Wireless Meshing I/O Units

Weidmuller's WI-I/O-9-U2 combines multi I/O and/or gateway functionality with the reliability of secure, scalable mesh distance communications. The WI-I/O-9-U2 IP-based addressing provides mesh/self-healing of network communications, multihop repeating and remote over the air re-configuration and diagnostics. The WI-I/O-9-U2 is further complemented by its ease of commissioning and integration into existing plant infrastructure.

Features:

- 902-928MHz Frequency Shift Keying (FSK): Frequency Hopping Spread Spectrum Channels/Hop Sets: 50 x 250kHz; 2 frequency channels.
- IP Based Wireless MESH Technology @ 1 Watt transmit power.
- Self-healing, repeatable, secure communications to 128bit AES
- User friendly operation with self discovery of radio path and expansion I/O
- Remote over the air re-configuration, firmware upgrade and fault analysis
- Scalable, simple to complex, and point to multipoint network design
- Block Mapping and Block Messaging technology for ease of system integration
- I/O and/or gateway functionality via feature key upgrade
- System wide view, localized I/O referencing, and printing/exporting of configuration

WI-I/O-9-U2 TC

The WI-I/O-9-U2 TC is a thermocouple adapter interface for the WI-I/O-9-U2 product. The WI-I/O-9-U2 TC provides greater accuracy by allowing calibration between the adapter, measurement devices and ambient temperatures. Temperature measurement accuracy depends on the measured temperature and ambient temperature. Errors are a result of both errors in cold junction temperature and thermocouple voltage measurement. The WI-I/O-9-U2 TC provides for greater accuracy by allowing calibration of the cold junction temperature offset value and thermocouple temperature (i.e. offset calibration).

Supported Thermocouple: Type T

Measurement ranges: -200 to +30°C and 0 to +390°C

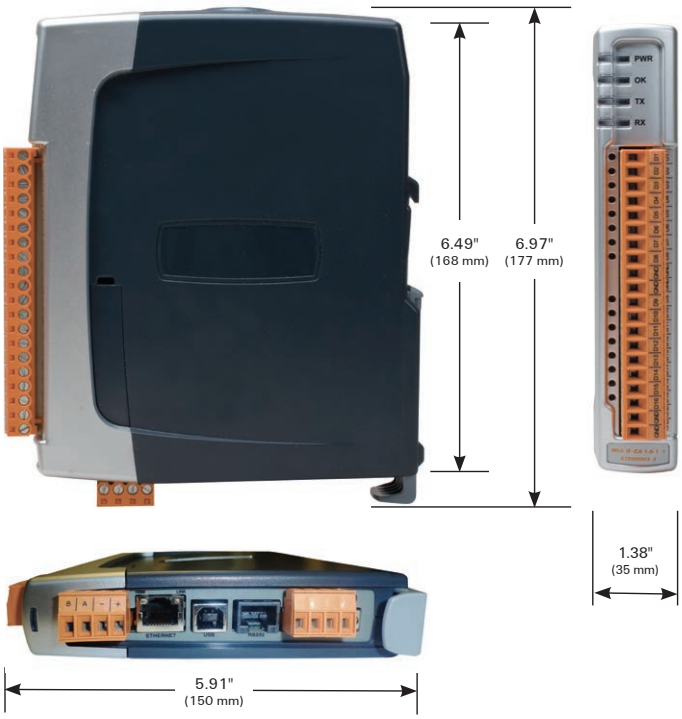
Basic Accuracy (Un-calibrated): +/- 3.5°C at -200 to +30°C +/- 2°C at 0 to +390°C

Calibrated Accuracy: +/- 1°C over ambient temperature range +/- 0.5°C at calibration temperature

Security and Configuration

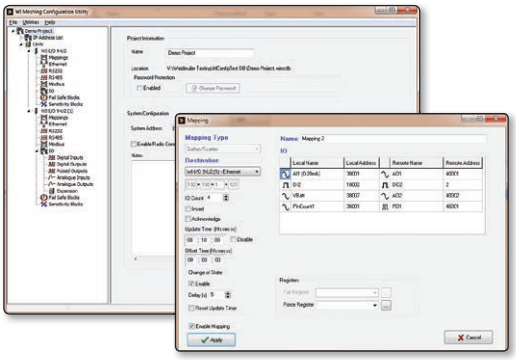
Data encryption: 64bit; 128bit AES
Password: https accessibility
User Configuration: Web page; software configuration

Dimensions



WI-I/O-9-U2 Meshed Multi I/O and Gateway

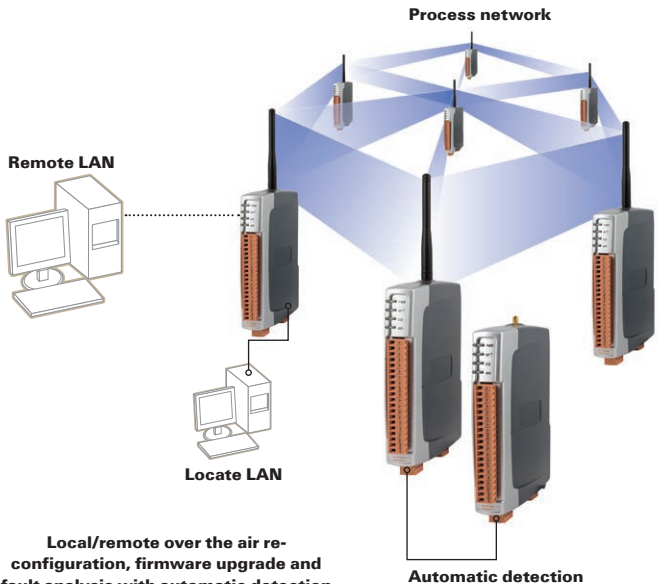
Configuring and commissioning time/effort on the WI-I/O-9-U2 has been designed for ease of customer use and cost savings during commissioning. The configuration utility allows for simple nomination of I/O points origin and destination with automatically detecting and routing the most efficient path to the destination node. This is complemented by periodic interrogation for optimal path verification, quick recovery of network communications and automatic detection of expansion I/O (Weidmuller's WI-I/O-EX-1-S). It also incorporates efficient 'change of state' radio communications and user configurable I/O or register periodic reporting of link status (ie update time). All combine to ensure the user is in charge of network communications.



Configuration is user friendly by nominating and labelling origin and destination points, and IP-based addressing finds the most efficient route.

Remote/local configuration, upgrade and analysis.

Weidmuller's IP-based addressing further aids in cost reduction providing remote analysis and/or upgrade. A user may perform remote or local over the air re-configuration and interrogation of nodes for diagnostics and firmware upgrade. User nominated localized referencing of I/O and system wide network viewing aids in fault analysis and exporting/printing of node configuration is supported.



Local/remote over the air re-configuration, firmware upgrade and fault analysis with automatic detection of expansion I/O to reduce overheads.

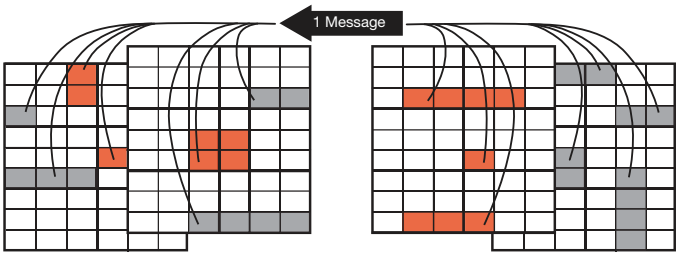
Automatic detection of expansion I/O

Quicker, more cost effective commissioning.

Radio network efficiency and commissioning of the WI-I/O-9-U2 into legacy process control/automation networks is aided with block mapping and block messaging technology.

Block mapping technology allows end-users to gather related, non-contiguous data points/registers, into a single radio message structure and scatter these points at receiving devices for ease of integration (eg PLC logic, SCADA tags).

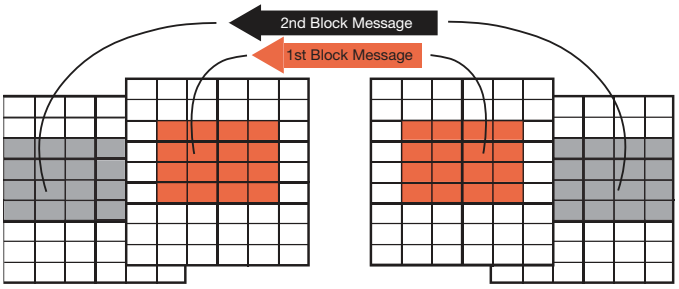
Block Mapping Technology



Block mapping technology enables non-contiguous data to be transferred between network devices reducing re-programming time and associated costs.

Block mapping technology is complemented by block messaging technology allowing end users to select continuous, related, I/O and registers for forwarding to receiving devices in a single message. Both block mapping and block messaging combine with highly efficient 'change of state', dense capacity radio messaging capabilities in providing scalable system design for ever growing application needs.

Block Messaging Technology



Block messaging communicates continuous blocks of data improving the efficiency of radio band use and even more scalable network design.

Cost effective, distance IP based mesh networks.

The WI-I/O-9-U2 combines distance, 900MHz, IP mesh communications with ease of configuration, local/remote over the air re-configurability, firmware upgrade and diagnoses of nodes in the network.

Featuring Weidmuller's IP-based addressing technology with its innovations in network communications efficiency, the WI-I/O-9-U2 provides for scalable network design for process control and automation base applications.

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WI-I/O-9-U2

Technical Data

Inputs	
Digital: opto-isolated (5kV) inputs suitable for voltage free contacts or NPN transistor	Up to 8 DI (Configurable), On-state Voltage <2.1V Wetting, Current 5mA
Analog: "floating" differential inputs, common mode voltage 27V, 24VDC for powering external loops provided, digital filtering 1 sec.	4 AI (2 differential: 2 single ended) resolution 14bits; accuracy 0.1% Current Range - 0-24mA Voltage Range: AI 1,2: 0-25V, AI 3,4: 0-5V
Pulse: (configurable Digital Inputs)	4 PI DI 1,2: Max. Pulse rate 50kHz, Pulse width min 10us DI 3,4: Max. Pulse rate 1kHz, Pulse width min 0.2ms
Outputs	
Digital	Up to 8 DO (Configurable) FET (30V DC @ 200mA max.) On-state Voltage - DO Max: 30 V DC Wetting Current - DO Max: 200mA
Analog: current sink to common, max loop voltage 27V, max loop resistance 1000 ohms	2 AO 0-24mA; resolution 13bits; accuracy 0.1%
Pulse: FET 30VDC 200mA max 10kHz	4 PO DO 1, 2 Max. Pulse rate 50kHz, Pulse width min. 10µs DO 3, 4 Max. Pulse rate 1kHz, Pulse width min 0.2ms
Power Supply	
Battery supply	12-15V DC
Normal supply	15-30V DC, over-voltage and reverse power protected
Battery charging circuit	included for 1.2-12 AHr sealed battery
Average Current Draw	220mA @ 12V DC (Idle), 110mA @ 24V DC (Idle)
Transmit Current Draw	500mA @ 12V DC (1W), 250mA @ 24V DC (1W)
Internal monitoring	power fail and battery voltage
Notes	An internal DC/DC converter provides 24V DC 150mA for analog loop supply.
Connections	
RS232/RS485	serial port 9600 baud, 8 bits, no parity, 1 stop bit
RS232 connection	EIA-562 (RJ45 connector)
RS485 connection	max cable distance 2000 m terminal connections
Ethernet Port	10/100 BaseT; RJ45 - IEEE 802.3
USB Port	USB-B connector for configuration
General Data	
Frequency	902-982MHz
Transmit Power	1mW (+0dBm) to 1W (+30dBm)
Transmission	Frequency Hopping Spread Spectrum (FHSS)
Modulation	Frequency Shift Keying (FSK)
Receive Sensitivity	-109dBm @ 19.2Kbps (3% FER)
Channel Spacing	50 x 250 KHz
Data Rate	19.2-115.2 Kbps "Auto Mode" selects fastest rate possible relative to RSSI
Range (LoS)	32Km (20 mi.) @ 1W
Operating Temperature	-40 to 60°C (-40 to 140°F)
Humidity	0-99%RH
EMC Standards	EN 300 683; FCC Part 15; AS 3548; 89/336/EEC
Approvals	Class 1 Div 2 , CE, IEC60950, IECex
Mounting	DIN-rail mounting
LED indication	Power, RF, RS232, RS485, D I/O (P I/O), A I/O
Antenna connector	1 x SMA female coaxial
Dimensions mm (in)	180 x 150 x 35 (5.91 x 7.09 x 1.38)

Ordering Data

	Type	Part No.
Wireless Mesh I/O 8 DI/O, 4AI, 2AO, 1-4 PI/O	WI-I/O-9-U2	**6720005011**
Wireless Mesh Radio + Modbus Gateway software (Preloaded)	WI-I/O-9-U2-MODTCP-900US	**6720005014**
Modbus TCP/RTU Gateway (software Add-on)	WI-I/O 9-U2-GTWY*	**6720005012**
TCP Adaptor (Type T Thermocouple Add-on)	WI-I/O 9-U2 TC	**6720005013**

***Note:** Gateway Software Add-on is licensed to a single WI-I/O-9-U2 Radio Serial number & is not intended for use on multiple radios. When ordering WI-I/O-9-U2-GTWY alone, please include existing WI-I/O-9-U2 radio Serial Number (printed on the side of the unit).