24-10737-00237, Rev.A

Smart Building Hub

Installation Instructions

LC-SBH200-x

Part No. 24-10737-00237, Rev. A
Issued April 2018

Refer to the QuickLIT website for the most up-to-date version of this document.

Applications

The Smart Building Hub (SBH) is the base controller for the Verasys Building Automation System and provides wired and wireless connections and plug and play configuration between all Smart Equipment layers and controls.

Offering many-to-one, multi-client connectivity, the SBH provides access to any Smart Equipment device that is directly connected on a BACnet® (MS/TP) field bus, zone coordinator, or input/output module (IOM). The SBH has a USB Wi-Fi access point, and an intuitive, browser-based interface to access advanced features like fault detection, alarms, and point configuration.

The wireless connection on the SBH means that you can use it up to 31 m away (100 ft, line of sight) indoors, and up to 91 m away (300 ft, line of sight) outdoors while using a supported mobile device. You can access the user interface either over Wi-Fi or an existing Ethernet network on site.

The SBH is permanently mounted onto a DIN rail or placed on a stable, flat surface and plugged into the system bus of a Verasys controller. You can supply power through the included AC power supply.

North American Emissions Compliance

United States

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 this 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 may cause harmful interference, in which case users will be required to correct the interference at their own expense.

RF Transmitters: Compliance Statement (Part 15.19)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Warning (Part 15.21)

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

RF Exposure (OET Bulletin 65)

To comply with FCC RF exposure requirements for mobile transmitting devices, this transmitter should only be used or installed at locations where there is at least 20 cm separation distance between the antenna and all persons.

Canada

Industry Canada Statement(s)

The term **IC** before the certification/registration number only signifies that the Industry Canada technical specifications were met.

Le terme « IC » précédant le numéro d'accréditation/inscription signifie simplement que le produit est conforme aux spécifications techniques d'Industry Canada.

Installation

Parts Included

- Smart Building Hub
- 6-pin RJ-12 extension cable
- USB Wi-Fi Adapter
- *Smart Building Hub Installation Instructions (Part No. 24-10737-00237)*
- *Smart Building Hub Quick Start Guide (Part No. 24-10737-00229)*

Special Tools Needed

To use the Smart Building Hub, you need a mobile device, like a tablet or smart phone, or a desktop or laptop computer that supports Wi-Fi.

Mounting

Location Considerations

Follow these guidelines when mounting the Smart Building Hub:

- Mount the Smart Building Hub in areas free of corrosive vapors and observe the environmental limitations listed in the *Technical Specifications* section of this document.
- Objects including ductwork, cabinets, doors, and glass can impede the wireless signal. Minimize the number of objects between the connected computer or mobile device and the Smart Building Hub. Use line of sight, if possible.
- Metal objects such as cabinet doors, enclosures, and pipes, and concrete objects such as pillars, walls, and ceilings can limit Wi-Fi service.
- The Smart Building Hub is not rated for outdoor mounting.

Mounting Options

- DIN rail mounting
- Wall mounting
- Placing on a flat surface

DIN Rail Mounting

To mount the bracket on a DIN rail:

1. Securely mount a 7.5 cm (3 in.) or longer section of 35 mm (1-1/8 in.) DIN rail in the required space.
2. On the SBH, pull the top two mounting clip upwards, to their extended position, see Figure 1.
3. Carefully slide the SBH upward onto the DIN rail so that the DIN rail channel hooks (‘A’ on Figure 2) at the bottom of the baseplate channel catch the lower part of the DIN rail. See Figure 2.

4. Hold the SBH securely against the DIN rail and push the top two mounting clips down to secure it..

Figure 1: Top mounting clips in upward extended position

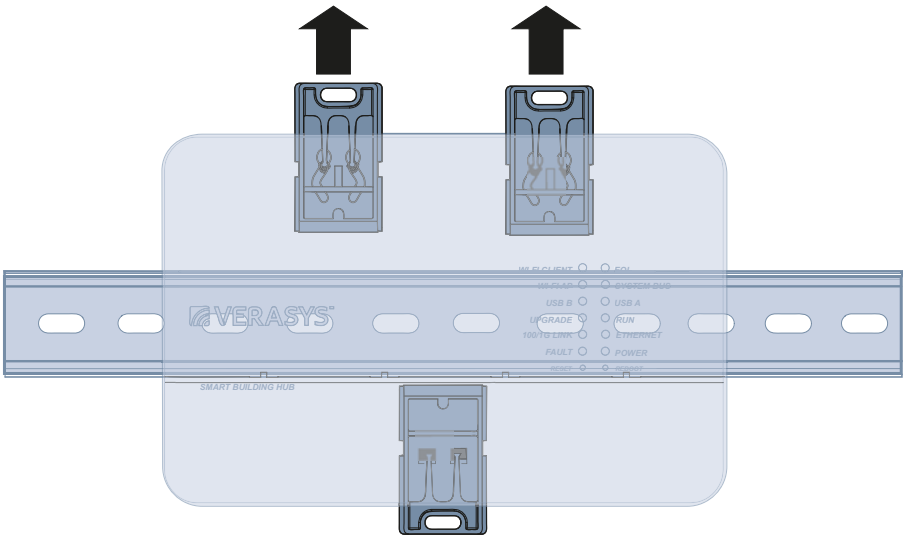
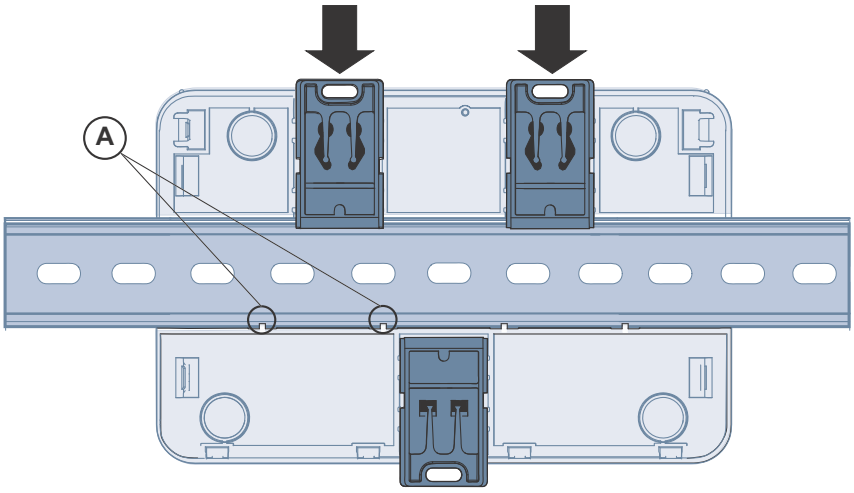


Figure 2: SBH secured with top mounting clips in downward position (rear view)



Wall mounting

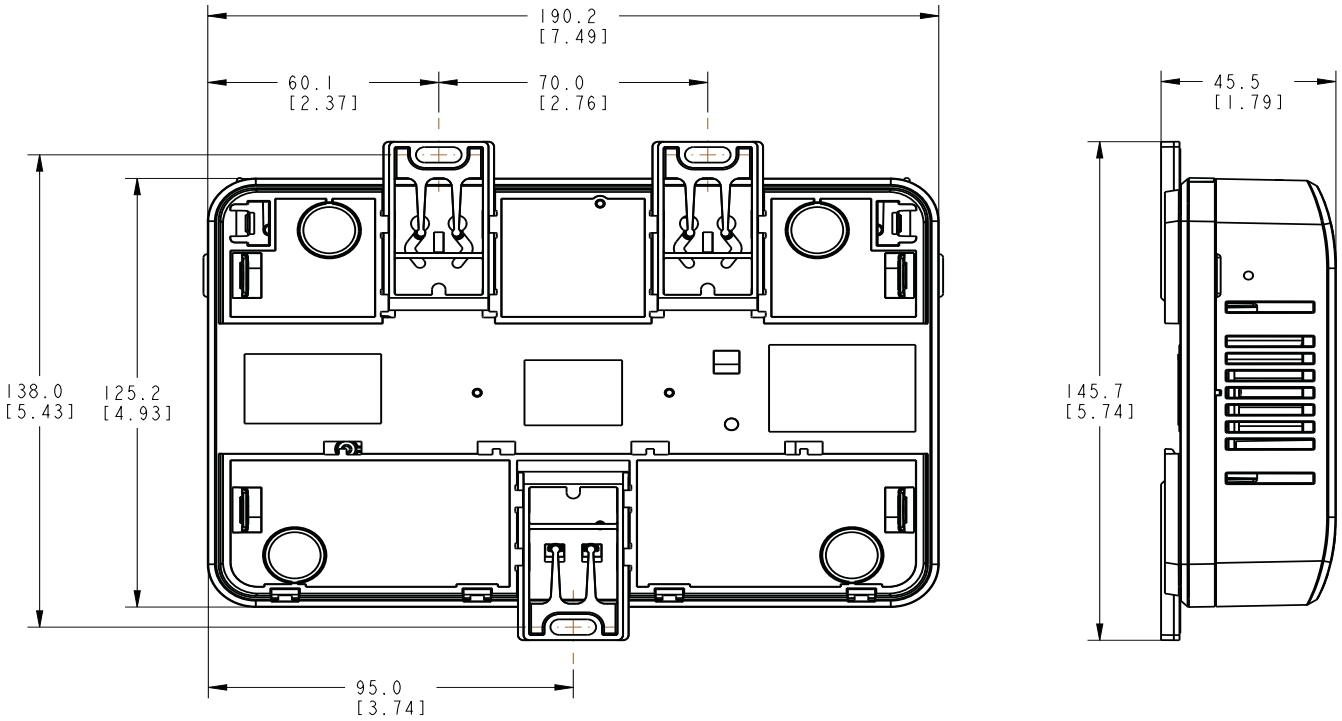
1. Pull the top two mounting clip upwards, to their extended position.
2. Mark mounting hole locations on the wall using the dimensions shown in Figure 3, or hold the bracket against the wall and mark the hole locations through the mounting clips.

Note: The screw holes on the SBH can accommodate M3.5 and #6 screws.

3. Drill holes in the wall based on the locations marked in step 2. Insert wall anchors for each hole if necessary.
4. Hold the bracket in place, insert the screws through the mounting clips and into the screw holes, and then carefully tighten all screws.

IMPORTANT: Do not overtighten the mounting screws. Overtightening the screws may damage the mounting clips or bracket.

Figure 3: Mounting Holes, Flat-Mounting (Left) and Side-Mounting (Right)



Wiring

Wiring Consideration and Guidelines

Follow these guidelines when wiring the SBH:

- Do not hang the SBH from a cable connection.
- Provide slack in the cable between the SBH and the device you connect it to.

System Bus Port

The SBH has one RS-485 system bus port that connects through a blue, 4-terminal, system bus adapter. You can also temporarily connect the system bus to a device using the 6-pin RJ-12 cable. For data transmission and other specifications, see the *Technical Specifications* section.

System Bus Communications Connections

Connect the SBH to the system bus for communication using the system bus adapter on the SBH.

Note: The SBH has a dedicated system bus address of 117. The system bus can accommodate one SBH.

Note: Performance of the SBH varies based on the amount of traffic it accommodates.

USB Port

The SBH200 features two USB 2.0 host (type A) ports and one USB 2.0 client (type micro) port. The USB host ports are dedicated for optional IO expansion modules.

Note: Do not use the USB port as a charging port.

Note: Do not connect devices other than those specified in Johnson Controls technical documentation.

Note: Use the USB port only when needed.

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Table 1: USB Port Pin Designations

Pin Number (Both Ends of Cable)	Signal Name
1	+5 VDC
2	Data -
3	Data +
4	No Connection
5	Ground

USB

Connect the Wi-Fi adapter that comes with the SBH into either of the USB ports.

Ethernet Port

The Ethernet port on the SBH is an 8-pin RJ-45 jack. The maximum allowable cable length is 100 m (328 ft).

External Power Supply Connections

To connect the SBH using the supplied external power source:

1. Connect the DC plug of the 24 VDC, 50 W, Class II power supply to the power supply port of the SBH. Alternatively, there can also be a 24 VAC provided through a 75VA Class II transformer.

⚠ CAUTION

Risk of Property Damage.
Do not apply power to the system before checking all wiring connections. Short circuited or improperly connected wires may result in permanent damage to the equipment.

⚠ ATTENTION

Risque de dégâts matériels.
Ne pas mettre le système sous tension avant d'avoir vérifié tous les raccords de câblage. Des fils formant un court-circuit ou connectés de façon incorrecte risquent d'endommager irrémédiablement l'équipement.

2. Connect the power supply to the supplied power cord.
3. Connect the power cord to a 100—240 VAC outlet.

IMPORTANT: Power should only be applied and removed by connecting and disconnecting the power cord from the 100—240 VAC outlet. Applying or removing power by connecting or disconnecting the 24 VDC/AC connector can damage the unit.

⚠ WARNING

Risk of Electric Shock.
Disconnect or isolate all power supplies before making electrical connections. More than one disconnection or isolation may be required to completely de-energize equipment. Contact with components carrying hazardous voltage can cause electric shock and may result in severe personal injury or death.

⚠ WARNING

⚠ ADVERTISSEMENT

Risque de décharge électrique.
Débrancher ou isoler toute alimentation avant de réaliser un branchement électrique. Plusieurs isolations et débranchements sont peut-être nécessaires pour -couper entièrement l'alimentation de l'équipement. Tout contact avec des composants conducteurs de tensions dangereuses risque d'entraîner une décharge électrique et de provoquer des blessures graves, voire mortelles.

Operation

Accessing Smart Equipment Using the Smart Building Hub

When the SBH is physically connected to an MS/TP network, you can access Smart Equipment devices. The SBH connects through the system bus. From this connection it has access to the devices on the trunk.

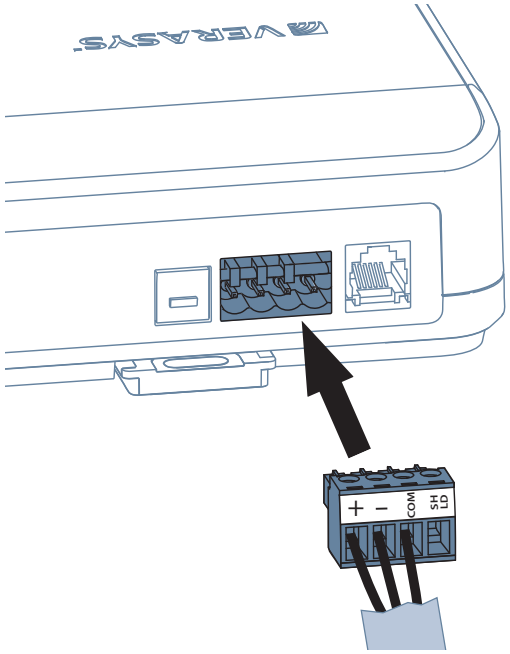
To interact with a device or product on the network to view devices, setpoints, or view alarms, select the device using a web-enabled device that is connected to the SBH Wi-Fi network. To use the network, you must have a web-enabled device that uses a supported internet browser.

Connecting to the Smart Building Hub Wi-Fi Network

1. The SBH permanently connects to the Verasys system using the four-terminal System bus port. Wire the system bus communications to the blue, four-terminal connector and connect to the port.See Figure 4.

Note: If this device is at the end of a line, set the end of line switch to on.

Figure 4: Connecting the Smart Building Hub to Your Equipment



2. Connect the Wi-Fi adapter to either of the USB ports. Connect the RJ-45 Ethernet port to the building Ethernet network. Use instructions from the building IT department.

3. In the Wi-Fi settings of your device or laptop, connect to the SBH Wi-Fi network using your default credentials. Find these credentials on a sticker on the *Smart Building Hub Quick Start Guide (Part No. 24-10737-00229)* that came with your device. Also find the default credentials on a sticker on the back of the SBH.
4. Direct your browser to www.smartbuildinghub.com to open the SBH browser interface.

Note: The SBH ships with a private www.smartbuildinghub.com SSL certificate installed to ensure secure communication. However, this certificate does not indicate that it is trusted in a browser. If you want to install your own certificate, refer to *Adding a Private Key and Certificate to Smart Building Hub* in the *Smart Building Hub Network and IT Guidance Technical Bulletin (LIT-12012324).*

5. Read and accept the SBH license agreement.
6. The first time you log in to the SBH, the **Change Password and Passphrase** web page appears. You must change the Admin password and Wi-Fi passphrase.

IMPORTANT: After you change the Wi-Fi passphrase or SSID, the web server restarts and you must rejoin the SBH Wi-Fi network using the new passphrase. On some mobile devices, you must select and forget the original SBH Wi-Fi network before rejoining the network with the new passphrase. A laptop running Microsoft® Windows® operating system is a device that behaves this way.

   a. Replace the default password in the **New Admin Password** field. To confirm the change, enter the new password in the **Verify New Admin Password** field.

   b. Replace the Wi-Fi Passphrase in the **New Wi-Fi Passphrase** field and click **Save**.

When you physically connect the SBH to the MS/TP network, all the devices on the network that have unique addresses appear in the device list and are available to configure.

To interact with a device or product on the network to view devices, set points, or view alarms, select a device using the mobile device that is connected to the SBH.

Reset Button Operation and Descriptions

If you lose your password or if you want to restore the unit to factory defaults, the SBH offers two reset functions:

- The **Network Reset Function** resets Wi-Fi and Ethernet settings. This function is intended for when you forget your Wi-Fi connection information.
- The **Reset to Factory Defaults** function resets all unit settings including user profiles. This also resets your SSL certificate to the Johnson Controls® self-signed certificate that is in the device when it comes from the factory.This function is for administrators who want to clear all user profiles from a device..

IMPORTANT: To use a unit that is reset to factory defaults, you must have the default login information supplied in the Quick Start Guide that shipped with the unit. The Reset to Factory Defaults function does not change the version of the application. If you did a software upgrade, the Smart Building Hub remains at the upgraded version rather than resetting to the version that it was running when it left the factory.

The reset button is located on the front of the device, on the lower left, under the LEDs. To reach the reset button, use a small screwdriver or similar tool, see Figure 5.

- If the SBH is connected to the network when you use the reset button, it disconnects.
- If you press the reset button for more than nine seconds, the reset operation cancels.
- If a fault condition already exists, the reset button does not work.

Note: For more information on resetting the unit, see Table 2

Figure 5: Using the Reset Button

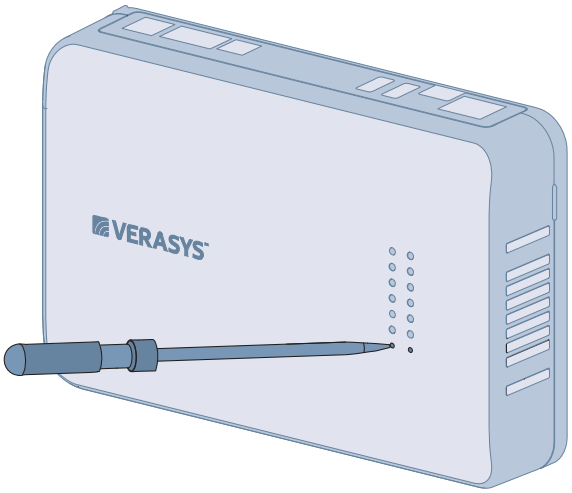


Table 2: Reset Button Operation and Descriptions

Reset Function	Reset Operation[1]
Reset the WI-Fi and Ethernet Settings	1. Press and hold the **RESET** button for two seconds. The **FAULT** LED displays slow flicker behavior. 2. Release the **RESET** button within three seconds. The **FAULT** LED continues slow flicker behavior. 3. Within five seconds, press the **RESET** button again, and then immediately release it to confirm that you want to reset Wi-Fi and Ethernet settings. If you do not press the reset button to confirm within five seconds, the reset operation is canceled. **Result**: You have reset the Wi-Fi SSID and passphrase and Ethernet settings to factory defaults. The LEDs stop flickering for two seconds, then the LEDs return to normal operation, based on the current state of the device.
Reset to Factory Defaults[2]	1. Press and hold the **RESET** button for six seconds. After two seconds, the **FAULT** LED displays slow flicker behavior. This changes to fast flicker behavior after an additional four seconds of holding the **RESET** button. 2. Release the **RESET** button within three seconds of seeing fast flicker behavior. The **FAULT** LED continues fast flicker behavior. 3. Within five seconds, press the **RESET** button again, and then immediately release it to confirm that you want to reset to factory defaults. If you do not press the **RESET** button to confirm within five seconds, the reset operation is canceled. **Result**: You have reset all unit settings to factory defaults. The LEDs stop flashing for two seconds, then the LEDs return to normal operation, based on the current state of the device.

1. For information on LED designations and flicker behavior, see Table 3.
2. Resets all unit settings, including user profiles.

Reboot Button

The SBH has a **REBOOT** button beside the **RESET** button. The SBH has a super capacitor that, when charged, keeps the SBH powered up for 30 seconds. To force a reboot immediately, press the **REBOOT** button.

Status Indication LEDs

The SBH communicates status using LEDs to indicate functional states according to the LED map shown in Figure 6. See Figure 3 for a comprehensive list of SBH LED functional information.

Figure 6: LED map

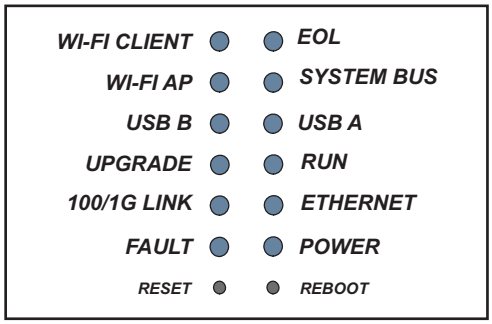


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Table 3: Smart Building HUB LED Designations and Descriptions

LED Name	Color	Normal	Descriptions/Other Conditions
Power	Blue or Purple	On steady	**Off** = No power **On Purple** = Power is supplied by primary voltage **On Blue** = OS booted and power is supplied by primary voltage
Fault	Red	Off	**Off** = No faults/normal operation **On steady** = Missing hardware, missing software, operating system has not yet been initialized, or reset is in progress **Slow flicker then fast flicker** = Reset button is being pressed **Medium flicker** (2 blinks per second) = Startup sequence **Fast flicker** (5 blinks per second) = Fault
Ethernet	Blue	Flicker with activity	**Off** = Receiving data **On steady** = Transmitting data **Flicker** = Data transmission
100/1G Link	Blue	On steady	**Off** = no network connection **On steady** = network is connected
Run	Blue	On steady	**Off** = No power or waiting for processes to start **On steady** = OS and all monitored processes have started and the device is ready to use
Upgrade	Blue	On steady	**Off** = No upgrade in progress **On steady** = upgrade in progress
USB A	Blue	On when a device is connected	**Off** = No device is connected **On steady** = a device is connected
USB B	Blue	On when a device is connected	**Off** = No device is connected **On steady** = A device is connected
System Bus	Blue	Flicker with activity	**Off** = Not receiving data **On steady** = Transmitting data **Flicker** = Data transmission
Wi-Fi AP	Yellow	Flicker with activity	**Off** = No Wi-Fi adapter connected **On steady** = A device is connected to the Wi-Fi Network of the SBH **Flicker** = Wifi adapter is connected but no devices are connected
EOL	Yellow	On if the device is the end of the line Off if it is in the middle of the bus	**Off** = EOL not switched on **On steady** = EOL is switched on
W-Fi Client	Yellow	Not Used	Not Used - This will be used at a future date

LED Test Sequence at Startup

During startup, the SBH automatically initiates a self-test to verify proper operation of the unit. Immediately after connecting supply power, the following LED lighting sequence occurs:

- The **POWER** LED starts purple and then turns blue and stays on.
- The **FAULT** LED flashes for approximately 30 seconds, then turns off and the **RUN** LED turns on solid when the SBH is fully functional.
- The Wi-Fi LEDs are off until you connect the Wi-Fi dongle. When the Wi-Fi dongle is connected, the corresponding **USB** LED is on and the **Wi-Fi AP** LED flickers indicating that the SBH is waiting for a device.

Repair Information

If the SBH fails to operate within its specifications, replace it. The SBH is not a serviceable product; however, it does support software updates to enable feature enhancements. For a replacement unit, software updates, or accessories, contact your local Johnson Controls® representative.

Do not open the SBH housing. The SBH has no user-serviceable parts inside.

The SBH requires no periodic field maintenance.

Troubleshooting

Table 4: Launch Issues Troubleshooting Information

Problem	Resolution
When you launch a web browser, it does not directed you to the SBH login page.	**Reason** Device behavior can vary based on the device and internet browser in use. For example, some devices cache browser information and do not automatically redirect you to the SBH login page when you launch the browser. **Solution** Direct your browser to www.smartbuildinghub.com
When you upgrade a controller or HVAC device that an SBH is connected to, the SBH does not display active or current data	**Solution** Disconnect the SBH from the field controller system bus, then reconnect it.
When you install the SSL certificate on your device, it asks you to re-install it.	**Solution** 1. Verify that the time on your client device is correct. If the device time is not current, for example, after a hard reset, close the browser, set the time, and then try to install the certificate. 2. Check your web browser settings and verify that cookies are enabled.
When you install the SSL key or certificate, the message 'Error Saving SSL Settings' appears.	**Reason** When an SSL key or certificate is corrupted, the SSL page detects it and alerts you to the corrupted key or certificate. However, if the corruption is minor, for example, you copied an extra space while installing the certificate, or you missed a character, the UI does not detect the problem and saves the corrupted key or certificate. The server detects the error and returns the '**Error Saving SSL Settings**' message. This correctly prevents the bad key or certificate from being used, but it does not inform you as to the source of the problem. **Solution** Reinstall the SSL key or certificate as described in the *Smart Building Hub Network and IT Guidance Technical Bulletin (LIT-12012324).*

Accessories

Table 5: Accessories

Product Code Number	Description
TL-PWRKIT-1D24	Power supply for USA, Canada, Europe.

Technical Specifications

Smart Building Hub

Power Consumption	38W maximum
Ambient Temperature Conditions	**Operating:** 0 to 50°C (32 to 122°F) **Operating Survival:** -30 to 60°C (-22 to 140°F) **Non-Operating:** -40 to 70°C (-40 to 158°F)
Ambient Humidity Conditions	**Storage:** 5 to 95% RH 30°C (86°F) maximum dew point conditions **Operating:** 10 to 90% RH, 30°C (86°F) maximum dew point conditions
Transmission Speeds	**Serial Communication (SA/FC Bus):** 9600, 19.2k, 67.8k, or 115.2k bps **Ethernet Communication:** 10, 100 Mbps, 1 Gbps
Transmission Range (Typical)	**Wireless Communication:** 30 m (100 ft) line-of-sight indoors 91 m (300 ft) line-of-sight outdoors

Network and Serial Interfaces	Two SA/FC ports (RJ-12 6-pin port; connects with 1.5 m [4.9 ft] RJ-12 field bus cable, and one Screw terminal plug, 4-pin) Three USB ports (one Micro-B port, and two USB A ports). All support USB 2.0 and Open Host Controller Interface [Open HCI] specification
Dimensions (H x W x D)	190 x 125 x 44.5 mm (7.48 x 4.92 x 1.75 in)
Housing	White Polycarbonate and Acrylonitrile butadiene styrene (ABS) blend
Weight	.387kg (.852 lbs)
Web Browser Requirements for Computers and Handheld Devices	**Computer:** Windows Internet Explorer® 10 and Windows Internet Explorer 11, or Google® Chrome™ **Handheld Device:** The handheld device must be running either Internet Explorer Mobile for Windows® Mobile version 5 or version 6 operating system (OS); Android™ or Google Chrome. Other web browsers may display the UI, but the functionality is not guaranteed.
Compliance CE	**United States:** UL Listed File E107041, CCN PAZX, UL 916, Energy Management Equipment, FCC Compliant to CFR47, Part 15, Subpart B, Class A. **Canada:** UL listed file E107041, CCN PAZX7, CAN/CSA C22.2 No.205,Signal Equipment; Industry Canada Compliant. **Europe:** CE Mark - Johnson Controls, Inc. declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive. **Australia and New Zealand:** RCM Mark, Australia/NZ Emissions Compliant.

The performance specifications are nominal and conform to acceptable industry standard. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products.

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