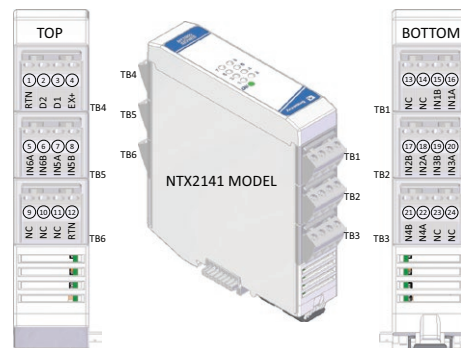
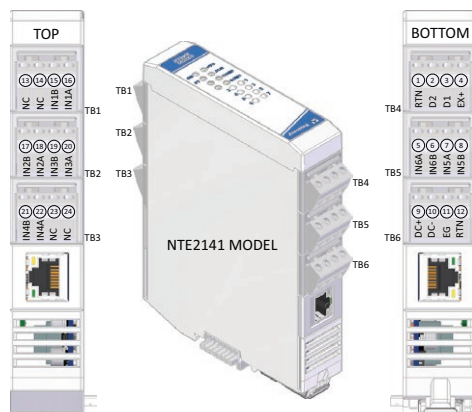




Ethernet I/O: BusWorks® NT Series

NT2140 Ethernet Discrete AC Input Modules



6 discrete AC inputs ♦ 2 discrete DC I/O ♦ Ethernet I/O plus Expansion I/O ♦ Multi-protocol support

The BusWorks® NT2000 series offers a cost-effective, modular solution for Ethernet remote I/O systems. Two module types are available. NTE Ethernet models provide the protocol interface plus I/O signal processing channels. NTX expansion modules add extra I/O channels when mated to any NTE Ethernet communication module.

NT2140 modules offer 6 AC optocoupler inputs for sensing on/off power status plus 2 DC logic I/O. NTE Ethernet models provide a compact network interface to monitor or control discrete device levels. Appending NTX expansion modules can interface up to 24 AC discrete inputs on a single IP address.

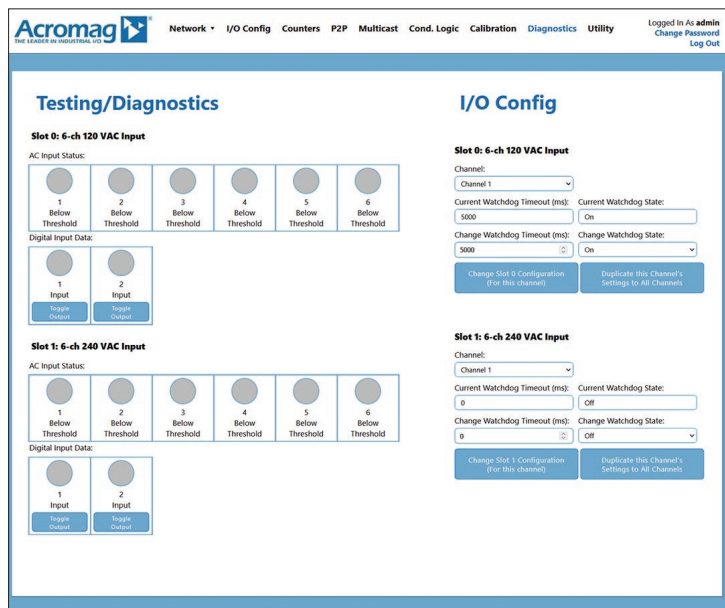
Applications include monitoring on/off levels of proximity, limit and toggle switches, or push buttons, contact closures and AC voltage power levels for a wide variety of industrial devices.

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

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

Key Features & Benefits

- 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, EtherNet/IP, or Profinet communication
 - i2o peer-to-peer or multicast communication
 - Dual RJ45 ports enable daisy chain topology
 - Six individually isolated 120/240V AC discrete input channels for AC voltage levels
 - Two bidirectional DC input/output channels for monitor/controlling TTL/0-32V logic levels
 - Tandem DC input/output channels allow loop-back monitoring of outputs
 - LED status indicators for visual troubleshooting
 - OPC-UA, MQTT and RESTful API IIoT support
 - Conditional logic for rule-based I/O operation
 - Advanced *alarm and *data logging functions
 - 1500V isolation between I/O, network, and power
 - Thin 25mm housing with pluggable terminals
 - Wide temperature operation (-40 to 70°C)
 - CE compliant. Hazardous approvals pending
- * Coming soon. Consult factory for availability.



Easily configure I/O modules using any web browser.



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NT2140 Ethernet Discrete AC Input Modules

Performance Specifications

■ Ethernet Interface (NTE models only)

Communication

Configurable for Modbus TCP/IP, EtherNet/IP, and Profinet.

10/100Mbps data rate, auto-sensing.

IP Address

Default 192.168.0.10. Configurable static IP or DHCP.

■ AC Discrete Inputs

Input Type

Six individually isolated AC voltage inputs to detect AC voltage levels. Built-in hysteresis provides a sensing threshold for monitoring AC line voltage.

Input Signal Voltage Range

120V AC: 0 to 130V_{RMS}, ±184V DC.

220V AC: 0 to 240V_{RMS}, ±340V DC.

Input Signal Threshold – 120V AC

Low-to-High threshold: 77V AC, 109V DC, typical.

High-to-Low threshold: 77V AC, 107V DC, typical.

Input Signal Threshold – 240V AC

Low-to-High threshold: 176V AC, 249V DC, typical.

High-to-Low threshold: 173V AC, 245V DC, typical.

Input Current

NTE2141/NTX2141: 1.1mA_{RMS} at 120V AC.

NTE2142/NTX2142: 1.7mA_{RMS} at 240V AC.

Input Response Time

20ms, typical.

Input Overvoltage Protection

Each channel includes a Metal Oxide Varistor (150V or 275V AC) and capacitively couples AC to an optocoupler circuit. Rated continuous input voltage is 130V AC (NT2141) or 240V AC (NT 2142).

■ DC Discrete Inputs

Input Type

Two bidirectional discrete I/O channels with active low inputs and tandem open-drain outputs.

Input Signal Voltage Range

0 to +32V DC.

Input Current

150µA, typical at 32V DC.

Input Signal Threshold

TTL compatible w/100mV DC with hysteresis included.

TTL logic limit - LOW: 0.8V DC max.

TTL logic limit - HIGH: 2.0V DC min.

Input Resistance

200K ohms (input only), 10K ohm output pull-up to Exc.

Input Response Time

5ms typical, not including network time.

Input Transient Voltage Suppressor

Installed at every I/O point, up to 38V working, 47V breakdown, and 77V clamping.

■ DC Discrete Outputs

Output Type

Two bidirectional discrete I/O channels with open-drain outputs and tandem active low inputs.

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.

Protections

Thermal overload shutdown.

Over-voltage shutdown.

Over-load shutdown.

Reverse polarity protection.

Output "OFF" Leakage Current

0.1µA typical, 50µA max (mosfet only, 25°C, 32V).

Does not include input bias current.

Output Response Time

5ms typical. Does not include network time.

■ Counters

Input Counter

Inputs Inputs (DC DIO channels 1-2) may operate as up/down event counters for signals up to 85 Hz.

Counter Preload Value

Each channel can start from 0 to 4,294,967,295.

Counter Debounce

0 to 65,535ms to filter noise or relay chatter.

Counter Alarms

Alarms can toggle an output state upon reaching the termination value. Alarm state can auto-reset after the next count or hold/latch until reset.

FRAM

4Kb (4096 bits) non-volatile memory stores counter value.

■ 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.

■ 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 field I/O group, network port group, and input power circuit. This model adds additional AC input Isolation (field i/o input group)

Power Supply

10-32V DC SELV power wired to NTE models only.

Power to NTX models is via NT bus connection.

4-32V field excitation per I/O.

Power Consumption

NTE2141/2142: 1.92W (AC High).

NTX2141/2142: 0.42W (AC High).

Dimensions (width x height x depth)

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

NTX: 25 x 116.9 x 116.65 mm (0.98 x 4.6 x 4.59 inches).

Weight

NTE: 0.5 lbs (0.23 kg).

NTX: 0.3 lbs (0.14 kg).

■ Standards and Certifications

Electromagnetic Compatibility (EMC)

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

Safety Approvals

Hazardous approvals pending.

Ordering Information

■ Models

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

NTE2141-1111 (120V AC)

NTE2142-1111 (240V AC)

Ethernet I/O module with dual RJ45 ports, 6 AC discrete inputs and 2 DC discrete I/O

NTX2141-0011 (120V AC)

NTX2142-0011 (240V AC)

Expansion I/O module with 6 AC discrete inputs and 2 DC discrete I/O

■ 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