Viconics Room Controller

TRC3500
Low Voltage Fan Coil Unit (FCU) & Zone Control
Firmware Revision 2.0

Application Guide

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Overview

This new cost-effective solution for upgrading low-voltage fan coil unit thermostats requires only the TRC3500 Room Controller. The Viconics Room Controller is both application-specific AND programmable. This enables the modification of preconfigured control sequences, or the creation of entirely new control sequences for fan coil applications. Their configurable control sequences, and scheduler functionalities deliver all the flexibility necessary for optimal applications.
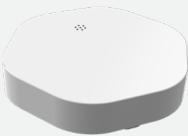
Touchscreen Room Controller	Part number	BACnet/MSTP or Modbus RTU	RF (Wi-Fi + ZB)	RH Sensor	Passive IR Sensor	Proximity Sensor	Halo Light	Color	Region
	TRC3500B11X-VC	●		●	●			White	Global
	TRC3500B11W-VC	●	●	●	●	●	●	White	Global (except NAM)
	TRC3500B11WA-VC	●	●	●	●	●	●	White	North America
	TRC3500B00X-VC	●		●	●			Black	Global
	TRC3500B00W-VC	●	●	●	●	●	●	Black	Global (except NAM)
	TRC3500B00WA-VC	●	●	●	●	●	●	Black	North America

The TRC3500 Room Controller. can also be used along with a VC2300 Relay Box for mixed-voltage solutions, when control of both line-voltage and low-voltage end devices is required.

Mixed-voltage Relay Box		Part number
	3 on/off outputs, 220/240 VAC 3 speed	VC2300E5000

Wireless accessories

The Viconics Room Controller is compatible with the following accessories.

Wireless accessories		Part number
	Wireless CO2 sensor with room temperature and humidity	SED-CO2-G-5045
	Wireless sensor with room temperature and humidity	SED-TRH-G-5045
	Wireless motion/temperature/ humidity sensor	SED-MTH-G-5045
	Wireless window/door sensor	SED-WDC-G-5045
	Wireless water leakage sensor	SED-WLS-G-5045

Examples of 1, 2 or 3-speed fan applications

The number of applications possible with the Viconics Room Controller is endless. The following table contains a list of examples:

System	Fan	Cooling	Heating	Other
4 pipes	3 speed	Tri-state valve actuator	Tri-state valve actuator	Door and motion detection + dehumidifcation
4 pipes	3 speed	0-10 Vdc valve actuator	0-10 Vdc valve actuator	Motion detection + dehumidifcation
4 pipes	3 speed	2 positions valve	2 positions valve	Motion detection + dehumidifcation
2 pipes	1 speed	2 positions valve	None	Fresh air damper
4 pipes	3 speed	0-10 Vdc valve actuator	2 positions valve actuator reheat	–
2 pipes	3 speed	0-10 Vdc valve actuator	None	–
2 pipes	3 speed	0-10 Vdc valve actuator	Electric reheat	–

Examples of ECM fan applications

The number of applications possible with the Viconics Room Controller is endless. The following table contains a list of examples:

| System	Fan	Cooling	Heating	Other
4 pipes	ECM	Tri-state valve actuator	Tri-state valve actuator	Door and motion detection + dehumidifcation
4 pipes	ECM	0-10 Vdc valve actuator	0-10 Vdc valve actuator	Motion detection + dehumidifcation
4 pipes	ECM	2 positions valve actuator	2 positions valve actuator	Motion detection + dehumidifcation
4 pipes	ECM	0-10 Vdc valve actuator	2 positions valve actuator reheat	–
2 pipes	ECM	0-10 Vdc valve actuator	None	–
2 pipes	ECM	0-10 Vdc valve actuator	Electric reheat	–

Lua4RC Programming for Viconics Room Controllers

Viconics Room Controllers can run custom applications designed to meet specific customer requirements. These scripts, referred to as Lua4RC scripts, can be developed for Integrators, or by qualified Integrators. Lua4RC adds a layer of programming on top of the embedded control logic of a Viconics Room Controller.

The script running on the Room Controller has the ability to override parameters set by the embedded application. With this added flexibility, you can adapt the control logic of the Viconics Room Controllers to meet the specific requirements of your projects.

Low Voltage Application Examples

Heating/cooling 4-pipe fan coil unit with 3-speed fan, tri-state floating valves, reheat and dehumidification sequence
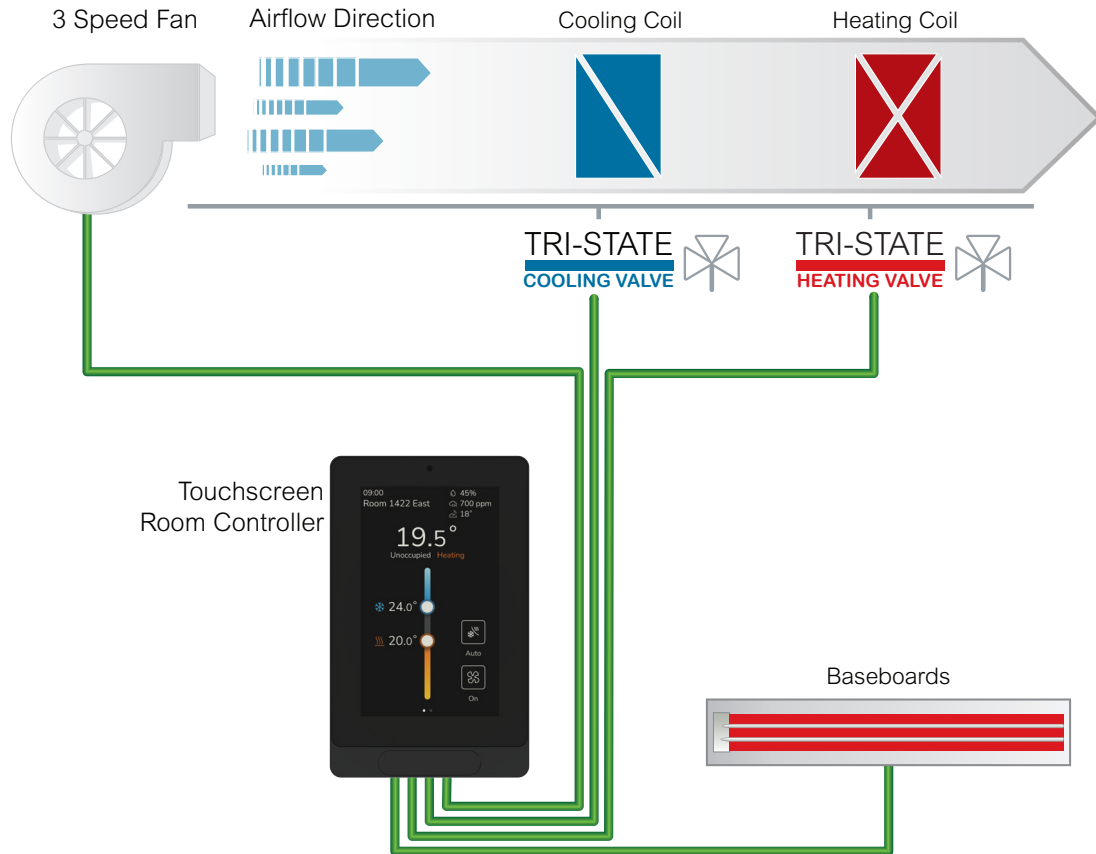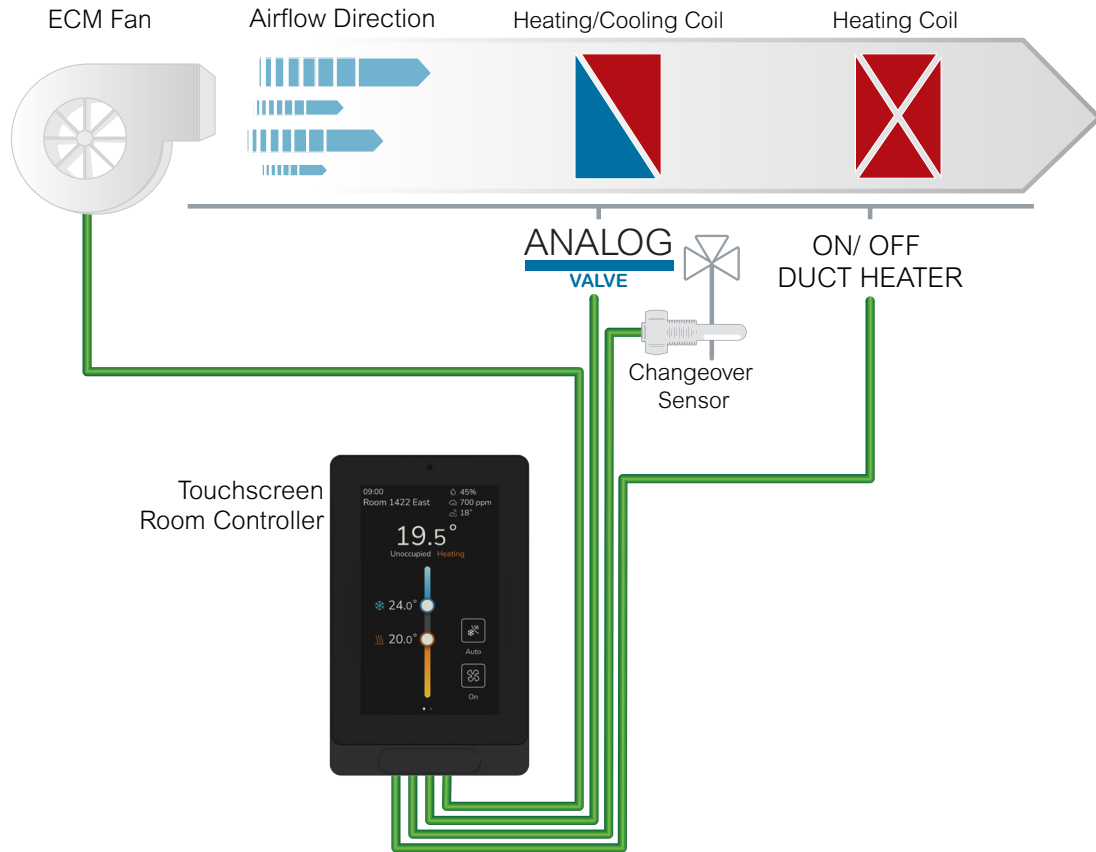

- Fan control, One, Two or Three speed (or Analog (ECM), with manual and auto speed control.

- Dehumidification using Cooling and Heating outputs, relative humidity reading from onboard sensor.

- Occupancy Schedule, onboard motion sensor and optional remote wired or wireless Motion and Door sensors.

- System modes: Off, Heat, Cool and Auto (auto changeover between heating and cooling modes).

- Effective Temperature Setpoint, for Cooling and Heating, for (Occupied and Temporary Override), Standby and Unoccupied (6 setpoints).

- Cooling output, Tri-State Floating (or On/Off or Analog), to maintain Room temperature.

- Heating output, Tri-State Floating (or On/Off or Analog), to maintain Room temperature.

- Electric baseboard, Reheat output (On/Off or PWM) to maintain Room temperature.

- Universal Inputs (8 UI) for Binary contact, 10K2 Temperature sensor and Analog signal.

- Native Wired communication protocols; Modbus RTU and BACnet MS/TP.

- Optional Wireless communication protocols; Zigbee and BACnet IP over Wi-Fi.

- LUA scrip capability to modify or to add functionalities.

Cooling with reheat 4-pipe fan coil unit with ECM fan, Analog cooling valve and On/Off heating valve
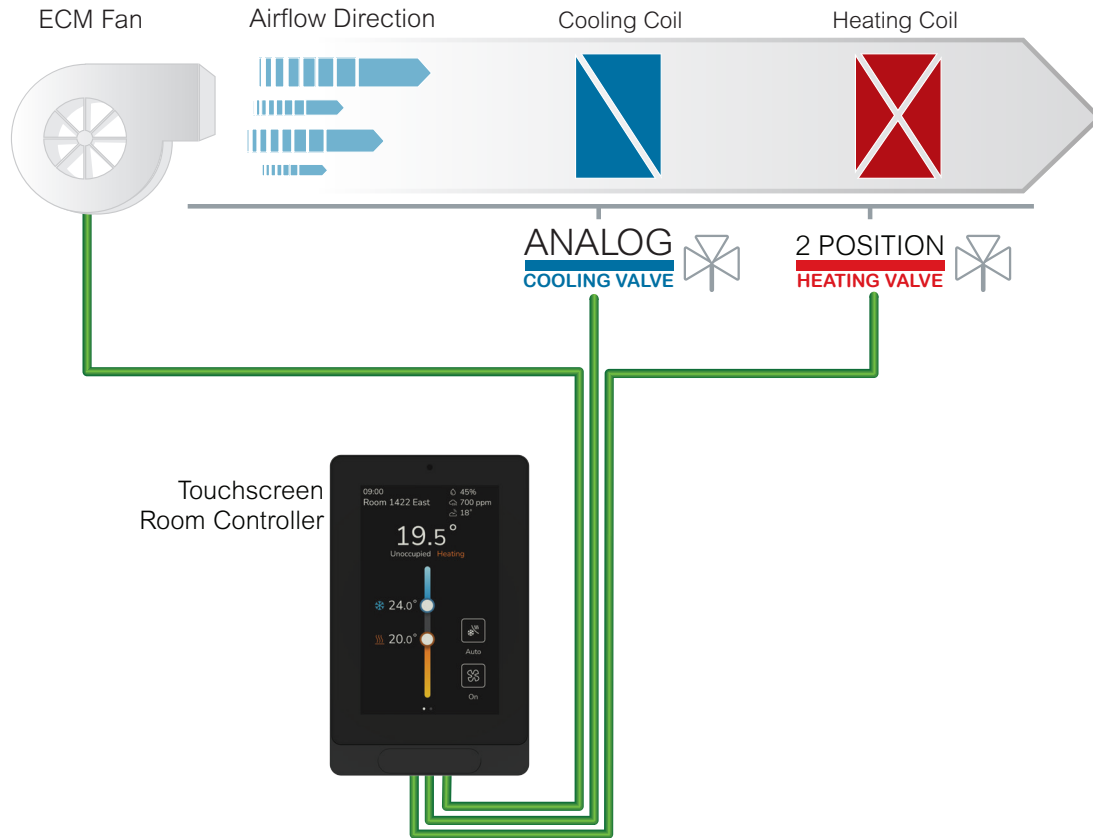
- Fan control, Analog (ECM) (or One, Two or Three speed), with manual and auto speed control.
- Occupancy Schedule, onboard motion sensor and optional remote wired or wireless Motion and Door sensors.
- System modes: Off, Heat, Cool and Auto (auto changeover between heating and cooling modes).
- Effective Temperature Setpoint, for Cooling and Heating, for (Occupied and Temporary Override), Standby and Unoccupied (6 setpoints).
- Cooling output, Analog 0-10 Vdc (or On/Off or Tri-State Floating), to maintain Room temperature.
- Heating output, On/Off, N.C. or N.O, (or Tri-State Floating or Analog) to maintain Room temperature.
- Universal Inputs (8 UI) for Binary contact, 10K2 Temperature sensor and Analog signal.
- Native Wired communication protocols; Modbus RTU and BACnet MS/TP.
- Optional Wireless communication protocols; Zigbee and BACnet IP over Wi-Fi.
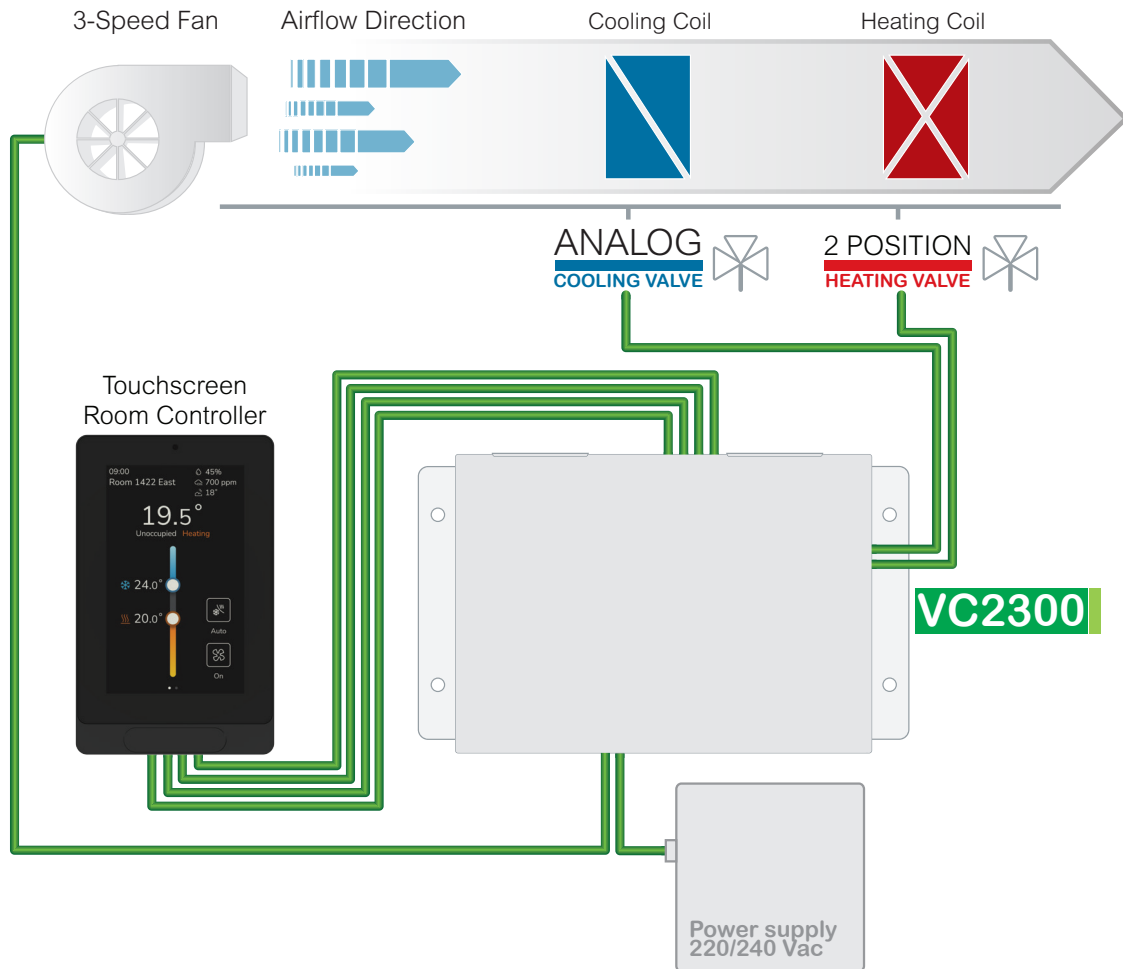- LUA scrip capability to modify or to add functionalities.

Cooling/heating 2-pipe changeover with reheat fan coil unit with ECM fan, Analog cooling valve and electric reheat for low voltage

- Fan control, Analog (ECM) (or One, Two or Three speed), with manual and auto speed control.
- Occupancy Schedule, onboard motion sensor and optional remote wired or wireless Motion and Door sensors.
- System modes: Off, Heat, Cool and Auto (auto changeover between heating and cooling modes).
- Effective Temperature Setpoint, for Cooling and Heating, for (Occupied and Temporary Override), Standby and Unoccupied (6 setpoints).
- Cooling/Heating output, Analog 0-10 Vdc (or On/Off or Tri-State Floating), to maintain Room temperature.
- Changeover water temperature sensor (10K type 2).
- Duct heater, reheat output (On/Off or PWM) to maintain Room temperature.
- Universal Inputs (8 UI) for Binary contact, 10K2 Temperature sensor and Analog signal.
- Native Wired communication protocols; Modbus RTU and BACnet MS/TP.
- Optional Wireless communication protocols; Zigbee and BACnet IP over Wi-Fi.
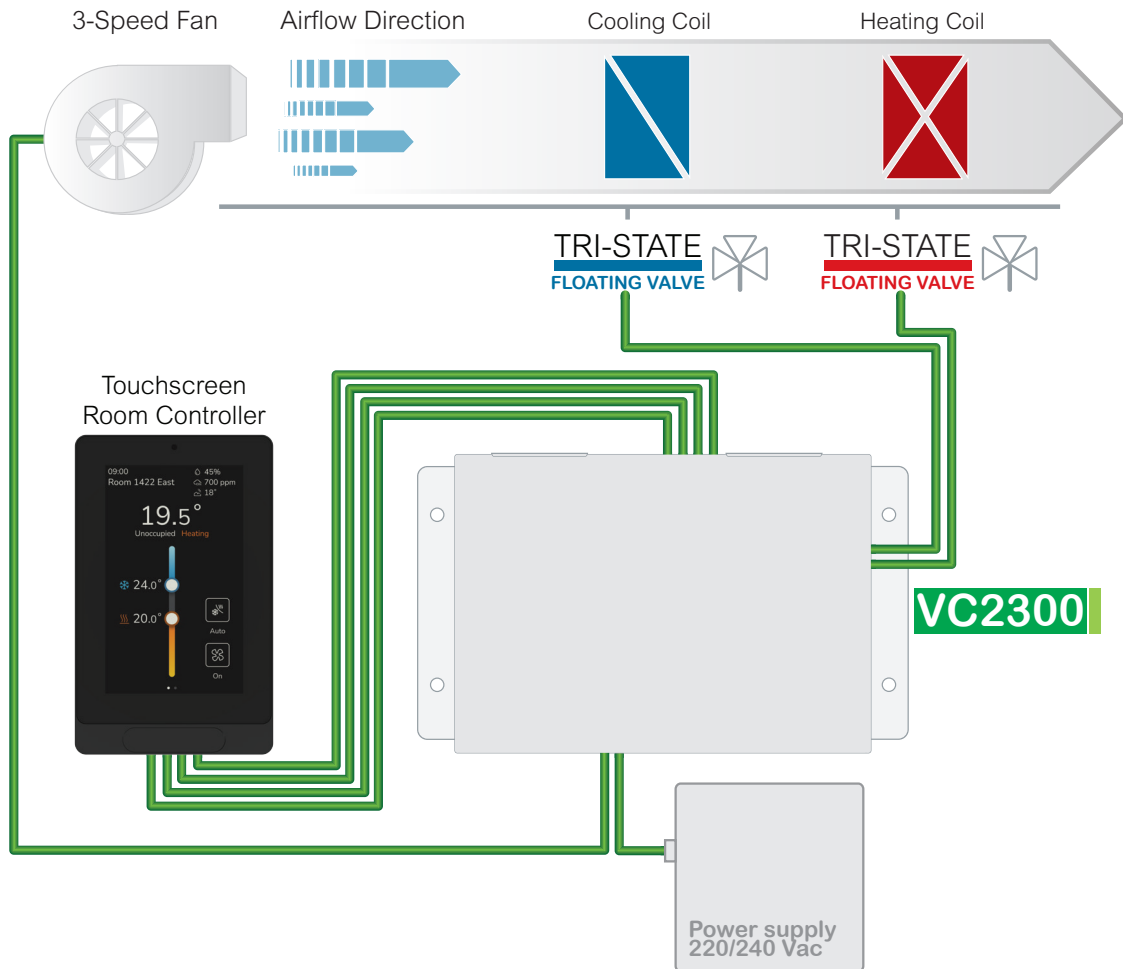- LUA scrip capability to modify or to add functionalities.

Mixed Voltage Application Examples

Heating/cooling 4-pipe fan coil unit with high voltage 3-speed fan, analog valves and electric reheat for mixed voltage

- Fan control, line-voltage One, Two or Three speed with manual and auto speed control.
- Occupancy Schedule, onboard motion sensor and optional remote wired or wireless Motion and Door sensors.
- System modes: Off, Heat, Cool and Auto (auto changeover between heating and cooling modes).
- Effective Temperature Setpoint, for Cooling and Heating, for (Occupied and Temporary Override), Standby and Unoccupied (6 setpoints).
- Cooling output, Analog 0-10 Vdc (or On/Off or Tri-State Floating), to maintain Room temperature.
- Heating output, Analog 0-10 Vdc (or On/Off or Tri-State Floating), to maintain Room temperature.
- Universal Inputs (8 UI) for Binary contact, 10K2 Temperature sensor and Analog signal.
- Native Wired communication protocols; Modbus RTU and BACnet MS/TP.
- Optional Wireless communication protocols; Zigbee and BACnet IP over Wi-Fi.
- LUA scrip capability to modify or to add functionalities.

Heating/cooling 4-pipe fan coil unit with high voltage 3-speed fan, tri-state floating valves and dehumidification sequence for mixed voltage

- Fan control, line-voltage One, Two or Three speed with manual and auto speed control.
- Dehumidification using Cooling and Heating outputs, relative humidity reading from onboard sensor.
- Occupancy Schedule, onboard motion sensor and optional remote wired or wireless Motion and Door sensors.
- System modes: Off, Heat, Cool and Auto (auto changeover between heating and cooling modes).
- Effective Temperature Setpoint, for Cooling and Heating, for (Occupied and Temporary Override), Standby and Unoccupied (6 setpoints).
- Cooling output, Tri-State Floating (or On/Off or Analog), to maintain Room temperature.
- Heating output, Tri-State Floating (or On/Off or Analog), to maintain Room temperature.
- Electric baseboard, Reheat output (On/Off or PWM) to maintain Room temperature.
- Universal Inputs (8 UI) for Binary contact, 10K2 Temperature sensor and Analog signal.
- Native Wired communication protocols; Modbus RTU and BACnet MS/TP.
- Optional Wireless communication protocols; Zigbee and BACnet IP over Wi-Fi.
- LUA scrip capability to modify or to add functionalities.

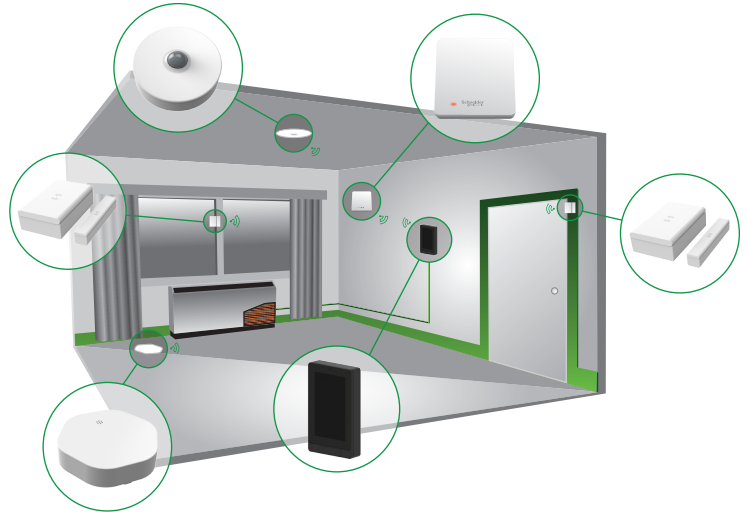# Appendices

Appendix – Wireless Sensors

Wireless ZigBee® Motion Sensors

Room Controllers with SED Series ZigBee® wireless sensors can be used in stand-alone mode, or with integration to a central management system, to allow for advanced functions such as central reservation and occupancy functions. Up to twenty different ZigBee motion sensors and sensors (SED-WDC, SED-MTH, SED-WLS, SED-CO2 or SED-TRH) can be used with a Room Controller

The SED Series sensors are factory delivered with batteries and are ready to be installed, configured, and used right out of the box. Due to the extremely small current consumption of the sensors, the expected battery life is approximately 5 years, which is equivalent to the battery shelf life.

Model Selection

Model	Part Number
Wireless window/door sensor	SED-WDC-G-5045
Wireless motion/temperature/humidity sensor	SED-MTH-G-5045
Wireless water leakage sensor	SED-WLS-G-5045
Wireless CO_2 sensor with room temperature and humidity	SED-CO2-G-5045
Wireless sensor with room temperature and humidity	SED-TRH-G-5045

TRC3500

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