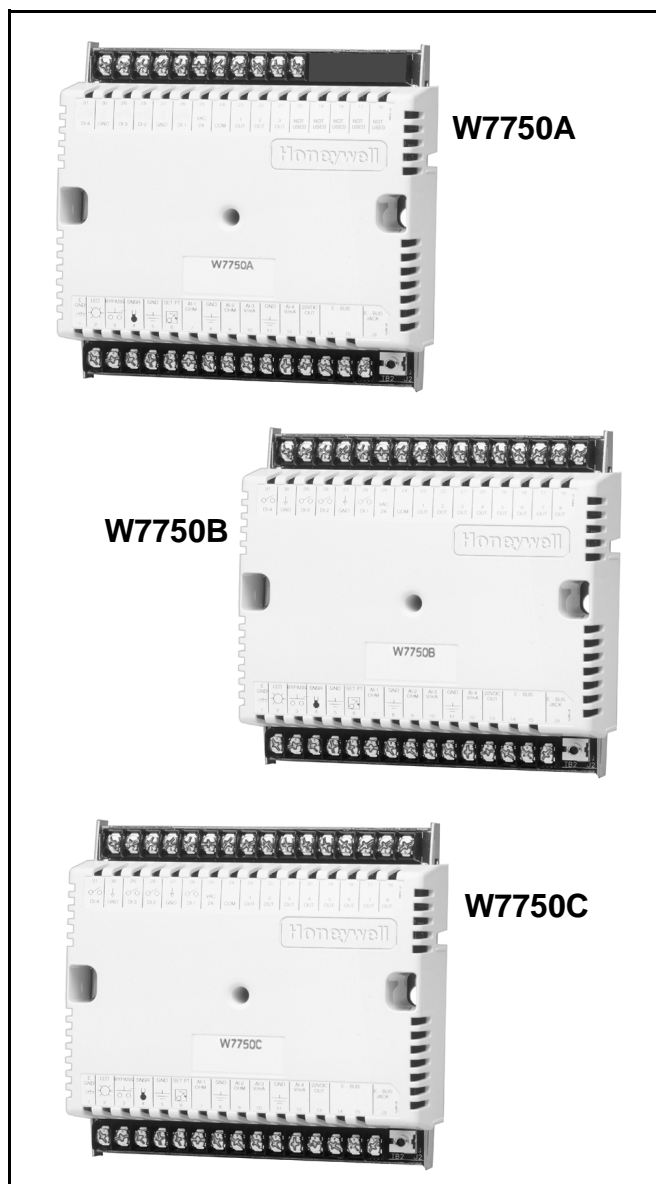




## Excel 10 W7750A,B,C CONSTANT VOLUME AHU CONTROLLER

### SPECIFICATION DATA



### FEATURES

- Controls single zone and heat pump Air Handling Unit.
- Uses Echelon® LONWORKS® network communications protocol.
- 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 LONWORKS 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,B,C) or PWM (W7750B,C only) providing modulating control for heating/cooling equipment.
- W7750B provides selectable High-Side/Low-Side switching using a jumper.
- W7750C provides High-Side switching of digital output loads.
- 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.

### GENERAL

The W7750A,B,C 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.



## DESCRIPTION

The W7750A,B,C 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

W7750C—Five digital outputs, three analog 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,C only).
- Floating chilled water cooling.
- Pulse width modulating cooling (W7750B,C only).
- Floating mixed air damper output.
- Pulse width modulating mixed air damper output, (W7750B,C only).
- Occupancy sensor override and window open override.

## SPECIFICATIONS

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 Thomas and Betts part number TKAD DIN rail adapters (purchase locally). Field wiring 14 to 22 AWG (2.0 to 0.34 mm<sup>2</sup>) attaches to screw terminals. To access the network for LONWORKS Bus communications an operator plugs into the LONWORKS Bus jack with an LONWORKS Bus Serial Interface Cable.

### Model W7750A 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).

### Models W7750B,C Inputs/Outputs:

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 2 to 10 Vdc or 4 to 20 mA (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 wall module LED) 2.5V at 3 mA.
- One 20 Vdc power supply for auxiliary devices with a maximum current of 50 mA.

NOTE: The W7750C Unit supports the same hardware as the W7750B except it has five 24 Vac Triac digital outputs (500 mA MAX) and three analog outputs (4 to 20 mA).

### ANALOG INPUTS:

#### Space Temperature:

Type: RTD.

Supported Sensors: T7770A,B,C,D.

#### Discharge Air Temperature:

Type: RTD.

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

#### Outdoor Air Temperature:

Type: RTD.

Supported Sensors: C7170A1002, C7031F1018.

#### Return Air Temperature:

Type: RTD.

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

#### Outdoor Air Humidity (W7750B,C only):

Type: Voltage/Current.

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

#### Return Air Humidity (W7750B,C only):

Type: Voltage/Current.

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

#### Outdoor Air Enthalpy (W7750B,C only):

Type: Current.

Supported Sensors: C7400A1004 (4 to 20mA).

#### Return Air Enthalpy (W7750B,C only):

Type: Current.

Supported Sensors: C7400A1004 (4 to 20mA).

#### Air Filter Differential Pressure (W7750B,C 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.

#### CO<sub>2</sub> Sensor (W7750B,C only):

Type: Voltage.

Supported Sensors: Third party 0 to 10V, 0 to 2000 ppm CO<sub>2</sub> sensors.

**Monitor Sensor for network use (W7750B,C 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,C:

- 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,C ONLY):**

Triac Outputs on the W7750B,C Models:

- 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 for the W7750A and 12 VA for the W7750B,C) maximum at both 50 and 60 Hz.

**CPU**

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

**Memory Capacity**

The W7750A,B,C 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.

**Communications**

The W7750A,B,C 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 LONWORKS Bus is insensitive to polarity, eliminating installation errors due to miswiring.

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

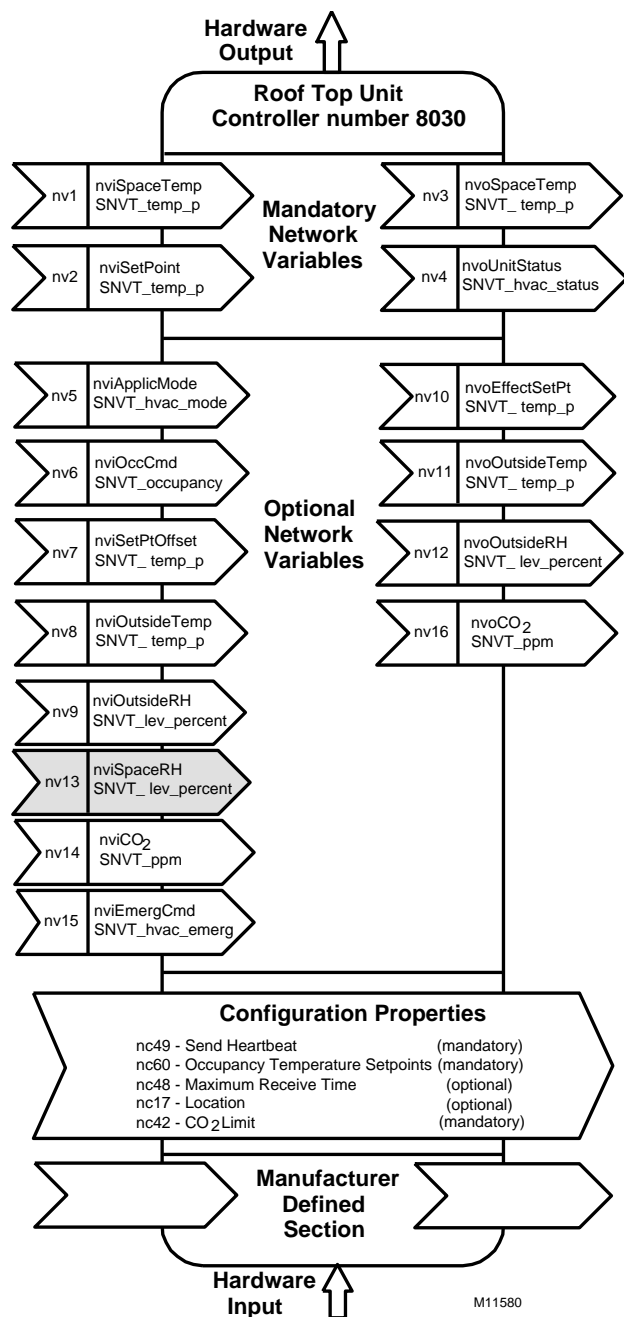
The maximum number of nodes per LONWORKS Bus segment is 60.

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

Approved cable types for LONWORKS Bus communications wiring is Level IV 22 AWG (0.34 mm<sup>2</sup>) plenum or nonplenum rated unshielded, twisted pair, solid conductor wire. For nonplenum areas, use Level IV 22 AWG (0.34mm<sup>2</sup>) such as U.S. part AK3791 (one pair) or U.S. part AK3782 (two pair). In plenum areas, use plenum-rated Level IV 22 AWG (0.34 mm<sup>2</sup>) such as U.S. part AK3791 (one pair) or U.S. 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 1.1 (see Fig. 1).



#### Dimensions (H/W/D):

W7750A,B,C: 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,C 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 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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Fig. 1. Functional profile of LONMARK RTU object details.

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