Replacing the Battery

The mobile transceiver is powered by a 3 volt lithium replaceable battery. The battery voltage is continually monitored and if low voltage is detected a "low battery" alarm is transmitted as part of the heartbeat transmission of the unit. Under normal circumstances the battery life is 1 to 1½ year.

Start by removing the rear cover, see "Removing the Rear Cover" on page 135, then remove the printed circuit board by pulling it out of the body of the NITX.

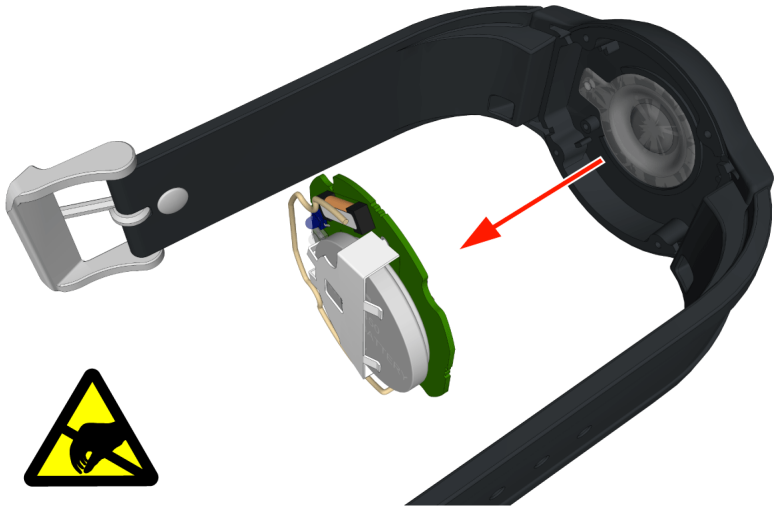


Figure 186. Remove the NITX circuit board

Remove the empty battery from the NITX circuit board by sliding it in the direction of the arrow. Place the new battery with the positive"+" terminal facing upwards and slide it into place.

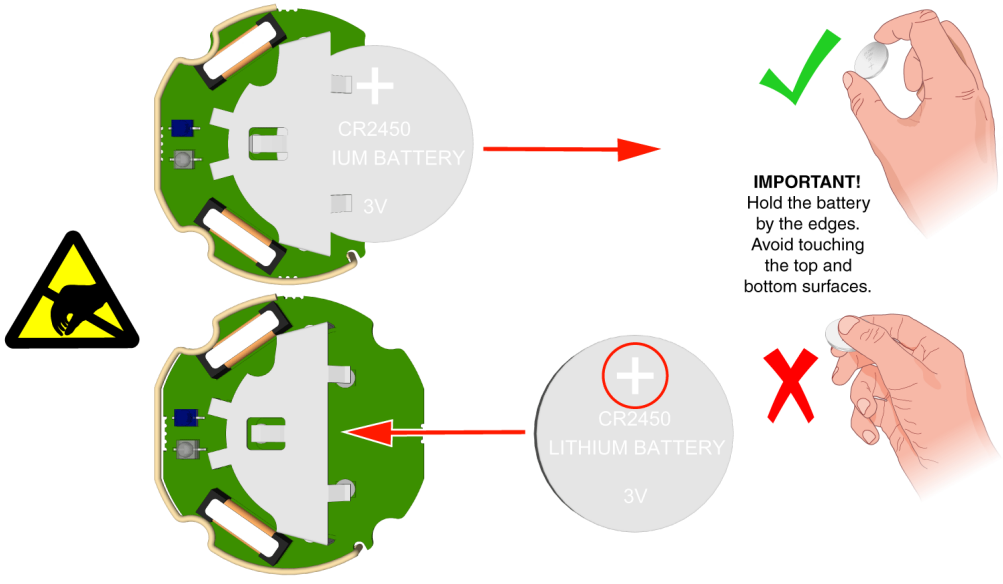


Figure 187. Removing the old and placing the new battery

Mobile Transceiver Accessories

Interchangeable rings, buttons and strap loops make it possible to customize the mobile transceiver body. The four rings and six buttons including a ring mounting tool are available as customization kit and the five strap loops including a rivet are available as an accessory kit.

Figure 188. Mobile transceiver accessories

8.3.4 NILF Low Frequency Beacon

The low frequency beacon NILF is contained in a white plastic enclosure with a slim design that is suitable for surface mounting on walls or at a door post. The NILF is powered by three 1.5V "C" (R14) alkaline batteries. In situations where battery power is not suitable a 24Vdc external power supply can be used.

An optional transceiver module NIRX can be mounted on the NILF circuit board used to monitor the NILF through a heartbeat signal, The NIRX will send out a tamper alarm upon front cover removal detection or send a low battery alarm.

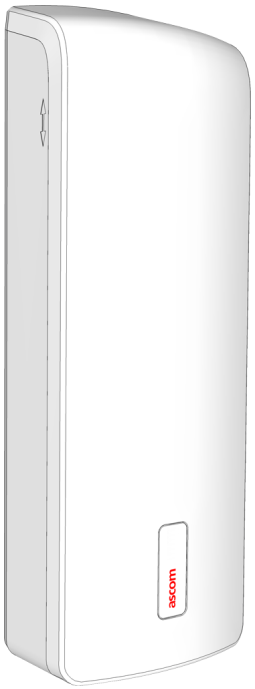


Figure 189. NILF - Low Frequency Beacon

The NILF operates at 125 kHz producing a spherical magnetic field with a range of up to 6.5 feet (2 meters) when battery powered or 10 feet (3 meters) when powered from an auxiliary 24Vdc power supply. The magnetic field strength can be adjusted to suit the requirements. A master/slave configuration can be used to extend the range of the LF field.

DIP switches are used to set the 12bit ID code, to select the transmission rate allowing a suitable interval between 0.1 - 2s and to set the output power, ranging from 0.30m to 3m.

NILF Installation

The slim design makes the NILF suitable for surface mounting on walls or at a door post at approximately 4 feet (1.2 meters) from the ground.

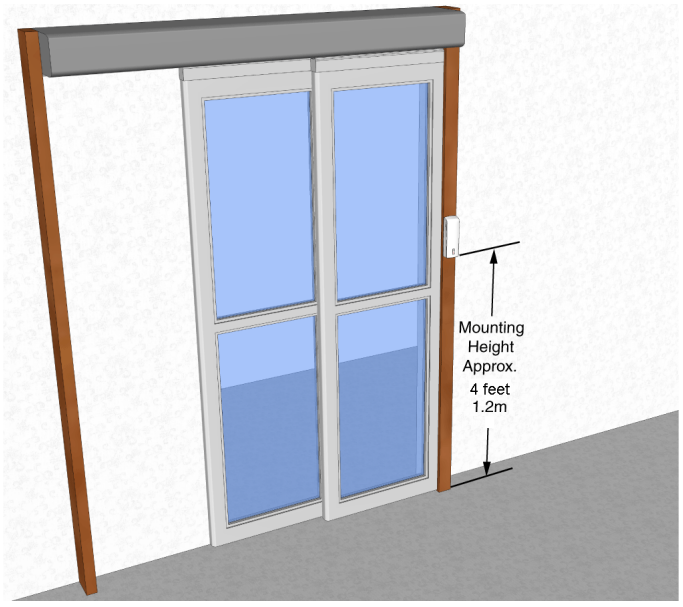


Figure 190. NILF installation example

WARNING: The NILF produces a low frequency magnetic field. Installing the NILF in proximity of metal objects or electrical cables can negatively influence the magnetic field which reduces the LF field coverage.

Open the NILF by removing the screw that is located at the bottom of the housing. To remove the front cover slightly lift it up and gently pull it off of the rear cover.

Figure 191. Removing the front cover of the NILF

Place the NILF onto the door post or the wall at approximately 4 feet (1.2 meters) from the ground and mark the holes for drilling with a sharp pencil.

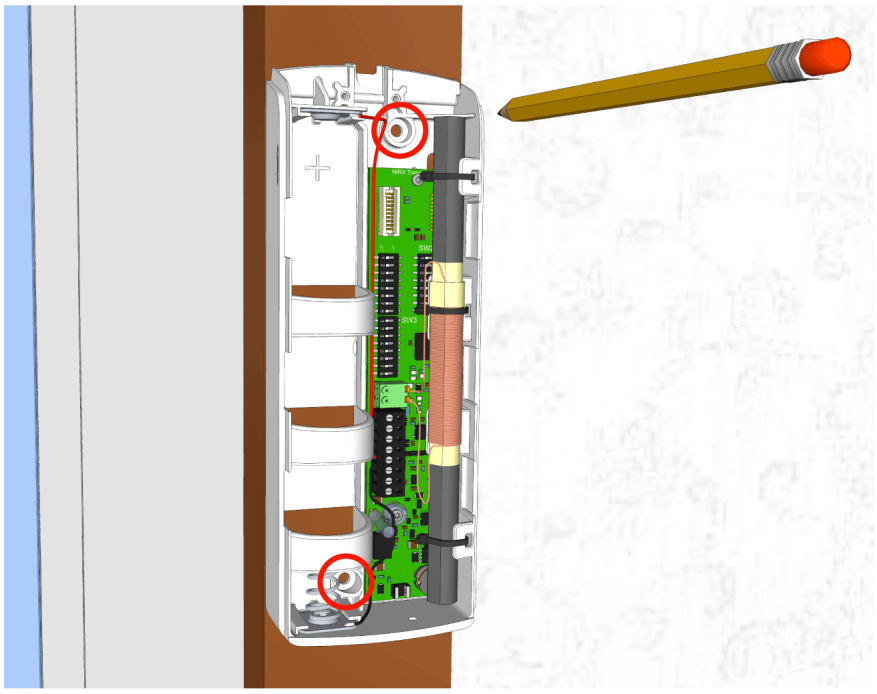


Figure 192. Mark the holes for drilling

Screws with a diameter of 1/8 in. (3.8mm) should be used to mount the NILF to the door post or the wall. Two suitably sized holes should be drilled at the marked spots. In a wooden door post holes should be drilled that are slightly smaller than the size of the screws that are used. When mounting

the NILF on a wall, holes should be drilled that accept a wall plug suitable for using screws with a diameter of 1/8 in. (3.8mm).

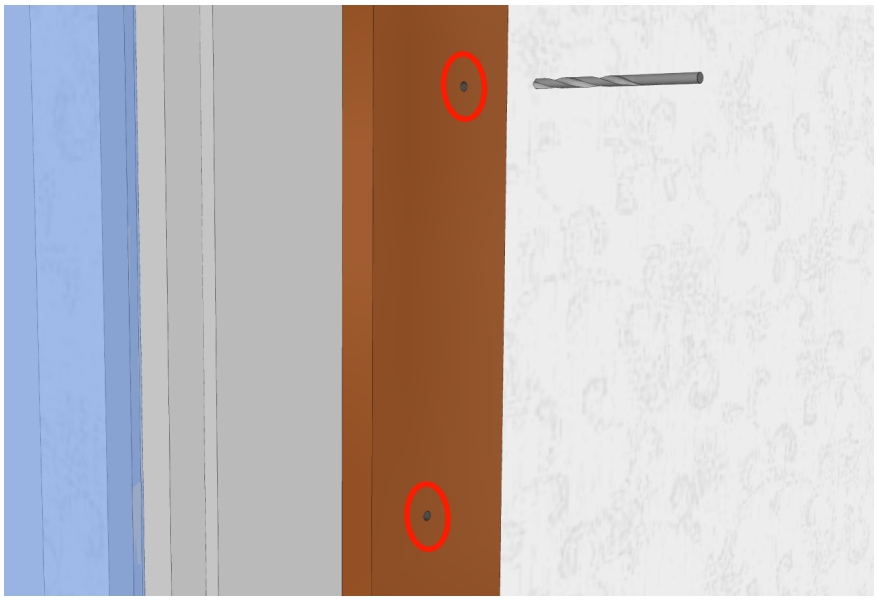


Figure 193. Drill the two holes with the proper drill

Mount the NILF on the door post or wall.

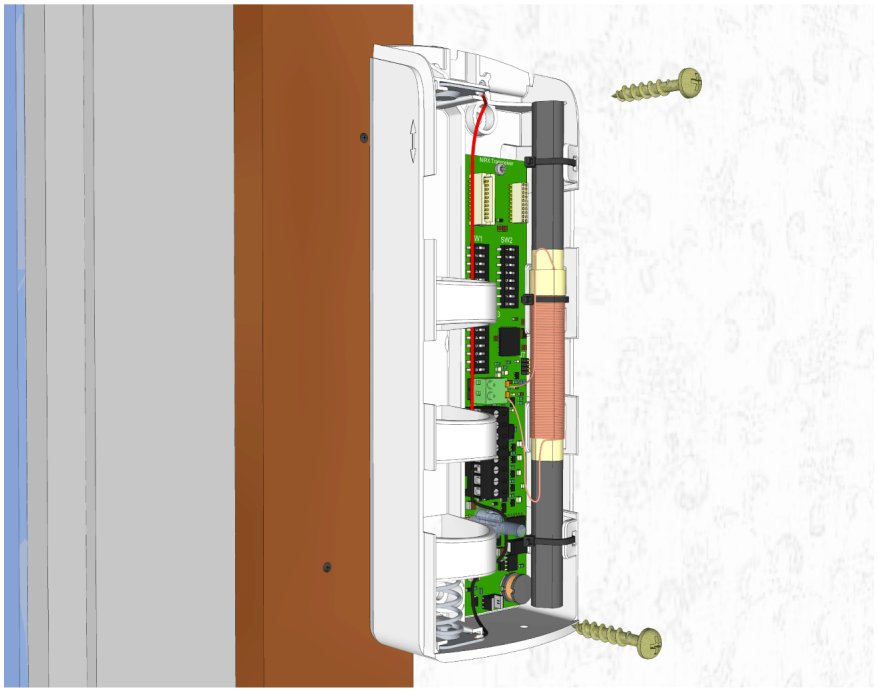


Figure 194. Placing the NILF on the door post

The two screws should be tightened carefully using the appropriate screwdriver. Make sure that the NILF does not bend when tightening the screws.

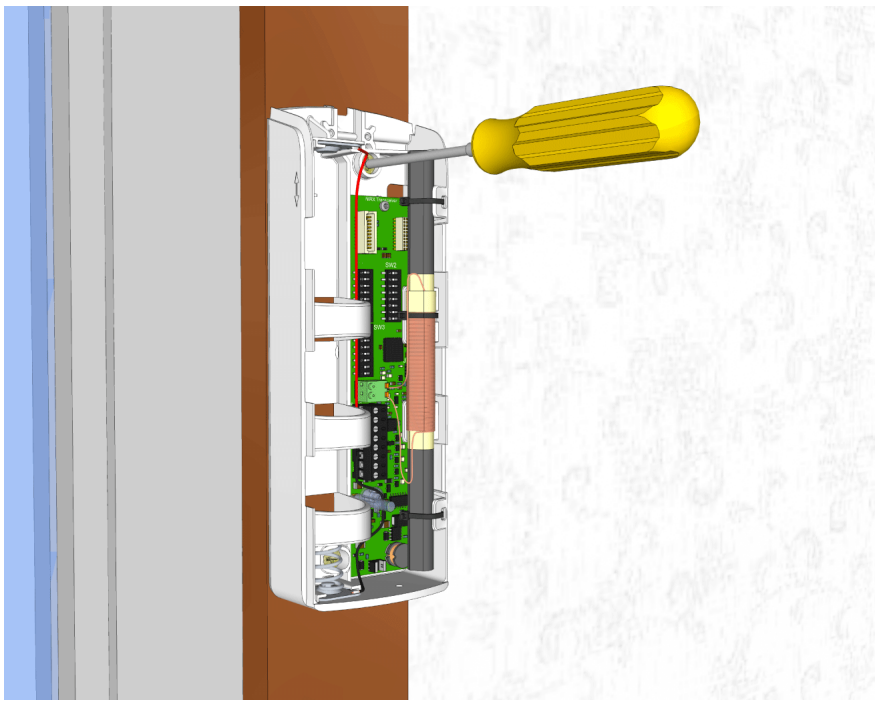


Figure 195. Tightening the two screws.

8.3.5 NILF Electrical Connections

The electrical connections on the component side of the low frequency beacon printed circuit board are shown in the following drawing of the NILF circuit board.

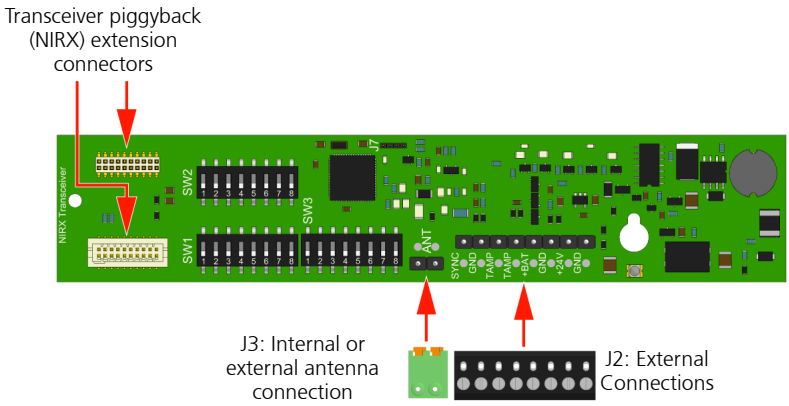


Figure 196. Low frequency beacon NILF electrical connections

NIRX Placement

The NIRX transceiver module can be piggyback mounted on the (NIRX) extension connectors.

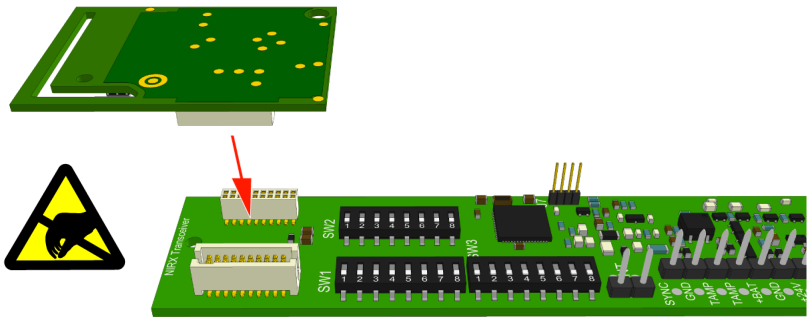


Figure 197. Placing the NIRX on the NILF board

Note: *To place an NIRX module it is necessary to remove the internal LF antenna*

Antenna Connection

The 2-pole antenna connection (J3) is connected to the internal LF antenna.

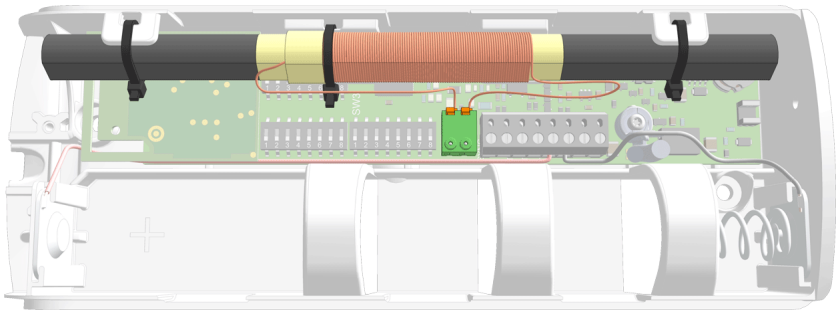


Figure 198. NILF internal antenna connected

External Connections

The 8-pole external connector (J2) has connections for a second beacon used for range extending in a master/slave configuration, a galvanically separated tamper alarm relay output, the internal battery and an external 24 Vdc power supply input.

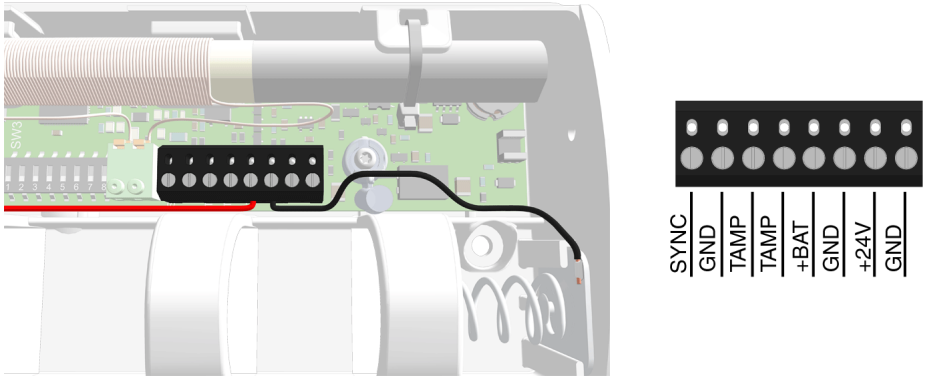


Figure 199. External connections - J2

External Connector		Description
1	SYNC	Master / Slave interconnection Beacon synchronization
2	GND	
3	TAMP	Tamper alarm relay output (galvanically separated)
4	TAMP	
5	+BAT	Battery connection
6	GND	
7	+24V	External 24Vdc power supply connection
8	GND	

For master / slave connection see "Master / Slave Beacon Interconnection" on page 147.

For tamper alarm relay connection see "Tamper Alarm" on page 150.

For 24Vdc external power supply connection see "External Power Supply Connection" on page 150.

8.3.6 NILF DIP Switch Settings

The NILF uses three sets of 8-pole DIP switches to set the ID, output power and transmission rate, master/slave mode and the active location functionality.

NILF ID

DIP switches SW1 (1-8) and SW2 (1-4) are used to set the 12 bit ID code of the NILF.

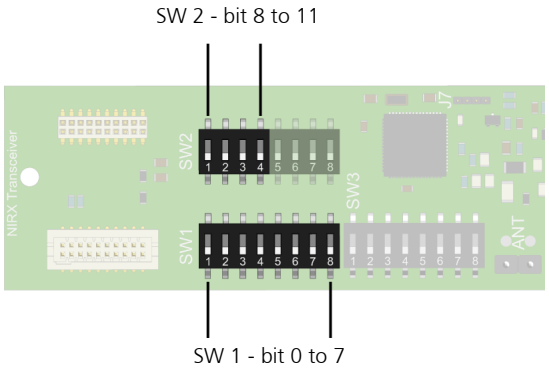


Figure 200. NILF 12 bit ID - DIP switch settings

NILF ID Settings			
SW1	**Low byte**	**SW2**	**High nibble**
1	Bit 0	1	Bit 8
2	Bit 1	2	Bit 9
3	Bit 2	3	Bit 10
4	Bit 3	4*	Bit 11
5	Bit 4		
6	Bit 5		
7	Bit 6		
8	Bit 7		

* When the highest bit (bit 11) of the NILF ID is set the NILF will function as an active location beacon. See “Beacon Mode” on page 148. for detailed information.

Output Power and Transmission Rate DIP Switch Settings

With the 4 bit output power DIP switch SW3 (1-4) selection the range of the LF field can be adjusted. In relation with the output power the repetition rate of the low frequency transmissions can be set to normal, high, low and very low using 2 bit DIP switch setting on SW2 (5 and 6).

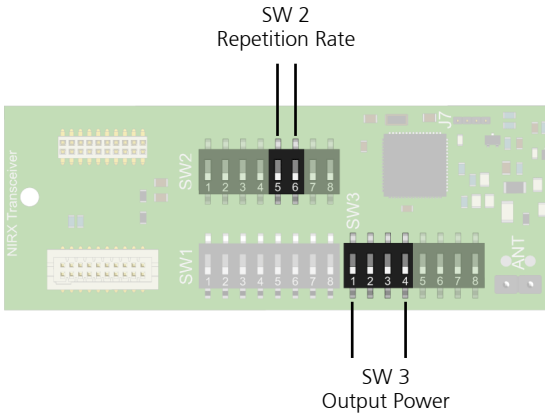


Figure 201. Output Power and Repetition Rate DIP switch settings

Lowering the output power to decrease the range of the LF field will increase the repetition rate of the transmissions. The table below shows the relation between the output power and the repetition rate.

Output Power			**Repetition Rate (transmissions/s)**			
			Normal	**High**	**Low**	**Very Low**
SW3 (4 - 1)	**Range**		**SW2 (6 - 5)**			
	meters	**feet**	00	01	10	11
0000	0.3	1	10	20	5	1
0001	0.35	1.15	8	16	4	0.8
0010	0.4	1.3	6.7	13.4	3.35	0.67
0011	0.55	1.8	5.0	10	2.5	0.5
0100	0.7	2.3	4.0	8	2	0.4
0101	0.85	2.8	3.3	6.6	1.65	0.33
0110	1.05	3.5	2.7	5.4	1.35	0.27
0111	1.2	4	2.4	4.8	1.2	0.24
1000	1.35	4.4	2.1	4.2	1.05	0.21
1001	1.6	5.2	1.8	3.6	0.9	0.18
1010	1.7	5.6	1.7	3.4	0.85	0.17
1011	1.9	6.2	1.5	3	0.75	0.15
1100	2.15	7	1.3	2.6	0.65	0.13
1101	2.4	8	1.2	2.4	0.6	0.12
1110	2.7	9	1.1	2.2	0.55	0.11
1111	3	10	1.0	2	0.5	0.10

External 24Vdc power supply required.

Master / Slave Mode DIP Switch Settings

With DIP switch SW2 (8) the master / slave mode of the NILF can be set.

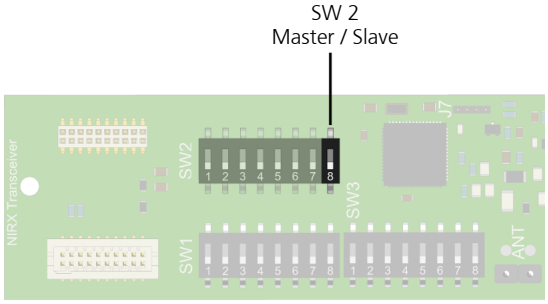


Figure 202. Master / Slave DIP switch settings

NILF Master / Slave Settings	
SW2 (8)	**Mode**
Off = 0	Master
On = 1	Slave

A master/slave configuration can be used to extend the range of the LF field (when master and slave use same ID) or to synchronize LF transmissions between two beacons when there is an overlap in the LF fields (when master and slave use different IDs).

Refer to "NILF ID" on page 145 for setting the ID of the slave NILF.
Refer to "Beacon Mode" on page 148 for setting the mode of the slave NILF.
Refer to "Output Power and Transmission Rate DIP Switch Settings" on page 146 to set the output power of the slave NILF. Note that the transmission rate is decided by the master synchronization, and setting this option on the slave will have no effect.

Master / Slave Beacon Interconnection

Connector J2 pin1 (SYNC) and pin 2 (GND) are the interconnection pins used for beacons operating in master / slave mode. Interconnect the "Sync / GND" connections between the master and slave beacon as depicted below.

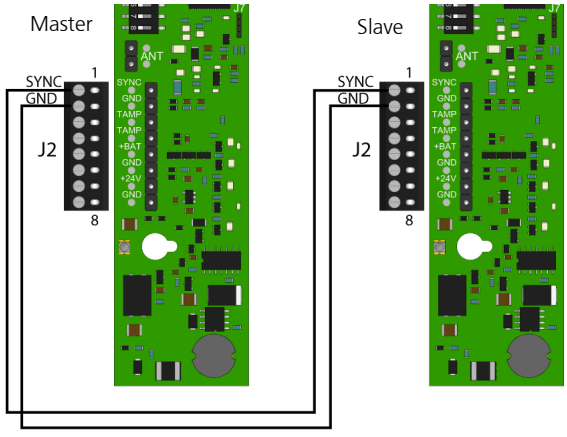


Figure 203. NILF master / slave interconnection

Note: *Minimum recommended cable requirements (twisted pair) for example CAT5. Length < 100m.*

Beacon Mode

With DIP switch SW3 (5) the mode of the LF location beacon can be set to passive or active.

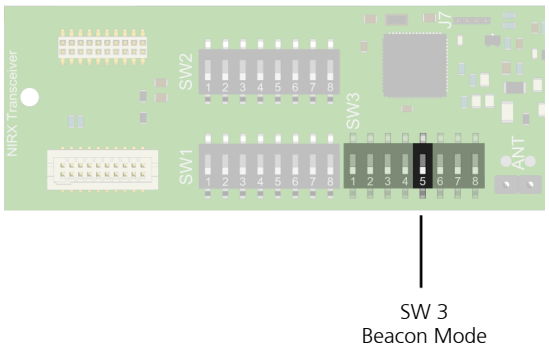


Figure 204. Beacon Mode DIP switch settings

NILF Location Beacon Mode		
SW3 (5)	**Mode**	**NILF ID**
Off = 0	Passive	000 - 7FF
On = 1	Active	800 - FFF

Note: *Setting the beacon mode to "Active" will automatically set the most significant bit (bit 11) of NILF ID, therefore the ID range for active location beacons will be from 800 to FFF,* see "NILF ID" on page 145.

Passive Location Beacon

Wireless devices that enter the LF field of a passive location beacon will receive a location update message that is stored locally by the wireless device as the last known location. When a call is made the last known location will be added to the message for linking and messaging.

Active Location Beacon

Wireless devices that enter the LF field of an active location beacon will be triggered to send out the location update message directly to the wireless server whenever the wireless device enters or leaves an LF field. Depending on the system configuration the location update messages can be used for access control, wanderer control and automatic location updates when moving from one active location to the other.

Placing the Batteries

The NILF requires three 1.5V "C" (R14) alkaline batteries. The battery voltage is continually monitored. A red LED will indicate low battery status (1 flash per minute) and tamper alarm (continuous rapid flashing). Under normal circumstances the battery life is minimum one year.

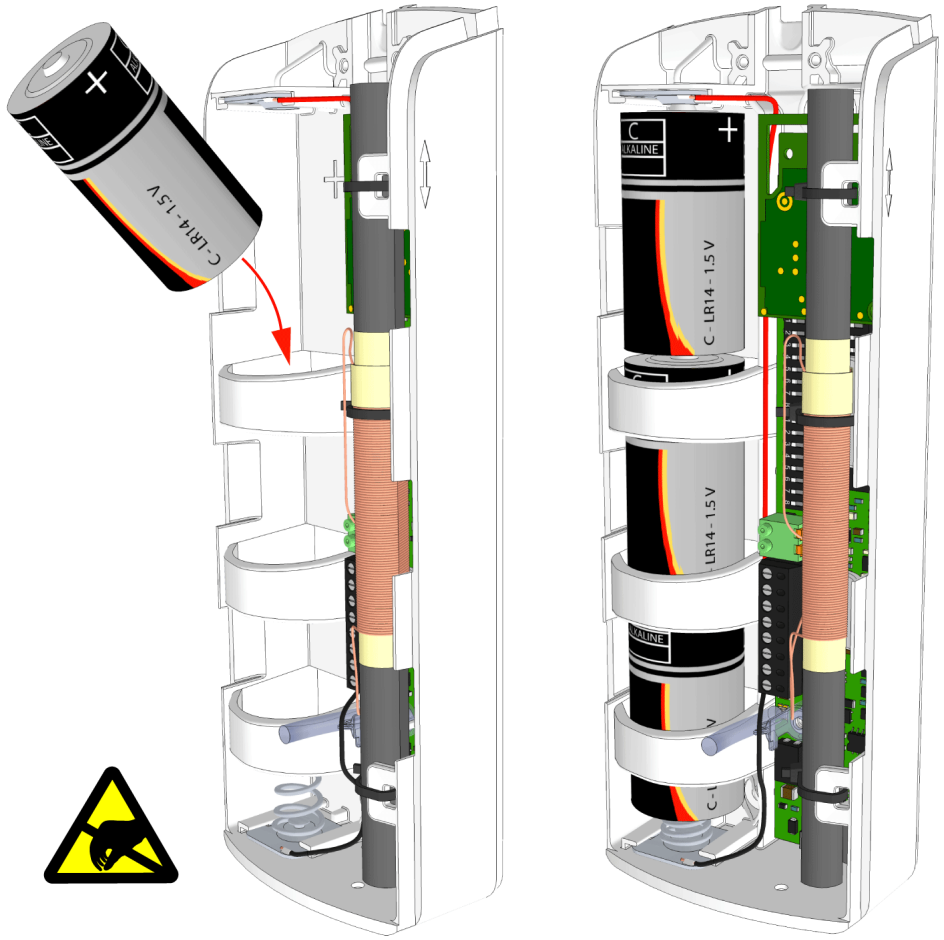


Figure 205. Placing the three 1.5V "C" (R14) alkaline batteries

Note: *Optionally an NIRX transceiver module can be mounted on the LF location beacon - NILF for actively monitoring the state of the NILF like tamper and low battery alarm conditions.*

External Power Supply Connection

Alternatively an external 24Vdc power supply can be connected to power the NILF.

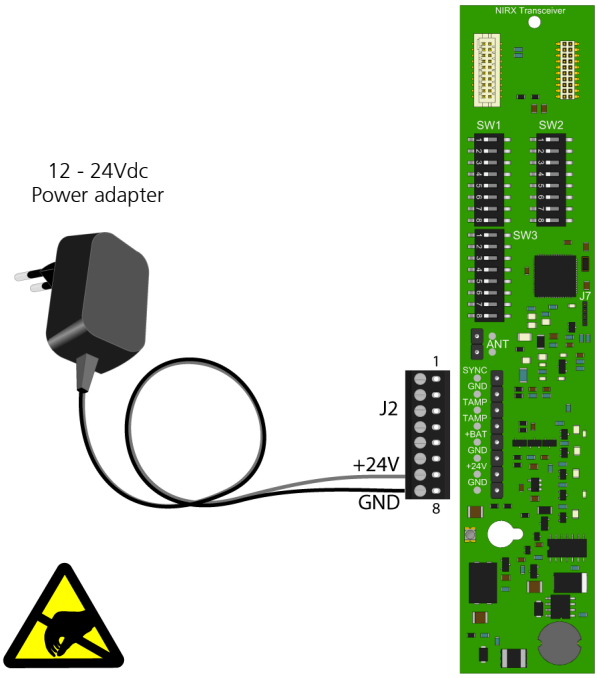


Figure 206. External 24Vdc power supply connection

Tamper Alarm

The tamper alarm output has a galvanically separated normally closed contact. The tamper alarm output can be connected to a third-party system for generating an alarm when the NILF is tampered with.

IMPORTANT: *The tamper alarm output is only functional when an external 24Vdc power supply is used to power the NILF.*

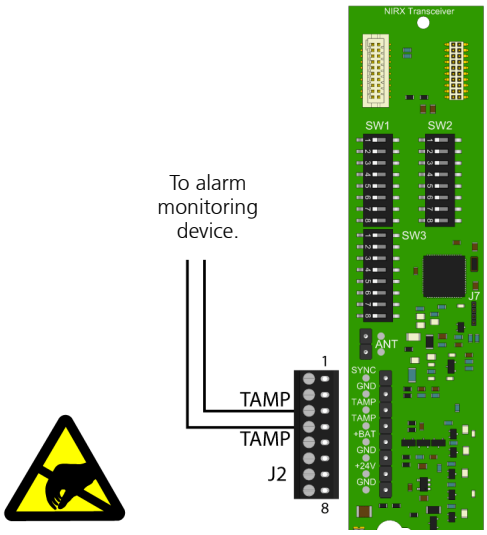


Figure 207. Galvanically separated normally closed tamper alarm output

9 Installation Examples

9.1 2-Bed Room with Active Toilet Cancel and Active Pull Cord Peripherals

A typical basic installation of a teleCARE IP system consists of one room controller with integrated corridor lamp (NIRC) to which the peripherals are connected. The room controller offers three room buses which connect the peripherals to the room controller

The example shown in the Illustration below is a 2-bed room with active peripherals for the toilet and shower. Each bed is equipped with a bedside module, and a handset.

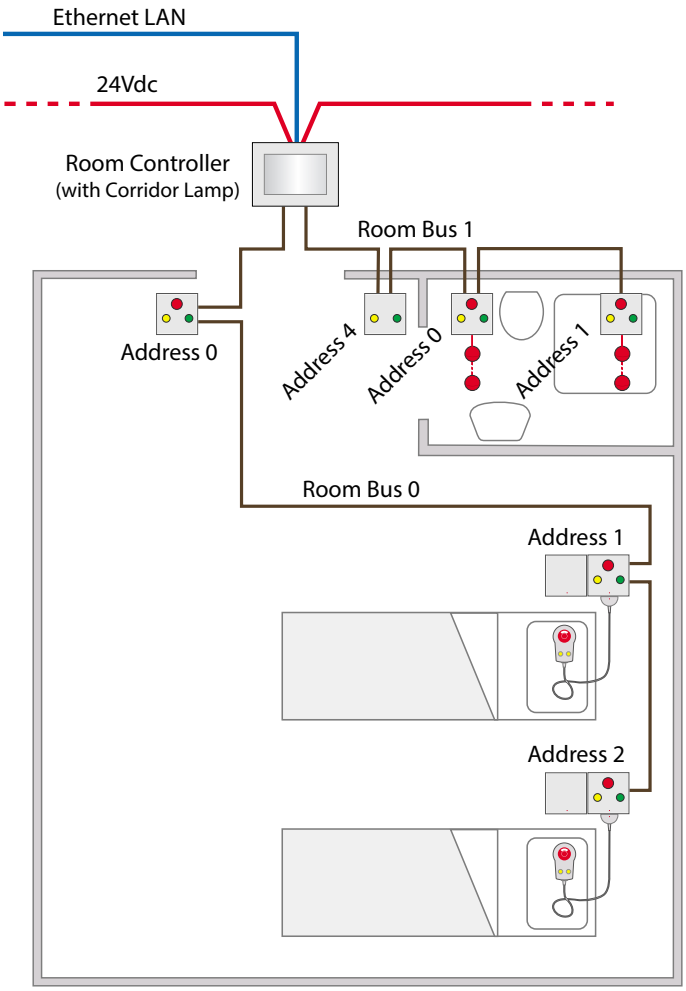


Figure 173. Typical 2-bed room with active toilet and shower peripherals

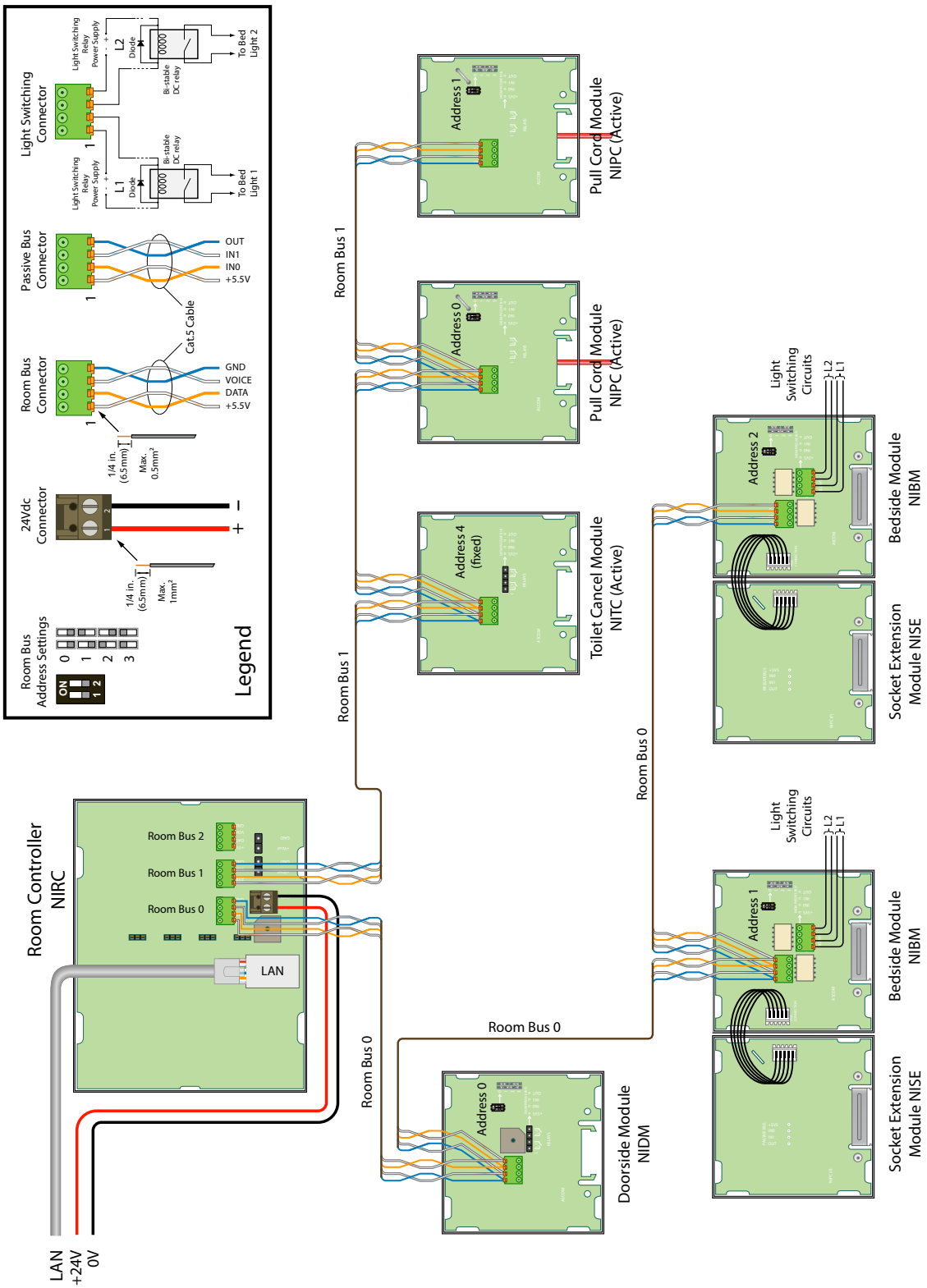


Figure 174. Wiring for 2-bed room with active toilet and shower peripherals

9.2 2-Bed Room with Passive Toilet Cancel and Passive Pull Cord Peripherals

The following installation of a teleCARE IP system consists of one room controller with integrated corridor lamp (NIRC) to which the peripherals are connected. The room controller offers three room buses which connect the peripherals to the room controller

The example shown in the Illustration below is a 3-bed room with a toilet and shower. Each bed is equipped with a bedside module, and a handset.

Passive peripherals are used for the toilet and shower. These peripherals are connected to a passive bus from the door side module.

Note:

1).In the examples that follow, all references to the NISE socket extension module and NIMS medical rail socket do not apply for UL 2560 systems.

2). References to the NISE socket extension module can be interpreted as applying to the speech module (NISP) instead.

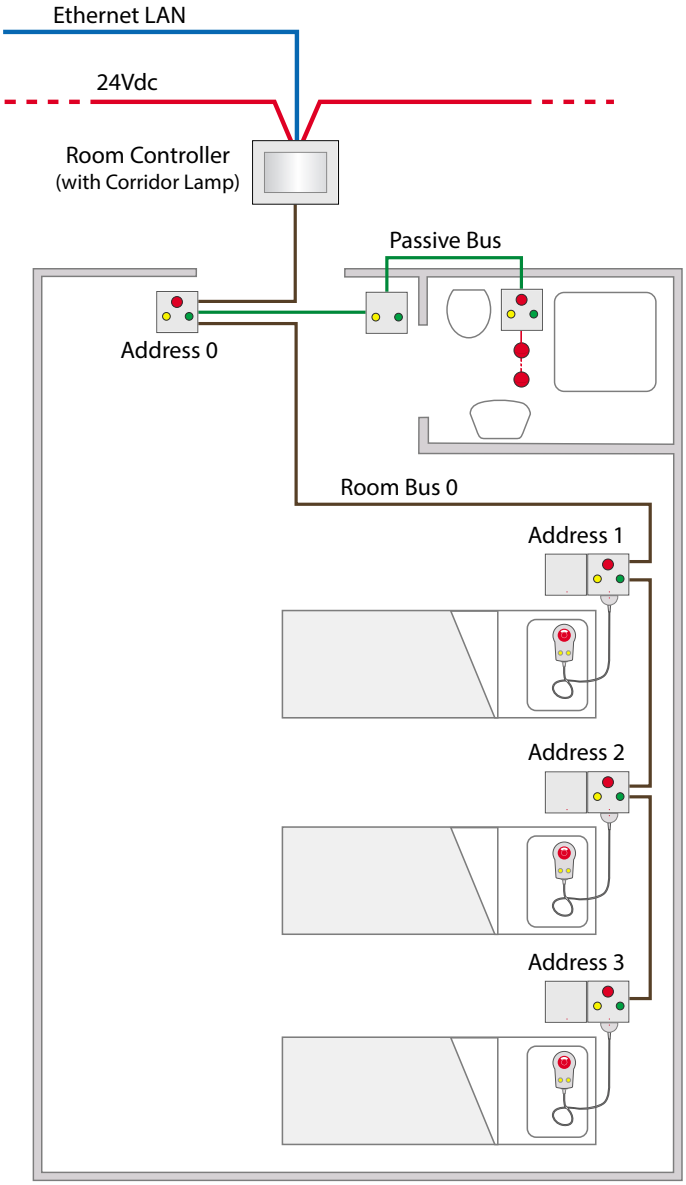


Figure 175. Typical 2-bed room with passive toilet and shower peripherals

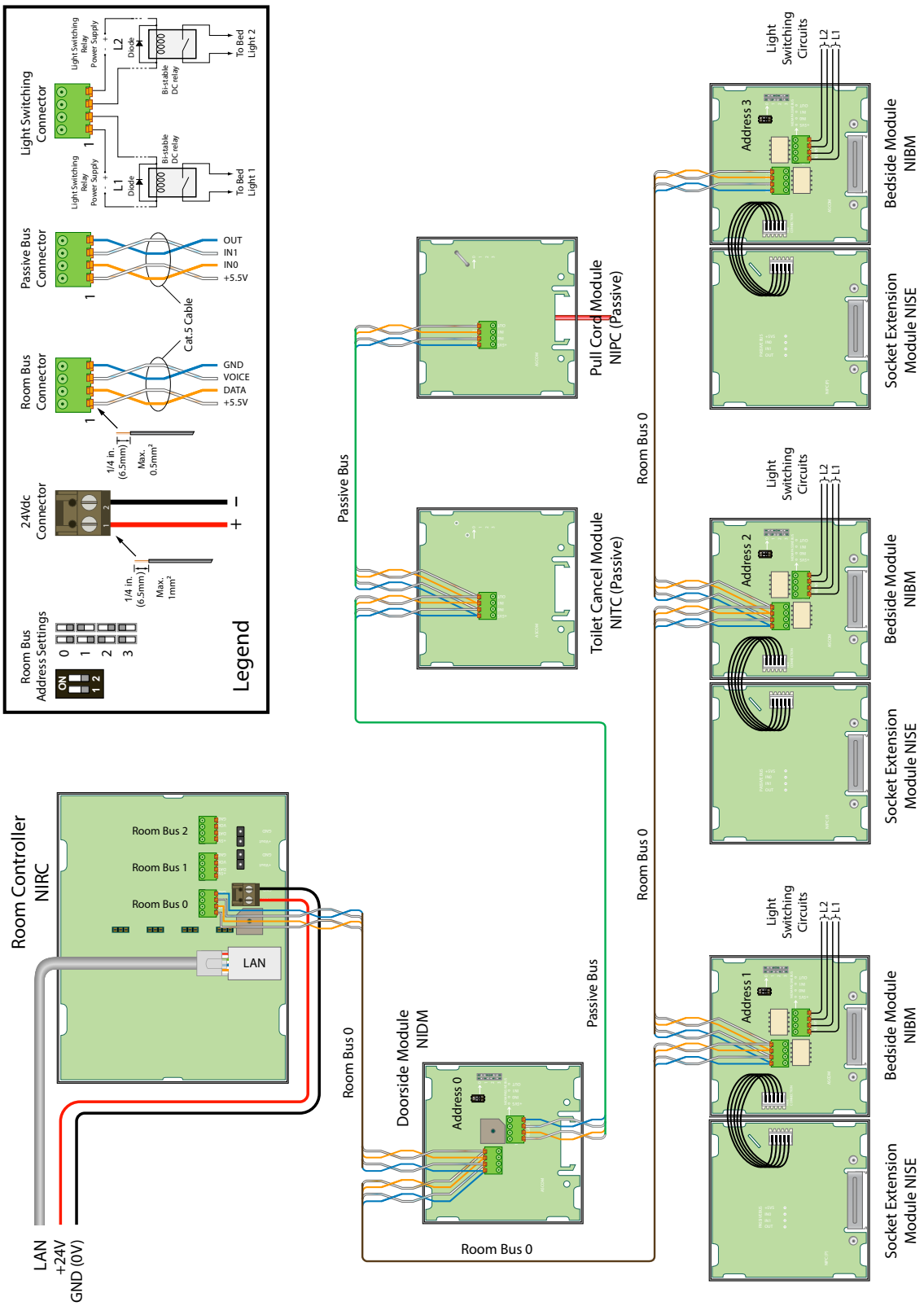


Figure 176. Wiring for 3-bed room with passive toilet cancel and passive pull cord

9.3 2-Bed Room with a Medical Rail Socket at each Bed

The example shown in the Illustration below is a 2-bed room with peripherals for the toilet and shower. Each bed is equipped with a medical rail socket (which is usually installed in the medical rail above the bed) and a handset.

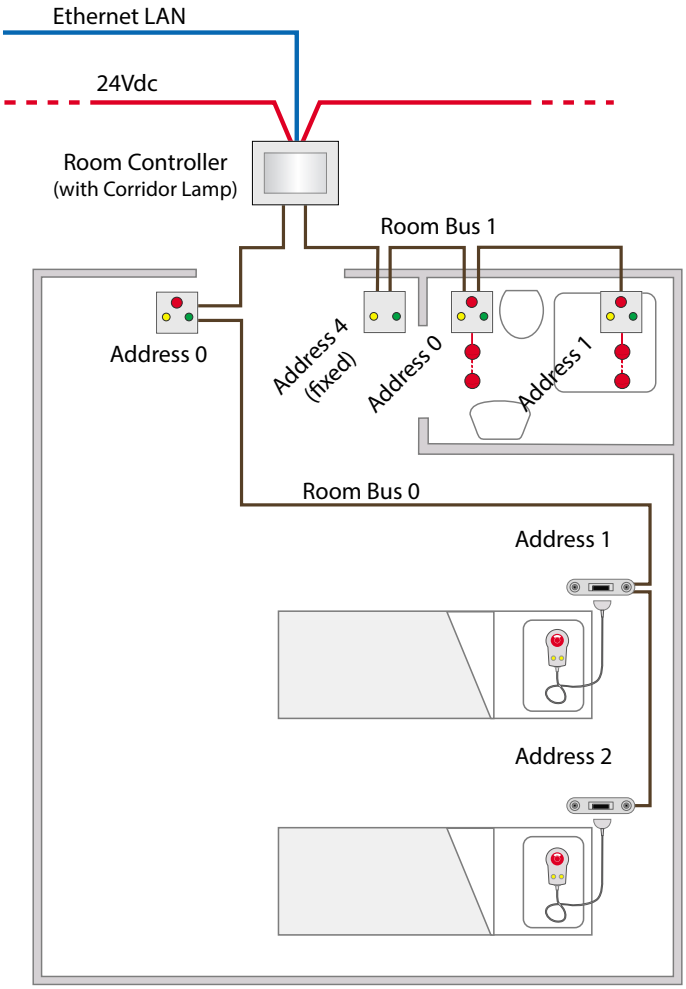


Figure 177. 2-Bed Room with medical rail sockets

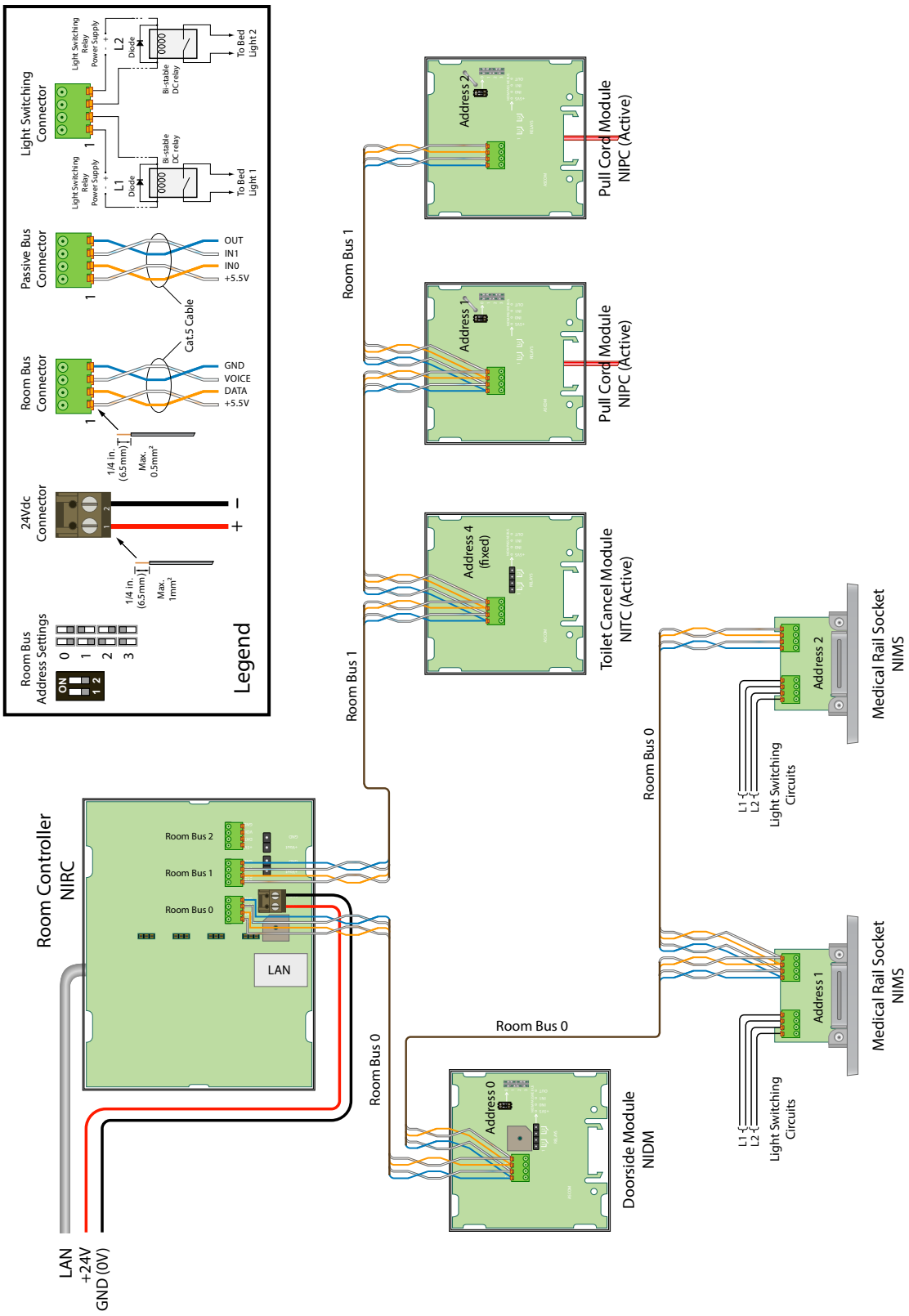


Figure 178. Wiring for a 2-bed room with medical rail sockets

9.4 Room Controller with Corridor Lamps (Master/Slave)

The example below shows the combination of a room controller and 2 corridor lamps. In the example there are three resident rooms, each containing 3 beds and a toilet with shower.

One of the rooms is connected to the room controller and each of the other rooms is connected to a corridor lamp. Each corridor lamp is connected to one of the room buses of the room controller.

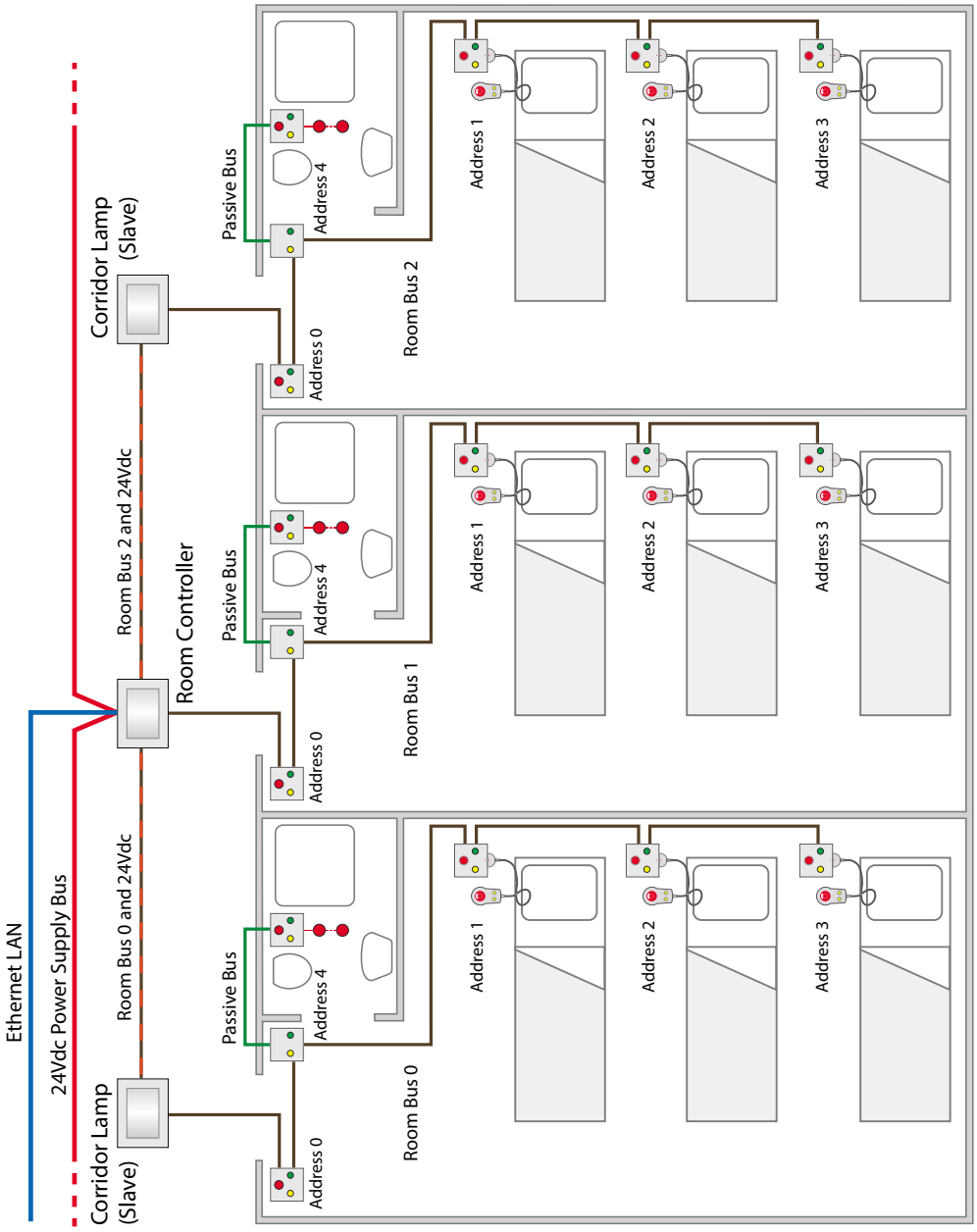


Figure 179. Room controller with corridor lamps installation

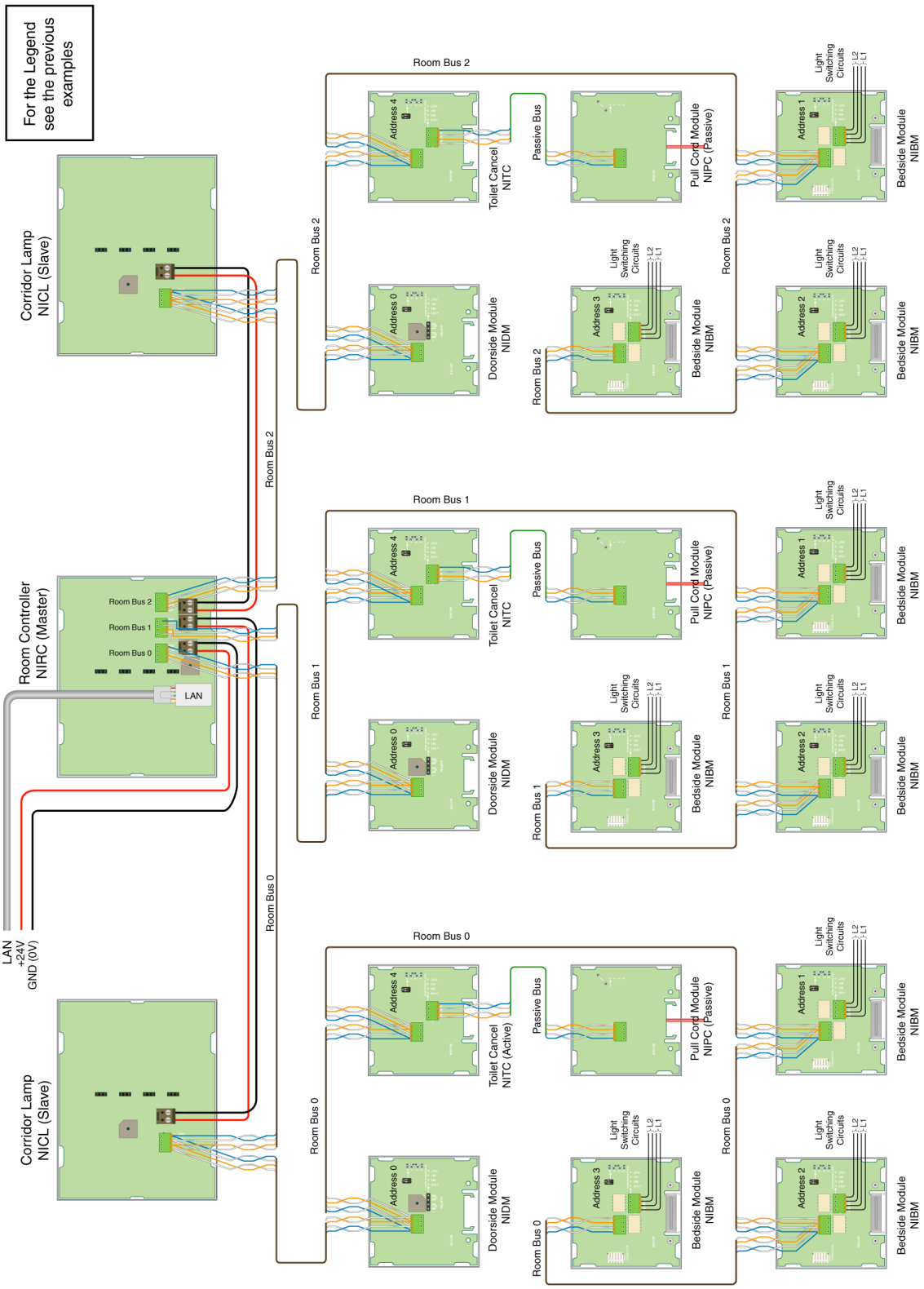


Figure 180. Wiring for three rooms with a room controller with two corridor lamps

9.5 4-Bed Room with Speech

The installation of a teleCARE IP system with speech is basically the same as without speech except that the teleCARE IP Speech Module is added at each active peripheral where speech communication is required.

The speech module can only be used in combination with the following active teleCARE IP peripherals: the door side module (NIDM), the bedside module (NIBM), the medial rail socket, active pull cord module (NIPC-XXA), and the room display (NIRD).

The example shown consists of one room controller with integrated corridor lamp to which only active peripherals are connected. The room controller handles the speech communication and all the signaling of the related room. Each bed location has a speech module.

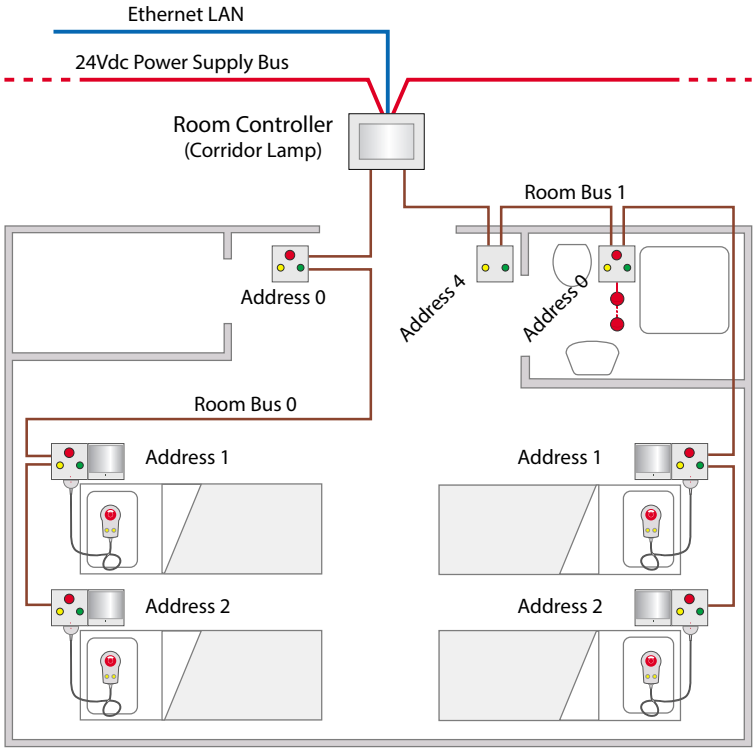


Figure 181. 4-bed room with speech

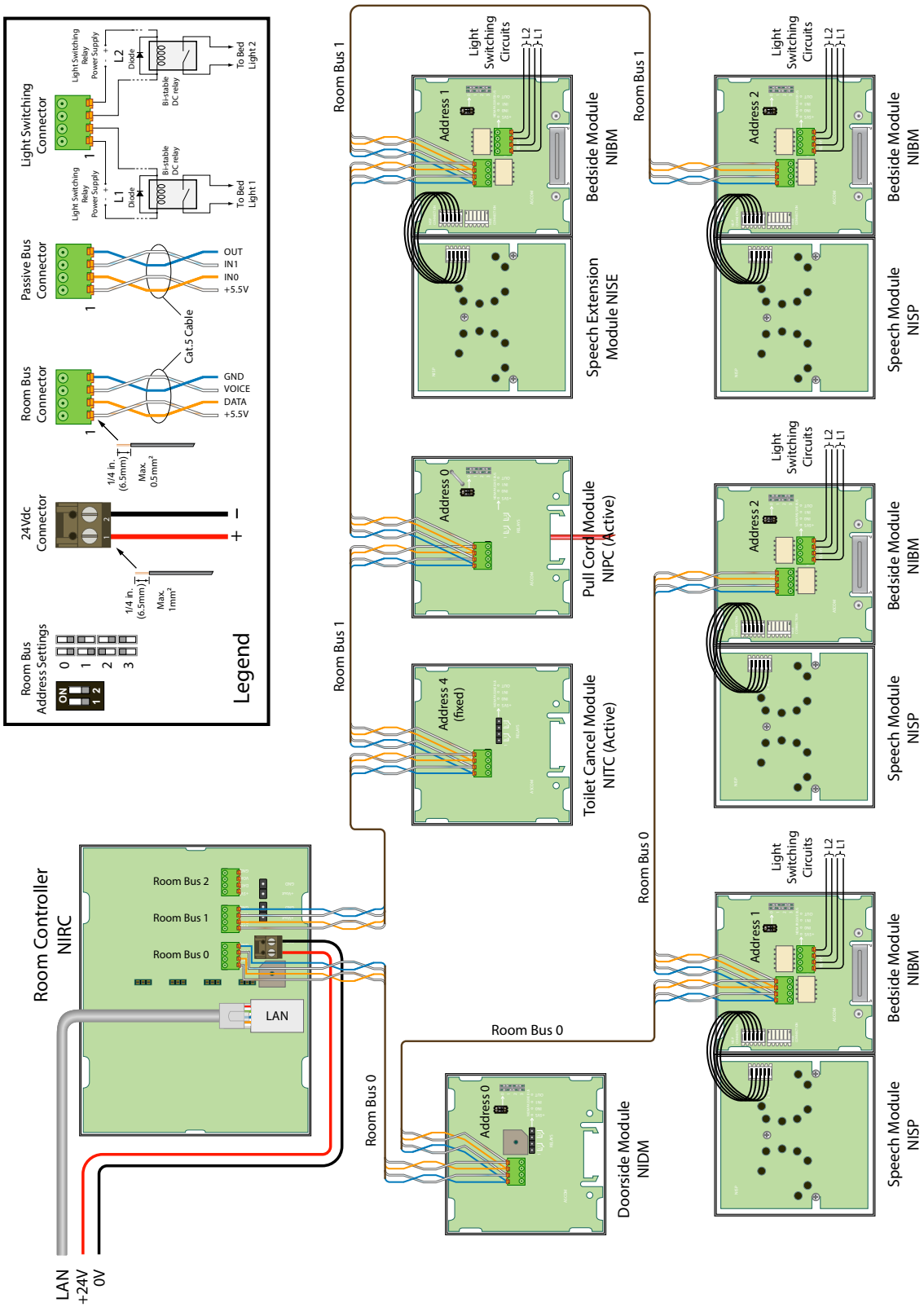


Figure 182. Wiring for 4-bed room with Speech at each bed

9.6 Duty Selector at a staff Station

The Duty Selector is an peripheral which can be connected to any one of the three room buses from the room controller. It has a fixed address number 5 on the room bus which cannot be changed.

It also has two inputs and two galvanically isolated outputs via relays. The two input circuits and the two output circuits are available as interfaces to external devices. These inputs and outputs can be controlled over the LAN via the room controller.

The duty selector is typically located at the staff station (as shown in the illustration below) where it is used to select the call forwarding groups and response sequences according to the duty configurations which have been configured in the system setup.

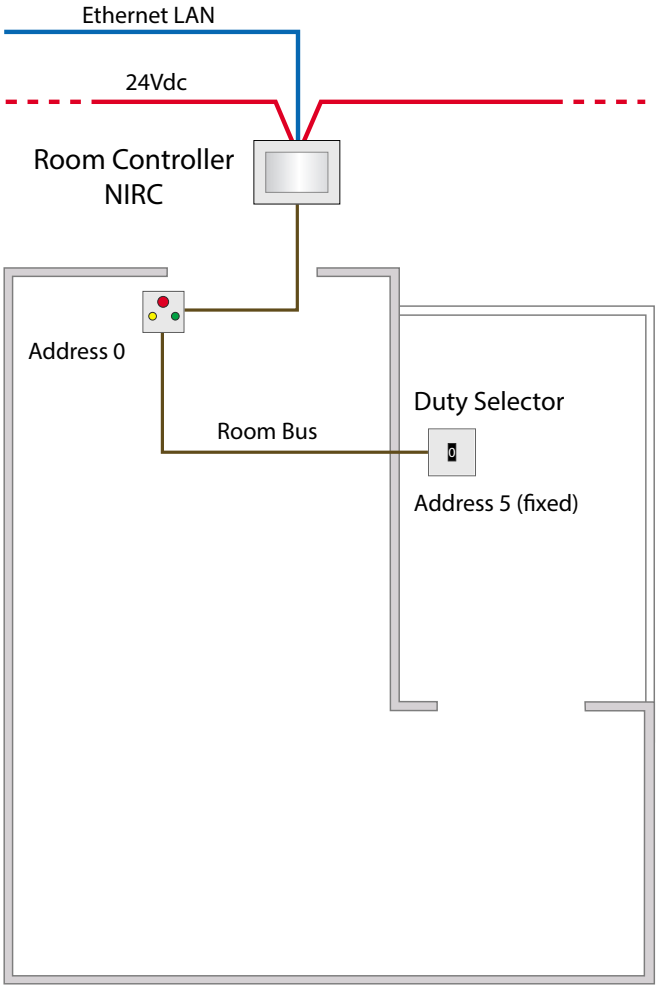


Figure 183. Staff station with duty selector and door side module

IMPORTANT: *A room controller (not a corridor lamp) must be installed at the staff station for room fault and LAN fault signaling.*

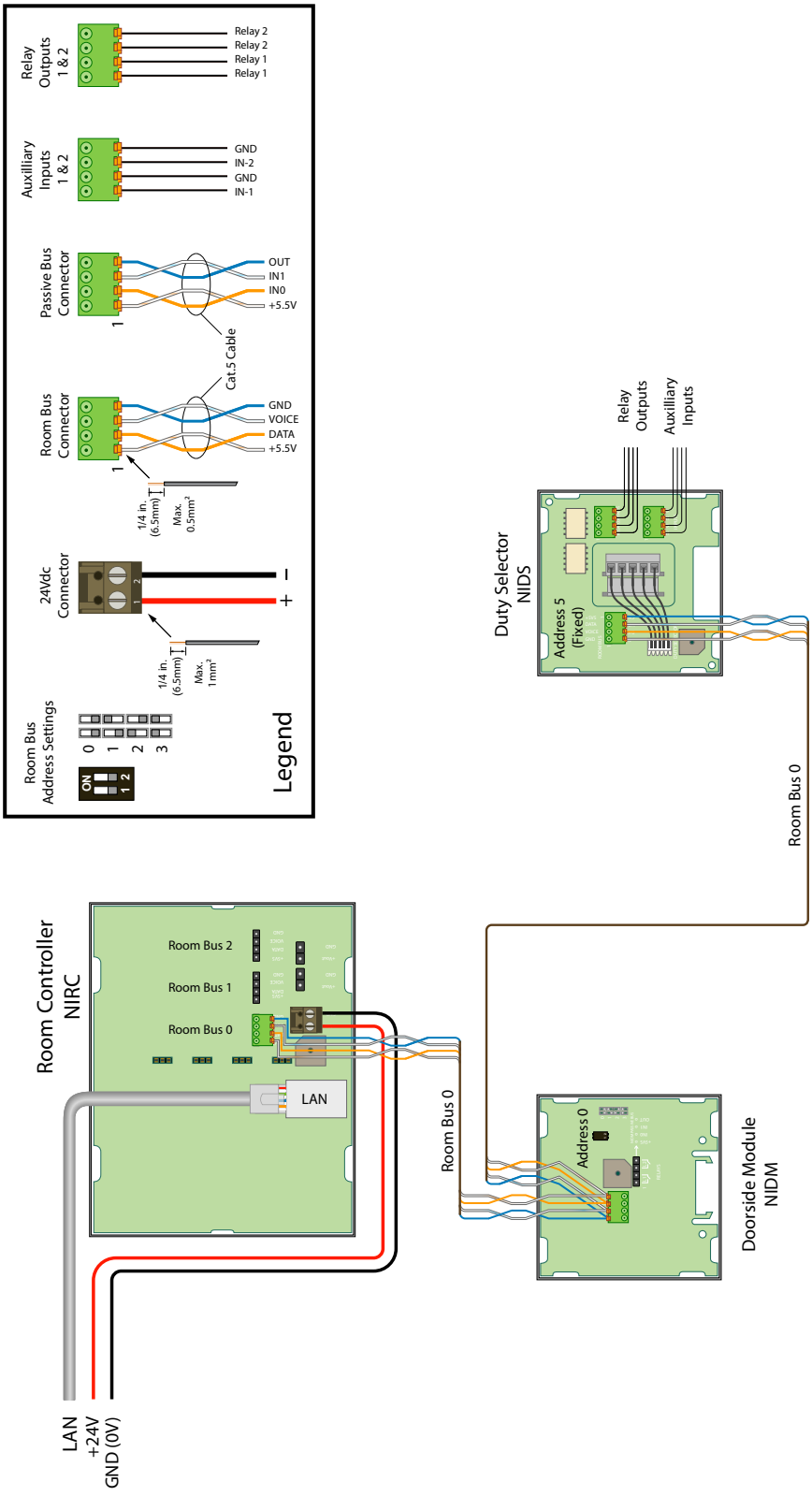
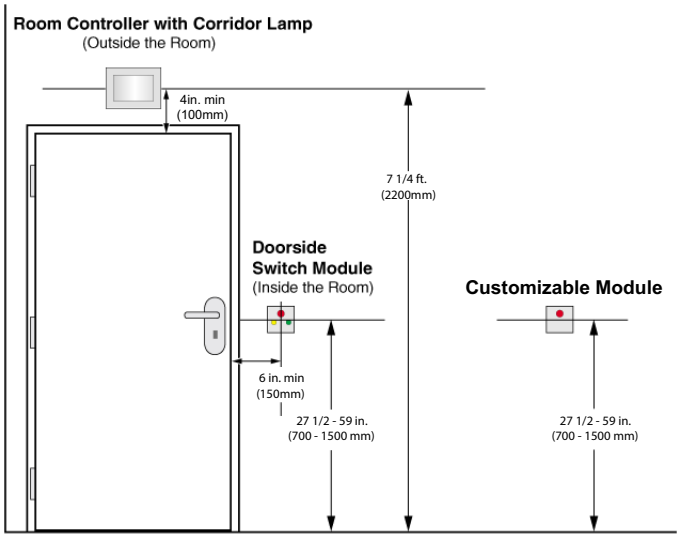


Figure 184. Wiring for staff station with duty selector and door side module

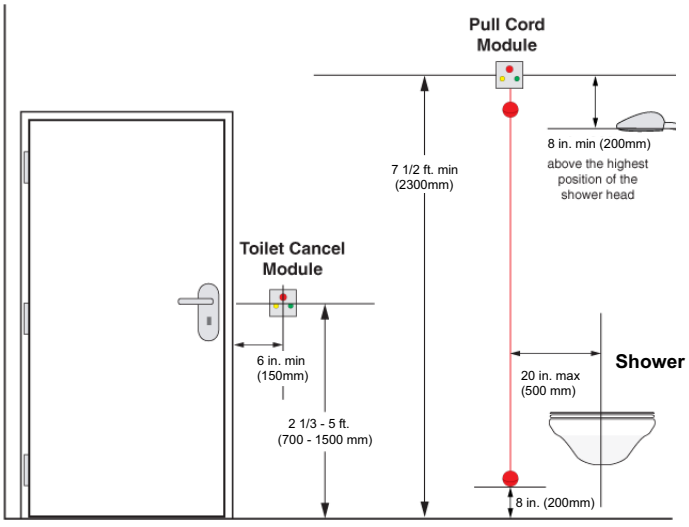
9.7 Positioning of the teleCARE IP Peripherals

The following illustrations show typical room installations with recommended locations for the teleCARE equipment.

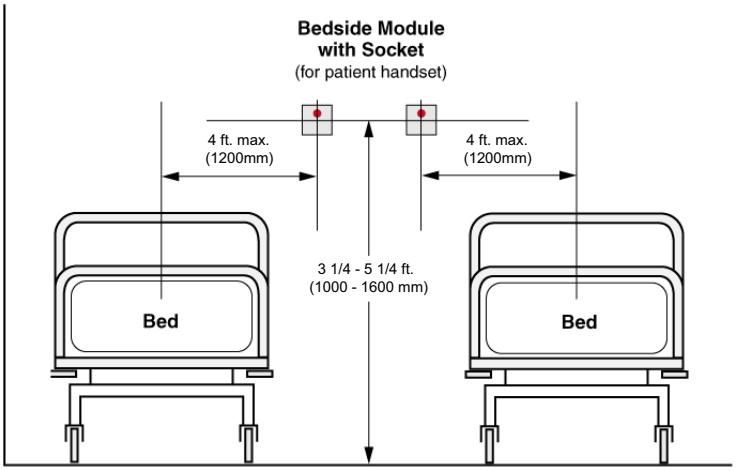
9.7.1 Room Controller, Door side Module and Customizable Module:



9.7.2 Toilet Cancel Module and Pull Cord Module



9.7.3 Bedside Module



Document History

Version	Date	Description
A	10 FEB 2014	• First released U.S.version A
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