

# Wireless I/O Unidirectional Transmitter/Receiver Units – Introduction

## Wireless Input/Output (I/O)

Wireless I/O connects directly to analog, discrete and pulse transducer signals. The signals are transmitted by radio and either re-created as output signals, or output via serial link or field-bus.

Weidmuller Wireless I/O units have the ability to form sophisticated peer-to-peer networks, with event-reporting messaging to optimize wireless density. Weidmuller products are designed for high reliability operation on open license-free radio bands.

## WI-I/O 9-L Unidirectional Transmitter/Receiver Units

The Unidirectional Wireless I/O range of products is suitable for connecting to a single sensor or group of sensors and provides an economical solution for remote monitoring systems. The Unidirectional L products can also be used in more complex networks as signal transmitters or receivers.

- Frequency hopping spread spectrum 902-928 MHz 1W license-free USA/Canada/Mexico
- Configurable sub-bands license-free South America, Australia/NZ, Asia, Europe

## Applications

- Wireless connection of flowmeters or energy meters
- Monitoring storage tanks
- Monitoring cathodic protection on pipelines
- Wireless alarms from power reticulation fault relays



## Features


### Matched transmitter/receiver pair of modules, or individual transmitter and receiver units

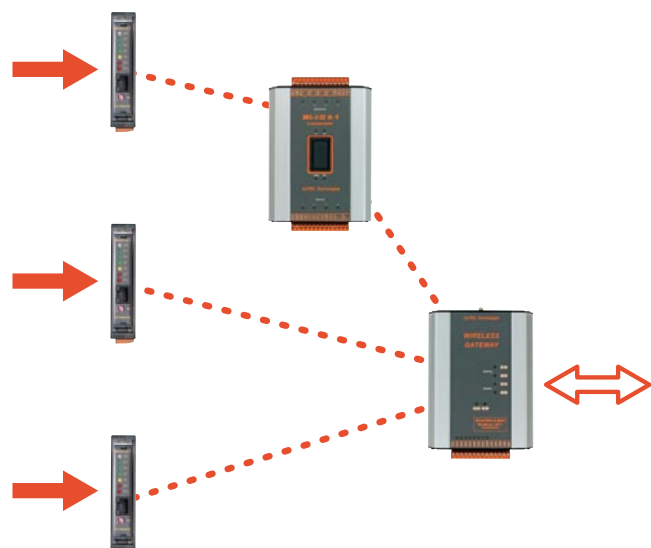
- Peer-to-peer communications. Exception reporting. Reliable self-checking messages. Highly secure data encryption.
- Multi-hop repeater functions - up to 5 intermediate units can be configured in any input-output link
- Factory configured as a matched Transmitter/Receiver pair or user-configurable with E-Series Windows configuration program

### Transmitter unit

- Input-only transmitter unit - two digital/pulse inputs, one analog input and one thermocouple mV input




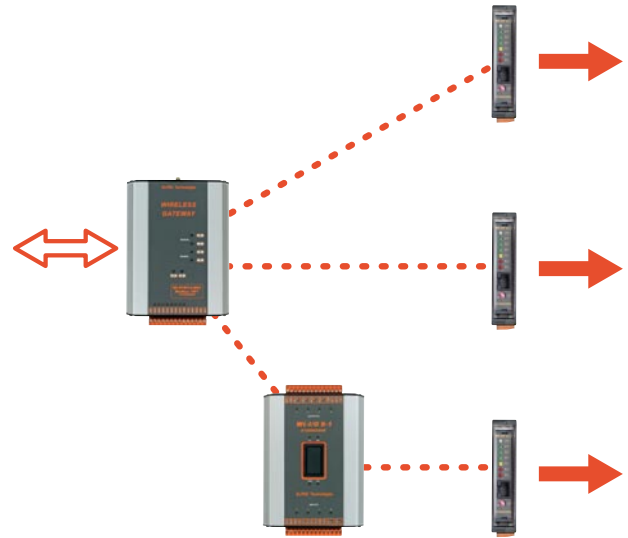
- Transmits to Receiver unit as a matched pair where the input signals are re-created as output signals, or can transmit to a Multi-I/O or Gateway unit
- Class 1 Div 2 hazardous areas approval 
- Up to 3000 wireless units per network
- External inputs plus internally calculated values - analog setpoint status, pulse count, power supply voltage
- Thermocouple input -100 to +100mV with cold-junction compensation and linearization for J, K or T-type
- Setpoints status generated by comparing analog input to high and low setpoints
- Digital inputs can also be used as pulse count inputs
- Power supply 9 – 30Vdc, measured and available as a transmitted variable
- 24Vdc analog loop supply internally provided
- RS232 Configuration and diagnostics port



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## Receiver unit

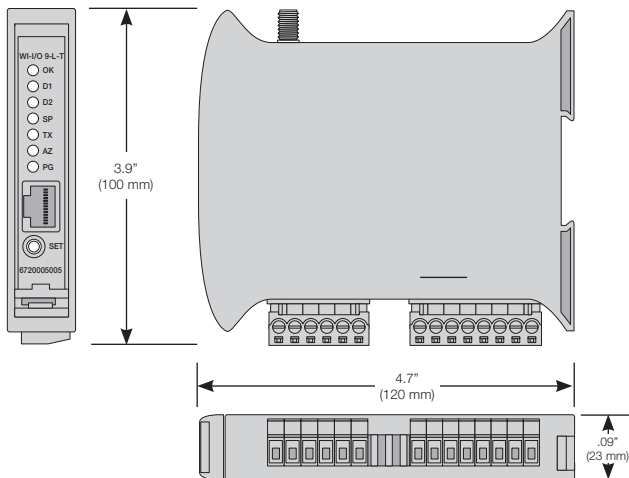
- Output-only receiver unit - three digital contact outputs and one analog output
- Receives radio commands from Transmitter unit as a matched pair where the input signals are re-created as output signals, or can receive commands from a Multi-I/O or Gateway unit
- Class 1 Div 2 hazardous areas approval 
- Up to 3000 wireless units per network
- Power supply 9 – 30Vdc; 24Vdc analog loop supply internally provided
- Communications failure indication and configurable output
- Outputs can be configured as retained or reset (fail-safe) on communications failure
- LED indication of radio signal strength
- RS232 Configuration and diagnostics port



## Transmitter/Receiver Unit Ordering Information

Unit	Description
WI-I/O 9-L-T	Wireless Transmitter (900 MHz)
WI-I/O 9-L-R	Wireless Receiver (900 MHz)
WI-I/O 9-L-P1	900 MHz Wireless Transmitter/ Receiver Pair
WI-I/O 9-L-P2	900 MHz Wireless Transmitter/ Receiver Pair with two WI-ANT-DPL-0-8 Dipole Antennas

## Dimensions



- **Temperature:** -40 to 60°C / -40 to 140 °F
- **Humidity:** 0 - 99% RH
- **Regulatory Approvals:** EMC compliant 89/336 EEC, EN 301 489, AS3548, FCC Part 15, Approved to FCC Part 15.247, RS210
- **Housing:** DIN rail thermo-plastic enclosure 100 x 22 x 120 mm / 3.9 x 0.9 x 4.7 inches
- **Transmitter Unit:** Power/OK, radio TX, DIN1, DIN2, analog set-point status
- **Receiver Unit:** Power/OK, radio RX, DO1, DO2, DO3, communications fail LEDs also used to provide radio signal strength indication

## General

- **Frequency:** frequency hopping spread spectrum 902-928MHz, sub-bands available, 1W
- **Sensitivity:** line-of-sight range 20 miles (4W ERP - “effective radiated power”), 15km (1W ERP); 3000 ft / 1000 m in obstructed industrial environments; radio distances can be increased by up to 5 intermediate transceiver or gateway units
- **Antenna Connector:** SMA connector for antenna or coaxial cable connection

## Transmitter Inputs

Input Type	Source	Function
Digital	external	status
Pulse Total	external	count
Analog	external	analog
Thermocouple	external	analog
Set Point	internal	status
Supply Voltage	internal	analog

Input values transmitted as per WIB-net (see page 4) protocol - exception-reporting on signal change, and update time. Up to 5 repeater addresses, configurable.

# Wireless I/O Unidirectional Transmitter/Receiver Units – Introduction

## Digital / Pulse Inputs

- Two inputs, suitable for voltage-free contacts / NPN, or voltage input 0-1 VDC on / >3 VDC off pulse input max. rate 10 Hz, 50 msec on time. Pulse counted as 16-bit register.

## Analog Inputs

- 0-20 mA (4-20mA, 0-10mA)
- “Floating” differential input, resolution 16-bit, accuracy < 0.1 %

## Thermocouple Inputs

- Millivolt (-10mV to +100mV), J, K, or T type linearization with on-board cold-junction compensation
- Accuracy better than 1°C

## Power Supply

- **Normal Supply:** 9 - 30 VDC, power consumption @12VDC - receiver normal 70mA, max. 250mA
- Transmitter normal 70mA, transmitting max. 600mA
- Analog loop supply internally generated, 24VDC 35mA
- Internal monitoring of supply voltage may be transmitted as an “input” (transmitter unit only)

## Set-point Status

- High and low set-points generate internal digital status - set-point status sets (on) when analog value < low set-point and resets (off) when analog value > high set-point. Status is transmitted as per digital input, set-point values are set via the front panel rotary switch or configuration software.
- Separate set-points for (4-20 mA), thermocouple and supply inputs are configurable

## Receiver Outputs

### Digital Outputs

- Three relay contact outputs, 260V 1A

### Analog Outputs

- 0-20mA, source output, 12-bit resolution, 0.1% accuracy

### Communication Failure

- Internal status based on configurable time-out value
- “Comms-fail” status can be configured to a local output

### Fail-Safe

- On “comms-fail,” outputs user-configurable as retained last correct value or reset (fail-safe)

## Serial Port

- RS232 RJ45 female DCE, used for configuration and diagnostics

## LED Indication

### Transmitter Unit

- Power/OK, radio TX, DIN1, DIN2, analog set-point status

### Receiver Unit

- Power/OK, radio RX, DO1, DO2, DO3, communications fail
- LEDs also used to provide radio signal strength indication

## Configuration and Diagnostics

- Factory configuration transmitter/receiver matched pair, AI to AO, 2DI to 2DO, SP status to DO3 via RS232 - RJ45 cable
- User configuration via serial port. Unidirectional units can be configured to network with multi-I/O and gateway units.
- Diagnostics features: read input values, write output values, radio signal strength, monitor communication messages





**WI-I/O 9-L-T  
Transmitter**



**WI-I/O 9-L-R  
Receiver**



**Technical Data**

**Transmitter Inputs:**

Digital:  
  
Pulse:  
  
Analog:  
"floating" differential input:  
resolution  
accuracy  
Thermocouple

two inputs, suitable for voltage free contacts / NPN, or voltage input 0-1 VDC on / >3 VDC off  
max rate 10 Hz, 50 msec on time.  
Pulse counted as 16 bit register.  
0-20 mA (4-20mA, 0-10mA)  
  
16 bit  
< 0.1 %  
Millivolt (-100mV to +100mV), J, K or T type linearization with on-board cold-junction compensation  
greater than 1°C

**Receiver Outputs**

Digital  
Analog  
resolution  
accuracy  
Comms-Fail

**Power Supply**

Power consumption @12VDC  
  
Analog loop supply internally generated  
Internal monitoring of supply low voltage status  
Power consumption increases for pulse inputs > 10Hz.

9-30 VDC  
Receiver 100mA, Transmitter 40mA quiescent, during radio transmission (50 msec) 300mA  
24VDC 30mA  
may be transmitted as an "input" (Transmitter unit only)

**Serial Port**

RS232 RJ45 female DCE, used for configuration and diagnostics

**General Data**

Operating Temperature  
Humidity  
EMC Standards  
Mounting  
LED indication: Transmitter Unit  
LED indication: Receiver Unit  
frequency hopping spread spectrum  
Transmit power  
Maximum line of sight range

-40 to 60°C (-40 to 140°F)  
0 - 99% RH  
FCC Part 15.247, RS210  
DIN-rail mounting  
Power/OK, Radio TX , DIN1, DIN2, Analog Setpoint status

**Antenna connector**

**Dimensions mm (in)**

**Configuration**

**Diagnostics**

**Ordering Data**

**Accessories:** DB9 Female-RJ45 Serial configuration cable

**General Data**

-40 to 60°C (-40 to 140°F)  
0 - 99% RH  
FCC Part 15.247, RS210  
DIN-rail mounting  
Power/OK, Radio TX , DIN1, DIN2, Analog Setpoint status  
  
902-928MHz, sub-bands available

1W  
20 miles (4W ERP), 15km (1W ERP); 3000 ft / 1000 m in obstructed industrial environments. Radio distances can be increased by up to 5 intermediate repeater units.  
Each transmission may be configured to be sent 1 to 5 times.  
SMA female coaxial

100 x 23 x 120 (3.9 x 0.9 x 4.7)  
User configuration via serial port. Unidirectional units can be configured to network with Multi-I/O and Gateway units.  
Diagnostics features - read input values, write output values, radio signal strength, monitor communication messages.

**Ordering Data**

Type	Part No.
WI-I/O 9-L-T	6720005005
WI-CSE-RJ45	6720005108

**Technical Data**

**Receiver Outputs**

three relay contact outputs, 260V 1A  
0-20mA  
12 bit  
0.10%  
Internal status based on configurable time-out value. Comms-fail status can be configured to a local output.  
On "comms-fail", outputs user-configurable as retained (last correct value) or reset (fail-safe)

9-30 VDC  
Receiver 100mA, Transmitter 40mA quiescent, during radio transmission (50 msec) 300mA  
24VDC 30mA

RS232 RJ45 female DCE, used for configuration and diagnostics

**Serial Port**

RS232 RJ45 female DCE, used for configuration and diagnostics

**General Data**

-40 to 60°C (-40 to 140°F)  
0 - 99% RH  
FCC Part 15.247, RS210  
DIN-rail mounting

Power/OK, Radio RX, DO1, DO2, DO3, Communications Fail.  
902-928MHz, sub-bands available

1W  
20 miles (4W ERP), 15km (1W ERP); 3000 ft / 1000 m in obstructed industrial environments. Radio distances can be increased by up to 5 intermediate repeater units.  
Each transmission may be configured to be sent 1 to 5 times.  
SMA female coaxial

100 x 23 x 120 (3.9 x 0.9 x 4.7)  
User configuration via serial port. Unidirectional units can be configured to network with Multi-I/O and Gateway units.  
Diagnostics features - read input values, write output values, radio signal strength, monitor communication messages.

**Ordering Data**

Type	Part No.
WI-I/O 9-L-R	6720005006
WI-CSE-RJ45	6720005108



**WI-I/O 9-L-P1**  
Set - 1 Transmitter, 1 Receiver



**WI-I/O 9-L-P2**  
Set with 2 WI-ANT-DPL-0-8



**Technical Data**

**Transmitter Inputs:**

Digital:

Pulse:

Analog:

"floating" differential input:

resolution

accuracy

Thermocouple

Accuracy

**Receiver Outputs**

Digital

Analog

resolution

accuracy

Comms-Fail

Fail-safe

**Power Supply**

Power consumption @12VDC

Analog loop supply internally generated

Internal monitoring of supply low voltage status

Power consumption increases for pulse inputs > 10Hz.

**Serial Port**

**General Data**

Operating Temperature

Humidity

EMC Standards

Mounting

LED indication: Transmitter Unit

LED indication: Receiver Unit

frequency hopping spread spectrum

Transmit power

Maximum line of sight range

**Antenna connector**

**Dimensions mm (in)**

**Configuration**

**Diagnostics**

**Ordering Data**

**Kit Contents**

two inputs, suitable for voltage free contacts / NPN, or voltage input 0-1 VDC on / >3 VDC off  
max rate 10 Hz, 50 msec on time. Pulse counted as 16 bit register.  
0-20 mA (4-20mA, 0-10mA)

16 bit  
< 0.1 %

Millivolt (-100mV to +100mV), J, K or T type linearization with on-board cold-junction compensation  
greater than 1°C

three relay contact outputs, 260V 1A

0-20mA

12 bit

0.10%

Internal status based on configurable time-out value. Comms-fail status can be configured to a local output.

On "comms-fail", outputs user-configurable as retained (last correct value) or reset (fail-safe)

9-30 VDC

Receiver 100mA, Transmitter 40mA quiescent, during radio transmission (50 msec) 300mA

24VDC 30mA

may be transmitted as an "input" (Transmitter unit only)

RS232 RJ45 female DCE, used for configuration and diagnostics

-40 to 60°C (-40 to 140°F)

0 - 99% RH

FCC Part 15.247, RS210

DIN-rail mounting

Power/OK, Radio TX, DIN1, DIN2, Analog Setpoint status

Power/OK, Radio RX, DO1, DO2, DO3, Communications Fail.

902-928MHz, sub-bands available

1W

20 miles (4W ERP), 15km (1W ERP); 3000 ft / 1000 m in obstructed industrial environments. Radio distances can be increased by up to 5 intermediate repeater units.

Each transmission may be configured to be sent 1 to 5 times.

SMA female coaxial

100 x 23 x 120 (3.9 x 0.9 x 4.7)

Factory configuration transmitter/receiver matched pair, AI to AO, 2DI to 2DO, SP status to DO3. User configuration via serial port. Unidirectional units can be configured to network with Multi-I/O and Gateway units.

Diagnostics features - read input values, write output values, radio signal strength, monitor communication messages.

**Type**

WI-I/O 9-L-P1 **6720005007**

- 2 Dipole antennas (6720005086)
- 2 3ft. antenna connecting cables/brackets
- 1 configuration cable

two inputs, suitable for voltage free contacts / NPN, or voltage input 0-1 VDC on / >3 VDC off  
max rate 10 Hz, 50 msec on time. Pulse counted as 16 bit register.  
0-20 mA (4-20mA, 0-10mA)

16 bit  
< 0.1 %

Millivolt (-100mV to +100mV), J, K or T type linearization with on-board cold-junction compensation  
greater than 1°C

three relay contact outputs, 260V 1A

0-20mA

12 bit

0.10%

Internal status based on configurable time-out value. Comms-fail status can be configured to a local output.

On "comms-fail", outputs user-configurable as retained (last correct value) or reset (fail-safe)

9-30 VDC

Receiver 100mA, Transmitter 40mA quiescent, during radio transmission (50 msec) 300mA

24VDC 30mA

may be transmitted as an "input" (Transmitter unit only)

RS232 RJ45 female DCE, used for configuration and diagnostics

-40 to 60°C (-40 to 140°F)

0 - 99% RH

FCC Part 15.247, RS210

DIN-rail mounting

Power/OK, Radio TX, DIN1, DIN2, Analog Setpoint status

Power/OK, Radio RX, DO1, DO2, DO3, Communications Fail.

LEDs also used to provide radio signal strength indication

902-928MHz, sub-bands available

1W

20 miles (4W ERP), 15km (1W ERP); 3000 ft / 1000 m in obstructed industrial environments. Radio distances can be increased by up to 5 intermediate repeater units.

Each transmission may be configured to be sent 1 to 5 times.

SMA female coaxial

100 x 23 x 120 (3.9 x 0.9 x 4.7)

Factory configuration transmitter/receiver matched pair, AI to AO, 2DI to 2DO, SP status to DO3. User configuration via serial port. Unidirectional units can be configured to network with Multi-I/O and Gateway units.

Diagnostics features - read input values, write output values, radio signal strength, monitor communication messages.

**Type**

WI-I/O 9-L-P2 **6720005008**

- 2 Dipole antennas (6720005080)
- 2 15ft. antenna connecting cables/brackets
- 1 configuration cable