SylSmart® Connected

BACnet Gateway user manual

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1. Overview

The SylSmart® Connected BACnet Gateway integrates Bluetooth® NLC lighting systems, set up with SylSmart® Connected Commissioning tools, with Building Management Systems (BMS) and other systems via BMS using BACnet protocol.

It collects data from the lighting system and translates it into BACnet objects, enabling seamless communication with other building systems.

This integration allows advanced lighting control to be incorporated into building automation workflows, enabling smarter coordination and communication between systems.

The gateway itself is not capable of communicating over the internet.

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2. Features

- The gateway allows sharing the following objects for the groups (lighting zones) and devices:

Object	Description	Type	Input / output	Reporting interval	Writable	CoV
Group Health Status	Indicates whether any node in the group is out of range or reporting errors	Multi-state	Input	Real-time*	No	Yes
Group Occupancy Status	Indicates whether the group is occupied or vacant	Binary	Input	Real-time*	No	Yes
Group Energy Use	Indicates total energy use measured across all nodes in the group	Analog	Input	15 minutes	No	Yes
Group Scene Recall	Recalls one of four predefined scenes	Multi-state	Output	Real-time*	Yes	N/A
Group Ambient Light Level	Indicates the average light level calculated across all light sensors in the group	Analog	Input	Real-time*	No	Yes
Group Light On Status	Indicates whether the light of any node in the group is on	Binary	Input	Real-time*	No	Yes
Group Light Level Set	Adjusts the light level in the group	Analog	Output	Real-time*	Yes	N/A
Group Light Level Status	Indicates the highest light level from all devices in the group	Analog	Input	Real-time*	No	Yes
Device Health Status	Indicates health of individual nodes in the group	Multi-state	Input	Real-time*	No	Yes
* The value is updated immediately after receiving a valid new message from any member of the group.						

- Data is shared through the Change of Value (CoV) method.
- Lighting system topology is displayed using Structured View objects.
- Naming of BACnet objects is configurable.
  - Group object function names use this format:

    APPLICATION_GROUP_ID@GW_NAME/PROJECT_NAME/AREA_NAME/ZONE_NAME/OBJECT_FUNCTION

    Lighting_G00@Silvair_Office_BACNet_GW_2/Silvair_Office/Ground_Floor/Corridor/Group_Health_Status
  - Device object function names use this format:

    APPLICATION_GROUP_ID_DEVICE_ID@GW_NAME/PROJECT_NAME/AREA_NAME/ZONE_NAME/DEVICE_NAME/OBJECT_FUNCTION

    Lighting_G00_D000@Silvair_Office_BACNet_GW_2/Silvair_Office/Ground_Floor/Corridor/Silvair_Dongle_c345/Device_Health_Status

  where:

  APPLICATION = 'Lighting'

  GROUP_ID = 'G' followed by a sequential 2-digit number, assigned alphabetically by zone topology

  DEVICE_ID = 'D' followed by a sequential 3-digit number, assigned alphabetically by device topology

  GW_NAME = Name of the gateway (spaces and URI reserved characters are replaced with '_')

  PROJECT_NAME/AREA_NAME/ZONE_NAME = Topology path (spaces and URI reserved characters are replaced with '_')

  DEVICE_NAME = Name of the device (spaces and URI reserved characters are replaced with '_')

  OBJECT_FUNCTION = Object function listed in section 1.1 (spaces and URI reserved characters are replaced with '_')

3. Technical specifications

Application	On-premise integration of the Bluetooth NLC-based lighting system with the BMS.
Capacity and performance	Up to approximately 200 Bluetooth mesh messages per second.
Project requirements	Up to approximately 200 Bluetooth mesh devices per gateway. Up to 100 lighting zones per gateway. One area per gateway. UTF-8 character set.
Power supply	5 V DC (± 5%), max. 5.5 V, 1 A, micro USB Power over Ethernet 48 V DC, 0.1 A (IEEE 802.3af)
Operating system	Linux-based OpenWrt 23.05.4
Processor	32-bit 575 MHz (Mediatek MT7628) 32-bit 64 MHz (Bluetooth Low Energy)
Memory	128 MB 16-bit DDR2 RAM 16 MB SPI NOR Flash
Communication protocol	Bluetooth (2.4 GHz Bluetooth Low Energy)
Bluetooth frequency	2.4–2.4835 GHz
Maximum emitting power	18 dBm
Standby power	1 A at 5 V DC 100 mA at 48 V DC
Ports	1 x RJ45 10/100 Ethernet with PoE support 1 x USB 2.0 Type-A
Network protocol	BACNet IP 1.30
Bluetooth scan coverage radius	100 m (open space)
FCC-ID	2ABU6-G1-E
Required operating temperature	-10°C to 50°C (14°F to 122°F)
Required humidity	5% to 95%, non-condensing
Enclosure dimensions	150 mm x 150 mm x 36 mm (5.9″ x 5.9″ x 1.4″)
Net weight	155 g (0.34 lbs)
Environment type	Indoor
Mounting position	Wall or surface mounted. As close to the geometrical center of the lighting network as possible, but as far as possible from potential sources of interference.
Accessories	USB cable, mounting template, metal magnetic fixing and screw

4. Safety precautions

- Use the gateway only as described in this manual.
- Make sure that all parts of the gateway are present, genuine, and not damaged.
- Make sure that the power source matches the specifications on the rating plate.
- Do not carry or lift the gateway by cables.
- Keep the gateway dry. Do not expose it to rain, snow, or frost.
- Keep the sockets clean and free of dust.
- Have the gateway repaired only by an authorized service center.

5. Requirements

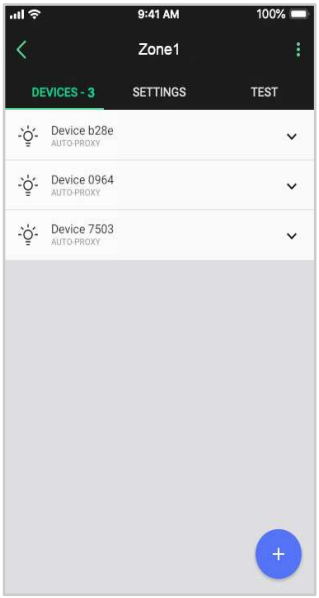
- The lighting system must be created in the SylSmart® Connected Commissioning application.
- All luminaires must be added to the area where the gateway will be installed.
- All luminaires must be fully configured with no errors in the project.
- The lighting network must be fully operational, confirmed by mesh quality tests performed using the mobile app before installing the gateway.
- The gateway must be connected to the local Ethernet network.
- The gateway must be installed within radio range of at least one relay node.
- The gateway must be placed as far away as possible from potential sources of interference (for example, high power electrical equipment, transmitters, or building features that could block the radio signal).
- If the BMS manages schedules, scheduling events must not be created in the SylSmart® Connected Commissioning application.

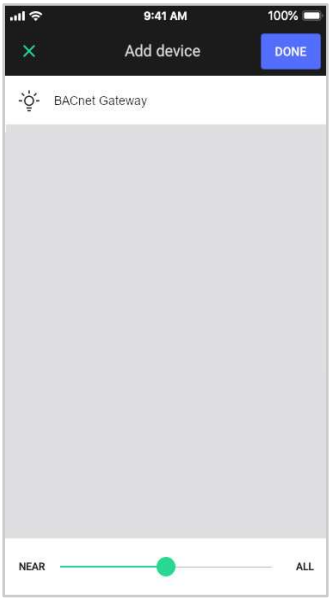
6. Commissioning

1. Make sure that all devices are fully configured and added to the area where the gateway will be installed.
2. Install the gateway in the required area.
3. Connect the gateway to power and to Ethernet or use a Power over Ethernet (PoE) connection. Then press the ON button.

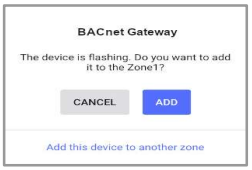
After the gateway starts, the LED displays:	Solid 

4. Add the gateway to the designated zone in the area.
   a. Go on site where the gateway is installed.
   b. Log in to the **SylSmart® Connected mobile app** (iOS/iPadOS or Android).
   c. Open the project, area, and zone where the gateway is installed.
   d. Move close to the gateway and tap **+**.
   e. Tap the gateway to add it to the zone.
   f. Tap **Add** to confirm.



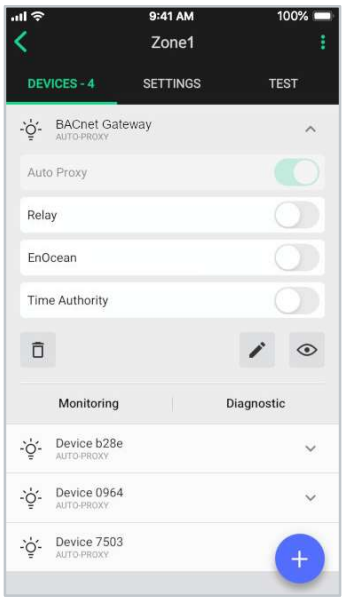


The LED displays: Flashing 



   g. Tap **Done**.
5. Tap the BACnet Gateway, and make sure that the relay function is disabled.
6. Perform a mesh quality test using the mobile app to make sure that the lighting network is fully operational.
7. Prepare the following parameters for gateway configuration and contact Sylvania:
   a. Location name – the name of the BACnet Gateway location (for example: Office1/Floor2/Room3).
   b. BACnet Gateway IPv4 address – static address (default: 192.168.1.123).
   c. Network IPv4 mask – subnet mask for the network (default: 255.255.255.0).
   d. Network IPv4 gateway – gateway IP address for the network.
   e. BACnet port – port number for BACnet communication (default: 47808).
   f. BACnet Object ID Range Start – starting ID for a continuous range of 2,000 BACnet Object IDs.
   g. Project ID – ID of the project in the SylSmart® Connected platform.
   h. Area ID – ID of the area where the gateway will be installed.
8. Sylvania prepares the file.

7. Moving the gateway to a different zone



1. If the gateway's network parameters have changed, or if you are moving the gateway to another area or project, make sure that it is reconfigured with the new configuration data as described in the Commissioning section.
2. Log in to the SylSmart® Connected mobile app, open the project and area.
3. Go to the zone to which the gateway you want to move is added.
   a. (iOS/iPadOS) Select the gateway and tap 🗑.
   b. (Android) Tap ⋮ to open the context menu and tap “Remove”.

The LED displays:	Flashing

4. Remove the gateway from this zone and install it in a different zone in the same or different area or project.
5. In the SylSmart® Connected mobile app, go to the zone where the gateway is installed.
6. Move close to the gateway and tap **+**.
7. Tap the gateway to add it to the zone.
8. Tap **Add** to confirm.
9. Tap **Done**.
10. Use a BACnet client (for example, Yabe) and the time sync command to make sure that the gateway has the correct time.

8. Updating the software using a USB drive

1. Contact Sylvania to obtain the new software (file named **update.bin**).
2. Format a USB drive using the FAT32 file system.
3. Copy the **update.bin** file to the USB drive.
4. Insert the USB drive into the gateway.
5. Power the gateway down, power it back up, and wait 30 seconds.

ⓘ If the gateway detects a newer software version on the USB drive, it starts the update.

ⓘ After the software is updated, the gateway restarts and returns to its previous state, which is one of the following:

Unprovisioned	Provisioned	Provisioned (Mesh-connected)
Solid	Solid	Solid dimmed

6. Update the configuration.

9. Updating the configuration

9. Prepare the following parameters for gateway configuration and contact Sylvania:
   a. Location name – the name of the BACnet Gateway location (for example: Office1/Floor2/Room3).
   b. BACnet Gateway IPv4 address – static address (default: 192.168.1.123).
   c. Network IPv4 mask – subnet mask for the network (default: 255.255.255.0).
   d. Network IPv4 gateway – gateway IP address for the network.
   e. BACnet port – port number for BACnet communication (default: 47808).
   f. BACnet Object ID Range Start – starting ID for a continuous range of 2,000 BACnet Object IDs.
   g. Project ID – ID of the project in the SylSmart® Connected platform.
   h. Area ID – ID of the area where the gateway will be installed.
2. SylSmart® Connected prepares the configuration file (**config-update.hex**) from the provided parameters and attaches it to the support ticket.
3. Format a USB drive using the FAT32 file system.
4. Copy the **config-update.hex** file to the USB drive.
5. Insert the USB drive into the gateway.
6. Power the gateway down, power it back up, and wait 30 seconds.

> If the gateway detects a newer configuration on the USB drive, it reads and validates the file.

> After the configuration is applied, the gateway restarts and returns to its previous state, which is one of the following:

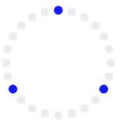
Unprovisioned	Provisioned	Provisioned (Mesh-connected)
		
Solid	Solid	Solid dimmed

7. Use a BACnet client (for example, Yabe) and the time sync command to make sure that the gateway has the correct time.

10. Copying logs to a USB drive

10.1 Using a reset button

1. Format a USB drive using the FAT32 file system.
2. Insert the USB drive into the gateway.
3. Use a pin to press and release the reset button.

The LED displays: Three rotating dots 

If the LED displays a solid purple ring, make sure that the USB drive is formatted as FAT32 and not damaged, then insert it again, and try again. Solid 

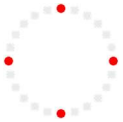
After the logs are copied to a USB drive, the BACnet server and the gateway restart, and the gateway returns to its previous state, which is one of the following:

Unprovisioned	Provisioned	Provisioned (Mesh-connected)
		
Solid	Solid	Solid dimmed

10.2 Using a BACnet command

1. Format a USB drive using the FAT32 file system.
2. Insert the USB drive into the gateway.
3. Use a BACnet client (for example, Yabe) and one of the following commands:
   a. **Warm start** (faster): Restarts the BACnet service and copies logs to the USB drive.
   b. **Cold start** (slower; requires password): Restarts the firmware, configures it again, restarts the BACnet service, and copies logs to the USB drive.

Wait until the LED displays: Three rotating dots 

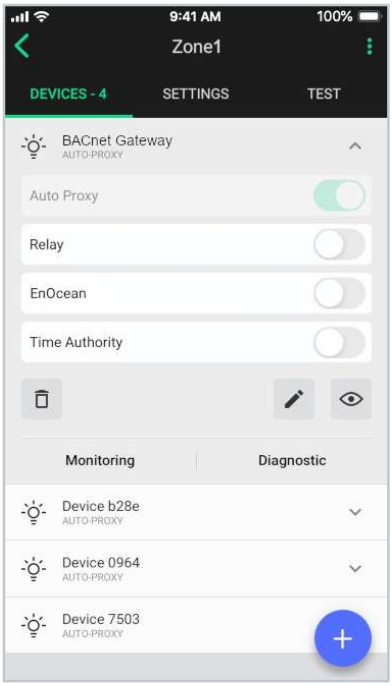
If the LED displays four red dots, make sure that the USB drive is formatted as FAT32 and not damaged, then insert it again, and try again. Solid 

After the logs are copied to the USB drive, the BACnet server and the gateway restart, and the gateway returns to its previous state, which is one of the following:

Unprovisioned	Provisioned	Provisioned (Mesh-connected)
		
Solid	Solid	Solid dimmed

11. Restoring system defaults

1. Remove the gateway from the project.
   a. Log in to the SylSmart® Connected mobile app (for iOS/iPadOS or Android), open the project and area.
   b. Go to the zone to which the gateway is added.
      i. (iOS/iPadOS) Select the gateway and tap 🗑.
      ii. (Android) Tap ⋮ to open the context menu and tap “Remove”.



The LED displays:	Flashing 

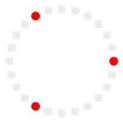
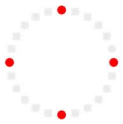
2. Use a pin to press the reset button on the gateway for at least 5 seconds.
3. Release the button.

The LED displays:	Nine flashes
After the system defaults are restored, the gateway restarts and returns to the Unprovisioned state:	Solid 

4. Use a BACnet client (for example, Yabe) and the time sync command to make sure that the gateway has the correct time.

12. Troubleshooting

If an error occurs, the system tries to restart the BACnet server. If multiple restart attempts fail, the gateway displays the last error state that caused the failure:

	An error occurred during server startup.
	An invalid configuration file was detected.
	The SylSmart® Connected firmware is unresponsive.
	Log backup to USB failed, possibly due to a missing USB drive, a corrupted or non-FAT32 file system, write protection, or other issues preventing access to the USB.
	An unexpected system error or crash occurred.

If any issues persist, make sure that the cables are correctly connected to the gateway. Then, copy the logs to a USB drive. If possible, use BACnet and perform a cold start. If not, use the reset button. Afterward, create a ticket in the Customer Support Portal and attach the logs to request troubleshooting.

13. Document revisions

Revision	Date	Editor	Changes
2.0	21 August 2025	CM	Moved the BIBBs section to the *SGW-105 SylSmart® Connected BACnet PICS* document. Revised and added new content.
1.0	7 February 2025	GM	Initial release.

Contact information

Support:	Support.sylsmart@sylvania-lighting.com
For more information please visit:	www.sylvania-lighting.com/connected

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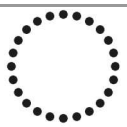
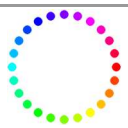
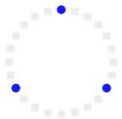
Appendix: LED states

	Solid	Gateway not connected to power		Solid	System is loading
	Solid	Starting maintenance		Rotating blue dot	Reading the configuration file from USB
	Rotating two blue dots	Reading the update.bin from USB and updating the software		Flashing	Idle
	Solid one red dot	Server startup error		Solid two red dots	Invalid configuration file
	Nine flashes	Restoring system defaults (via press and hold the reset button)		Rotating three blue dots	Copying logs to USB (via press and release the reset button), and restarting BACnet service
	Flashing	Starting BACnet service		Rotating orange dot	New configuration detected, updating the configuration, and restarting BACnet service
	Rotating two orange dots	Configuring BACnet server		Solid	Starting Silvair firmware
	Solid	Gateway in an Unprovisioned state		Flashing once per second	Attention in an Unprovisioned state
	Solid	Gateway in a provisioned state		Solid dimmed	Gateway in a provisioned state, with Bluetooth Mesh devices detected
	Flashing once per second	Attention in a provisioned state		Rotating three blue dots	Copying logs to USB (via BACnet), restarting BACnet service
	Flashing once per second	Restarting Silvair firmware (via BACnet), restarting BACnet service		Solid one red dot	A corrupted configuration file was detected
	Solid two red dots	An invalid configuration was detected		Solid three red dots	The Silvair firmware is unresponsive