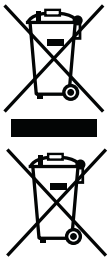
Installation Guide
teleCARE IP
Emergency Call System

10 FEB 2014 / Ver A

Copyright	© 2014 Ascom (US), Inc. This document may not be copied in whole or in part or otherwise reproduced without prior written consent from Ascom, except where specifically permitted under US and international copyright law.
Disclaimer	The information in this document is subject to change. Use this product only in accordance with the instructions provided in the installation and user guide manuals. Use this product only in accordance with the purposes for which it is designed. For the latest version of all Ascom teleCARE documentation, contact your local supplier or visit the Ascom Partner Website at https://www.ascom-ws.com.
Trademarks and patents	The teleCARE name and logo are trademarks of Ascom. Other trade names used in this document may be trademarks or registered trademarks of the manufacturers or vendors of the respective products. This publication may contain examples of screen captures and reports used in daily operations. Examples may include fictitious names of individuals and companies. Any similarity to names and addresses of actual businesses or persons is entirely coincidental.
HIPAA disclaimer	All examples of personal or protected health information in this document are fictitious. Any resemblance to a real person or facility is purely coincidental. The owners and users of this product are solely responsible for complying with all applicable protected health information privacy laws. The users, by their use of this product, agree to indemnify the manufacturer or seller of this product against all claims, litigation, and suits filed for protected health information violations.
European Union directives 	The European directive "Waste Electrical and Electronic Equipment" (WEEE) aims to minimize the impact of electrical and electronic equipment waste on the environment and human health. To conform to this directive, electrical equipment marked with this symbol must not be disposed of in European public disposal systems. European users of electrical equipment must now return end-of-life equipment for disposal. Further information may be found on the following website: www.recyclethis.info.
Battery Disposal	This product may use sealed lead-acid batteries. Please refer to manufacturer instructions and all state, provincial, and local codes for information, instructions and requirements regarding proper disposal.
Environmental Requirements	Refer to the installation guide and product data sheet for complete product ratings and information. Avoid exposing the device to direct sunlight or other heat sources. Do not expose the device to open flame. Keep the device away from excessive heat and moisture. Protect your device from aggressive liquids and vapors. Keep the device away from strong electromagnetic fields.
Terms used in this manual	Specialized terms are used throughout this manual. The first time a term is used it is defined in the text.
Regulatory Compliance (EU/EFTA)	This equipment is intended to be used in the whole EU & EFTA. This equipment is in compliance with the essential requirements and other relevant provisions of EMC Directive 2004/108/EC and RoHS Directive 2011/65/EU. For NIRX/NITX/NILF/NICR/NIRD products: R&TTE Directive 1999/5/EC and RoHS Directive 2011/65/EU. The Declaration of Conformity may be consulted at: http://www.ascom-ws.com/doc/

Regulatory Compliance (US/CAN)	**Safety Compliance** The equipment described herein complies with: ANSI/UL 2560 Emergency Call Systems for Assisted Living and Independent Living Facilities CAN/CSA C22.2 No. 205 Signal Equipment **Note:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: Reorient or relocate the receiving antenna. Increase the separation between the equipment and receiver. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. Consult the dealer or an experienced radio or television technician for help. **Information to user** This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: i) this device may not cause harmful interference, and ii) this device must accept any interference received, including interference that may cause undesired operation. This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device. Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement. CAN ICES-3 (B)/NMB-3(B) **Modifications** Changes or modifications to the equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. **NIRC3 (only)** **Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. CAN ICES-3 (A)/NMB-3(A)

1 Introduction 1
1.1 General 1
1.2 Installation and Commissioning 1
1.3 teleCARE IP With Speech 2

2 Practical Engineering Parameters 4
2.1 General Limitations 4
2.2 Network Expectations 4
2.3 VoIP Requirements (Supplementary) 5
2.4 teleCARE IP Compatible Ascom Handsets (Supplementary) 5

3 System LAN Cabling 6
3.1 Ethernet Switch 6
3.2 Ethernet LAN and Room Bus Cables 7

4 System Power 10
4.1 24Vdc / 3 Amp Power Supply (Standard) 10
4.2 24Vdc / 8 Amp Power Supply (Seismic) 12
4.3 Secondary Power 16
4.4 teleCARE IP Power Supply Wiring 16
4.5 Power Supply Unit (24Vdc) with Multiple Power Buses 17

5 Control Equipment 19
5.1 Preparation 19
5.2 Room Controller 19
5.3 Preparing the Room Bus and Power Cables 26
5.4 Connection Terminals 31
5.5 Connecting the IP Room Controller Printed Circuit Board 35
5.6 LED Lamp Boards 43
5.7 Corridor Lamp (NICL) 49
5.8 System Manager (NISM2) 57

6 Peripherals 61
6.1 Preparation 61
6.2 Installation Instructions 61
6.3 Backplates and Surface Mounting Spacer 62
6.4 Switch Module Electrical Connections 64
6.5 Bedside Module (NIBM2) 72
6.6 Medical Rail Socket (NIMS2) 77
6.7 Door Side Module (NIDM) 81
6.8 Pull Cord Module - Active (NIPC-G3A and NIPC-W3A) 82
6.9 Toilet Cancel Module - Active (NITC-XXA) 84
6.10 Pull Cord Module - Passive (NIPC-XXP) 85
6.11 Toilet Cancel Module - Passive (NITC-XXP) 86
6.12 Pull Cord Module (NIPC2) Active and Passive 87
6.13 Duty Selector (NIDS) 97
6.14 Card Reader (NICR) 99
6.15 Speech Module (NISP) 104

6.16 Room Display (NIRD) 106
6.17 Television Interface Module 113
6.18 Sunblind Control Module 115

7 Corridor Equipment 117
7.1 Corridor Display (NICD) 117

8 Wireless Functionality 126
8.1 General 126
8.2 Principle of the teleCARE IP with Wireless Functionality 127
8.3 teleCARE IP Wireless Components 131

9 Installation Examples 152
9.1 2-Bed Room with Active Toilet Cancel and Active Pull Cord Peripherals 152
9.2 2-Bed Room with Passive Toilet Cancel and Passive Pull Cord Peripherals 154
9.3 2-Bed Room with a Medical Rail Socket at each Bed 157
9.4 Room Controller with Corridor Lamps (Master/Slave) 159
9.5 4-Bed Room with Speech 161
9.6 Duty Selector at a staff Station 163
9.7 Positioning of the teleCARE IP Peripherals 165

Document History 167

1 Introduction

The installation guide covers the mechanical and electrical installation of the teleCARE IP Emergency Call System. The teleCARE IP "System Description" (TD 92608GB) should be read before reading this manual to gain a general understanding of the teleCARE IP system.

Throughout this document there are "cross-references" in the text which indicate that further details can be found in another section of this document. The cross-references are colored blue and linked to the relevant place in the document. Positioning the cursor over the "cross-reference" then click the left mouse button to go to the relevant section of the document. The product illustrations in this document represent the products when the illustrations were created. The actual appearance of the products may vary due to subsequent technical modifications and component changes.

1.1 General

teleCARE IP is a Local Area Network (LAN) based Emergency Call System for assisted living and independent living facilities. The LAN/WLAN infrastructure is used to communicate the information generated in the emergency call system, such as calls for help or assistance, staff presence, emergency alarms, technical alarms, etc. The IP integration is at room level with at least one IP port per room.

teleCARE IP operates on a Ethernet LAN based on 10/100 BaseT, using a Cat 5 (or higher) structured wiring for 100 BaseT. The network shall be a dedicated network.

The teleCARE IP system is modular, scalable and built around the Room Controller (NIRC). Power is supplied using an external 24Vdc power supply.

teleCARE IP peripherals are connected to the room controller by a digital room bus. Each room controller includes 3 room buses with 8 addresses per bus.

The modularity of teleCARE IP makes it easy to extend and add new functions to already installed systems. The LAN technology allows easy installation of new room controllers and peripherals in order to extend the existing teleCARE IP system.

1.2 Installation and Commissioning

The installation and commissioning of teleCARE IP should only be undertaken by qualified technicians and carried out in accordance with all regulations. Only original teleCARE IP parts and components are to be used in any teleCARE IP installation. In order for the system to function properly these parts must be installed in accordance with the appropriate teleCARE IP installation instructions.

The teleCARE IP equipment should only be installed when the building work is completed and when the environment is clean, dry and totally weatherproof. All control and distribution equipment must be accessible for commissioning and servicing.

The acceptable environmental conditions for the teleCARE IP system, associated power supplies and related equipment are all listed systems and components and are in compliance with the safety requirements of ANSI/UL 2560 Standard for Safety, Emergency Call Systems for Assisted Living and Independent Living Facilities and CAN/CSA No. 205-12, Signal Equipment.

WARNING: The teleCARE IP equipment should not be installed in areas where the air pressure is below 850 millibar (approximate maximum altitude of 6100ft (2000m).

WARNING: teleCARE IP components, including all handsets, are not intended for use in oxygen enriched environments.

WARNING: teleCARE IP components, including all handsets, are not intended for use in rooms where flammable (anesthetic) gases are used.

1.3 teleCARE IP With Speech

The basic installation for a teleCARE IP system with speech is the same as for teleCARE IP without speech with the exception that room controllers with speech support and a supplementary VoIP gateway are required. In addition each location where speech is required must have a teleCARE IP speech module. The speech module can only be used in combination with the teleCARE IP door side module (NIDM), the bedside module (NIBM), and the pull cord module (NIPC).

1.3.1 Compatible Ascom IM Handsets

teleCARE IP with speech is designed to work with Ascom Interactive Messaging using the Ascom handsets which support multi-layer interactive messaging. At the time of publication of this document the Ascom handsets which support multi-layer interactive messaging are:

9d24 / mkII (software 3.71 or higher)

d62 (software 3.0.5 or higher)

d81 (software 2.0.5 or higher)

i75 (software 1.7.7 or higher)

1.3.2 System Overview teleCARE IP with Speech

The following illustration shows a typical example of a teleCARE IP speech system. The options and system components depend on the specific project requirements.

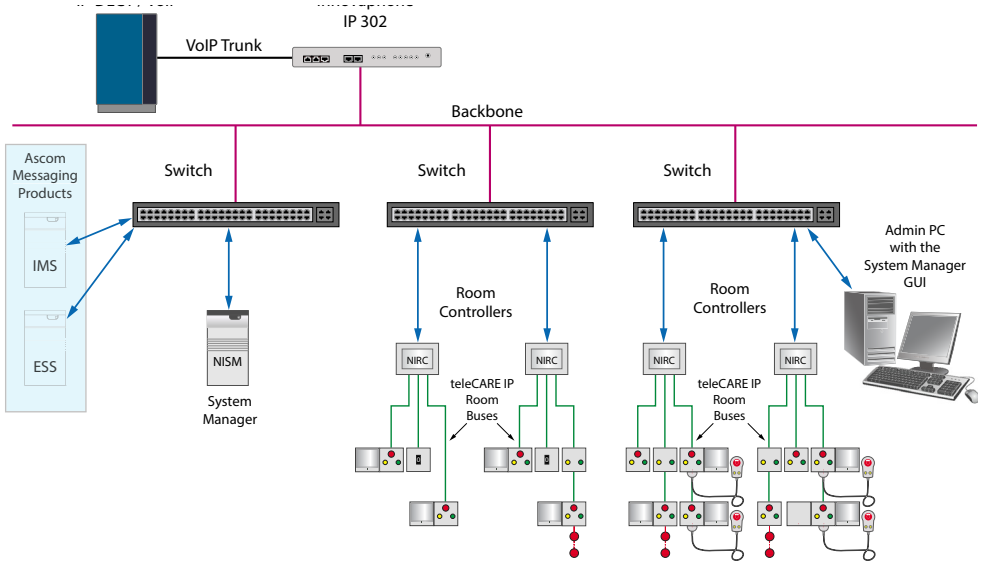


Figure 1. System overview teleCARE IP with speech

1.3.3 Innovaphone VoIP Gateway

The teleCARE IP system uses the supplementary Innovaphone VoIP gateway to support VoIP speech functionality. The Innovaphone VoIP gateway is an IP based gateway providing the VoIP based solution which supports all the features of a traditional PBX. For the teleCARE IP VoIP the SIP Trunk must be used for the interface to the main PBX. The SIP trunk must be set to "Early offer".For more information refer to the teleCARE IP Configuration Manual TD 93019US.

The Innovaphone VoIP gateway power supply can be sourced from the LAN (VoIP gateway Class 3 IEEE 802.3af) or by a mains adapter power supply (output 40Vdc 375mA). It is connected and integrated in the existing telephone system network directly using SIP protocol. It is configured with the project specific requirements using the teleCARE IP System Manager.

A license is required for the Innovaphone VoIP gateway. For this an activation code has to be ordered from Ascom before downloading the license from the Innovaphone Customer Portal (https://my.innovaphone.com/).

2 Practical Engineering Parameters

In order to ensure the optimal performance of a teleCARE IP system it is important to consider certain parameters and limitations. The following tables show the most important practical values which can have an influence on the teleCARE IP system performance.

WARNING: Any deviation from the values and recommendations shown in the following tables can significantly reduce the performance of the teleCARE IP system.

2.1 General Limitations

teleCARE IP Items	Practical Limits
NIRCs per NISM	Max. 200
Active peripherals per room bus (addressable - 0 to 3)	Max. 4
Active peripherals per room bus (fixed address - 4 to 7)	Max. 4
Pull cord peripherals on a passive bus	Max. 1
Toilet cancel peripherals on a passive bus	Max. 1
Total cable length of an NIRC IP room bus	Max. 100 feet (30 meters)
Minimum IP room bus voltage	4.5 Vdc
Minimum NIWC room bus voltage	18.6 Vdc

2.2 Network Expectations

Network Expectations
The LAN must be dedicated and isolated from any general purpose LAN
The LAN installation should be in accordance with ANSI/TIA/EIA-568-A
LAN cable type: Category 5 (or higher)
Maximum LAN cable length: 328 ft (00 meters)
A switch port is required for each room controller
Existing customer LANs must be assessed by Ascom before committing
For details of the teleCARE IP load and performance see document TD92636GB, (IP Infrastructure Requirements)

2.3 VoIP Requirements (Supplementary)

VoIP Considerations
The Innovaphone VoIP gateway version 8 is required for teleCARE IP with speech, as the interface to the PBX.
An interoperability test between the VoIP gateway and main PBX must be performed.
The connection between the PBX and the Innovaphone can be BRI or SIP Trunk
teleCARE IP only supports CODEC G.711 (a-law)
SIP trunk to the VoIP gateway must be set to "Early offer"
teleCARE VoIP shall use the Emergency Call System LAN only.
Ascom Testimonials: Delay - less than 50 ms is good Jitter - less than 30 ms is good Packet Loss - 1% is good (up to 4% is acceptable)
The maximum capacity of the network used for voice should not exceed 25% of the total network capacity
The maximum capacity of the network used for used for data and voice together should not exceed 75% of the total network capacity

2.4 teleCARE IP Compatible Ascom Handsets (Supplementary)

teleCARE IP Compatible Ascom Handsets
9d24 / mkII (software 3.71 or higher) d62 (software 3.0.5 or higher) d81 (software 2.0.5 or higher) i75 (software 1.7.7 or higher)

3 System LAN Cabling

3.1 Ethernet Switch

The 8-port Ethernet Switch, Ascom part number APS5001, shall be used with the teleCARE IP system and can be purchased through Ascom.

WARNING: Use of any Ethernet Switch other than Ascom part number APS5001 violates the UL 2560 listing.

3.1.1 Ethernet Switch DIN Rail Mounting

The Ethernet Switch shall be mounted on a 1.5in (35mm) DIN-rail, which can be mounted on a wall. See instructions inside the Ethernet Switch Installation Guide provided with the switch.

3.1.2 Ethernet Switch 19" Rack and Cabinet Mounting

The Ethernet Switch can be mounted into a 19in (483mm) rack secured to a DIN Rail, which must be attached with screws or other fixtures to the rack and must not be easily movable.

3.1.3 Ethernet Switch Installation – Seismic

For installations requiring seismic considerations, refer to OSHPD Installation Requirements and Instructions, document number 3101998, for selection, sourcing, and installation of racks and cabinets. After the racks or cabinets are installed, the Ethernet Switch can then be installed into a cabinet or rack, in accordance with the instructions described in 3.1.2.

WARNING:

- Use only the cabinets or rack listed in the OSHPD Installation Requirements and Instructions document (P/N 3101998).
- Do not use the uninterruptible power supplies described in the OSHPD installation document. The battery backup for the teleCARE IP system must be provided by the power supply described in section 4.2, 24Vdc / 8 Amp Power Supply (Seismic).
- Use the rack mounting accessories described in section 3.1.2 to mount the Ethernet switch to the rack or cabinet.
- Do not apply the OSHPD Label to the rack, cabinet or, Ethernet Switch. If an OSHPD label is required, contact your Ascom Sales Representative.

3.1.4 Ethernet Switch Power

The Ethernet Switch must be powered by the 24Vdc / 3 Amp Power Supply Ascom model APS5000 described in Section 4 of this manual. The power conductors must be in accordance with the requirements specified in section 4.4 and connected to the four-pin removable keyed connector provided with the unit. Power connections to the Ethernet Switch shall be in accordance with the Figure 2.

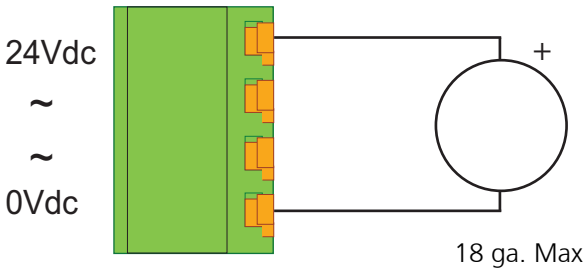


Figure 2. Ethernet Switch Power Connection

3.1.5 Ethernet Switch Operation

When properly installed and operating, LED indicators on the Ethernet Switch will be observed as follows:

PWR (green)	Illuminates steady when proper power is supplied to the Ethernet Switch.
LINK (green)	Each port has a LINK LED which indicates that a valid Ethernet link has been established. The LED flashes when data transfer is occurring.
HS (yellow)	Each port has a DATA RATE LED which illuminates steady indicating that data is transferring at 100 Mbps.

3.2 Ethernet LAN and Room Bus Cables

High quality cables must be used to install the teleCARE IP system. The individual wire cores of the cables should be color coded. Care should be taken when stripping cables from the outer mantle to avoid damaging the insulation of the wire cores.

The system wiring is classified as low voltage and therefore cabling must be separated from higher voltage system through the use of separate conduits or divided cable trays.

A minimum of 19.75in (50cm) of free cable should be left at the location of the room controllers, and corridor lamps. For the room peripherals a minimum of 6in (15cm) of free cable should be left at the location of each peripheral. All cables should be clearly marked at both ends.

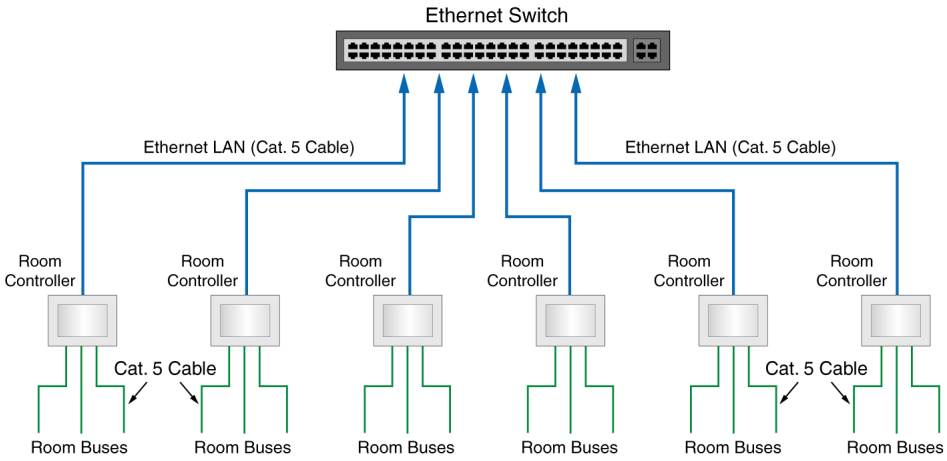


Figure 3. Ethernet LAN and room bus cabling

Note: *Suitable existing wiring could be also be used for the room bus. Contact your local representative for further information.*

3.2.1 Ethernet LAN Cable

The cable required for the Ethernet LAN must comply with the specification TIA/IEA 568-A Category 5 or higher. This is a standard 4 x unshielded twisted pair (UTP) solid bare copper with a diameter of 24 gauge (0.5mm).

Cable Type	Wire Size Diameter / AWG	Max. Cable Length
TIA/IEA 568-A, Category 5 or higher (4 x UTP)	24 gauge (0.5mm)	328ft (100m)

Table 1. Recommended Ethernet LAN cable

Caution: *The maximum length of the Cat 5 (or higher) Ethernet LAN cable is 328 feet/100 meters.*

3.2.2 Room Bus Cable

The room bus cable connects the room controller to the associated teleCARE IP peripherals. It consists of four wires which carry 5.5 volts, Data, Voice and Ground.

The recommended cable for the room bus is TIA/IEA 568-A Category 5 or higher. It is also acceptable to use 2 x twisted pairs of solid copper wires each 0.10in (0.6mm) diameter. The table below shows the recommended cable types with the preferred cable type in bold italics.

Cable Type	Wire Size Diameter / Area	Max. Cable Length
TIA/IEA 568-A Category 5 or higher (4 x UTP)	24awg (0.5mm) / (0.25mm^2)	98.4ft (30m)

Table 2. Recommended teleCARE room bus cable

Room Bus Cable Considerations

It is important to consider the factors of cable length and load when installing the room bus for the following reasons:

- The resistance of the wires in the room bus cable increases with the length and this causes the voltage to decrease progressively along the length of the cable.
- The room bus voltage also drops in proportion to the load.
- The effect of "cross-talk" increases as the cable length increases.

Room Bus Power Considerations

The room bus power supply output from the room controller is limited to 300mA per room bus but the maximum acceptable load on the room bus decreases significantly as the distance from the room controller increases due to the resistance of the room bus cable.

Room Bus Voltage Considerations

The power supply to the room bus at the output from the room controller is >5.5Vdc without load but this will drop as the room bus cable length and/or the load increases. The minimum acceptable voltage at any point on the room bus cable is 4.5Vdc.

Room Bus Cable Length and Power Limitations

The IP Room Controller offers up to three room buses. The load of any room bus must not exceed 300mA and the minimum acceptable voltage anywhere along the room bus is 4.5 volts.

When UTP category 5 cable (or higher) is used the length of any room bus cable should not exceed 98.4ft (30m), irrespective of the load. Below 98.4ft (30m), the maximum acceptable length of the room bus cable depends on the load (including third-party devices).

4 System Power

The teleCARE IP system power supply shall be sourced from an external 24Vdc power supply, utilizing a dedicated 2-wire power distribution bus. The external power requirement for teleCARE IP is 24Vdc, with an acceptable range of 21.6Vdc to 26.4Vdc.

WARNING: Use of any Power Supply other than those which are specified in this manual violates the UL 2560 listing.

4.1 24Vdc / 3 Amp Power Supply (Standard)

The 24Vdc / 3 Amp Power Supply, Ascom part number APS5000, must be used with the teleCARE IP system and can be purchased through Ascom.

The teleCARE IP Standard Power Supply shall be used to power the teleCARE IP system. This power supply converts 115Vac / 60Hz input power to a 24Vdc / 3 Amp, Class 2 Rated regulated output.

There is a built-in charger to charge sealed lead acid batteries. The batteries provide the Secondary Power to the teleCARE IP system in the event of mains AC power failure. There is an automatic switchover to the batteries when input AC power fails. During switchover, there is zero voltage drop at the power output. The power output fuse is rated at 15A/32Vdc.

WARNING:

- Do not use the Standard Power Supply for installations that require seismic considerations. Use the 24Vdc / 8 Amp Power Supply (Seismic) described in section 4.2 instead.
- Make certain that the AC circuit breaker is off before making any wiring connections between the circuit breaker and the power supply.
- Always de-energize the power supply prior to servicing.
- When servicing, the AC mains circuit breaker should be in the off position and locked out to prevent accidental activation.
- When necessary, always replace the fuse with the same type and rating (15A/32Vdc).
- This power supply is intended for indoor use only. Do not expose the unit to rain or moisture.
- After installation or servicing make sure that the cover is secured with the provided Key Lock.

4.1.1 Power Supply (Standard) Installation

The teleCARE IP Standard Power Supply is provided with an Installation Guide that is packaged with the unit. The unit is intended for wall mounting at a fixed location. Follow the instructions in the Installation Guide for mounting the power supply to a wall.

Note: *Power distribution is best organized with the power supply unit located as close as possible to the rooms which it powers. This minimizes the voltage drop caused by the length of the power supply wires and the load of the powered teleCARE IP system devices.*

For setup and configuration, refer to the illustrations in the Installation Guide to identify the switch which must be set for 24Vdc operation, and to identify the terminals for connecting the power supply board to the batteries and teleCARE IP system.

WARNING:

- Batteries must be secured within the HPFF8 cabinet enclosure.
- Batteries must be lead acid and must comply with UL 2054. (See Section 4.3, Secondary Power.)
- Before applying power, inspect the Power Supply Board (Figure 1 in the Power Supply Installation Guide) to ensure that SW1 is set to the Open position, to configure the unit for 24Vdc operation.
- Before applying power, inspect the Power Supply Board to ensure that jumper J1, AC Delay, is in place.
- The Power Supply Board is not wired to chassis ground. When connecting the mains AC grounding conductor, DO NOT connect to the G terminal on the Power Supply Board.
- Use a crimping wire nut of appropriate size to connect the mains AC grounding conductor to the green with yellow stripe grounding conductor lead attached to the power supply cabinet backpan.
- Measure the output voltage at the [+BAT-] and [+DC-] terminals before connecting the batteries or teleCARE IP system. Improper high voltage will damage the connected devices.
- Always de-energize the power supply unit prior to connecting the batteries and teleCARE IP system.
- Refer to sections 4.4 and 4.5 in this manual before connecting and powering the teleCARE IP system.

Connect the AC mains power (115Vac/60Hz) to the terminals marked [L, N] on the Power Supply Board. Apply mains AC power. Measure and confirm 20Vdc to 26.4Vdcat the [+BAT-] and [+DC-] terminals. Adjust the potentiometer next to SW1 to get 26.4Vdc at the [+BAT-] terminals. De-energize the power supply, connect the batteries and teleCARE IP system, and re-energize the power supply.

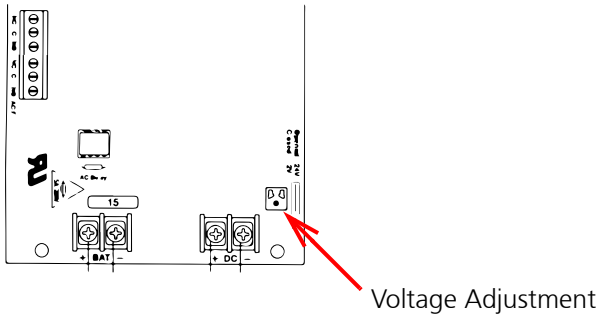


Figure 4. Adjust the voltage to 26.4 Vdc

4.1.2 Power Supply (Standard) Operation and Maintenance

The teleCARE IP Standard Power Supply should be tested at least once a year for proper operation. Under normal load conditions, the DC output voltage should be checked for proper voltage level, which is 24Vdc for the teleCARE IP system.

Under normal load conditions, check that the battery is fully charged. Check for the specified voltage (24Vdc) at both the battery terminals and power supply board terminals marked [+BAT-] to ensure there is no break in the battery connection wires.

Note:

- The maximum charging current under discharge is 0.7 amperes.
- Expected battery life is 5 years. However, it is recommended to change the batteries in 4 years, or less if needed.

Red (DC)	Green (AC)	Power Supply Status
ON	ON	Normal operating condition.
ON	OFF	Loss of AC, Stand-by battery supplying power.
OFF	ON	No DC output.
OFF	OFF	Loss of AC. Discharged or no stand-by battery. No DC output.

Table 3. Power Supply Board LED Diagnostics (Red DC / Green AC)

Red (BAT)	Battery Status
ON	Normal operating condition
OFF	Battery fail/low battery

Table 4. Power Supply Board LED Diagnostics (Red BAT)

4.2 24Vdc / 8 Amp Power Supply (Seismic)

For installations requiring Seismic compliance, the only external power supply which is certified for use with the teleCARE IP system is model HPFF8 by Honeywell Power Products, which can be purchased through an electrical supplier such as, Graybar or Arrow.

Note: *The HPFF8 is listed under OSHPD Special Seismic Certification Pre-Approval: OSP-0071-10.*

The HPFF8 power supply converts 115Vac / 60Hz input power to 24Vdc / 8 Amps of continuous power output, distributed through four supervised power limited output circuits. The maximum current for any one output circuit is 3.0 Amperes. Each power output circuit has built in fault detection and automatic recovery when faults are removed.

There is a built-in charger to charge sealed lead acid batteries. The batteries shall provide Secondary Power to the teleCARE IP system in the event of mains AC power failure. There is an automatic switchover to the batteries when input AC power fails. During switchover, there is zero voltage drop at the power output.

WARNING:

- Batteries must be secured within the HPFF8 cabinet enclosure using Seismic Installation Kit (SEISKIT-COMMENC).
- Batteries must be lead acid and must comply with UL 2054. (See section 4.3, Secondary Power.)
- The HPFF8 Power Supply is a UL 864 listed power supply, normally intended to power and function with a Fire Alarm System (FAS). When used to power the teleCARE IP system, the features normally required to make the power supply operational as a FAS unit are not supported by Ascom.
- Except for the instructions for mounting the unit to a wall, which are provided in the HPFF8 Installation and Operation Manual, follow only the instructions provided in this manual for safety, setup, configuration, and wiring to the teleCARE IP system.
- Make certain that the AC circuit breaker is off before making any wiring connections between the circuit breaker and the power supply.
- Always de-energize the power supply prior to servicing.

- When servicing, the AC mains circuit breaker should be in the off position and locked out to prevent accidental activation.
- This power supply is intended for indoor use only. Do not expose the unit to rain or moisture.
- After installation or servicing make sure that the cover is secured with the provided Key Lock.

4.2.1 Power Supply (Seismic) Installation

The HPFF8 Power Supply is provided with an Installation Manual that is packaged with the unit. The unit is intended for wall mounting at a fixed location. Follow the instructions for Backbox Mounting of a Standard Cabinet provided in the Installation Manual.

Note: *Power distribution is best organized with the power supply unit located as close as possible to the rooms which it powers. This minimizes the voltage drop caused by the length of the power supply wires and the load of the powered teleCARE IP system devices.*

For setup and configuration, use the illustrations provided in the HPFF8 Installation Manual to identify the locations of jumpers and terminals. Follow the instructions in this manual for connecting the power supply board to the batteries and teleCARE IP system

Inspect the Control Circuit Board (Figure 1.1 in the HPFF8 Installation Manual) to ensure that the Charger Disable Jumper (J1) and Ground Fault Disable Jumper (J2) are both installed.

Install the Reference Resistor to the REF+ and REF- terminals on TB3. Use either a 3.9K or 4.7k ohm, ¼ watt resistor as the Reference Resistor.

Caution: *The same value resistor used for the Reference Resistor must be used as the End of Line (EOL) resistor for the teleCARE IP system power bus.*

Before connecting and powering the teleCARE IP system, refer to sections 4.4 and 4.5 in this manual. Install the EOL resistor at the last NIRC unit on the teleCARE IP power bus.

Caution: *Measure the output voltage at the [+BAT-] and [+DC-] terminals before connecting the batteries or teleCARE IP system. Improper high voltage will damage the connected devices.*

Caution: *Always de-energize the power supply unit prior to connecting the batteries and teleCARE IP system.*

Caution: *Maintain vertical separation where power-limited (i.e., DC power to teleCARE IP) and non-power-limited circuits (i.e., mains AC and battery wiring connections to the Control Circuit Board) appear to cross.*

Before connecting and powering the Secondary Power Batteries, the batteries must be secured within the HPFF8 cabinet enclosure using the Seismic Installation Kit. Follow the instructions provided with Honeywell model SEISKIT-COMMENC.

Connect the AC mains power (115Vac/60Hz) to the TB1 terminals marked [L1, Ground, L2] on the HPFF8 Power Supply Board.

Apply mains AC power. Measure and confirm 24Vdc at the [+BAT-] and [1L1/1L2 through 4L1/4L2 and A+/A-] terminals.

De-energize the power supply, connect the batteries and teleCARE IP system (to the 4L1/4L2) terminals.

Caution: *Connect the negative (-) lead of the teleCARE IP System to the 4L1 terminal and the positive (+) lead to the 4L2 terminal.*

Re-energize the power supply.

4.2.2 Power Supply (Seismic) Operation and Maintenance

The HPFF8 Power Supply should be tested at least once a year for proper operation. Under normal load conditions, the DC output voltage should be checked for proper voltage level, which is 24Vdc for the teleCARE IP system.

Under normal load conditions, check that the battery is fully charged. Check for the specified voltage (24Vdc) at both the battery terminals and power supply board terminals marked [+BAT-] to ensure there is no break in the battery connection wires.

Note:

- The maximum charging current under discharge is 0.75 amperes.
- Expected battery life is 5 years. However, it is recommended to change the batteries in 4 years, or less if needed.

The HPFF8 provides supervised functions of the field wiring for the following adverse conditions:

- Field-wiring fault (short or open) on the teleCARE IP power bus.
- AC failure or brownout at the power supply.
- Battery failure (no battery or battery voltage less than 20.5Vdc) condition at the power supply.
- Battery charger failure on the power supply.
- Ground fault condition.
- +/- Reference Resistor

There are 8 LEDs on the Control Circuit Board for indicating normal and trouble operation of the HPFF8 Power Supply (see Figure 1.1 in the HPFF8 Installation Manual.) When viewed from top to bottom, the LEDs operate as follows:

LED	Label	Condition	Illumination	Reset
1	PWR ON	Power On	Steady	Auto
		Loss or Brownout	Blink	
2	AUX TRBL Note 1	Normal	Off	Auto
		Excessive load or short	Steady	
3	BAT TRBL Note 2	Normal	Off	Auto
		Charger Fault	Blink	
		No battery or <20.5Vdc	Steady	
4	GF TRBL	Normal	Off	Auto
		Ground Fault	Steady	
5	SIG4 TRBL Note 3	Normal	Off	Auto
		Short or Open Present	Steady Note	
		Short or Open Past Note	Blink	Note 6
6	SIG3 TRBL Note 3	Normal	Off	Auto
		Short or Open Present	Steady Note	
		Short or Open Past Note	Blink	Note 6
7	SIG2 TRBL Note 3	Normal	Off	Auto
		Short or Open Present	Steady Note	
		Short or Open Past Note	Blink	Note 6
8	SIG1 TRBL Note 3	Normal	Off	Auto
		Short or Open Present	Steady Note	
		Short or Open Past Note	Blink	Note 6

Table 5. Control Circuit Board LED Diagnostics

Note:

1 Relates to the A+/A- terminals on TB4. Not used in teleCARE IP.

2 A battery fail indication can occur if there was an AC failure within the first 24 hours after initial power-up and the battery voltage had been discharged to a voltage of 20.5Vdc or less. The BAT TRBL LED may also illuminate steady, after a certain delay during charging, to indicate the battery was discharged and may not support full load. The delay is based on operational conditions (time remaining in the first 24 hours and time in stand-by) and will automatically reset if the battery charging has time to reach its full float voltage.

3 SIG4 TRBL through SIG1 TRBL associate with TB4 terminals 4L1/4L2 through 1L1/1L2 respectively.

4 The HPFF8 has Trouble Memory for the supervised outputs. This is useful as an aide in knowing when past troubles have occurred and if intermittent problems are present on the SIG4 through SIG1 output circuits.

5 If all four SIG TRBL LEDs are illuminated steady, check if the Reference Resistor is missing or doesn't match the EOL resistor used to terminate the teleCARE IP Power Bus. Otherwise, each power circuit probably has a trouble.

6 To restore a SIG4 – SIG1 blinking LED to normal, press SW2 on the Control Circuit Board or, power cycle the HPFF8 OFF/ON.

4.3 Secondary Power

Secondary Power for the teleCARE IP system shall be provided by two teleCARE IP Batteries installed in the primary power supply. The batteries are each rated for 12Vdc, 7 ampere hours (AH) and can be purchased through an electrical supplier such as Graybar.

WARNING:

- Batteries must be secured within the power supply cabinet as described in section 4.2.1.
- The teleCARE IP Batteries shall be lead acid and must comply with UL 2054.
- When installing or servicing the teleCARE IP Batteries, follow the instructions for installation of the appropriate power supply and observe all WARNINGS and CAUTIONS described in sections 4.1 and 4.2.

Use the following table to determine the total Standby and Active load in amperes hours for Secondary Power, when used with the teleCARE IP Standard Power Supply for standard installation and the HPFF8 Power Supply for seismic installations.

100% Load (3A)	1 Hour Battery Life
10% Load (.3A)	3 Hours Battery Life

Table 6. Total Secondary Power at 24Vdc

4.4 teleCARE IP Power Supply Wiring

It is important to use the correct wire sizes and to consider the length of the 24Vdc power supply wires. The minimum acceptable wire size of the 24Vdc bus is 18 gauge (1mmØ) (0.8mm²).

For the stub wiring between the 24Vdc bus and the control module wire size 18 gauge (1mmØ) (0.8mm²) must be used.

Warning: *Incorrect wire size can result in dangerous overheating of the wires!*

Caution: *Excessive 24Vdc bus length can result in unacceptable voltage drop! The lowest acceptable voltage at any point in the 24Vdc distribution is 21.6Vdc.*

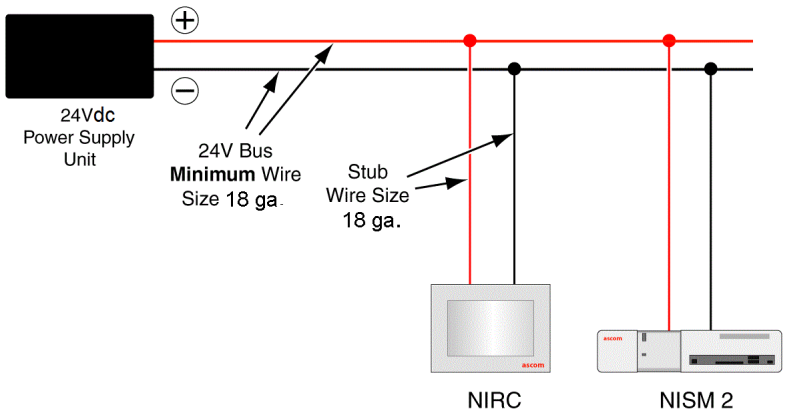


Figure 5. teleCARE IP 24Vdc power supply wiring

4.5 Power Supply Unit (24Vdc) with Multiple Power Buses

The output of the power supply unit can be divided over multiple buses. This method is recommended as it will reduce the power cable lengths.

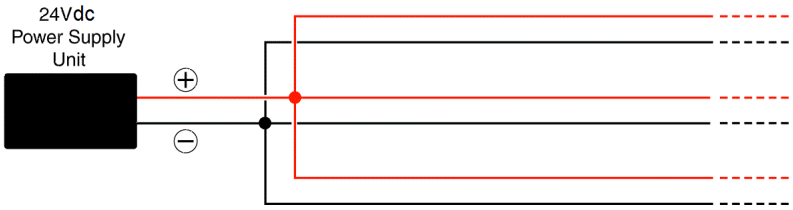


Figure 6. Multiple power buses

4.5.1 Power Supply Basic Installation

The 24Vdc power is carried on a two-wire bus that loops from room controller to room controller. The minimum wire size for the 24Vdc power supply bus is 18 gauge (1mmØ) (0.8mm²).

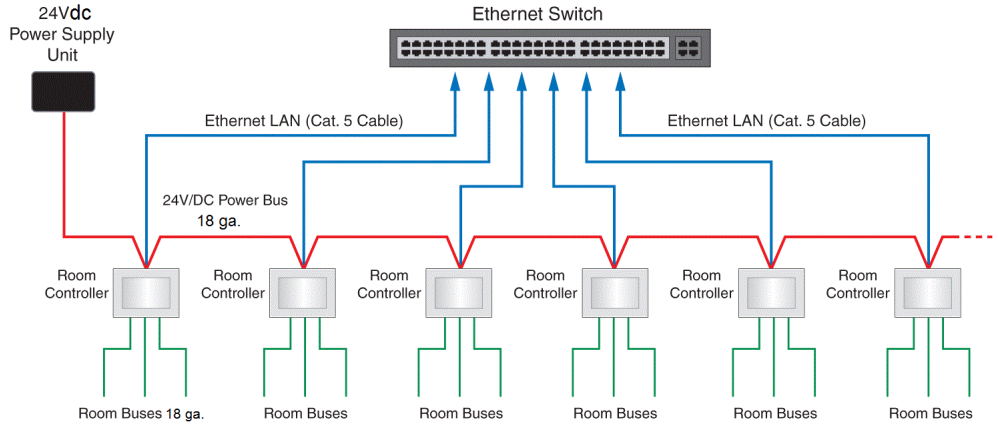


Figure 7. LAN and room bus cables with power supply (24Vdc)

4.5.2 Power Supply for Systems with Slave Corridor Lamps

Each slave corridor lamp receives its 24Vdc power supply from the power output connections of the associated room controller - not directly from the external power supply bus. The room controller can support two corridor lamps.

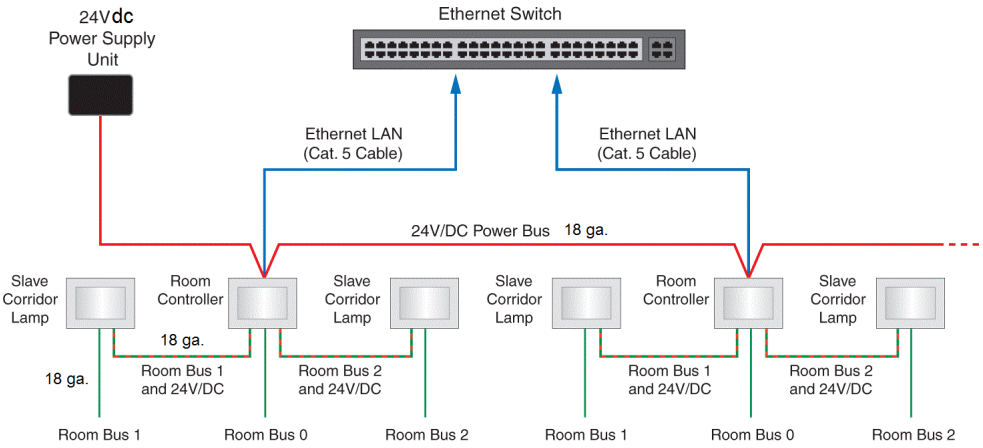


Figure 8. Power supply (24Vdc) for room controllers with corridor lamps

5 Control Equipment

This section describes the installation instructions for the following products:

- "Room Controller" (details on page 19)
- "Blank Front Cover for the Room Controller" (details on page 22)
- "Corridor Lamp (NICL)" (details on page 49)
- "System Manager (NISM2)" (details on page 57)

5.1 Preparation

It is important to refer to the following teleCARE IP control module installation instructions for complete electrical connection and assembly details before starting the installation.

The Ingress Protection of the control modules is IP40, therefore the areas in which the teleCARE equipment is to be installed must be clean, dry and weatherproof.

The walls on which the control modules are to be installed should be finished (painted, wall papered etc.) before the control module is installed.

It is important to have the appropriate length of free cable pulled out at every location where the control module is to be installed. The length of stripped cable and length of exposed copper wire must conform to the relevant installation instructions. Electrical power to the equipment must be off before connecting any devices.

5.2 Room Controller

5.2.1 NIRC

Note: *Except when specifically mentioned otherwise, the references to "room controller" used in this document are applicable to both the NIRC and NIRC3.*

The Room Controller (NIRC) has been tested and found to comply with the emission levels for a Class B device as described in EN55022:2010.

The input power for the NIRC shall be supplied over an external 24Vdc power supply bus,. The external power supply input requirement is 24Vdc ± 10%. The power input has an on-board, self-resetting fuse.

Each room bus has four wires, consisting of: data, voice, power (5.5Vdc) and ground (0V). The room bus power output is used for the power supply to the connected peripheral device. Each room bus power output has a self-resetting 650mA fuse.

The NIRC has a 6-pole output connector for an external corridor lamp with 4 LEDs. These outputs are in parallel to the NIRC's on-board LED connectors. Additionally, the NIRC has an internal buzzer for optional audible signaling of calls and faults.

The NIRC can support up to 3 slave corridor lamps, however, the NIRC is capable of providing the power supply for no more than 2 slave corridor lamps. Each room bus can accept one corridor lamp and each corridor lamp has the fixed room bus address 5.

The NIRC can accommodate 4 LED Lamp Boards (NILDs), enabling the NIRC to be used as a corridor lamp. The NIRC also has the provisions to provide 24Vdc power for up to two teleCARE IP Corridor Lamps (NICLs).

When an NICL data bus is connected to one of the three NIRC room buses, it becomes an active corridor lamp that operates independently of the NIRC. In this configuration, the NICL takes up fixed

Room Bus Address 5 on the NIRC bus. When connected to the NIRC External Corridor Lamp Outputs bus, an NICL becomes a passive corridor lamp and the LEDs operate in parallel with the NIRC display lamps.

5.2.2 NIRC3

Warning

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Improved technology gives the NICR3 more speed and additional functionality. This includes the addition of a fourth room bus and the integrated Power over Ethernet (PoE) capability.

The NIRC3 can be extended with an optional voice piggyback module (NIVP) to include speech and with an optional transceiver module (NIRX) for wireless nurse call functionality.

The NIRC3 is compatible with all the existing teleCARE IP peripherals except for the corridor lamp (NICL) which cannot be used together with the NIRC3.

IMPORTANT: *The NIRC3 is not compatible with the corridor lamp (NICL). The corridor lamp (NICL2) must be used when connected to an NIRC3 room bus. Therefore it is necessary to replace the NICL with an NICL2 whenever you replace an NIRC with an NIRC3.*

5.2.3 Room Bus Addresses

Each room bus of the NIRC supports eight addresses. The lowest four addresses (0 - 3) are for teleCARE IP peripherals and the highest four address (4 - 7) are dedicated for devices, such as the duty selector, card reader and the corridor lamp.

The total room bus address applications are summarized in the following table:

Room Bus Address	Active Peripheral	Address Setting
0 - 3	Door side Modules Bed side Modules Pull Cord Modules Medical Rail Socket	Set by DIP switch
4	Toilet Cancel Module	Fixed
5	Slave Corridor Lamp Duty Selector	
6	Card Reader	
7	Room Display	

Table 7. Room bus addresses and applications

5.2.4 NICR Room Controller with Corridor Lamp

Figure 11. The teleCARE IP room controller with corridor lamp

The NIRC printed circuit board has four connectors for LED boards (which must be ordered separately). The LED board is available in five colors: red, green, yellow, white and blue. The LEDs are used for the signaling of calls, staff presence and faults.

The Room Controller with corridor lamp is available in gray or white and includes a translucent dome cover. Alternatively a blank cover is available if lamps are not required.

The IP room controller with corridor lamp consists of a housing, a printed circuit board, a cover and a lamp dome, as shown in the following illustration:

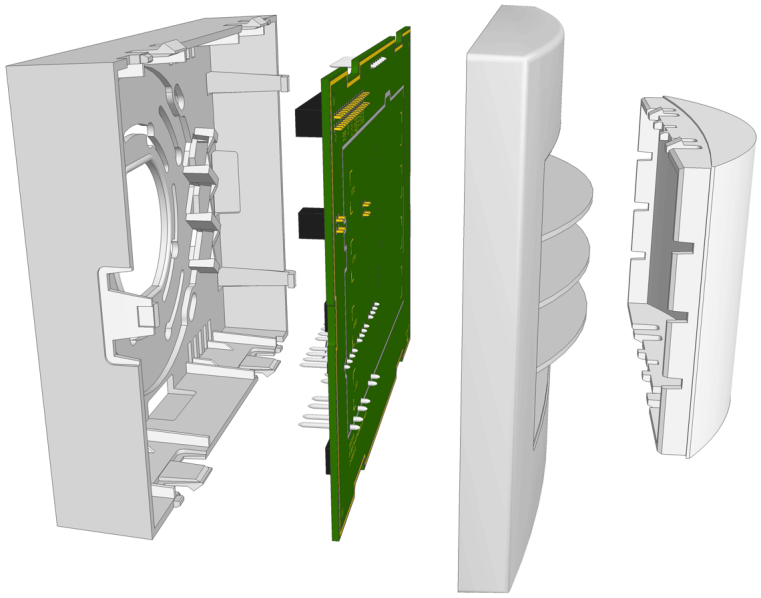


Figure 12. Room controller (NIRC) parts

5.2.5 Blank Front Cover for the Room Controller

A blank solid plastic front cover for the room controller is available in gray and white. The blank front cover is fitted to the room controller in place of the standard front cover with a translucent dome cover. It is used when there is no requirement for LED lamps on the room controller.

Figure 13. Room controller with blank front cover

Note: *The blank front cover must be ordered separately.*

5.2.6 Installing the Room Controller

When installing the Room Controller the first step is to separate the top section (cover, PC board and lamp dome) from the housing. To do that simply grip the top edge of the cover and pull it away from the housing, as shown in the following illustration:

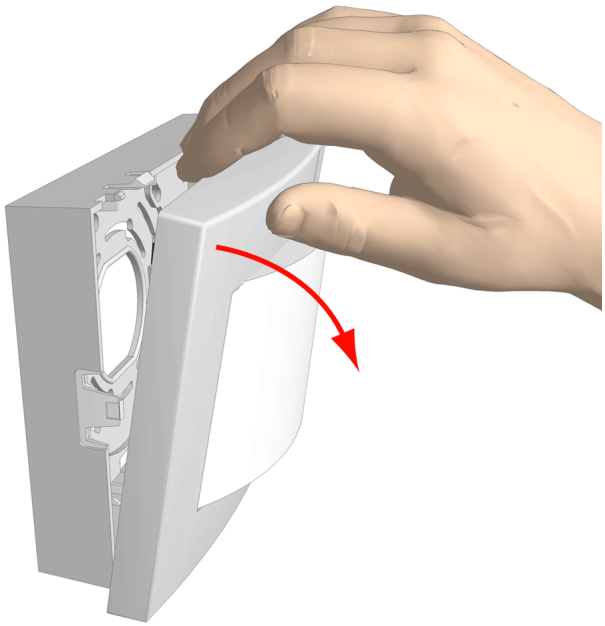


Figure 14. Separating the top section from the housing

5.2.7 Removing the Room Controller Printed Circuit Board

To remove the circuit board from the housing, press the holding clip outwards (1) until it releases the circuit board, as shown in the following illustration:

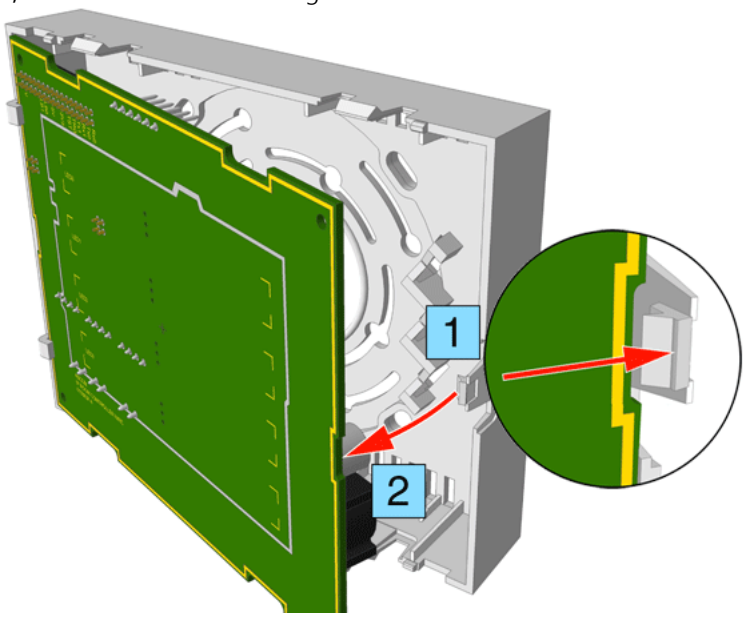


Figure 15. Removing the circuit board from the housing

With the printed circuit board released from the holding clip (2), partly rotate the circuit board and remove it from the housing.

5.2.8 Room Controller Housing

The room controller housing is designed to be surface mounted. It can be mounted over a back box or fixed directly on to a wall surface. The same housing is used for the IP room controller with LED lamps and with blank cover and for the corridor lamp.

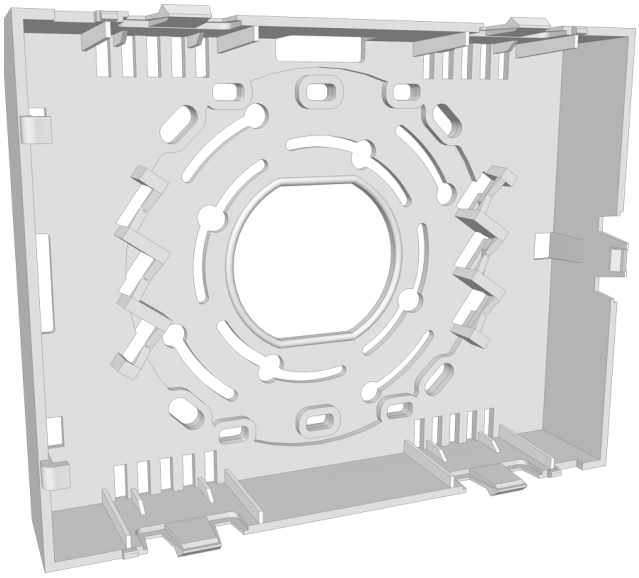


Figure 16. Room controller housing

5.2.9 Mounting the Housing over a Back Box

To mount the housing over a back box, start by partially unscrewing the fixing screws (1) in the back box so that they extend at least 0.2in (5mm) outside the wall surface.

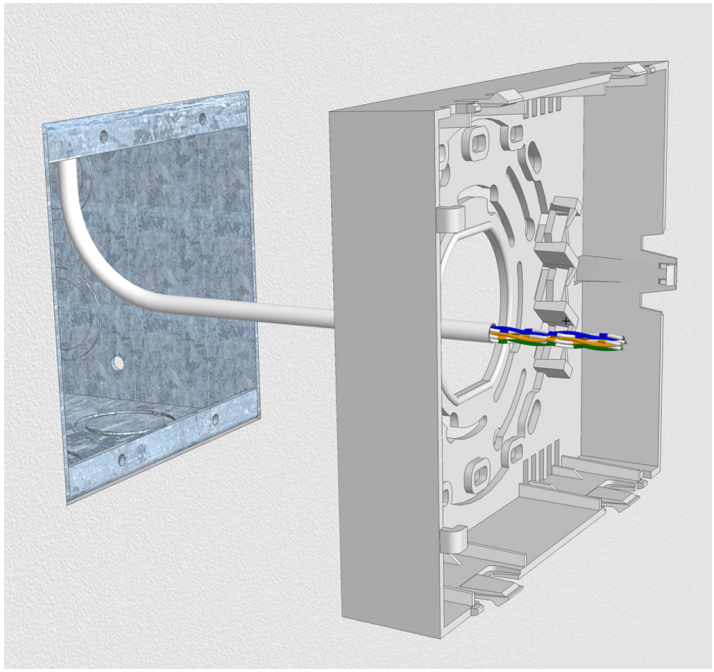


Figure 17. Lining up the housing with a back box

Place the housing over the back box so that the long sides are at the top and bottom. Pass the heads of the screws through the appropriate “key-hole” slots (2) in the base of the housing, as shown in the following illustration:

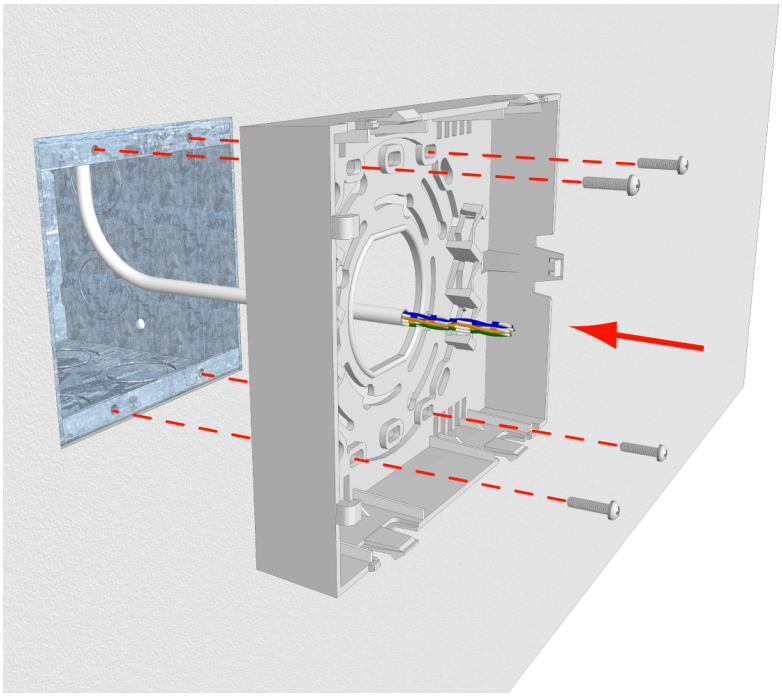


Figure 18. Positioning the screws in the keyhole slots

Turn the housing (3) until the long sides are horizontal, then tighten the back box fixing screws to secure the housing.

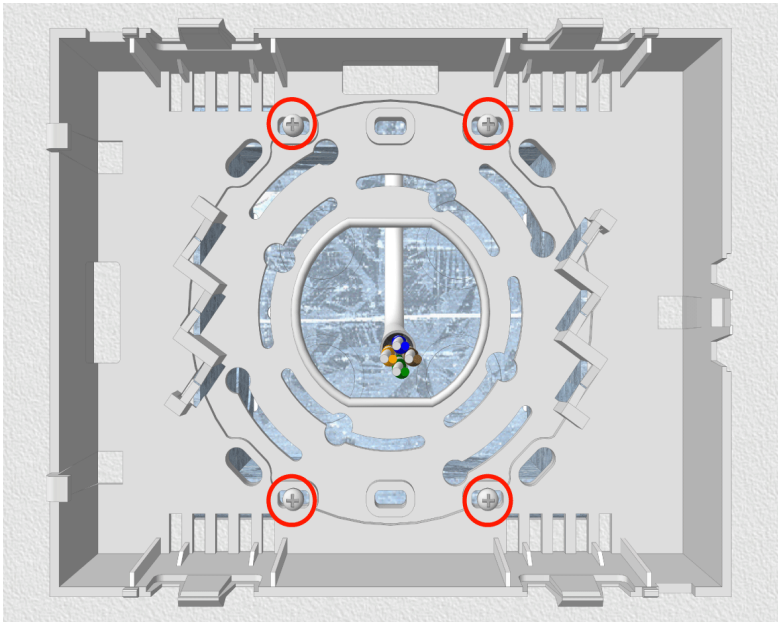


Figure 19. Fixing the housing