

Applications

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

The SBH has many-to-one, multi-client connectivity, that provides access to any Smart Equipment device that directly connects to 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 from up to 31 m away (100 ft, line of sight) indoors, and from 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.

You can mount the SBH permanently onto a DIN rail or place it on a stable, flat surface and connect it to 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 the users will be required to correct the interference at their own expense.

Canada

This Class (A) digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe (A) respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Installation

Parts included

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

Special tools needed

To use the SBH, you need a mobile device, such as a tablet or smart phone, or a desktop or laptop computer that supports Wi-Fi.

Mounting

Location considerations

Follow these guidelines when you mount the SBH:

- Mount the SBH in areas free of corrosive vapors and observe the environmental limitations listed in the [Technical specifications](#) section.
- 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 SBH. 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.
- Do not mount the SBH outdoors.

Mounting options

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

DIN rail mounting

To mount the SBH on a DIN rail, complete the following steps:

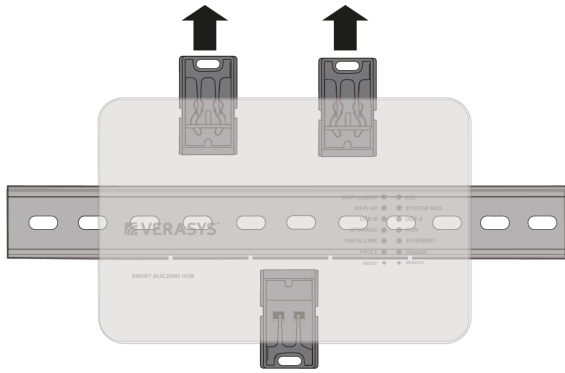
1. Mount a 7.5 cm (3 in.) or longer section of 35 mm (1 to 1/8 in.) DIN rail horizontally.
i Note: Mount the SBH in the horizontal position.
2. On the back of the SBH, extend the top two mounting clips as shown in the following figure.



(barcode for factory use only)

LC-SBH200-0, LC-SBH200-0S, LC-SBH200-0E, LC-SBH200-0LA

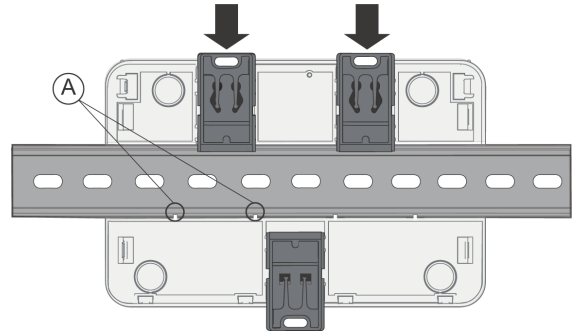
Figure 1: Top mounting clips extended (front view)



3. Place the SBH on the DIN rail as shown in the following figure, so that the DIN rail channel hooks (A) at the bottom of the baseplate channel catch the lower part of the DIN rail.
4. Push the top mounting clips down to secure the SBH on the DIN rail, as shown in the following figure.

► **Important:** Do not overtighten the mounting screws. Overtightening the screws can damage the mounting clips or bracket.

Figure 2: Top mounting clips in downward position (rear view)

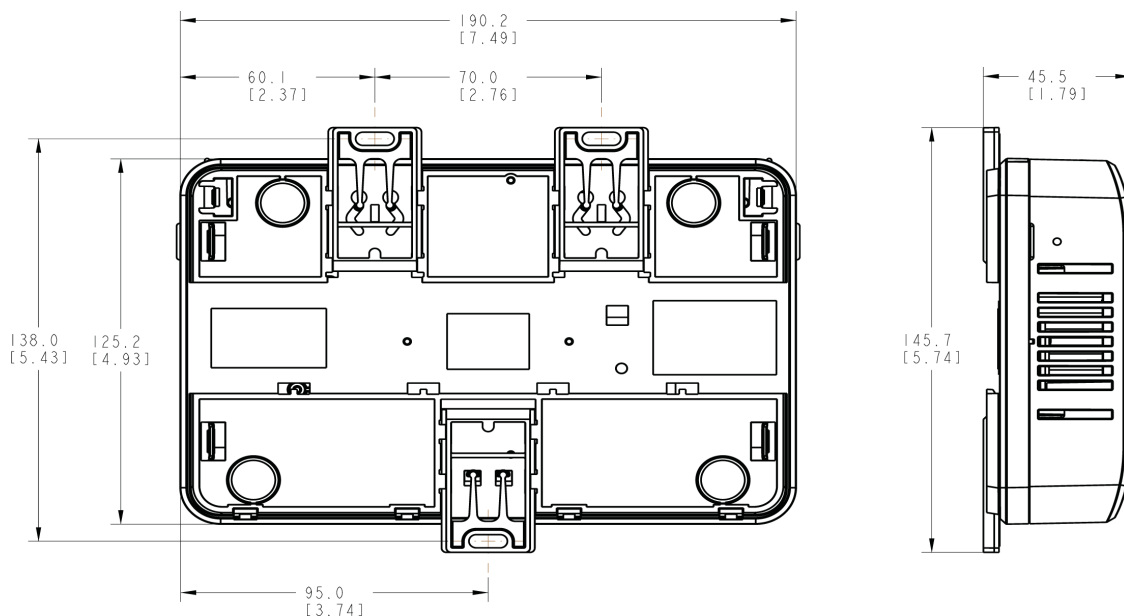


5. To remove the SBH from the DIN rail, extend the top mounting clips to the extended position and carefully lift the SBH off the DIN rail.

Wall mounting

1. Pull the top two mounting clips upwards to their extended position.
2. Mark mounting hole locations on the wall. Use 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.
4. Insert wall anchors for each hole if necessary.
5. Hold the bracket in place, insert the screws through the mounting clips and into the screw holes, and then carefully tighten all screws.

Figure 3: Mounting holes, flat-mounting (left) and side-mounting (right)



Wiring

Wiring guidelines

Follow these guidelines when you wire 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 RJ12 cable. For data transmission and other specifications, see the [Technical specifications](#) section.

System bus communications connections

To connect the SBH to the system bus for communication, use the system bus adapter on the SBH.

Note:

- The SBH has a dedicated system bus address of 117 by default. You can change the default address in the **BACnet Settings** menu. Ensure that the SBH has a unique address on the system bus network. The system bus can accommodate one SBH.
- Performance of the SBH varies based on the amount of traffic it accommodates.

USB port

The SBH200 has 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.

- Do not use the USB port as a charging port.
- Do not connect devices other than those specified in Johnson Controls® technical documentation.
- Use the USB ports only when needed.

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.

The SBH also supports the third-party USB Wi-Fi adapters listed in the following table.

Table 2: Supported third-party USB Wi-Fi adapters for SBH

Manufacturer	Model Name
D-LINK®	DWA-131 E

Table 2: Supported third-party USB Wi-Fi adapters for SBH

Manufacturer	Model Name
D-LINK	DWA-171 A
D-LINK	DWA-171 C
NETGEAR®	A6100
TP-LINK®	Archer
PREMIERTEK®	PT-8811AU

Ethernet port

The Ethernet port on the SBH is an 8-pin RJ45 jack. The maximum allowable cable length is 100 m (328 ft).

External power supply connections

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.

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.

AVERTISSEMENT

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.

To connect the SBH using the supplied external power source, complete the following steps:

- **Important:** Power should only be applied and removed by connecting and disconnecting the power cord from the 100 VAC to 240 VAC outlet. Applying or removing power by connecting or disconnecting the 24 VDC/AC connector can damage the unit.
- 1. Connect the DC plug of the 24 VDC, 50 W, Class II power supply to the power supply port of the SBH. Alternatively, you can connect a 24 VAC power supply with a 75 VA, Class II transformer.
- 2. Connect the power supply to the supplied power cord.
- 3. Connect the power cord to a 100 VAC to 240 VAC outlet.

Operation

Accessing Smart Equipment using the SBH

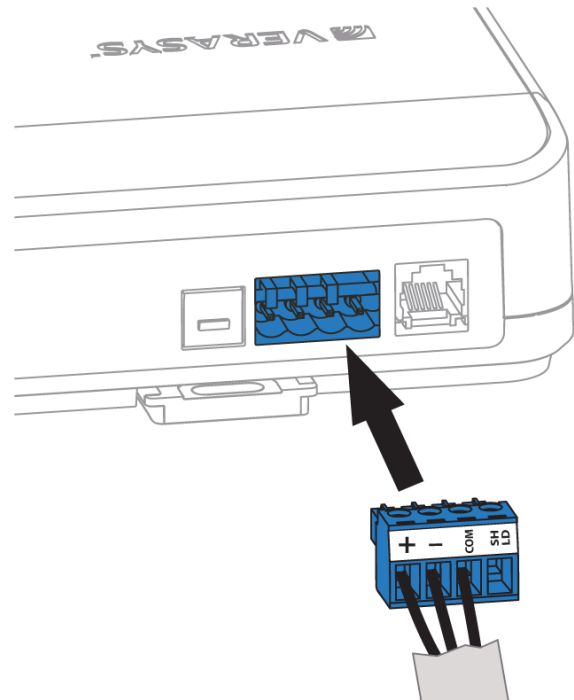
When the SBH is physically connected to an MS/TP network, you can access Smart Equipment devices. The SBH connects to the network through the system bus and can access the devices on the trunk through this connection.

To interact with a device on the network to see its setpoints, alarms, and other parameters, use a web-enabled device that is connected to the SBH Wi-Fi network to select the device. To use the network, you must have a web-enabled device that uses a supported internet browser.

Connecting to the SBH 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 as shown in the following figure.
2. If the SBH is at the end of a line, set the end-of-line (EOL) switch to **ON**.

Figure 4: Connecting the SBH to your equipment



3. Connect the Wi-Fi adapter to either of the USB ports.
4. Connect the RJ45 Ethernet port to the building Ethernet network. Use instructions from the building IT department.
5. In the Wi-Fi settings of your device or laptop, connect to the SBH Wi-Fi network using the default credentials. You can find the default credentials on a sticker on the *Smart Building Hub Quick Start Guide (Part No. 24-10737-00229)* that came with the SBH. You can also find the default credentials on a sticker on the back of the SBH.
6. To open the SBH browser interface, direct your browser to www.smartbuildinghub.com.
 - ⓘ **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)*.
7. Read and accept the SBH license agreement.
8. The first time you log in to the SBH, the **Change Password and Passphrase** 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 you rejoin the network with the new passphrase. For example, on a laptop running a Microsoft® Windows® operating system, you must select and forget the original Wi-Fi network before you rejoin.

- a. In the **New Admin Password** field, replace the default password. Enter the new password in the **Verify New Admin Password** field to confirm the change.
 - b. In the **New Wi-Fi Passphrase** field, replace the Wi-Fi passphrase and click **Save**.
9. To see and interact with a device on the network, use the web-enabled device or laptop that is connected to the SBH Wi-Fi network.

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.

Reset button operation and descriptions

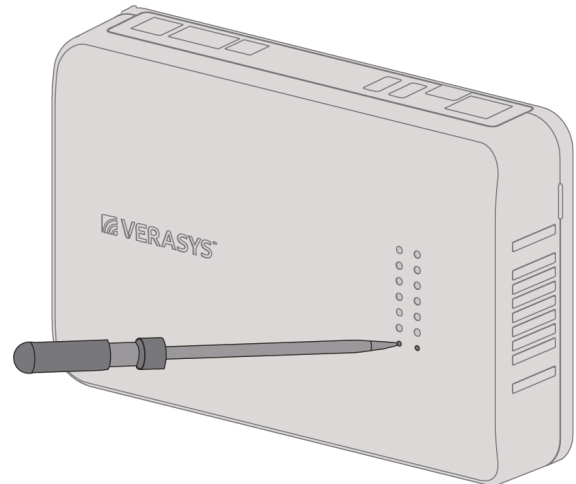
If you lose your password or if you want to restore the unit to factory defaults, the SBH has the following two reset functions:

- **Network Reset**
- **Reset to Factory Defaults**

Use the instructions in the following sections according to the type of reset you require. For both resets, the following information applies:

- The reset button is located on the front of the device, on the lower left, under the LEDs, see the following figure and Figure 6. To reach the reset button, use a small screwdriver or similar tool as shown in the following figure.
- If the SBH is connected to the network when you press the reset button, it disconnects from the network.
- 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.

Figure 5: Reset button



Network Reset

The **Network Reset** function resets Wi-Fi and Ethernet settings. Use this function when you forget your Wi-Fi connection information. To reset the Wi-Fi and Ethernet settings, complete the following steps:

1. Press and hold the **RESET** button for two seconds. The **FAULT** LED flickers slowly.
2. Release the **RESET** button within three seconds. The **FAULT** LED continues to flicker slowly.
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: The Wi-Fi SSID and passphrase and Ethernet are set 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.

See Table 3 for more information about LED designations and flicker behavior.

Reset to Factory Defaults

The **Reset to Factory Defaults** function resets all device settings including user profiles. The function also resets your SSL certificate to the Johnson Controls self-signed certificate that is included in the device. This function is for administrators who want to clear all user profiles from a device. The **Reset to Factory Defaults** function does not change the version of the software. If you run a software upgrade, the SBH retains the upgraded software version and does not reset to the factory default version.

► **Important:** To use an SBH that is reset to factory defaults, you must use the default login credentials. Find the default credentials on a sticker on the *Smart Building Hub Quick Start Guide (Part No. 24-10737-00229)* that came with the SBH. Also find the default credentials on a sticker on the back of the SBH.

To reset to factory defaults, complete the following steps:

1. Press and hold the **RESET** button for six seconds. After two seconds, the **FAULT** LED flickers slowly. After an additional four seconds of holding the **RESET** button, the **FAULT** LED changes to a faster flicker.
2. Release the **RESET** button within three seconds of seeing a fast flicker. The **FAULT** LED continues to flicker quickly.
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: All device settings reset to factory defaults. The LEDs stop flashing for two seconds, and then the LEDs return to normal operation based on the current state of the device.

See Table 3 for more information on LED designations and flicker behavior.

Table 3: SBH LED designations and operation

LED name	Color	Normal LED operation	LED operation for all conditions
POWER	Blue or purple	On steady	Off: The device has no power. On purple: Primary voltage supplies power. On blue: Operating system (OS) is initialized and primary voltage supplies power.
FAULT	Red	Off	Off: No faults. Device is operating normally. On steady: Missing hardware or software, operating system is not yet 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 = other 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 is in progress On steady: Upgrade is 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

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 uses status LEDs to indicate functional states according to the LED map shown in the following figure. Table 3 provides SBH LED functional information.

Figure 6: LED map

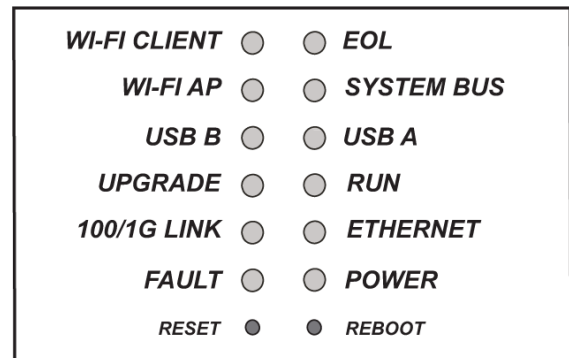


Table 3: SBH LED designations and operation

LED name	Color	Normal LED operation	LED operation for all conditions
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 is connected On steady: A device is connected to the Wi-Fi network of the SBH Flicker: Wi-Fi 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
Wi-Fi CLIENT	Yellow	n/a	Not currently used

LED test sequence at startup

During startup, the SBH automatically initiates a self test to verify correct operation. Immediately after you connect the supply power, the following LED lighting sequence occurs:

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

Repair information

Replace the SBH if it fails to operate within its specifications. The SBH is not a serviceable product; however, it does support software updates to enable feature enhancements. For a replacement SBH, 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 direct you to the SBH login page.	Reason Device operation varies based on the device and Internet browser you 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 connects to, the SBH does not display active or current data.	Solution Disconnect the SBH from the field controller system bus, and 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.

Table 4: Launch issues troubleshooting information

Problem	Resolution
When you install the SSL key or certificate, the message Error Saving SSL Settings appears.	<p>Reason</p> <p>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, if 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 about the source of the problem.</p> <p>Solution</p> <p>Reinstall the SSL key or certificate as described in the <i>Smart Building Hub Network and IT Guidance Technical Bulletin (LIT-12012324)</i>.</p>

Accessories

Table 5: SBH200 Accessories

Code Number	Description	Shipped with
ACC-PWRKIT-1A24	Verasys LC-SBH200-0 power supply for North America	LC-SBH200-0S
AC-PWRKIT-1D24		LC-SBH200-0E
ACC-PWRKIT-1E24	Verasys LC-SBH200-0 power supply for Europe	
ACC-WIFIKIT-0DU	Verasys LC-SBH200-0 USB Wi-Fi adapter for North America and Europe	LC-SBH200-0
		LC-SBH200-0S
		LC-SBH200-0E

Technical specifications

Table 6: Technical specifications SBH

Power consumption	38 W maximum
Ambient temperature conditions	<p>Operating: 0°C to 50°C (32°F to 122°F)</p> <p>Operating survival: -30°C to 60°C (-22°F to 140°F)</p> <p>Non-operating: -40°C to 70°C (-40°F to 158°F)</p>
Ambient humidity conditions	<p>Storage: 5% to 95% RH 30°C (86°F) maximum dew point conditions</p> <p>Operating: 10% to 90% RH, 30°C (86°F) maximum dew point conditions</p>
Transmission speeds	<p>Serial communication (SA/FC bus): 9600, 19.2k, 67.8k, or 115.2k bps</p> <p>Ethernet communication: 10 Mbps, 100 Mbps, 1 Gbps</p>
Transmission range (typical)	<p>Wireless communication:</p> <p>30 m (100 ft) line-of-sight indoors</p> <p>91 m (300 ft) line-of-sight outdoors</p>
Network and serial interfaces	<p>Two SA/FC ports (RJ12 6-pin port; connects with 1.5 m [4.9 ft] RJ12 field bus cable, and one screw terminal plug, 4-pin)</p> <p>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</p>
Dimensions (H x W x D)	190 mm x 125 mm x 44.5 mm (7.48 in. x 4.92 in. 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	<p>Computer:</p> <p>Windows Internet Explorer® 10 and Windows Internet Explorer 11, or Google® Chrome™</p> <p>Handheld device:</p> <p>The handheld device must run 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.</p>

Table 6: Technical specifications SBH

Compliance	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.
CE	Europe: CE Mark - Johnson Controls 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.

Product warranty

This product is covered by a limited warranty, details of which can be found at www.johnsoncontrols.com/buildingswarranty.

Software terms


Use of the software that is in (or constitutes) this product, or access to the cloud, or hosted services applicable to this product, if any, is subject to applicable terms set forth at www.johnsoncontrols.com/techterms. Your use of this product constitutes an agreement to such terms.

Patents

Patents: <http://jciapat.com>

Single point of contact

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