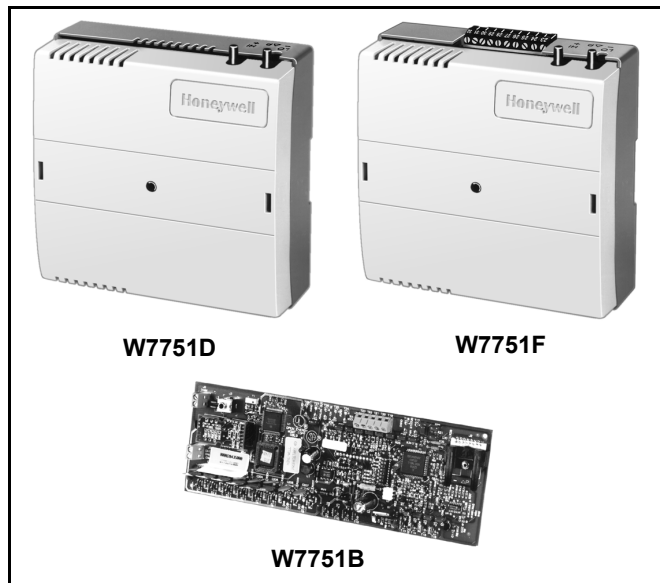


Excel 10 W7751B,D,F VAV II Controllers

SPECIFICATION DATA



FEATURES

- Uses Echelon® LONWORKS® network (E-Bus) protocol.
- Free Topology Transceiver (FTT) high speed 78 kilobit communications network.
- Compliant with VAV Device Object Type number 8010 functional LONMARK® profile.
- Capable of stand-alone operation, but can also use E-Bus network communications.
- 120 controllers per Q7750A Excel 10 Zone Manager.
- Easy user access to the E-Bus network communications jack.
- Designed for Pressure Independent or Pressure Dependent Single or Dual Duct Variable Air Volume (VAV) and Constant Volume Air Terminal Unit control.
- Uses a Microbridge air flow sensor with patented dual integral restrictor design.
- Easy user access to air flow sensor inputs.
- Provides Proportional Integral Derivative (PID) temperature control.
- Energy saving setpoint reset for electrical demand limit control.
- Floating or modulating hot water or three-stage electric heat.
- Series or induction fan control.
- Provides patented nonlinear floating algorithm for velocity control loops.
- Individual zone pressurization for supply and exhaust control.
- Factory configured via EEPROM with critical user parameter default values.
- Supports motion sensor interface for enhanced energy savings.
- Supports Terminal Regulated Air Volume (TRAV) concept.
- Supports pressurize and depressurize, night purge, and morning warm-up sequences.
- Both plastic housing and controller module wiring subbase are UL 94-5V rated (W7751D,F).

GENERAL

The W7751B,D,F are Variable Air Volume (VAV) Controllers in the Excel 10 family product line. These VAV systems provide pressure independent or pressure dependent air flow control and series or induction fan control using single and dual duct applications. VAV systems generally provide cool air only to the zones. The W7751 controllers provide additional outputs that control VAV box reheat coils. The heaters can be staged electric or modulating hot water. Supply and exhaust pressurization control are provided on a zone basis.



DESCRIPTION

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SPECIFICATIONS

Models:

W7751B: Implemented on a snap track compatible Printed Wiring Board (PWB). Terminal blocks for connections to the digital input terminals (13 through 17), wall module terminals (19 through 25), and communications terminals (29 and 30). Connection for access to E-Bus is provided by plugging connector into the communications jack. Digital outputs, earth ground and 24 Vac power connections are made with quarter inch (6.35 mm) quick connects.

W7751D: Uses two-piece construction controller module and internally wired subbase. Field wiring 14 to 22 AWG (2.0 to 0.34 sq mm), through conduit, connects to subbase terminal blocks. Controller module plugs into prewired subbase.

W7751F: Uses two-piece construction controller module and externally wired subbase. Field wiring 14 to 22 AWG (2.0 to 0.34 sq mm) connected to terminal blocks on subbase external edges (top and bottom). Controller module plugs into prewired subbase. See Table 2 for control techniques supported.

Status Information: See Table 1.

Single Duct Applications: See Table 3.

Dual Duct Applications: See Table 4.

Input/Output: See Tables 1 and 5.

Triac Outputs: Power ratings: 20 Vac to 30 Vac at 25 mA MIN to 500 mA MAX current for any voltage, W7751B has a MAX current of 400 mA.

NOTE: Triacs sink current to the 24 Vac common (terminal 10 on the W7751B model or terminals 2 and 4 on the W7751D,F models. The controller and all Triac loads must be wired to the same 24 Vac source.

IMPORTANT

If non-Honeywell motors, actuators, or transducers are to be used with Excel 10 Controllers, Triac compatibility must be verified (see previous NOTE).

Power Supply:

24 Vac with a valid range of 20 to 30 Vac at 50/60 Hz.

Power Consumption (no load):

10 VA maximum at both 50 and 60 Hz.

CPU: Motorola or Toshiba 3150 Neuron[®] processor, containing three eight bit CPUs. Each Neuron has a unique 48-bit network identification number.

Memory Capacity:

The W7751B,D,F VAV Controllers uses a 64K by 8 ROM/PROM, 512 bytes of EEPROM and 2K of RAM.

Differential Pressure Range: 0 to 2.0 in. w.c. (0 to 0.5 kPa) maximum for the onboard flow sensor.

Vibration: Rated V2 Level compliant.

Dimensions (H/W/D):

W7751B: 3-1/4 x 9.0 in. (83 x 229 mm).

W7751D,F: 5-21/32 x 5-21/32 x 2-11/32 in. (144 x 144 x 60 mm).

Environmental Ratings:

Operating Temperature: 32 to 125°F (0 to 51.7°C).

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

Relative Humidity: 5% to 95% noncondensing.

Specified Sensing Temperature Range:

20K ohm NTC sensor temperature range of 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 or C7770A Air Temperature Sensor.

Communications:

W7751 uses FTT transformer-coupled communications port with manchester encoded data presented to controllers and devices on the E-Bus at 78 kilobits per second (kbs) via Echelon communication protocol. Using 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 up to 5000 ft (1524m).

For greater network lengths, see form 74-2865 E-Bus Wiring Guidelines.

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

Approved cable type for E-Bus communications wiring is Level IV 22 AWG (0.34mm²) plenum or nonplenum rated unshielded, twisted pair, solid conductor wire.

LONMARK[®] Functional Profile:

W7751 Controllers support the LonMark Functional Profile number 8010 VAV Controller, version 1.0 (see Fig. 1).

Mounting Options:

W7751B: Snaptrack compatible PWB.

W7751D: Subbase can be mounted to standard 4x4 in. and 5x5 in. junction boxes. Can also snap to 35 by 7.5 mm (1-3/8 by 9/32 in.) EN 50 022 DIN rail. Provides slotted hole pattern for the R7450 series IRC devices (118 by 87 mm).

W7751F: Subbase can be mounted in a ring cabinet or wall mounted. Can also snap to 35 by 7.5 mm (1-3/8 by 9/32 in.) EN 50 022 DIN rail. Provides slotted hole pattern for the R7450 series IRC devices (118 by 87 mm).

Approval Bodies:

The W7751 is listed under UL 916 (E87741) and is also listed by cUL (E87741).

The W7751B,D,F models meet FCC part 15 class B requirements (the W7751B meets class B with a ferrite clamp-on). Without the ferrite clamp-on the W7751B meets Class A requirements. The W7751B must be enclosed in a metal cabinet to meet class A and B requirements.

For CE requirements the W7751B,D,F models meet CISPR22B (the W7751B meets CISPR22B with a ferrite clamp-on and must be enclosed in a metal cabinet).

Accessories:

205979 Excel 10 Connector Cable from Excel 10 Q7752A Serial Interface Adapter to Excel 10 Controller or Wall Module.

209541B Excel 10 Termination Module.

C7770A Excel 10 Air Temperature Sensor.

T7770 Excel 10 Wall Modules.

Q7750A Excel 10 FTT Zone Manager.

Q7751A,B Excel 10 Router.

Q7752A,B Excel 10 Serial Interface Adapter.

Table 1. W7751 Controller LED Status Information.

LED Status	Controller Status
Off	No power to processor
On	Non-operational or (not configured)
Slow Blink	Operational (communicating in normal state)
Fast Blink	An alarm is present or in (Manual Test Mode)

Table 2. Control Techniques Supported.

Heating and Cooling	Fan
<ul style="list-style-type: none"> Up to three stages of electric or hot water heat Floating hot water heat Pulse Width Modulated (PWM) heat Floating damper output 	<ul style="list-style-type: none"> no fan induction fan (Parallel Temperature or Fan Flow) (PWM Fan) series fan (Series Fan)
Other Important Control Features	
<ul style="list-style-type: none"> Three setpoint sets for heating and cooling. Occupied—Normal hours or if bypass invoked from wall module during unoccupied hours. Standby—Energy saving period during occupied hours, invoked by motion detector. Unoccupied—Off hours. Supply, exhaust pressurization control are provided on a zone basis. 	

Table 3. Single Duct Application (Pressure Independent or Pressure Dependent)

Damper Control Only
Damper Control, 1, 2, or 3 Stages Reheat
Damper Control, 1 Stage Peripheral Heat
Damper Control, Floating or PWM Reheat
Damper Control, Floating or PWM Peripheral Reheat
Damper Control, Floating or PWM Reheat Plus Floating or PWM Peripheral Heat ^a
Return Flow Tracking
Staged Heat Options: Reheat Standard, stepped (1, 1 and 2, 1 and 2 and 3) Binary (1, 2, 1 and 2) Peripheral Heat 1 stage only
Fan Options ^b : Series (Induction fan): Parallel ^c Temperature Flow PWM fan None
Modulating Heat Options (Reheat and Peripheral): Floating Pulse Width Modulation (PWM)

^a If both Reheat and peripheral heat are used in the same application:
 — Both must be same output type such that both are staged, floating or staged PWM (all PWM actuators must use the same time-based mode parameters).
 — The first and second stage ordering is selectable between; stage 1 - reheat, stage 2 peripheral or stage 1 - peripheral, stage 2 reheat.

^b All single duct applications support series fan, (Induction fan): parallel temperature and fan flow or PWM fan for operations or no fan.

^c Parallel fan options:
 Standard: Controlled by temperature. Acts as form of reheat.
 Flow: Adds return air from the plenum to ensure minimum discharge flow.

NOTE: PWM fan actuator temperature controls just the opposite of a VAV damper actuator such that an increase in air flow gives a decrease in fan speed.

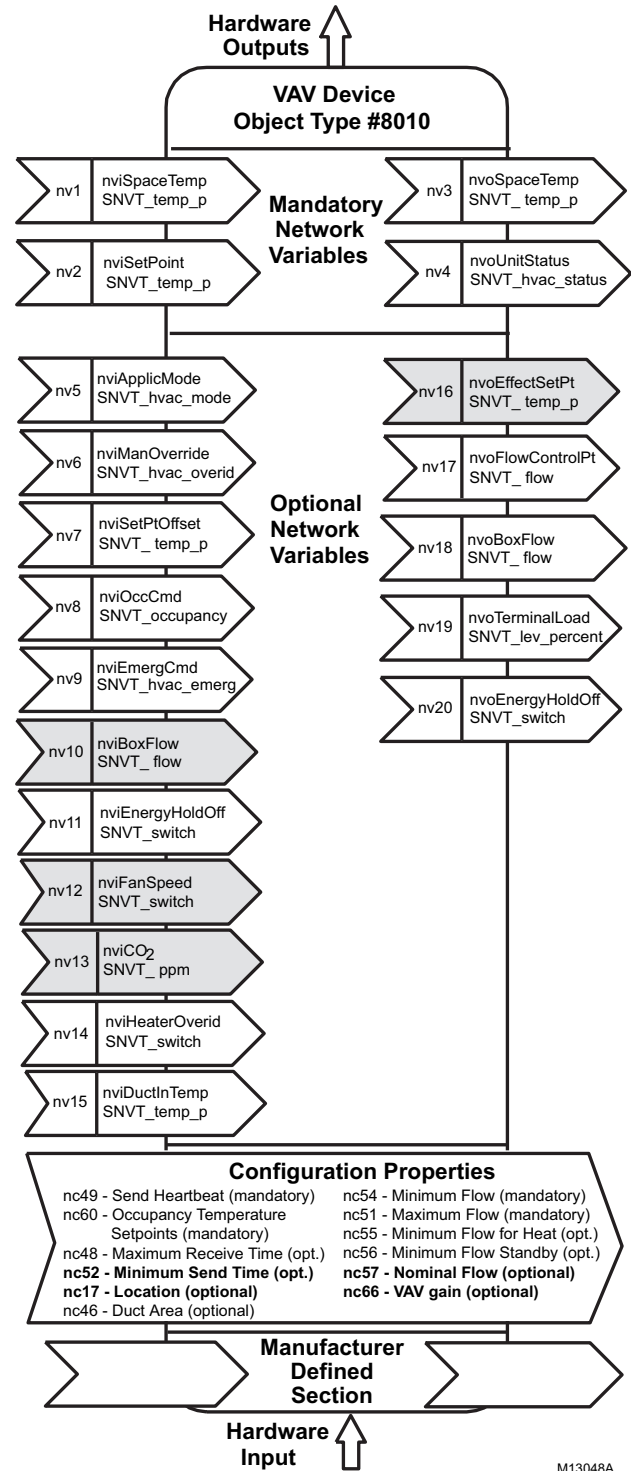


Fig. 1. Functional profile of LonMark VAV object details (variables not implemented in Excel 10 VAV Controllers are grayed, or in bold print in Configuration Properties).

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Table 4. Dual Duct Applications.

These applications require two VAV Controllers and two ML6161 Direct-coupled Damper Actuators per zone
Dual Duct, Pressure Independent, with: flow mixing, cold and hot duct flow pickups (uses satellite Excel 10 for the hot duct)
Dual Duct, Pressure Independent, no flow mixing, with cold and hot duct flow pickups (uses satellite Excel 10 for the hot duct)
Dual Duct, Pressure Independent, constant volume, with cold and hot duct flow pickups (uses satellite Excel 10 for the hot duct)
These applications require one VAV Controller and one or two ML6161 Direct-coupled Damper Actuators per area supplied by the VAV box
Dual Duct, Pressure Independent, with cold duct pickup only
Dual Duct, Pressure Independent, constant volume, with discharge pickup only, Flow sensor in discharge air. The temperature control loop controls the cool damper position and the flow controls adjust the heating damper position
Dual Duct, Pressure Independent, discharge pickup, no mixing
Dual Duct, Pressure Dependent, with flow mixing
Dual Duct, Pressure Dependent, without flow mixing

Table 5. VAV II Controller Inputs.

Analog inputs - 4 total	Digital inputs - 5 total
Space temperature sensor (fixed location): T7560, or T7770A,B,C,D	Wall Module Bypass Pushbutton: Momentary DI (fixed location)
Air flow pressure sensor (fixed location): Microbridge 0-2 inw (0 to 0.5 kPa) velocity pressure sensor	Hardware test (fixed location)
Configurable analog input options (any two unique items from the following): Space temperature setpoint from: T7770B,D 55 to 85°F (13 to 29.5°C) - 9846 to 1290 ohms. Discharge Air Temperature: Type RTD, Supported Sensors: C7041B,C,J,K, C7770A1006 Supply Air Temperature: Type RTD, Supported Sensors: C7041B,C,J,K, C7770A1006	Configurable digital input options (up to three unique items from following): Window open: (contact closed = window closed) Occupancy switch: (contact closed = room occupied; contact open = room unoccupied) Heat/cool changeover: (contact closed = heat) Monitoring input: (contact closed = input on or closed-reportable on network)

Table 6. VAV II Controller Digital Outputs

Configurable digital output options (8 total)
Floating damper open
Floating damper closed
Reheat types: Reheat (floating) valve open Reheat (floating) valve closed PWM ^a
Three stage binary control ^b : Stage 1 (output 1) Stage 2 (output 2) Stage 3 (both outputs 1 and 2)
Peripheral heating types: Peripheral heat (floating) valve open Peripheral heat (floating) valve closed PWM ^a Stage 1
Fan Series (Induction fan): Parallel Temperature Flow PWM fan
Auxiliary contact (On when occupied, Off when unoccupied or Standby) Normal (On/Off digital) Pulsed (requires one pair open and closed)
Network (up to 2 outputs commanded from the network) Normal (On/Off digital) Pulsed (requires two outputs)

^a All PWM actuators must use the same time-based mode parameters.

^b Staged reheat coils are disabled if air flow is less than one half of reheat air flow setpoint.

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Automation and Control Solutions

Honeywell International Inc.
1985 Douglas Drive North
Golden Valley, MN 55422
customer.honeywell.com

Honeywell Limited-Honeywell Limitée
35 Dynamic Drive
Scarborough, Ontario M1V 4Z9

