Viconics Room Controller

TRC6500
Roof Top Unit (RTU), Heat Pump and Indoor Air Quality (IAQ)

Firmware Revision 2.0

Application Guide

VICONICS
Beyond Comfort

Version 2

Table of Contents

Overview

The TRC6500 Rooftop and Indoor Air Quality Controller is a new, cost-effective solution for upgrading rooftop unit thermostats. This solution allows existing wiring between the rooftop unit and the temperature controller to be re-used, reducing overall costs and installation time. The TRC6500 can also add new features like CO_2 and fresh air monitoring to the existing functions of a rooftop unit.

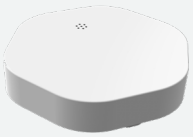
The TRC6500 Rooftop and Indoor Air Quality Controller can be configured to handle a broad variety of applications covering all the standard implementations necessary for rooftop HVAC systems.

In addition to controlling heating, cooling and air quality, depending on the model and accessories, the TRC6500 can handle Passive Infrared (PIR) occupancy detection using either onboard or remote sensors, and can have custom programs implemented to fulfill specific user requirements. The applications described here cover all these features, and in combination with the TRC6500's advanced scheduling and occupancy controls can provide the functionality for any required rooftop HVAC implementation.

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
	TRC6500B11X-VC	●		●	●			White	Global
	TRC6500B11W-VC	●	●	●	●	●	●	White	Global (except NAM)
	TRC6500B11WA-VC	●	●	●	●	●	●	White	North America
	TRC6500B00X-VC	●		●	●			Black	Global
	TRC6500B00W-VC	●	●	●	●	●	●	Black	Global (except NAM)
	TRC6500B00WA-VC	●	●	●	●	●	●	Black	North America

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

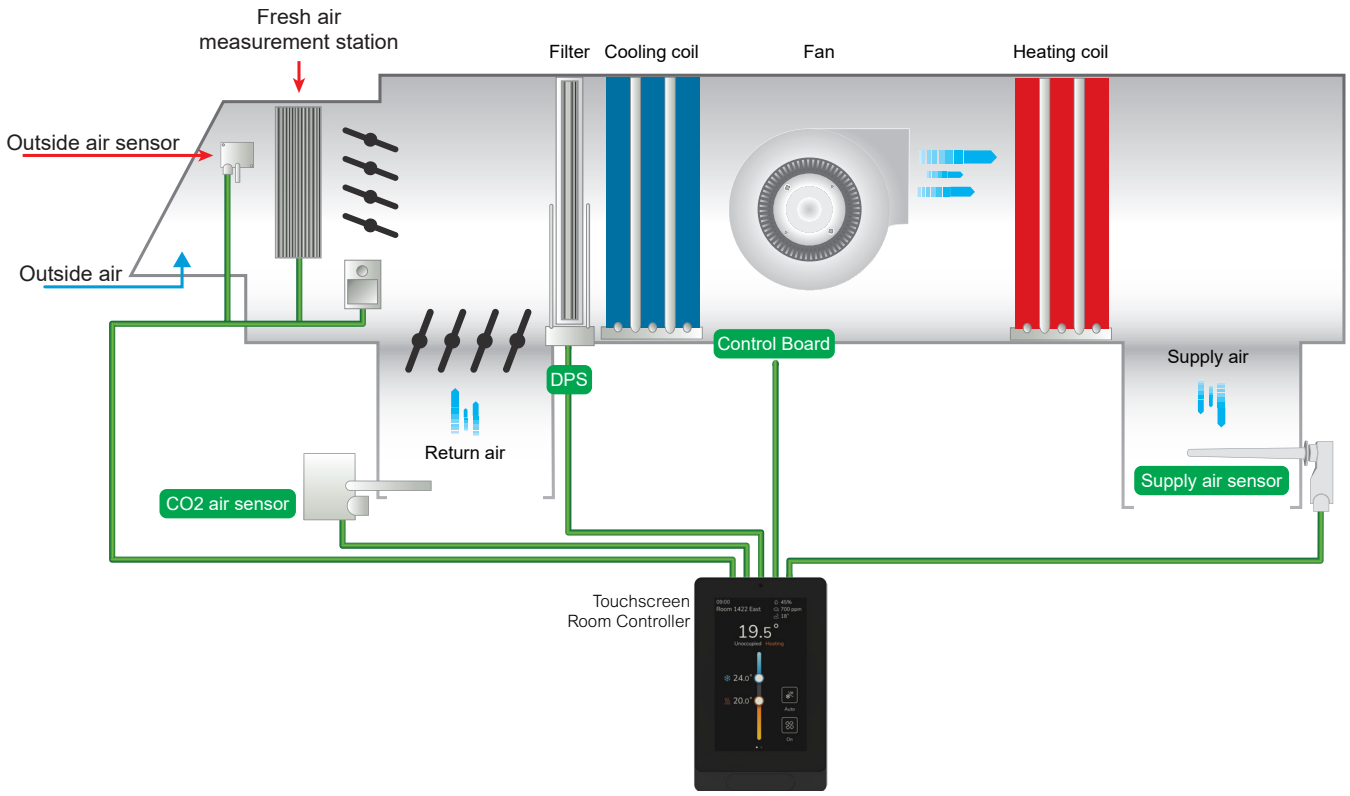
Lua4RC Programming for Viconics Room Controllers

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.

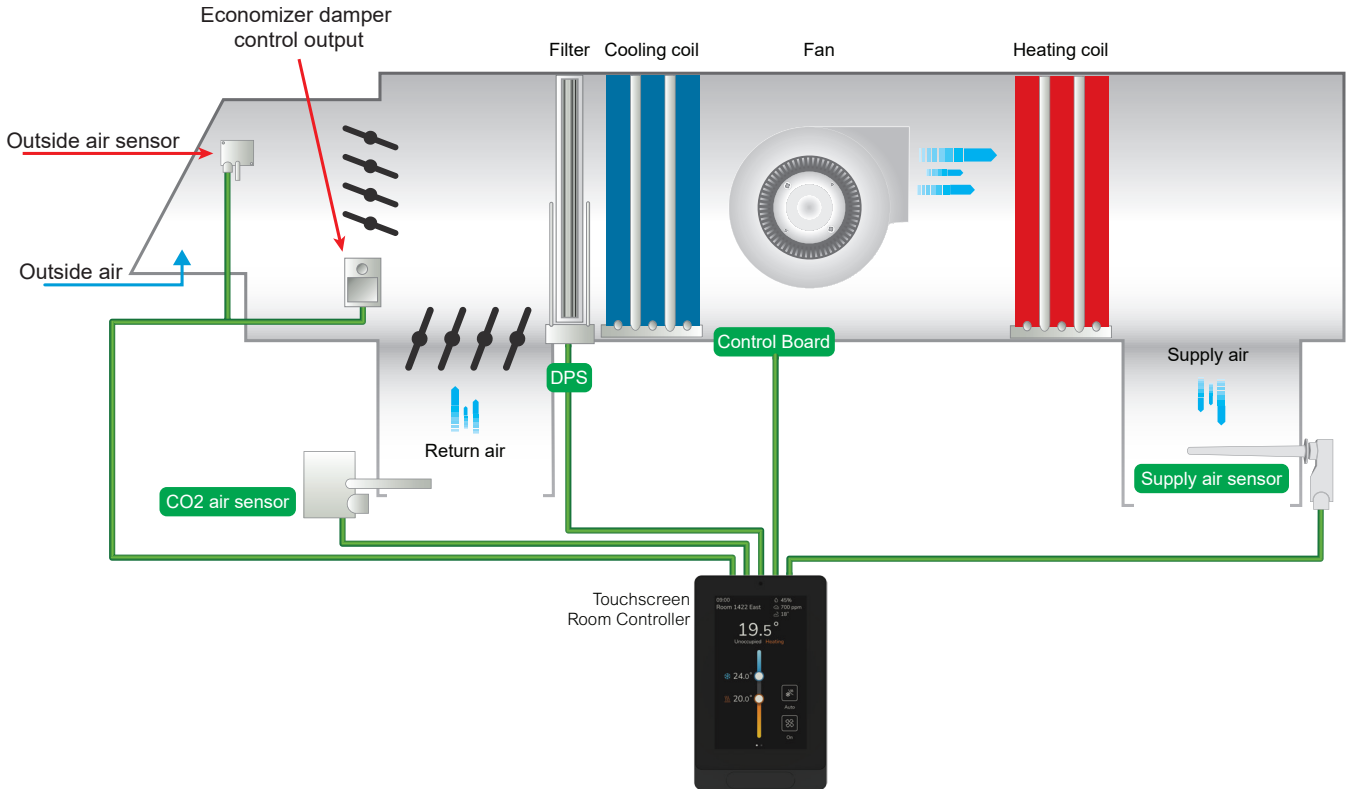
Rooftop Unit & Indoor Air Quality Application Examples

2 heating / 2 cooling for rooftop unit and indoor air quality



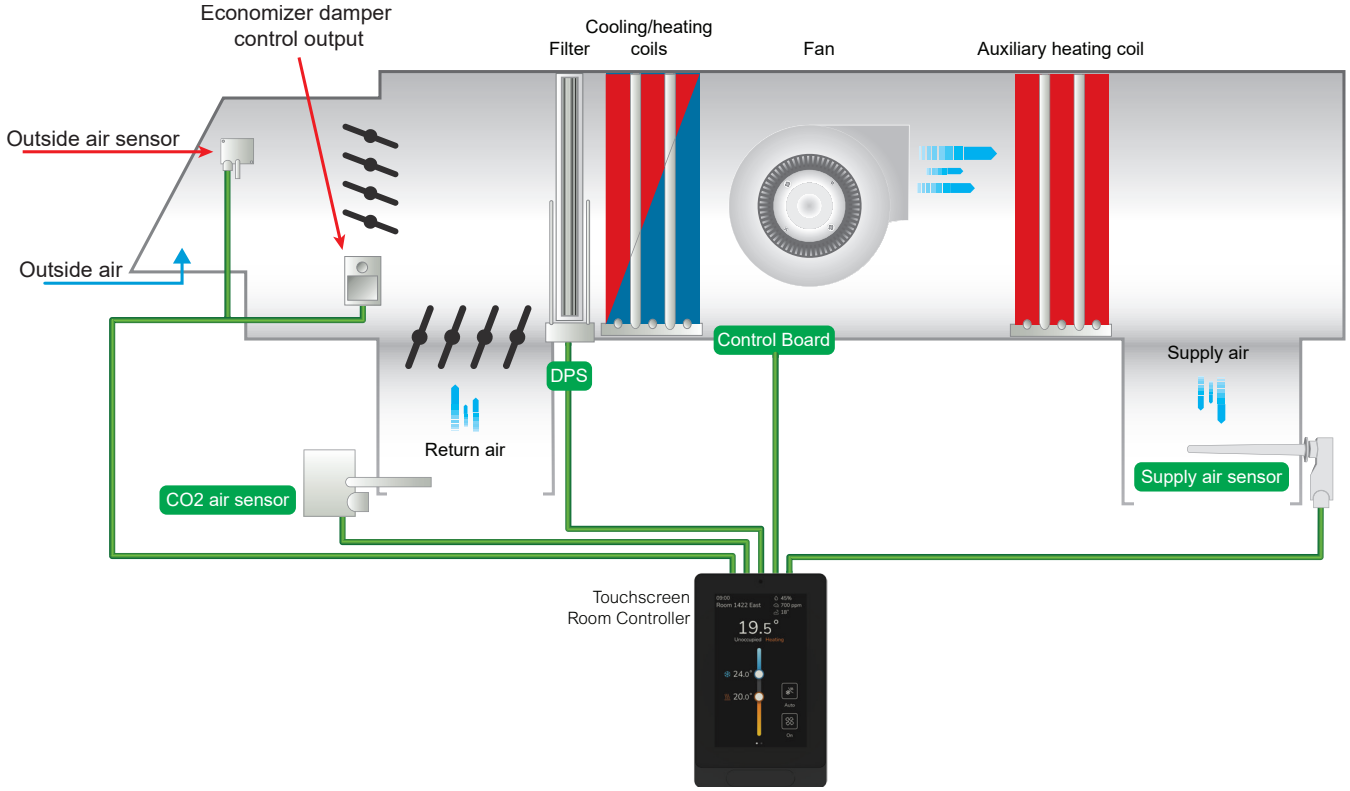
- Single speed Fan (G) with On, Auto and Smart modes.
- Modulating output (AO) for Outside Air Damper to control Airflow, CO2 and Economizer (free-cooling).
- Occupancy Schedule, built-in motion sensor and optional remote wired or wireless Motion and Door sensors.
- System modes: Off, Heat, Cool and 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).
- Two Cooling stages (Y1, Y2) to maintain Room temperature Effective Setpoint.
- Two Heating stages (W1, W2) to maintain Room temperature Effective Setpoint.
- Universal Inputs (8 UI) for Binary contact, 10K2 Temperature sensor and Analog signal.
- Auxiliary Binary output (BO) that follows the Occupancy, can be used for Lighting, Exhaust Fan, On/Off Outside Air Damper, etc.
- 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.

2 cooling / modulating heat for rooftop unit and indoor air quality



- Single speed Fan (G) with On, Auto and Smart modes.
- Modulating output (AO) for Outside Air Damper to control CO2 and Economizer (free-cooling).
- Binary output (BO) for Dehumidification control from built-in relative humidity sensor.
- Occupancy Schedule, built-in 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).
- Two Cooling stages (Y1, Y2) to maintain Room temperature Effective Setpoint.
- Modulating (AO), to maintain Room temperature Effective Setpoint and Duct Supply Air minimum temperature setpoint.
- Universal Inputs (8 UI) for Binary contact, 10K2 Temperature sensor and Analog signal.
- Auxiliary Binary output (BO) that follows the Occupancy, can be used for Lighting, Exhaust Fan, On/Off Outside Air Damper, etc.
- 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.

2 compressors for cooling / heating and 1 auxiliary heat for heat pump and indoor air quality



- Single speed Fan (G) with On, Auto and Smart modes.
- Modulating output (AO) for Outside Air Damper to control Airflow, CO2 and Economizer (free-cooling).
- Occupancy Schedule, built-in 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).
- Two Cooling/Heating stages (Y1, Y2) to maintain Room temperature Effective Setpoint.
- Reversing Valve control (O/B) for Heat Pump.
- One Auxiliary Heating stage (W1 or Modulating (AO)) to maintain Room temperature Effective Setpoint and Duct Supply Air minimum temperature setpoint (if Modulating).
- Universal Inputs (8 UI) for Binary contact, 10K2 Temperature sensor and Analog signal.
- Auxiliary Binary output (BO) that follows the Occupancy, can be used for Lighting, Exhaust Fan, On/Off Outside Air Damper, etc.
- 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

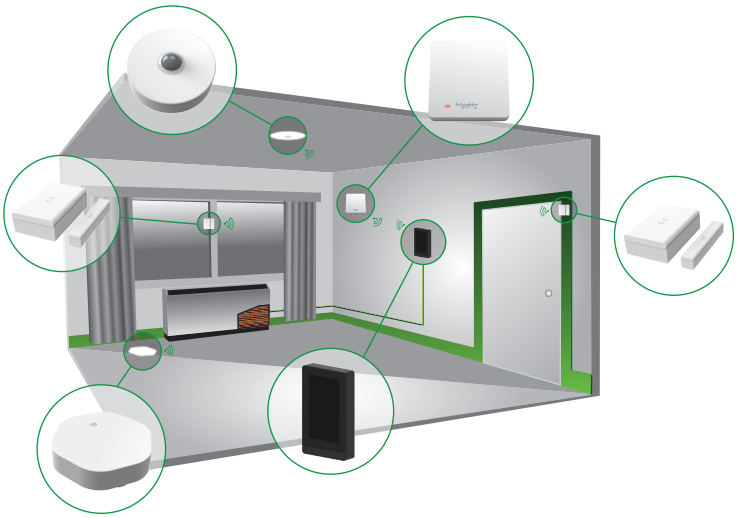
Wireless ZigBee® Motion Sensors

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 CO2 sensor with room temperature and humidity	SED-CO2-G-5045
Wireless sensor with room temperature and humidity	SED-TRH-G-5045



TRC6500

www.viconics.com

998-22956703-2_EN, September 2024