display of calls for 2 groups h two light fields for each group (green, t).		
	2 LED modules green		
	2 LED modules red		
	Inscription to customer specifications.		
	Connection to OSYlink-Group lamp (77 0802 00).		
Diı 80	mensions (HxWxD): (each lamp) x 86 x 70 mm		
Gr	oup lamp, 3 groups	77 0113 02	
as	77 0112 02, but for 3 groups		
Gr	oup lamp, 4 groups	77 0114 02	
as	77 0112 02, but for 4 groups		
Co	orridor display Alpha 16	77 0150 00	
Dis ter sig	splay with alphanumerics for calls and sys- n information. Tone generator for acoustic nals, loudspeaker for announcements.		
Fo	r mounting in corridors and staff rooms.		
	Single-sided design		C3 - 314 KUt B1
	16 digits, alphanumeric		
	Connection cable with free wire ends for connection to group bus (OSYnet).		
Dii (H.	mensions w/o mounting accessories xWxD): 120 x 765 x 35 mm		

Functions	Order No.	
Corridor display Alpha 16, double- sided	77 0160 00	
as 77 0150 00, but double-sided design.		C5 - 514 Ruf B1
Dimensions w/o mounting accessories (HxWxD): 120 x 765 x 125 mm		

#### 8.2 Switches

Functions	Order No.	
Call switch	77 0211 00 A	
Water protected switch for raising calls.		
<ul> <li>Connection to room bus (RAN)</li> </ul>		
Dimensions (HxWxD): 91 x 91 x 36 mm		
Call switch	77 0211 00 C	
as 77 0211 00 A, but with glass frame.		
Call switch	77 0211 00 F	
as 77 0211 00 A, but with narrow frame. <i>Dimensions (HxWxD): 80 x 80 x 36 mm</i>		
Call switch/WC	77 0211 01 A	77 0044 00 4
as 77 0211 00 A, but for raising WC calls / WC emergency calls.		77 0211 00 A
Call switch/WC	77 0211 01 C	
as 77 0211 00 C, but for raising WC calls / WC emergency calls.		
Call switch/WC	77 0211 01 F	-
as 77 0211 00 F, but for raising WC calls / WC emergency calls.		

Functions	Order No.	
Staff presence switch	77 0212 00 A	
<ul> <li>Water protected switch for activating presence for 2 staff groups.</li> <li>1 presence button staff 1 (green)</li> <li>1 presence button staff 2 (yellow)</li> <li>Connection to room bus (RAN)</li> <li>Dimensions (HxWxD): 91 x 91 x 36 mm</li> <li>Staff presence switch</li> </ul>	77 0212 00 C	
as 77 0212 00 A, but with glass frame.		77 0212 00 4
Dimensions (HxWxD): 107 x 107 x 36 mm		77 0212 00 A
Staff presence switch as 77 0212 00 A, but with narrow frame.	77 0212 00 F	
Cancel switch/WC	77 0213 00 0	
<ul> <li>Water protected switch for cancelling WC calls and WC emergency calls.</li> <li>2 cancel buttons (grey)</li> <li>Acoustic signalling of forwarded calls</li> <li>Connection to room bus (RAN)</li> <li><i>Dimensions (HxWxD): 91 x 91 x 36 mm</i></li> </ul>	11 02 10 00 A	
Cancel switch/WC	77 0213 00 C	
as 77 0213 00 A, but with glass frame. <i>Dimensions (HxWxD): 107 x 107 x 36 mm</i>		77 0213 00 A
Cancel switch/WC	77 0213 00 F	
as 77 0213 00 A, but with narrow frame. Dimensions (HxWxD): 80 x 80 x 36 mm		

Functions	Order No.	
Cardiac alarm switch	77 0214 00 A	
Water protected switch for raising cardiac alarms.		
2 alarm buttons (blue)		
<ul> <li>Connection to room bus (RAN)</li> </ul>		
Dimensions (HxWxD): 91 x 91 x 36 mm		
Cardiac alarm switch	77 0214 00 C	
as 77 0214 00 A, but with glass frame.		
Dimensions (HxWxD): 107 x 107 x 36 mm		77 0214 00 A
Cardiac alarm switch	77 0214 00 F	
as 77 0214 00 A, but with narrow frame.		
Dimensions (HxWxD): 80 x 80 x 36 mm		

Functions	Order No.	
Pull cord call switch	77 0215 00 A	
Water protected switch for raising calls via pull cord.		
2 m pull cord and call handle (red) with nurse symbol		
<ul> <li>Connection to room bus (RAN)</li> </ul>		
Dimensions (HxWxD): 91 x 91 x 56 mm		
Pull cord call switch	77 0215 00 C	
as 77 0215 00 A, but with glass frame.		
Dimensions (HxWxD): 107 x 107 x 56 mm		
Pull cord call switch	77 0215 00 F	
as 77 0215 00 A, but with narrow frame.		
Dimensions (HxWxD): 80 x 80 x 56 mm		
Pull cord call switch/WC	77 0215 01 A	4
as 77 0215 00 A, but for raising WC calls / WC emergency calls.		
Pull cord call switch/WC	77 0215 01 C	
as 77 0215 00 C, but for raising WC calls / WC emergency calls.		77 0215 00 A
Pull cord call switch/WC	77 0215 01 F	
as 77 0215 00 F, but for raising WC calls / WC emergency calls.		

Functions	Order No.	
Pneumatic call switch	77 0216 00 A	
Water protected switch for raising calls by squeezing the bulb.		
2 m air hose and red rubber bulb		
Connection to room bus (RAN)		
Dimensions (HxWxD): 91 x 91 x 56 mm		
Pneumatic call switch	77 0216 00 C	
as 77 0216 00 A, but with glass frame.		
Dimensions (HxWxD): 107 x 107 x 56 mm		
Pneumatic call switch	77 0216 00 F	
as 77 0216 00 A, but with narrow frame.		
Dimensions (HxWxD): 80 x 80 x 56 mm		
Pneumatic call switch/WC	77 0216 01 A	
as 77 0216 00 A, but for raising WC calls / WC emergency calls.		
Pneumatic call switch/WC	77 0216 01 C	
		77 0216 00 A
as 77 0216 00 C, but for raising WC calls / WC emergency calls.		
Pneumatic call switch/WC	77 0216 01 F	
as 77 0216 00 F, but for raising WC calls / WC emergency calls.		

Functions	Order No.	
Call switch/WC with cancel switch	77 0217 00 A	
Water protected switch for raising WC calls and WC emergency calls as well as for can- celling WC calls and WC emergency calls.		
1 call button (red)		
<ul> <li>Acoustic signalling of forwarded calls</li> <li>Connection to room bus (RAN)</li> </ul>		
Dimensions (HxWxD): 91 x 91 x 36 mm		
Call switch/WC with cancel switch	77 0217 00 C	
as 77 0217 00 A, but with glass frame.		77 0217 00 A
Dimensions (HxWxD): 107 x 107 x 36 mm		
Call switch/WC with cancel switch	77 0217 00 F	
as 77 0217 00 A, but with narrow frame.		
Dimensions (HxWxD): 80 x 80 x 36 mm		
Call switch with privacy switch	77 0218 00 A	
Water protected switch for raising calls and for local switching the privacy function.		
1 call button (red)		
1 privacy button (grey)		
Connection to room bus (RAN)		
Dimensions (HxWxD): 91 x 91 x 36 mm		
Call switch with privacy switch	77 0218 00 C	
as 77 0218 00 A, but with glass frame.		
Dimensions (HxWxD): 107 x 107 x 36 mm		77 0218 00 A
Call switch with privacy switch	77 0218 00 F	
as 77 0218 00 A but with parrow frame		
$a_3 + 1 + 02 + 0 + 00 - a_3$ , but with hallow halle. Dimensions (Hyll/yD): 80 y 80 y 36 mm		
DIMENSIONS (HXWXD): 80 X 80 X 36 MM		

Functions	Order No.	
Staff presence combination with call tone	77 0219 00 A	
Water protected switch for activating staff presence and for raising calls		
1 call button (red)		
<ul> <li>1 presence button staff 1 (green)</li> <li>Acoustic signalling of forwarded calls</li> <li>Connection to room bus (RAN)</li> </ul>		
Dimensions (HxWxD): 91 x 91 x 36 mm		
Staff presence combination with call tone	77 0219 00 C	
as 77 0219 00 A, but with glass frame.		77 0219 00 A
Dimensions (HxWxD): 107 x 107 x 36 mm		
Staff presence combination with call tone	77 0219 00 F	
as 77 0219 00 A, but with narrow frame.		
Dimensions (HxWxD): 80 x 80 x 36 mm		

#### 8.3 Room terminals

Fu	nctions	Order No.	
Co	omTerminal Flamenco	77 0510 00	
Co fea an	ommunication terminal with duplex speech ature, for use in patient rooms, staff rooms d function rooms.		
-	Innovative control panel made of real glass with integrated sensors and display elements for easy and intuitive operation		
•	Surface mounting, plug-in electronic components		
	Connection to OSYnet group bus		
-	Red call button with symbol, location light and reassurance light		
-	Blue alarm button with symbol, location light and reassurance light, configurable		
-	Green large presence button for staff 1, with reminder light		
-	Yellow large presence button for staff 2, with reminder light		10:34 €€ cues
-	4 function keys with situation related func- tions		
•	Graphic display, backlit, 128x64 dot ma- trix		4
•	High-quality loudspeakers and high-end electret microphone		
-	Configuration menu for selection of room functions and for system parameter set- ting		
•	Integrated function monitoring feature with status indication		
-	International version, language selectable via configuration		
	Moisture-protected casing		
-	Close and smooth surface, easy to clean and to disinfect		
	No data loss during power failure		
-	Possible mixed operation in Flamenco <sup>IP</sup> systems without speech		
-	Room bus (RAN) for connection of further user elements and displays		
Di	mensions (HxWxD): 205 x 110 x 34 mm		

Functions	Order No.
ComTerminal Flamenco, desktop installation	77 0511 00
<ul> <li>as 77 5100 00 but for desktop installation.</li> <li>Desktop installation</li> <li>Connection to group bus (OSYnet) via connection socket ComStation (77 0452 30 A or 77 0452 30 F)</li> <li>2.5 m connection cable with strain relief</li> </ul>	
Dimensions (HxWxD): 30 – 120 x 110 x 240 mm	

Functions	Order No.
RoomTerminal Flamenco	77 0520 00
Room terminal for use in patient rooms, staff rooms and function rooms, without speech communication.	
<ul> <li>Surface mounting, plug-in electronic com- ponents</li> </ul>	
Connection to OSYnet group bus	
<ul> <li>Red call button with symbol, location light and reassurance light</li> </ul>	
<ul> <li>Blue alarm button with symbol, location light and reassurance light</li> </ul>	
<ul> <li>Green large presence button for staff 1, with reminder light</li> </ul>	
<ul> <li>Yellow large presence button for staff 2, with reminder light</li> </ul>	
4 function keys with situation related func- tions	10.34
Attention tone for announcements	
<ul> <li>Call re-activation after a programmed time</li> </ul>	
<ul> <li>Graphic display, backlit, 128x64 dot ma- trix</li> </ul>	
<ul> <li>Configuration menu for selection of room functions and for system parameter set- ting</li> </ul>	
<ul> <li>Integrated function monitoring feature with status indication</li> </ul>	
<ul> <li>International version, language selectable via configuration</li> </ul>	
<ul> <li>Moisture-protected casing (IP 54)</li> </ul>	
<ul> <li>Close and smooth user surface, easy to clean and to disinfect</li> </ul>	
No data loss during power failure	
<ul> <li>Possible mixed operation in Flamenco<sup>IP</sup> systems with speech</li> </ul>	
<ul> <li>Room bus (RAN) for connection of further user elements and displays</li> </ul>	
Dimensions (HxWxD): 205 x 110 x 34 mm	

Functions	Order No.	
RoomTerminal Flamenco, desktop installation	77 0521 00	
as 77 5200 00 but for desktop installation.		
Desktop installation		1900 2
<ul> <li>Connection to group bus (OSYnet) via connection socket ComStation (77 0452 30 A or 77 0452 30 F)</li> </ul>		
2.5 m connection cable with strain relief		
Dimensions (HxWxD): 30 – 120 x 110 x 240 mm		
ControlTerminal Flamenco	77 0550 00	
ControlTerminal for patient rooms, staff rooms and function rooms, without speech communication. The ControlTerminal includes a room lamp and is installed in the corridor instead of a room lamp. Surface mounting Connection to OSYnet group bus No data loss during power failure 4 light sections: LED red: calls LED green: staff presence 1 LED yellow: staff presence 2 LED white: WC call Possible mixed operation in Flamenco <sup>IP</sup> systems with speech Room bus (RAN) for connection of further		
Room bus (RAN) for connection of further user elements and displays		
Dimensions (HxWxD): 110 x 150 x 40 mm		
ControlTerminal Flamenco glass decor	77 0555 00	
as 77 0550 00, but with decorative glass frame.		
Dimensions (HxWxD): 110 x 150 x 40 mm		

Functions	Order No.	
ControlTerminal Flamenco with doorplate	77 0551 00	
as 77 0550 00, but additionally with label field for room designation.		Tresta
Dimensions (HxWxD): 190 x 150 x 40 mm Label field (HxW): approx. 70 x 92 mm		100 Patient Room

### 8.4 Connection sockets

Functions	Order No.	
Connection socket with call switch	70 0171 60 A	
Connection socket for two call devices with call button and extra external call input.		
1 red call button with reassurance light for raising calls		
<ul> <li>2 identical sockets for connection of plug- in call devices (e.g. pear push switch)</li> </ul>		
1 backside connection to an additional call button with location and reassurance light. Normally closed or normally open contact can be set by DIP switch		
<ul> <li>2 outputs for light control, see chapter 17.</li> <li>"Light control" on page 207</li> </ul>		
<ul> <li>Connection to room bus (RAN)</li> </ul>		
Dimensions (HxWxD): 91 x 91 x 36 mm		
Connection socket with call switch	70 0171 60 C	
as 70 0171 60 A, but with glass frame.		
Dimensions (HxWxD): 107 x 107 x 36 mm		
Connection socket with call switch	70 0171 60 F	
as 70 0171 60 A, but with narrow frame.		
Dimensions (HxWxD): 80 x 80 x 36 mm		

Functions	Order No.	
Connection socket with call switch, bedhead unit	70 0171 50	
Connection socket for two call devices with call button and extra external call input.		
<ul> <li>1 red call button with reassurance light for raising calls</li> </ul>		
<ul> <li>2 identical sockets for connection of plug- in call devices (e.g. pear push switch)</li> </ul>		
1 backside connection for an additional call button with location and reassurance light. Normally closed or normally open contact can be set by DIP switch.		Participant 2004
<ul> <li>2 outputs for light control, see chapter 17.</li> <li>"Light control" on page 207</li> </ul>		
Connection to room bus (RAN)		
Dimensions (HxWxD): 70.5 x 70.5 x 28 mm		
Connection socket combi	70 0424 00	
For wall mounting. For connecting of patient units and call devices.		
1 socket for patient handset (74 0747 00)		
<ul> <li>1 socket for call device (e.g. pear push switch)</li> </ul>		
<ul> <li>2 outputs for light control, see chapter 17.</li> <li>"Light control" on page 207</li> </ul>		••
5 entertainment programmes		1 and the second second
Connection for TV sound		
<ul> <li>TV control in combination with RAN inter- face (77 0840 00)</li> </ul>		
<ul> <li>Connection to room bus (RAN)</li> </ul>		
Dimensions (HxWxD): 90 x 181 x 10 mm		

Fu	nctions	Order No.	
Co un	onnection socket combi, bedhead it	70 0434 00	
Fo co	r installation in medical supply units. For nnecting of patient units and call devices.		
	1 socket for patient handset (74 0747 00)		
	1 socket for call device (e.g. pear push switch)		
-	2 outputs for light control, see chapter 17. "Light control" on page 207		
	5 entertainment programmes		
	Connection for TV sound		
	TV control in combination with RAN inter- face (77 0840 00)		
	Connection to room bus (RAN)		
Diı	mensions (HxWxD): 181 x 131 x 37 mm		
Сс	onnection Socket ComStation	77 0452 30 A	
Da Co me mo Dir	ta socket for connecting a mStation <sup>BUS-C</sup> , ComStation <sup>CT</sup> Flamenco, mStation <sup>T</sup> Flamenco, ComTerminal Fla- enco desktop installation, Terminal Fla- enco desktop installation. For wall punting on a 2 gang back box. mensions (HxWxD): 91 x 162 x 79 mm		
Сс	onnection Socket ComStation	77 0452 30 F	
as Dir	77 0452 30 A, but with narrow frame. nensions (HxWxD): 80 x 151 x 79 mm		
Сс	onnection Socket ComStation <sup>PC</sup>	77 0452 60 A	
Da Fo Dir	ta socket for connecting a ComStation <sup>PC</sup> . r wall mounting on a 2 gang back box. mensions (HxWxD): 91 x 162 x 55 mm		
Co	onnection Socket ComStation <sup>PC</sup>	77 0452 60 F	
as Dir	77 0452 60 A, but with narrow frame. nensions (HxWxD): 80 x 151 x 55 mm		

#### 8.5 Patient units

Functions	Order No.
Patient handset	74 0747 00
<ul> <li>Patient handset with duplex speech facility.</li> <li>Designed for use at the patient bed</li> <li>Ergonomic housing with all-round protective edge</li> </ul>	
Protection class (IP54)	
<ul> <li>Automatic switching of volume in relation to the type of usage</li> </ul>	
<ul> <li>Audio transmission (TV/Radio) discrete or open via loudspeaker</li> </ul>	
<ul> <li>TV control in combination with RAN inter- face (77 0840 00)</li> </ul>	
Clear inscription with simple symbols	
<ul> <li>Excellent voice quality, high-quality micro- phone and high-quality loudspeaker</li> </ul>	
Red call button with reassurance light and integrated location light	
Yellow light button for reading light	
Yellow light button for room light	
<ul> <li>2 buttons for control of the entertainment programmes (TV/Radio)</li> </ul>	
2 buttons for volume control (TV/Radio)	
2 buttons for TV control, status indication	
<ul> <li>1 ear phone socket (3.5 mm jack) for conventional ear phones (32 Ohm), e.g.</li> <li>70 0801 00</li> </ul>	
<ul> <li>Connection cable with rugged connector, cable length 2.5 m</li> </ul>	
<ul> <li>Wall fixing with patient handset bracket (70 0800 00) possible</li> </ul>	
Weight: 297 g	
Dimensions (HxWxD): 195.5 x 52 x 25 mm	

Functions	Order No.	
Pear push switch incl. call and light switch 2 m connection cable	70 0710 00	
Humidity protected call and light switch for raising calls and reading light control.		
Approx. 2 m flexible connection cable with plug for plug-in connection to a connec- tion socket, socket for pear push switch		
Dimensions (HxW): 60 x 20 mm		
Pear push switch incl. call and light switch 4 m connection cable	70 0710 01	
as 70 0710 00, but 4 m connection cable.		
Dimensions (HxWxD): 60 x 20 mm		
Pear push switch incl. 2 call switches 2 m connection cable	70 0711 00	
Humidity protected call switch for raising calls.		
Approx. 2 m flexible connection cable with plug for plug-in connection to a connec- tion socket, socket for pear push switch		
Dimensions (HxW): 60 x 20 mm		
Pear push switch incl. 2 call switches 4 m connection cable	70 0711 01	
as 70 0711 00, but 4 m connection cable.		
Large-surface pneumatic switch plug-in connection to connection socket	70 0106 99	
Call switch for large-surface pneumatic acti- vation. Only a very slight actuation force is required in order to activate the switch. It is therefore very well suited when there are acti- vation problems due to illness.		
Red call button, round, Ø 90 mm		-
Approx. 2 m flexible connection cable with plug for plug-in connection to a connec- tion socket, socket for pear push switch		
Dimensions (HxØ): 45 x 110 mm		

Functions	Order No.
Sound detector plug-in connection to connection socket	70 0790 01
The sound detector registers the noises pro- duced by the patient as call and then initiates a call. Furthermore a call can be initiated by pressing the red call button on the unit.	
<ul> <li>Microphone sensitivity adjustable</li> </ul>	
Noise filtering adjustable	Vanden
<ul> <li>Call button (red) for manual raising of calls</li> </ul>	
<ul> <li>Microphone ON/OFF switch (grey)</li> </ul>	
Approx. 2 m flexible connection cable with plug for plug-in connection to a connec- tion socket, socket for pear push switch	
Dimensions (HxWxD): 110 x 20 x 50 mm	
Diagnostic connection cable plug-in connection to connection socket	70 0812 10
Connection cable for connecting a medical electrical device to the nurse call system via a connection socket, order no. 70xxxxx, in order to trigger a diagnostic call in the nurse call system for alarms of the medical electri- cal equipment.	
<b>Warning!</b> The transmission of alarm condi- tions of medical electrical equipment (e.g. monitoring devices) to the nurse call system serves only as supporting, additional informa- tion. This is a distributed information system. Due diligence for the operation of such medi- cal electrical equipment remains unaffected in case of the connection to the nurse call system.	A
<ul> <li>Free wire ends for the connection of a medical electrical device</li> </ul>	
Plug for plug-in connection to a connec- tion socket, socket for pear push switch	
Cable length 2 m	

Fu	nctions	Order No.	
<b>Se</b> plu	ensor mat Ig-in connection to connection socket	Z 00 8002 02	
La on in f be is i	rge mat for triggering of calls by stepping it or by pressing it. The mat is placed e.g. front of the bed. If the patient leaves the d or falls from the bed onto the mat, a call nitiated.		
	Large sensor area Disconnection call Fault monitoring Water-proof PVC, easy to clean Approx. 2 m flexible connection cable with plug for plug-in connection to a connec- tion socket, socket for pear push switch		
		7 00 0004 40	
<b>вг</b> plu	eatning sensor set Ig-in connection to connection socket	2 00 8201 40	
No per slig allo	n-contact breath controlled call sensor for rsons with greatly restricted mobility. The ghtest breathing on the breathing sensor ows to specifically trigger a call.		
•	A highly flexible goose-neck (670 mm) serves for comfortably adjusting the sen- sor directly at the bed		
•	Optical status indication directly at the sensor head		
	Disconnection monitoring		
•	Approx. 2 m flexible connection cable with plug for plug-in connection to a connection socket, socket for pear push switch		
Dir sei	nensions of the nsor unit (HxWxD): 80 x 130 x 30 mm		

#### 8.6 Radio call devices

Functions	Order No.	
Radio receiver-T plug-in connection to connection socket	Z 00 8202 33	
Radio receiver on operating frequency 869.2125 MHz (social alarm frequency) for receiving the signals from associated radio transmitters.		
Plug-in connection to a connection socket, socket for pear push switch. Activating the radio trigger generates the same call type that would be generated by a pear push switch connected to the same socket.		
<b>Note!</b> The radio transmission is not moni- tored. The transmitters may be used only as complementary call devices in combination with a nurse call system.		
Integrated antenna		
64 radio transmitters programmable		
<ul> <li>Master mode can be activated to receive any number of radio transmitters</li> </ul>		
If the battery of the assigned radio trigger is low, the LED on the radio receiver is flashing red		
<ul> <li>Radio range dependent depending on structural conditions of the building, up to 30 m</li> </ul>		
Short cable (approx. 16 cm) with plug		
Dimensions (HxWxD): 66 x 46 x 18 mm		
Magnetic wall bracket for radio receiver-T	Z 00 8202 21	
for magnetic mounting of a radio receiver-T to the wall beside the connection socket.		
Dimensions (HxWxD): 64 x 40 x 12 mm		

Functions	Order No.
Radio receiver-T UP with free wire ends	Z 00 8202 35
Radio receiver on operating frequency 869.2125 MHz (social alarm frequency) for receiving the signals from associated radio transmitters.	
Plug-in connection to a connection socket, socket for pear push switch. Activating the radio trigger generates the same call type that would be generated by a pear push switch connected to the same socket.	
<b>Note!</b> The radio transmission is not moni- tored. The transmitters may be used only as complementary call devices in combination with a nurse call system.	
Integrated antenna	
64 radio transmitters programmable	
<ul> <li>Master mode can be activated to receive any number of radio transmitters</li> </ul>	
If the battery of the assigned radio trigger is low, the LED on the radio receiver is flashing red	Mr.
<ul> <li>Radio range dependent depending on structural conditions of the building, up to 30 m</li> </ul>	
<ul> <li>Connection to the room bus (RAN) via RAN interface (77 0840 00)</li> </ul>	
Frame with 55 mm internal dimension required, not included in scope of delivery. When using a frame from the Flamenco range, an intermediate frame is required, i.e: Intermediate frame (77 0210 56) + Frame A (77 0210 51) or Frame F (77 0210 53) or Frame C (77 0210 52)	
Dimensions (HxWxD): 55 x 55 x 10 mm	

Functions	Order No.
<b>MyAmie</b> to be assigned to radio receiver-T or -T UP	P68007/02
A small and waterproof personal radio trigger for wireless initiation of calls. It is light weight and provides different wearing options. A wrist strap and a neckcord are included with scope of delivery.	
Call button	
<ul> <li>Control LED lights up red, if call button is pressed</li> </ul>	in the second se
<ul> <li>Radio coverage in connection with radio receiver-T or -T UP depending on struc- tural conditions of the building, up to 30 m</li> </ul>	The second secon
<ul> <li>Lithium battery, prognosticated battery life: 7 years</li> </ul>	
When the battery is low, the LED on the radio receiver flashes red	
<ul> <li>Dust tight and protected against ingress of water when MyAmie is immersed in water under defined conditions of pressure and time (IP 67)</li> </ul>	
Dimensions (HxWxD): 14 x 27 x 36 mm	

Fu	nctions	Order No.	
iVi to	be assigned to radio receiver-T or -T UP	P68005/47	
Th tor gra au fall	e iVi allows the wearer to press a call but- to generate a call manually. An inte- ated, intelligent fall detection technology tomatically generates a call if it detects a		
	Call button		
	Automatically generating a call if a fall is detected		-0
	Adjustable sensitivity		
	Radio coverage in connection with radio receiver-T or -T UP depending on struc- tural conditions of the building, up to 30 m		10 - B
•	Lithium battery in easy-open compart- ment to enable simple replacement. Bat- tery life: approx. 12 months		
-	When the battery is low, the LED on the radio receiver flashes red		ALL E
-	Dust tight and protected against ingress of water when iVi is immersed in water under defined conditions of pressure and time (IP 67)		
	Accessories: brooch clip, neckcord, belt clip		
Diı	nensions (HxWxD): 58 x 38 x 14 mm		

Functions	Order No.	
Universal sensor to be assigned to radio receiver-T or -T UP	61005/30	
Universal sensor for wireless transmission of the alarm messages of wired telecare sensors.		
<ul> <li>Four keys and LCD display for easy con- figuration</li> </ul>		
<ul> <li>Normally open or normally-closed contact (potential free) can be connected</li> </ul>		
Connection to the free wire-ends of the 200 cm connection cable with RJ11 plug. Connection to the 3.5 mm jack socket as an option		
<ul> <li>Radio coverage in connection with radio receiver-T or -T UP depending on struc- tural conditions of the building, up to 30 m</li> </ul>		
<ul> <li>Expected service life of the replaceable battery approx. 5 years under normal con- ditions</li> </ul>		
When the battery is low, the LED on the radio receiver flashes red		
Dimensions (HxWxD): 85 x 51 x 25 mm		
Large-surface pneumatic radio switch to be assigned to radio receiver-T or -T UP	75 0711 00	
Wireless call switch for large-surface pneu- matic activation. Only a very slight actuation force is required in order to activate the switch. It is therefore very well suited when there are activation problems due to illness.		
■ Red call button, round, Ø 90 mm		
LED initiation indicator lights up red when the call button is pressed		
<ul> <li>Radio coverage in connection with radio receiver-T or -T UP depending on struc- tural conditions of the building, up to 30 m</li> </ul>		-
Approx. 3 years expected battery life un- der normal conditions. The battery can only be replaced by Tunstall		
When the battery is low, the LED on the radio receiver flashes red		
Dimensions (HxØ): 45 x 110 mm		

Fu	nctions	Order No.	
Wi to i	reless sensor mat 869 MHz be assigned to radio receiver-T or -T UP	Z 00 8002 01	
Lai on e.g pat	rge mat for triggering of calls by stepping or pressing the mat. The mat is positioned by the bed. A call is raised when the cient gets out of bed or falls out of bed and to the mat.		
	Large sensor area		
	Soft PVC, easy to clean		- Hora
	Radio coverage in connection with radio receiver-T or -T UP depending on structural conditions of the building, up to 30 m		
	Battery operation - no wiring		
-	When the battery is low, the LED on the radio receiver flashes red		
Dir Ste	nensions (W x D): 1200 x 500 mm apping area thickness: 4 mm		
Wi to I	reless step-on sensor mat CM be assigned to radio receiver-T or -T UP	Z 00 8003 01	
Ro wit cal the out ma	bust, step-, slip- and stumble-resistant mat h bevelled edges and knobbed surface for I release. The mat is placed e.g. in front of bed. A call is raised when the patient gets of bed or falls out of bed and onto the t.		
	Rectangular form		
	Polyurethane, easy to clean		
	Radio coverage in connection with radio receiver-T or -T UP depending on structural conditions of the building, up to 30 m		
	Battery operation - no wiring		
	Battery (CR 2032) replaceable		
-	When the battery is low, the LED on the radio receiver flashes red		
Dir Ste	nensions (W x D): 1100 x 700 mm apping area thickness: 9 mm		

Fun	ctions	Order No.	
Wir to b	eless step-on sensor mat NM e assigned to radio receiver-T or -T UP	Z 00 8003 02	
Rob with call the out mat	bust, step-, slip- and stumble-resistant mat bevelled edges and knobbed surface for release. The mat is placed e.g. in front of bed. A call is raised when the patient gets of bed or falls out of bed and onto the		
	Semicircular form		
-	Polyurethane, easy to clean		
-	Radio coverage in connection with radio receiver-T or -T UP depending on struc- tural conditions of the building, up to 30 m		-
	Battery operation - no wiring		
	Battery (CR 2032) replaceable		
-	When the battery is low, the LED on the radio receiver flashes red		
Dim Step	ensions (W x D): 1100 x 700 mm oping area thickness: 9 mm		
Rac to b	<b>lio smoke alarm</b> e assigned to radio receiver-T or -T UP	68005/70	
Smo calls dete ciple alar and	oke alarm device for wireless triggering of s in case of smoke development. Smoke ection is based on the scattered light prin- e. The smoke alarm transmits the smoke m by radio to the assigned radio receiver emits an acoustic signal in parallel.		
-	Loud local audible alarm in case of smoke detection		
-	Radio coverage in connection with radio receiver-T depending on structural condi- tions of the building, up to 30 m		
-	Battery operation - no wiring		
	Battery life: 10 years		
	Smoke alarm service life: 10 years		
-	When the battery is low, the LED on the radio receiver flashes red		
Dim Wei	ensions (HxØ): 50 x 150 mm ght: approx. 185 g		

## 8.7 Call handling consoles

Fu	nctions	Order No.	
Co	omStation <sup>BUS-C</sup>	77 0605 50	
Wa an nu	ard console for ward nurse station for swering and handling calls and to support rsing service.		
	Microphone, loudspeaker and handset for speech communication		
	Call answering and call handling		
	Automatic answering according to priority		
	Announcements		
	Enabling and disabling of ward coupling		
	Enabling and disabling of shifts		
	Display of system messages		
	Handset or hands-free speech		
	5.7 inch multi-functional colour display, LED illuminated		
	Operation using select buttons as soft keys		The second second
	Plastic foil keypad		
	Desktop or wall mounting		
	Output for staff presence		
	Output for external call tone		
•	Connection to the group bus (OSYnet) via Connection Socket ComStation (77 0452 30 A or 77 0452 30 F)		
Diı	nensions (HxWxD): 55 x 273 x 185 mm		
Co	omStation <sup>PC</sup>	77 0602 00	
Sc de wit gro	reen based version of a ward console for centralised processing of all functions hin a ward. Prepared for connection to the bup bus (OSYnet). Speech communication via desktop speech unit with integrated handset. Interface for system computer System computer (80 6010 00D)		
	Monitor (80 6049 00)		
	UPS 600 VA/360 W (21 9000 00)		

Functions	Order No.	
ComStation <sup>PC</sup> - continued -	77 0602 00	
<ul> <li>Display and processing of prepared ward functions</li> <li>Calls, Emergency calls, Alarms</li> <li>Indication of call location</li> <li>Staff presence states</li> <li>Bed identification 1 – 6</li> <li>Call status (fresh / answered)</li> </ul>		
<ul> <li>Additional information</li> <li>Date / Clock time</li> <li>Speech control and speech status</li> <li>Technical system messages</li> <li>Operating modes</li> <li>Ward mode</li> <li>Ward coupling</li> <li>Freely defined operating modes</li> </ul>		
Announcements Flexible installation of different announce- ment circuits, ordered by rooms or areas as individual or general announcements to all rooms or to rooms with active presences states only.		
<b>Software maintenance contract</b> The acquiring of the system software Primus- Global <sup>+</sup> is combined with placing of a Soft- ware maintenance contract with costs.		

Functions	Order No.		
ComStation <sup>CT</sup> Flamenco	77 0606 00		
Desktop terminal with duplex speech facility for the nurse station. Designed for handling and processing of calls, raising of calls or alarms to call for additional staff. Enabling and disabling ward couplings and shifts (zone nursing).			
Innovative control panel made of real glass with integrated sensors and display elements for easy and intuitive operation			
4 function keys with situation related func- tions			
<ul> <li>Red call button with symbol, location light and reassurance light</li> </ul>			
<ul> <li>Blue alarm button with symbol, location light and reassurance light, configurable</li> </ul>			
<ul> <li>Green large presence button for staff 1, with reminder light</li> </ul>			
<ul> <li>Yellow large presence button for staff 2, with reminder light</li> </ul>		and a state of the	
Moisture-protected casing			
<ul> <li>Close and smooth surface, easy to clean and to disinfect</li> </ul>			
<ul> <li>Indication of nurse call system faults with fault location</li> </ul>			
<ul> <li>Possible mixed operation in Flamenco<sup>IP</sup> systems without speech</li> </ul>			
<ul> <li>Room bus (RAN) for connection of further user elements and displays</li> </ul>			
<ul> <li>International version, language selectable via configuration</li> </ul>			
Integrated configuration menu			
<ul> <li>Possible mixed operation in Flamenco<sup>IP</sup> systems without speech</li> </ul>			
Integrated interface for room bus (RAN)			
<ul> <li>Connection to group bus (OSYnet) via connection socket ComStation (77 0452 30 A or 77 0452 30 F)</li> </ul>			
2.5 m connection cable with strain relief			
Dimensions (HxWxD): 30 – 120 x 110 x 240 mm			
Fu	nctions	Order No.	
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Сс	omStation <sup>T</sup> Flamenco	77 0606 20	
Desktop terminal without speech communica- tion for the nurse station for displaying and acknowledging of calls, raising of calls or alarms to call for additional staff. Enabling and disabling ward couplings and shifts (zone nursing).			
1	Innovative control panel made of mem- brane switches and display elements for easy and intuitive operation		
	4 function keys with situation related func- tions		
•	Red call button with symbol, location light and reassurance light		
	Blue alarm button with symbol, location light and reassurance light		
•	Green large presence button for staff 1, with reminder light		. 3
•	Yellow large presence button for staff 2, with reminder light		
•	Close and smooth user surface, easy to clean and to disinfect		
•	Indication of nurse call system faults with fault location		
•	International version, language selectable via configuration		
	Integrated configuration menu		
•	Possible mixed operation in Flamenco <sup>IP</sup> systems with speech		
	Integrated interface for room bus (RAN)		
1	Connection to group bus (OSYnet) via connection socket ComStation (77 0452 30 A or 77 0452 30 F)		
	2.5 m connection cable with strain relief		
Dir 30	nensions (HxWxD): – 120 x 110 x 240 mm		

Functions	Order No.
ManagementCenter <sup>PC</sup>	77 0610 00
Central console as PC console for central handling and processing of all functions within the nurse call system. Prepared for the connection to a separate IP-SystemManager running function module VOIP GATE and for the connection to the IP network of the nurse call system.	
Speech communication via desktop speech unit with integrated hand-held re- ceiver.	
Interface for system computer	
<ul> <li>System computer (80 6010 00D)</li> </ul>	
Monitor (80 6049 00)	
UPS 600 VA/360 W (21 9000 00)	
<ul> <li>Indication and processing of functions which are prepared for the nurse call system (selection)</li> <li>Calls, Emergency calls, Alarms</li> <li>Indication of call location</li> <li>Staff presence states</li> <li>Bed identification 1 – 6</li> <li>Call status (fresh / answered)</li> <li>Additional information</li> <li>Speech control and speech status</li> <li>Technical system messages</li> <li>Messages from external systems via interfaces</li> </ul>	
Announcements Flexible preparation of different announce- ment circuits sorted by rooms, wards, areas as individual or general announcements to all rooms or only to rooms with active presence states.	
Control of operating modes Central mode / Ward mode	
Ward coupling	
<ul> <li>Mixed operating modes, freely defined</li> </ul>	
<b>Software maintenance contract</b> The acquiring of the system software Primus- Global <sup>+</sup> is combined with placing of a Soft- ware maintenance contract with costs.	

# 8.8 System software and PC

Functions	Order No.
Call recording Flamenco, complete set	50 1027 10
The complete set Call Recording Flamenco is used to support the care documentation. All call data, staff registrations and system events are recorded. Data storage is effected with date, time plus relevant information as to the data source such as ward and room.	
Filtering and sorting of data can be selected for numerous combinations of criteria. For succeeding post-processing and analysis there is an export function to convenient office applications.	
Connection to the nurse call system's IP net- work.	
Components System computer (80 6010 00D) Monitor (80 6049 00)	
UPS 600 VA/360 W (21 9000 00)	
<ul> <li>PrimusGlobal+ "Call recording" (77 0710 00)</li> </ul>	
<b>Software maintenance contract</b> The acquiring of the system software Primus- Global <sup>+</sup> is combined with placing of a Soft- ware maintenance contract with costs.	

Functions	Order No.	
PrimusGlobal module Building Services		
The module Building Services is a supple- ment to the basic package of the Primus- Global+ software family. To support the building services an information service dis- plays all nurse call system events.		
<ul> <li>Specification</li> <li>Displayed data are taken from the nurse call system</li> </ul>		
<ul> <li>Visualisation in block graphics</li> </ul>		
<ul> <li>Parallel display of system messages, system status, and fault messages</li> </ul>		
<ul> <li>System requirement</li> <li>Existing installation of PrimusGlobal+ "Call recording", e.g. as Call recording Flamenco, complete set.</li> </ul>		
<b>Software maintenance contract</b> The acquiring of the system software Primus- Global <sup>+</sup> is combined with placing of a Soft- ware maintenance contract with costs.		
PrimusGlobal <sup>+</sup> module "Connect"	77 0720 00	
Supplement to the PrimusGlobal <sup>+</sup> <sup>"</sup> Manage- mentCenter". The module "Connect" pro- vides interfaces to other systems, such as hospital information system (HIS).		FlamencolP nurse call system PrimusGlobal+ module "Connect"
Depending on the respective application, Connect uses the appropriate system driver (e.g. system driver HL7)		HIS I
PrimusGlobal <sup>+</sup> system driver HL7	77 0720 01	
Nursing and/or personal data to be used at the console of the Flamenco <sup>IP</sup> nurse call sys- tem can be assessed from the hospital infor- mation system (HIS). The system driver HL7 establishes the link between the hospital information system and the software family PrimusGlobal <sup>+</sup> .		Note: The second secon

Functions	Order No.
PrimusGlobal <sup>+</sup> System set-up and configuration	77 0790 00
Basic installation work for operating the sys- tem and installation/preparation of the rele- vant function modules, components, and drivers.	
Hardware is prepared and tested according to the specific requirements.	
The hierarchic structure for the user screen surface is established according to the requirements.	
PrimusGlobal <sup>+</sup> Project data for up to 36 rooms, block graphics	77 0790 01
Additionally to the system set-up & configura- tion the single rooms have to be configured according to the project specific require- ments. The project specific data and designa- tions for buildings, wards and rooms are established. The individual display elements for rooms and wards are placed and acti- vated in the desired way. Presentation as block graphic elements.	
PrimusGlobal <sup>+</sup> Project data for up to 36 rooms, layout graphics	77 0790 02
as 77 0790 01, but presentation in compli- ance with the plan view.	
The plan views have to be delivered by the customer as CAD files.	

Functions		Order No.	
SystemOrganizer		77 0750 00	
Software for comfortable planning and config- uring of Flamenco <sup>IP</sup> nurse call systems. Comprehensive range of settings for simple use and operation.			
Op	Deration Interactive and user-guided application		
	2 display levels (electric, organisational structure)		
	Access to all system and project data via tree structure		
	Organisation of several projects and ar- chiving of data		
-	Read out of project configuration of cur- rent project, presentation of current con- figuration		
	Plausibility check during data input		
Pr	erequisites Operating system: Microsoft Windows 10 (32 bit, 64 bit), Windows 7 (32 bit, 64 bit)		
	10/100 Mbit LAN access		
	"SystemOrganizer" training course		
Sy	vstem computer	80 6010 00D	
System computer for operation and control of a ManagementCenter <sup>PC</sup> , a ComStation <sup>PC</sup> , or for the use of independently operating software applications.			
Design and version in compliance with cur- rent standard equipment. Further details on request.			
Monitor		80 6049 00	
De rer rec	esign and version in compliance with cur- nt standard equipment. Further details on quest.		

### 8.9 TV

Functions	Order No.	
IR TV control module universal incl. cable set	77 0360 11	
Interface for the control of a standard TV set		

#### 8.9.1 Connection of standard TV sets

Interface for the control of a standard TV set using infrared signals. A wide range of TV manufacturers and Is are supported, e.g. LG, Philips, Samsung. Integrated audio amplifier for driving an operator device. The output volume can be adjusted within predefined limits.

The adjustment of the audio level with the TV sets in use has to be taken into account.

Consisting of a control module and an infrared transmitting unit. Mounting directly to the IR input of the TV set.

For the configuration of the control signals the TV set model must be known.

- Terminal program for the configuration of the IR TV control module delivered on a USB stick
- Loader for convenient and quick transfer of the configuration to further IR TV control modules
- Integrated interface to the room bus (RAN)
- 2 LEDs indicate the operating state
- Incl. cable set
- The following IR signal s are supported: RC5/RC5X (e.g. Philips), RC6, SAM-SUNG, LG/NEC
- Configuration laptop requirements: Microsoft Windows 10 64 bit or Microsoft Windows 7 64 bit. USB 2.0 connection
- Power supply from the nurse call system (24 V DC)
- Integrated galvanic separation point according to DIN VDE 0834-1.

Dimensions (HxWxD): 35 x 135 x 90 mm

Functions	Order No.
TV audio amplifier	77 0365 00
Audio amplifier for the distribution of audio signals to max. 4 listening points/beds. Usable with TV sets with headphones socket. All required connecting cables and fixing materials are included with delivery.	
<ul> <li>Up to 4 listening points/beds</li> <li>Integrated galvanic separation point according to DIN VDE 0834-1.</li> <li>Potentiometer with pin to the outside for volume control</li> <li>External 12 V power supply. NOTE TO THE INSTALLATION: A second mains socket is required per TV set for the TV audio amplifier.</li> </ul>	
Dimensions (HxWxD): 27 x 86 x 70 mm	

### 8.9.2 Hospital LED TV

Functions	Order No.	
Hospital LED TV, professional		
TV for use in patient rooms. Prepared for use together with Flamenco <sup>IP</sup> nurse call system.		
Aspect ratio: 16:9		
VESA standard		
Design and version in compliance with cur- rent standard equipment. Further details on request.		
<ul> <li>Hospital LED TV, professional 32"</li> <li>Screen diagonal: 81 cm / 32 inch</li> </ul>	74 7005 32/ 15	
<ul> <li>Hospital LED TV, professional 40"</li> <li>Screen diagonal: 100 cm / 40 inch</li> </ul>	74 7005 40/ 15	Image similar
Hospital LED TV, professional 48" ■ Screen diagonal: 121 cm / 48 inch	74 7005 48/ 15	
TV installation kit	74 7002 56/ 15	

Functions	Order No.
<ul> <li>TV wall mount "Base"</li> <li>One pivot point</li> <li>Tilting, pivoting</li> <li>VESA MIS-D, 100, MIS-D, 75</li> <li>Additional adapter for VESA MIS-E 200 x 200mm</li> </ul>	74 7002 80
<ul> <li>TV wall mount "Advance"</li> <li>Two pivot points</li> <li>Tilting, pivoting and extendible</li> <li>VESA MIS-D, 100, MIS-D, 75</li> <li>Additional rails for VESA MIS-E 200 x 200mm</li> </ul>	74 7002 81
<ul> <li>TV wall mount "Comfort"</li> <li>Three pivot points</li> <li>Tilting, pivoting and extendible</li> <li>VESA MIS-D, 100, MIS-D, 75</li> <li>Additional rails for VESA MIS-E 200 x 200mm</li> </ul>	74 7002 82

## 8.10 Supplementary system components

Functions	Order No.
Loudspeaker with announcement interface	05 0024 01
Big, high efficiency, ceiling-mounted loud- speaker. For mounting in hallways and large rooms.	
<ul> <li>Adjustable amplifier for announcements</li> </ul>	
<ul> <li>Transducer for entertainment transmis- sion</li> </ul>	
Connection to OSYlink-Announcement	
Weight: approx. 2.4 kg Diameter: approx. 268 mm Height: 138 mm Cut-out in ceiling: 243 mm	
Door entry speaker	77 0350 00
For voice communication between main door and nurse call system. Suitable for use at out- side and inside doors.	
2 integrated buttons: Call and Delete	
<ul> <li>3 status lamps</li> </ul>	
Microphone and loudspeaker	
<ul> <li>Surface mounting</li> </ul>	
Installation in furniture possible	
<ul> <li>Direct connection to OSYlink-Door entry speaker</li> </ul>	
<ul> <li>Control of door lock release</li> </ul>	
■ IP 53	
Ambient temperature (operation): -25 – +55 °C	
Dimensions (HxWxD): 215 x 100 x 36 mm	

## 8.11 Interfaces

### 8.11.1 Interfaces in the group

Functions	Order No.
OSYlink-Door entry speaker	77 0801 00
Interface for connecting a door entry speaker (77 0350 00) to the group bus (OSYnet).	
<ul> <li>2-wire-connection to the door entry speaker (data and speech)</li> </ul>	
<ul> <li>Connection for door opener transformer 12 V AC</li> </ul>	
<ul> <li>Mounting on wall or top-hat rail (35 mm), several units can be mounted side-by- side</li> </ul>	
<ul> <li>Outputs short-circuit and overload pro- tected</li> </ul>	
Input for local call cancelling in combina- tion with a separate switch	
Dimensions (HxWxD): 90 x 106 x 58 mm	
OSYlink-Group lamp	77 0802 00
Interface for connecting group lamps to the group bus (OSYnet). Usable as collective or direction display. Room allocation and group forming possible.	9
<ul> <li>4 x 2 potential-free outputs for connecting 4 group lamps, with two light sections each</li> </ul>	
<ul> <li>Power supply selectable (jumper) internal from the nurse call system or external</li> </ul>	
<ul> <li>Flexible allocation of user addresses in the software SystemOrganizer</li> </ul>	
<ul> <li>Mounting on wall or top-hat rail (35 mm), several units can be mounted side-by- side</li> </ul>	
Dimensions (HxWxD): 90 x 106 x 58 mm	

Functions	Order No.	
OSYlink-Universal	77 0803 00	
and/or technical devices to the group bus (OSYnet).		
see chapter 4.2.1 "OSYlink-Universal" on page 38		
<ul> <li>The outputs are configured using the SystemOrganizer</li> </ul>		
<ul> <li>Mounting on wall or top-hat rail (35 mm), several units can be mounted side-by- side</li> </ul>		
Dimensions (HxWxD): 90 x 160 x 58 mm		
OSYlink-Announcement L	77 0804 00	
Interface for connecting announcement loud- speakers with announcement interface (05 0024 01) to the group bus (OSYnet). Connection of single devices or groups.		
<ul> <li>1 audio output for driving active loud- speakers (max. 5 loudspeakers)</li> </ul>		
1 potential-free digital output for control of signalling the activity of the announce-ment system		
<ul> <li>Mounting on wall or top-hat rail (35 mm), several units can be mounted side-by- side</li> </ul>		
Dimensions (HxWxD): 90 x 106 x 58 mm		

Functions	Order No.	
OSYlink AS-CCS	77 0870 00	
Interface for the compatible connection of the room terminals of a ward using one of the fol- lowing legacy systems to the Flamenco <sup>IP</sup>		
C201, NewLine, CCS 2000 G, CCS 1080 G, CCS 1080 W.		
For connecting a half-duplex speech system CCS1080 W additionally a speech amplifier (74 8000 00) with the power supply unit (21 8000 00) is required.		Turns Last
Configuration with SystemOrganizer		
<ul> <li>24 V-power supply from the ward power supply unit</li> </ul>		NAMES OF TAXABLE PARTY.
<ul> <li>Mounting on wall or top-hat rail (35 mm), several units can be mounted side-by- side</li> </ul>		
Dimensions (HxWxD): 90 x 160 x 58 mm		
Important note Existing projects are often complex in struc- ture (project history, customized solutions, existing cabling, etc.) That's why the function- ality has to be checked in case of using the OSYlink AS-CCS for each single project.		
OSYlink AS-L200	77 0872 00	
Interface for the compatible connection of the room terminals of a ward using one of the fol- lowing legacy systems to the Flamenco <sup>IP</sup> system: EccoLine L200, NewLine L200.		
Configuration with SystemOrganizer		
<ul> <li>24 V-power supply from the ward power supply unit</li> </ul>		Tenes to the Constant of Constant
<ul> <li>Mounting on wall or top-hat rail (35 mm), several units can be mounted side-by- side</li> </ul>		
Dimensions (HxWxD): 90 x 160 x 58 mm		
Important note Existing projects are often complex in struc- ture (project history, customized solutions, existing cabling, etc.) That's why the function- ality has to be checked in case of using the OSYlink AS-L200 for each single project.		

#### 8.11.2 Interfaces in the room

Functions	Order No.	
RAN interface	77 0840 00	
Interface for the connection of a third-party device to the room bus (RAN).		
A top-hat rail clip is included with delivery.		
<ul> <li>Available applications</li> <li>External call device raises call type "Call".</li> <li>External call device raises call type "Car-</li> </ul>		
<ul><li>diac alarm".</li><li>External call device raises call type "WC call".</li></ul>		
<ul> <li>External presence sensor switches pres- ence 1 or 2.</li> </ul>		
<ul> <li>External devices serves as privacy button.</li> <li>Telephone call raises call type "Tele- phone call".</li> </ul>		
TV set is controlled using patient handset.		
Dimensions (HxWxD) without top-hat rail clip: 32 x 34 x 16 mm		
RAN interface with speech	77 0880 00	
Interface for the connection of analogue speech systems per bed to the room bus (RAN). As patient units telephones or other devices with speech can be used, provided that they comply with the specification for the connection. The patient unit to be used has to be approved by Tunstall GmbH.		
Mounting on a top-hat rail e.g. in a medical supply unit.		
Dimensions (HxWxD) without fixing clips: 13 x 51 x 95 mm		

Functions	Order No.	
RAN interface universal	70 0848 00	
<ul> <li>Interface for the connection of external actuators being controlled by the patient handset, e.g. blinds upwards / blinds downwards. Transferring the signals in combination with a connection socket combi (70 0424 00) or a connection socket combi, bedhead unit (70 0434 00).</li> <li>2 potential-free normally open contacts</li> <li>Maximum contact load: 60 mA / 24 V.</li> <li>Control by one or all patient handsets in the room</li> <li>Connection to the room bus (RAN).</li> <li>Intended for mounting on a 35 mm sup Dimensions (HxWxD): 76 x 72 x 41 mm</li> </ul>		RAN-Sich it it e lio Nie was al Nie was al
Telephone interface relay	11 5350 00	
for connecting analogues telephones to a nurse call system. A telephone call will be displayed as a call in the nurse call system. <i>Dimensions (HxWxD): 70 x 35 x 70 mm</i> <i>Mounting on a 35 mm top-hat rail.</i>		SAR 5

# 8.12 System control (hardware and software)

Fu	nctions	Order No.	
IP	SystemManager	76 2100 00	
De me tioi	centralised control unit for operating a Fla- nco <sup>IP</sup> nurse call system for each organiza- nal group.		
Th for nu fac	e number of required IP-SystemManagers one complete system depends on the mber of wards and required central inter- es.		
All the ins cifi are coi dat	IP-SystemManagers are equipped with same technology and differ through the talled software modules and a project-spe- c configuration. The IP-SystemManagers set up according to the requirements and figured with the provided project-specific ta at the factory.		
Sy Va ava Ma up be any	stem and function modules rious system and function modules are ailable for installation on the IP-System- inagers - from the basic nurse call function to complex interfaces. Single modules can added and the system can be expanded at y time.		
Th Ma sej	e modules are not part of the IP-System- nager product. They must be purchased parately.		
Se ■	<b>tup and equipment</b> Device for mounting to a top-hat rail (35 mm) with 2 top-hat rail retaining clips on the rear of the device		
-	Installation into a 19" cabinet with option- ally available accessories possible, spa- tial requirement: 3 U		
	Nurse call systems with or without voice communication can be implemented		
	Remote access or system updates possible through the IP network		
	Subsequent system expansion or system changes possible without a problem		

Functions	Order No.	
IP-SystemManager - continued-	76 2100 00	
<b>Power supply</b> The IP-SystemManager is supplied with 24 V DC through the nurse call system. Depending on the system setup, a separate power sup- ply can also be used.		
<b>Fault messages</b> All fault messages of the nurse call system are displayed only on one IP-SystemMan- ager. This IP-SystemManager must be deter- mined during the planning of the system.		
<ul> <li>Connections (availability depends on the installed system and function modules)</li> <li>OSYnet group bus connection: data wires (3 pole) and speech wires (2 pole)</li> </ul>		
Ethernet connection (10/100 Mbit LAN connection RJ45); separation point ac- cording to DIN EN 60601-1 (2 x MOPP) in- tegrated.		
2 ESPA 4.4.4 interfaces (RS-232), sepa- ration point according to DIN EN 60601-1 (2 x MOPP) not integrated, order separa- tion device separately when using the in- terface: Interface isolator RS232 (76 5010 00)		
Dimensions (HxWxD): 132 x 216 x 48 mm		
System support		
In order to keep the system and the software modules up-to-date, it is mandatory to con- clude a software maintenance contract for all system and function modules installed. The annual costs include the usage rights and a regular software maintenance in the form of security updates to ensure system integrity.		
Software support IP-SystemManager Price/month per IP-SystemManager	76 702100	

Functions	Order No.	
19" Mounting Set	76 0900 01	
Mounting set for installation of the IP-System- Manager in a 19" system cabinet.		
Sheet steel frame with pre-mounted top-hat rail (35 mm) and front cover. Integrated cable catch, tension relief and necessary accessories are included.		
Dimensions (HxWxD): 132.5 x 482.6 x 180 mm Type of mounting: 19", 3 U Length of top-hat rail: 425 mm		
Ethernet switch, 8 port 10/100 Mbit/s, unmanaged	76 4500 00	
The switch is suitable for use in Flamenco <sup>IP</sup> nurse call system and can be directly mounted on a standard top-hat rail.		
Unmanaged switch, IEEE 802.3		
10/100 Mbit Ethernet		
<ul> <li>8 ports (RJ45)</li> <li>Autopagatetion and outo processing</li> </ul>		EDECORALS
LED status displays		
<ul> <li>Potential-free signalling contact signals power supply failure (24 V DC), current carrying capacity: typically 100 mA</li> </ul>		
Dimensions (HxWxD): 94 x 135 x 30 mm		

Functions	Order No.	
System module HEALTH	76 0730 00	
System software for the operation of a nurse call system, intended for the use in hospitals or similar institutions. Prepared for installation on an IP-SystemManger.		
The system module HEALTH provides the function of a complete nurse call system and can be combined with further function modules.		
<ul> <li>Controlling one physical ward of a nurse call system</li> </ul>		
<ul> <li>Suitable for systems with or without voice communication</li> </ul>		
<ul> <li>Functional characteristics according to DIN VDE 0834</li> </ul>		
Installation on an IP-SystemManager		
System support		
In order to keep the system and the software modules up-to-date, it is mandatory to con- clude a software maintenance contract. The annual costs include the usage rights and a regular software maintenance in the form of security updates to ensure system integrity.		
Software support HEALTH system, base costs Price/month per nurse call system	76 7030 00	
Software support System module HEALTH Price/month per installed module	76 7130 00	

Functions	Order No.	
System module CARE	76 0735 00	
System software for the operation of a nurse call system, intended for the use in nursing homes or similar institutions. Prepared for installation on an IP-SystemManger.		
The system module HEALTH provides the function of a complete nurse call system and can be combined with further function modules.		
<ul> <li>Controlling one physical ward of a nurse call system</li> </ul>		
<ul> <li>Suitable for systems with or without voice communication</li> </ul>		
<ul> <li>Functional characteristics according to DIN VDE 0834</li> </ul>		
Installation on an IP-SystemManager		
System support		
In order to keep the system and the software modules up-to-date, it is mandatory to con- clude a software maintenance contract. The annual costs include the usage rights and a regular software maintenance in the form of security updates to ensure system integrity.		
Software support CARE system, base	76 7035 00	
<b>costs</b> Price/month per nurse call system		
Software support System module CARE	76 7135 00	
Price/month per installed module		

Functions	Order No.	
Function module UM/A	76 0740 00	
System software for an unidirectional con- nection of telephone systems or pagers to the Flamenco <sup>IP</sup> nurse call system.		
Messages from the nurse call system are selectively forwarded to mobile devices, e.g. DECT, and are displayed there.		
<ul> <li>Displaying of messages from the nurse call system: Calls, emergency calls, alarms</li> </ul>		
<ul> <li>Displaying of calling location: Bed, room, ward</li> </ul>		
Acknowledgement of the message		
Confirmation of call acceptance		
The function module is installed on the appro- priate IP-SystemManager. It makes the func- tionality available in the entire nurse call system.		
The telephony system and/or the messaging server is physically connected to the LAN.		
Function module UM/A supports Ascom sys- tems.		
System support		
In order to keep the system and the software modules up-to-date, it is mandatory to con- clude a software maintenance contract for all system and function modules installed. The annual costs include the usage rights and a regular software maintenance in the form of security updates to ensure system integrity.		
Software support Function module UM/A Price/month per installed module	76 7040 00	

Functions	Order No.	
Function module UMS/A	76 0740 01	
System software for an unidirectional con- nection of telephone systems or pagers to the Flamenco <sup>IP</sup> nurse call system. This extended connection supports voice communication, SIP/VoIP.		
Messages from the nurse call system are selectively forwarded to mobile devices, e.g. DECT, and are displayed there. Voice com- munication can take place between the nurse call system and the telephony system.		
<ul> <li>Displaying of messages from the nurse call system: Calls, emergency calls, alarms</li> </ul>		
<ul> <li>Displaying of calling location: Bed, room, ward</li> </ul>		
Acknowledgement of the message		Lipified Massaging & Speech
<ul> <li>Confirmation of call acceptance</li> </ul>		
<ul> <li>Cancelling of calls (if permitted)</li> </ul>		
The function module is installed on the appro- priate IP-SystemManager. It makes the func- tionality available in the entire nurse call system.		
The telephony system and/or the messaging server is physically connected to the LAN.		
Function module UMS/A supports Ascom systems.		
System support		
In order to keep the system and the software modules up-to-date, it is mandatory to con- clude a software maintenance contract for all system and function modules installed. The annual costs include the usage rights and a regular software maintenance in the form of security updates to ensure system integrity.		
Software support Function module UMS/A Price/month.per.installed.module	76 7040 01	

Price/month per installed module

Functions	Order No.	
Function module UMS/T	76 0740 10	
as 76 0740 01, but function module UMS/T supports Tetronik systems.		Unified Messaging & Speech
Software support Function module UMS/T	76 7040 01	
Price/month per installed module		
Function module MED	76 0741 00	
System software for an unidirectional con- nection of electro-medical systems to the nurse call system Flamenco <sup>IP</sup> .		
Filtered messages are received by the nurse call system and displayed there. Hereby the priorities, the display order, and the display location can be configured.		
The function module is installed on the appro- priate IP-SystemManager. It makes the func- tionality available in the entire nurse call system.		Medical Systems
The communication is realised using ESPA 4.4.4 protocol via a serial interface RS-232.		A B C Medical Device
The choice of the data to be transferred and the configuration is made in a close agree- ment with the customer.		Medical Device System Server
System support		
In order to keep the system and the software modules up-to-date, it is mandatory to con- clude a software maintenance contract for all system and function modules installed. The annual costs include the usage rights and a regular software maintenance in the form of security updates to ensure system integrity.		
Software support Function module	76 7041 00	
Price/month per installed module		

Functions	Order No.	
Function module FAS	76 0742 00	
System software for an unidirectional con- nection of fire alarm systems to the nurse call system Flamenco <sup>IP</sup> .		
Filtered messages are received by the nurse call system and displayed there. Hereby the priorities, the display order, and the display location can be configured.		
The function module is installed on the appro- priate IP-SystemManager. It makes the func- tionality available in the entire nurse call system.		FAS (Fire Alarm System)
The communication is realised using ESPA 4.4.4 protocol via a serial interface RS-232.		
The choice of the data to be transferred and the configuration is made in a close agree- ment with the customer.		
System support		
In order to keep the system and the software modules up-to-date, it is mandatory to con- clude a software maintenance contract for all system and function modules installed. The annual costs include the usage rights and a regular software maintenance in the form of security updates to ensure system integrity.		
Software support Function module FAS Price/month per installed module	76 7042 00	

Functions	Order No.	
Function module VOIP GATE	76 0743 00	
The software is installed on an IP-System- Manager and represents a gateway to VoIP applications.		
This gateway can be used to connect a Man- agementCenter to the Flamenco <sup>IP</sup> nurse call system or to install a speech channel between an OSY-ControlCenter and the Fla- menco <sup>IP</sup> nurse call system.		
The communication is established via the NF connection terminal of the IP-SystemManagers. Depending on the number of requested speech channels possibly several IP-System-Managers have to be installed for the application.		VolP-Gateway
System support		
In order to keep the system and the software modules up-to-date, it is mandatory to con- clude a software maintenance contract for all system and function modules installed. The annual costs include the usage rights and a regular software maintenance in the form of security updates to ensure system integrity.		
Software support Function module VOIP GATE Price/month per installed module	76 7043 00	

## 8.13 Power supply

Functions	Order No.	
<b>Power supply unit UPS</b> Device revision E	77 3400 00	
Power supply unit for supplying the nurse call system		
with safety extra-low voltage (SELV), compli- ant with EN 62368-1. The number of rooms, that can be connected, is project specific. Integrated batteries for uninterruptible opera- tion with a minimum of approx. 17 minutes backup power supply.		
Wide range input for international use. Short- circuit and overload protected.		
Control LEDs and contact outputs for trans- mission of status information: operation, bat- tery operation, battery low, fault message.		°° T <u>I</u> ° ërror
<ul> <li>Closed housing in protection class I</li> <li>Testing voltage PRI – SEC: 4 kV</li> <li>Certified acc. 2x MOPP, 60601-1, 3rd</li> <li>Degree of protection: IP 20</li> </ul>		
<ul> <li>Designed for wall mounting in rooms</li> </ul>		ad according
Input ■ Nominal voltage: 115 – 230 V AC		e <sup>ithe</sup> to
Nominal voltage range: 90 – 264 V AC		3rd
Input frequency: 47 – 63 Hz		4 MOPP, 60601
Nominal current: 12.5 A DC		
<ul> <li>Output voltage in mains operation.</li> <li>24 V DC +/- 3%</li> </ul>		
<ul> <li>Output voltage in battery operation: typ. 27 – 20 V DC</li> </ul>		
Rated output power: 300 W		
Battery capacity: 7 Ah		
<ul> <li>Bridging time for nominal current: approx. 17 minutes</li> </ul>		
Weight: 8.1 kg Dimensions (HxWxD): 244 x 325 x 178 mm		

Functions	Order No.
<b>Power supply unit UPS 60</b> Device revision E	77 3400 10
Power supply unit for supplying the nurse call system with safety extra-low voltage (SELV), compliant with EN 62368-1. The number of rooms, that can be connected, is project specific.	
Uninterruptible operation in connection with battery set for UPS 60, order no. 77 3450 00, with min. 1 hour backup power supply.	
Wide range input for international use. Short- circuit and overload protected.	
Control LEDs and contact outputs for trans- mission of status information: operation, bat- tery operation, battery low, fault message.	TH FORMER
Closed housing in protection class I.	nine di
Testing voltage PRI – SEC: 4 kV	· · · · · · · · · · · · · · · · · · ·
Certified acc. 2x MOPP, 60601-1, 3rd	
Degree of protection: IP 20	
Designed for wall mounting in rooms, preferably above the battery set for UPS 60.	sified according
Input	
Nominal voltage: 115 – 230 V AC	The second se
Nominal voltage range: 90 – 264 V AC	17- 1000 1040 N
Input frequency: 47 – 63 Hz	CPP, 600-
Output	
Nominal current: 12.5 A DC	
<ul> <li>Output voltage in mains operation:</li> <li>24 V DC +/- 3%</li> </ul>	
<ul> <li>Output voltage in battery operation: typ. 27 – 20 V DC</li> </ul>	
Rated output power: 300 W	
Battery capacity to be connected: 24 Ah	
Bridging time: min. 1 hour	
<i>Weight: 3.1 kg</i> Dimensions (HxWxD): 244 x 325 x 178 mm	

Functions	Order No.
Battery set for UPS 60	77 3450 00
Batteries which build in connection with the power supply unit UPS 60 an uninterruptible power supply (UPS) with approx. 1 hour backup power supply.	
Closed housing in protection class III. Designed for wall mounting in rooms, prefera- bly below the power supply unit UPS 60.	ů · · · · ·
Input <ul> <li>Nominal voltage: 24 V DC</li> </ul>	
Output Output current: 12.5 A	
Battery capacity: 24 Ah	
Weight: 25.2 kg Dimensions (HxWxD): 244 x 450 x 178 mm	

Functions	Order No.	
<b>Power supply unit</b> Device revision E	77 3401 00	
Power supply unit for supplying the nurse call system with safety extra-low voltage (SELV), compliant with EN 62368-1. The number of rooms, that can be connected, is project spe- cific.		
Wide range input for international use. Short- circuit and overload protected.		THI THE
Control LEDs and contact output for trans- mission of the active operation status.		
<ul> <li>Closed housing in protection class I</li> <li>Testing voltage PRI – SEC: 4 kV</li> <li>Certified acc. 2x MOPP, 60601-1, 3rd</li> </ul>		
<ul><li>Degree of protection: IP 20</li><li>Designed for wall mounting in rooms</li></ul>		dified according
<ul> <li>Input</li> <li>Nominal voltage: 115 – 230 V AC</li> <li>Nominal voltage range: 90 – 264 V AC</li> <li>Input frequency: 47 – 63 Hz</li> </ul>		C TO
Output <ul> <li>Nominal current: 12.5 A DC</li> </ul>		
<ul> <li>Output voltage: 24 V DC +/- 3%</li> <li>Rated output power: 300 W</li> </ul>		
<i>Weight: 2.9 kg</i> Dimensions (HxWxD): 244 x 325 x 178 mm		

## 8.14 Installation

Fu	nctions	Order No.	
Ne	twork isolator LAN	76 5000 00	
Ex sej	ternal network isolator for galvanic network paration according to EN 60601-1.		
	Suitable as separator according to DIN VDE 0834-1:2018-06		
	Dielectric strength of signal and shielding: 5 kV		
	Operating mode: Continuous operation		
	Data throughput: 10/100/1000 MBit/s		
	Ports: 2x RJ45		
	Network specifications: IEEE 802.3		
•	Standards: Safety: EN / IEC 60601-1 3rd EMC: EN / IEC 60601-1-2		
Dir We	mensions (HxWxD): 23 x 29 x 65 mm eight: approx. 50 g		
Int	erface isolator RS232	76 5010 00	
4 k vid infl 3.	V galvanic separated RS 232 isolator pro- es effective protection against external uences and fulfils the standard IEC 61850-		INT
	Suitable as separator according to DIN VDE 0834-1:2018-06		
	4 kV RSM galvanic separation		
	15 kV ESD protection		allan a
	Supply voltage: 24 V DC (from the nurse call system), max. 1 W		
	Diagnostic LEDs		EAT
	Standard: IEC 61850-3		
	Mounting on top-hat rail (35 mm)		
Dir We	mensions (HxWxD): 99 x 22.5 x 92 mm eight: approx. 100 g		

Functions	Order No.
OSYnet-Y-RepeaterOpto	77 4000 00
<ul> <li>Data repeater for electric isolation of the group bus (OSYnet).</li> <li>Designed for separating and/or isolating the group bus into two independent sections. Y-distribution.</li> <li>Application: One for each physical group.</li> <li>Direct connection to group bus (OSYnet) and its sections (Sub-D, 9-pole).</li> <li>Top-hat mounting (35 mm)</li> <li>Dimensions (HxWxD): 85 x 25 x 83 mm</li> </ul>	
OSYnet-Gateway	77 4001 00
Active gateway for electric isolation of OSY- net group bus. Designed to extend the max. cable length for the OSYnet by 700 m.	
<ul> <li>Direct connection to the group bus (OSY- net) and its sections, screw clamps</li> <li>Electric isolation of line sections</li> <li>Top-hat mounting (35 mm)</li> </ul>	
Dimensions (HxWxD): 105 x 37 x 35 mm	
8-port star repeater	77 4002 10
For the star structured distribution of OSYnet data networks, especially for existing projects with existing cabling. The 8-port star repeater is connected	
between an IP-SystemManager and the appropriate group lines or single bus users.	
<ul> <li>Star structured connection of max. 7 OSYnets to an 8-port star repeater</li> <li>Max. 10 bus users per OSYnet</li> </ul>	and the second s
Max. 100 m cable length per output	
<ul> <li>Outputs are not electrically isolated</li> <li>Top-hat mounting (35 mm)</li> </ul>	
Max three 8-port star repeaters can be mounted side-by-side. They are automat- ically interconnected.	
Dimensions (HxWxD): 76 x 144 x 75 mm	

## 8.15 Accessories

Functions	Order No.	
Push-wire connector for junction boxes, 5-polee.g. for connection socket ComStation, Con- trolTerminal Flamenco, ControlTerminal with doorplate Flamenco.Wire cross-section: 0.5 - 2.5 mm²	00 0210 21	
Push-wire connector for junction boxes, 4-pole e.g. for ControlTerminal Flamenco, Control- Terminal with doorplate Flamenco, for inter- connecting non used NF wires.	00 0222 88	
Connector 5-pole	00 0211 37	
<ul> <li>Plug-in screw clamp e.g. for the connection of connection socket with call switch (70 0171 60) or connection socket with call switch, bedhead unit (70 0171 50) or for use of a RS-232 connection terminal of an IP-SystemManager.</li> <li>Screw connections up to 1.5 mm<sup>2</sup></li> <li>Distort protection</li> <li><i>Dimensions (HxWxD): 10 x 20 x 19 mm</i></li> </ul>		
Steel loudspeaker frame	00 0272 48	
<ul> <li>for loudspeaker with announcement interface (05 0024 01).</li> <li>Weight: approx. 600 g</li> <li>Fire resistance class F30 according to DIN 4102-2</li> <li>Diameter of ceiling cut-out: 243 mm Installation depth: approx. 150 mm</li> <li>(Note on figure: Loudspeaker not included with delivery.)</li> </ul>		

Functions	Order No.	
Surface mounting frame for room signal lamps Material: ABS Dimensions (HxWxD): 80 x 86 x 21 mm	00 0281 26	
<b>Terminating resistor 122 Ohm</b> as bus termination in the last bus user.	00 0040 76	010
Line transformer, 3 channel (100/25 V, 1 VA per channel)	14 1030 00	
to transform the entertainment voltages from 100 $V_{\text{eff}}$ to 25 $V_{\text{eff}}.$		
One transformer is required per entertain- ment channel.		
Mounting on top-rat rail (35 mm). Suitable to be integrated into distributor units.		Construction     C
<ul> <li>Potential separation</li> <li>Input voltage: 100 V<sub>eff</sub></li> <li>Output voltage: 25 V<sub>eff</sub></li> <li>Max. output power: 1 VA, per channel</li> <li>Erequency response: 50 Hz = 10 kHz</li> </ul>		
Dimensions (HxWxD): 90 x 106 x 58 mm		
Back box solid wall, 1-gang Mounting opening: Ø 60 mm Depth: 46 mm	17 0100 00	

Functions	Order No.	
Back box solid wall, 2-gang Mounting opening: 140 x 60 x 42 mm, oval Without separating.	17 0410 00	
Back box partition wall, 1-gang Burr hole: Ø 68 mm Depth: 47 mm	17 5100 00	
<b>Back box partition wall, 2-gang</b> Burr hole: Ø 2 x 68 mm, oval Depth: 47 mm, Centre distance: 71 mm, without separating	17 5400 00	
Connection cable e.g. for connection socket with call switch (70 0171 60) or connection socket with call switch, bedhead unit (70 0171 50): for the connection of a call device to the additional, external call input. Length: 50 cm	50 0308 02	
Equipment and cable clamp Practical protection for all patient units. Cables and equipment are safely guided along the bed supporting rod or the "bed gal- lows". The clamp will come off when the pull- ing force it too high. Packing unit = 10 clamps.	70 0361 00	

Functions	Order No.	
Patient handset bracket Wear-free plastic bracket with integrated ele- ment to change the volume with the unit parked at the bracket. Vertical or horizontal mounting. Dimensions (HxWxD): 198 x 57 x 18 mm	70 0800 00	
Patient handset bed bracket Völker Wear-free plastic bracket with integrated ele- ment to change the volume with the unit parked at the bracket. For use with a bed from Völker company. Dimensions (HxWxD): 198 x 100 x 60 mm	70 0800 10	
<ul><li>Headphone</li><li>Headphone with 3.5 mm jack plug to listen discretely to entertainment/TV programmes in connection with the patient handsets.</li><li><i>1.8 m connection cable</i></li></ul>	70 0801 00	
Self-releasing adapter, patient unit Automatic release for excessive pulling force. Separates the line connection between patient handset and connection socket, thereby preventing any physical damage 13-pole connector <i>Dimensions (HxWxD): 17 x 17 x 120 mm</i>	74 0812 50	WIIIIII
Self-releasing adapter, pear push switch as 74 0812 50, but for pear push switch. 8-pole connector Dimensions (HxWxD): 14 x 14 x 120 mm	74 0812 51A	- Hillin

Functions	Order No.			
Connector, 3-pole Plug-type connecting clamp for connecting of switches and room lamps to the room bus (RAN). Screw connections up to 1.5 mm <sup>2</sup>	70 0807 00	B Y R		
<b>Connector, 7-pole</b> Plug-type connection clamp for connecting the room lamps universal. Screw connections up to 1.5 mm <sup>2</sup>	70 0807 07	CONTRACTOR OF THE OWNER		
Over-voltage protection circuit	70 0890 97			
<ul><li>LED module, red</li><li>for room lamps.</li><li>Signalling of calls</li></ul>	77 0190 00			
<ul> <li>LED module, yellow</li> <li>for room lamps.</li> <li>Signalling of staff presence 2</li> </ul>	77 0190 01			
<ul><li>LED module, green</li><li>for room lamps.</li><li>Signalling of staff presence 1</li></ul>	77 0190 02			
LED module, white for room lamps. Signalling of WC calls	77 0190 03			
<ul><li>LED module, blue</li><li>for room lamps.</li><li>Signalling of alarms</li></ul>	77 0190 04			
Functions		Order No.		
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Smoke detector with switch output		77 0902 00		
Smoke detector for the initiation of call in case of smoke development. Smoke is detected based on the light scattering princi- ple (Tyndall-effect). The smoke detector transmits the smoke alarm to the nurse call system.				
-	For all current Tunstall GmbH nurse call systems		1.	
•	Loud acoustic signal in case of smoke de- tection			
-	Smoke detection self-tests. Faults are sig- nalled at the smoke detector (LED or sig- nal tone)		Comments.	
	Battery operation			
-	Built-in battery for a prognosticated life- time of 10 years			
	EN 14604:			
	Test according to DIN 14676			
-	Potential-free switching contact for con- nection to a nurse call system			
Dir	nensions (H x Diameter): 55 x 100 mm			
NTP TimeServer/DCF		77 0910 10		
The TimeServer is used to receive time sig- nals using DCF77 signals.				
It is designed as a standalone version and enables the transmission of time signals via the Ethernet using the SNTP protocol.				
In conjunction with the Flamenco system, the system time is automatically updated.				
05	SYnet-Connecting plug	77 0950 00		
for OSYnet-Y-RepeaterOpto.				

Functions	Order No.
ControlTerminal ConfigSet Configuration tool for configuring the Control- Terminal Flamenco and the ControlTerminal with doorplate Flamenco. USB/OSYnet-Interface All required connection cables and plugs Wall power supply unit for the ControlTer- minal to be configured Configuration software Online help	
ControlTerminal installation kit for mounting a Control Terminal to a standard two gang back box. Mounting plate 4-pole connector, up to 2.5 mm <sup>2</sup> 2 insertion bridges 8-pole connectors Fixing screws Pre-mounted.	77 0960 00
<ul> <li>Surface mounting box, 1-gang, for decorative frames A, F</li> <li>Surface mounting housing for wall mounting of switches, product range 77 21xx xx A and 77 21xx xx F.</li> <li>Surface mounting box incl. necessary accessories</li> <li>Colour matching to switch design</li> <li>Colour: studio white</li> <li>Housing material: Polycarbonate</li> <li><i>Dimensions (HxWxD): 80 x 80 x 42 mm</i></li> </ul>	77 0210 55

Functions	Order No.	
Surface box, 2-gang, for decorative frames A, F	77 0210 61	
Surface mounting housing for wall mounting of connection socket ComStation (77 0452 30 A or 77 0452 30 F) or Connec- tion Socket ComStation <sup>PC</sup> (77 0452 60 A or 77 0452 60 F).		
<ul> <li>Surface mounting box incl. necessary accessories</li> </ul>		
Colour matching to switch design		
Colour: studio white		
Housing material: Polycarbonate		
Dimensions (HxWxD): 80 x 151 x 42 mm		

# 9. Mounting positions

# 9.1 Room terminals







# 9.2 Room lamps, corridor displays



Group lamp			
	Order no.: 77 0112 02, 77 0113 02, 77 0114 02		
11122	<ul> <li>Mounting on a 1-gang back box. The back box is centred behind the group lamp. Dimensions (HxWxD) without mounting frame:</li> <li>2 groups: 160 x 86 x 70 mm</li> <li>3 groups: 240 x 86 x 70 mm</li> <li>4 groups: 320 x 86 x 70 mm</li> <li>Woll visible for the pursing staff</li> </ul>		
	External sources of light must not prevent the group lamp from being identified.		
	<ul> <li>Mounting height above floor level according to DIN VDE 0834-1 = 150 – 250 cm.</li> </ul>		
	Corridor display Alpha 16		
570	Order no.: 77 0150 00		
	Ceiling mounting, ceiling mount included with delivery.		
182	1.8 m connection cable (75 cm from tube end) with free wire ends for on-site connection to the OSYnet group bus.		
	<ul> <li>Unobstructed view of the corridor display must be ensured.</li> </ul>		
	<ul> <li>External sources of light must not prevent the corridor display from being identified.</li> </ul>		
DISPLAY 770	Mounting height above floor level according to DIN VDE 0834-1 = 150 – 250 cm.		
Einheit = mm Unit = mm			



# 9.3 Switches

For all switches, the following applies:

- In case more than one switch shall be installed one above the other, multiframes are available.
- Devices of the nurse call system and low-voltage system (e.g., switches or sockets) must not be covered with the same cover plate. A common cover is permissible if the function of insulation and contact protection are retained after the external cover is removed.



	Cardiac alarm switch	
	Order no.: 77 0214 00	
	<ul> <li>Mounting on a 1-gang back box.</li> <li>The cardiac alarm switch must be in a place that is easy for the pursing staff to access.</li> </ul>	
	<ul> <li>Mounting height above floor level according to DIN VDE 0834-1 = 70 – 150 cm.</li> </ul>	
	Pull cord call switch in bathroom/WC (wall mounting)	
300 mm	Order no.: 77 0215 00, 77 0215 01	
	Mounting on a 1-gang back box.	
	The specific provisions of DIN VDE 0100 must be observed in WCs and wet rooms.	
2250 mm	Pull cord switches in shower stalls must be installed at least 200 mm above the highest possible position of the shower head.	
	The call handle must be in a place that is easy for the patient to access	
	It must also be possible for people lying on the floor to access the pull cord. Therefore, the call handle must be between 100 mm and 200 mm above the floor.	
300 mm	Pneumatic call switch	
► <del>-</del>	Order no.: 77 0216 00, 77 0216 01	
	Mounting on a 1-gang back box.	
	The specific provisions of DIN VDE 0100 must be observed in WCs and wet rooms.	
2250 mm	The rubber ball must be in a place that is easy for the patient to access.	

# 9.4 Connection sockets



# 9.5 System control

#### 9.5.1 IP-SystemManager, OSYnet-Y-RepeaterOpto, OSYnet-Gateway, 8-port star repeater, Line transformer

- In dry rooms only.
- Mounting on top-hat rail.
- Always easily accessible to authorised persons (access space at least 60 cm wide).
- Heat dissipation must not be hindered.
- When installing in switch cabinets or similar, it may be necessary to remove heat losses by means of forced ventilation.

#### 9.5.2 Distributors for the nurse call system

- Distributors for the nurse call system must not also be used for the low-voltage system. A separation between the nurse call system and low-voltage system in one housing does not suffice.
- Mounting height above floor level according to DIN VDE 0834-1 = 70 220 cm, except switch cabinets.

### 9.6 **Power supply**

# 9.6.1 Power supply unit UPS (77 3400 00), Power supply unit (77 3401 00), Power supply unit UPS 60 (77 3400 10)

- Wall mounting through keyholes on the rear of the device.
- Dimensions of all devices (HxWxD): 244 x 325 x 178 mm.
- Weight of the power supplies: power supply unit UPS (77 3400 00): 8.1 kg, power supply unit (77 3401 00): 2.9 kg, power supply unit UPS 60 (77 3400 10): 3.1 kg
- Use in an operating area with restricted access.
- Accessible for authorised persons at all times (access space at least 60 cm).
- Mounting above a non-combustible surface only.
- Installation at a maximum height of 2 meters only.
- Installation only in dry rooms.
- Permissible ambient temperature during operation: 0 +40°C. If this value is exceeded, there is a risk of the device overheating.
- A sufficient air circulation must be provided above and below the device. For this reason, the distance to other devices or walls above and below the power supply unit must be at least 50 mm.
- In case of installation into switch cabinets or similar equipment, the heat loss must be dissipated by forced-air ventilation.
- All-pole switch gear must be provided on site for the deactivation of the system.
- A safe separation of the alternating and direct current supply circuits must be observed on site!
- Observe the country-specific regulations (e.g., VDE).

#### 9.6.2 Battery set for UPS 60 (77 3450 00)

- Wall mounting through keyholes on the rear of the device, preferably below the power supply unit UPS 60. Dimensions (HxWxD): 244 x 450 x 178 mm, weight: 25.2 kg
- For requirements for the mounting position refer to power supply unit UPS 60.

# **10. System structure**





IP-SystemManager



# **10.1** Hierarchical system structure

The Flamenco<sup>IP</sup> system is set up hierarchically. In the rooms, all devices are connected with each other through an intelligent RAN room bus (Room Area Network) and form a functional unit.

Starting from the room bus, the connection to the next hierarchical level of the system is established through the room terminal. The room terminals form the connection to the OSYnet group bus and from there to the decentralised system control unit, the IP-SystemManager. Each IP-SystemManager provides the complete nurse call function for an organisational group, i.e., ward.

Several IP-SystemManagers are connected to each other through an IP network infrastructures, then forming a complete system with cross-ward functions such as ward coupling or cross-ward speech connection. In the process, the network can be set up exclusively for the nurse call system or as part of the existing IP infrastructure on site.

For the connection of external systems such as a fire alarm system, additional IP-SystemManagers are integrated into the IP network.





### 10.2 IP-SystemManager control unit



IP-SystemManager (76 2100 00) The complete system control is implemented through decentralised IP-SystemManagers, i.e., installed in the wards. The system control consists of the data transmission function, including the system functions and speech communication.

Each IP-SystemManager assumes a special task in the nurse call system. For this purpose, it is configured with the required project-specific data in advance at the Tunstall factory.

Accordingly preconfigured IP-SystemManagers also provide system interfaces for the input and output of data, speech connections and system messages.

## 10.3 Speech communication

Speech communication and data transmission are physically and logically separated. The system's speech line links the system's speech units: ComTerminal Flamenco, Patient handset, ComStation<sup>BUS-C</sup>, ComStation<sup>PC</sup>, ComStation<sup>CT</sup> Flamenco.

ManagementCenter<sup>PC</sup> and the individual IP-SystemManagers are connected to the system through the IP network and voice communication is implemented through VoIP.

#### 10.3.1 System-external speech connections

In addition to speech communication within the nurse call system, however, speech communication with mobile terminal devices (DECT, WLAN or GSM) is also possible. The interfaces for the external systems are part of the IP-SystemManagers and are available as separate function modules.

The terminal devices used can be used in parallel with the system's own devices. The planning and conception of such solutions, however, requires detailed knowledge in regard to technology, areas of application and the following functional and organisational processes.

# **11. System control**

The nurse call system is controlled through several decentralised IP-SystemManagers. Through an IP network (LAN), all IP-SystemManagers of the nurse call system communicate with each other and with external devices or systems (e.g., IPBX) connected to the nurse call system through the IP network.

All IP-SystemManagers are equipped with standardised hardware and differ through the installed software modules in the form of so-called system and function modules. The software modules provide functions and enable the IP-SystemManager connections required for these functions.

All IP-SystemManagers are set up with the corresponding software modules according to the requirements and configured with product-specific data, insofar as provided by the customer in advance.

# 11.1 Overview





### **11.2** Calculating control units

For each nurse call system, a maximum of 63 IP-SystemManagers can be installed.

#### 11.2.1 One IP-SystemManager per ward

One IP-SystemManager is required for the control of the nurse call operation of one organisational group, i.e., generally of one ward.

According to DIN VDE 0834:2016-6, an organisational group is a group of rooms that comprise an organisational unit. An autonomous organisational group consists of all rooms that can be managed by one person.

You must therefore provide one IP-SystemManager per ward.

#### Software module

On each IP-SystemManager used to control the nurse call operation of an organisational group, a system module must be installed. Choose between:

- System module HEALTH (76 0730 00) for use in hospitals and comparable facilities
- System module CARE (76 0735 00) for use in nursing homes and comparable facilities

#### Installation location

The OSYnet group bus for the ward is connected to the IP-SystemManager. The IP-SystemManager must be installed at the ward.

The cable length between the IP-SystemManager and the next active IP network component (e.g., switch) may not exceed 90 m.

#### 11.2.2 One IP-SystemManager with operating mode "System"

One single IP-SystemManager of all IP-SystemManagers of the nurse call system must be set to operating mode "System" at the factory. This is generally a separate IP-SystemManager. The IP-SystemManager with operating mode "System" must be defined during system planning and this definition must be reported to Tunstall.

The IP-SystemManager with operating mode "System" manages and coordinates cross-ward functions (like ward coupling), speech communication of the nurse call system and superordinate system messages.

All fault messages of the nurse call system are displayed on the IP-SystemManager with operating mode "System".

The IP-SystemManager with operating mode "System" provides a centralised ESPA 4.4.4 interface for the connection of a radio paging system or a DECT system.

#### Software module

The same system module installed on the IP-SystemManagers for nurse call operation, i.e., HEALTH or CARE, must be installed on the IP-SystemManager with operating mode "System":

- System module HEALTH (76 0730 00) for use in hospitals and comparable facilities
- System module CARE (76 0735 00) for use in nursing homes and comparable facilities

A function module can also be installed on the IP-SystemManager with operating mode "System" if a PBX and/or a messaging server shall be coupled to the nurse call system through the IP network. Depending on the desired connection, select one of the following:

- Function module UM/A (76 0740 00) for messaging to Ascom systems
- Function module UMS/A (76 0740 01) for messaging and speech connections to Ascom systems
- Function module UMS/T (76 0740 10) for messaging and speech connections to Tetronik systems

#### Installation location

As all fault messages of the nurse call system are displayed on the IP-SystemManager with operating mode "System", it should be installed in a centralised technology room.

The cable length between the IP-SystemManager and the next active IP network component (e.g., switch) may not exceed 90 m.

If a PBX and/or messaging system shall be coupled to the nurse call system, the respective system must be connected to the IP network. In the process, the maximum cable length depends on the type of connection to the IP network.

#### 11.2.3 One IP-SystemManager per ManagementCenter

If a ManagementCenter shall be installed in the nurse call system, an additional IP-SystemManager must be installed. Through this IP-SystemManager, the speech line of the ManagementCenter is connected to the nurse call system.

The function module VOIP GATE (76 0743 00) must be installed on the IP-System-Manager for the connection of the ManagementCenter.

#### Installation location

The IP-SystemManager with the function module VOIP GATE should be installed in the vicinity of the speech unit of the ManagementCenter.

The cable length between the IP-SystemManager and the next active IP network component (e.g., switch) may not exceed 90 m.

#### 11.2.4 One IP-SystemManager for each electrical medical system

If an electrical medical system shall be connected to the nurse call system, i.e., if messages of the electrical medical system shall be displayed in the nurse call system, an additional IP-SystemManager is required.

The function module MED (76 0741 00) must be installed on this IP-SystemManager.

#### Installation location

The electrical medical system is connected to the nurse call system through an RS-232 interface (ESPA 4.4.4) of the IP-SystemManager with function module MED. For this reason, the cable length between the IP-SystemManager and the connection point of the electrical medical system may not exceed 10 m.

The cable length between the IP-SystemManager and the next active IP network component (e.g., switch) may not exceed 90 m.

#### 11.2.5 One IP-SystemManager per fire alarm system

If a fire alarm system shall be connected to the nurse call system, i.e., if messages of the fire alarm system shall be displayed in the nurse call system, an additional IP-SystemManager is required.

The function module FAS(76 0742 00) must be installed on this IP-SystemManager.

#### Installation locations

The fire alarm system is connected to the nurse call system through an RS-232 interface (ESPA 4.4.4) of the IP-SystemManager with function module FAS. For this reason, the cable length between the IP-SystemManager and the connection point of the fire alarm system may not exceed 10 m.

The cable length between the IP-SystemManager and the next active IP network component (e.g., switch) may not exceed 90 m.

11.2.6	Overview of hardware & software for the control units
--------	---

Function	IP-SystemManager (76 2100 00)	Software on the IP-SystemManager		
Function		Application	Software module	Order no.
Nurse call operation for one ward	1 per ward	Hospital	System module HEALTH	76 0730 00
		Nursing home	System module CARE	76 0735 00
Functions between wards, speech communication,	1 per nurse call system	Hospital	System module HEALTH	76 0730 00
connection, system messages	Operating mode "System"	Nursing home	System module CARE	76 0735 00
Connection to a PBX and/or a messaging server		Messaging Ascom	Function module UM/A	76 0740 00
		Messaging + speech connection Ascom	Function module UMS/A	76 0740 01
		Messaging + speech connection Tetronik	Function module UMS/T	76 0740 10
ManagementCenter speech connection	1 per ManagementCenter		Function module VOIP GATE	76 0743 00
Connection to a medical electrical system	1 per medical electrical system		Function module MED	76 0741 00
Connection to a fire alarm system	1 per fire alarm system		Function module FAS	76 0742 00

Tab. 12: Required control units for a Flamenco<sup>IP</sup> nurse call system

### 11.3 Security and software management

Tunstall focuses on the security of their systems as an elementary component of the service and safety concept. As a result of the networking of the system through partially unknown IT/IP infrastructures, Cyber security is an increasingly important topic. To guarantee system integrity, regular system and security updates are absolutely necessary. Only in this way can it be guaranteed that the nurse call system can be operated securely over many years and always meets the current security standard.

Enabling the security of our systems is of prime importance to us. For the observance of fundamental quality and security rules, Tunstall urgently recommends the conclusion of software management contract that contains all system and function modules.

Especially in the networked world with many unknown people, this fee-based service gives you certainty that your system is always up-to-date with the best-possible protection. The software management available for the system components can be found in the "Product overview" chapter.

# 12. IP network

Through an IP network (LAN), all IP-SystemManagers of the nurse call system communicate with each other and with external devices or systems (e.g., PBX) connected to the nurse call system through the IP network. A ManagementCenter<sup>PC</sup> is also connected to the nurse call system through the IP network. Both data and voice (VoIP) are exchanged through the IP network. In the process, the network can be set up exclusively for the nurse call system or as part of the existing IP infrastructure on site.

The following describes basic requirements on a network and individual components to enable the secure communication of the nurse call system. These are minimum requirements that must be coordinated with the respective person responsible for IT. From the viewpoint of IT, requirements on the nurse call system can also result in order to use the existing networks together and securely. The requirements and specifications for system setup and use can be used for the risk analysis according to EN 80001-1.

# 12.1 General requirements, responsibilities and system security

#### 12.1.1 Purpose

The purpose of the Flamenco<sup>IP</sup> nurse call system is calling and searching for people. Various triggering units and signal generators are used for this purpose.

Based on the more or less great endangerment of callers as a result of a system fault, a reliable system monitoring system has been integrated. In the process, all devices and transmission routes required for passing on information by triggering a call are monitored. Faults are displayed immediately to the responsible personnel.

The nurse call system can be used as a component of a distributed information system. The use in combination with active medical products, however, does not replace the regulations for personnel and the duty of proper supervision during the operation of such devices.

In addition to the creation of the safety of patients and personnel, the nurse call system is used for the effective support of the organisation of care. Here, the system can be expanded with extensive interfaces to further systems.

#### Limitations

- The nurse call system is not a social alarm system according to the EN 50134 series of standards.
- The nurse call system is not a medical product and not an accessory for medical products and does not correspond with Directive 93/42/EEC or Regulation (EU) 2017/745.
- The nurse call system does not fulfil the conditions for use as a distributed alarm system.

#### 12.1.2 Responsibility agreement

As manufacturer, Tunstall assumes the responsibility for the following tasks within the responsibility agreement insofar as such an agreement has been concluded.

- Delivery of components of a nurse call system for the setup of a system according to the valid DIN VDE 0834
- Definition of the purpose and areas of application
- Description of possible application limitations
- Provision of all necessary technical and functional documents for safe setup and safe operation of the nurse call system
- Information on requirements for integration into an IT network
- Information regarding endangering situations in case of a lack of provision of the required properties of the IT network
- As manufacturer, Tunstall does not assume responsibility for the on-site network in case the nurse call system is set up as a network-supported system

#### 12.1.3 Electrical safety

The nurse call system is set up according to the system separation principle pursuant to DIN VDE 0834. All connected external devices and networks must be designed according or fulfil these requirements through safe galvanic isolation. The separating devices are specified and released for use by Tunstall.

#### 12.1.4 Purpose of integration of the nurse call system into IT networks

Nurse call systems can be integrated into IT networks if there is no sensible possibility for the conventional setup of the system. Such a possibility, for example, can be the spatial expansion of the system by several buildings or the number of line connections, which causes enormous costs. An additional reason is the simplified system management and organisation of updates, as well as centralised fault management.

IT networks are increasingly used for nurse call systems insofar as the necessary security requirements can be fulfilled.

#### 12.1.5 Basic system setup and structure

The nurse call system is an independent and intrinsically safe system that can use existing or newly created networks for communication between subsystems and/or components. Thereby, the medium used (copper, fibre-optic, WLAN) is irrelevant for the function. The network structure can be set up as a bus, ring, star, mesh, etc.

For the communication of the nurse call system through a network, the network-specific services are used, which have to be coordinated in detail.

At setup, the requirements of the current DIN VDE 0834 must be observed.

#### 12.1.6 System monitoring and operating securities

The relevant components and transmission paths, including possible network connections, are monitored permanently by a regular data exchange (every 30 seconds minimum) and faults are reported immediately (local displays per organisational group, contacts, centralised displays through PrimusGlobal). All system-relevant events are logged and can then be evaluated.

#### 12.1.7 Possible dangerous situations in case of faults in the network properties

The nurse call system is equipped with a multistage safety concept. In case of a failure in the network infrastructure all local control units (in the form of the IP-System-Managers) continue to work autonomously. The individual organisational groups based on an IP-SystemManager assume the basic function of the nurse call system and local indications on displays and ward consoles are retained. The connections between the individual organisational groups fail and a voice connection is no longer possible, e.g., for an alarm announcement.

A firmware update of network components can also cause an outage of the network structure, e.g. a network switch update, which can take several minutes.

In case of partial failures or temporary network disturbances, only the failed segments are affected insofar as the other routes remain usable.

After the return of failed connections, the nurse call system continues to work with its full scope of functions and the previous system settings.

#### 12.1.8 Cyber security of the entire system

Through the use of networks and the possible remote access for updates, remote maintenance and system services, a special focus should be placed on cyber security. To guarantee system integrity and data protection within the nurse call system, Tunstall provides a fee-based, regular software management in the form of a software management agreement with the corresponding security patches.

The access to the system and protective mechanisms used must be designed and set up in consultation with the people responsible for the IT systems. The security of the system itself and possible connections to the medical networks lie in the responsibility of the owner.

# **12.2** Requirements for integration into networks

The Flamenco<sup>IP</sup> nurse call system is a nurse call system according to standard DIN VDE 0834 that can be integrated into existing network structures insofar as supported by the necessary standards. The purpose of the integration of the nurse call system into an existing network infrastructure, for example, can include the spatial expansion of previously existing infrastructures, the integration of existing systems (telephony, alarm emission) or management (e.g., remote maintenance) of the system.

Even though the nurse call system can be integrated into existing infrastructures without a problem, some services (e.g., DHCP) are fundamentally provided by the Flamenco<sup>IP</sup> nurse call system within the system.

#### 12.2.1 Physical connection

The components of the Flamenco<sup>IP</sup> nurse call system can fundamentally be connected in every Ethernet infrastructure based on standard IEEE 802.3 (VLAN tags according to 802.1q are not supported by the components/terminal devices). Connection takes place using 10Base-T/100Base-TX switch ports with auto-sensing of the operating modes. PoE is not required and should be deactivated if possible.

#### 12.2.2 Flamenco<sup>IP</sup> subnets (Flamenco domains)

All components of the nurse call system must be operated in their own subnets (broadcast domains/LANs/VLANs/LISes) according to the planning documents to avoid interference effects due to external network components. These subnets are called Flamenco domains in the following.

The communication of the system components is implemented through Internet Protocol Version 4 (IPv4) and uses both unicast/broadcast and multicast.

Individual Flamenco domains (subnets) can be connected through existing network infrastructures to realise spatial expansion.

For the problem-free integration of the Flamenco<sup>IP</sup> systems into existing infrastructures, the following conditions must be fulfilled:

- 1. The communication of all Flamenco<sup>IP</sup> system components with each other must be possible in an unlimited manner that is transparent in regard to protocols.
- 2. Communication with the infrastructure services used (NTP, SIP, etc.) must be possible in an unlimited manner that is transparent in regard to protocols.
- 3. Insofar as the SystemOrganizer or ManagementCenter is located outside of a Flamenco domain, communication must be possible between the Flamenco domains and this component in an unlimited manner that is transparent in regard to protocols.
- Network traffic not listed under Items 1 3 must not occur in the Flamenco domains.
- 5. For a problem-free function of the system components, especial in regard to voice integration, a functional IPv4 multicast integration is necessary. Within the Flamenco domains, IGMP in Version 3 must be supported, and IPv4 multicast routing must be supported in the entire infrastructure.

- The fulfilment of the requirements on transmission quality within the network (bandwidth, latency, jitter, packet loss) must be guaranteed through the implementation of suitable QoS configurations if necessary, refer to chapter 12.5.1 "QoS requirements" on page 179.
- 7. If a remote maintenance of the system is intended, an unlimited communication between the remote maintenance station and the Flamenco<sup>IP</sup> system components is required. Terminal devices in the IT infrastructure on which system software is running must also be able to be accessed from the remote maintenance station. The requirements on the transmission quality (Item 6) do not have to be observed for the remote maintenance station.

An overview of the communication relationships and ports used of the Flamenco<sup>IP</sup> system are located in the appendix of this chapter, refer to chapter 12.5.2 "Communication relationships in the Flamenco<sup>IP</sup> system" on page 180.

#### 12.2.3 Network services in the existing infrastructure, NTP

In order for a centralised and precise time source to be available for the entire Flamenco<sup>IP</sup> system, components of the system can call their time information from an NTP server. For this purpose NTP Version 2 (unicast, no authentication) is used.

# 12.3 Flamenco<sup>IP</sup> system software on provided computers

#### 12.3.1 SystemOrganizer

The SystemOrganizer software is the configuration tool for Flamenco<sup>IP</sup>nurse call systems. It allows the complete parametrisation of the system.

- Operating system: Microsoft Windows 7, Microsoft Windows 10
- CPU: 1 gigahertz (GHz), 32-bit (x86) processor
- Memory: 1 GB RAM (32 bit)
- Free disk space: 16 GB available space

#### 12.3.2 PrimusGlobal+ "Call recording"

Software for supporting the nursing documentation.

Permanent recording of all system events (calls, presences, etc.) with date and time and appropriate information about the data origin e.g. ward and room designation.

Using this software the locations (wards, rooms, etc.) to be analysed can be selected. The data can be filtered according to system event time or system event type (calls, presences, further events).

- Operating system: Microsoft Windows 7, Microsoft Windows 10
- CPU: 1 gigahertz (GHz), 32-bit (x86) processor
- Memory: 1 GB RAM (32 bit)
- Free disk space: 32 GB available space

#### 12.3.3 PrimusGlobal+ "ManagementCenter"

Software for the central call handling console for central processing of all functions within the nurse call system.

Calls from several wards can be displayed.

- Operating system: Microsoft Windows 7, Microsoft Windows 10
- CPU: 1 gigahertz (GHz), 32-bit (x86) processor
- Memory: 1 GB RAM (32 bit)
- Free disk space: 32 GB available space

# 12.4 Networking with external systems

#### 12.4.1 Telephony systems

Through connection to an existing telephony system, voice connections can be established between the Flamenco<sup>IP</sup> system components and terminal devices for telephony. For the integration of the PBX into the network, an alarm server is also required. This alarm server manages the connection between the nurse call system and the PBX.

The physical connection of the alarm server and PBX to the nurse call system is established through LAN, refer to chapter 12.5.3 "Speech networking of the Flamen-co<sup>IP</sup> nurse call system" on page 181.

#### 12.4.2 Alarming systems in LAN

The Flamenco<sup>IP</sup> nurse call system enables the connection of external alarm systems through the interfaces of the IP-SystemManager.
## 12.5 Annexes

#### 12.5.1 QoS requirements

For the transmission of voice between the Flamenco domains, the following requirements apply:

- Packet loss: < 1%</p>
- Latency (one-way): < 150 ms
- Average jitter (one-way): < 30 ms</p>
- Bandwidth: 100 kbit per voice connection

The voice data and signalling data have already been marked by the Flamenco<sup>IP</sup> system components in order to treat them in a prioritised manner within the network infrastructure. Here, the DiffServ method (DSCP – Differentiated Services Code Point) is used and the corresponding DSCP markings between the Flamenco domains must be retained.

For the transmission of voice and signalling data, the following DSCP values are used:

- VoIP voice data DSCP EF
- VoIP signalling DSCP AF31

# 12.5.2 Communication relationships in the Flamenco<sup>IP</sup> system

Source			Destination		on		
System component	Protocol	Port	System component	Port	Application	Remark	Type *
IP-System- Manager	UDP	≥ 1024	NTP Server	123	NTP	Synchronization with an external time server	EF
IP-System- Manager	TCP	≥ 1024	IP-System- Manager	4700	MessageServer	The IP-SystemManagers build a network of client/server connections	IF
IP-System- Manager	TCP	≥ 1024	Call handling PC	4700 - 4799	MessageServer	Client/Server connection to the call handling PC	EF
IP-System- Manager	TCP	≥ 1024	IP-System- Manager	4800	TimeSync	The time is synchronized via a TCP socket connection	IF
IP-System- Manager	UDP	≥ 1024	IP-System- Manager	5060, 5061	SIP	Speech connections between wards via SIP	IF
IP-System- Manager	UDP	≥ 1024	Com- Station <sup>TEL</sup>	5060, 5061	SIP	Speech connections to the ComStation <sup>TEL</sup> via SIP	F
IP-System- Manager	MCAST	≥ 1024	IP-System- Manager	5555	RTP	Streams speech to multicast addresses when making announcements. Default 239.255.255.245-239.255.255.252.	IF
Configuration PC	TCP	≥ 1024	IP-System- Manager	21	FTP	Serves for configuration with the SystemOrganizer	EF
IP-System- Manager	TCP	≥ 1024	Configuration PC	20	FTP	Serves for configuration with the SystemOrganizer	EF
Configuration PC	TCP	≥ 1024	IP-System- Manager	23	Telnet	Serves for configuration with the SystemOrganizer	EF
Configuration PC	TCP	≥ 1024	IP-System- Manager	22	SSH/SCP	Serves for configuration with the SystemOrganizer	EF
IP devices	UDP	≥ 1024	IP-System- Manager	67	DHCP	Request IP addresses for the nurse call system	IF
IP-System- Manager	UDP	≥ 1024	IP devices	68	DHCP	Assign IP addresses for the IP devices of the nurse call system	IF
IP-System- Manager	TCP	≥ 1024	Com- Station <sup>TEL</sup>	80/443	HTTP	Provides entry masks for the ComStation <sup>TEL</sup>	EF

* Used abbreviations for type:					
F	Flamenco - Intra domain communication				
IF	Flamenco - Inter domain communication				
EF	Flamenco - External services				

## 12.5.3 Speech networking of the Flamenco<sup>IP</sup> nurse call system





## 12.5.4 Example for the integration into network infrastructure

## **13. Power supply**

Electric power for the nurse call system is provided with +24 V DC, which is generated by locally installed power supply units. The power supply cable lpwr is installed as a ring circuit. The number of the power supply units and their locations depend on the total electric power that is needed. The IP-SystemManagers are supplied from theses power supply units, too.



Fig. 11: Power supply ring circuit

The power supply units must be hard-wired to the general power supply. An all-pole switching device must be provided on site for system shut-down.

## 13.1 Power supply cables (lpwr)

NOTE! The older marking "Ip" is used in other documents instead of the marking "Ipwr",

The power supply cable lpwr is laid as a ring. The power supply unit should be connected to the rooms over the shortest possible line roots to avoid unnecessary voltage drops.

Maximum voltage differential from the power supply unit to the farthest room being supplied via the ring circuit may not exceed 4 V at maximum load.

Where greater voltage drops are observed, additionally a stub line can be laid from the supply unit, or a cross linking within the +24 V ring circuit can be realised. If neither solution will solve the problem, a second power supply unit must be installed. Coupling of power supply units in parallel is not permitted.

A wire cross-section of 2.5 mm<sup>2</sup> must be laid. Depending on the laying type, single wires (NYA 2.5 mm<sup>2</sup> for +24V and 0V) or a common cable (NYM  $2x2.5 \text{ mm}^2$ ) can be laid.

## 13.2 Auxiliary power supply

DIN VDE 0834-1 requires an auxiliary power supply. If no auxiliary power supply system is present, comparable measures must be taken. For this purpose, power supply unit UPS (77 3400 00) provides an emergency power supply for at least 15 minutes, while power supply unit UPS 60 (77 3400 10), together with the battery set for UPS 60 (77 3450 00), provides an emergency power supply for at least 1 hour.

DIN VDE 0834-1:2016-06 requires the owner to guarantee save operation even after one hour has passed.

## 13.3 Current demand

The overview below has been produced as a guide to calculating current demand in the Flamenco<sup>IP</sup> system. The values are average values and may differ slightly from case to case. The total power consumption of the system will fluctuate according to the functions that are being used.

		Standby current consumption	Additional current demand
05 0024 01	Loudspeaker with announcement interface	80 mA	
11 5350 00	Telephone interface relay	10 mA	
70 0106 99	Large-surface pneumatic switch	35 mA	
70 0171 50	Connection socket with call switch, bedhead unit	21 mA	
70 0171 60	Connection socket with call switch	21 mA	
70 04x4 x0	Connection socket combi / combi, bedhead unit	30 mA	
70 0790 01	Sound detector	30 mA	
74 0452 30	Connection socket ComStation	0 mA	
74 0452 60A	Connection socket ComStation <sup>PC</sup>	0 mA	
74 0747 00	Patient handset	20 mA	
76 2100 00	IP-SystemManager	120 mA	
76 4500 00	Ethernet switch, 8 port	typ. current	consumption: 95 mA
77 011x 02	Direction lamp / Group lamps	0 mA	Per light section switched on: 75 mA
77 0150 00	Corridor display Alpha 16	Average cu 300 mA	rrent consumption:
77 0160 00	Corridor display Alpha 16, double- sided	Average cu 600 mA	rrent consumption:
77 017x xx	Room lamp or room lamp with doorplate	20 mA	Per light section switched on: 30 mA
77 0182 10	Room lamp universal, 2 sections	0 mA	Per light section switched on: 30 mA
77 0185 20	Room lamp universal, 2 sections, glass decor	0 mA	Per light section switched on: 30 mA

Tab. 13: Current demand

		Standby current consumption	Additional current demand
77 0211 0x	Call switch	9 mA	23 mA after call initiation
77 0212 00	Staff presence switch	8 mA	28 mA at Staff 1 + 2
77 0213 00	Cancel switch/WC	8 mA	39 mA after call initiation
77 0214 00	Cardiac alarm switch	8 mA	24 mA after cardiac alarm initiation
77 0215 0x	Pull cord call switch	9 mA	23 mA after call initiation
77 0216 0x	Pneumatic call switch	14 mA	24 mA after call initiation
77 0217 00	Call switch/WC with cancel switch	8.5 mA	31.5 mA after call initiation
77 0218 00	Call switch with privacy switch	8,5 mA	36,5 mA nafter call initiation
77 0219 00	Staff presence combination with call tone	8.5 mA	19.5 mA after call initiation
77 0350 00	Door entry speaker	30 mA	During operation: 45 mA
77 0360 11	IR TV control module universal	23 mA	During data transmission for a short time: 45 mA
77 051x 00	ComTerminal Flamenco	115 mA	Display back-light switched on + all LEDs: 40 mA
77 052x 00	RoomTerminal Flamenco	38 mA	Display back-light switched on + all LEDs: 40 mA
77 055x 00	ControlTerminal Flamenco or ControlTerminal with doorplate Flamenco	42 mA	Per light section switched on: 30 mA
77 0605 50	ComStation <sup>BUS-C</sup>	230 mA	
77 0606 00	ComStation <sup>CT</sup> Flamenco	115 mA	Display back-light switched on + all LEDs: 40 mA

Tab. 13: Current demand

		Standby current consumption	Additional current demand
77 0606 20	ComStation <sup>T</sup> Flamenco	52 mA	Display back-light switched on + all LEDs: 40 mA
77 0801 00	OSYlink-Door entry speaker	53 mA	
77 0802 00	OSYlink-Group lamp	26 mA	
77 0803 00	OSYlink-Universal	40 mA	Max. current con- sumption: 100 mA
77 0804 00	OSYlink-Announcement L	32 mA	
77 8400 00	RAN interface	8 mA	10 mA after call initiation
77 8700 00	OSYlink AS-CCS	90 mA	
77 8720 00	OSYlink AS-L200	90 mA	
77 0880 00	RAN interface with speech	26 mA	64 mA during speech connection
77 4000 00	OSYnet-Y-RepeaterOpto	60 mA	
77 4001 00	OSYnet-Gateway	50 mA	
77 4002 10	8-port star repeater	70 mA	
Z 00 8002 02	Sensor mat	10 mA	
Z 00 8201 40	Breathing sensor set	200 mA	
Z 00 8202 33	Radio receiver-T	12 mA	

Tab. 13: Current demand

#### 13.3.1 Standard basis for calculation

To calculate the required current, first add all standby current figures or the average current consumption, respectively.

In a simplified manner, the additional current demand can be calculated as follows: You may assume that on the average 5 calls, 5 presence states and one speech connection are active at any one time.

Current demand for each call = 100 mA Current demand for each presence state = 100 mA Current demand for each speech connection = 50 mA

The power supply unit should not be loaded by more than 80% of its capacity. Maximum capacity for the power supply units is 12 A. The 80% permissible load, therefore, amounts to 9.6 A.

		Standby current consumption:	
Quantity	Device	for each device	for 25 rooms
25	ComTerminal Flamenco	115 mA	2875 mA
25	Room lamp, 3 sections	20 mA	500 mA
25	Room lamp cardiac alarm, WC	20 mA	500 mA
50	Connection socket combi, bedhead unit	30 mA	1500 mA
50	Patient handset	20 mA	1000 mA
25	Pull cord call switch/WC	9 mA	225 mA
25	Cancel switch/WC	8 mA	200 mA
1	ComStation <sup>BUS-C</sup>	230 mA	230 mA
1	Connection socket ComStation	0 mA	0 mA
1	OSYlink-Group lamp	26 mA	26 mA
1	Group lamp, 2 sections	0 mA	0 mA
1	IP-SystemManager	120 mA	120 mA
	Sum (standby curr	urrent consumption): 7176 m/	
		Additional curre	nt consumption:
Quantity	Function	per function	per ward
5	Active call	100 mA	500 mA
5	Active presence state	100 mA	500 mA
1	Active speech connection	50 mA	50 mA
1	Group lamp	2 x 75 mA	150 mA
	Sum (additional curr	ent consumption):	1200 mA
	Total (standby + additional curre	nt consumption):	8376 mA

### 13.3.2 Sample calculation for 25 two-bed rooms with WC

80% load on a power supply unit (100% load = 12 A) = 9.6 A

Result: 1 power supply unit is required for the above 25 two-bed rooms with WC.

## 14.1 Cable legend

To simplify the handling of installation plans, Tunstall GmbH has introduced an expanded cable legend. The cables are organised according to their application areas. Relevant types of cables are allocated to specific application areas. These shall be considered as minimum requirements.

Marking	Designation	Cable type
la	General cables	IY(ST)Y 2x2x0.8
la2	General cables	IY(ST)Y 2x2x0.6
la3	General cables	IY(ST)Y 3x2x0.6
la4	General cables	IY(ST)Y 4x2x0.6
la5	General cables	IY(ST)Y 4x2x0.8
OSYnet	OSYnet group bus	Recommended cables:
		CAT7 (22 AWG) with diameter = 0.64 mm
		IY(ST)Y 4x2x0,8 with diameter = 0.8 mm
		Optional cables:
		CAT5 (23 AWG) with diameter = 0.57 mm
		CAT6 (23 AWG) with diameter = 0.57 mm
		CAT7 (23 AWG) with diameter = 0.57 mm
		IY(ST)Y 4x2x0,6 with diameter = 0.6 mm
le	Entertainment cables	2x IYY per channel
		or similar cables (1 double wire required for each programme)
In	RAN room bus	IY(ST)Y 2x2x0.8
lpwr	Power cable	NYM 2x2.5 mm <sup>2</sup>
		<b>ATTENTION!</b> The older marking "lp" is used in other documents instead of the marking "lpwr",
ls	Speech line plus RAN room bus	2x IY(ST)Y 2x2x0.8

Tab. 14: Cable legend

## 14.2 OSYnet group bus

The following types of cables are recommended for the OSYnet group bus:

- CAT7 (22 AWG) with diameter Ø = 0.64 mm
- IY(ST)Y 4x2x0.8 with diameter  $\emptyset$  = 0.8 mm

The following types of cables may be used optionally:

- CAT5 (23 AWG) with diameter Ø = 0.57 mm
- CAT6 (23 AWG) with diameter Ø = 0.57 mm
- CAT7 (23 AWG) with diameter Ø = 0.57 mm
- IY(ST)Y 4x2x0.6 with diameter Ø = 0.6 mm

Theses cables are twisted in pairs with the following design:





**Note!** The system cable CCS32 from Tunstall has been used in many earlier reconditioning projects. This cable may also be used.



**Warning!** No stub lines may be installed for the OSYnet group bus. All devices must be directly connected to the bus.

#### 14.2.1 Maximum permissible cable length for OSYnet

The maximum permissible length for the OSYnet group bus is 700 m.

Turatal	OSYnet	Ward 1	
	<	max. 700 m	$\longrightarrow$
Tunstill	OSYnet	Ward 2	
			•

Bus termination at the last bus user (= 120 ohms resistor)

Bus termination: The last device (e.g. a ComTerminal) at a bus cable must be fitted with a 120 ohms resistor (Order no. 00 0040 76) between the connecting points DH and DL.

## 14.3 Power supply cables (lpwr)

**NOTE!** The older marking "Ip" is used in other documents instead of the marking "Ipwr",

The power supply for all components is established with a separate network, e.g., NYM 2x2.5 mm<sup>2</sup>. The power supply cable lpwr is laid as a ring. The power supply unit should be connected to the rooms over the shortest possible cable route to avoid unnecessary voltage drops.

Maximum voltage differential from the power supply unit to the farthest room being supplied via the ring circuit should not exceed 4 V.

Where larger voltage drops are observed, another cable should be laid from the supply unit, or a cross linking within the +24 V ring circuit should be realised. If neither solution will solve the problem, a second power supply unit should be installed. Coupling of power supply units in parallel is not allowed.

The power supply ring circuit should be made using cables of  $2.5 \text{ mm}^2$  cross section. Depending on the type of circuit, single core leads (NYA 2.5 mm<sup>2</sup> for +24V and 0V) or a common cable (NYM 2x2.5 mm<sup>2</sup>) may be used.





### 14.4 RAN room bus

The RAN (room area network) links all components in a room. For data transfer, three conductors of IY(ST)Y 2x2x0.8 (Cable = In) are required.





#### Note!

The sum of all RAN cables connected to one Terminal may be max. 50 m long. The max. permissible number of RAN users is 30.

Devices for speech communication require an additional speech line, i.e. 2x IY(ST)Y 2x2x0.8 (cable type = ls).

All devices with RAN connection can be connected at random (star, bus, or mesh network). Later expansion of the RAN can be realised from any device and independent of the device's particular function. Only additional devices with speech communication require an extra speech line.

For a better overview, split the various RAN connections into function groups. This type of arrangement is more service-friendly (refer to next page).

The type of installation has no influence on the RAN functions.



### Service friendly



### 14.5 Electromagnetic compatibility (EMC)

All electronic components of the nurse call system emission and sensibility values are well within the prescribed parameters for electromagnetic compatibility (EMC). Nevertheless, interference with the nurse call system may occur in specific situations and due to insufficient interference suppression of fluorescent lamps - particularly in medical supply units.

Customers should make provisions which prevent such interference from external sources. In many cases, this type of external interference can be avoided by installing suppressor elements (varistor circuits). These varistor circuits are commercially available from the manufacturers. Tunstall offers the over-voltage protection circuit 230 V (70 0890 97).

The EMC properties of the various electro medical supply units may differ to a great extent. Even two supply units of the same type may act and react with considerable difference if they are wired in different ways.

Normally, nurse call systems are widely distributed over the building, and their EMC behaviour is affected by the specific design and layout of the network.

This situation should also be considered when effecting changes or amendments to existing medical supply units.

#### 14.5.1 Spacing to cables with dangerous voltage

Cables of the nurse call system must not be laid along with the cables of the low-voltage system or with cables of other systems of dangerous voltage in common cables, conduits or cable trays.

Cables of the nurse call system and cables of the low-voltage system must be placed at a minimum spacing of 30 cm. For shorter distances of less than 10 m the spacing may be reduced to 10 cm.

Rufanlage Nurse call system Systéme d'appel malade

Fig. 13: Spacing to cables of the low-voltage system

For laying nurse call system cables in medical supply units the regulations of ISO 11197 have to be observed.

# **15. System security**

## 15.1 Partial failure of the nurse call system

The Flamenco<sup>IP</sup> nurse call system is set up hierarchically. If individual group bus users or room bus users fail, the remaining users continue working.

If the group bus fails, the room functions are retained. A triggered call continues to be displayed on the room lamp. The triggered call device can be identified by the reassurance light.

All elements that trigger calls and their transmission paths are monitored. Faults in the transmission of the call are indicated immediately on the ward console with a specification of the location of the fault so that the nursing staff is informed immediately.

Faults in the ward are indicated to the nursing staff on the ward consoles:

- ComStation<sup>BUS-C</sup>
- ComStation<sup>PC</sup>
- ComStation<sup>CT</sup>
- ComStation<sup>T</sup>
- ManagementCenter<sup>PC</sup>

The faults of all wards are also displayed on the IP-SystemManager with operating mode "System" (collective display), see page 165.

Using the integrated test function in the room terminal (ComTerminal, RoomTerminal, ControlTerminal), a defective room bus user can be easily localised.

## 15.2 Failure of control units (IP-SystemManager)

In case an IP-SystemManager fails, the other IP-SystemManagers of the nurse call system continue to work.

The ward with the failed IP-SystemManager switches to minimum operation, i.e., the display of calls on the room lamp and call cancellation at the call location. Signalling on the room lamp is guaranteed by the room terminal.

If an IP-SystemManager fails, the "Power" LED on the device extinguishes. The fault is displayed on the IP-SystemManager with the operating mode "System" (collective display), see page 165.

# 15.2.1 Failure of the IP-SystemManager with operating mode "System"

A failure of the IP-SystemManager with operating mode "System" does not impair the basic nurse call functions. If this IP-SystemManager fails, the individual wards continue to work without the cross-ward functions. Speech communication, however, is no longer available. External systems connected through centralised interfaces or the IP network fail.

The fault message output of the IP-SystemManager with operating mode "System" indicates a fault.

Call handling at the ManagementCenter is no longer possible. The Management-Center indicates the fault immediately.

#### 15.2.2 Failure during ward coupling

During the coupling of several wards, it must be noted that calls are not detected in case of the failure of a ward and unoccupied nurse station. The owner must define and derive measures for this situation in a risk analysis.

## 15.3 Failure of the IP network

A failure of the IP network does not impair the basic nurse call functions. If IP network fails, the individual wards continue to work without the cross-ward functions. Speech communication, however, is no longer available. External systems connected through centralised interfaces or the IP network fail.

The IP-SystemManager with operating mode "System" indicates a fault. The failure of the IP network can be seen on every IP-SystemManager.

Call handling at the ManagementCenter is no longer possible. The Management-Center indicates the fault immediately.

## 15.4 Collective display for faults in the nurse call system

The IP-SystemManager with operating mode "System" is decisively vital for system security. During the planning of the nurse call system, it must be determined which IP-SystemManager shall receive the operating mode "System" and this decision must be reported to Tunstall.

All fault messages of the nurse call system are displayed on this IP-SystemManager. An LED display on the IP-SystemManager and a fault message output (potential free changeover contact) are used for this purpose. This output must be used in such a way that a nurse call system specialist or a technician trained by a specialist is informed immediately about the displayed fault. An acoustic fault indicator, for example, can be connected to the fault message output.

## 15.5 Power supply failure

In case of a failure of the power supply, existing calls and status information are saved and are not lost. Configuration data is saved in the system in a redundant manner.

#### 15.5.1 Emergency power supply

Normally, the nurse call system is connected to an emergency power supply. This maintains operation in the event of a failure of the general power supply. In buildings without an emergency power supply, operation of the nurse call system must be

maintained by other means. Power supply units with an emergency power supply of 15 minutes or one hour are available for this purpose, refer to chapter 8.13 "Power supply" on page 132.

For devices (e.g., PC) that are not connected to the 24 V supply of the nurse call system, separate uninterruptible power supplies (UPS) are required.

DIN VDE 0834-1:2016-06 requires the owner to guarantee save operation even after one hour has passed.

DIN VDE 0834-1:2016-06 requires the owner and planner to determine the power source for safety purposes before the planning of the nurse call system.

#### 15.5.2 Fault signalling

The power supply units of the Flamenco<sup>IP</sup> system indicate the failure of the mains power supply through the extinguishing of an LED display. At the same time, a potential free relay contact (NO) is switched. The contact can be loaded with a maximum of 30 V DC/1 A. This contact must be used for the clear indication of the failure of the mains power supply to a responsible party (e.g., through the connection of an acoustic fault indicator). The responsibility must be determined by the planner, owner and installer as early as the planning stage.

### 15.6 Failure of connected systems

In most applications, the Flamenco<sup>IP</sup> system is connected to other systems. Nevertheless, it remains an independent system. This means that if PBX, television systems or other interfaces fail, the nurse call system still functions autonomously.

## 15.7 Responsibility for fault signalling

The owner of the nurse call system must instruct the staff to report any functional irregularities, any failures and faults.

Nurse call system specialists or persons trained by such specialists must take measures to avert risks and initiate the elimination of faults in case of malfunction.

# **16. Electrical safety**

## 16.1 System separation

DIN VDE 0834:2016-06 stipulates that nurse call systems must meet the requirements of EN 60601-1 (2 x MOPP) with regard to electrical safety. MOPP (Means of Patient Protection) is a protective measure designed to reduce the risk of electric shock to the patient. 2 x MOPP corresponds to 4 kV isolation.

The Flamenco<sup>IP</sup> nurse call systems are constructed according to the principle of system separation, i.e. the entire nurse call system is constructed according to EN 60601-1. The power supply units are equipped with a 4 kV isolation. External devices may only be connected to the nurse call system via a safe separation (2 x MOPP) according to EN 60601-1. If such a separation point is not located in the device, a separate separator must be inserted between them.



Fig. 14: System separation principle

## **16.2** Connection of system-external devices

System-external device must be connected to the nurse call system only through interfaces that guarantee safe separation according to EN 60601-1 (2 x MOPP).

#### 16.2.1 Light control relays

When selecting the light control relays, safe separation according to EN 60601-1 (2 x MOPP) must be observed. For details refer to refer to chapter 17. "Light control" on page 207.

#### 16.2.2 Diagnostic call

Electrical medical devices can be connected the diagnostic connection cable, order no. 70 0812 10. This connection cable is connected to the socket for pear push switch of connection sockets for the triggering of diagnostic calls. Electrical medical devices are self-powered according to EN 60601-1 with internal galvanic separation. A galvanic separation to the nurse call system is therefore not required.

#### 16.2.3 RAN interfaces

If an external device is connected to a RAN interface, a separator according to EN 60601-1 (2 x MOPP) must be inserted between the device and the interface.

#### 16.2.4 OSYlink modules

If an external device is connected to an OSYlink module, a separator according to EN 60601-1 (2 x MOPP) must be inserted between the device and the module.

#### 16.2.5 IP-SystemManager

#### Connection to the IP network

The LAN port of the IP-SystemManager is already internally equipped with a separation point according to EN 60601-1 (2 x MOPP). An external separator is therefore not required.

#### **RS-232**

The IP-SystemManagers have two serial outputs (ESPA 4.4.4). These outputs are not internally equipped with a separation point according to EN 60601-1 (2 x MOPP). If these outputs are used, an external separator according to EN 60601-1 (2 x MOPP) must be inserted between the external device and the RS-232 output of the IP-SystemManager. The outputs are required for the connection of the following:

- Radio paging system/DECT
- Fire alarm system
- Electrical medical system

Interface isolator RS232 (76 5010 00) is suitable as a separator.

# 17. Light control

The Flamenco<sup>IP</sup> nurse call system offers the patient the possibility to switch lights using the patient units. For this purpose the connection sockets are equipped with appropriate outputs.

	Order no.	Pe ca (B	ear push switch incl. Il and light switch estNr. 70 0710 0x)	Ра (О 74	tient handset rder no. 0747 00)
Connection socket combi	70 0424 00, 70 0425 00	<ul> <li>Switching on/off one light source (room light or reading light) without dimming</li> <li>Dimming one light source (room light or</li> </ul>	-	Switching on/off two light sources	
Connection socket combi, bedhead unit	70 0434 00, 70 0435 00		without dimming Dimming one light		reading light) with- out dimming Dimming two light sources (room light and reading light)
Connection socket combi, TVL	70 0424 50, 70 0425 50		reading light)		
Connection socket combi, bedhead unit, TVL	70 0434 50, 70 0435 50				
Connection socket with call switch	70 0171 60		Switching on/off one light source (room	-	
Connection socket with call switch, bedhead unit	chi can switch onnection socket 70 0171 50 th call switch, odhead unit		light or reading light) without dimming Dimming one light source (room light or reading light)		

Tab. 15: Connection sockets and patient units for light control

The switching outputs provide an output voltage of 24 V DC and an output current of max. 200 mA, sourced from the nurse call system power supply. The potential refers to the 0 V connections of the nurse call system. The outputs prepare a switching pulse (24 V DC, max. 200 mA) for as long as the button on the patient unit is held down (pear push switch or patient handset).

The light relays to be used must meet the requirements specified in the following sections.

- refer to chapter 17.1 "Application: Switching the light on/off (without dimming)" on page 208.
- refer to chapter 17.2 "Application: Dimming the light" on page 209.

# 17.1 Application: Switching the light on/off (without dimming)

	Requirements		
Relay type	Pulse relay (electronic)		
	Pulse relay (mechanical)		
Nominal control voltage	24 V DC		
Control voltage range	18 - 26 V DC		
Max. current consumption	200 mA		
Freewheeling diode	+24 V When using a mechanical relay a freewheeling diode must be connected (e.g. 1N4002) directly at the relay connectors.		
Potential separation	When installing the galvanic separation of the electric circuits must be ensured. It is necessary to comply with the German standard DIN VDE 0834.		
Connection example with electr	ronic pulse relay)		
L N Light source	Connection socket LT1 O V Pulse relay (electronic) Connection socket Pulse relay		
Connection example with mech	nanical pulse relay)		
'└ <u></u> N_ <del> </del>			
Light source	Pulse relay Freewheeling		
Light source	Pulse relay (electronic) Patient un nanical pulse relay)		

Tab. 16: Light relays for the application: Switching the light on/off (without dimming)

## 17.2 Application: Dimming the light

	Requirements		
Relay type	<ul> <li>Switching relay (electronic)</li> </ul>		
	Switching relay (mechanical)		
Nominal control voltage	24 V DC		
Control voltage range	18 - 26 V DC		
Max. current consumption	200 mA		
Freewheeling diode	+24 V When using a mechanical relay a freewheeling diode must be connected (e.g. 1N4002) directly at the relay connector.		
Potential separation	When installing the galvanic separation of the electric circuits must be ensured. It is necessary to comply with the German standard DIN VDE 0834.		
Ballast	An appropriate dimmable ballast is required to use the dim- ming, e.g. OSRAM DALI.		
Connection example with elect	ronic switching relay)		
Connection example with mech PE N Light source Dimmable ballast	Ananical switching relay)		

Tab. 17: Light relays for the application: Dimming the light

# 18. Voltage surge protection

The German standard DIN VDE 0834-1 regulates that all cables of the nurse call system which are to emerge from the building shall be provided with voltage surge protection according to EN 50468 at the emerging point.

For the voltage surge protection you have especially to follow:

EN 61663-2: Lightning protection -Telecommunication lines - Part 2 Lines using metallic conductors (IEC 61663-2:2001).

In the following the structure of the voltage surge protection is presented for cables of the Flamenco<sup>IP</sup> nurse call system, which are laid between two buildings.

**Note!** For the described fine protection of the Flamenco<sup>IP</sup> nurse call system it is provided that a basic surge protection to absorb the higher energies has been completed according to the valid regulations. The installation of a fine protection would be useless without this upstream protection.

The voltage surge protection has to be installed in the main building connection point. This should be installed directly where the cables enter the building.



**Note!** To make sure a permanent protection of the Flamenco<sup>IP</sup> nurse call system, the voltage surge protection devices have to be installed acc. to the manufacturer 's specifications.

## 18.1 SPD module

The following surge protection device (SPD) module is suitable for the use with Flamenco<sup>IP</sup>. But it is just an examples. SPD modules of other makes can be used as well.

Functions	Order no.	
SPD module for network cables DPA M CLE RJ45B 48	77 4900 02	
Surge arrester class E, fully shielded, tested acc. to EN 61643-21 for universal use acc. to EN 50173 up to 48 V DC for the protection of 4 pairs of data network interfaces via RJ45 socket, for single application or application in 19 inch cabinets, space-saving, width 19 mm.		
<ul> <li>Max. continuous operating DC voltage: 48 V</li> </ul>		
Nominal current: 1 A		
<ul> <li>C2 Total nominal discharge current (8/20) line-PG: 10 kA</li> </ul>		
<ul> <li>Mounting on 35 mm top hat rail acc. to EN 60715</li> </ul>		
Unit used in the figure on the right: mm		





Fig. 15: Voltage surge protection between two buildings
# **19. Installation examples**

## **19.1 Product legend for the examples**

00 0040 76	12 ohms resistor (bus termination)
05 0024 01	Loudspeaker with announcement interface
74 0452 30	Connection socket ComStation
76 2100 00	IP-SystemManager
76 0730 00	System module HEALTH
76 0740 00	Function module UM/A
76 0743 00	Function module VOIP GATE
77 0111 02	Direction lamp
77 0112 02	Group lamp, 2 groups
77 0160 00	Corridor display Alpha 16, double sided
77 0510 00	ComTerminal Flamenco
77 0520 00	RoomTerminal Flamenco
77 0550 00	ControlTerminal Flamenco
77 0605 00	ComStation <sup>BUS-C</sup> Flamenco
77 0606 00	ComStation <sup>CT</sup> Flamenco
77 0606 20	ComStation <sup>T</sup> Flamenco
77 0802 00	OSYlink-Group lamp
77 0803 00	OSYlink-Universal
77 0804 00	OSYlink-Announcement
77 0960 00	ControlTerminal Installation kit
77 3400 00	Power supply unit UPS

### 19.2 System with speech (ward console)



#### 19.3 System with speech (central console)



### 19.4 System without speech



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