

### 5.2.10 Mounting the Housing without a Back box

The housing can be mounted on a flat surface, without a back box, using four suitable screws in the outer fixing holes, as shown in the illustration below. When the NIRC housing is without a back box the cables should enter and leave the housing through the two knock-outs in the sides of the housing.

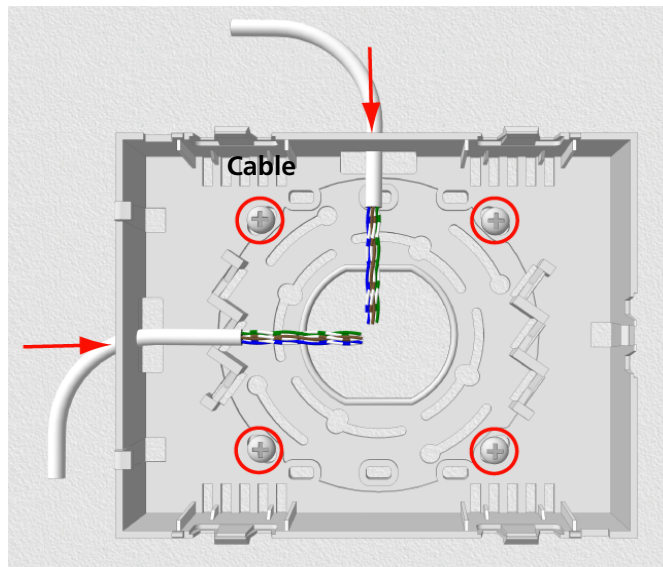


Figure 20. Mounting the NIRC housing without a back box

**Caution:** Do not distort the NIRC housing when it is mounted with or without a back box. To prevent distortion only mount the NIRC housing on a smooth, level surface and do not over-tighten the fixing screws! If the housing is distorted the top section will not fit properly and could fall off.

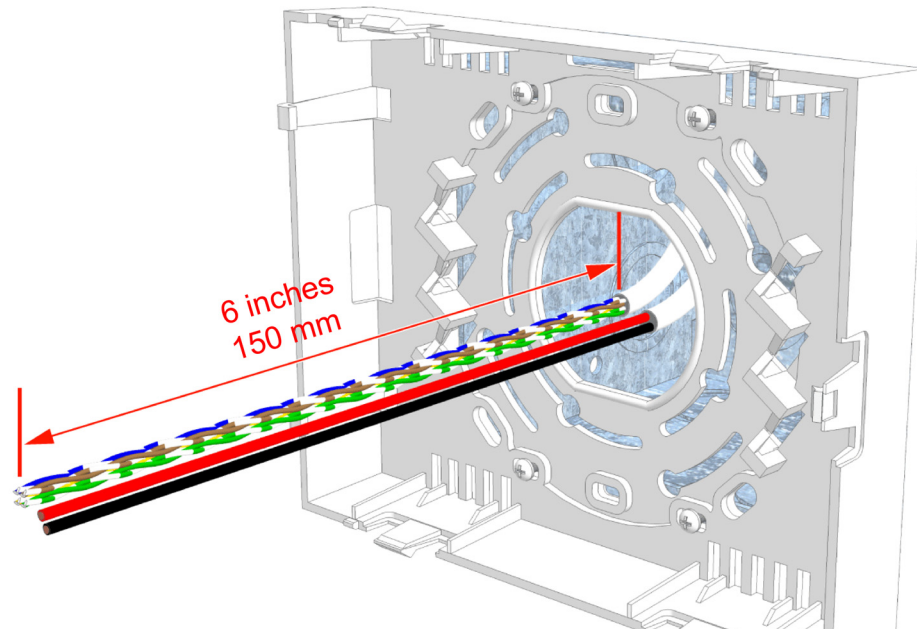
## 5.3 Preparing the Room Bus and Power Cables

It is important to prepare the cables appropriately and to guide the wires correctly inside the housing in order to avoid the wires pressing on the printed circuit board which could result in damage and also prevent the top section from closing properly.

The following instructions apply to the room bus cables, the power supply cable and the corridor lamp cables.

### 5.3.1 Stripping the Outer Jacket of the Cables

The first step is to strip the outer jacket of the cables to a length of 6.0in (150mm), then position the cable in the back box so that only the stripped wires enter the NIRC housing.



*Figure 21. Stripping and positioning the cables for the NIRC*

**Caution:** Each room bus requires four wires. If the cable contains more than four wires the excess wires should be carefully stowed in the back box, away from the printed circuit board and other components to avoid electrical faults and safety problems.

Details of the room bus connections are given in [5.4.1, 4-Pole Connector Terminal \(NICT-4AA\)](#), [page 31](#).

Details of the 24Vdc power supply and corridor lamp connections are given in [5.4.2, 2-Pole Connector Terminal \(NICT-2BA\)](#), [page 33](#).

**Note:** The 4-pole and the 2-pole connector terminals required for the room bus and the 24V power supply are not supplied with the IP room controller. The connectors are available as accessories and must be ordered separately.

Details of for connecting the LED lamp boards are given in section [5.6, LED Lamp Boards](#), [page 43](#).

### 5.3.2 Room Controller PCB Connections (NIRC-GMS and NIRC-WMS with Speech)

The electrical connections on the component side of the IP room controller printed circuit board are shown in the following drawing of the NIRC circuit board.

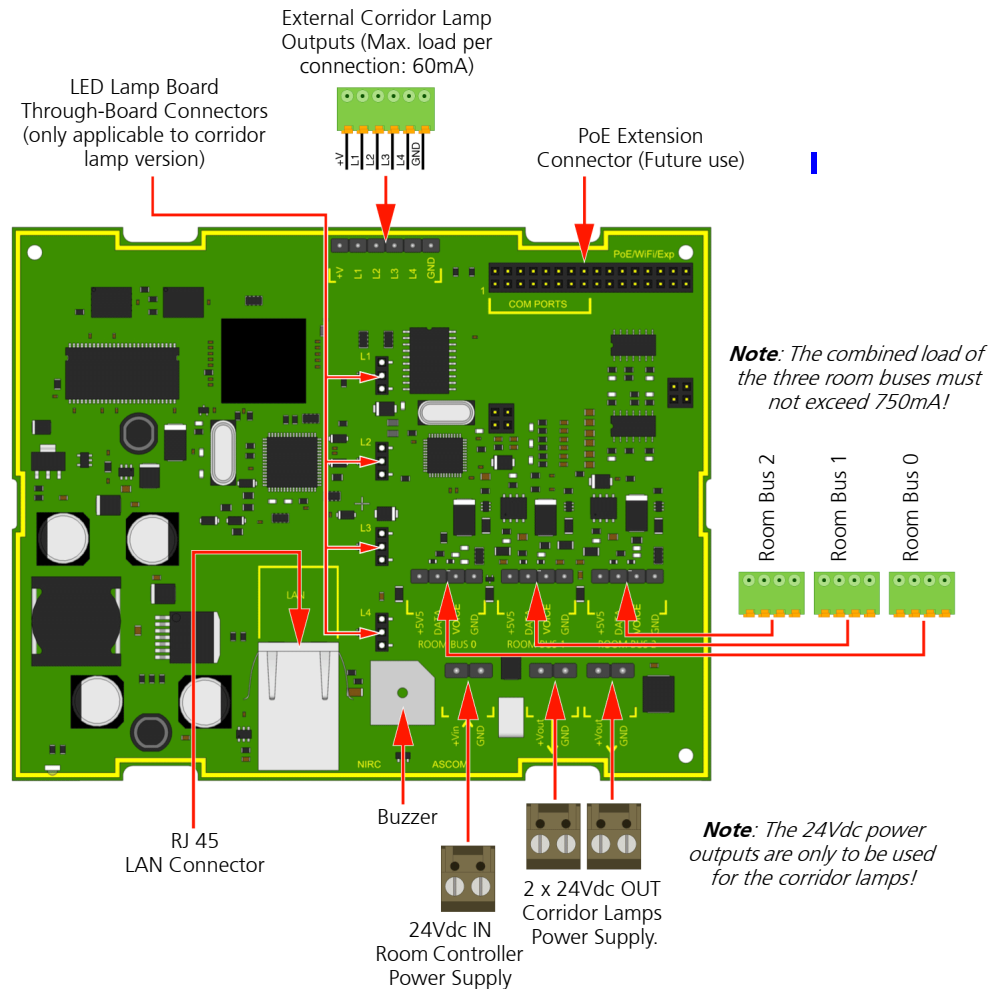


Figure 22. IP room controller (with speech) PCB electrical connections

Details of the room bus connections are given in [5.4.1, 4-Pole Connector Terminal \(NICT-4AA\)](#), page 31.

Details of the 24Vdc power supply and corridor lamp connections are given in [5.4.2, 2-Pole Connector Terminal \(NICT-2BA\)](#), page 33

**Note:** The 6-pole, 4-pole and the 2-pole connector terminals required for the external corridor LED lamps, the room bus and the 24V power supply are not supplied with the IP room controller. The connectors are available as accessories and must be ordered separately.

Details of for connecting the LED lamp boards are given in section [5.6, LED Lamp Boards](#), page 43.

Details of for connecting external corridor lamp LEDs are given in section [5.6.4, External Corridor Lamp Connections](#), page 47

### 5.3.3 IP Room Controller (NIRC) Printed Circuit Board Back View

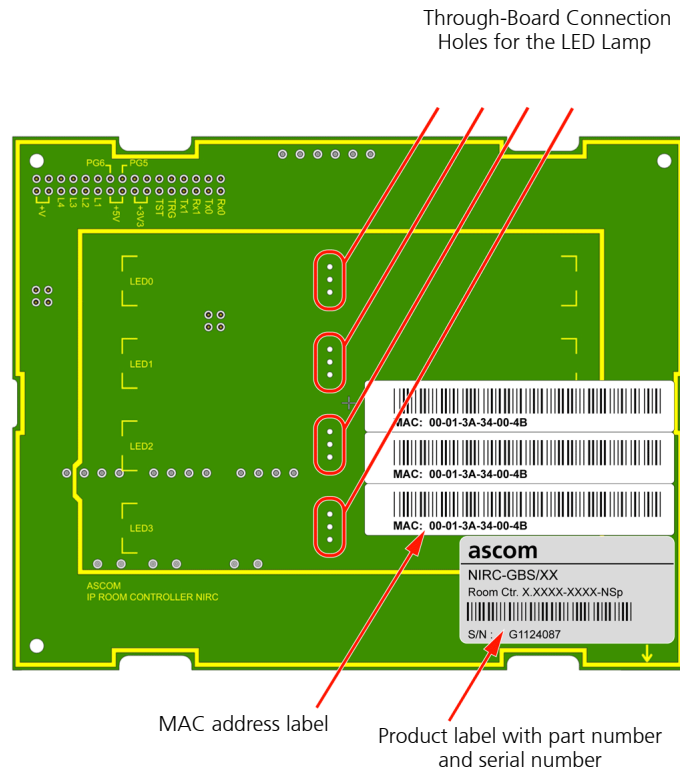


Figure 23. NIRC printed circuit board back view

On the back of the printed circuit board there are four sets of through-board connection holes for LED lamp boards. Details of for connecting the LED lamp boards are given in section 5.6, [LED Lamp Boards](#), page 43.

Also on the back of the IP room controller printed circuit board there is a set of three identical MAC address labels and a product label which includes the part number and serial number.

The three MAC labels are self-adhesive and can be removed from the printed circuit board. One of the labels should be left on the room controller printed circuit board. The other two can be removed and one can be stuck on the cover of the room controller, so the board can be identified without opening the room controller. The other can be used in a list of all room controller locations, for example, for administration purposes.

### 5.3.4 Room Controller (NIRC3) PCB Connections

The electrical connections on the component side of the room controller printed circuit board are shown in the following drawing of the NIRC3 circuit board.

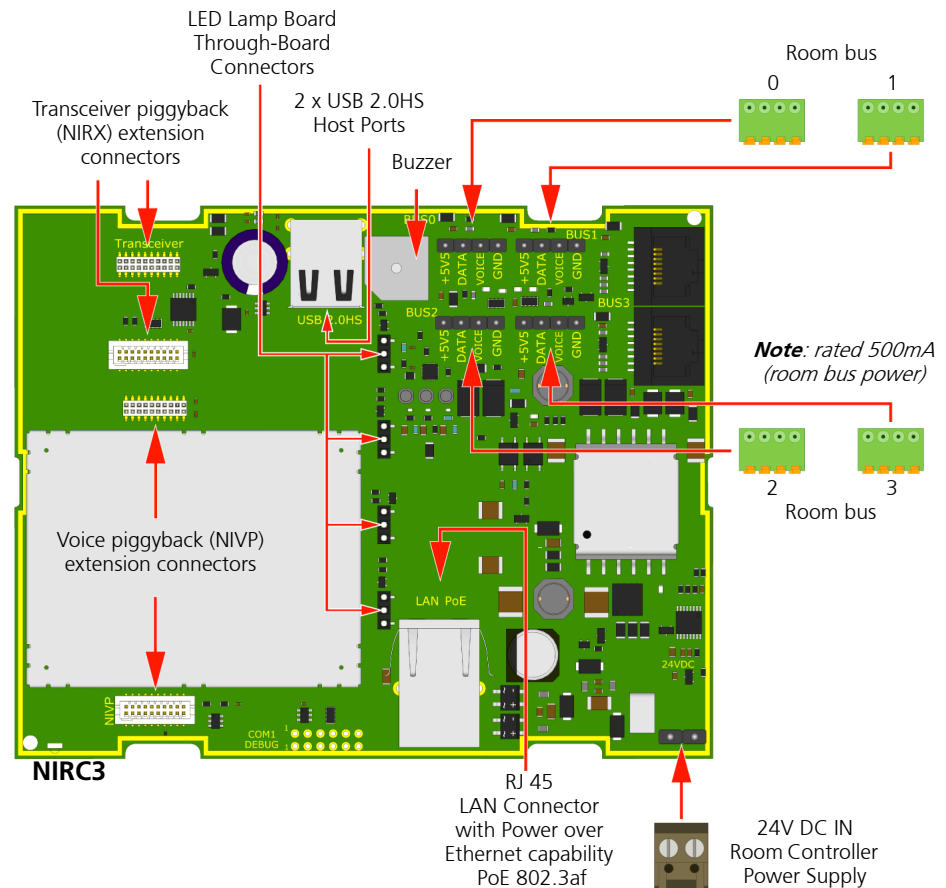


Figure 24. Room controller (NIRC3) PCB electrical connections

Details of the room bus connections are given in [5.4.1, 4-Pole Connector Terminal \(NICT-4AA\)](#), page 31.

The NIRC3 can be powered directly from a Power over Ethernet (PoE 802.3af or 802.3at) switch or through an external 24V DC power supply.

Details of the 24V DC power supply connections are given in [5.4.2, 2-Pole Connector Terminal \(NICT-2BA\)](#), page 33

The NIRC3 has two USB2.0HS host ports. Will be used in a future release to support WiFi functionality.

**Note:** The 4-pole and the 2-pole connector terminals required for the room bus and the 24V power supply are not supplied with the room controller. The connectors are available as accessories and must be ordered separately.

Details of the LED lamp boards are given in section [5.6, LED Lamp Boards](#), page 43.

Details on how to install the transceiver piggyback module (NIRX) are given in section [“NIRX teleCARE IP Transceiver”](#) on page 172.

### 5.3.5 Room Controller (NIRC3) Printed Circuit Board Back View

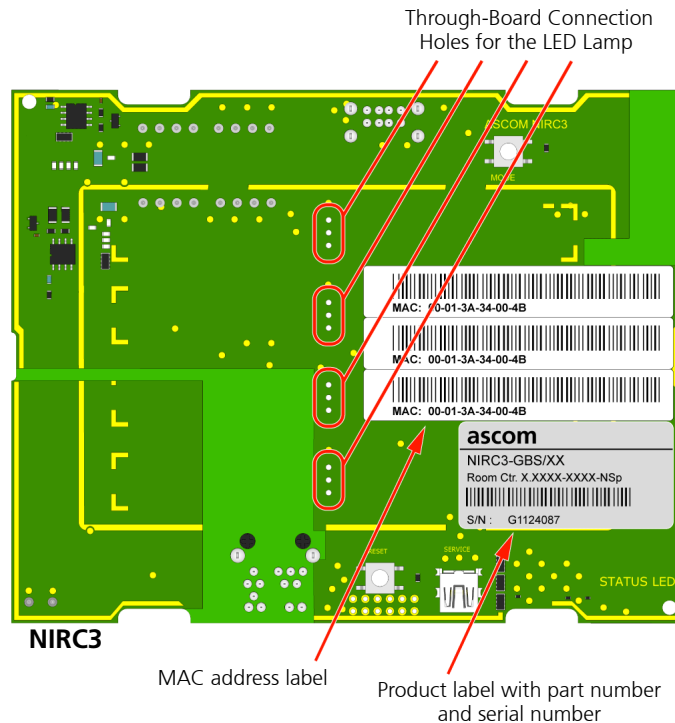


Figure 25. NIRC3 printed circuit board back view

On the back of the NIRC3 printed circuit board there are four sets of through-board connection holes for LED lamp boards. Details of for connecting the LED lamp boards are given in section 5.6, [LED Lamp Boards](#), page 43.

## 5.4 Connection Terminals

The 4-pole and the 2-pole connector terminals required for the room bus and the 24Vdc power supply are not supplied with the IP room controller. The connectors are available as accessories and must be ordered separately.

### 5.4.1 4-Pole Connector Terminal (NICT-4AA)

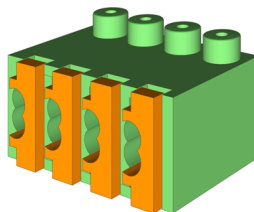


Figure 26. 4-pole connector terminal

The 4-pole connector terminal is used for connecting the room bus. It has a screw-less "spring-cage" connection technique and each terminal has two connection points.

The designation of the required four wires is as shown in the following illustration.

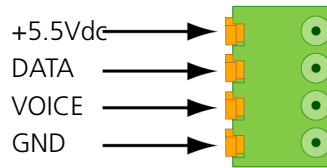


Figure 27. 4-pole connector terminal with the room bus

### Preparing the Wires for the 4-pole Connector Terminal

The 4-pole connector terminal has four terminals with two connection points at each terminal. Each connection point accepts one solid wire of maximum wire size 20 gauge ( $0.5\text{mm}^2$ ) ( $0.8\text{mm}\varnothing$ ).

To connect the wires first strip the jacket from the cables and pull the wires through the housing leaving a length of 6in (150mm) free, as described in section 5.3, [Preparing the Room Bus and Power Cables on page 26](#). Then strip 0.25in (6.5mm) of the insulation from the end of each wire which is to be connected.

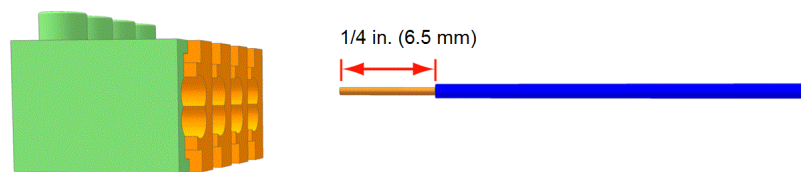


Figure 28. Stripping the wires for insertion in the connection terminal

After stripping the wire to expose 0.25in (6.5mm) of conductor, insert the wire in the appropriate opening of the connection point by pressing the wire firmly into the terminal, as illustrated below.

**Note:** Each connection point in the connector terminal accepts only one wire. Maximum wire size 24 gauge ( $0.5\text{mm}^2$ ) ( $0.8\text{mm}\varnothing$ ).

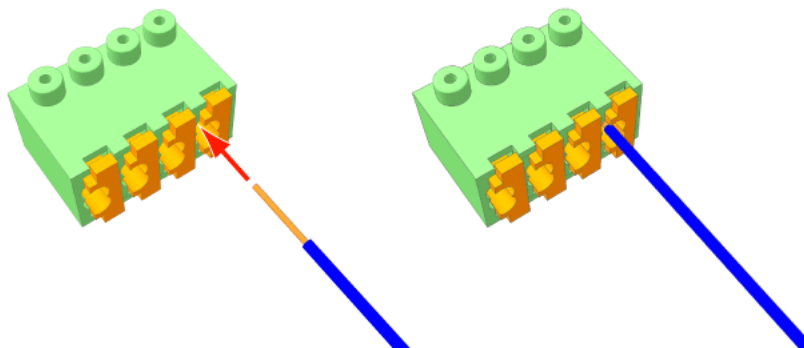
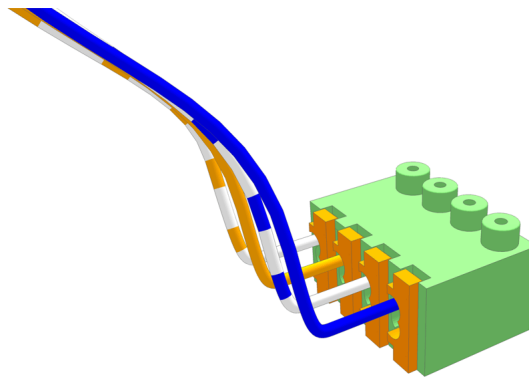


Figure 29. Inserting a wire in the connection point

Check that a good connection has been made by gently pulling on the wire after it has been inserted. The wire should stay fixed in the terminal.

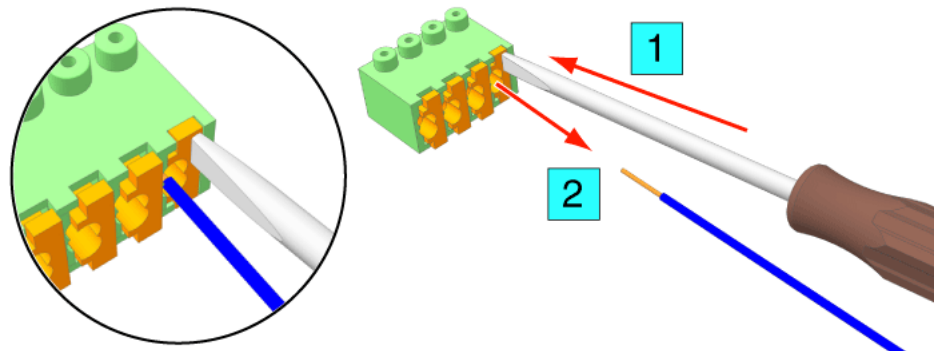
Four wires are required for the room bus, passive bus and light relay outputs, so repeat the above illustrated procedure on the remaining three wires.



*Figure 30. Connector terminal complete with four wires*

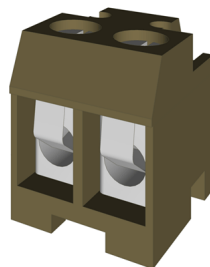
#### **Disconnecting a Wire from the Connector Terminal**

First carefully place the point of a small screw driver (point approximately 0.1 in (2.5mm) wide) on the relevant orange colored release key of the connection terminals and press the key in firmly to open the spring-cage connector (1). With the release key pressed in pull the wire from the terminal (2) then remove the screw driver.



*Figure 31. Removing a wire from a connection point*

#### **5.4.2 2-Pole Connector Terminal (NICT-2BA)**



*Figure 32. 2-pole connector terminal*



The 2-pole connector terminal is used for connecting the 24Vdc power supply when a separate power supply is used. It is also used for the 24Vdc power supply from the room controller to the corridor lamp.

The 2-pole terminal connector has two screw terminals. Each terminal accepts one wire (up to wire size 14 gauge (1.5mm<sup>2</sup>) (1.4mmØ) or two wires (each up to 18 gauge (1mm<sup>2</sup>) (1.15mmØ)).

**Note:** The recommended maximum wire size for the teleCARE power supply is 18 gauge (1mm<sup>2</sup>) (1.15mmØ).

### Preparing the Wires for the 2-pole Connector Terminal

To connect the wires first pull the wires through the housing leaving a length of 6in (150mm) free, as described in section 5.3, [Preparing the Room Bus and Power Cables on page 26](#). Then strip 0.25 inch (6.5mm) of the insulation from the end of each wire which is to be connected.

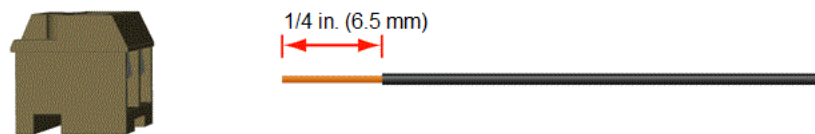


Figure 33. Stripping the wires for insertion in the connection point

After stripping the wire insert the wire in the appropriate opening of the connector terminal and tighten the terminal screw.

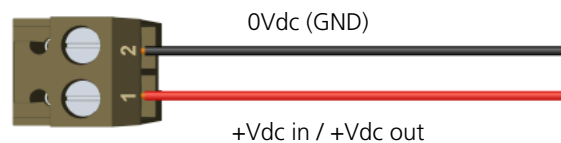


Figure 34. 2-pole connector terminal wiring

**Note:** If stranded wire is used for the power supply cabling then a suitable ferrule (barrel outer diameter > 0.04in (1mm)) should be used over the wire cores to ensure a reliable connection.

### 2-Pole Connector Terminal with Looped Wiring

In cases where the power supply cable loops from room controller to room controller, the incoming and outgoing wires are connected in the same screw terminal, as shown in the following illustration:

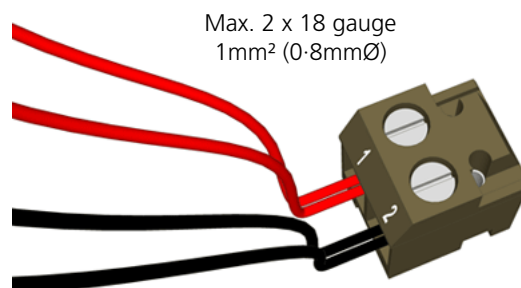


Figure 35. Connector terminal with looped wiring

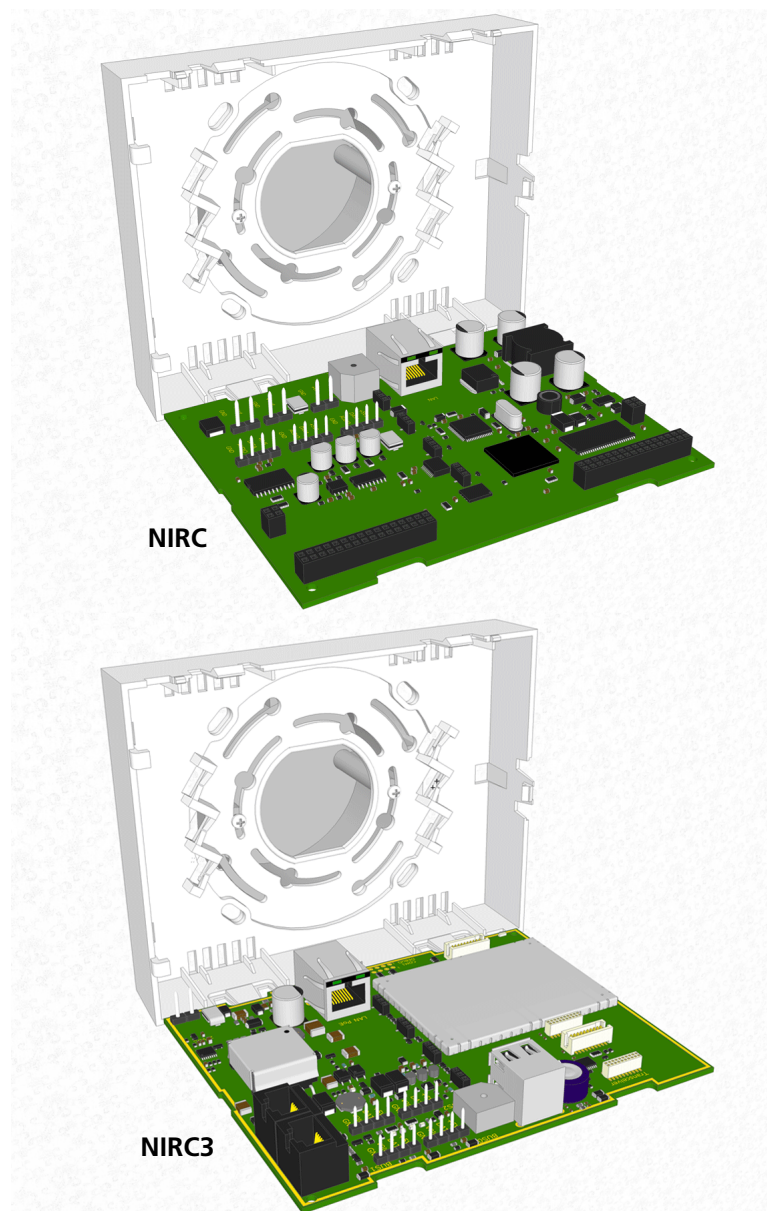
**Note:** The maximum size of each wire when two wires are inserted in one screw terminal of the 2-pole connector terminal is 18 gauge (1 mm<sup>2</sup>) (1.15 mmØ).

## 5.5 Connecting the IP Room Controller Printed Circuit Board

When preparing the wiring for connecting the printed circuit board of the IP room controller make sure that the power supply wires and the room bus wires are stripped of the cable outer jacket and that the wires are long enough, as described in section 5.3, [Preparing the Room Bus and Power Cables on page 26](#).

It is best to arrange the wires and cables neatly and securely inside the housing. The power wires and the room buses should be guided around sides of the room controller housing and held in place by the wire holding clips.

The instructions will include the procedures for both the NIRC and the NIRC3 room controller.

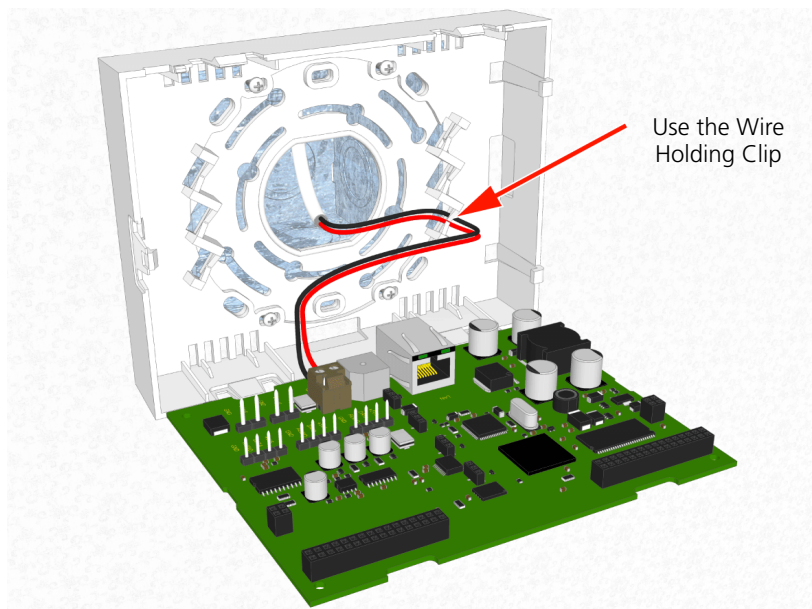


### 5.5.1 Connecting the 24Vdc Power Supply

The 24Vdc power supply uses a 2-pole connection terminal as described in section 5.4.2 on page 33. The connection point on the room controller circuit board for the power supply is shown in section 5.3.2 on page 28.

The power supply wires should be guided around the sides of the room controller housing and held in place by the wire holding clip, as shown in the following illustration:

*Figure 36. Connecting the 24V/DC power supply*



The connection point on the room controller circuit board for the power supply of the NIRC3 is shown in section 5.3.5 on page 37.

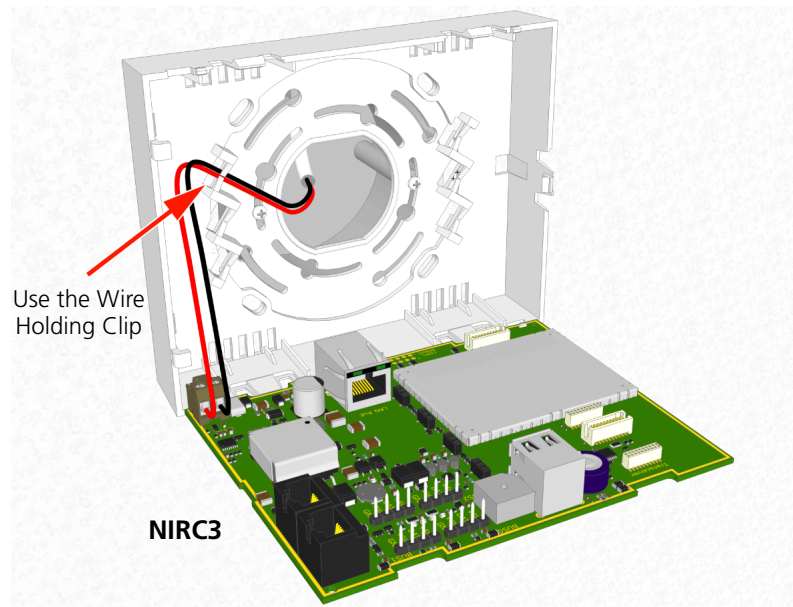


Figure 37. NIRC3 - Connecting the 24V DC power supply

**Note:** An external power connection is not required when Power over Ethernet - PoE is used to power the NIRC3.

### 5.5.2 Connecting the Power Supply and Corridor Lamp Power Outputs

The room controller supports two corridor lamps and each has a 2-pole connector similar to the 24Vdc power supply, as described in [section 5.4.2 on page 33](#). The connection points on the room controller circuit board for the power supply and corridor lamps are shown in [section 5.3.2 on page 28](#).

The power supply wires and the corridor lamp power supply wires should be guided around the sides of the room controller housing and held in place by the wire holding clip, as shown in the following illustration:

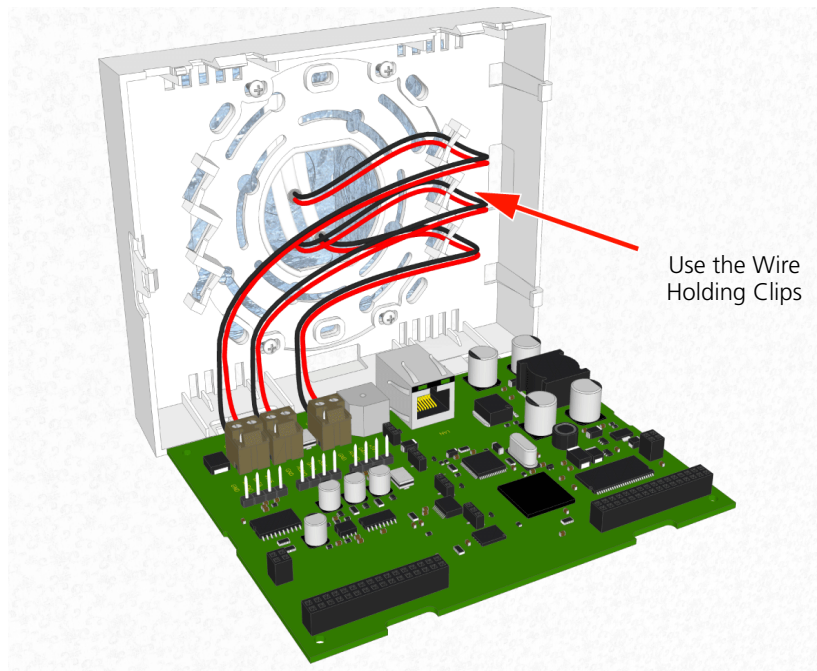


Figure 38. Power supply and corridor lamp power connections

### NIRC3

The corridor lamp (NICL2) that must be used with the NIRC3 is powered directly from the 5.5V room bus power and does not require a separate 24 volt power connection, therefore the NIRC3 is not equipped with the 24 volt power outputs.

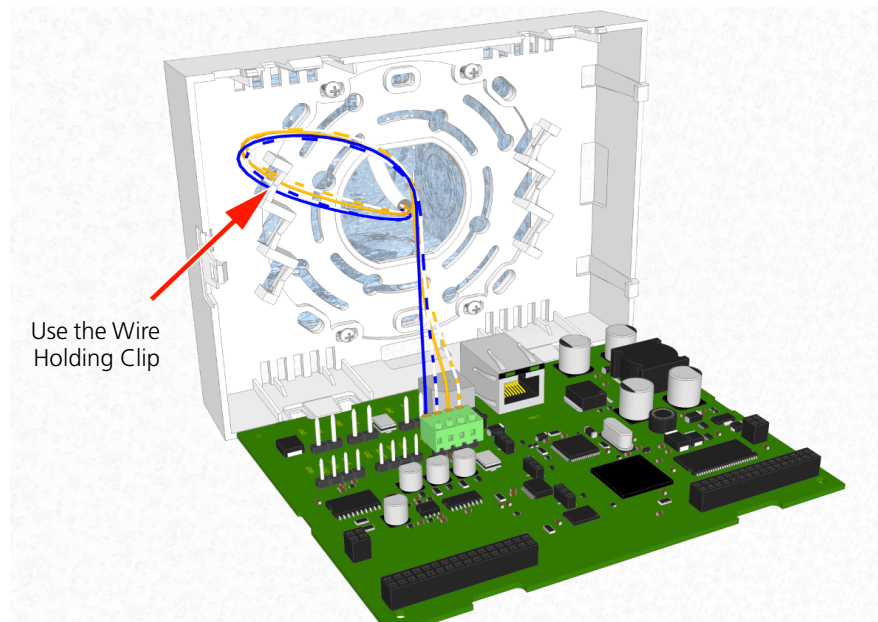
**IMPORTANT:** Because the NIRC3 does not have 24V power outputs, the corridor lamp (NICL) should not be connected to the NIRC3. Only connect corridor lamps (NICL2) to the NIRC3 room buses.

### 5.5.3 Connecting the Room Bus

The room bus uses a 4-pole connection terminal as described in [section 5.4.1 on page 31](#). The connection point on the room controller circuit board for the room bus is shown in [section 5.3.2 on page 28](#).

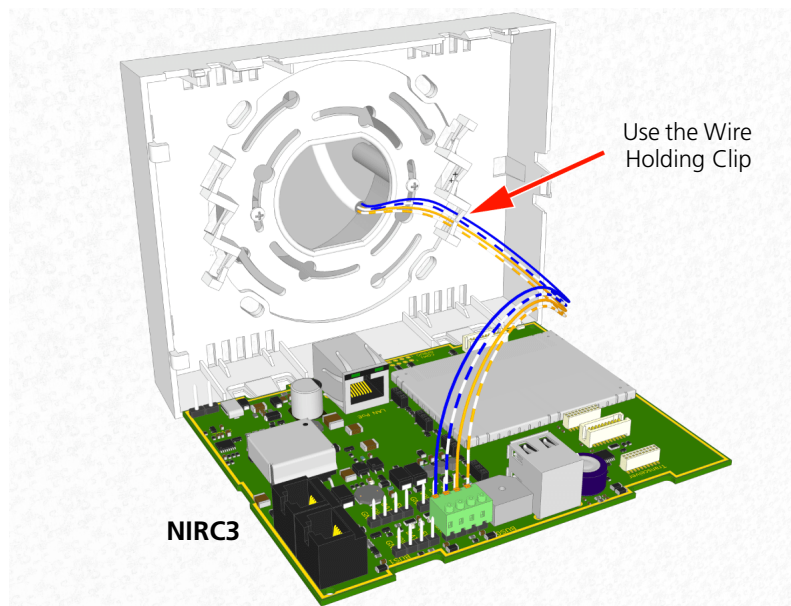


The room bus wires should be guided around sides of the room controller housing and held in place by the wire holding clip, as shown in the following illustration:



*Figure 39. Connecting the room bus*

The connection point on the room controller circuit board for the room bus of the NIRC3 is shown in section [5.3.5 on page 37](#)



*Figure 40. NIRC3 - Connecting the room bus*

#### 5.5.4 Connecting Multiple Room Buses

The IP room controller supports three room buses and each has a 4-pole connection terminal which is wired as described in section 5.4.1 on page 31. The connection points on the room controller PCB for the room buses are shown in section 5.3.2 on page 28.

The room bus wires should be guided around the sides of the room controller housing and held in place by the wire holding clip, as shown in the following illustration:

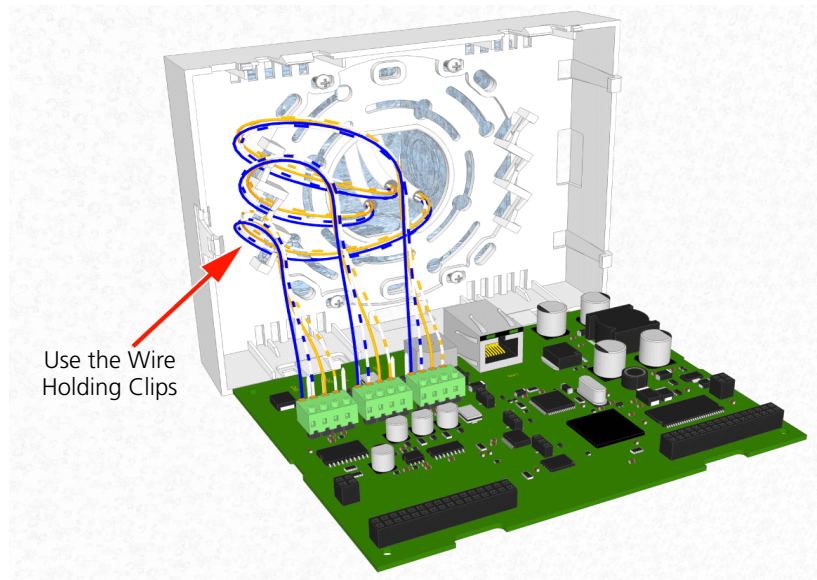


Figure 41. Connecting multiple room buses

The connection points on the room controller PCB for the room buses of the NIRC3 are shown in section 5.3.5 on page 37.

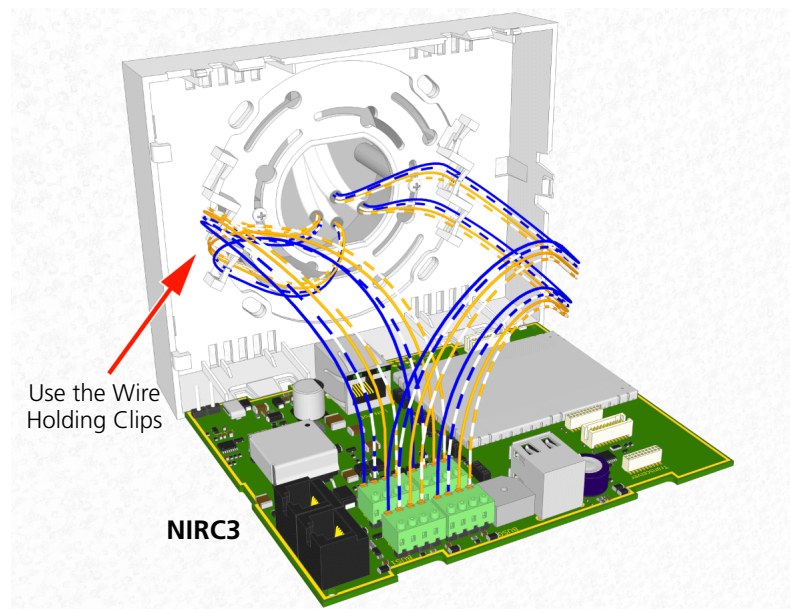
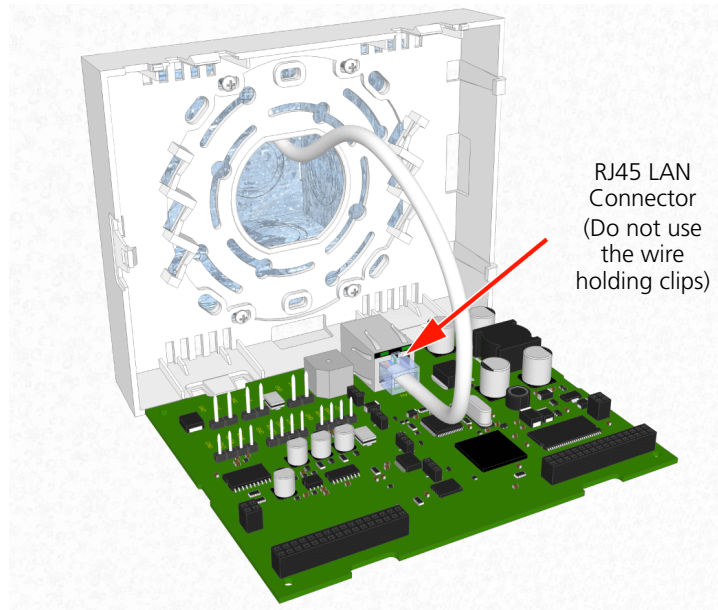


Figure 42. NIRC3 - Connecting multiple room buses

### 5.5.5 Connecting LAN Cable

The LAN cable has an RJ45 plug which connects to the socket on the room controller printed circuit board shown in section 5.3.2 on page 28. The LAN cable should not be guided through the wiring clips inside the room controller housing. It should be plugged directly into the RJ45 connector on the printed circuit board with enough cable to avoid straining the LAN connection.

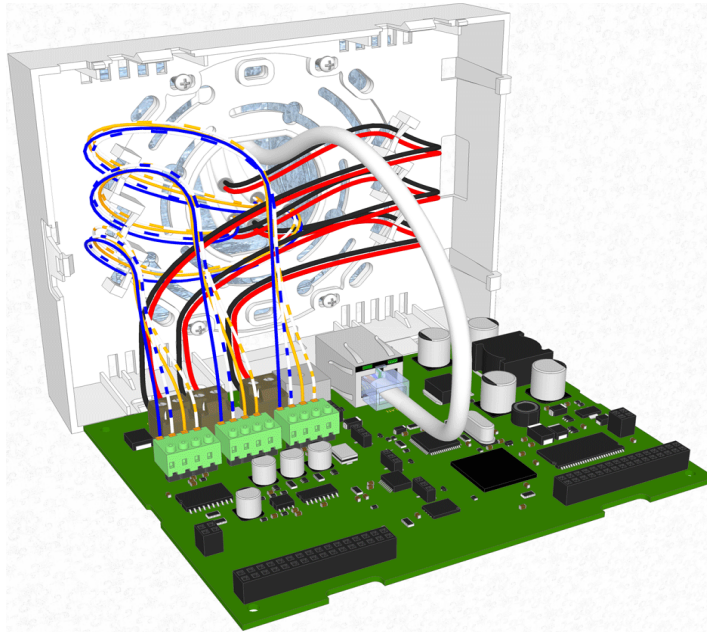


*Figure 43. Connecting the LAN cable*



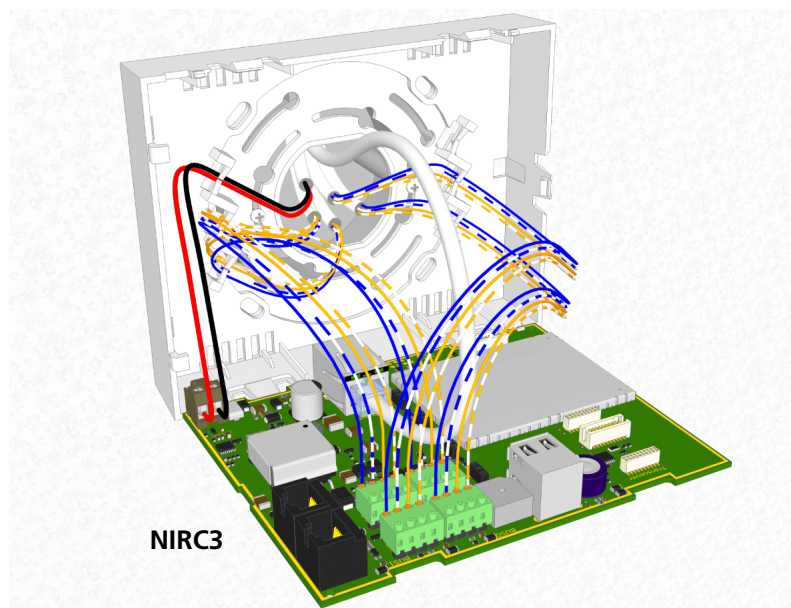
### 5.5.6 Fully Wired IP Room Controller

The following illustration shows how the room controller should look with all wiring connected when external power is used:



*Figure 44. Fully Wired IP room controller*

The following illustration shows how the room controller (NIRC3) should look with all wiring connected when external power is used:



*Figure 45. Fully Wired room controller - NIRC3*

## 5.6 LED Lamp Boards

The LED lamp board contains four high intensity LED lamps which are used in the corridor lamp of the room controller and corridor lamp. The three pins in the back side of the board are used to connect the LED lamp board through holes in the back side of the room controller or corridor lamp printed circuit board. The room controller and the corridor lamp each accept up to four LED lamp boards.

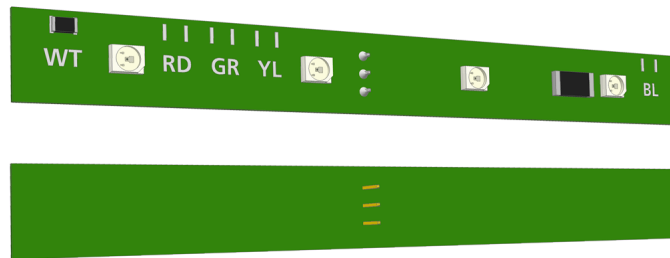


Figure 46. LED lamp board front and back view

**Note:** The LED lamp boards are not delivered as part of the IP room controller and therefore, must be ordered separately.

The LED lamp board is available in five colors: red, green, yellow, white and blue. The LEDs are used for the signaling of various types of call, as well as staff presence and faults. The functions of the LEDs are determined by the system setup.

The color of the LEDs is determined during manufacture and cannot be changed. A resistor on the component side (front) of the board indicates the color of the LEDs, as shown in the following illustration:



Figure 47. LED lamp boards: white, red, green, yellow and blue

The LED lamp boards can be plugged into any of the LED connection points on the room controller board and the corridor lamp but it is normal to have each color in the same position in every room controller board. The functioning of the LEDs colors is determined by the system setup.

### 5.6.1 Auxiliary Lamp Connection - NILD2

The green LED board (NILD2-GAA) has a galvanically separated output that can be used to connect to an auxiliary lamp. It has a maximum switching capacity of 0.4A at 60V peak.

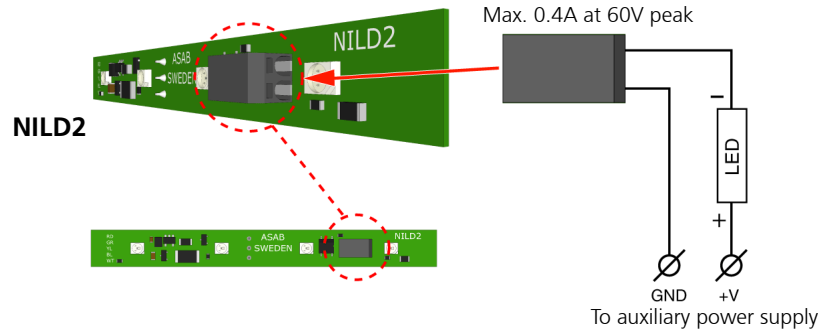


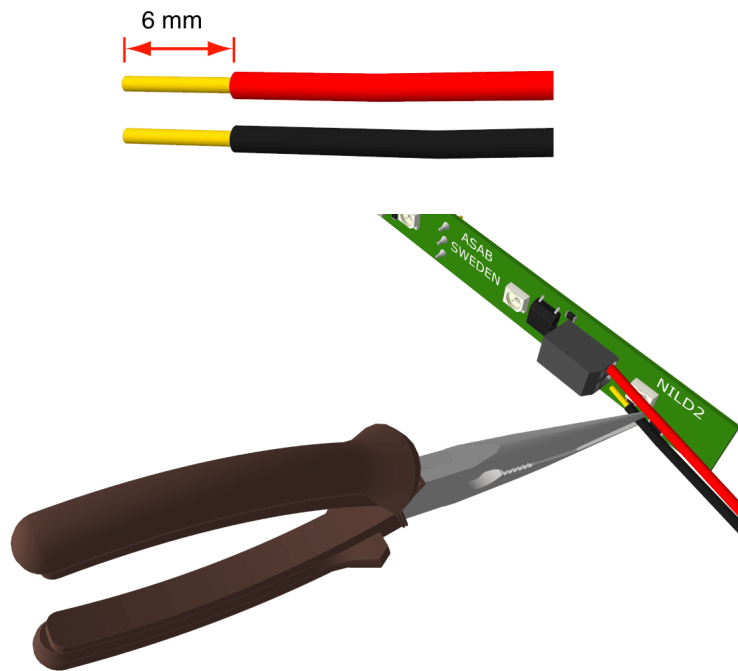
Figure 48. External corridor lamp connections through the NILD2-GAA

**IMPORTANT:** In order to retain the galvanic separation, it is not allowed to connect the GND (-) of the auxiliary power supply to the GND (-) of the NIRC3.

### 5.6.2 Connecting the Wires to the NILD2-GAA

The 2-pole connector terminal on the green LED lamp board (NILD2-GAA) has two terminals with one connection point at each terminal. A connection point accepts one solid wire of maximum wire size 0.5MM<sup>2</sup> (0.8mmØ). To connect the wires first strip 6 mm of the insulation from the end of each wire which is to be connected.

After stripping the wire, insert the wire in the appropriate opening of the connection point by pressing the wire firmly into the terminal, as illustrated below:



*Figure 49. Connecting the wires of an external lamp*

**Note:** Each connection point in the connector terminal accepts only one solid wire.  
Maximum wire size 0.5MM<sup>2</sup> (0.8mmØ).