WIRELESS THERMOSTAT SYSTEM

VICONICS WIRELESS

DESCRIPTION

The **Viconics Wireless** thermostat system provides wireless networked control of Heating, Ventilating, and Air Conditioning (HVAC) equipment on a Building Automation System (BAS).

The **Viconics Wireless** thermostats integrate into a supervisory controller using BACnet(R) Internet Protocol (IP) or BACnet Master- Slave/Token-Passing (MS/TP) communications. **VWG-40** Coordinators allow the supervisory controller to communicate with multiple Viconics wireless thermostats.

The wireless mesh network uses ZigBee(R) technology to enable remote monitoring and programming and to enhance reliability by providing redundant transmission paths through other Viconics wireless thermostats, creating a resilient, self healing mesh network.

VT7300A5031W Thermostat

VWG-40 Coordinator

VWG-RA-1000

FEATURES

- ***Wireless communication***
- ***Integral humidity sensing capability (dehumidification models)***
- ***On/off, floating, or proportional 0 to 10 VDC control***
- ***Three speeds of fan control (model-dependent)***
- ***Integral wireless signal strength testing built into wireless thermostats and coordinators***
- ***Backlit Liquid Crystal Display (LCD)***
- ***Two configurable binary inputs***
- ***Over 20 configurable parameters***

APPLICATION

- ***Commercial structures with brick or solid concrete walls and/or ceilings that impede hard-wired thermostat applications***
- ***Office buildings, retail stores, and other commercial real estate where tenant turnover is frequent***
- ***Museums, historical buildings, atriums, and other sites where building aesthetics and historical preservation are important***
- ***Buildings with marble, granite, glass, mirrored, wood veneer, or other decorative surfaces that present challenges to hard-wired applications***
- ***Buildings with asbestos or other hazardous materials that must not be penetrated or disturbed***
- ***Buildings with occupants sensitive to disruptions to business***
- ***College dorms, hotels, and condos***

SPECIFICATIONS

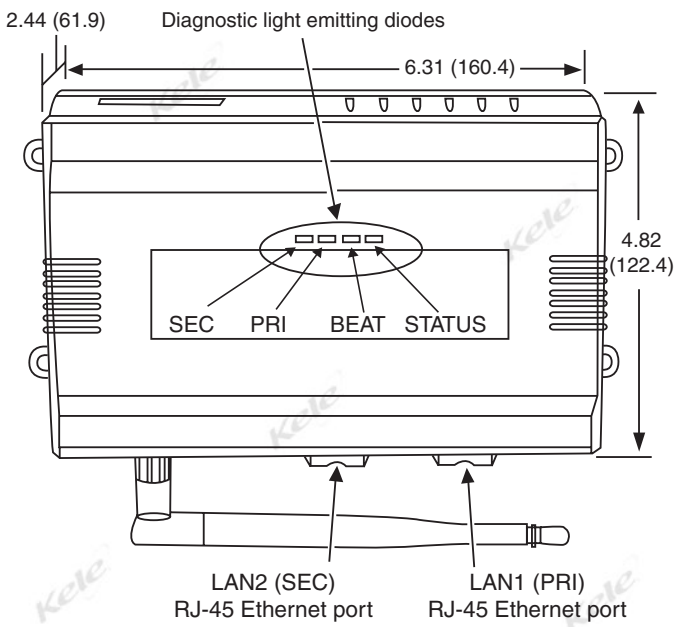
Supply Voltage	
Coordinator	15 VDC
Thermostats	19 to 30 VAC, 50/60 Hz
Supply Current	2 VA
Supply Watts	15 W maximum (coordinator)
Coordinator	
Operating System	NiagaraAX
Platform	IBM® PowerPC 405EP 250 MHz Processor 64 MB SDRAM & 64 MB Serial Flash Battery Backup - shutdown begins within 10 seconds Real-time clock - 3 month backup maximum with battery
Frequency	2.4Ghz
Modulation	DSSS (Direct-sequence spread-spectrum transmission)
Communication (coordinator)	
	Ethernet Two 10/100 Mbps Ports (RJ-45 Connection), BACnet IP (VWG-40-IP -1000) RS-232 9-Pin D-Shell Connection RS-485 3-Pin Non-Isolated Port, BACnet MS/TP (VWG-40-MSTP-1000)
Fan Switching	(VT7300) 30 VAC, 1.0 A maximum, 3.0 A inrush
Relay Output	(VT7300A, C, VT7600) 30 VAC, 1.0 A maximum, 15 mA minimum, 3.0 A in-rush
Analog Output	(VT72xxF, VT73xxF) 0 to 10 VDC
Auxiliary Contacts	30 VAC, 1.0 A Maximum, 3.0 A inrush
Digital Inputs	Dry contacts
Accuracy	
Temperature	±0.9°F (±0.5°C) at 70°F (21°C
Models with Humidity	±5% RH from 20 to 80% RH at 50° to 90°F (10° to 32°C)
Sensor Type	
Thermostat	(local) 10K NTC

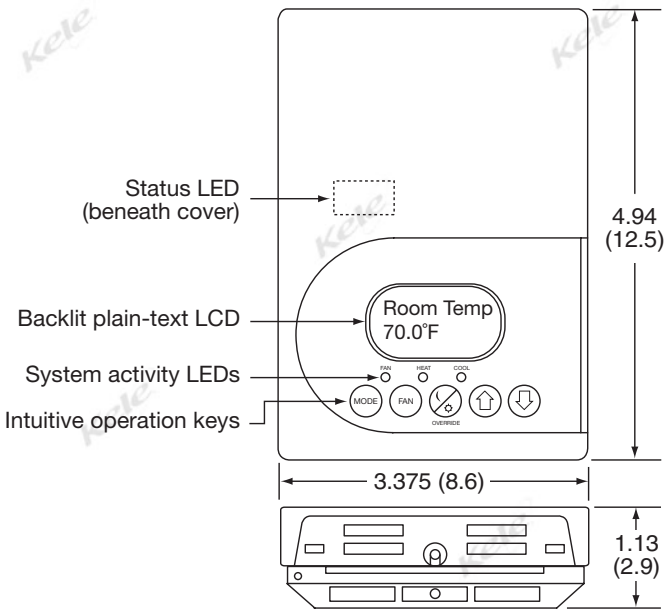
SPECIFICATIONS (CONTINUED)

Setpoint Range	Heating 40° to 90°F (4.5° to 32°C) in 0.5° increments Cooling 54° to 100°F (12° to 38°C) in 0.5° increments
Transmission Power	10 mW Maximum
Range	Through walls 30 ft (10 m) Line-of-sight 100 ft (30 m) Open space
Deadband	2°F (1°C) between heating and cooling
Number of Zones	30 Maximum
Operating Temperature	32° to 122°F (0° to 50°C)
Display	-40° to 122°F (-40° to 50°C)
Operating Humidity	95% RH maximum (non-condensing)
Weight	
Coordinator	1.10 lb (0.49 kg)
Thermostat	0.75 lb (0.34 kg)

Approvals	
Coordinator	UL916, C-UL listed to Canadian Standards Association, (CSA) C22.2 No. 205-m1983 "Signal Equipment", CE, FCC part 15 Class A, C-Tick,
Thermostat	United States UL Listed, CCN XAPX, Under UL 873, Temperature Indicating and Regulating Equipment FCC Compliant to Part 15.247 Regulations for Low Power Unlicensed Transmitters, C-Tick Canada UL Listed, CCN XAPX7, Under CSA C22.2 No. 24, Temperature Indicating and Regulating Equipment Industry Canada, ICES-003
RoHS Statement	Yes
Warranty	1 year

DIMENSIONS, CONTROLS, AND CONNECTIONS - in (cm)





WIRELESS THERMOSTAT SYSTEM
VICONICS WIRELESS

Viconics Wireless Thermostat Controller System Overview
A Viconics Wireless Thermostat Controller System consists of:
A supervisory controller
At least one VWG-40 Coordinator
Multiple Viconics Wireless Thermostat Controllers

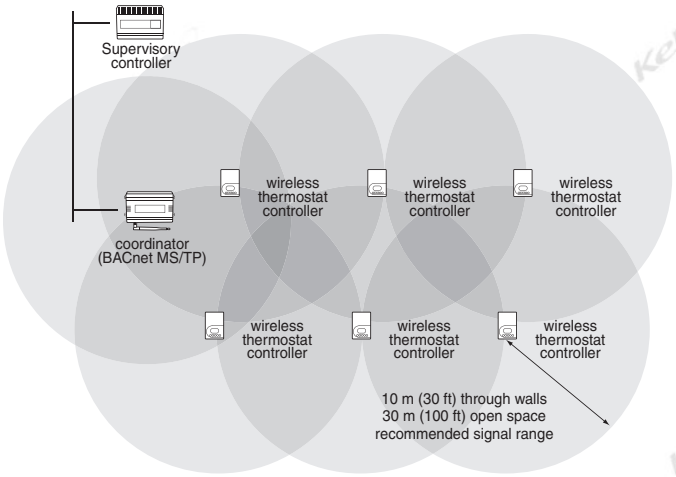


Figure 1

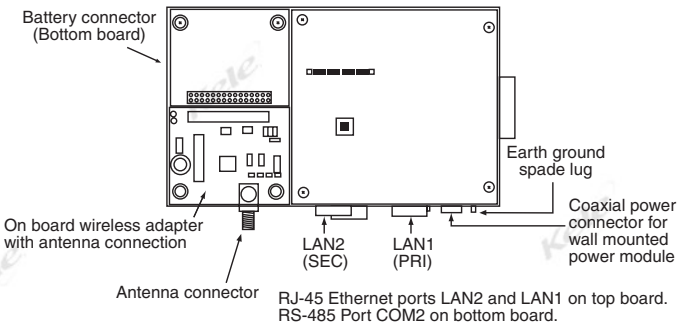
Component Descriptions
Supervisory Controllers (building automation system)
The Viconics Wireless Thermostat Controller System interfaces with Web-enabled, Ethernet-based, supervisory controllers that connect BAS networks to IP networks and the Web. Supervisory controllers provide scheduling, alarm and event management, trending, energy management, data exchange, dial-out capability, and password protection with a computer running Microsoft® Internet Explorer® Web browser.

VWG-40 Coordinators
A VWG-40 Coordinator provides a wireless interface between a supervisory controller and the Viconics Wireless Thermostat Controllers, allowing the exchange of BACnet IP (VWG-40-IP-1000 model) or BACnet MS/TP (VWG-40-MSTP-1000 model) messages. The VWG-40 Coordinator initiates the formation of the wireless mesh network - one is required per wireless mesh network. Each VWG-40 Coordinator and the Viconics Wireless Thermostat Controllers assigned to it share a "Personal Area Network Identification" (PAN ID). A VWG-40 Coordinator requires a 15 VDC power source. An optional remote-mount antenna and cable is available to allow transmission when the coordinator is mounted inside a metal panel.

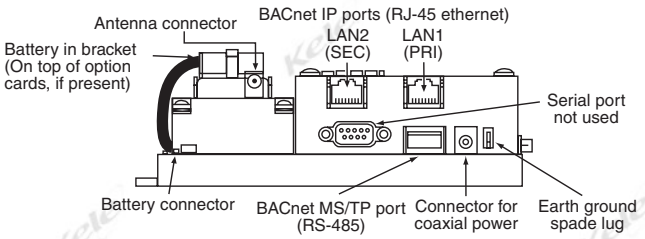
A VWG-40 Coordinator enables the Viconics Wireless Thermostat Controllers to communicate with the supervisory controller, which schedules zone occupancy of the wireless system, collects trend data, overrides points, and monitors alarms. The Viconics Wireless Thermostat Controller System confirms and synchronizes data transmissions between the Viconics Wireless Thermostat Controllers and VWG-40 Coordinators.

Together, these components provide wireless monitoring and temperature control of building Heating, Ventilating, and Air Conditioning (HVAC) equipment. Figure 1 illustrates a simple Viconics Wireless Thermostat Controller System using a BACnet MS/TP Version of the VWG-40 Coordinator

Viconics Wireless Thermostat Controllers
Depending on the model, the Viconics Wireless Thermostat Controllers can communicate sensed temperature, setpoint temperature, and other data with an associated supervisory controller and control a variety of fan coil and zoning equipment. The Viconics Wireless Thermostat Controllers are designed for indoor, intra-building applications only. The Viconics Wireless Thermostat Controllers can also serve as repeaters to extend the range of the BACnet data communications within the wireless mesh network.



VWG-40 Coordinator (Cover Removed)



VWG-40 Coordinator Communications Port (Cover Removed)

Component Quantities
A Viconics Wireless Thermostat Controller System can support up to:
- 100 Viconics Wireless Thermostat Controllers per MS/TP trunk on the supervisory controller
- 254 Viconics Wireless Thermostat Controllers integrated through BACnet IP on a supervisory controller
- 30 Viconics Wireless Thermostat Controllers per VWG-40 Coordinator

Each increment of 30 Viconics Wireless Thermostat Controllers requires one additional VWG-40 Coordinator. Viconics Wireless Thermostat Controllers can be added as repeaters, as required, to extend range and provide redundant pathways. Viconics Wireless Thermostat Controllers serving only as repeaters do not count towards the totals shown in Table 1; however, indiscriminate use of Viconics Wireless Thermostat Controllers as repeaters can lead to reduced performance.

TABLE 1	
Number of Viconics wireless thermostats	**VWG-40 Coordinators Required**
1-30	1
31-60	2
61-90	3
91-100	4

Viconics Wireless Communication
The Viconics Wireless Thermostat System uses DSSS RF wireless technology and operates on the 2.4 GHz ISM band. The system meets the IEEE 802.15.4 standard for low power, low duty-cycle RF transmitting systems and is compatible with wireless mesh networks compliant with the ZigBee® standard. The Viconics Thermostats have a transmission power of 10 mW.

A successful Viconics Wireless Thermostat System requires that a minimum RF (wireless) signal strength be maintained between the VWG-40 Coordinators and Viconics Wireless Thermostats. VWG-40 Coordinator and Viconics Wireless Thermostat locations are important considerations in system design. Distance, metal objects, and other obstructions can reduce or completely block the RF signal transmission between a VWG-40 Coordinator and Viconics Wireless Thermostat.

CAUTION: APPLICATIONS TO AVOID
Locations or applications that prohibit cellular telephones or Wireless Fidelity (WiFi) systems are unsuitable for the wireless products. Examples include:
- **Operating rooms or radiation therapy rooms**
- **Critical environments**
- **Department of defense applications requiring Diacap certification (for example, military bases and military hospitals)**

Do not use the products in applications that cannot tolerate intermittent interference, or where:
- **Critical control features would impact life-safety or result in large monetary loss, including secondary (backup) lifesafety applications**
- **Data centers, production lines, or critical areas would be shut down**
- **Loss of critical control would result from loss of data from humidity or temperature sensor communications**
- **Operation of exhaust fans or Air Handling Units (AHUs) would impair a purge or pressurization mode**
- **Missing data would invalidate reporting required by the customer security points being monitored**

ORDERING INFORMATION

MODEL	DESCRIPTION
VWG-40-IP-1000	Coordinator BACnet IP version
VWG-40-MSTP-1000	Coordinator BACnet MS/TP version
VWG-APP-1000	Wireless Niagara card
VT7200C5031W	2 Outputs-on/off / floating - no fan
VT7200F5031W	2 Outputs - 0 -10 VDC analog - no fan
VT7300A5031W	Commercial - 2 outputs-on/off
VT7300F5031W	Commercial - 2 outputs - 0-10 VDC
VT7305A5031W	Hotel - 2 outputs-on/off
VT7305F5031W	Hotel - 2 outputs - 0-10 VDC
VT7350C5031W	6 Commercial - 2 outputs-on/off / floating / RH
VT7350F5031W	Commercial - 2 outputs - 0-10 VDC / RH
VT7355C5031W	Hotel - 2 outputs - on/off / floating / RH
VT7355F5031W	Hotel - 2 outputs - 0 - 10 VDC / RH
VT7600A5031W	Single stage, non-programmable
VT7600B5031W	Multi-stage, non-programmable
VT7600H5031W	Heat pump, non-programmable
VT7605B5031W	Multi-stage economizer
VT7652H5031W	Commercial - 2 outputs-on/off / floating

* Hotel Version: Center button changes display from celsius to farenheight
Commercial Version: Center button is for occupancy override

ACCESSORIES	
VWGPSNAAC1201000	120 VAC to 15 VDC power supply
VWG-PS-AC24-1000	24 VAC to 15 VDC power supply for VWG-40
VWG-WA-1000	Relacement antenna for VWG-40 Coordinator
VWG-RA-1000	Remote antenna for VWG-40 Coordinator
VWG-BB-1000	Replacement battery pack for VWG-40 Coordinator