VT8000 Room Controllers

VZ8250 Data Sheet
Variable Air Volume (VAV) Unit
Firmware release version 2.4

Application specific and programmable Room Controller with customizable screen colors. The VZ8250 is a low voltage variable air volume and zone 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 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.
- **Flexible:** 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.
- **Customize**: supports the display of custom messages when integrated to a BACnet MS/TP or IP (requires a Wi-Fi module) system.
- **Protocols:** wired BACnet MS/TP or Wireless BACnet IP, Modbus RTU and wireless ZigBee Pro.
- **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 Multi-Purpose Manager (MPM).
- **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 motion sensor, the VZ8250 uses advanced occupancy routines to generate automatic energy savings during occupied and unoccupied periods without sacrificing comfort.

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

VICONICS
Beyond Comfort

VZ8250 Overview

Introduction

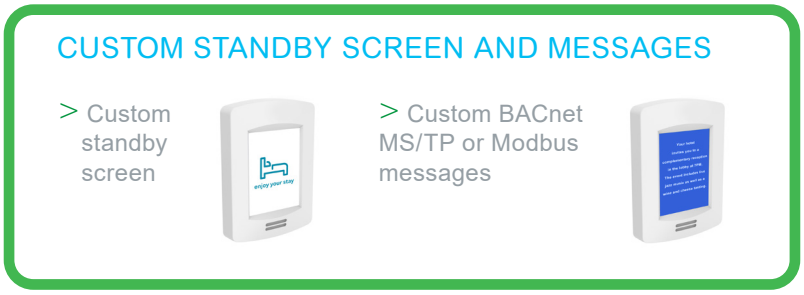
Smart energy management has never been easier than with the VZ8250 Room Controllers for Variable Air Volume (VAV) applications. Designed for new construction and retrofit projects, the Room Controllers dramatically decrease project delivery costs by reducing installation, configuration and commissioning 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 VZ8250 Room Controllers, part of the VT8000 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 VAV applications. Their configurable control sequences 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 VZ8250 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 VZ8250 is integrated via a BACnet MS/TP, BACnet IP or Modbus RTU system.



Optional Passive Infrared Motion Sensor

All models are available with a discrete optional passive infrared (PIR) motion sensor. With this sensor, the VZ8250 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 VZ8250 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.

Balancing

During balancing, a technician will install a calibrated flow sensor (Balometer) over the outlet in each room and use this to calibrate the VZ8250:

- Pressure Independent:
  - True air flow will be measured and compared to the airflow calculated by the VZ8250 at various setpoints.
  - VZ8250 calibration parameters will be adjusted by the technician to ensure the calculated air flow matches the true air flow.
- Pressure Dependent:
  - True air flow at various damper percentages will be measured and used to set the appropriate damper percentages for the air flow required for the zone.

VZ8250 Features

Product Highlights

The VZ8250 Room Controller has the following high level functionality:

- Low-voltage microprocessor-based Variable Air Volume (VAV) controller.
- Configurable to support damper control for Pressure Independent (PI) and Pressure Dependent (PD) VAV systems.
- Pre-programmed, containing all required I/O to accomplish VAV Application.
- Embedded local configuration utility using the touch screen allowing for simplified configuration, sequence selection, re-initialization, setting of setpoints and control of display settings.
- Accurate temperature control using a PI (Proportional-Integral) algorithm.
- Integrated Changeover function.
- Configurable temporary or permanent local override setpoints.
- Local or remote override during unoccupied mode.
- Adjustable local unoccupied heating and cooling setpoint limits, as well as maximum heating and minimum cooling limits.
- Adjustable dead and proportional bands.
- Remote night set back.
- Door, window, wall, ceiling or motion detection.
- Custom programs using Lua Scripts.

Communication & Connectivity

The VZ8250 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 (RS-485), as needed.

Integration to Building Management Systems (BMS)

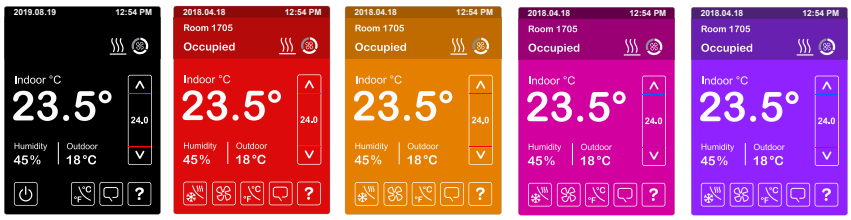
The VZ8250 Room Controller can be seamlessly integrated with the following:

- EcoStruxure™ Building Expert™, EcoStruxure Building Operation and other Schneider Electric systems.
- Most third party BMS
- Wireless integration to BACnet IP, Open Building Information Exchange (oBIX) and EcoStruxure Web Services (EWS) via MPM devices
- Direct wired integration to BACnet MS/TP and Modbus.

Custom Match Styling to Decor

- LED-backlit LCD touch screen
- 10 color options for LCD screen
- 22 selectable languages
- Over 12 screens are available for Commercial and Hospitality use cases

10 selectable screen colors



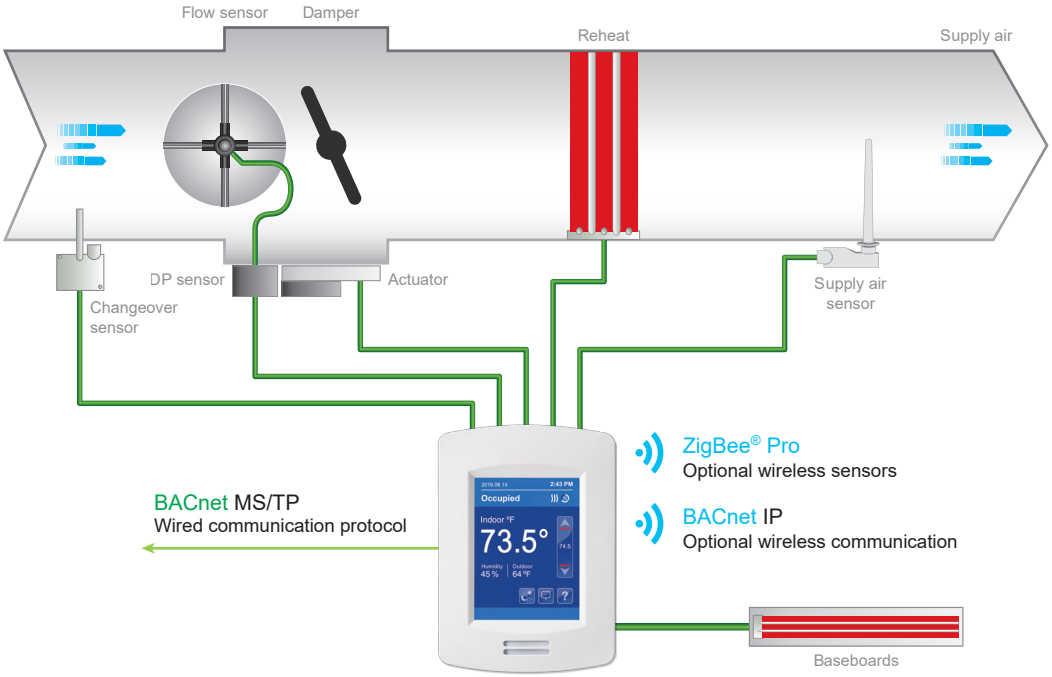
VZ8250 Applications

The VZ8250 Room Controller is a new cost-effective solution that provides contractors with an easy to implement solution for Variable Air Volume (VAV) applications. It is designed for zone temperature control in Variable Air Volume systems. An Air Handling unit and a VAV rooftop unit serve many zones within a building by supplying a varying amount of supply air at a constant supply air temperature.

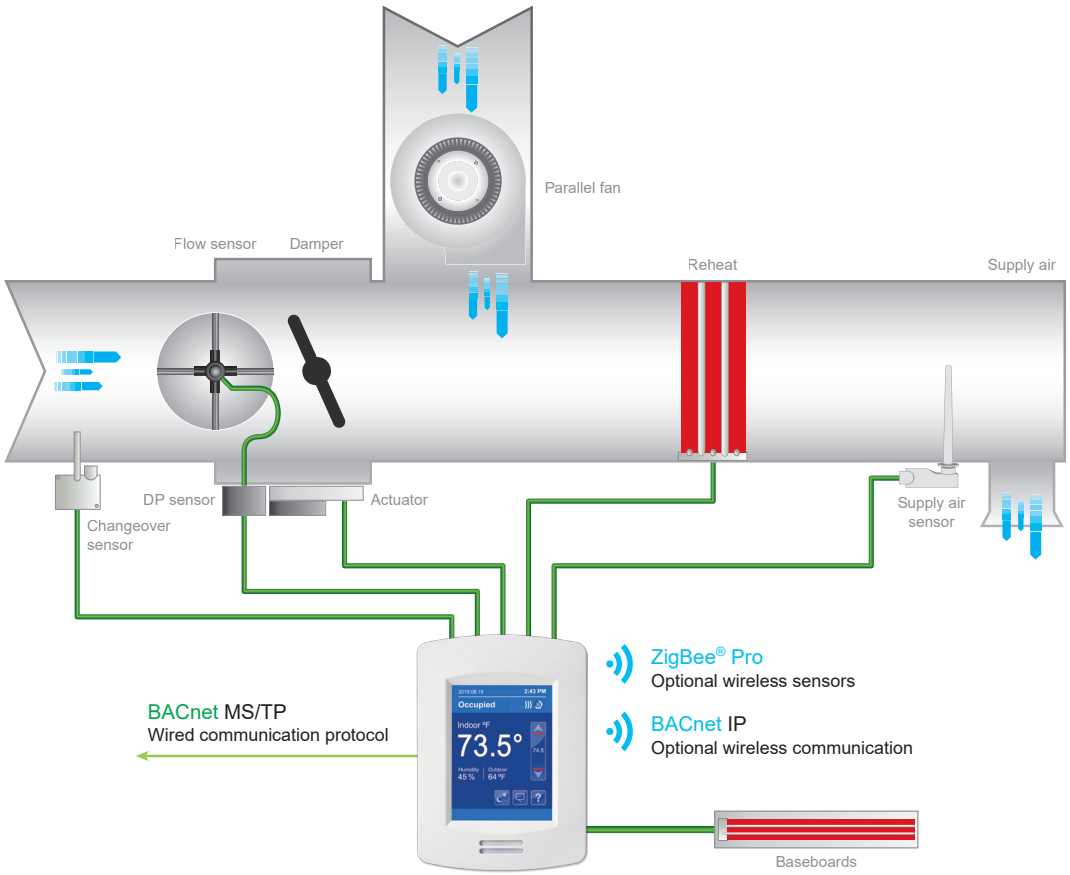
The supply air is discharged into the main duct and branches from this main duct are run to individual zones. Each zone has its own Room Controller, which in turn controls a VAV box (damper). This damper opens and closes to maintain the zone setpoint by varying the airflow to the zone.

It supports Pressure Independent (PI) operation using a differential air pressure sensor to manage air flow setpoints, and Pressure Dependent (PD) operation with approximate airflow based on balanced damper positions.

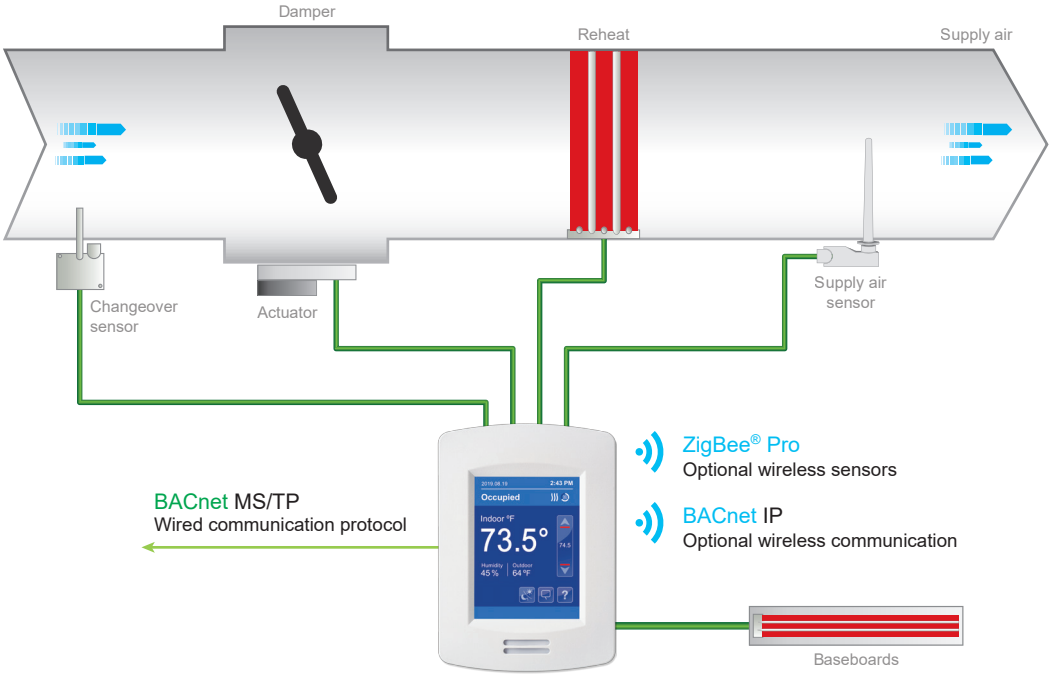
Typical Pressure Independent Application (no fan)



Typical Pressure Independent Application (parallel fan)



Typical Pressure Dependent Application (no fan)



VZ8250 Programming

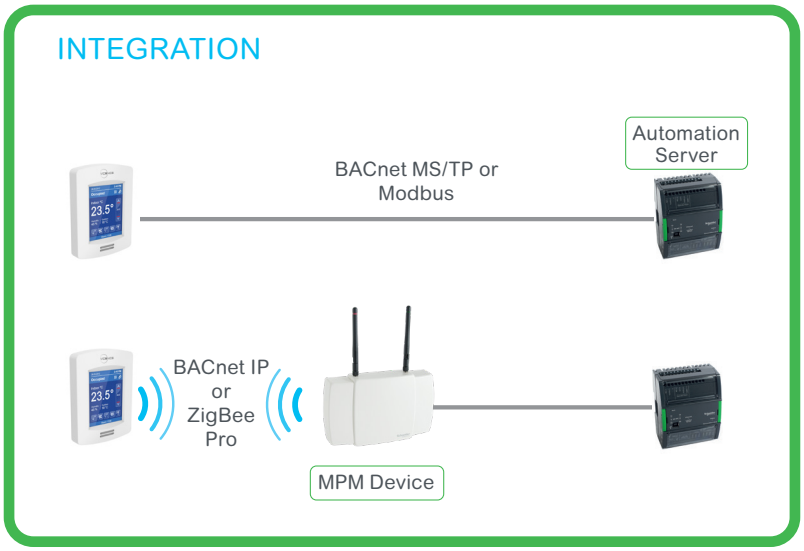
Programming with Lua: HVAC Applications and Beyond

The VZ8250 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 VZ8250'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 VZ8250 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 VZ8250 to manage other devices, such as sensors and relays.

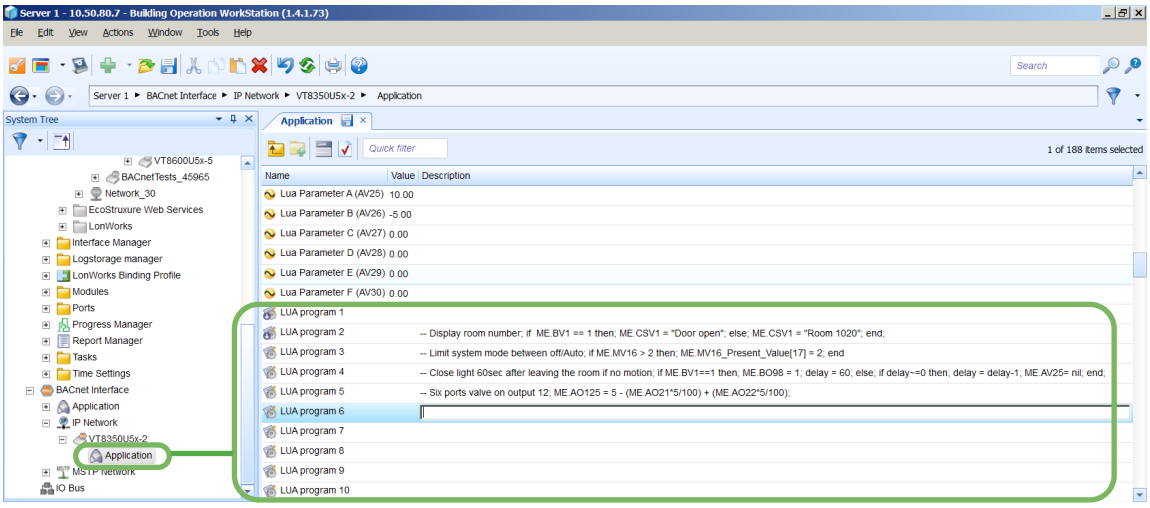
Loading Lua via BMS

When integrated into a BACnet MS/TP or IP building management system, the VZ8250 allows 10 Program BACnet objects able to contain 480 characters each. No special software, license or tool is required.



Viewing Objects in EcoStruxure Building Operation

All PG Objects of the VZ8250 Room Controller can easily be viewed through a Building Management System.



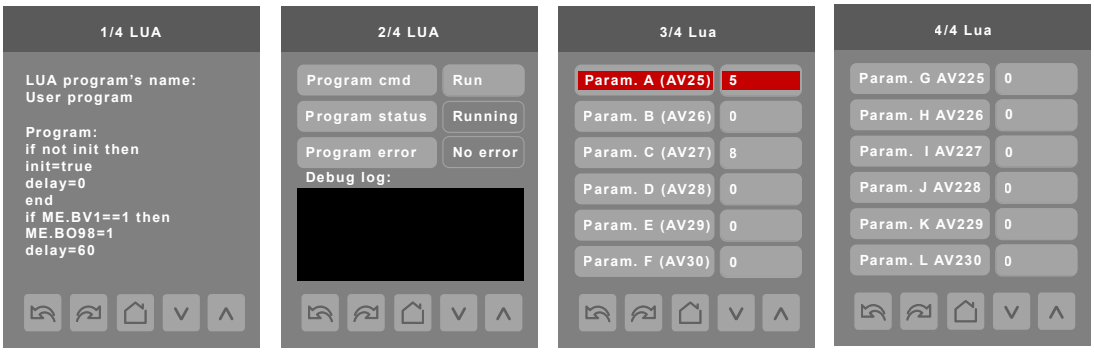
Loading Lua via USB

When there is no BACnet MS/TP, BACnet IP or Modbus integration, a Lua script can be uploaded directly into the VZ8250 unit using the 8000 Uploader Tool. Unlike the 10 PG objects used when the unit is integrated via BACnet MS/TP or Modbus, there is only one script, which can contain up to 80kBytes. In addition to Lua scripts, standby screen images and firmware upgrades can also be loaded into the VZ8250 using the 8000 Uploader Tool.

Viewing the Lua Status via VZ8250 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	**Nine Electronic Relays**: 24VAC or 24Vdc ±15% same as input power, 1.0 Amp., in-rush = 3.0 Amps; **Four Analog Outputs**: 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 calibrated
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)
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 gauge typical, 24 gauge minimum
Shipping Weight	0.34 kg (0.75 lb)

Safety and Certifications

EMC/ Safety Standards	Radio Standards (For models with ZigBee Radio)
EMV Directive 2014/30/EU	RED 2014/53/EU
FCC 15B Class B	ETSI EN 300 328
ICES-003 Class B	ETSI EN 301 489-1
	ETSI EN 301 489-17
EN 60730-1	FCC Part 15C
EN 60730-2-9	RSS-247
EN 60730-2-13	
UL 60730-1	
CAN/CSA-E60730-1	
UL 60730-2-9	
CAN/CSA-E60730-2-9	
UL60730-2-13	

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.

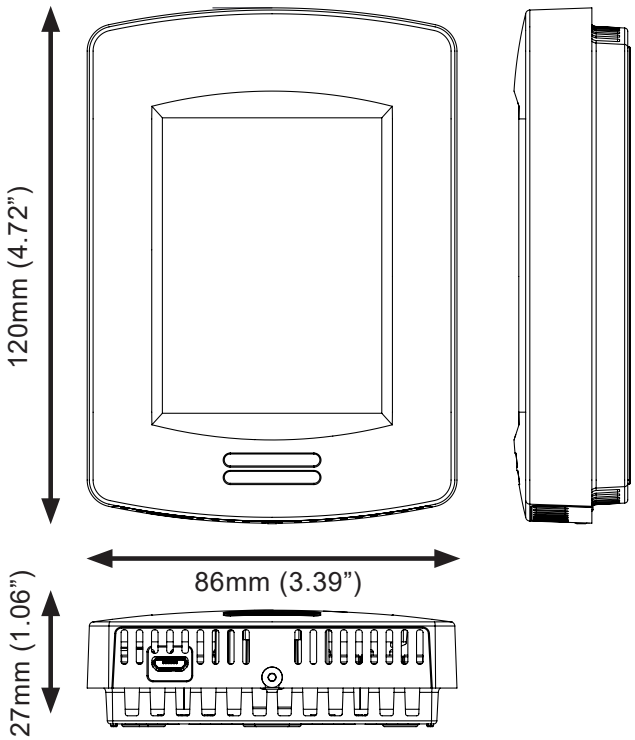
This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:
(1) This device may not cause interference; and
(2) This device must accept any interference, including interference that may cause undesired operation of the device.
In order to comply 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.

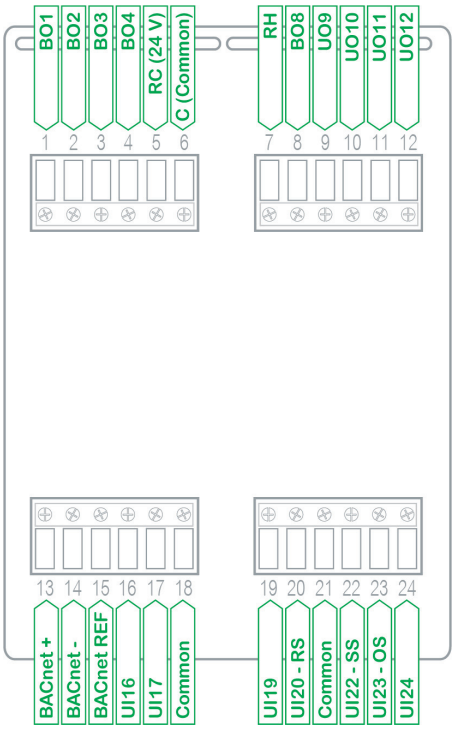
Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :
1) l'appareil ne doit pas produire de brouillage;
2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage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

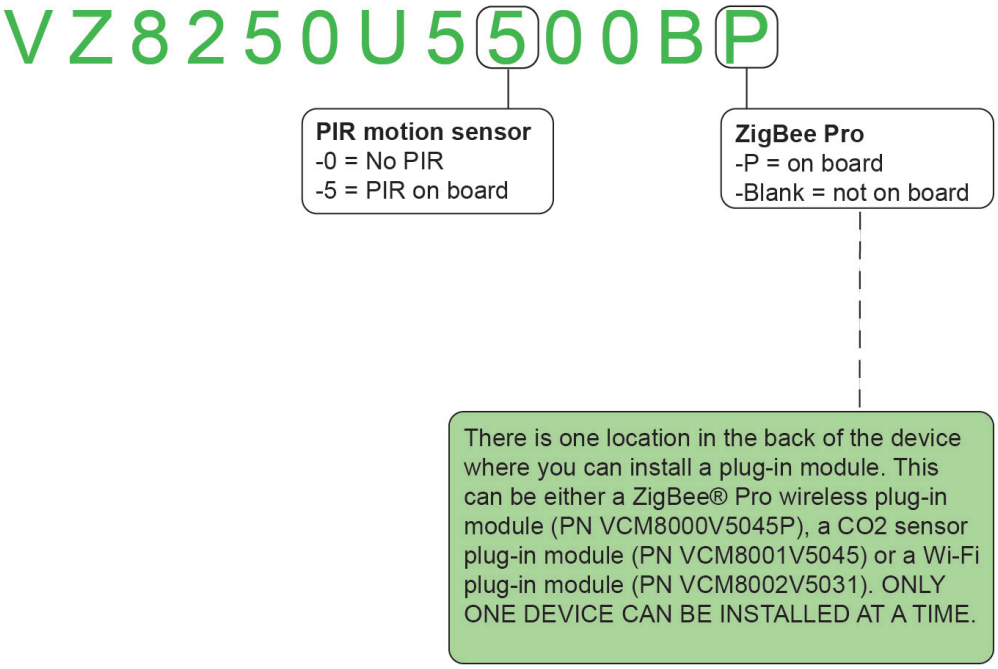
Check with your local government for instruction on disposal of this product.

Dimensions


120mm (4.72”)
86mm (3.39”)
27mm (1.06”)


BO1
BO2
BO3
BO4
RC (24 V)
C (Common)
RH
BO8
UO9
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
UI20 - RS
Common
UI22 - SS
UI23 - OS
UI24

Ordering Information



Part numbers

VZ8250 part numbers	RH sensor	PIR motion sensor	ZigBee built-in
VZ8250U5000B	x		
VZ8250U5500B	x	x	
VZ8250U5500BP	x	x	x

Part numbers

Communication modules

Consult their respective datasheets for the latest available part numbers and features