

The 6424 MeshScape® Wireless Sensor Input/Output Node Integrates a Variety of Sensors into a Self-Forming and Self-Healing Wireless Network or can act as an equipment controller as an On/Off relay switch.

Features at a Glance

- MeshScape-compatible wireless sensor node
- Line-powered mesh node
- Operates on a worldwide and license-free 2.4 GHz ISM radio band with 15 user-selectable channels
- Star and star-mesh network topologies
- Data rates up to 250 kbps
- 10-bit analog to digital conversion resolution
- Two RJ11 connectors for easy installation
 1. Four Analog-to-Digital Channels:
 - o Two 0 ~ 3 VDC or 0 ~ 10 VDC analog signals
 - o Two 0 ~ 3 VDC or 4 ~ 20 mA analog signals
 2. Four digital I/O for on/off monitoring/control or
 3. 1 Optically isolated solid state relay for switching up to 50V AC/DC @ 1Amp + 2 Digital I/O
- RoHS-compliant
- FCC-compliant hardware modules
- Available in indoor/outdoor (NEMA) enclosure

Wi-IO Input/Output

The Wi-IO enables wireless bi-directional communication to virtually any analog sensor, digital sensor, or serial output device. Each Wi-IO node provides great flexibility, with four analog inputs and four digital I/O pins that connect directly to sensors and output devices.

Ease of Installation

The Wi-IO can be installed in minutes with no need to run network wires. It serves as a MeshScape 6424 Mesh Node in a star or star-mesh network topology. Installation is also made easier by the connection between the RJ11 connectors and the sensors or any other output devices.

Typical Applications

The Wi-IO is a general purpose device used to monitor a wide variety of analog, digital, and serial inputs and outputs. Examples of input switches and signals are light sensors and motion detectors as well as proximity, pressure, flow, amp, voltage, and serial instruments. Digital I/O enables output and verification of associated control points.

Long Range

The Wi-IO transmits at a radio power of 60-mW, allowing for communication distances of at least 750 feet clear line of sight.

Try it for yourself

Setting up a wireless mesh network is fast and easy. The MeshScape self-forming and self-healing network is designed for rapid deployment and easy operation.

For more information, visit www.millennialnet.com

MeshScape GO Networking

The Wi-IO uses the industrially-proven MeshScape GO networking system, which employs patented Persistent Dynamic Routing™ (PDR) techniques to form a self-configuring wireless mesh network. PDR uses a node-initiated network formation to enable efficient topology discovery and facilitates network re-formation (required in ever-changing RF environments) by applying “best route” information. With MeshScape, you can deploy industrial-class wireless mesh networks that are:

- **Self-administrating:** a self-forming and self-healing mesh network requires no administration
- **Robust:** a network that ensures multi-route reliable data transmission over extensive distances
- **Responsive:** a network that quickly adapts to changes in topology and radio frequency (RF)
- **Power efficient:** very low power consumption
- **Scalable:** with the application, can scale to hundreds of wireless nodes with minimal overhead
- **Low latency:** very short network data delivery times

The Wi-IO is designed to be part of the MeshScape LAN-based system, which can be configured to provide either single-site monitoring/control via a local PC or multi-site monitoring/control via an internet web interface.



The Millennial Net Wi-IO is a general purpose node featuring two RJ11 connectors with six conductors each that integrates a variety of sensors and actuators into a wireless mesh sensor network.

Remote Monitoring/Control Software Features

The Wi-IO is designed to interface with any Modbus® - or MeshScape-compatible Remote Monitoring and Control software applications, such as Millennial Net's Wi-EMS. The Wi-EMS is a full-featured and easy-to-use Wireless Energy Management System that provides all the tools you need to report, trend, and analyze energy consumption.

6424 Wi-IO Specifications

Parameter	Value	Unit	Notes
Power			
External power supply	9 ~ 24	VDC	
Power supply voltage for external devices	3.0 ± 0.5%	VDC	Max output current 50 mA
Digital Input / Output Channels			
Number of channels	4	channel	Each of the four channels can be configured as digital input or output channel; DIO1 and DIO3 can be configured through jumper for opto-isolated switching output and return.
Logic "1" input voltage	2.8	VDC	Minimum
Logic "0" input voltage	0.5	VDC	Maximum
Maximum output current	4	mA	Maximum
Opto-isolated Output Channels			
Number of channel	1	channel	Remotely controlled based on schedule or real time command
Maximum voltage	50	V, AC or DC	
Maximum current	1	A	
Analog-to-digital Converter Channels			
Number of channels	4	channel	Through jumpers, two channels can be configured to accept 0 ~ 3 VDC or 0 ~ 10 VDC analog signals, and the other two can be configured to accept 0 ~ 3 VDC or 4 ~ 20 mA analog signals
Input impedance	197 (3V range) 4 (10V range)	KΩ	
Acquisition time	20	μsec	Minimum
Resolution	10	bits	
Radio			
Operating frequency range	2405 ~ 2475	MHz	ISM band
Number of available channels	15		IEEE 802.15.4 channels 11 ~ 25
Channel spacing	5	MHz	
Maximum RF transmit power	18	dBm	
Receiver sensitivity	-95	dBm	At 10 ⁻⁵ bit error rate
RF data transmission rate	250	Kbits/sec	
Channel agility	Yes		Automatically realigns RF channel when network (MeshGate) switches to a new channel.
Environmental & Mechanical			
Storage temperature range	-40 ~ +85	°C	
	-40 ~ +185	°F	
Operating temperature range	-10 ~ +55	°C	
	14 ~ +131	°F	
Dimension	118 x 69 x 25.4	mm	
	4.7 x 2.7 x 1	in	
Weight	3.3	oz	
	95	g	
Regulatory Compliance			
FCC & IC for unlicensed operation			

6424 Wi-IO I/O Configuration

All Wi-IO Inputs and Outputs are configured by switching jumper positions on Headers P2, P4, P6. Table 1 and Figure 1 describe Input/Output contacts on RJ11 connector. Table 2 and Figure 2 show Input/Output configuration on all Headers.

Table 1: WI-IO RJ11 Contacts Descriptions

Contact Number	I/O Description
1	GND
2	ADC3: 0-3 VDC or 4-20mA
3	ADC2: 0-3 VDC or 4-20mA
4	ADC1: 0-3 VDC or 0-10 VDC
5	ADC0: 0-3 VDC or 0-10 VDC
6	Switched 3 VDC Output
7	GND
8	DIO0: Digital I/O or UART TX output
9	DIO1: Relay A or Digital I/O or UART RX input
10	Power Input
11	DIO3: Relay B or Digital I/O or UART RTS output
12	DIO2: Pulse Input or Analog Output or Digital I/O or UART CTS input



Figure 1: RJ11 Connector Contact Numbers on Wi-IO

Table 2: WI-IO I/O Configurations

I/O Description	Header	Pins	Jumper
<i>Analog I/O</i>			
ADC0: 0-3 VDC	P4	3-4	Off
ADC1: 0-3 VDC	P4	5-6	Off
ADC2: 0-3 VDC	P4	7-8	Off
ADC3: 0-3 VDC	P4	9-10	Off
ADC0: 0-10 VDC	P4	3-4	On
ADC1: 0-10 VDC	P4	5-6	On
ADC2: 4-20mA	P4	7-8	On
ADC3: 4-20mA	P4	9-10	On
<i>Digital I/O</i>			
DIO0		Always enabled	
DIO1	P4	1-2	On
DIO2	P6	1-2	On
DIO3	P2	2-3	On
<i>Solid State Relay*</i>			
Relay A	P4	1-2	On
Relay B	P6	1-2	On

* - Relay A and Relay B must be enabled together.

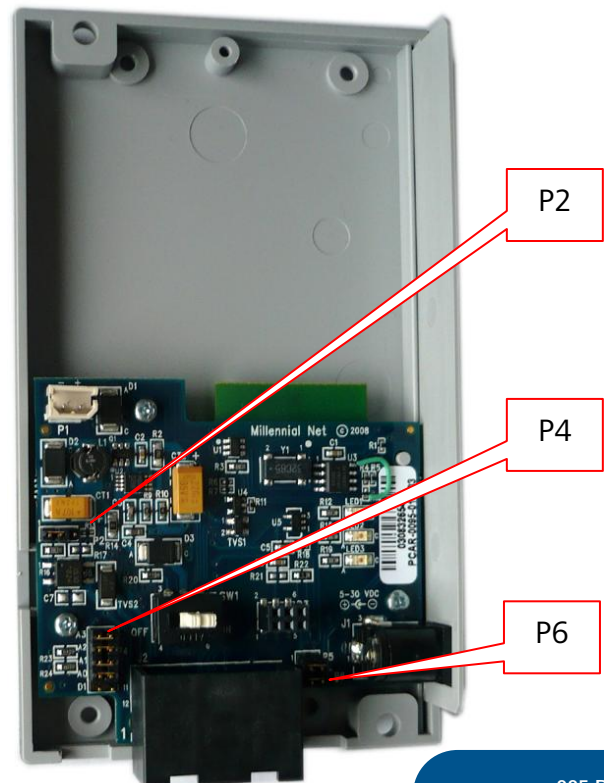


Figure 2: Header Locations on Wi-IO