

Excel 10 W7750A,B Constant Volume AHU Controller

EXCEL 5000 **OPEN**™
S Y S T E M

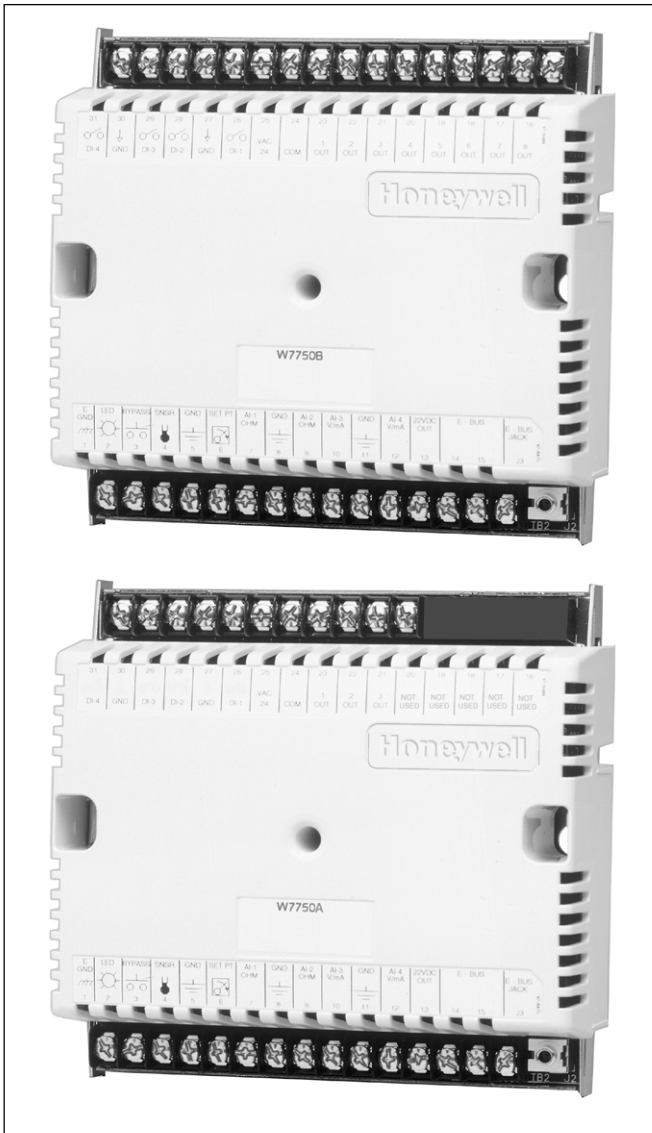
SPECIFICATION DATA

GENERAL

The W7750A,B is the Constant Volume Air Handling Unit (CVAHU) Controller in the Excel 10 product line family. The CVAHU is a LonMark® compliant device designed to control single zone and heat pump air handlers.

FEATURES

- Controls single zone and heat pump Air Handling Unit.
- Uses Echelon® LonWorks® network (E-Bus) communications protocol.
- High-speed 78 kilobit communications network.
- Conforms with Echelon® LonMark® HVAC Interoperability standard for Roof Top Unit controllers (profile number 8030).
- Free Topology Transceiver (FTT) network technology is insensitive to polarity, simplifying installation.
- Capable of stand-alone operation and has enhanced features available when using the E-Bus network communications.
- 120 controllers per Q7750A Excel 10 Zone Manager.
- Designed for both staged heating/cooling control and modulating heating/cooling control.
- Uses either Series 60 Floating Control (W7750A and B) or PWM (W7750B only) providing modulating control for heating/cooling equipment.
- Supports two types of economizer control, modulating control and enable/disable control.
- Provides Proportional Integral Derivative (PID) temperature control.
- Uses an adaptive algorithm (patent pending) that continuously adjusts the discharge air setpoint as needed.
- Factory configured via EEPROM with critical user parameter default values.
- Motion sensor interface for enhanced energy savings.
- Window sensor input for additional energy savings.



DESCRIPTION

The W7750A,B is the Constant Volume Air Handling Unit (CVAHU) Controller in the Excel 10 product line family. The CVAHU is a LonMark® compliant device designed to control single zone and heat pump air handlers.

Control Techniques Supported (Heating and Cooling):

Output capacity:

W7750A—Six digital outputs
W7750B—Eight digital outputs

- Heat pump control: Up to four compressors and up to four stages of auxiliary heat.
- Up to four stages of electric or gas fired heating.
- Up to four stages of mechanical cooling.
- Floating hot water or steam heat.
- Pulse width modulated heat (W7750B only).
- Floating chilled water cooling.
- Pulse width modulating cooling (W7750B only).
- Floating mixed air damper output.
- Pulse width modulating mixed air damper output, (W7750B only).
- Occupancy sensor override and window open override.

SPECIFICATIONS

Models: W7750A,B

The W7750 is field mounted at or near the Air Handling Unit or Heat Pump. The W7750 can also be mounted using DIN rail and two each 2TK2D Augat DIN rail adapters (purchase locally). Field wiring 14 to 22 AWG (2.0 to 0.34 mm²) attaches to screw terminals. To access the network for E-Bus communications an operator plugs into the E-Bus jack with an E-Bus Serial Interface Cable.

Inputs/Outputs:

The W7750A Unit supports the following hardware features:

- Three 20 Kohm NTC (10,000 through 80,000 ohm) or PT3000 (250 through 12,000 ohm) resistive analog inputs (one reserved for space temperature and one reserved for the setpoint knob).
- Three dry contact digital inputs (one reserved for the Bypass pushbutton).
- LED digital output (*only* for the wall module LED) 2.5V at 3 mA.
- Six 24 Vac relay digital outputs (1.5A relays rated at 7.5A inrush current).

The W7750B Unit supports the following hardware features:

- Four 20 Kohm NTC (10,000 through 80,000 ohm) or PT3000 (250 through 12,000 ohm) resistive analog inputs (one reserved for space temperature and one reserved for the setpoint knob).
- Two 0.2 to 10 VDC or 4 to 20 mA (user selectable) analog inputs.
- Five dry contact digital inputs (one reserved for the Bypass pushbutton).
- Eight 24 Vac Triac digital outputs (500 mA MAX).
- LED digital output (*only* for the wall module LED) 2.5V at 3 mA.
- One 22 Vdc power supply for auxiliary devices with a maximum current of 50 mA.

Analog Inputs:

Space Temperature:

Type: RTD.
Supported Sensors: T7770A,B,C,D; T7780A.

Discharge Air Temperature:

Type: RTD.
Supported Sensors: C7100A1015*, C7770A1006, C7031B1033, C7031C1031, C7031D1062, C7031F1018, C7031J1050, C7031K1017.

Outdoor Air Temperature:

Type: RTD.
Supported Sensors: C7170A1002.

Return Air Temperature:

Type: RTD.
Supported Sensors: C7100A1015*, C7770A1006, C7031B1033, C7031C1031, C7031D1062, C7031F1018, C7031J1050, C7031K1017.

Outdoor Air Humidity (W7750B only):

Type: Voltage/Current.
Supported Sensors: C7600B1000 and C7600B1018 (2 to 10V), C7600C1008 (4 to 20mA).

Return Air Humidity (W7750B only):

Type: Voltage/Current.
Supported Sensors: C7600B1000 and C7600B1018 (2 to 10V), C7600C1008 (4 to 20mA).

Outdoor Air Enthalpy (W7750B only):

Type: Current.
Supported Sensors: C7400A1004 (4 to 20mA).

Return Air Enthalpy (W7750B only):

Type: Current.
Supported Sensors: C7400A1004 (4 to 20mA).

Air Filter Differential Pressure (W7750B only):

Type: Voltage.
Supported Sensors: Third party 2 to 10V, 0 to 5 inw (0 to 1.25 kPa) differential pressure sensors.

* The PT3000 sensor is not recommended for floating control (real time - discharge or return configured as space sensor). The PT3000 sensor is intended for monitoring or differential (staged) control

CO₂ Sensor (W7750B only):

Type: Voltage.

Supported Sensors: Third party 0 to 10V, 0 to 2000 ppm CO₂ sensors.

Monitor Sensor for network use (W7750B only):

Type: Voltage.

Supported Sensors: Third party 2 to 10V, 2 to 10 volts displayed.

Digital Inputs:

Dry-contact inputs are sensed using a 9 milliamp at 4.8 volts detection circuit. It is very important that the device used contains high quality, noncorroding contacts with resistivity that does not degrade; that is, increase over time. Use noble metal (such as gold or silver), or pimpled or sealed contacts to assure consistent, long-term operation.

Two of the following Digital Inputs (DIs) can be configured when using the W7750A, and four of the following when using the W7750B:

- Fan Status: Contact Closed = Fan on
- IAQ Switch: Contact Closed = Poor Air Quality
- Time Clock: Contact Closed = Occupied Mode; Contact Open = Unoccupied Mode
- Schedule Master: Contact Closed = Local time clock is used as master time clock
- Economizer Enable Signal: Contact Closed = Economizer Enabled for cooling use
- Smoke Monitor: Contact Closed = Smoke Detected
- Dirty Filter: Contact Closed = Dirty Filter
- Shutdown Signal: Contact Closed = Shut off all equipment
- Occupancy Switch: Contact Closed = Room is Occupied; Contact Open = Room is Unoccupied
- Window Monitor: Contact Closed = Window is Closed
- Wall Module Bypass Pushbutton: Momentary DI (See Appendix B—System Engineering Form, 74-2958.)

Triac Outputs (W7750B only):

Triac Outputs on the W7750B Model:

- Power ratings: 20 Vac to 30 Vac at 25 mA MIN to 500 mA MAX current for any voltage.

Power Supply Requirements

24 Vac with a valid range of 20 to 30 Vac at 50/60 Hz. Controller uses 6 VA maximum at both 50 and 60 Hz.

CPU

Motorola or Toshiba 3150 Neuron™ processor, containing three eight-bit CPU's. Each Neuron has a unique 48-bit network identification number.

Memory Capacity

The W7750A,B Controller uses a 64K ROM/PROM (16K reserved for network operations, 48K usable for control algorithm code).

512 bytes EEPROM
2K RAM

Specified Space Temperature Sensing Range

45° to 99°F (7° to 37°C) with an allowable control setpoint range from 50° to 90°F (10° to 32°C) when initiated from the network and 55° to 85°F (13° to 29°C) when configured and connected to a T7770 Wall Module or a T7780A Digital Display Wall Module (DDWM).

Communications

The W7750A,B Controller uses a Free Topology Transceiver (FTT) transformer-coupled communications port running at 78 kilobits per second (kbs). Using the transformer-coupled communications interface offers a much higher degree of common mode-noise rejection while assuring dc isolation. The E-Bus is insensitive to polarity, eliminating installation errors due to miswiring.

The maximum E-Bus network length is 5000 ft (1524m). With the addition of a Q7751A Router, the maximum length of the E-Bus network can increase to 10,000 ft (3048m).

The maximum number of nodes per E-Bus segment is 60.

The maximum number of nodes per Q7750A Zone Manager FTT network is 120.

Approved cable types for E-Bus communications wiring is Level IV 22 AWG (0.34 mm²) plenum or nonplenum rated unshielded, twisted pair, solid conductor wire. For nonplenum areas, use Level IV 22 AWG (0.34mm²) such as US part AK3791 (one pair) or US part AK3782 (two pair). In plenum areas, use plenum-rated Level IV 22 AWG (0.34 mm²) such as US part AK3791 (one pair) or US part AK3792 (two pair). Additionally, Echelon® approved cable can be used. Contact Echelon® Corp. Technical Support for the recommended vendors of Echelon® approved cables.

LonMark® Functional Profile

W7750 Controllers support the LonMark® Functional Profile number 8030 Roof Top Unit Controller, version 1.0 (see Fig. 1).

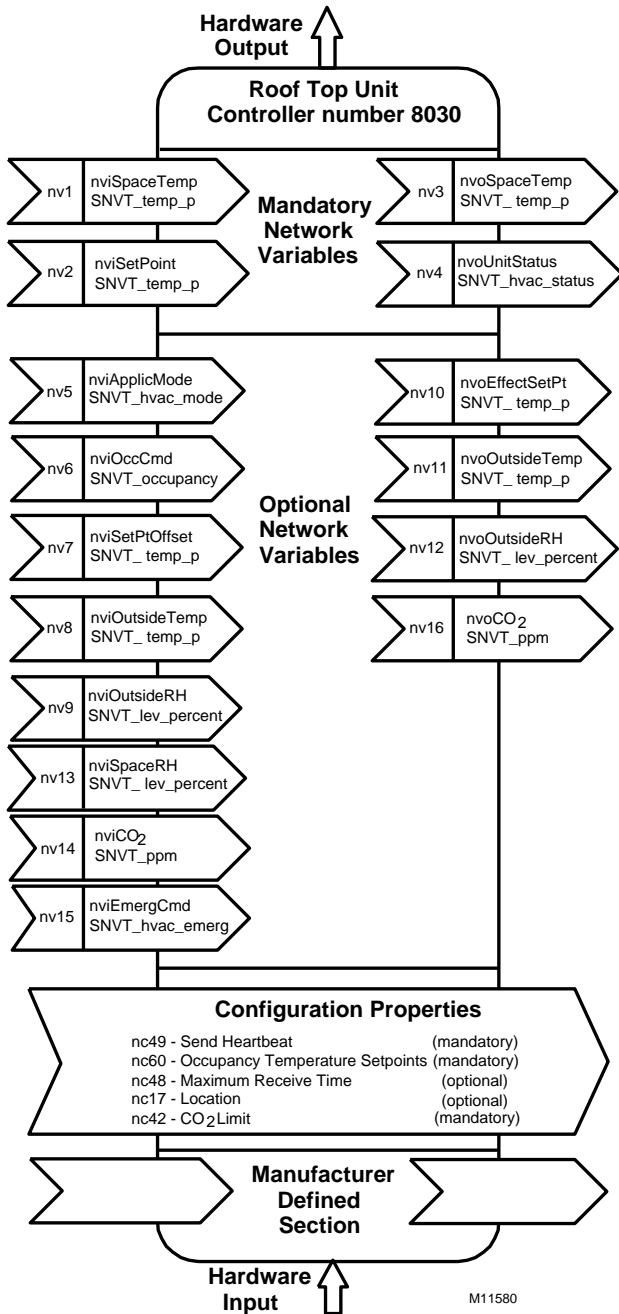


Fig. 1. Functional profile of LonMark® RTU object details.

Dimensions (H/W/D):

W7750A,B: 5-5/8 x 6 x 2-1/8 in. (143 x 152 x 54 mm).

Environmental Ratings:

Operating Temperature: -40° to 150°F (-40° to 65.5°C).
Shipping Temperature: -40° to 150°F (-40° to 65.5°C).

Relative Humidity:

5% to 95% noncondensing.

Vibration:

V2 level compliant.

Corrosion:

The W7750 is not sealed against corrosive vapors or compounds.

Approval Bodies:

- The W7750A,B is listed under UL 916 (E87741) and is also listed under cUL (E87741).
- The W7750 meets FCC part 15 Class B requirements.
- The W7750 conforms to requirements per European Consortium standards EN50081-1 (CISPR 22 Class B) and EN 50082-1 (IEC 801-2, IEC 801-3 and IEC 801-4) for CE mark labeling.

Accessories:

- Excel 10 T7770A,B,C,D Wall Modules.
- Excel 10 T7780A Digital Display Wall Module.
- Excel 10 C7770A Air Temperature Sensor.
- Excel 10 Q7750A FTT Zone Manager.
- Excel 10 Q7751A,B Router.
- Excel 10 Q7752A Serial Interface.
- Excel 10 Connector Cable 205979 from the Excel 10 Q7752A Serial Interface to an Excel 10 Controller or Wall Module.
- Excel 10 Q7740A,B FTT Repeaters
- 209541B FTT Termination Module

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