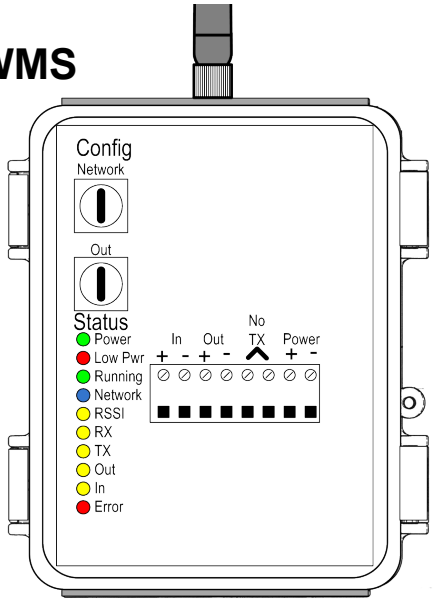
Wireless Monitor System (Remote) – WMS
DOC # WSD20166-44, Rev 2
WMS5026-2

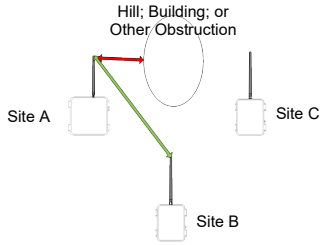


- NEMA Package (1, 2, 4 and 4X)
- IP66 Rated (All Openings Sealed)
- Easy Installation
- Easy Configuration
- 7 Year Warranty

1) Description

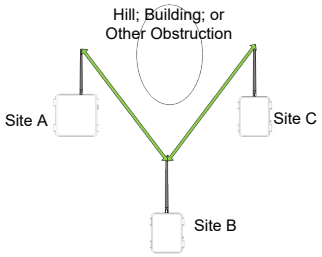
The **Wireless Monitoring System** is a inexpensive alternative to traditional wireless systems for transferring contact closure status between one or more sites. Especially if any of the sites are not within line of sight of a master station. Traditional wireless system will require repeaters or mounting the antenna on a high tower. Both increase the cost of an installation. If there are zoning restrictions or neighbored associations installing a tower or repeater may not be an option.

The WMS uses a different approach to wireless communications. Each WMS uses Mesh Networking to communicate between sites. With Mesh Networking, every site is repeater. As long as each site has another site with line of sight, all sites may communicate with each other. This allows the WMS to get around obstructions without adding a tower or repeater.



Traditional Wireless

Site A needs to transfer a contact to and from Sites B and C. However, due to an obstruction, Site A can only transfer to Site B and not Site C.



Mesh Network

Site A needs to transfer a contact to and from Sites B and C. But unlike Traditional Wireless, a Mesh Network can work without line of sight to all sites. The signal intended for Site C is not sent directly to Site C, but is received by Site B and automatically forwarded to Site C. Without additional hardware.

Simple to use - They work right of the box – simply connect up the Power, Inputs and Outputs, then set one or two switches. No configuration software is required.

The WMS also uses a NEMA rated enclosure for harsh environments. You don't need an extra enclosure to protect the WMS. All wiring is done inside the box, and when exit points are properly sealed, IP66 level protection is provided against dust and water incursion.

Whether your requirement is to transfer contact closure data between two or more locations then the **Wireless Monitoring System** is definitely for you.

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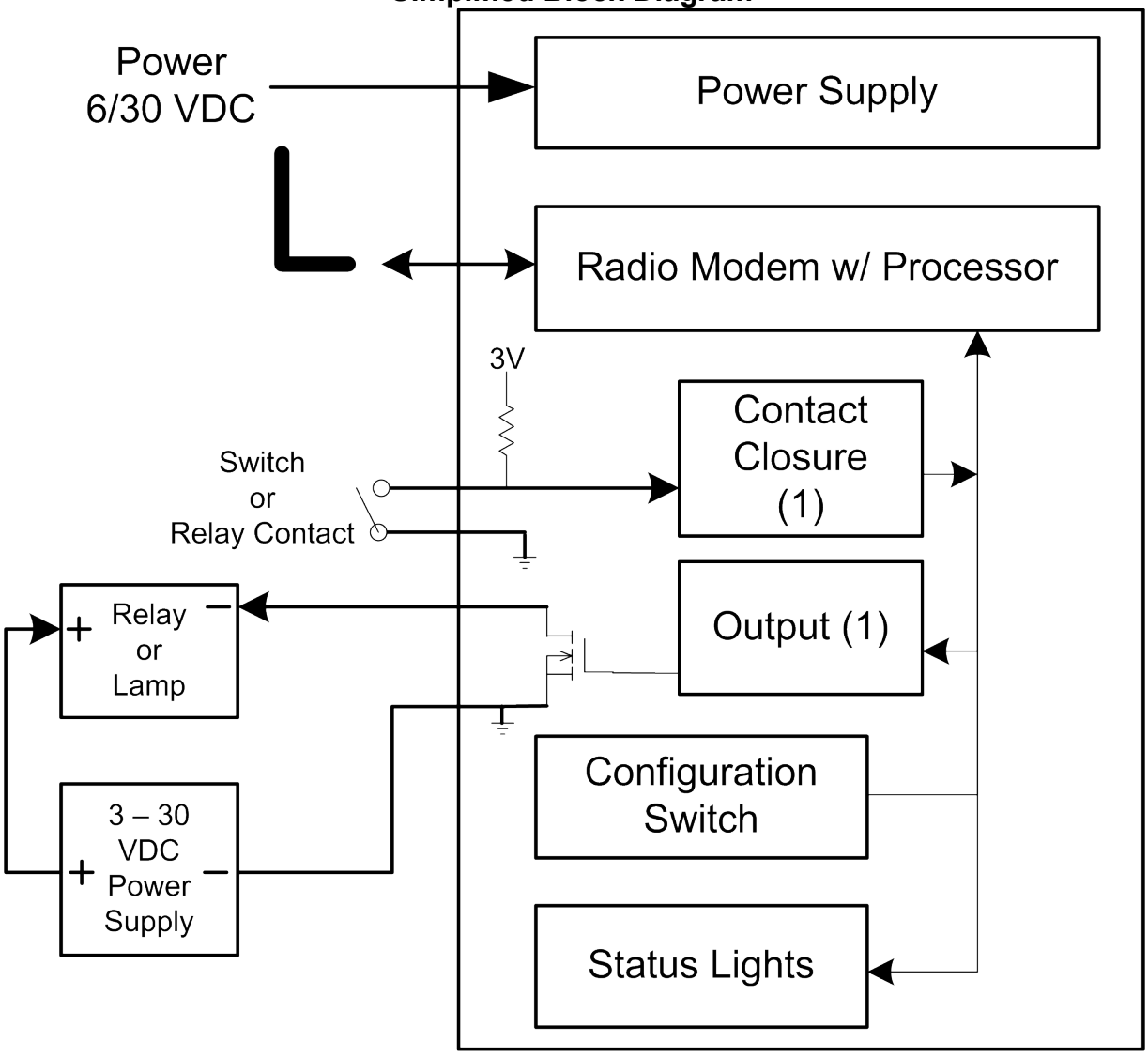
2) Overview

The **Wireless Monitoring System (WMS)** has two different models. This document covers the Remote WMS, WMS5026-2. See WSD20166-43 for Base Station WMS, WMS5026-1.

Field wiring are terminated with screw terminals inside the WMS, which allows the WMS to be used without an external enclosure. A total of 10 status indicators provides instant operational status. 7 General system status and 3 I/O status.

3) Technical Data

Simplified Block Diagram



AGM Wireless Monitoring System (WMS) Product Numbers -
Base Station (8 DIO) = WMS5026-1
Remote Station (1 DIO) = WMS5026-2

Installation Notes

The WMS uses the 900 MHz ISM radio band. Licensing is not required. However, it is possible for other 900 MHz radios to interfere with each other. The following recommendations will help prevent interference and allow the WMS to operate without issues:

1. Minimum distance between two WMS using the included whip antenna is 2 inches.
2. Minimum distance between a WMS and any other 900 MHz ISM radio is 10 feet.
3. If any other 900 MHz radio is operating within range of the WMS, use horizontal orientation for the other radios and vertical orientation for the WMS.
4. Do not point any high gain directional antennas used by other 900 MHz radios directly at a WMS.
5. If possible, use extra WMSs in place of towers and long coax cable runs. If you find you can not get around a obstruction without a tower, try setting up a WMS to the side of the object. If you still need a tower, try putting a WMS with a external antenna at the top of the tower rather than running coax cable up the tower.

Status Indicators

- Power – WMS has Power
- Low Power – Input Voltage is too low (Minimum Voltage 6 VDC)
- Running – WMS Functioning
- Network – At least one other WMS has been detected on Network
- RSSI – Radio Signal Strength
- RX – Flashes when Status from Remote Site Received
- TX – Flashes when Input Status is Transmitted
- Out – Current Status
- In – Current Status
- Error – Communications Faults
  - On Steady – Output Has Not Been Updated in Over 1 Minute
  - Flashing – More Than One Input is Attempting to Control Output

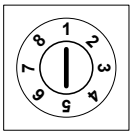
Relative Signal Strength Indication (RSSI)

% Strength	RSSI Light Status	Frequency	
100-95	Always On		
95-85	Pulses Every 0.2 Seconds	5.00	Hz
85-75	Pulses Every 0.4 Seconds	2.50	Hz
75-65	Pulses Every 0.6 Seconds	1.67	Hz
65-55	Pulses Every 0.8 Seconds	1.25	Hz
55-45	Pulses Every 1 Seconds	1.00	Hz
45-35	Pulses Every 1.2 Seconds	0.83	Hz
35-25	Pulses Every 1.4 Seconds	0.71	Hz
25-15	Pulses Every 1.6 Seconds	0.63	Hz
15-5	Pulses Every 1.8 Seconds	0.56	Hz
Under 5	Always Off		

Note: RSSI light only shows relative signal strength of the last packet received. It using this indicator to align antennas, power down all Wireless Monitoring Systems not being used to align the antennas.

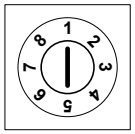
Configuration Switch and Jumper

Network



Network – Sets the Mesh Network – All Remote WMS Must Be Set the Same

Out



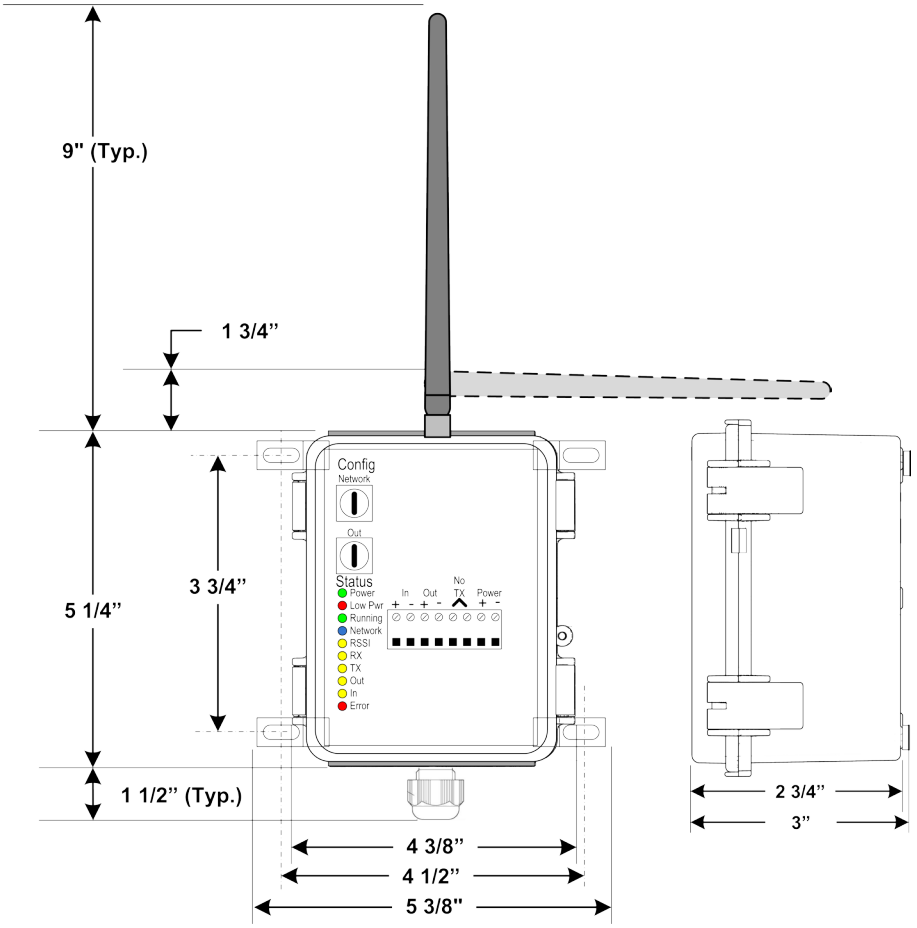
Out – When used with Base Station, Selects Which I/O Will Be Transferred
For Remote to Remote Transfers, Network and Out Switches Must Be Set the Same

No
TX

No TX Jumper – Disables the Transmitting of Input Status to Remote Sites

Dimensions

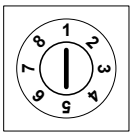
(not to scale)



4) Configuration

Configuration Switch and Jumper

Network



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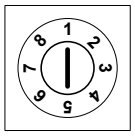

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TX

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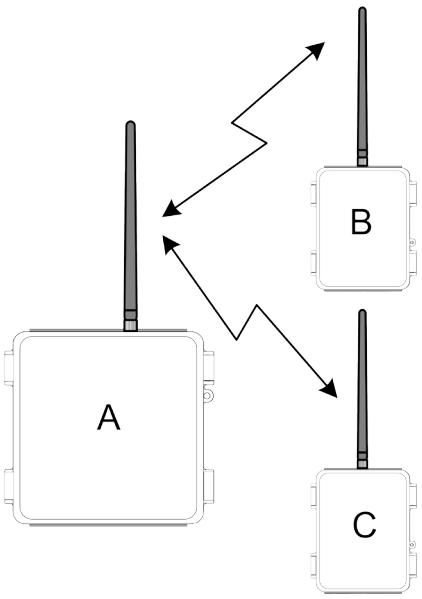
The modules of the **Wireless Monitoring System (WMS)** are configured by rotary switch(s) and one jumper. No configuration software is required. On Remotes you need to set two switches. One switch defines which one of the 8 available networks you want to use. The Second Switch defines the output to use on Base Station or which Remote you want to use on the network. For Remote to Remote transfers, both switches must be set to the same setting.

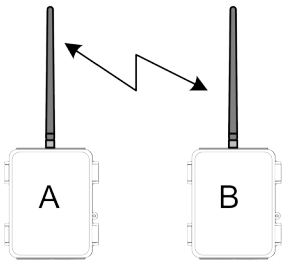
The "No TX" jumper is used to enable or disable sending of input status. See the table below.

Jumper Status	Results
Remote WMS to Remote WMS	
No Jumper on either Remote	Input and Output transferred both ways.
No Jumper on one Remote, Jumper installed on one or more other Remotes	Input of Remote WMS without the jumper will be transferred to all outputs with matching Out switch.
No Jumper on two Remotes, Jumper installed on all other Remotes	Input and Outputs transferred between the two Remotes without jumpers installed. Outputs of Remote WMS with jumper installed will show error condition and should not be used. Note: The Remotes with jumpers installed will still transfer data over the Mesh network. Use this combination when the Remote WMS will only be used as a repeater.
Base Station WMS to Remote WMS	
No Jumper on Base Station WMS and Remote WMS	8 Inputs on Base Station transferred to outputs on up to 8 Remote WMS. One Input from each of the Remote WMS transferred to output on the Base Station.
No Jumper on Base Station WMS and Jumper installed on Remote WMS	8 Inputs on Base Station WMS transferred to outputs on up to 8 Remote WMS. The Base Station may control multiple Remote WMS outputs, however none of the Remote WMS's may control the Base Station Outputs.
Jumper on Base Station WMS and no Jumper installed on Remote WMS	The Base Station WMS monitors the Input Status of the Remote WMS's only. None of the Base Station Inputs transferred to any Remote WMS outputs.

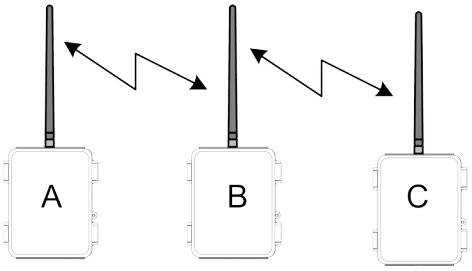
5) Sample Configurations



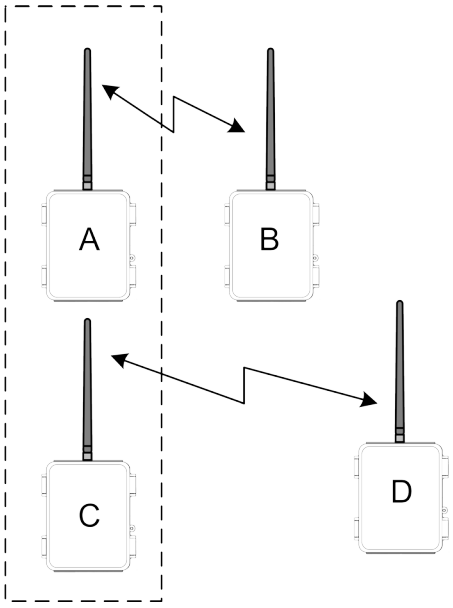
Base Station (A) to Remote (B & C)
Contact Closure Transferred Both Ways
Up to 8 Remotes may be used



Remote (A) to Remote (B)
Input and Output Transferred Both Ways



Remote (A) to Remotes (B&C)
Input from A Transferred to Both B and C
One Way Transfer



Two Remote WMS (A&C) Located at the Same Site. Both Network Switches Set the Same but With Different Out Switch Settings

Remote (A) to Remote (B)
Input and Output Transferred Both Ways

Remote (C) to Remote (D)
Input and Output Transferred Both Ways

Note: Antennas of All WMS must be at least 1 foot apart

6) Specifications

Physical - 5.4 X 5.3 X 3 inches (AUX) - Reverse SMA Antenna Connector - PCB Conformally Coated - NEMA 1, 2, 4 & 4X case (IP66 Rated if Cables Sealed) - Wire Size: 12 to 24 Gauge - Wire Connector: Internal Screw Terminals - Mounting Brackets or - Temperature Range (-)20 to (+)70 Deg C **Power** - 6 to 30 VDC - 2 Watts **Configuration** - Two 8 Position Rotary Switches - Terminal to Disable Sending Inputs **Inputs and Outputs** Discrete Inputs: 1 each - Type: Dry Contact or V Level. Internal Pull Up = 3 VDC Max Pull Up V = 30 VDC Discrete Outputs: 1 each - Type: MOSFET Driver. Rating – 100 mADC.1@ 30 VDC Max	**Wireless** Performance: - Power output: 250 mW - Indoor/Urban range: Up to 1000 ft - Outdoor/RF line-of-sight range: up to 4 miles - Minimum Distance between Antennas = 1 Foot - RF data rate: 200 kb/s - Receiver sensitivity: -101 dBm - Frequency range: ISM 902 – 928 MHz - Spread Spectrum: FHSS (Frequency Hopping Spread Spectrum) - Modulation: FSK (Frequency Shift Keying) Networking: - Mesh Network - Channel capacity: 8 Network Addresses **FCC Approval** - Contains FCC ID: MCQ-XB900HP - Complies with Part 15 of the FCC Rules. - Operation is subject to the following two conditions: (*i.*) this device may not cause harmful interference and (*ii.*) this device must accept any interference received, including interference that may cause undesired operation.

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