6.18.1 Sunblind Motor Controller

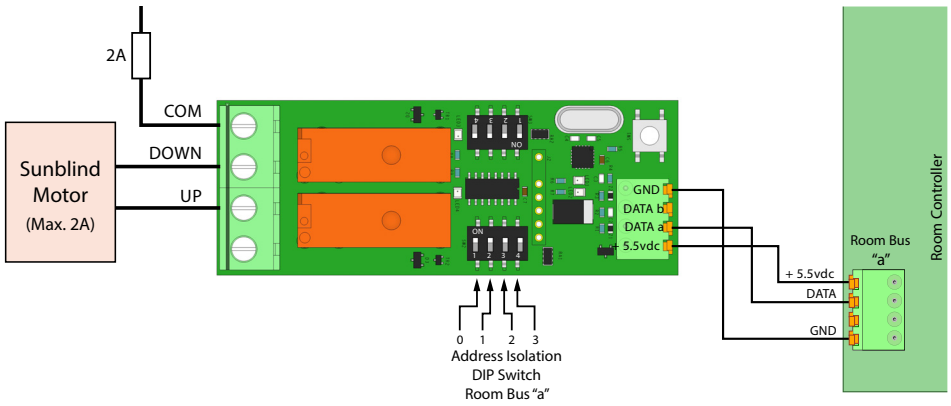


Figure 155. Sunblind control module electrical connections

The sunblind control module can be connected to one room bus and will only respond to room bus addresses 0 to 3 of the connected room bus. The Room Bus "a" DIP switches are used to prevent the sunblind control module from responding to specific room bus addresses. Setting a DIP switch to the ON position selects that particular address, 0 to 3 to control the module.

WARNING: Up to 230Vac power to the sunblind motor control relay must be fused at 2 Amps. Appropriate cable for the voltage and current must be used for the sunblind motor control.

WARNING: The equipment that is connected to this interface is not considered to be part of the teleCARE IP system.

7 Corridor Equipment

7.1 Corridor Display (NICD)

The NICD is a supplemental IP based corridor display suitable for use in teleCARE IP, and contains a LAN interface for connection to the teleCARE IP LAN network.

The NICD has a large character, 3-color (Red/Green/Amber) message display and a signaling buzzer. It is available as a single or double sided unit with a 6-character or a 12-character display.

Figure 159. 6 and 12 character Corridor Display (NICD)

WARNING: The NICD equipment described in this section is for supplementary purposes only, is not evaluated to UL 2560 and is not part of the teleCARE IP system UL listing.

From the built-in web interface the basic configuration of the NICD can be adjusted, for example the IP address, host name and communication port.

General text display settings can be set in the NISM2. Up to 50 NICDs can be added to a single NISM2.

The NISM2 is used to define such things as message display time, number of stored messages, the color of the displayed message depending on message priority and buzzer options. The NICD display mode can be constant or scrolling.

The display mode can be set to constant (with short blank period in between) or to scrolling (from bottom to top) when there are two or more active calls to be displayed. The NICD can display up to 30 different messages. If the maximum number of messages is reached, the oldest message with the lowest priority will be cleared first. When the display is not showing any messages (idle), it can be configured to show the time/date or any other type of welcome message.

7.1.1 Corridor Display Network Requirements

- Ethernet 10 BaseT
- half duplex
- no auto-crossing
- no auto-negotiation
- no auto-polarity

Note: *The display will not work on non-standard (reversed polarity) switches using a normal straight cable. Reversed polarity switches require a special Reverse Polarity Cable.*

7.1.2 Preparing Single-Sided Displays Prior to Mounting

Before a single-sided display can be mounted, the LAN cable must be connected to the rear of the display first. The first step is to remove the metal strain reliever plate from the back of the display by unscrewing the 2 screws.

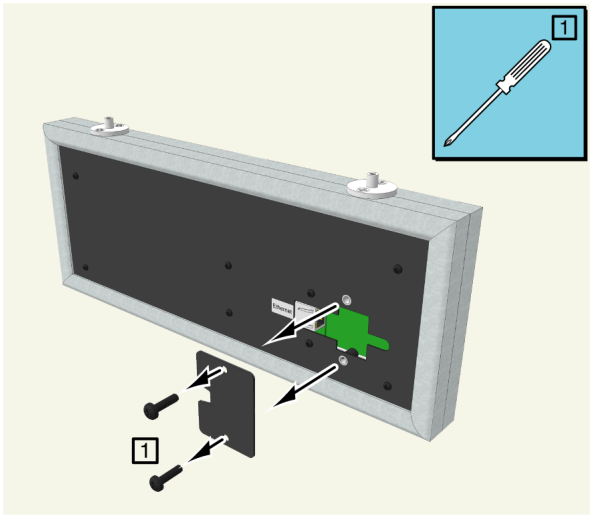


Figure 160. Remove the strain reliever plate

Plug the RJ-45 connector of the network cable into the ethernet socket of the display and place the strain reliever plate back in place.

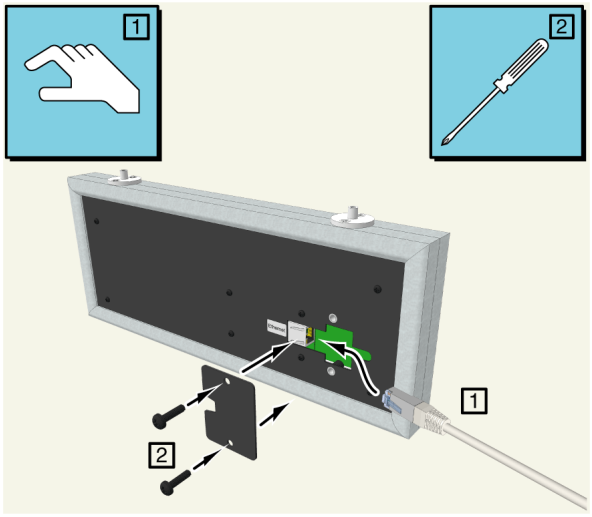


Figure 161. Plug in the RJ-45 connector

7.1.3 Mounting the Corridor Display

The NICD is prepared for wall mounting using a special wall mounting bracket which is available as an accessory.

Figure 162. Wall mounted NICD

NICD Wall Mounting Bracket

The NICD wall mounting bracket is available in two sizes, for the 6-character display and for the 12-character display.

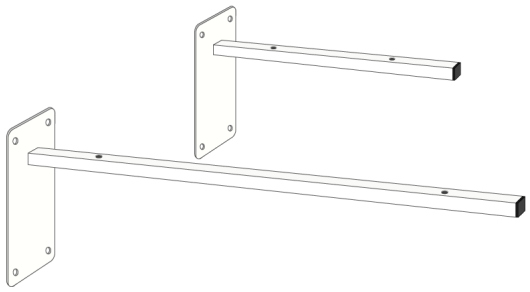


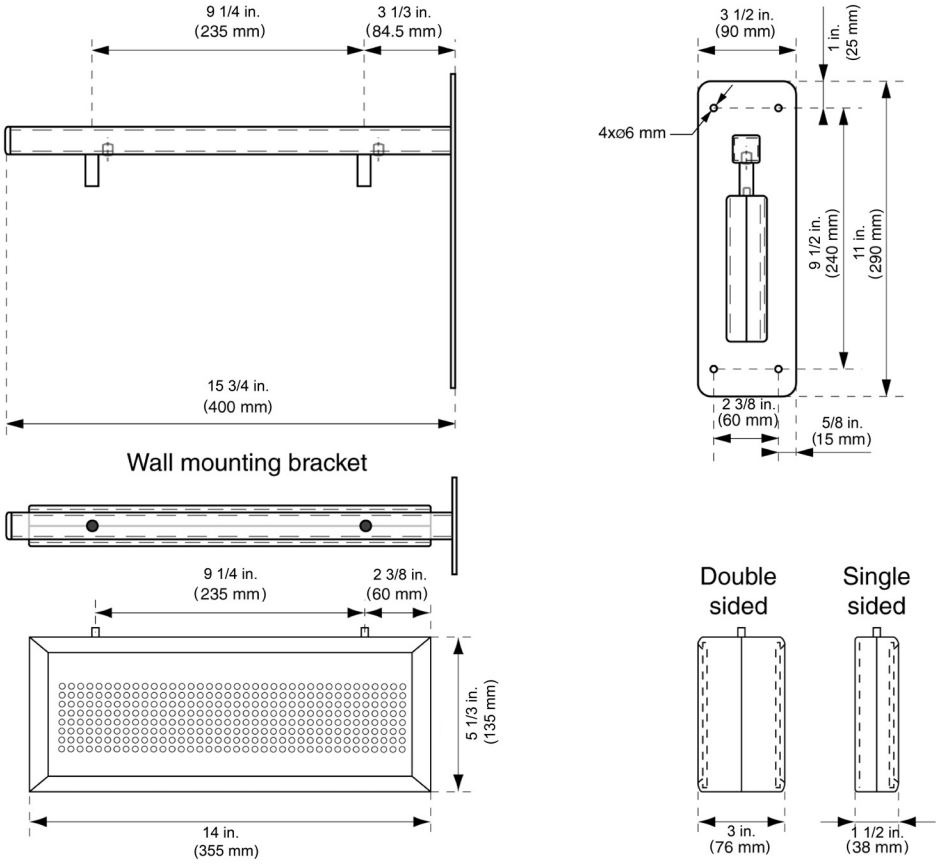
Figure 163. 6 and 12 character mounting brackets

Dimensions & Weights

The method used to fix the mounting bracket to the wall must be capable of safely supporting the combined weight of the NICD and the mounting bracket.

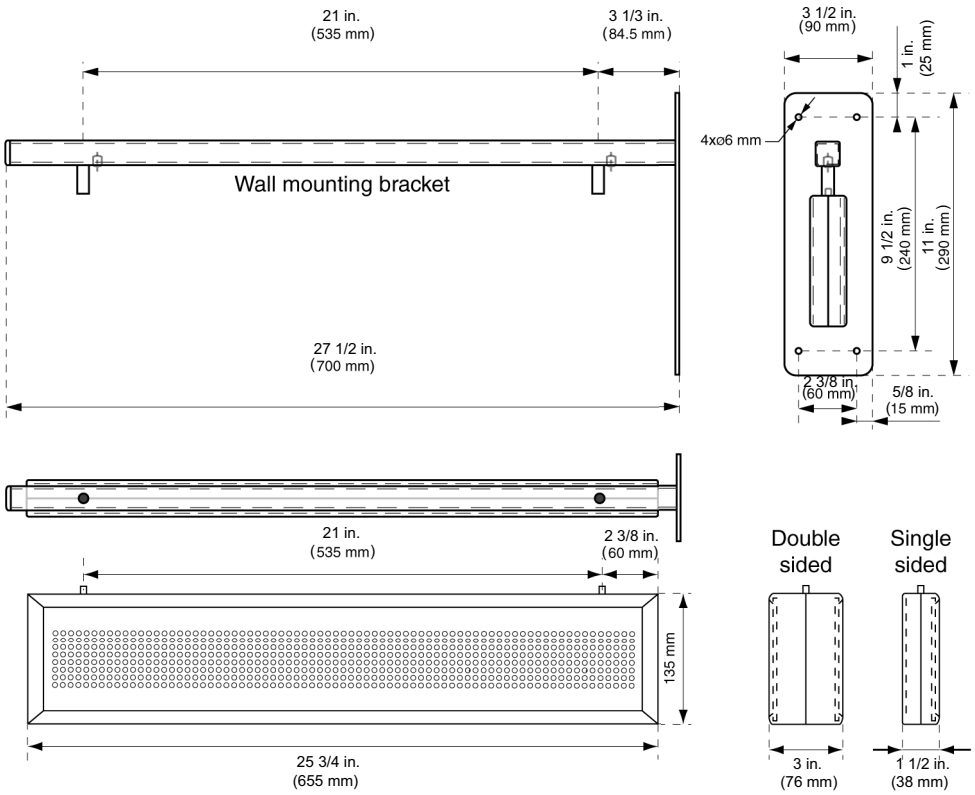
6 Character NICD

- Weight of the 6 character single-sided display = 3.7 pounds/1.7 kg
- Weight of the 6 character double-sided display = 4.4 pounds/2 kg
- Weight of the 6 character mounting bracket = 3.3 pounds/1.5 kg



12 Character NICD

- Weight of the 12 character single-sided display = 6.2 pounds/2.8 kg
- Weight of the 12 character double-sided display = 7.3 pounds/3.3 kg
- Weight of the 12 character mounting bracket = 4.4 pounds/2 kg



When placing the wall mounting bracket on the wall, consider the minimum height at which the display should be mounted. The minimum installation height depends on things like opening a door in the vicinity of a display or an object transported through the corridor. Make sure that in none of these circumstances the object will hit the display.

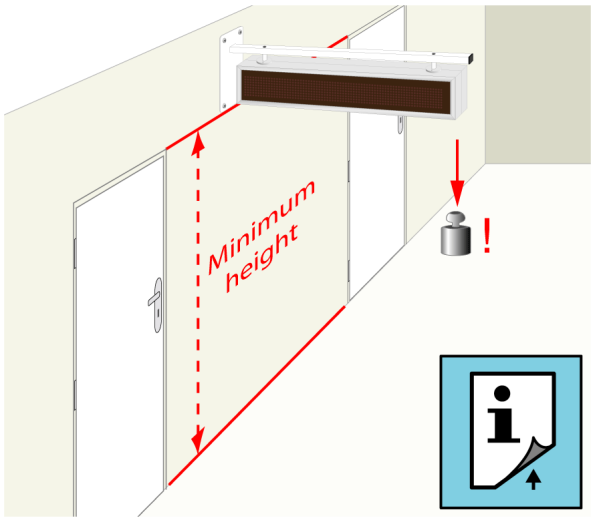


Figure 164. Minimum installation height

To mount the bracket on the wall, drill four holes according to the dimensions of the 6 or 12 character mounting bracket.

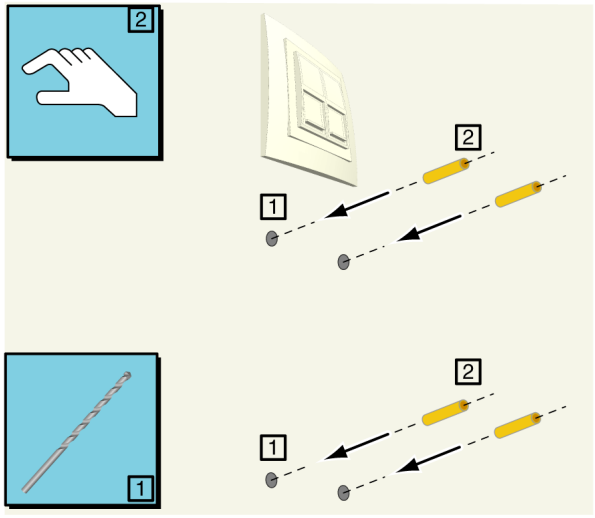


Figure 165. Drilling four holes for mounting the bracket

Fix the mounting bracket on the wall by using four well-fitted screws capable of carrying the weight of both the display and the mounting bracket.

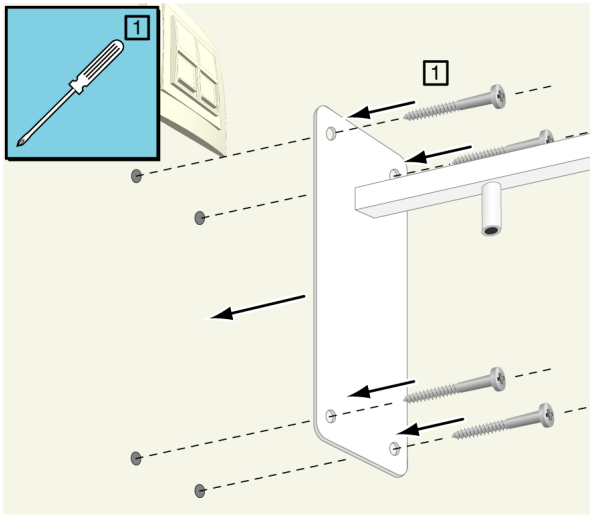


Figure 166. Fixing the wall mounting bracket

The next step is to mount the display on the wall mounting bracket. First start by removing the two hex screws at the top of the display using an allen key (Hex key wrench).

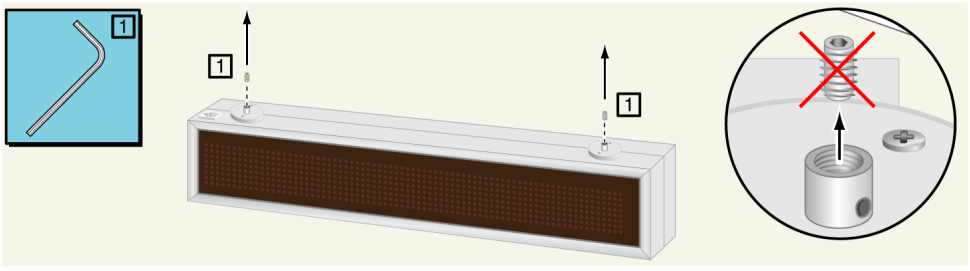


Figure 167. Use the included accessories to mount the display on the bracket.

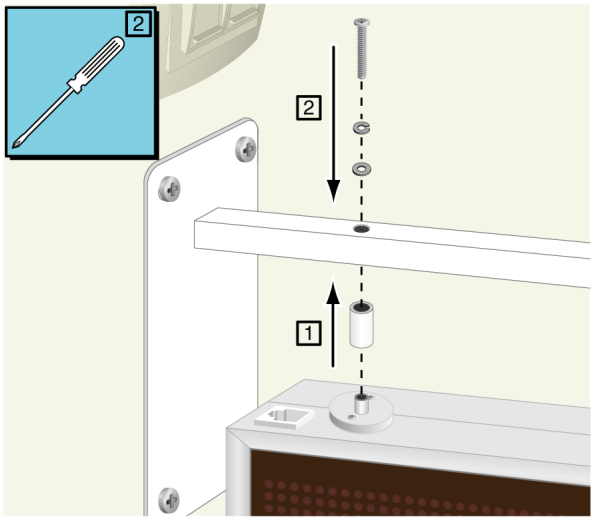


Figure 168. Mount the display on the bracket

Finally connect the ethernet cable from the outlet to the corridor display.

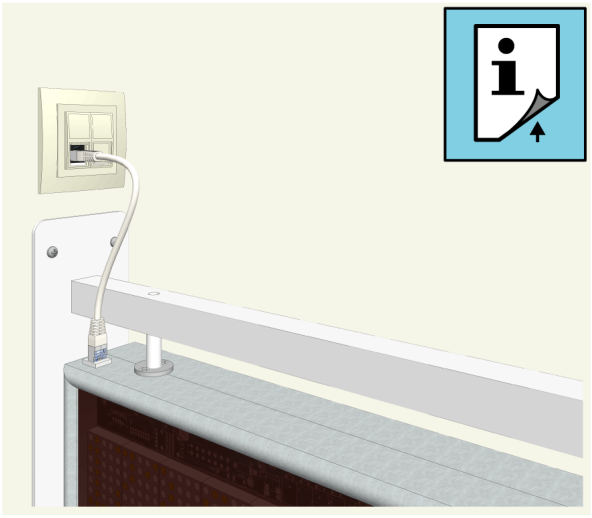


Figure 169. Connecting the displays ethernet cable

Direct Wall Mount

With the direct wall mount holder, single sided displays can be mounted directly onto the wall by sliding the displays holding slots onto the wall mount holder that is fixed to the wall.

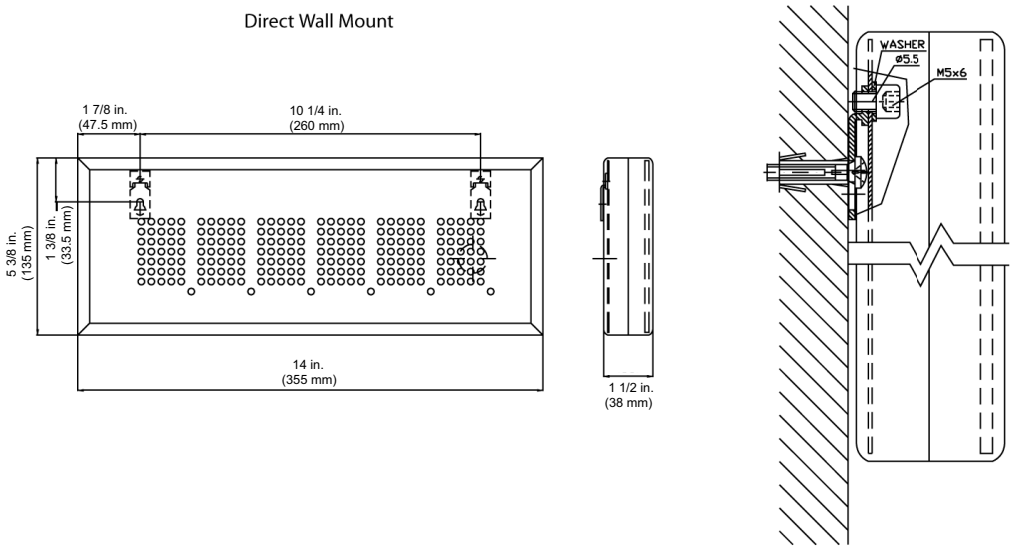


Figure 170. Close the loop and tighten the suspension wire

7.1.4 Corridor Display Electrical Connections

The NICD can be powered using Power over Ethernet (PoE) through a PoE switch or through an external 24Vdc power supply using a shielded PoE injector with the 24V negative lead "-" connected to the shield.

A standard T-568B straight-through shielded ethernet cable is used to connect the NICD to the LAN network.

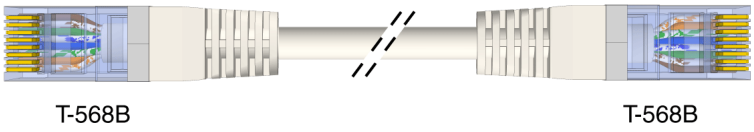


Figure 171. T-568B straight-through shielded ethernet cable

RJ-45	color (T-568B)	Name	Ext. Power Supply
1	white / orange	TX+	
2	orange	TX-	
3	white / green	RX+	
4	blue	SP1	24 Vdc either polarity
5	white / blue	SP1	
6	green	RX-	
7	white / brown	SP2	24 Vdc polarity opposite to SP1
8	brown	SP2	

Table 9. T-568B cable specification

Caution: *The display will not work on supplementary non-standard (reversed polarity) ethernet switches using a normal straight cable. A "Reverse Polarity Cable" is required when connecting to a reversed polarity switch.*

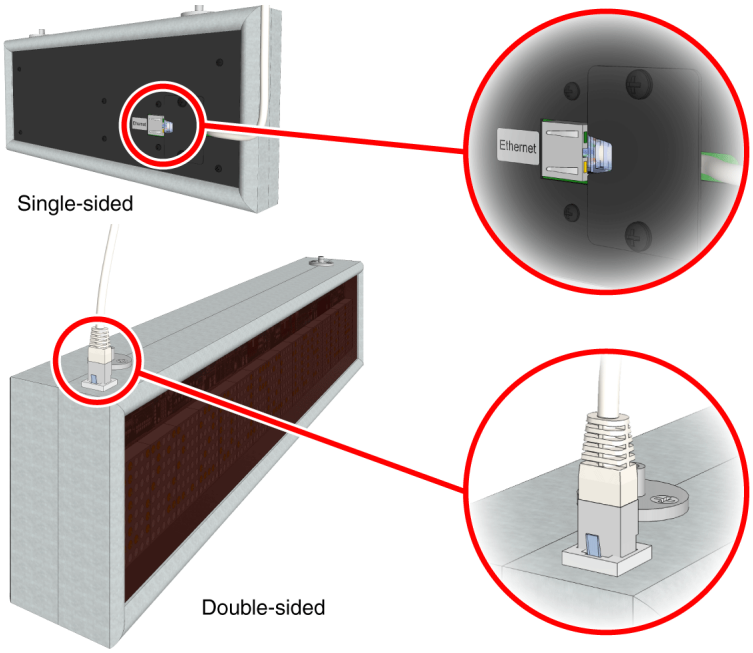


Figure 172. Single and double sided display network connection

Corridor Display Power Requirements

The following table shows the power requirements for the various corridor displays.

Display Type	PoE type	PoE Class	Power Consumption		
			Ext. Supply	PoE Supply	
			24 Vdc	42 Vdc	57 Vdc
6 character Single Sided	PoE (802.3af)	Class 2 < 6.49 W	7.6 W 0.31 A	7.5 W 0.17 A	7.9 W 0.14 A
6 character Double Sided	PoE (802.3af)	Class 0 < 12.94 W	15 W 0.62 A	13.8 W 0.32 A	14.0 W 0.24 A
12 character Single Sided	PoE (802.3af)	Class 0 < 12.94 W	11.3 W 0.47 A	10.8 W 0.25 A	11.0 W 0.19 A
12 character Double Sided	PoE+ (802.3at)	Class 4 < 25.50 W	22.7 W 0.94 A	21.2 W 0.50 A	21.4 W 0.37 A

Table 10. Corridor display power requirements

When using an external power supply to power the display, a shielded PoE injector is required with the 24Vdc negative lead "-" connected to the shield. The 24Vdc from the external supply will be injected on the spare wires of the network cable (SP1 and SP2 pairs).

8 Wireless Functionality

8.1 General

teleCARE IP with wireless functionality is intended for use in nursing homes and in assisted living facilities.

teleCARE IP is able to support wireless functionality through the NICR3 teleCARE IP room controller combined with the NIRX transceiver, which is piggy-back mounted on the circuit board of the NIRC3.

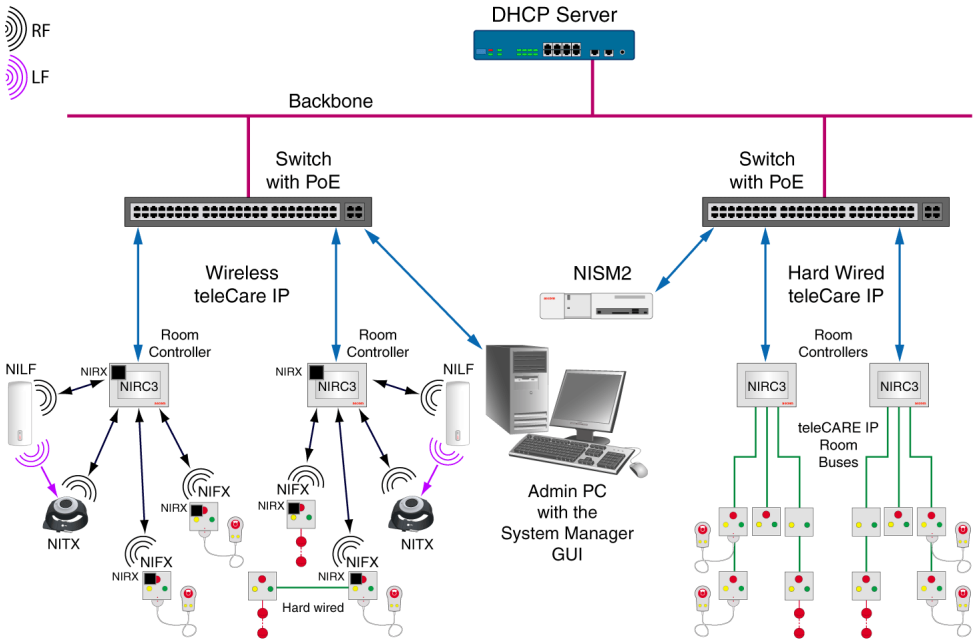


Figure 173. Wireless teleCARE IP and hard-wired teleCARE IP

The wireless call peripherals consist of the NIFX fixed transceiver, the NITX mobile transceiver and an optional low frequency beacon NILF.

The NIFX fixed wireless transceiver is a three-button wall mounted switch module. It comes as a socket version used for the connection of a patient handset or equipped with a pull-cord. Both variants of the NIFX include a 125 kHz LF receiver and an NIRX 916 to 921 MHz Class 1 transceiver which is piggy-back mounted on the circuit board of the NIFX. The fixed wireless transceiver switch modules can be powered by two AA disposable alkaline batteries, or connected to an external 12 - 24Vdc power supply.

The NITX mobile call transceiver can be attached to a wrist strap, or to a neck pendant. It can also be used as a mobile alarm transmitter connected to third party equipment. The NITX is powered by an internal three volt replaceable lithium battery. It includes a 916 to 921 MHz transceiver and a 125 kHz LF receiver for receiving the location update information from LF beacons.

The NILF low frequency beacon includes a 125 kHz transmitter and can be extended with the piggy-back mounted NIRX 916 to 921 MHz transceiver. The LF 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 can be powered by three C size disposable alkaline batteries, or connected to an external 24Vdc power supply.

8.2 Principle of the teleCARE IP with Wireless Functionality

The system is configured using the teleCARE IP System Manager - NISM2. The wireless server is a Unite application on the NISM2 serving as the central controller for all wireless devices in the teleCARE IP system with wireless functionality.

The wireless server has similar functions to those found in the teleCARE IP room controller, such as event handling, assignment handling and linking, with additional functions such as signal strength comparison. The main difference between the wireless server and the teleCARE IP room controller is that the wireless server controls all wireless devices in the system, whereas each room controller is responsible for only the devices which are hard-wired to it.

The NIRC3 room controller requires the piggy-back mounted NIRX transceiver module to give it wireless compatibility. When combined with the NIRX the room controller also serves as a base station and portal for the wireless devices.

The NIFX fixed transceiver has a piggy-back mounted NIRX transceiver, whereas the NITX mobile transceiver has its' own internal transceiver.

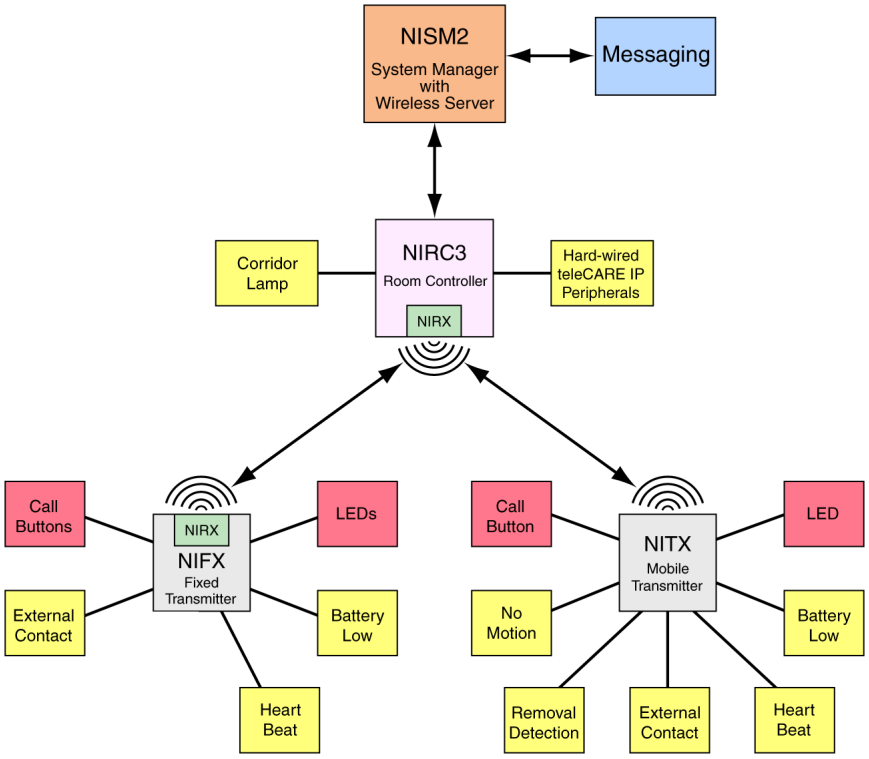


Figure 174. Principle diagram of teleCARE IP wireless functionality

8.2.1 Location Based Wireless Nurse Call Using LF Beacons

The addition of the NILF low frequency beacons gives location based wireless functionality available including access control. The NILF will send out its ID, including location information, at regular intervals using a low frequency 125 kHz signal that will be picked up by the wireless transceiver modules that pass by the NILF.

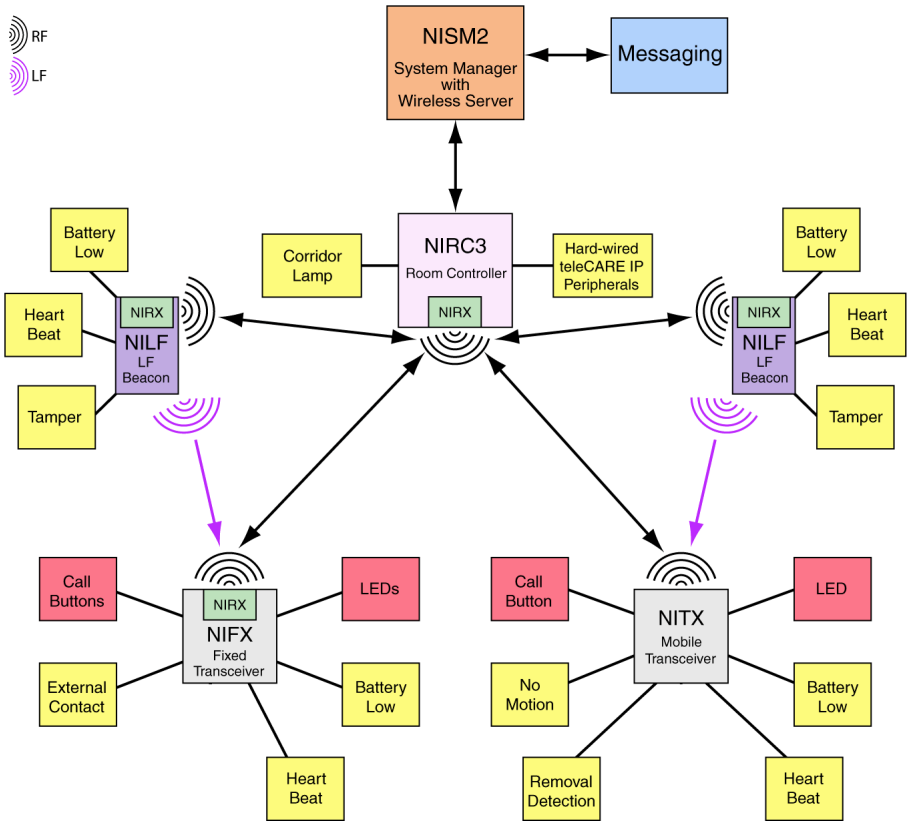


Figure 175. Location based wireless functionality

The range of an LF beacon is adjustable and can be up to approximately 6.5 feet (2 meters) with battery power and approximately 10 feet (3 meters) with external power.

When a wireless device comes within range of a passive NILF location beacon it will receive the beacon ID with the location information. It then stores the location as the last known location. The stored last known location will be added to the next event that is transmitted from the wireless device, like a button press, battery low alarm, etc.

When a wireless device comes within range of an active NILF location beacon, it sends a location update message to the wireless server. In addition, based on the received location information, the wireless server can check to see if the person carrying the wireless device is allowed to access that location. Doors can be opened or stay closed depending on the access rights. Automatic alarms can be generated when a person leaves or enters a certain location.

Whenever a call is made from a wireless module the location will be transmitted to the wireless server, when the wireless module is not in range of an LF beacon the last two known locations will be transmitted.

8.2.2 Wireless Nurse Call with Speech

Wireless transceivers can be used to generate calls to notify the staff that help is needed. These devices don't support speech themselves. To be able to set up a speech session with a person that initiated a wireless nurse call, the wired teleCARE IP speech modules are required.

To be able to support speech for wireless call, a phone number will be included in the message towards the messaging devices, including speech options. When selecting the IM option “speech” on the messaging device, a speech session will be started with the wired peripheral that is configured with that phone number.

For wireless speech, hard-wired speech modules are required at all the locations that contain wireless transceivers that are configured to use static locations. In static location mode, calls from the wireless transceiver are always linked to the location that is selected in the configuration of the wireless transceiver.

When the wireless device is configured to use dynamic locations, speech modules are also required at, or close to the locations that are covered by location beacons NILF. When in range of a location beacon the wireless device will store the location information which will be used the next time a call is made.

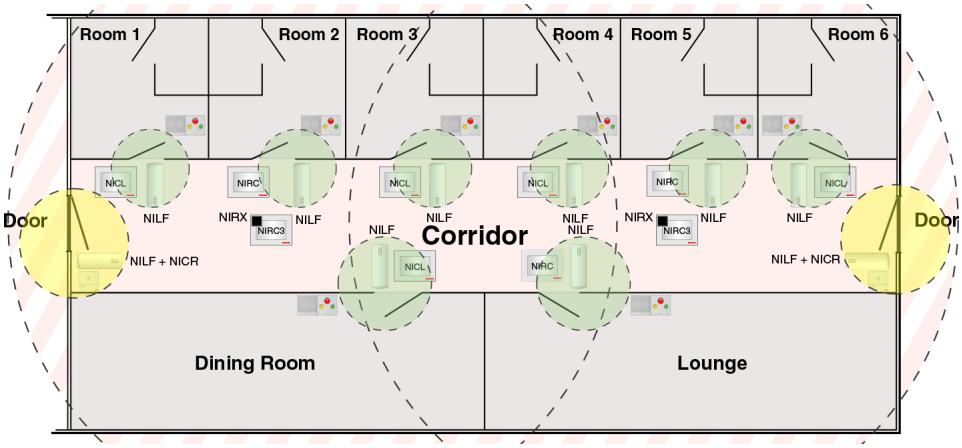


Figure 176. Wireless nurse call example with speech

This example consists of two room controllers (NIRC3) with transceiver module (NIRX) mounted for the wireless communication and three room controllers (NIRC) with five corridor lamps from an existing teleCARE IP configuration with speech. Each location has a doorside module with speech unit and a passive location beacon. The two main entry doors to the corridor are controlled by an active location beacon with access control unit.

Wireless speech will be based on the location of the wireless transceiver.
For wireless transceivers that are configured to use a static location, the phone number of the hard-wired teleCARE IP speech module at the location that is assigned to the wireless transceiver will always be used in the IM “speech” option.

For wireless transceivers that are configured to use dynamic locations, the phone number for the IM “speech” option will be automatically updated when the wireless transceiver moves between locations that are covered by active location beacons NILF.

When using passive location beacons, the IM options will not be updated when moving between passive locations, and the speech location will be the location where the wireless call was first made.

The table below shows the speech handling for wireless transceivers based on their static or dynamic location mode setting in combination with passive or active location beacons.

Transceiver Location mode	**Location Beacon (NILF)**	**Location at the start of a New call**	**IM "Speech" location change update**		
			Before speech	**During speech**	**After speech**
Static	NA	Fixed default location	No	No	No
Dynamic	Passive	Last known	No	No	No
	Active	Last known	Yes	No	No

8.3 teleCARE IP Wireless Components

8.3.1 NIRX teleCARE IP Transceiver

The NIRX transceiver is a printed circuit module which is piggy back mounted on the NIRC3 room controller and the NIFX fixed transceiver. Mounting the NIRX will add wireless nurse call functionality to the NIRC3 room controller and the fixed transceiver. Optionally the NIRX can also be mounted on the NILF location beacon for actively monitoring the state of the NILF, such as tamper and low battery alarm conditions.

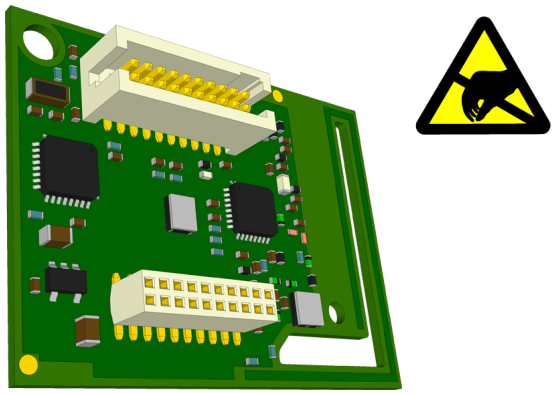


Figure 177. Transceiver piggyback module (NIRX)

Connecting the Transceiver Module

The NIRX is piggyback mounted on the NIRC3 room controller, on the NIFX fixed transceiver and on the NILF low frequency beacon printed circuit boards:

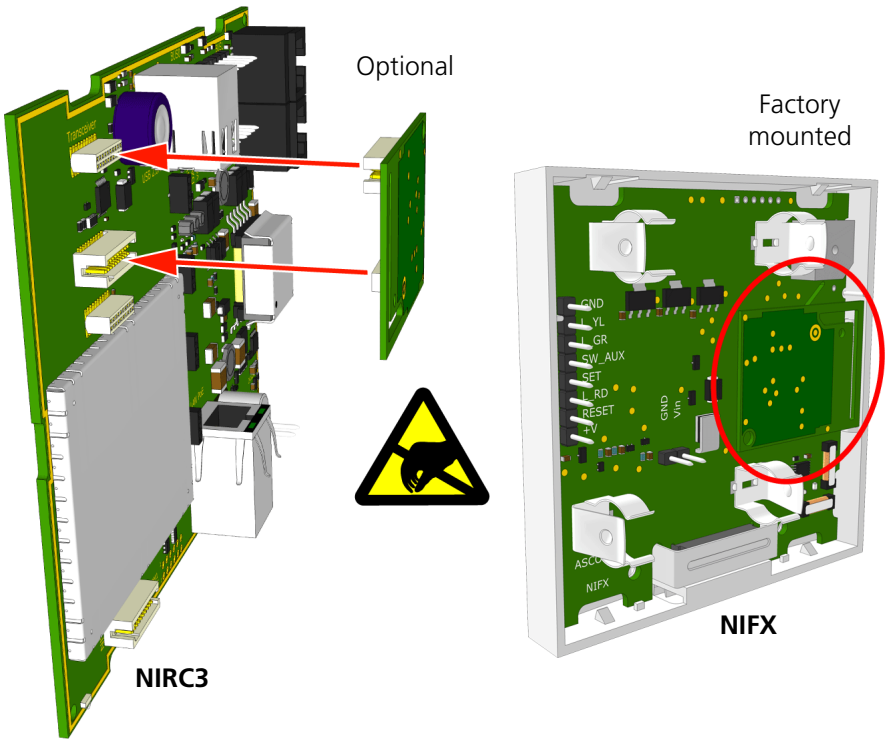


Figure 178. Piggyback mounting of the transceiver module on the NIRC3 and NIFX

Note: *The NIFX is delivered with an NIRX mounted from the factory.*

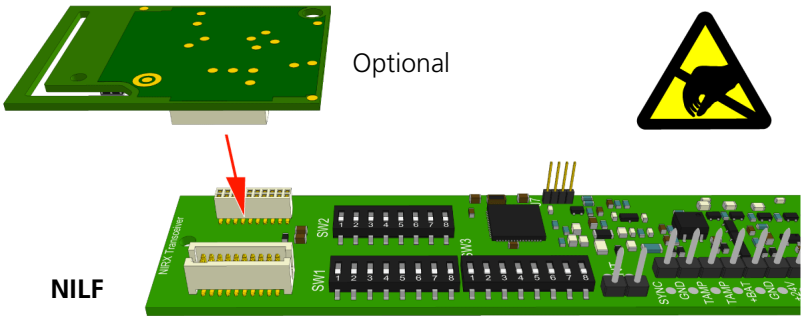


Figure 179. Piggyback mounting the transceiver module on the NILF

8.3.2 NIFX Fixed Transceiver

The NIFX series fixed transceiver is a wireless teleCARE IP switch module which is available as socket module or pull cord module. It has 3 function buttons, a white plastic body and includes a spacer for surface mounting. The pull cord version includes the cord with two red balls but no socket.

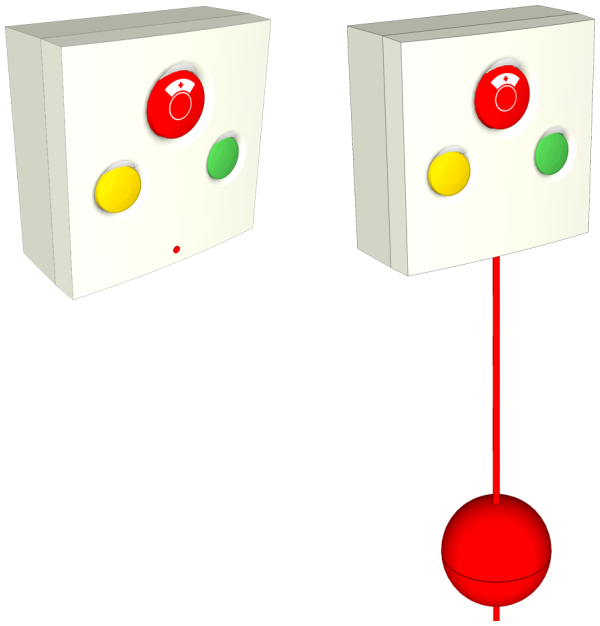


Figure 180. NIFX wireless switch module and pull-cord module

The NIFX socket variant supports the connection of a passive patient handset, see "Handset Connection" on page 134.

Replacing the Batteries

The fixed transceiver requires 2 x 1.5V AA disposable alkaline batteries. The battery voltage is continually monitored and if low voltage is detected a "low battery" alarm is transmitted and the low battery status is included in every heartbeat transmission of the unit. Under normal circumstances the battery life is 1 to 1½ year.

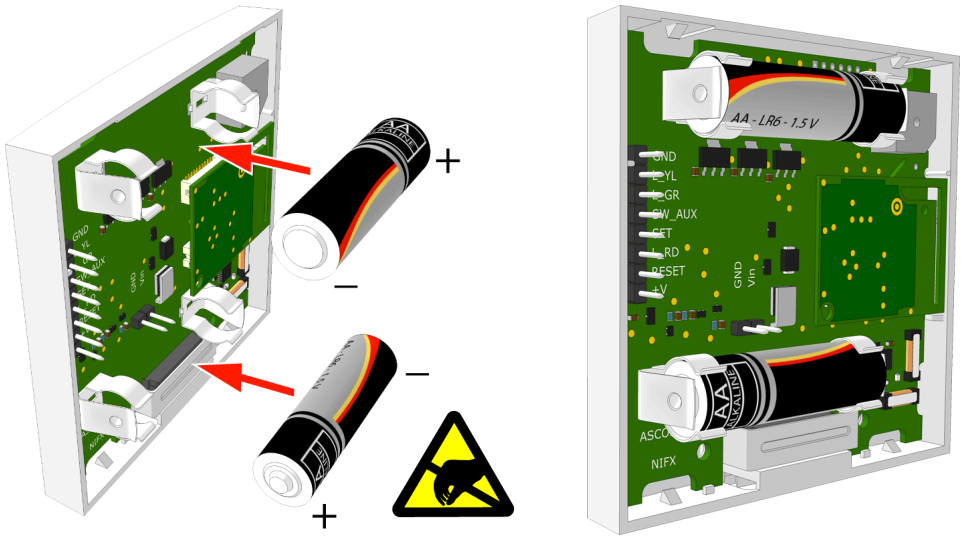


Figure 181. Replacing the batteries

When battery powered the fixed transceiver LEDs stay active for a period of 30 seconds after a call has been made.

Connecting a DC Power Adapter

Alternatively, an external CE certified 12-24Vdc power adapter can be used.

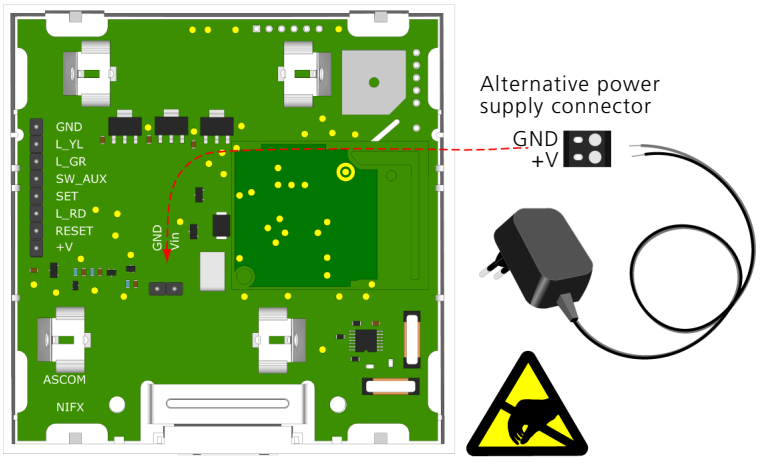


Figure 182. Connecting an external 12-24Vdc power adapter

When externally powered the red, yellow and green LEDs will permanently emit a low intensity light for locating and identification in the dark.

Handset Connection

The socket module version of the fixed transceiver includes a teleCARE Safe Release socket for connecting the NIPH2-A1A handset with handset disconnect alarm functionality. Speech/ Entertainment handsets are not supported.

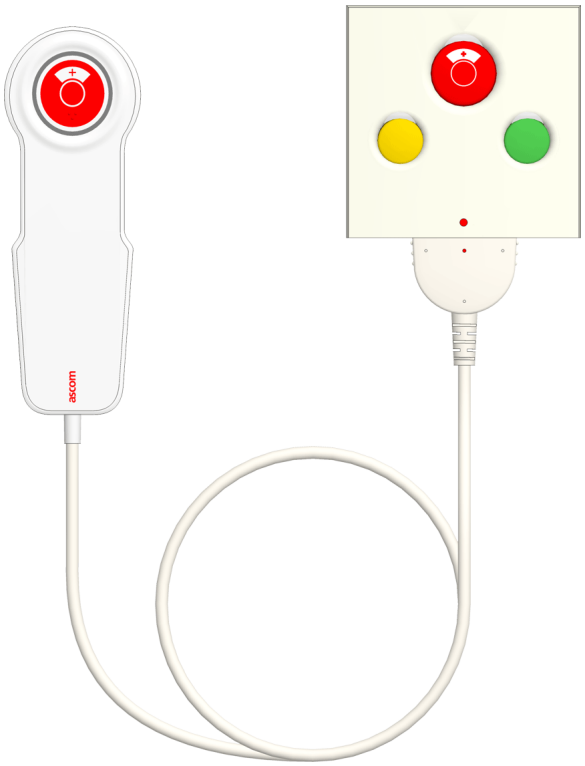


Figure 183. NIPH2-A1A handset connected to the NIFX

8.3.3 NITX Mobile Transceiver

The NITX mobile transceiver is a wireless call unit for residents. It is robust and water resistant (IP 65).

The NITX (AAA and BAA) contains a 916 to 921 MHz RF transceiver, a call button and a reassurance LED. The NITX-BAA also includes a 125 kHz LF receiver used for call cancellation using a cancel pendant and for location determination using LF beacons. Each mobile transceiver has a unique identity (ID) which is transmitted with every event from the mobile transceiver.

Figure 184. teleCARE IP mobile transceiver

The mobile transceiver can be fitted with a wrist strap so that it can be worn like a wrist watch. Alternatively, it can be attached to a lanyard so that it can be worn around the neck. The wrist strap and lanyard must be ordered separately.

Removing the Rear Cover

Removing the rear cover of the NITX is necessary when replacing the battery or when connecting an external alarm contact to the NITX circuit board.

Remove the four torx screws at the back of the NITX using A special screwdriver (T3) or bit (IP-3). When the screws are removed, gently pull off the rear cover.

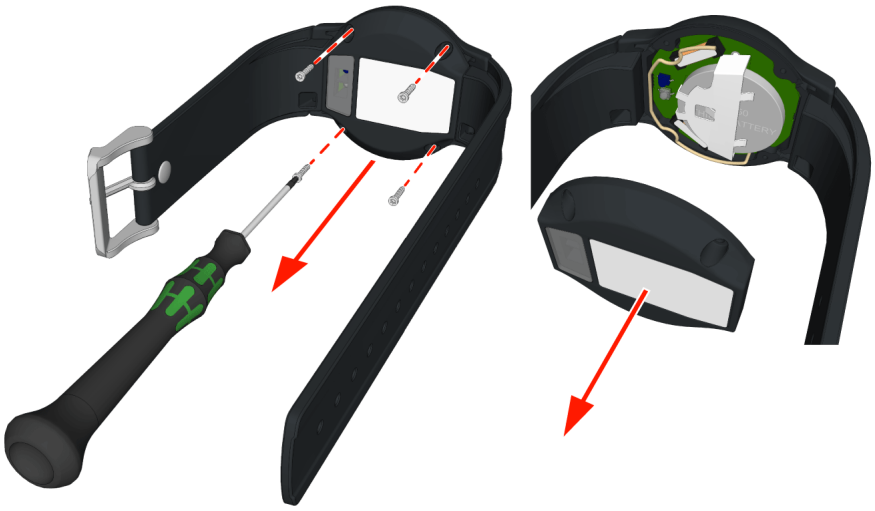


Figure 185. Removing the rear cover

Note: *Removing the rear cover will wear out the screw holes of the NITX front cover, therefore the NITX can be opened and closed approximately three times.*

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.

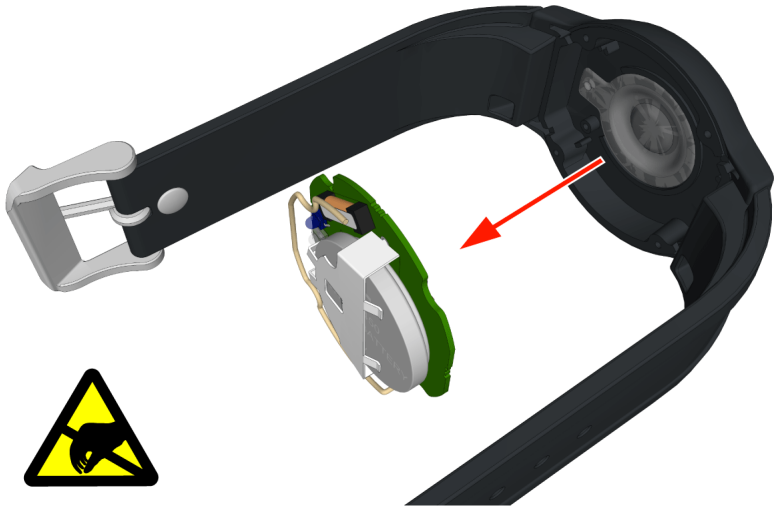


Figure 186. Remove the NITX circuit board

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.

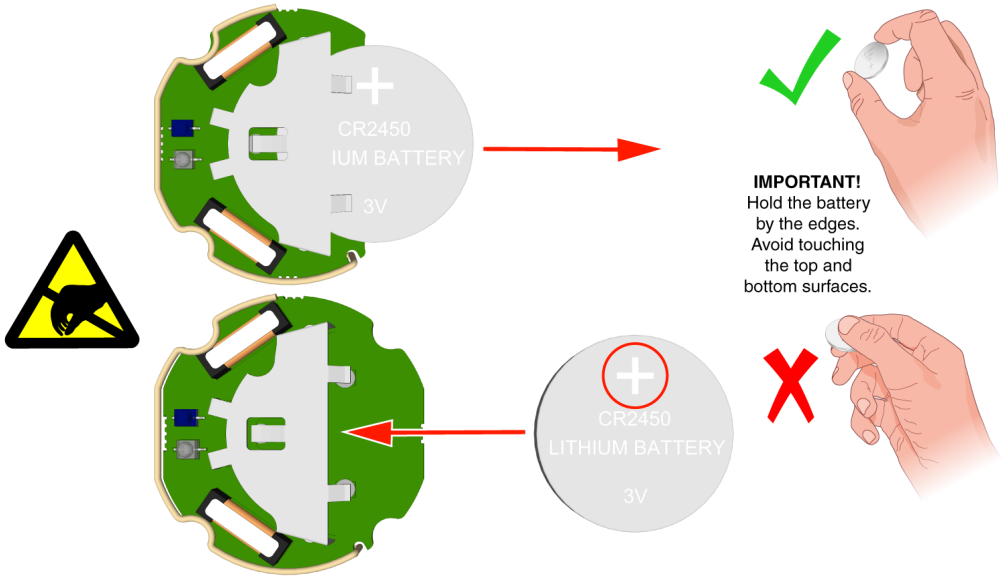


Figure 187. Removing the old and placing the new battery

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.

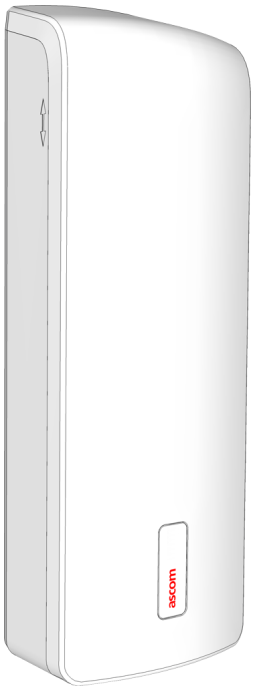


Figure 189. NILF - Low Frequency Beacon

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.

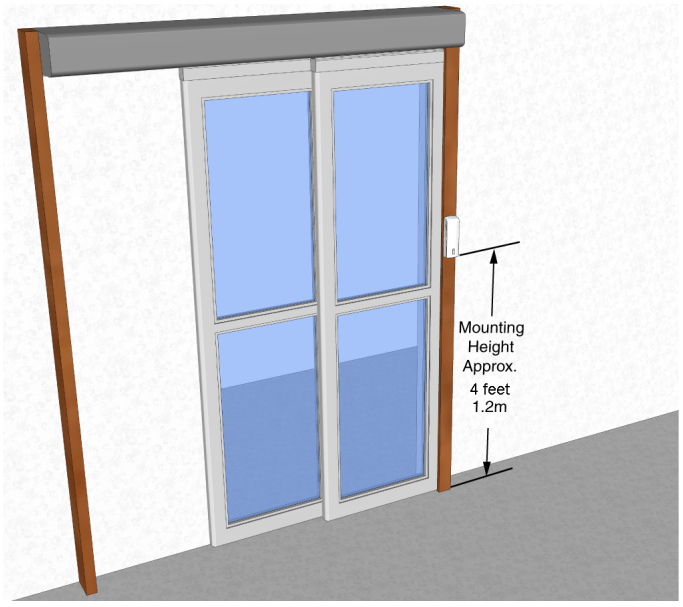


Figure 190. NILF installation example

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.

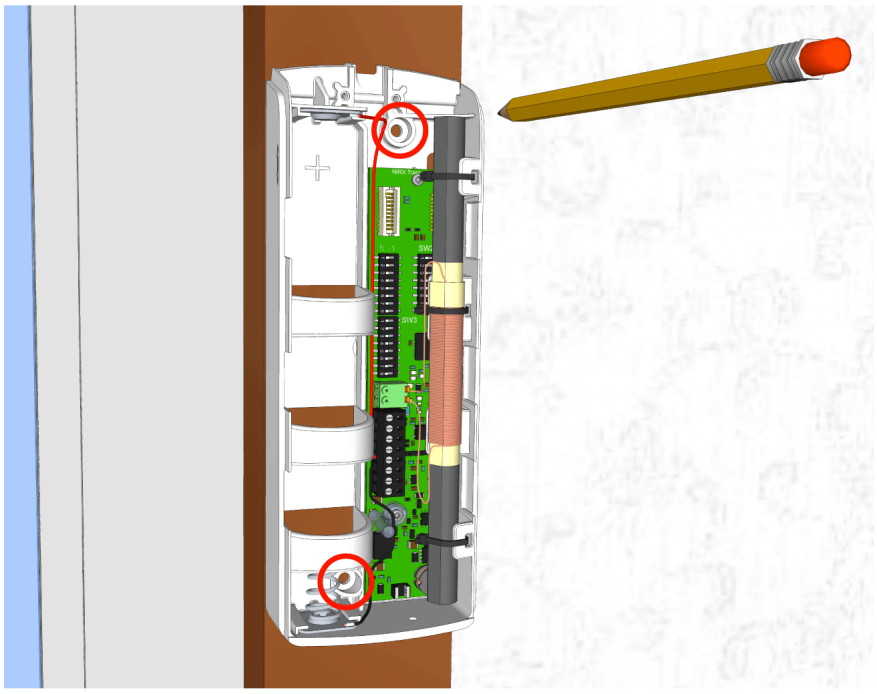


Figure 192. Mark the holes for drilling

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).

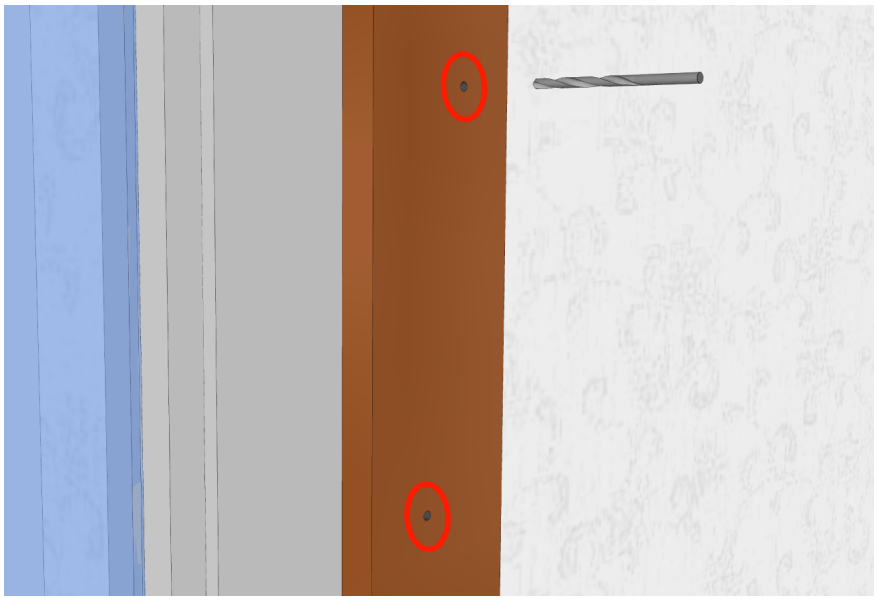


Figure 193. Drill the two holes with the proper drill

Mount the NILF on the door post or wall.

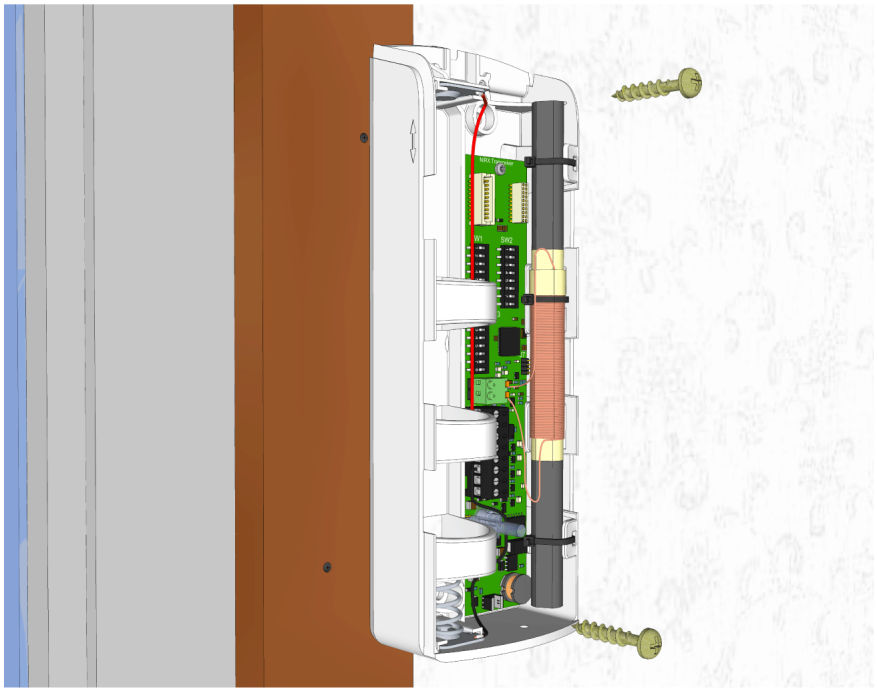


Figure 194. Placing the NILF on the door post

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

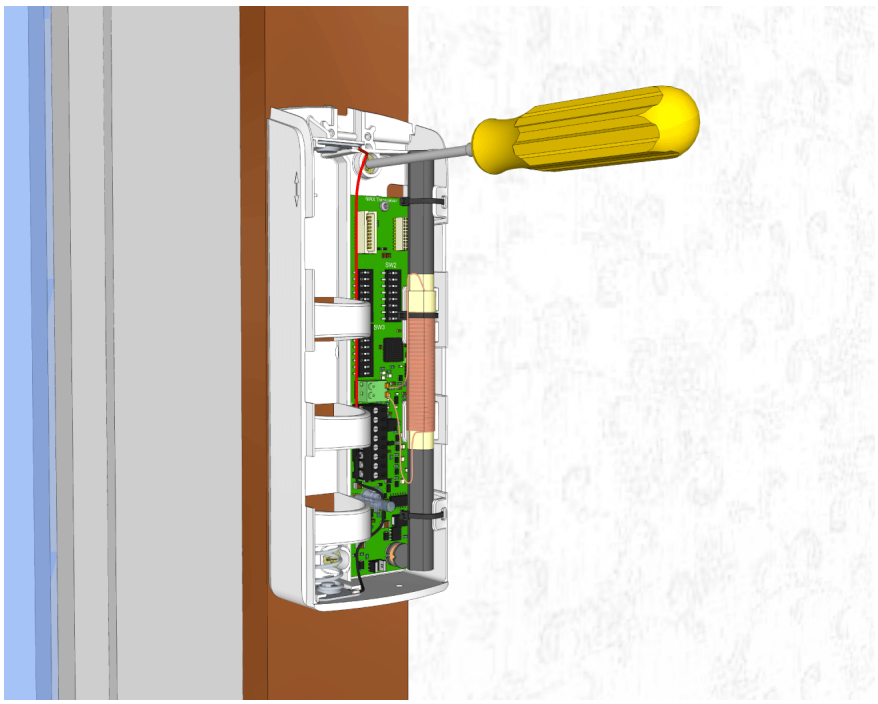


Figure 195. Tightening the two screws.

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.

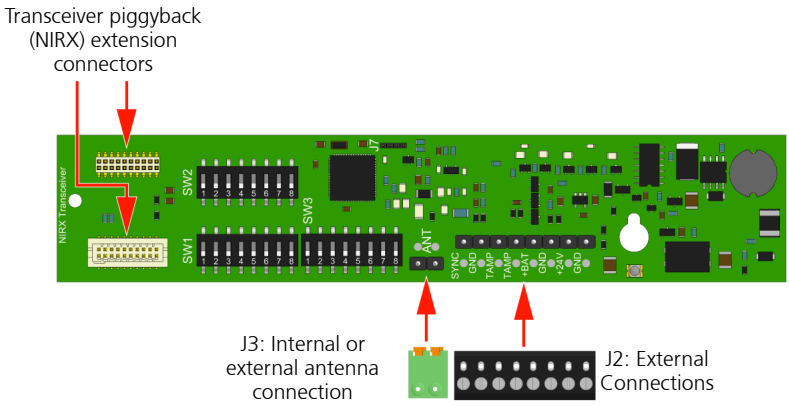


Figure 196. Low frequency beacon NILF electrical connections

NIRX Placement

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

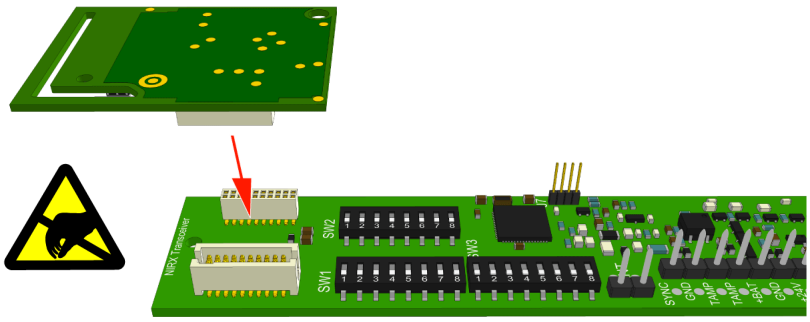


Figure 197. Placing the NIRX on the NILF board

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.

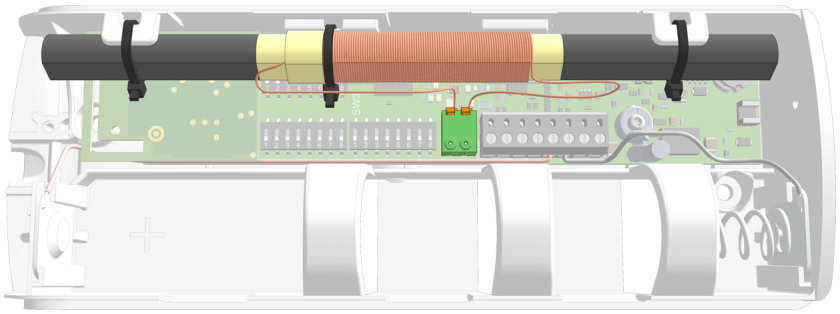


Figure 198. NILF internal antenna connected

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.

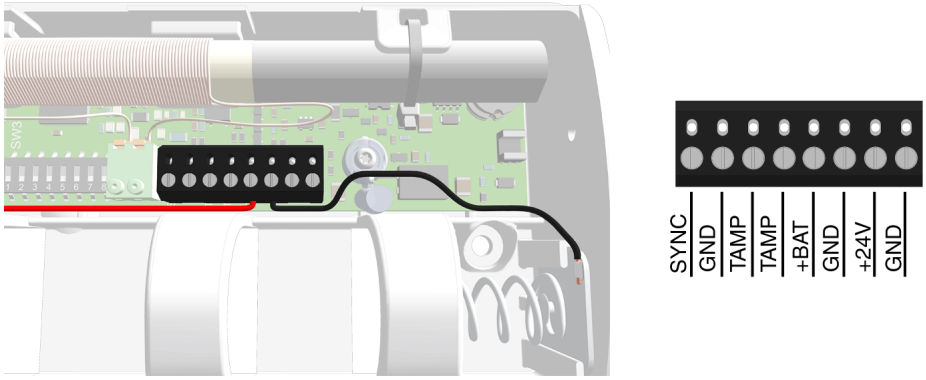


Figure 199. External connections - J2

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.

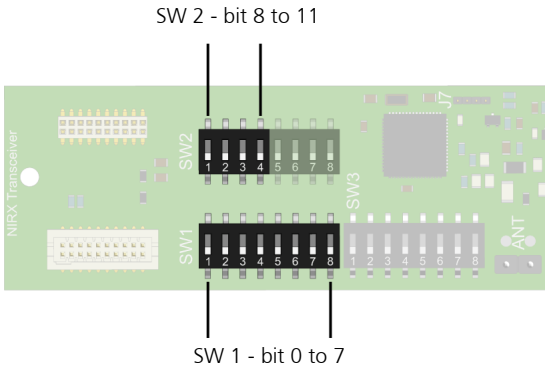


Figure 200. NILF 12 bit ID - DIP switch settings

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.