SpaceLogic™ Room Controllers

SE8650 Specification Sheet
Roof Top Unit (RTU), Heat Pump and Indoor Air Quality (IAQ)

Firmware release version 2.6

Application specific and programmable Room Controller with customizable covers and screen colors. The SpaceLogic SE8650 is a low voltage rooftop, heat pump and indoor air quality Room Controller. Suitable for commercial and high end hospitality markets.

Product at a glance

The perfect balance between simplicity and sophistication. Select from a wide variety of casings, fascias, and configurable screen colors to match decor. Display your own logo and custom messages on screen to reinforce your brand and provide a more enjoyable occupant experience.

- **Interface:** touch screen interface.
- **Aesthetics:** up to ten selectable screen colors, two color casing options (white and silver) and eight selectable fascias.
- **Flexible:** configurable economizer/scheduler, supports upload of custom standby screen and Lua scripts.
- **Conformity:** conforms to ASHRAE specifications for Green Building Standards and applicable safety, EMC and radio standards.
- **Protocols:** wired BACnet MS/TP or wireless BACnet IP, Modbus RTU, wireless Zigbee Pro, BACnet/IP and email notification via Wi-Fi (requires a Wi-Fi module).
- **Peripherals:** easy to install Zigbee Pro, CO2 sensor or Wi-Fi plug-in modules.
- **Sensors**: CO2, occupancy, motion, light, temperature, relative humidity and water leak sensors.
- **Integration:** wireless connection to EcoStruxure™ Building Operation (EBO) servers or controllers, and other third party BMS.
- **Automatic Demand Response:** load shedding application for demand response.

Benefits

All models can be equipped with a discrete optional Passive Infrared (PIR) motion sensor. With the embedded sensor, the SpaceLogic SE8650 uses advanced occupancy routines to generate energy savings during occupied and unoccupied periods without sacrificing comfort.

- Generate energy savings
- Display custom logo
- Interchange between °C/°F
- Suitable for commercial/hospitality markets
- 22 selectable languages

Schneider Electric

Version 15

SE8650 Overview

Introduction

Smart energy management has never been easier than with the SE8650 Room Controllers for Rooftop Units, Heat Pump and Indoor air Quality applications. Designed for new construction and retrofit projects, the Room Controllers dramatically decrease project delivery costs by reducing installation, configuration and commissioning time. No complex software or tools are required to customize functionality to meet your applications requirements. The Room Controllers provide all the advanced features and monitoring functions required by modern building automation systems in a simple compact enclosure.

Application Specific and Programmable

The SE8650 Room Controllers, part of the SpaceLogic SE8000 family, are both application-specific AND programmable. This enables the modification of pre-configured control sequences, or the creation of entirely new control sequences for HVAC, lighting and other applications. The SE8650 Room Controllers provide exceptional control of staged heating and cooling equipment such as packaged roof-top units. Their configurable control sequences, economizer and scheduler functionalities deliver all the flexibility necessary for optimal indoor air quality applications.

Touch Screen with Customizable User Experience

The touch screen of the SE8650 Room Controller offers a customizable user experience with selection of languages, temperature scales, buttons, and screen colors. Using the 8000 Uploader Tool, it also supports the upload of an image or logo that becomes the default standby screen of the device. Custom messages can also be displayed on-screen using BACnet® objects when the SE8650 Room Controller is integrated via a BACnet MS/TP, BACnet IP or Modbus RTU system.

CUSTOM STANDBY SCREEN AND MESSAGES

> Custom standby screen

> Custom BACnet MS/TP or Modbus messages

Optional Passive Infrared Motion Sensor

All models are available with a discrete optional passive infrared (PIR) motion sensor. With this sensor, the SE8650 Room Controller uses advanced occupancy routines and optional additional Lua scripts to generate automatic energy savings during occupied and unoccupied periods without sacrificing comfort.

Automatic Demand Response

The Automatic Demand Respond (ADR) implements the Load Shedding application compatible with regulations for Occupant Controlled Smart Thermostats. The application requires a BACnet command from interfacing equipment to turn-on and turn-off the Load Shedding feature. Messaging and confirmations are performed by adjoining equipment having Internet connectivity and then providing the Room Controller the BACnet or Modbus command message.

Zigbee Wireless Sensors

The SE8650 Room Controllers support pairing of a number of Zigbee wireless sensors. Facility managers benefit from being able to monitor critical areas and be informed of events of concern in a timely manner which facilitates the maintenance of a safe and efficient operation.

SE8650 Features

Product highlights

The SE8650 Room Controller has the following high level functionality:

- Suitable for both commercial and hospitality markets and systems
- Customizable color digital touch screen interface with multi-language support
- Fully programmable control sequences using scripting
- On board configuration interface utility
- Configurable sequence of operations
- Configurable Economizer and Scheduler
- Universal inputs and outputs including a CO_2 sensor input, and a fresh air station input
- Humidity sensor with on-board dehumidification strategy
- Optional PIR occupancy sensor
- Optional Zigbee Pro wireless sensors available for windows, doors, motion, temperature, humidity, CO2 and water leak
- Optional or embedded on-board Zigbee Pro module

Communication & Connectivity

The SE8650 Room Controller is ready for networked communication with a Building Management System using BACnet™ (MS/TP on board, or IP via Wi-Fi), Zigbee™ Pro, or Modbus RTU (RS-485), as needed.

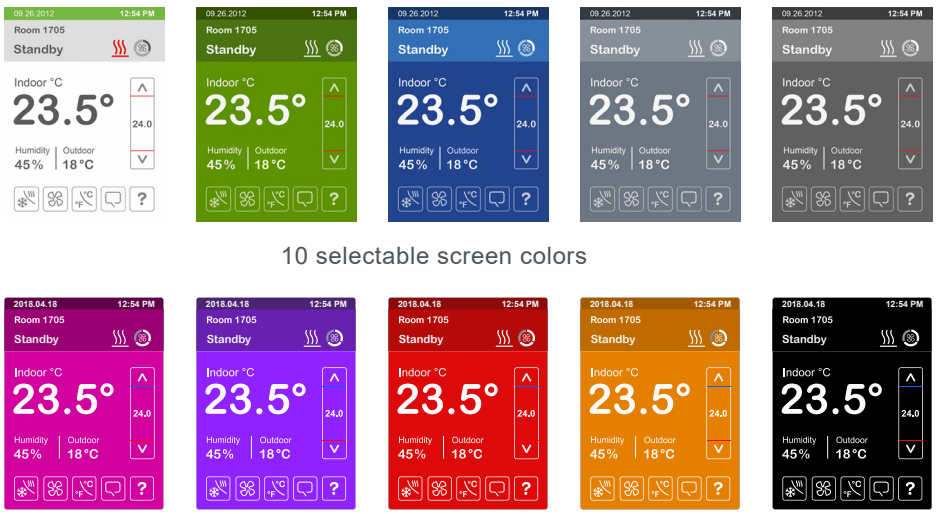
Integration to Building Management Systems (BMS)

The SE8650 Room Controller can be seamlessly integrated with the following:

- EcoStruxure™ Building Operation (EBO) and SpaceLogic™ AS-P/AS-B Automation Servers and RP-C/RP-V Room Purpose Controllers
- Most third party BMS
- Direct wired integration to BACnet MS/TP and Modbus
- Zigbee wireless integration to EBO servers or controllers with the SpaceLogic™ Wireless Adapter - Advanced
- Wireless integration to BACnet IP via Wi-Fi (requires a Wi-Fi module)

Custom Match Styling to Decor

- Two color casing options (white and silver)
- LED-backlit LCD touch screen
- 10 color options for LCD screen
- Removable fascia customized with replacement fascia available in eight styles and colors
- 22 selectable languages
- Over 12 screens are available for Commercial and Hospitality use cases



10 selectable screen colors

Multiple Fascias

SE8650 Applications

Indoor Air Quality

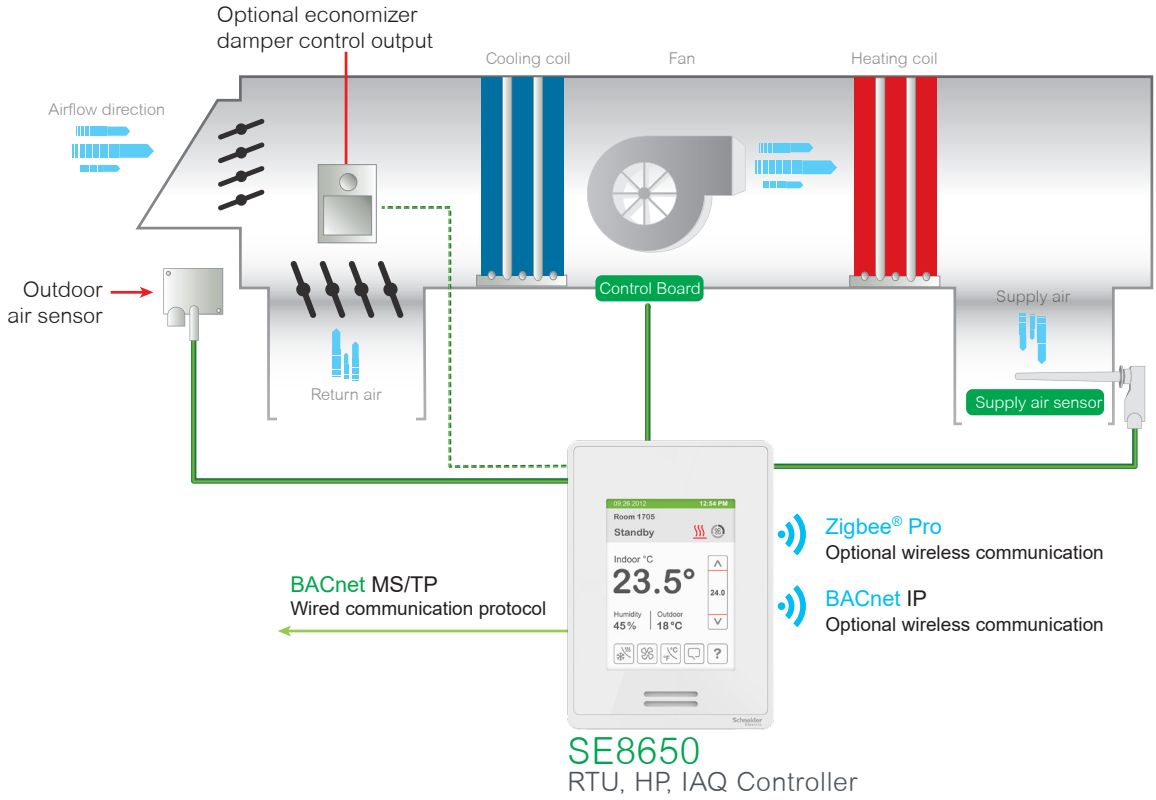
Indoor air quality is increasingly becoming a major concern to businesses, building managers, tenants, and employees because of its direct impact on the comfort, well-being, and productivity of the building's occupants. The SE8650 Room Controller, along with a CO_2 sensor, is a cost-effective solution capable of controlling economizer free cooling, and demand-based ventilation strategies, while providing a fresh air measurement input. When integrated to a building management system, the Room Controller can monitor and verify the CO_2 and fresh air levels, ensuring optimal air quality and energy efficiency.

Rooftop Units

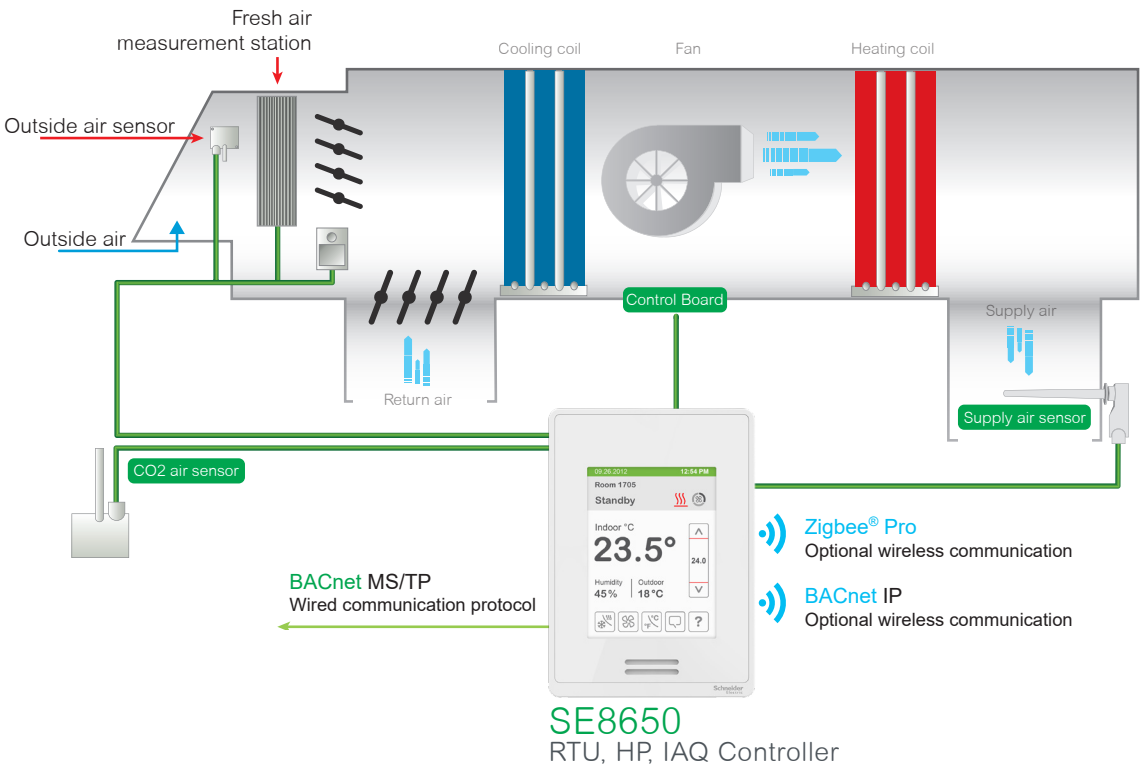
The SE8650 Room Controller can be configured to manage different types of staged equipment, such as the following:

- 1 Heating stage / 1 Cooling stage
- 2 Heating stages / 2 Cooling stages
- 3 Heating stages / 2 Cooling stages
- Modulating heat / 2 Cooling stages

Typical Room Application



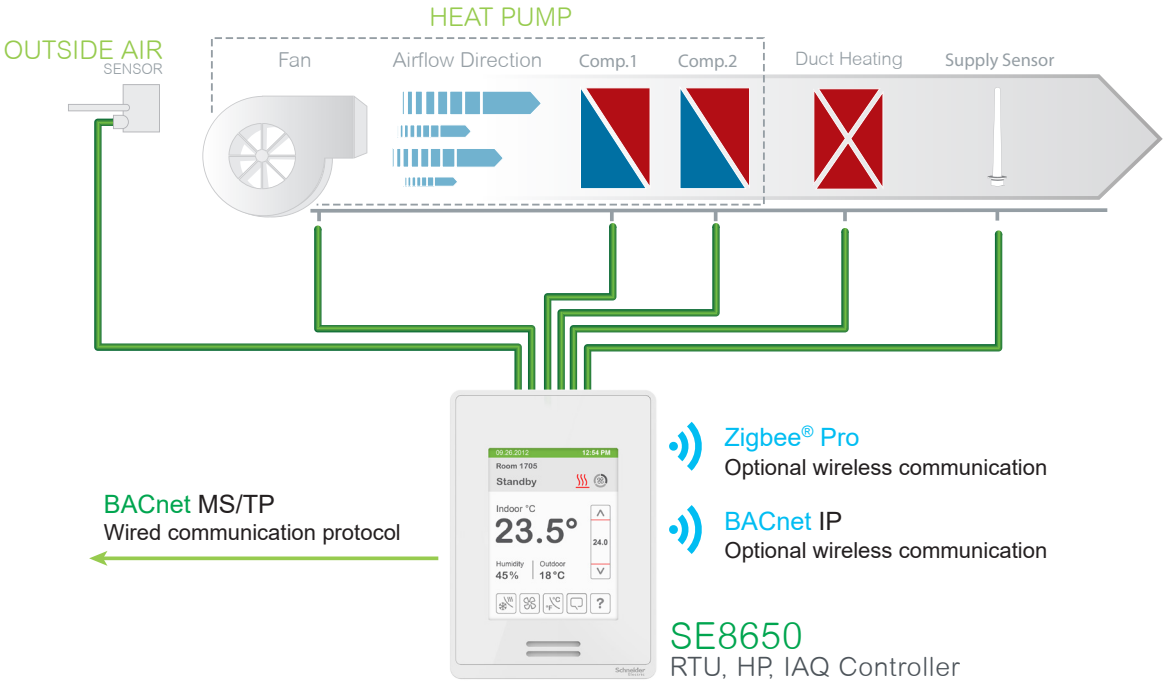
Typical Indoor Air Quality Application



Heat Pump

- Selectable single or dual stage compressor stages
- High balance point: Locks out auxiliary heating when outside air temperature is above this value
- Low balance point: Locks out heat pump compressor operation when outside air temperature is below this value
- Comfort/economy mode: In economy mode, heat pump use is maximized before turning on auxiliary heating
- Compressor/auxiliary interlock: Adds flexibility by locking out heat pump operation during auxiliary heating to prevent high pressure trip when the coil is downstream of the auxiliary heat source

Typical Heat Pump Application



SE8650 Programming

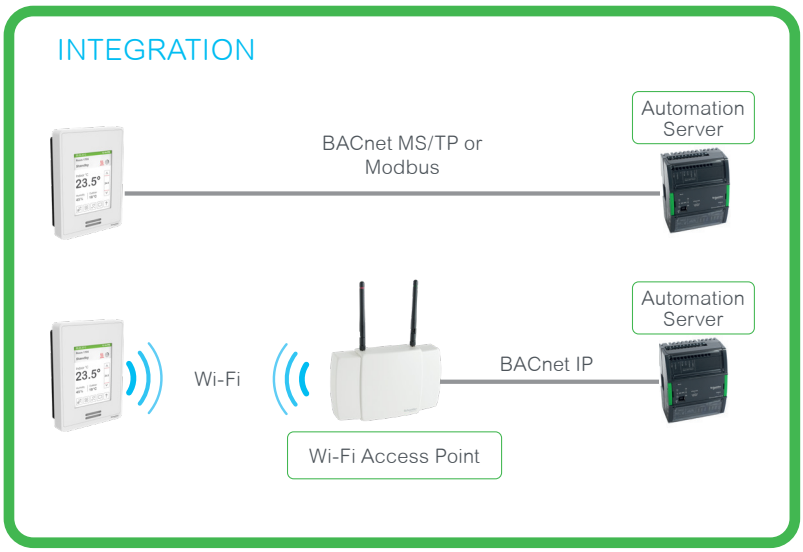
Programming with Lua: HVAC Applications and Beyond

The SE8650 Room Controllers are programmable using the open source programming language Lua. Although building management systems often use open protocols and standards, their program BACnet objects and scripting features remain proprietary and incompatible with third party devices. The SE8650's use of an open language enables operability with all systems.

Programming can be used to go beyond the pre-configured control sequences of the SE8650 to create customized HVAC applications. It can also be used to comply with specific project requirements and manage other applications, such as lighting and other equipment. Using Lua scripts also enables you to take advantage of the extra inputs and outputs of the SE8650 to manage other devices, such as sensors and relays.

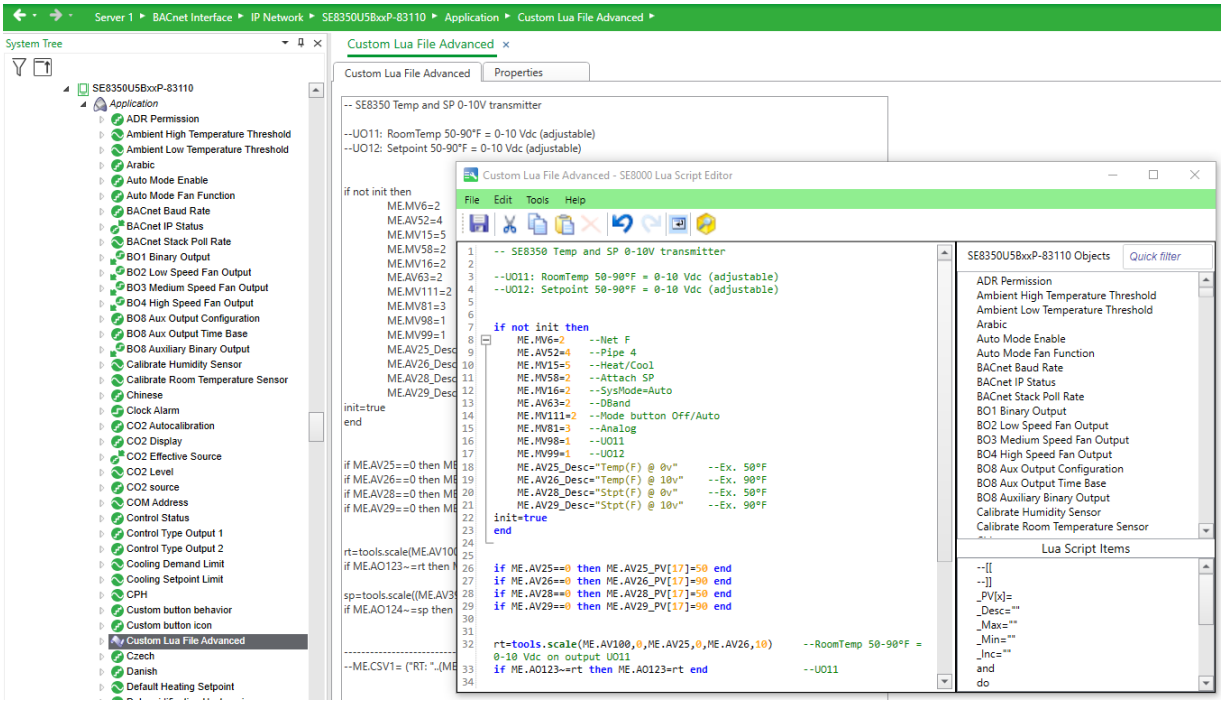
Loading Lua via BMS

When integrated into a BACnet MS/TP or IP building management system, the SE8650 allows a program BACnet object able to load a Lua script. No special software, license or tool is required.



Viewing Objects in EcoStruxure™ Building Operation

All program BACnet objects of the SE8650 Room Controller can easily be viewed through a Building Management System.



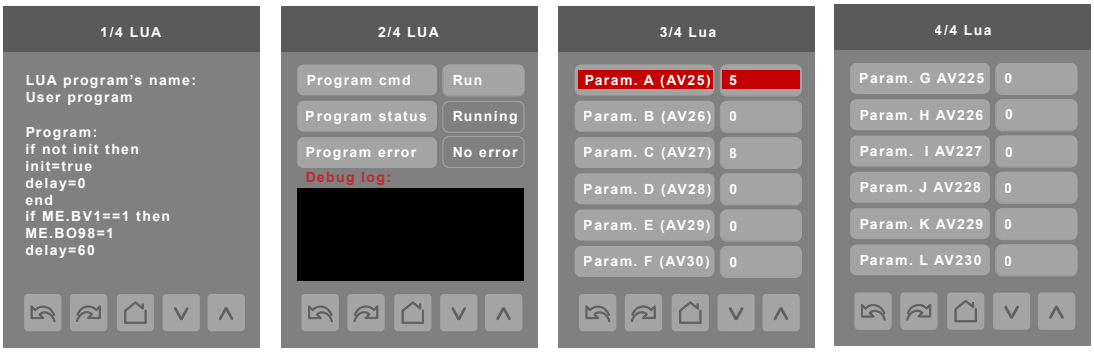
Loading Lua via USB

When there is no BACnet MS/TP, BACnet IP or Modbus integration, a Lua script can be uploaded directly into the SE8650 unit using the 8000 Uploader Tool. In addition to Lua scripts, standby screen images and firmware upgrades can also be loaded into the SE8650 using the 8000 Uploader Tool.

Viewing the Lua Status via SE8650 Touch Screen

As shown on the screen captures below, we can:

- View the first few lines of the Lua script (to facilitate identification of which script is running).
- View the program status and any error information.
- Start or stop the script.
- View the status of 12 objects provided for general use by Lua scripts.



Specifications

Main Specifications

Item	Description
Dimensions	12cm/4.72in (H) x 8.6cm/3.38in (W) x 2.5cm/1in (D)
Power Requirements	Input: 24VAC ±15% recommended, Absolute Max 29.5VAC, 50/60Hz or 24Vdc ±15% Peak device consumption: up to 6VA with CO2 sensor or Wi-Fi module Plus Output Load (max total 94VA) Transformer maximum rating: 100VA, 4.17 A
Output Ratings	**5 DO (Electronic Relays):** 24VAC or 24Vdc ±15%, 50/60Hz, 1.0 Amp., in-rush = 3.0 Amps (< 100 ms) **4 UO (Electronic Relays or Analog Outputs – Configurable):** 0 - 10 Vdc, 5mA maximum, (2 kilo-ohm resistance) Configurable Output Analog/Electronic Relay
Operating Conditions	0 °C to 50 °C (32 °F to 122 °F) 0% to 95% R.H. non-condensing
Storage Conditions	-30 °C to 50 °C (-22 °F to 122 °F) 0% to 95% R.H. non-condensing
Temperature Sensor	Local 10 K NTC type 2 thermistor
Temperature Sensor Resolution	± 0.1 °C (± 0.2 °F)
Temperature Control Accuracy	±0.5 ° C (± 0.9 °F) @ 21 °C (70 °F) typical
Humidity Sensor Precision	Reading range from 10-90 % R.H. non-condensing 10 to 20% precision: 10% 20% to 70% precision: 5% 70% to 90% precision: 10%
Humidity Sensor Stability	Less than 0.25 % yearly (typical drift)
Dehumidification Setpoint Range	30% to 95% R.H.
Occ, Unocc and Standby Cooling Setpoint Range	12.0 to 37.5 °C (54 to 100 °F)
Occ, Unocc and Standby Heating Setpoint Range	4.5 °C to 32 °C (40 °F to 90 °F)
Room and Outdoor Air Temperature Display Range	-40 °C to 50 °C (-40 °F to 122 °F)
Proportional Band for Room Temperature Control	Cooling and Heating: Default: 1.8°C (3.2°F)
Analog Inputs	Modulating 0-10 VDC across UI19, UI24 to Common
Binary Inputs	Dry contact across terminals UI16, UI17 to Common
Remote Temperature Sensor	10 K NTC type 2 thermistor UI20, UI22, UI23
Wire Gauge	Power supply: 16 or 18 gauge Communications: 22 guage typical, 24 gauge minimumr
Shipping Weight	0.34 kg (0.75 lb)

Safety and Certifications

EMC / Safety Standards	Radio Standards (For models with Zigbee Radio)
EMC Directive 2014/30/EU	RED 2014/53/EU
S.I. 2016/1091 – Electromagnetic Compatibility Regulations 2016	S.I. 2017/1206 – Radio Equipment Regulations 2017
FCC 15B Class A	ETSI EN 300 328
ICES-003 Class A	ETSI EN 301 489-1
	ETSI EN 301 489-17
BS/EN 60730-1	FCC Part 15C
BS/EN 60730-2-9	RSS-247
BS/EN 60730-2-13	
UL 60730-1	
CAN/CSA-E60730-1	
UL 60730-2-9	
CAN/CSA-E60730-2-9	
UL 60730-2-13	
CAN/CSA-E60730-2-13	

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.

THE GRANTEE IS NOT RESPONSIBLE FOR ANY CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

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 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/TV technician for help.

This device complies with Industry Canada's licence-exempt RSSs. 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.
In order to comply with FCC/ISED RF Exposure requirements, this device must be installed to provide at least 20 cm separation from the human body at all times.

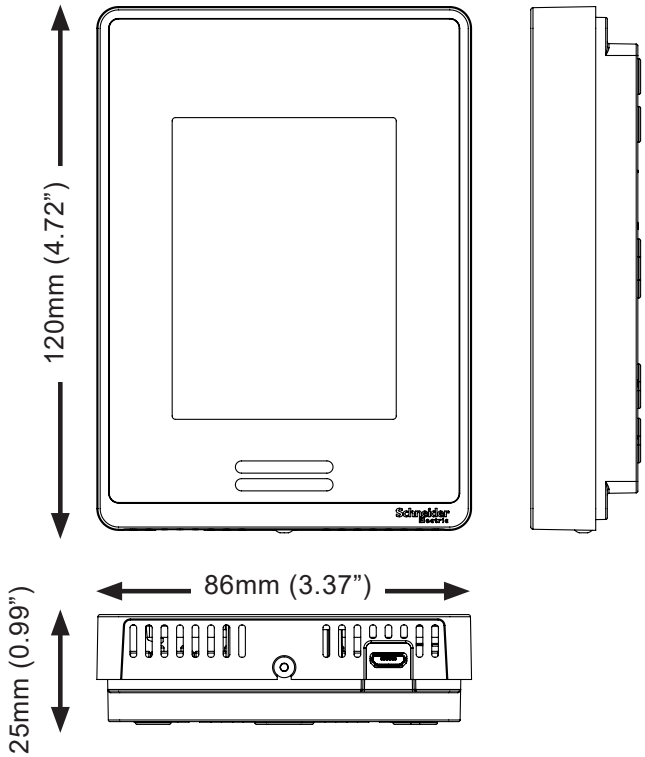
Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :
1) l'appareil ne doit pas produire de brouillage;
2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

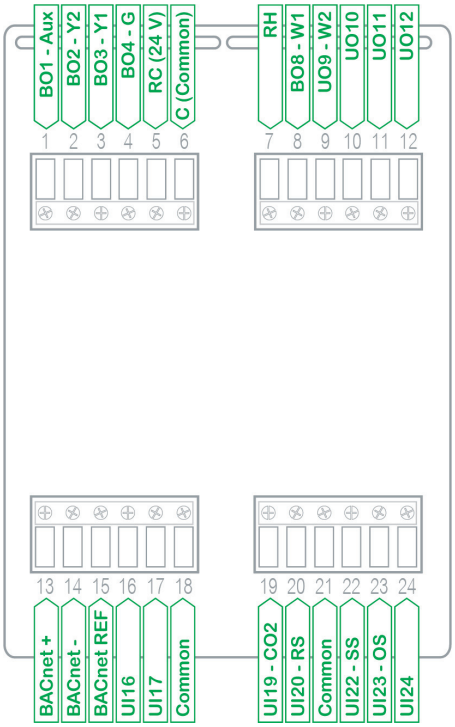
Afin de se conformer aux exigences d'exposition RF FCC/ISED, cet appareil doit être installé pour fournir au moins 20 cm de séparation du corps humain en tout temps.

Check with your local government for instruction on disposal of this product.

UK Representative	Manufacturer
Schneider Electric Limited Stafford Park 5 Telford, TF3 3BL United Kingdom	Schneider Electric Industries SAS 35 rue Joseph Monier Rueil Malmaison 92500 France

Dimensions


120mm (4.72”)
86mm (3.37”)
25mm (0.99”)


BO1 - Aux
BO2 - Y2
BO3 - Y1
BO4 - G
RC (24 V)
C (Common)
RH
BO8 - W1
UO9 - W2
UO10
UO11
UO12
1 2 3 4 5 6
7 8 9 10 11 12
13 14 15 16 17 18
19 20 21 22 23 24
BACnet +
BACnet -
BACnet REF
UI16
UI17
Common
UI19 - CO2
UI20 - RS
Common
UI22 - SS
UI23 - OS
UI24

Ordering Information

SE8650U5B00P

PIR motion sensor
-0 = No PIR
-5 = PIR on board

Zigbee Pro
-P = on board
-Blank = not on board

Fascia and casing
-00 = Silver/Silver
-11 = White/White
(Replacement fascias available separately)

Replacement fascias (ordered separately)

FAS-00	Silver
FAS-01	White
FAS-05	Light tan wood
FAS-06	Dark brown wood
FAS-07	Dark black wood
FAS-10	Brushed steel finish
FAS-11	Metallic bronze
FAS-12	High gloss black

There is one location in the back of the device where you can install a plug-in module. This can be either a Zigbee® Pro wireless plug-in module (PN VCM8000V5045P), a CO2 sensor plug-in module (PN VCM8001V5045) or a Wi-Fi plug-in module (PN VCM8002V5031). ONLY ONE DEVICE CAN BE INSTALLED AT A TIME.

Part numbers

SE8650 part numbers	RH sensor & control	PIR motion sensor	Zigbee built-in	BACnet MS/TP or Modbus	Silver fascia & casing	White fascia & casing
SE8650U0B00	x		*	x	x	
SE8650U5B00	x	x	*	x	x	
SE8650U5B00P	x	x	x	x	x	
SE8650U0B11	x		*	x		x
SE8650U5B11	x	x	*	x		x
SE8650U5B11P	x	x	x	x		x

* Note: Zigbee Pro plug-in module is available.

Accessories

Plug-in modules and fascias

Consult their respective data sheets for the latest available part numbers and features.