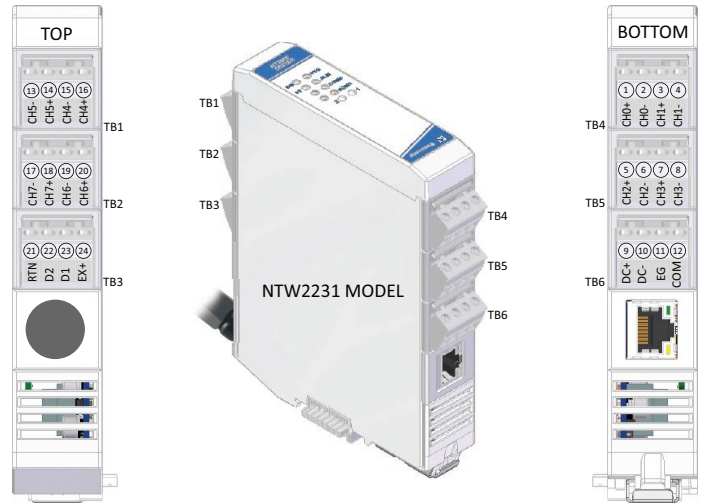


# Wireless I/O: BusWorks® NTW Series

## NTW2230 Wi-Fi Ethernet Analog I/O Modules



8 differential voltage inputs ♦ 2 discrete I/O ♦ Ethernet I/O plus Expansion I/O ♦ Multi-protocol support

BusWorks® NTW2000 modules offer a cost-effective, wireless solution for Ethernet remote I/O systems. NTW Wi-Fi models provide the protocol interface plus I/O signal processing channels. Connecting NTX expansion modules can add extra I/O channels or a mix of signal types over a single Wi-Fi interface.

NTW2230 modules offer 8 voltage inputs and 2 bidirectional discrete digital I/O channels. Each input has true differential 16-bit A/D. Each module has an embedded wireless IoT gateway providing a Wi-Fi interface to monitor sensor levels or 0-10V devices. An RJ45 port provides additional flexibility for a cabled network interface.

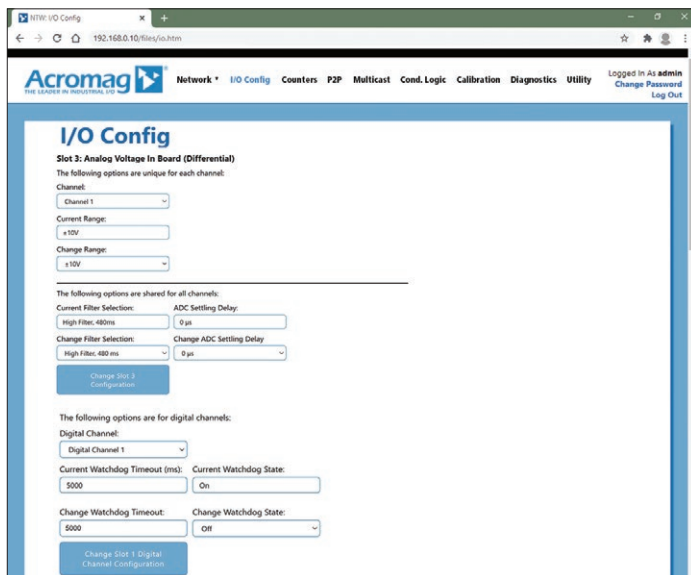
Applications include collecting pressure, HVAC levels, temperature, and other data at sensors, transducers, or transmitters. The 0-10V signal is very commonly used for automation and environmental controllers.

An isolated RS-485 bus links up to three NTX expansion modules to the NTW Wi-Fi module with connectors that join units along the DIN rail. This internal NT bus distributes power and communication between the modules. Users can mix temperature, current, voltage, and discrete I/O modules across the NT bus.

Acromag's i2o® messaging technology allows direct peer-to-peer communication between remote modules without a master controller.

### Key Features & Benefits

- Wireless 802.11 a/b/g/n dual-band 2.4 and 5 GHz Wi-Fi interface
- Configured over Ethernet with web browser
- Expandable I/O capacity, up to 64 I/O channels of mixed signal types on one IP address
- Field-selectable Modbus TCP/IP or EtherNet/IP communication
- i2o peer-to-peer communication
- RJ45 port enables cable connections
- Eight voltage inputs with true differential node pairs referenced to input common
- Accepts  $\pm 1/5/10V$  and 0 to 1/5/10V inputs
- Discrete I/O can monitor and control equipment with TTL or 32V logic levels
- OPC-UA, MQTT and RESTful API IIoT support
- Conditional logic for rule-based I/O operation
- 1500V isolation between I/O, network, and power
- Thin 25mm housing with pluggable terminals
- Wide temperature operation (-40 to 70°C)
- LED status indicators for visual troubleshooting
- CE compliant. UL/cUL Class 1 Div 2 and ATEX/IECEx Zone 2 approvals (pending)



Easily configure I/O modules using any web browser.



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# Wireless I/O: BusWorks® NTW Series

## NTW2230 Wi-Fi Ethernet Analog I/O Modules

### Performance Specifications

#### ■ Ethernet Interface

##### Communication

Configurable for Modbus TCP/IP and EtherNet/IP.

10/100Mbps data rate, auto-sensing.

##### IP Address

Default 192.168.0.10. Configurable from static IP or via WLAN using DHCP

#### ■ Wi-Fi Interface

##### Wireless Communication

Dual Band 2/4/5GHz Wi-Fi interface.

IEEE 802.11a/b/g up to 54Mbps.

IEEE 802.11n up to 150Mbps.

IEEE 802.11r fast roaming.

##### Data Rate

Fixed 100Mbps, full-duplex (not auto-negotiated).

##### Wi-Fi Security

WPA3 / TLS 1.2 with PKI and X.509 certificate management. AES 256-bit encryption.

##### Antenna

Single external UFL antenna wired to external whip/tilt type antenna using an RP-SMA connector. 2.15dBi.

Dimension (straight): 108.5 x 10 mm (4.27 x 0.39").

Dimension (bent): 31.5 x 87 mm (1.24 x 3.43").

##### Communication Distance

100 meters line-of-sight, typical.

##### RF Certification

USA (FCC Part 15), Canada (IC RSS), EU (RED), Japan (MIC), China (SRRC), AU/NZS.

#### ■ Analog Inputs

##### A/D Converter

Eight input channels differentially multiplexed to a 24-bit sigma-delta ADC through unity-gain differential buffers (only 16-bits are used).

##### Input Voltage Ranges

±1V, ±5V, ±10V, 0-1V, 0-5V, 0-10V. Inputs are referenced to input common (COM) using resistive dividers at each input node and do not float.

##### Input Accuracy

Better than ±0.05% of span typical, ±0.1% maximum.

#### ■ Discrete Inputs (Active-Low)

##### Input Signal Voltage Range

0 to +32V DC.

##### Input Current

280µA, typical at 32V DC.

##### Input Signal Threshold

TTL compatible w/100mV of hysteresis, typical.

1.7V DC Low-to-High, 1.6V DC High-to-Low.

0.8V DC TTL LOW limit, 2.0V DC TTL HIGH limit.

##### Input Resistance

100K ohms typical (input only), ~10K ohms with internal pull-ups.

##### Input Response Time

5ms typical, not including network time.

#### ■ Discrete Outputs (Sinking)

##### Output "OFF" Voltage Range

0 to 32V DC.

##### Output "ON" Current Range

0 to 250mA DC, continuous.

##### Output Rds ON Resistance

0.8 ohms typical, 1.6 ohms maximum.

##### Output Response Time

5ms typical. Does not include network time.

#### ■ General I/O

##### Input Update/Conversion Rate

Fresh data available to the network every 10ms.

##### Response Time from an Ethernet command

Less than 5ms, typical.

##### Excitation

External voltage of 4-32V required between I/O EXC and any RTN for DI/O. Excitation must source 52mA minimum (at 32V). For 2 channels at 250mA max rated load, excitation must source 0.5A min.

##### I/O Pull-Ups (Internal)

Each discrete I/O channel has a 10KΩ pull-up to EXC to pull the tandem open drain output and input high/OFF.

#### ■ Environmental and Physical

##### Temperature and Humidity

Operating: -40 to +70°C (-40 to +158°F).

Storage: -40 to +85°C (-40 to +185°F).

Relative Humidity: 5 to 95%, non-condensing.

##### Isolation

1500V AC for 60 seconds and 250V AC or 354V DC continuous between I/O channels (group), each network port and power circuits.

##### Power Supply

10-32V DC SELV power wired to NTW model only.

Power to NTX models is via NT bus connection.

##### Power Consumption

NTW2231: <=1.5W (input).

##### Dimensions (width x height x depth - w/o antenna)

NTW: 25 x 116.9 x 139.2 mm (0.98 x 4.6 x 5.48 inches).

##### Weight

NTW: 0.5 lbs (0.23 kg).

#### ■ Standards and Certifications

##### Electromagnetic Compatibility (EMC)

CE marked, per EMC Directive 2004/108/EC.

##### Safety Approvals

UL/cUL: Class I; Div 2; Groups A, B, C, D (pending).

ATEX/IECEx: Zone 2 (pending).

### Ordering Information

#### ■ Models

[Go to on-line ordering page >](#)

##### NTW2231-1111

Wi-Fi Ethernet I/O module with one RJ45 port, 8 differential voltage inputs and 2 discrete I/O

#### ■ Expansion I/O Modules

See [Acromag.com/NT](#) for a full list of NTX Expansion I/O Units.

#### ■ Accessories

##### 5035-369

##### 5035-370

Ethernet patch cable, low EMI, double-shielded. 3 feet (5035-369) or 15 feet (5035-370).

##### P55R-VB24

Power supply, 24V DC, 15W output.

See [www.acromag.com](#) for other sizes.

ISO9001   
AS9100 

**Acromag**   
THE LEADER IN INDUSTRIAL I/O

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