



Wireless Repeater Application Guide 24 Vac Powered VYKONStat Repeater VRP5000W1028W

(September 1, 2010)

Product overview

The VRP5000W1028W wireless repeater has been specifically designed to be used within a Vykon wireless network for Vykon wireless thermostats.



The repeater is intended to be a low cost additional communication component when some remote thermostats are too far from the main mesh of Vykon device cluster and cannot communication with either:

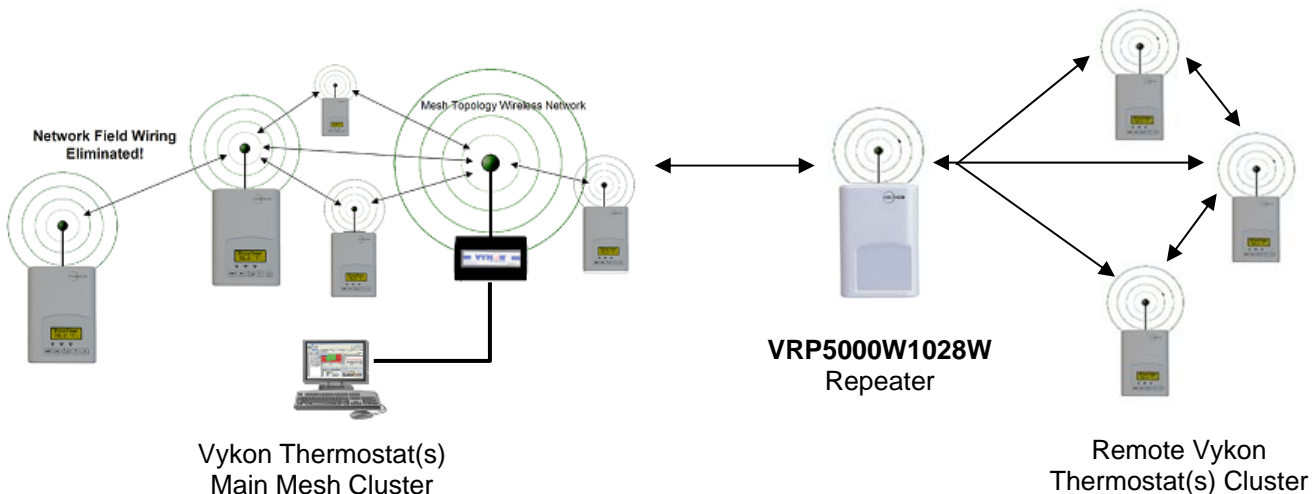
- A Vykon Wireless Controller

OR

- A JACE wireless communication card and related WirelessStatNetwork driver file that have been specifically designed to be used by the Niagara AX® powered JACE controllers.

The additional repeater(s) will enable the remote thermostat(s) to establish communication and will act as bridge(s) to the main mesh.

The repeater(s) can typically be installed where most convenient. Either on a wall or even in a suspended ceiling space if required.



The following additional documentation is available:

- VYKONStat Wireless Survey Tool User Guide
- VYKONStat Wireless Controller Application Guide

Installation

- Remove security screw on the bottom of repeater cover.
- Open up by pulling on the bottom side of repeater.
- Remove Assembly and remove wiring terminals from sticker. **(Fig. 3)**
- Please note the FCC ID and IC label installed in the cover upon removal of cover for the wireless products.

A) Installation (wall or within suspended ceiling):

- 1- Swing open the repeater PCB to the left by pressing the PCB locking tabs. **(Fig. 4)**
- 2- Pull out cables 6" out of the wall.
- 3- Mounting surface must be flat and clean.
- 4- Insert cable in the central hole of the base.
- 5- Align the base and mark the location of the two mounting holes on the wall. Install proper side of base up.
- 6- Install anchors if required.
- 7- Insert screws in mounting holes on each side of the base. **(Fig. 4)**
- 8- Gently swing back the circuit board on the base and push on it until the tabs lock it.
- 10- Strip each wire 1/4 inch.
- 11- Insert each wire according to wiring diagram.
- 13- Gently push back into hole excess wiring **(Fig. 5)**
- 14- Re-Install wiring terminals in correct location. **(Fig. 5)**
- 15- Reinstall the cover (top side first) and gently push back extra wire length into the hole in the wall.
- 16- Install security screw.



- Electronic controls are static sensitive devices. Discharge yourself properly before manipulation and installing the thermostat.
- Short circuit or wrong wiring may permanently damage the thermostat or the equipment.

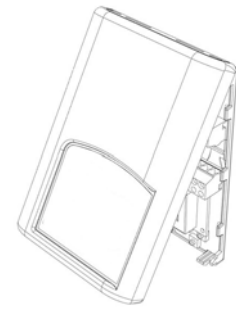


Fig.3

Location of PCB retaining tabs

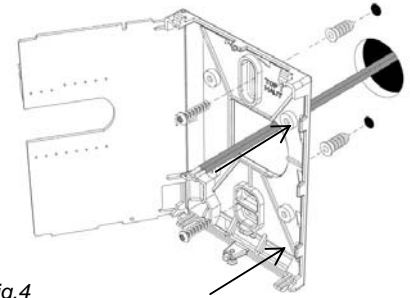


Fig.4

Re-install terminal blocks

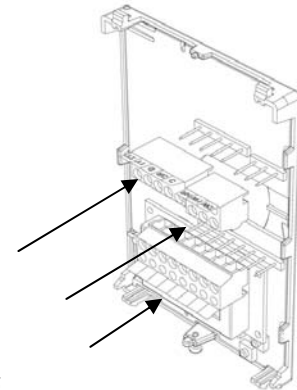


Fig.5

Repeater assembly
(VRP5000W)



Proper design considerations need to be addressed prior to any installation of a VWG or JACE with a Vykon wireless communication card and related wireless thermostats.

1. To properly avoid network interference with 802.11 Wi-Fi devices in the 2.4GHz spectrum range, Vykon recommends the use of 802.15.4 channels 15, 25 and 26 only. 802.11 Wi-Fi transmissions overlap and may interfere with other channel selection allowed by 802.15.4 (Channels 11 to 24)
2. Maximum distance between each node (thermostat(s) or repeater(s)) should be:
 - Clear line of sight distance between 2 nodes should be under 100 feet (30 M)
 - Non line of sight distance for typical wall gypsum partitions made with metal stud frame should be under 30 feet (10M)
3. Ensure that the minimum distance between any Vykon ZigBee node and any Wi-Fi devices (wireless routers, wireless adapters, lap-tops using wireless networks, etc....) to be at least 3 foot (1 M) and preferably 10 feet (3 M) or more.
4. Ensure that at least one thermostat is within 30 feet of the VWG/ JACE for every cluster of 10 thermostats installed.
5. Always try to locate if possible the VWG / JACE near the center of all associated wireless thermostats.
6. Always try to locate the VWG / JACE near on in line of sight to as many wireless thermostats as possible.
7. Try to avoid metal, brick walls or concrete obstructions between wireless devices as much as possible.
8. Make sure the antenna on the VWG / JACE is always perpendicular to the floor.
9. Avoid placing VWG / JACE and thermostats near metal or enclosed in metal boxes. If the VWG / JACE needs to be installed inside a metal cabinet, use the remote antenna accessory.

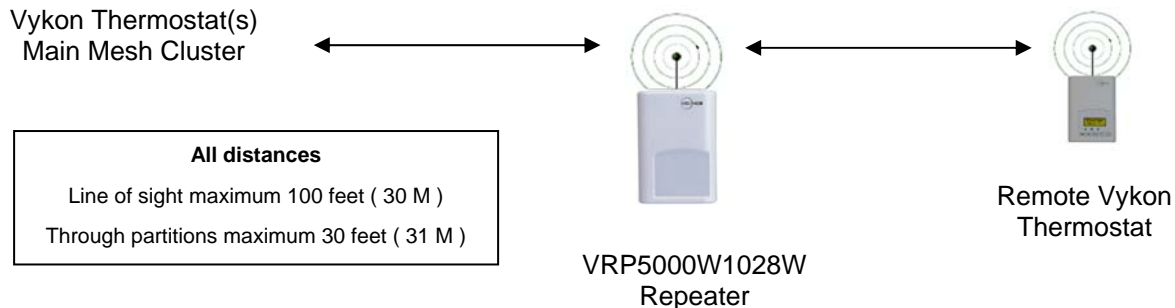
VRP5000W1028W Deployment Considerations

When Vykon wireless thermostat nodes cannot be discovered or added to a VWG / JACE database due to distance, the use of repeaters to bridge communication back to the VWG / JACE becomes necessary.

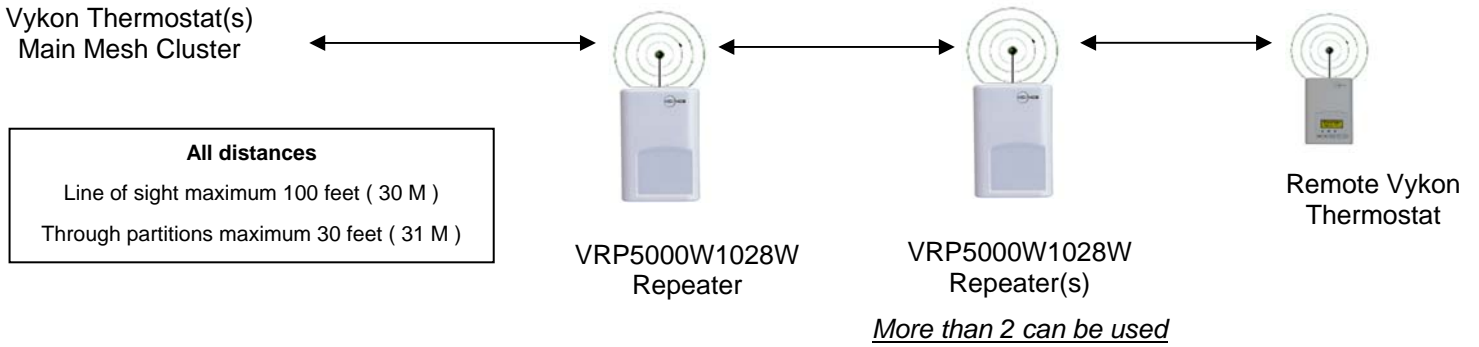
The number of repeater(s) necessary depends on how many devices are not able to join the VWG / JACE and how they are organized and distanced from each other.

- Clear line of sight distance between 2 nodes should be under 100 feet (30 M)
- Non line of sight distance for typical wall gypsum partitions made with metal stud frame should be under 30 feet (10M)

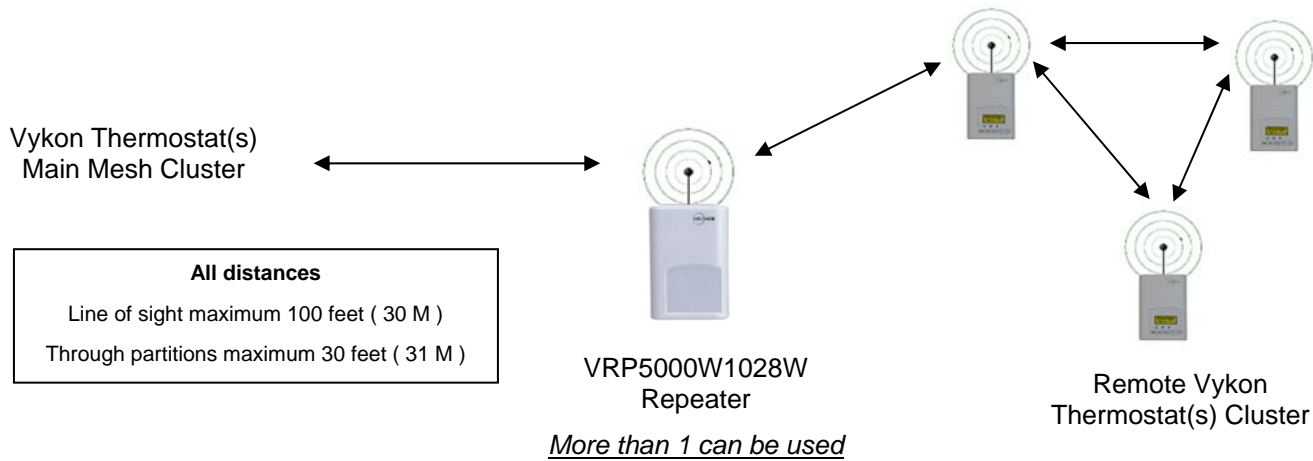
If a single thermostat is too far away and cannot join the main network a single repeater may be used:



If a single thermostat is too far away and cannot join the main network with a single repeater, multiple repeaters can be used to increase the covered communication distance to the required coverage expected:



If 2 or more thermostats are too far away and cannot join the main network a single repeater may be used as long as the cluster of devices distanced as recommended for the main network deployment:



Repeater Status LED

- Be sure all thermostats / repeaters connected to a VWG / JACE are using the same PAN ID and Channel as the JACE wireless communication card.

Repeater Wireless Adapter LED Status Indicators	
1 x 200ms short blink	Power on
2 x 200ms short blinks	Power on and adapter communicating with repeater base
3 x 200ms short blinks	Power on, adapter communicating with repeater base and there is connectivity to wireless network
4 x 200ms short blinks	Power on, adapter communicating with repeater base, connectivity to wireless network and VWG / JACE is communicating with Wireless repeater
4 x 200ms short blinks and 1 x 1500ms long blink	Power on, adapter communicating with repeater base, connectivity to wireless network and VWG is communicating with Wireless repeater.
System Troubleshooting Recommendations	
<ol style="list-style-type: none"> 1. If a repeater is not detected by the VWG / JACE, verify that the LED is blinking at least 4 times. If it is only blinking twice, ensure that the PAN and Channel of the thermostat is the same as the VWG / JACE it must communicate with. 2. When commissioning a network, it is recommended to use channels 15, 25 or 26. Alternate these channels between floors. 3. If a particular repeater or thermostat refuses to join the network and cannot be seen by the VWG / JACE. Please move momentarily closer to the VWG / JACE until it has joined the network and it is added to the database. It can then be re-located to its original position. 	

Status display instructions

The repeater features a two-line, eight-character display. There is a low level backlight level that is always active and can only be seen at night.

When left unattended after configuration, the repeater will display its currently assigned communication MAC address.



Installer configuration parameter menu

Configuration is done locally at the repeater.

- To enter configuration, press and hold the Left button for 8 seconds
- Press again the Left button repetitively to scroll between all the available parameters
- Use the (up / right) and (down / middle / center) key to change the parameter to the desired value.
- To acknowledge and save the new value, press the Left button again.
- The next listed parameter is now displayed

Configuration interface

Left	Enters the configuration mode. Press and hold for 8 seconds Pressing repetitively will scroll all available parameters one by one
Middle / Center	Adjust / rotate parameter value down
Right	Adjust / rotate parameter value up

Configuration parameters Default value	Significance and adjustments
Com Addr	<p>Repeater networking address</p> <p>Default value = 254</p> <p>Range is: 0 to 254 Valid range is 0 to 254</p>
PAN ID	<p>Personal Area Network Identification</p> <p>Default value = 0</p> <p>Range is: 0 to 500</p> <p>This parameter (Personal Area Network Identification) is used to link specific thermostats or repeaters to a single specific Vykon wireless gateway (VWG / JACE) For every thermostat or repeater reporting to a gateway be sure you set the SAME PAN ID value both at the gateway and the wireless device(s).</p> <p>The default value of 0 is NOT a valid PAN ID. The valid range of available PAN ID is from 1 to 500</p>
Channel	<p>Channel selection</p> <p>Default value = 10 Range is: 10 to 26</p> <p>This parameter (Channel) is used to link specific thermostats or repeaters to specific Vykon wireless gateway(s) (VWG / JACE) For every thermostat or repeater reporting to a gateway be sure you set the SAME channel value both at the gateway and the wireless device(s).</p> <p><i>Vykon recommends using only the following channels (15, 25 or 26)</i></p> <p>The default value of 10 is NOT a valid channel. The valid range of available channel is from 11 to 26</p>

Specifications

Repeater power requirements:	19-30 Vac 50 or 60 Hz; 2 VA Class 2
Operating conditions:	0 °C to 50 °C (32 °F to 122 °F) 0% to 95% R.H. non-condensing
Storage conditions:	-30 °C to 50 °C (-22 °F to 122 °F) 0% to 95% R.H. non-condensing
Wire gauge	18 gauge maximum, 22 gauge recommended
Dimensions:	4.94" x 3.38" x 1.13"
Approximate shipping weight:	0.75 lb (0.34 kg)
Agency Approvals all models:	UL: UL 873 (US) and CSA C22.2 No. 24 (Canada), File E27734 with CCN XAPX (US) and XAPX7 (Canada) Industry Canada: ICES-003 (Canada)
Agency Approvals all models	FCC: Compliant to CFR 47, Part 15, Subpart B, Class A (US) CE: EMC Directive 89/336/EEC (Europe Union) C-Tick: AS/NZS CISPR 22 Compliant (Australia / New Zealand) Supplier Code Number N10696 FCC: Compliant to: Part 15, Subpart C

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 UNDESIRE OPERATION.

Drawing & Dimensions

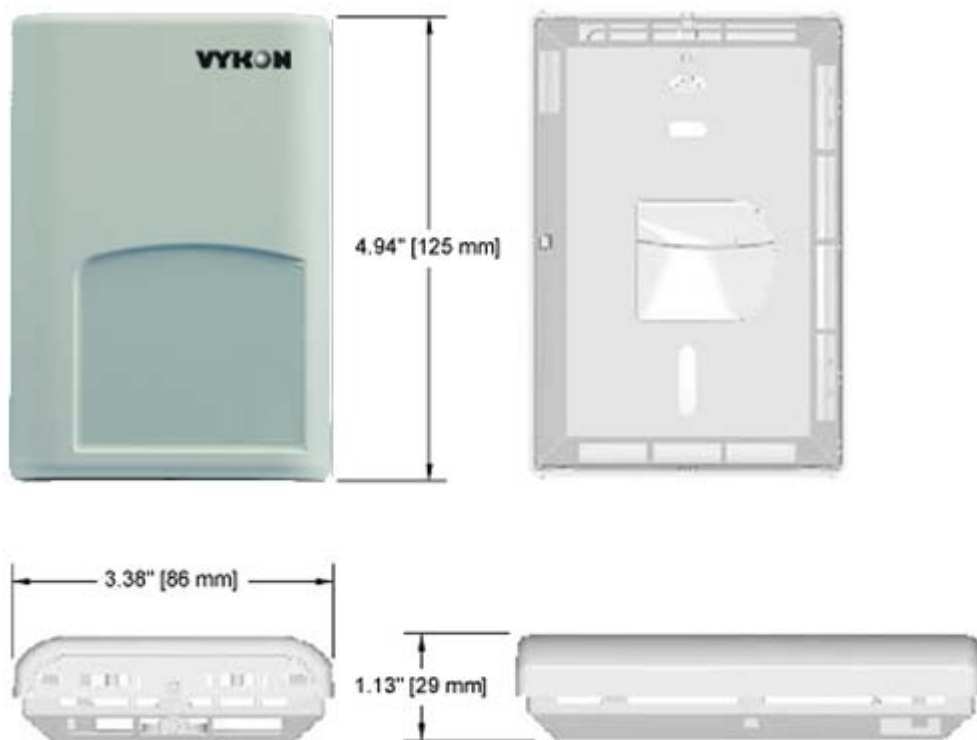


Fig.13 – Repeater dimensions