Product overview ───────────

The VWG-40 and related wireless thermostats are targeted to retrofit applications where the addition of communicating field bus wiring within the building space is prohibitive. The Gateway and Communicating Thermostats with wireless field bus encourages the use of existing wiring utilized by existing electronic thermostat type controls.

The VWG-40 when utilized in conjunction with the VT7xxxXxxxxW series wireless thermostats will offer the integrator simple BACnet IP or BACnet MS/TP objects to integrate over standard building automation systems using familiar integration toolsets.

A maximum of 30 wireless thermostats can be wirelessly attached to a single VWG

The following additional documentation is available on www.viconics.com

- Gateway BACnet integration guide (VWG-40-IP & VWG-40-MSTP), is available in document ITG-VWG-40-BAC-Exx
- Information on design consideration of wireless mesh networks and VWG set-up / diagnostics is available in document LIT-VWG-40-SETUP-Exx

Part available ───────────

Part number	Description
VWG-40-IP-1000	Viconics BACnet over IP wireless gateway. Includes: - Supports up to 30 wireless thermostats - Factory mounted wireless adapter - 24 Vac panel mounted power supply - Gateway mounted antenna
VWG-40-MSTP-1000	Viconics BACnet RS485 MS-TP wireless gateway. Includes: - Supports up to 30 wireless thermostats - Factory mounted wireless adapter - 24 Vac panel mounted power supply - Gateway mounted antenna
VWG-40-LON-1000 *(Upcoming)*	Viconics LON wireless gateway. Includes: - Supports up to 30 wireless thermostats - Factory mounted wireless adapter - 24 Vac panel mounted power supply - Gateway mounted antenna
VWG-APP	Interface software for VWG configuration and set-up. Operates under Windows XP ™. Uses a LAN crossover IP connection for initial set-up.
VWG-RA	Remote antenna for gateway when the gateway is installed inside a metal cabinet or when remote antennal mounting is required by physical installation
VWG-WA	Replacement antenna for gateway mounted antenna setup
VWG-PS-DC	24 Vac to 15 Vdc panel mounted power supply for VWG
VWG-PS-AC	120 Vac to 15 Vdc power supply for VWG with cord
VWG-BB	Replacement battery backup pack for the VWG

Trademarks ───────────

Disclaimers

NO WARRANTY. Viconics, Inc. (herein after referred to as "Viconics") makes no warranty as to the accuracy of or use of this technical documentation. Any use of the technical documentation or the information contained therein is solely at the risk of the user.

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Electronic controls are static sensitive devices. Discharge yourself properly before manipulation and installing the Viconics wireless gateway.

All Viconics wireless gateways and related wireless thermostats are to be used only as operating controls. Whenever a control failure could lead to personal injury and/or loss of property, it becomes the responsibility of the user to add safety devices and/or alarm system to protect against such catastrophic failures.

All VT7000 series wireless thermostats and associated VWG (Viconics Wireless Gateway) have been rigorously tested to ensure reliable operation in most building applications using the latest 2.4 ZigBee technologies. Viconics cannot guarantee against potential network interference should additional wireless systems be deployed sharing close proximity.

Best practices covered in this manual and all related Viconics VWG documents should be considered as a guide to apply Viconics Wireless Network devices only. The instructions included in this manual are based upon Viconics in house testing and should be referred to as a guide only.

Viconics Inc. may not be held liable for continued reliable, or robust operation of any and all wireless based devices. Although Viconics has taken many precautions in assuring the robustness of the VT7000 series wireless thermostat product line and associated network access point (VWG-40-XXXX-1000) Please note; future application of additional wireless devices utilizing the same or similar channels and / or frequencies may degrade performance of overall system and / or reliability.

Non-approved modifications or changes made to the VWG or wireless thermostats may void the FCC compliance of the VWG and wireless thermostats.

Ferrites supplied with the power supply and VWG MUST be installed according to instructions. Failure to do so may void the FCC compliance of the VWG and wireless thermostats.

Only VWG-PS-DC and VWG-PS-AC power supply can be used with the VWG. The usage of another non-approved power supply may void the FCC compliance of the VWG and wireless thermostats.

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

Overview ———————————————————————————————————————

This document covers the mounting and wiring of the Viconics VWG-40 series product. It assumes that you are an engineer, technician, or service person who is performing control system installation. Instructions in this document apply to the following products:

Models   **Description**
VWG-40-IP-1000   Viconics BACnet over IP wireless gateway.
VWG-40-MSTP-1000   Viconics BACnet RS485 MS-TP wireless gateway.
VWG-40-LON-1000   Viconics LON wireless gateway. *(Upcoming)*

- **Note**   Not covered in this document is the configuration appliance software required for fully setup the gateway. This includes setting host IP address, passwords, database, and other thermostat and network utilities. Refer to the document LIT-VWG-40-SETUP-Exx for more information.

Table of contents ———————————————————————————————

These are the main topics included in this document:
- Preparation
- Precautions
- Mounting
- Board Layout
- About Expansion Options
- Wiring Details
- Power Up and Initial Checkout

Also included in this document are several appendixes, as follows:
- Using Status LEDs
- Maintaining the VWG
- Replacement and accessory
- Certifications
- Declaration of Conformity

Information and specifications published here are current as of the date of publication of this document. Viconics, Inc. reserves the right to change or modify specifications without prior notice. One or more U.S. or foreign patents may cover products or features contained herein.

Preparation ———————————————————————————————————————

Unpack the VWG and power module (either **VWG-PS-DC** or **VWG-PS-AC**) and inspect the contents of the packages for damaged or missing components. Be sure the factory-installed ferrite is on the cord of the power supply unit. If damaged, notify the appropriate carrier at once and return any damaged components for immediate repair or replacement.

Included in this Package

Included in this package you should find the following items:

- VWG-40-XX-1000 base controller.
- Local antenna for the VWG
- This VWG-40-XX-1000 *Hardware installation guide*
- Configuration tool on a mini-CD

- Power module required for operation, are ordered and sold separately. The power module can be one of the following:
    – VWG-PS-DC: 24Vac in-line (DIN-mount capable), *or*
    – VWG-PS-AC: External 120 Vac wall-mount power adapter

Material and Tools Required

The following tools and supplies may be required for installation:

- DIN rail, type NS35/7.5 (35mm x 7.5mm), recommended for panel mount installation. Length of DIN rail should be minimum 6.5 " (165 mm).
- If using an VWG-PS-DC power supply, use UL listed, Class 2, 24Vac transformer, supplying a minimum of 5VA to the VWG. Note that the VWG-PS-DC power supply provides isolation — a dedicated transformer is *not* required.
- Suitable screws and screwdriver for mounting DIN rail, or if DIN rail not used, for mounting bases of VWG controller and VWG-PS-DC power supply (if used).

Precautions

This document uses the following warning and caution conventions:

⚠️ **Caution**	Cautions remind the reader to be careful. They alert readers to situations where there is a chance that the reader might perform an action that cannot be undone, might receive unexpected results, or might lose data. Cautions contain an explanation of why the action is potentially problematic.
⚡ **Warning**	Warnings alert the reader to proceed with extreme care. They alert readers to situations where there is a chance that the reader might do something that can result in personal injury or equipment damage. Warnings contain an explanation of why the action is potentially dangerous.

Safety Precautions

The following items are warnings of a general nature relating to the installation and start-up of the VWG controller. Be sure to heed these warnings to prevent personal injury or equipment damage.

⚡ **Warning**

- Depending on power module used, the circuit powering the VWG is 24Vac at 50/60 Hz (if using the VWG-PS-DC power supply or 120 Vac at 50/60 Hz (if using the VWG-PS-AC power supply). Disconnect power before installation or servicing to prevent electrical shock or equipment damage.
- Make all connections in accordance with national and local electrical codes. Use copper conductors only.
- To reduce the risk of fire or electrical shock, install in a controlled environment relatively free of contaminants.
- This device is only intended for use as a monitoring and control device. To prevent data loss or equipment damage, do not use it for any other purpose.
- All Viconics wireless gateways and related wireless thermostats are to be used only as operating controls. Whenever a control failure could lead to personal injury and/or loss of property, it becomes the responsibility of the user to add safety devices and/or alarm system to protect against such catastrophic failures.

Static Discharge Precautions

Static charges produce voltages high enough to damage electronic components. The microprocessors and associated circuitry within a VWG controller are sensitive to static discharge. Follow these precautions when installing, servicing, or operating the system:

⚠️ **Caution**

- Work in a static-free area.
- Discharge any static electricity you may have accumulated. Discharge static electricity by touching a known, securely grounded object.
- Do not handle the printed circuit board (PCB) without proper protection against static discharge. Use a wrist strap when handling PCBs. The wrist strap clamp must be secured to earth ground.

Mounting ──

Mount the VWG in a location that allows clearance for wiring, servicing, and antenna removal.

Environmental Requirements

Note the following requirements for the VWG mounting location:

- This product is intended for indoor use only. Do not expose the unit to ambient conditions outside of the range of 0ºC (32° F) to 50°C (122° F) and relative humidity outside the range 5% to 95% non-condensing (pollution degree 1).

- If mounting inside an enclosure, that enclosure should be designed to keep the unit within its required operating range considering a 20-watt dissipation by the controller. This is especially important if the controller is mounted inside an enclosure with other heat producing equipment.

- Do not mount the unit:
    – In an area where excessive moisture, corrosive fumes, or explosive vapors are present.
    – Where vibration or shock is likely to occur.
    – In a location **subject to electrical noise**. This includes the proximity of large electrical contractors, electrical machinery, welding equipment, and spark igniters.

Physical Mounting

The following information applies about physically mounting the unit.

- You can mount the VWG in any orientation. It is not necessary to remove the cover before mounting.

- Mounting on a 35mm wide DIN rail is recommended. The VWG unit base has a molded DIN rail slot and locking clip, as does the VWG-PS-DS 24Vac power supply module.

- If DIN rail mounting is impractical, you can use screws in mounting tabs on the VWG

The following procedure provides step-by-step DIN rail mounting instructions for the VWG. Mount the VWG prior to mounting any accessory items.

Procedure 1 - To mount on DIN rail

Step 1 Securely install the DIN rail using at least two screws, near both ends of the rail.
Step 2 Position the VWG on the rail, tilting to hook DIN rail tabs over one edge of the DIN rail
Step 3 Pull out the DIN rail clip and push down and in to force the DIN rail clip to snap over the other edge of the DIN rail.
Step 4 To prevent the VWG from sliding on the DIN rail, secure with clips provided by the DIN rail vendor, or place a screw in one of the four mounting tabs in the base of the VWG.
Step 5 If VWG-PS-DC 24 Vac power supply is used, mount onto the DIN rail in the same manner.
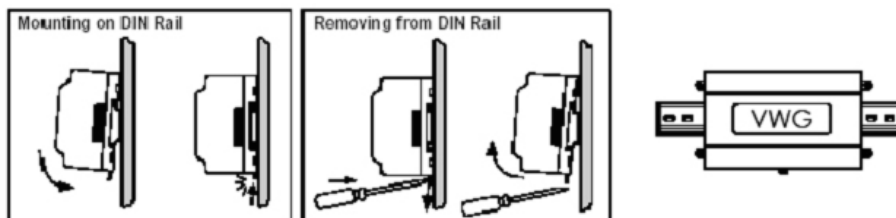
Removing and Replacing the Cover

You must remove the VWG cover to connect the battery (new unit) or to replace the battery. The cover snaps onto the base with four plastic tabs (two on each end).

To remove the cover, press in the four tabs on both ends of the unit, and lift the cover off. If accessory modules are plugged into the VWG, you may need to slide them away from the unit to get to the cover tabs. To replace the cover, orient it so the cutout area for communication ports is correct, then push inwards to snap in place.
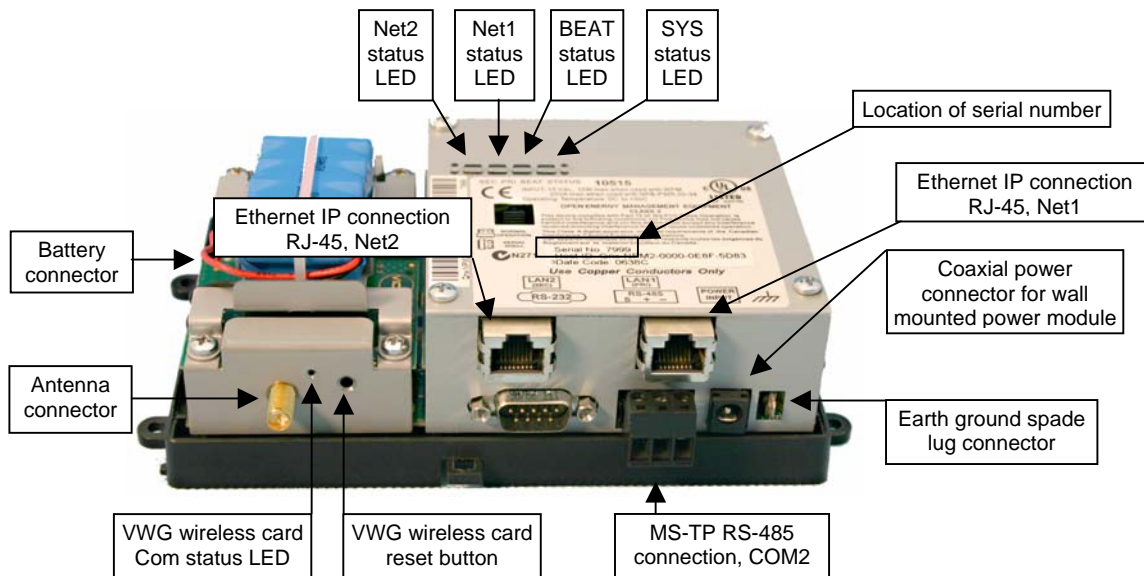
Installation Minimum Spacing Distance Requirements

Make sure minimum spacing distance requirements is available to freely rotate wireless antenna in all possible orientations.
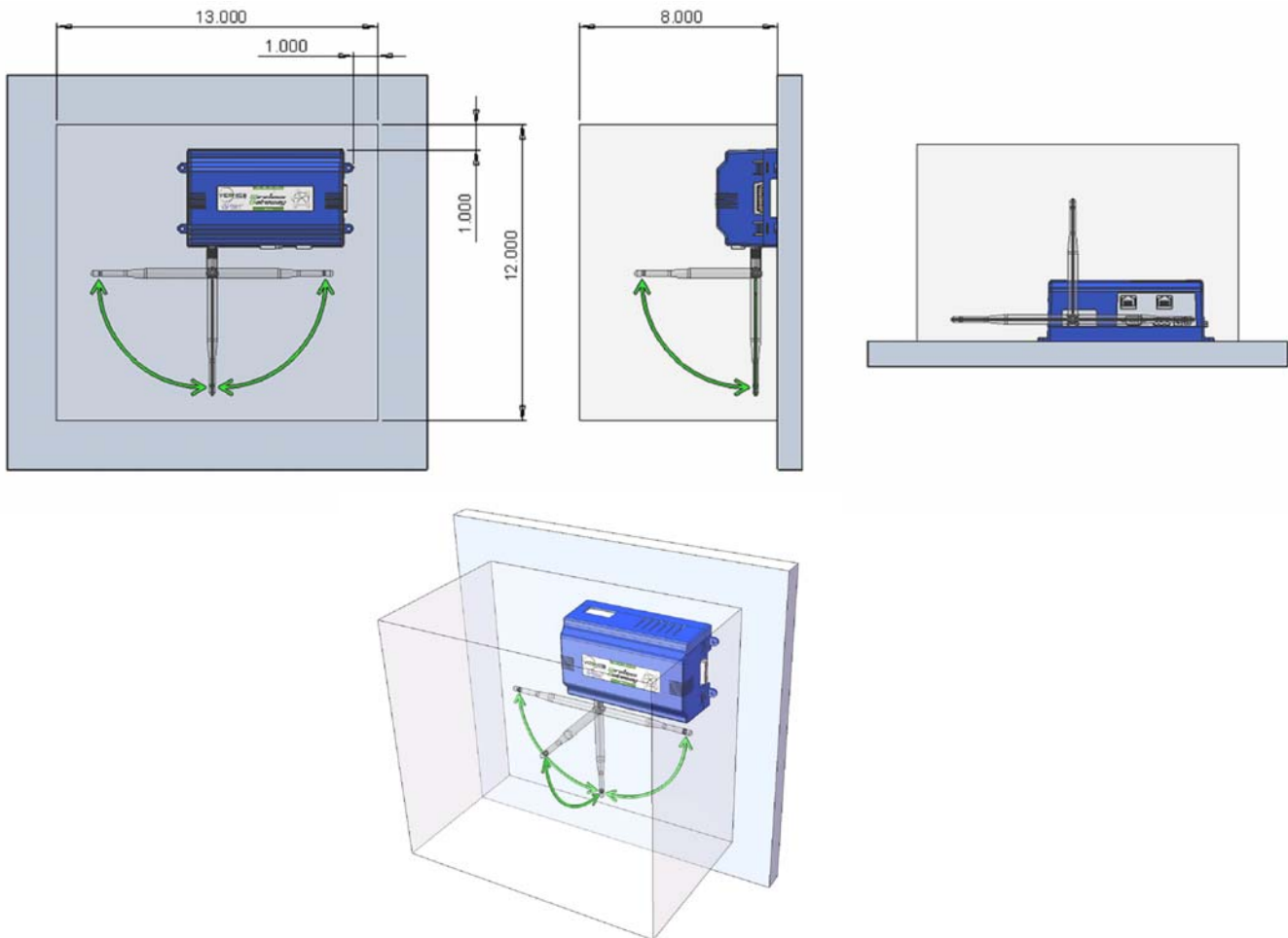
Board Layout

Figure below shows the location of LEDs, connections and other features of the VWG with the cover removed.

Wiring Details

See figure above to locate connectors and other components on the VWG controller. Make connections to the VWG in the following order.

1. Connect earth-grounding wire with spade connector from the earth ground lug on the VWG. See "Grounding" for details.
2. Prepare power wiring (leave the unit powered off). See "Power Wiring" for details.
3. Connect communications wiring. See "Communications Wiring," page 14 for ports available on the VWG base unit. For ports on any installed option board (LON, RS-485, modem) see the specific mounting and wiring guide for any additional details.
4. Connect the backup battery to the VWG battery connector, and apply power to the unit. See "Power Up and Initial Checkout," page 17.

Grounding

Use an earth ground spade lug (0.187") on the base of the VWG for connection to earth ground. For maximum protection from electrostatic discharge or other forms of EMI, you should connect this to earth ground using a #16 AWG or larger wire. Keep this wire as short as possible.

If desired, you can use the wall mount VWG-PS-AC 120 Vac power supply in your office (when initially commissioning the VWG), and then install the panel mount 24 Vac VWG-PS-DC power supply at the job. The following sections provide more details:

- VWG-PS-AC (120 Vac Wall mounted power supply module)
- VWG-PS-DC (Panel mount 24Vac-power supply module)

VWG-PS-AC 120 Vac Wall mounted power supply module ─────────────────────

Both the U.S. and International models of wall power modules are self-contained switching power supplies designed to plug into a standard building power receptacle of appropriate voltage. To supply power to the VWG, you then simply plug the coaxial connector from the VWG-PS-AC into the coaxial power connector on the VWG base board.

VWG-PS-DC Panel mount 24Vac-power supply module ─────────────────────

Using the VWG-PS-DC module lets you power the VWG from a standard Class 2 24Vac transformer. The VWG-PS-DC module provides power isolation (it makes no difference if the transformer output is "floating" or has one side tied to ground). Therefore, you can use an existing nearby transformer, providing that it has 5 VA capacity available to power the VWG.

Power Wiring

Only VWG-PS-DC and VWG-PS-AC power supply with factory installed ferrite on the power cord can be used with the VWG. The usage of another non-approved power supply may void the FCC compliance of the VWG and wireless thermostats.

Connect power cord as showed into coaxial connector.

⚠️ **Caution** Do not plug the coaxial connector from the power supply into the VWG until all other mounting and wiring is completed. See "Power Up and Initial Checkout," section.

Communications Wiring

Connect communications wiring to the VWG using either Net1, Net2 or the RS-485 connection based on VWG model used and configuration.

Note Prior to connecting cables, provide strain relief for them to prevent damage to the controller.

Ethernet—BACnet over IP wiring

Two, female 10/100-Mbit Ethernet connections are provided on the VWG. These are RJ-45 connectors labeled NET2 and NET1. Use a standard Ethernet patch cable for connecting to a hub or Ethernet switch. An activity LED for each Ethernet port is visible and labeled "NET2" and "NET 1" on the cover.

Note Typically, you *only use NET1* (primary port), unless you have a specific application for isolating a driver's network traffic to a separate IP address (and LAN) using NET2. In all cases, port selection can be changed and is dependent of configuration made using the VWG configuration tool.

The packing slip accompanying the VWG will provide the "factory-shipped" IP settings for both NET1 and NET2. Refer to the document LIT-VWG-40-SETUP-Exx for more information for details on the default IP address and how to change it. *(VWG-40-IP only)*

The supplied ferrite in the VWG packaging needs to be installed on the IP wire in a specific way for FCC compliance. Place IP wire into the provided ferrite as shown in diagram below. Make sure to follow the placement dimension. Close and snap the ferrite casing as shown.

Wire IP cable into NET1 or NET2 as per configuration.

8
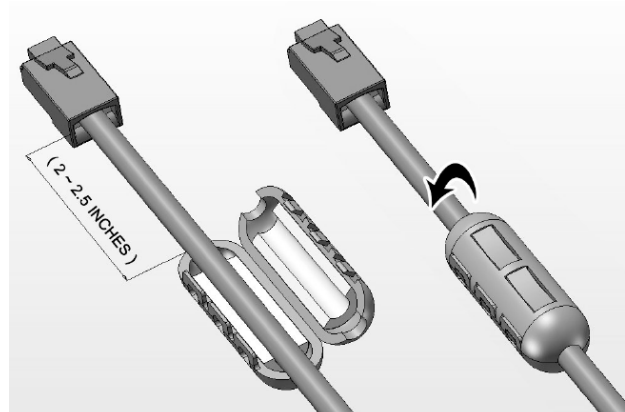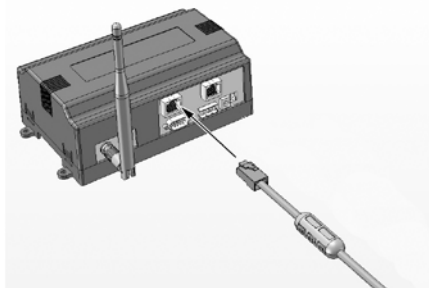
RS485—BACnet MS-TP wiring.

An RS485, optically isolated port uses a 3-position, screw terminal connector and always operates as COM2. Wire to this connector with shielded 8-22 AWG wiring (refer to the TIA/EIA-485 standard). The screw terminals (from left-to-right) are shield, plus (+), and minus (–).*(VWG-40-MSTP only)*

The supplied ferrite in the VWG packaging needs to be installed on the MS-TP wire in a specific way for FCC compliance. Place MS-TP wire into the provided ferrite as shown in diagram below. Make sure to follow the placement dimension. Close and snap the ferrite casing as shown.

Wire MS-TP cable into MS-TP RS-485 connector.
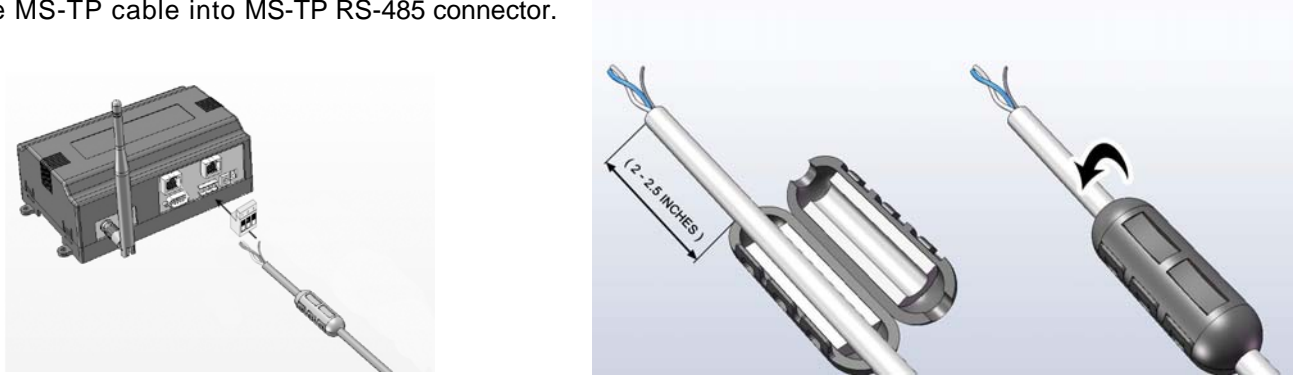
Antenna installation

Controller mounted antenna (VWG-WA)

All VWG-40 are supplied with a controller-mounted antenna. The antenna is shipped loose in the controller main packaging box.

This installation type is to be used only when the controller (and antenna) is not installed inside a closed metal enclosure and that clear reception is expected.

Gently screw the antenna into the antenna connector at the top of the VWG. Do not over tight the antenna.

Remote mounted antenna (VWG-RA)

If a remote mounted antenna is required because of the location of the VWG, a separate antenna can be ordered. Part number VWG-RA

This installation type can typically be used when the controller is installed inside a closed metal enclosure.

Gently screw the female connection of the remote antenna into the VWG. Remote antenna has a weighted magnetic base for metal surface mounting. Wire length is 1.5 M (4.9 Ft)

Power Up and Initial Checkout

Procedure   - Initial power up and checkout

1. Connect the Backup Battery.
2. Apply Power.
3. Check the Status LEDs.

1) Connect the Backup Battery
With the cover removed from the VWG (see "Removing and Replacing the Cover,"), locate the red and black wires coming from the backup battery, with 2-position connector plug. Plug the connector into the battery connector on the bottom board (below option slot 2 area). The connector is keyed—you cannot insert it incorrectly. The red (positive) connection should be the furthest from the two 30-pin option modules connectors.

For more details on the backup battery, see "About the Battery".

2) Apply Power

Apply power to the VWG by plugging in the power plug into either the VWG (if wall mount AC adapter VWG-PS-AC) or the 24Vac-powered VWG-PS-DC module.

3) Check the Status LEDs

When power is applied, the green LED labeled *"SYS"* will light. This is a green LED. Once the VWG boots, the yellow *"BEAT"* (heartbeat) LED will begin blinking, with a typical rate of about 1 Hz. Boot time should begin within 30 seconds after power is applied.

The blink pattern of the heartbeat LED under normal operation will differ for each installation (depending on station activity). But, in general, the LED should blink about once per second. The rate will be slower when the control engine is executing the station database, and as more objects / wireless thermostats are added.

After applying power, if the heartbeat LED comes on (steady) and stays lit longer than two minutes, contact technical support for assistance. See also the "Using Status LEDs" section.

About the Battery

The VWG is provided with a custom 10-cell NiMH battery pack mounted to the unit (under the cover). This battery allows the VWG to continue operation through very short power bumps (a few seconds in duration). If a longer power outage occurs, the battery provides enough run time for the VWG to backup data and then shutdown. Typically, this is one minute. Shutdown occurs automatically, after data is backed up to on-board flash memory.

The battery is trickle-charged by the VWG during normal operation. Following an extended power outage, the battery is charged at a faster rate. The power and battery circuitry is monitored by the VWG. The battery should be replaced approximately every three years, or more often if the unit is in a high temperature environment.

Note A NiMH battery characteristic is to lose charge if not left in charge mode (trickle charge). Leaving the battery unconnected, or in the unit powered off will cause the battery to fully discharge in a matter of weeks. Note that in the case of a new VWG, it ships from the factory with a completely discharged battery. Therefore, allow at least 18 hours for the battery to charge if it has not been in a powered unit.

For more information on the use and replacement of the battery, refer to the "Required Battery Maintenance" section.

Related Documentation

For more information on configuring and using the VWG controller, consult the following documents available from the VWG section at www.viconics.com:

- Gateway BACnet integration guide (VWG-40-BIP & VWG-40-MSTP), is available in document ITG-VWG-40-BAC-Exx
- Information on design consideration of wireless mesh networks and VWG set-up / diagnostics is available in document LIT-VWG-40-SETUP-Exx

Using Status LEDs ———————————————————————————————————————

The VWG controller includes several LEDs that can help determine the status of the unit. They are located in two places: the top of the controller (visible through the cover), and for serial ports, on the bottom board (only with cover removed). From left-to-right these LEDs include:

- Ethernet Ports
- Heartbeat
- System
- Wireless card communication status

Ethernet Ports
Each Ethernet port ("NET2", "NET 1") has one green LED, visible on the top cover. A "NET*x*" LED indicates activity on that port as follows:
- **Off**—No Ethernet link is made
- **On**—Ethernet link is present, but no activity on the LAN
- **Blinking**—Ethernet link is present with data activity on the LAN.

Beat
The "BEAT" LED is located to the right of the Ethernet status LEDs, and is yellow. Under normal operation, this LED should blink about once per second. Blink patterns differ as station activity varies, but any pulse rate from once per second to 10 blinks per minute usually indicates normal operation. If the heartbeat LED stays *on constantly, does not light,* or blinks *very fast* (more than once per second), contact System Engineering for technical support.

System
The "SYS" LED is located to the right of the heartbeat ("BEAT") LED, and is green. This LED provides a CPU machine status check, and should remain lit whenever the VWG is powered. If the SYS LED *does not light* while power is applied, contact technical support for assistance.

Wireless card communication status
The Wireless card communication status is located right beside the wireless antenna connection on the VWG. This LED provides a simple diagnostic status of the Viconics wireless network.

1 x 200ms short blink	Power on
2 x 200ms short blinks	Power on and card memory initialized properly
3 x 200ms short blinks	Power on, card memory initialized properly and serial communication with VWG main board active
4 x 200ms short blinks	Power on, card memory initialized properly, serial communication with VWG main board active and wireless networks started successfully
4 x 200ms short blinks and 1 x 1500ms long blink	Power on, card memory initialized properly, serial communication with VWG main board active, wireless networks started successfully and wireless communication with thermostats active

Maintaining the VWG ———————————————————————————————————————

This section provides information on the following topics:
1. Cleaning
2. Required Battery Maintenance
3. Replacement Parts
4. Replacing the VWG base assembly
5. Returning a Defective Unit

1) Cleaning

If dust or metal filings are present inside the unit, clean with vacuum or compressed air. Otherwise, no cleaning inside the unit is required. Optionally, if the cover becomes dirty, you can wipe it with a damp cloth and mild detergent.

2) Required Battery Maintenance

Battery life expectancy is a function of its discharge cycles (the number of discharges and their depth) and the ambient temperature of the battery during normal operation. In most applications, the battery should see relatively few discharges. Therefore, ambient temperature has more to do with determining the life expectancy of the battery than does any other factor. If the VWG is installed in a conditioned space, the battery should provide dependable service for approximately three years (average). In an environment where the operating temperature is higher (that is, 50°C or 122°F), you should only expect the battery to last approximately one year.

The NiMH battery in the VWG controller is fully discharged when factory shipped. Additionally, NiMH batteries lose charge over time if not kept trickle-charged (for more details, see "About the Battery,"). Therefore, even a new unit (or replacement battery) will require up to 18 hours of powered operation before it can provide reliable backup power (is at full charge).

3) Standard Replacement Parts

Standard replacement parts are listed in Table 4 and can be ordered from stock without restriction. Standard replacement parts cannot be returned for credit and should be disposed of in an appropriate manner.

Table 4   Standard replacement parts.

Part Number	Description
VWG-BB	NiMH Battery Pack (with battery bracket)—see "Replacing the Battery,"

Note   Screws used for the VWG are standard #6-3 2 x 3/8" types, which you can obtain locally if lost.

Non-replaceable Parts
Other than the parts listed in the replacement parts sections, there are no serviceable components on the base assembly.

- ### Memory
The current release of the VWG limits the maximum number of wireless thermostats that can be attached to the VWG40 to 30. Modification, or replacement of memory components requires software configuration and is not a field upgrade. For additional information if modifying the memory capacity of the VWG, contact Viconics for technical support.

- ### Fuse
The VWG contains a non-user replaceable fuse, soldered on the circuit board. This fuse provides protection from internal shorts or connection to incorrect power supplies. If the fuse circuitry is suspect, contact Viconics for technical support. See the "Returning a Defective Unit" section.

Returning a Defective Unit

For proper credit on the returned unit, ship the defective module to Viconics within 30 days.

Prior to returning the unit, contact Viconics to obtain a return material authorization (RMA) number and other instructions. Please provide:

- Product model
- Serial number
- Nature of the defect

Certifications

Federal Communications Commission (FCC)

This equipment generates, uses, and radiates radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause interference with radio communications. It has been tested and found to comply with the limits for a computing device pursuant to Part 15 Subpart C of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

Canadian Department of Communications(ICES-003)

This digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numerique respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Specifications

Platform
• PowerPC 405EP 250 MHz processor
• 64MB SDRAM & 64 MB Serial Flash
• 128 KB Static RAM
• Battery Backup - 5 minutes typical - shutdown begins within 10 seconds
• Real-time clock - 3 months backup max via battery

Operating System
• QNX RTOS
• IBM J9 JVM Java Virtual Machine
• NiagaraAX

Wired Communications
• 2 Ethernet Ports – 10/100 Mbps (RJ-45 Connectors)
• 1 RS 232 Port (9 pin D-shell connector)
• 1 RS 485 non-isolated port (3 Screw Connector on base board)

Wireless Communications
• Direct spread spectrum 2.4 GHz ISM bands
• Transmission power is under 1 mW at –0.4 dBm for channels 11 to 25 and –4.0 dBm for channel 26

Power Supply
• VWG-PS-DC   24 Vac to 15 Vdc panel mounted power supply for VWG
• VWG-PS-AC   120 Vac to 15 Vdc power supply for VWG with cord

Chassis
• Construction: Plastic, din rail or screw mount chassis, plastic cover
• Cooling: Internal air convection
• Dimensions: 6.313" (16.04 cm) W x 4.820"(12.24 cm) H (including connectors) x 2.438" (6.19 cm) D

Environment
• Operating temperature range: 0° to 50°C (32°F to 122°F)
• Storage Temperature range: 0° to 60°C (32°F to 140°F)
• Relative humidity range: 5% to 95%, non-condensing

Agency Listings
• UL 916, C-UL listed to Canadian Standards Association
• (CSA) C22.2 No. 205-M1983 "Signal Equipment"
• FCC Part 15 Subpart C
• C-tick (Australia)