



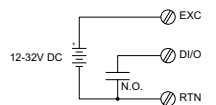
# Ethernet I/O: BusWorks® XT Series

## XT1110 Ethernet Discrete I/O Modules (sinking outputs)

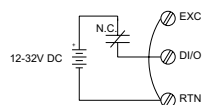


### EXAMPLE INPUT CONNECTIONS

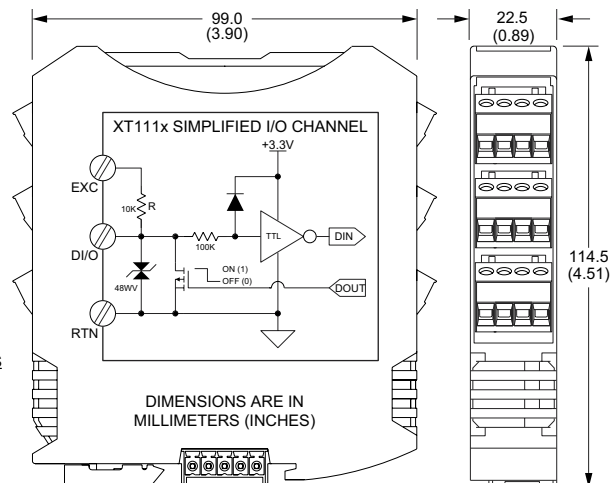
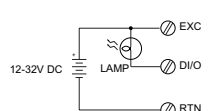
#### NORMALLY OPEN DRY CONTACT



#### NORMALLY CLOSED DRY CONTACT



### EXAMPLE OUTPUT CONNECTIONS



16 discrete tandem input/output channels ♦ Modbus TCP/IP, Ethernet/IP, Profinet, or i2o communication

### Description

The XT1110 interfaces discrete I/O signals between measurement and control devices over Ethernet. Channels are individually configurable for input or low-side switched output operation.

Rugged construction, high density design, and easy USB-to-PC/Windows setup combine for a very effective I/O solution. These units are ideal for remote monitoring, distributed control, or SCADA applications.

### Input/Output Ranges

Input: 0-32V DC, TTL thresholds

Output: 0-32V DC, open-drain, up to 250mA

### Ethernet Communication

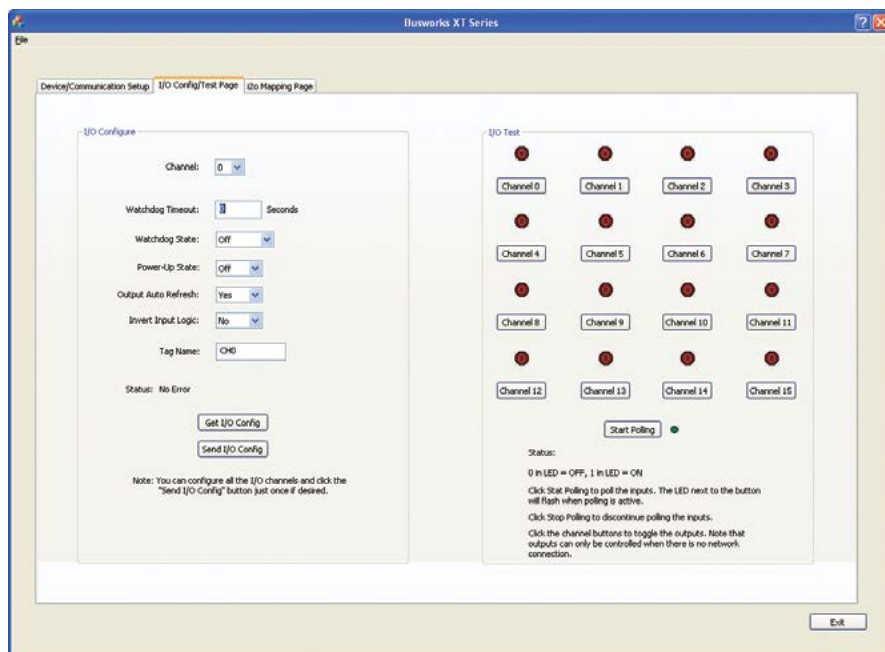
Modbus TCP/IP, Ethernet/IP, Profinet, i2o® peer-to-peer, 10/100Base-T(X) PriorityChannel™ device determinism

### Power Requirement

12 to 32V DC (2.5W)

### Key Features & Benefits

- 16 solid-state discrete I/O channels (any mix of inputs or outputs)
- Built-in 10K ohm pull-up resistors for 2/3-wire sensors (contacts, proximity, TTL)
- Configurable normal/reverse input logic
- Outputs include built-in read-back capability
- Easy setup with Windows software via USB
- Watchdog timer control of failsafe outputs
- Continuously changing "heart-beat" register validates module operation
- High-Density 22.5mm wide package with pluggable, front-facing terminals
- Dual Ethernet 10/100 ports (auto-negotiation) reduce switch port requirements
- 1500V AC isolation (between I/O, power, and network ports) and surge/transient protection
- Supports bussed/rail and redundant power
- -40°C to +70°C wide temperature operation
- Withstands 25g shock and 4g vibration
- CE and UL/cUL Class 1 Div 2 Zone 2 approvals. ATEX Certified.



BusWorks XT software (download free from [www.acromag.com](http://www.acromag.com)) allows you to configure I/O modules offline with USB, save the file, and download settings into units later, at your convenience.



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# Ethernet I/O: BusWorks® XT Series

## XT1110 Ethernet Discrete I/O Modules (sinking outputs)

### Performance Specifications

**IMPORTANT:** To prevent damage or errors from grounded PCs and surges, Acromag strongly recommends use of the USB-ISOLATOR when configuring an XT1000 I/O module.

#### ■ USB Interface

##### USB Connector

Type: USB Mini-B type socket, 5-pin.  
Data rate: 12Mbps. USB v1.1 and 2.0 compatible.  
Maximum cable length: 5.0 meters.

##### USB Transient Protection

Transient voltage suppression on power and data lines.

##### Driver

Not required. Uses Windows HID drivers.

#### ■ Input

##### Input Type

16 active-low, buffered inputs, with a common connection. Inputs are tied in tandem to output drains for optional loopback monitoring of output state.

##### Input Signal Voltage Range

0 to 32V DC.

##### Input Current

280µA, typical at 32V DC.

##### Input Signal Threshold

1.7V typical with 100mV of hysteresis.

##### Input Resistance

100K ohms, typical.

##### Input Response Time

10ms, nominal.

#### ■ Output

##### Output Type

16 open-drain, smart, n-channel mosfet switches with a common source connection. Provides low-side (sinking) switching between the load and return.

##### Output Voltage

0 to 32V DC.

##### Output "ON" Resistance

0.8 ohms typical, 1.6 ohms maximum.

##### Output "ON" Current Range

0 to 250mA DC, continuous (up to 4A total for all 16 channels combined). See Operating Temperature specification for effect of channels at full load. See manual for detailed effects of operating temperature.

##### Output Response Time

10ms, nominal.

#### ■ Ethernet Communication

##### Protocols

Modbus TCP/IP, i2o peer-to-peer, Ethernet/IP, or Profinet depending on model number.

##### Ethernet Communication Controller

Innovasic RapID™ Platform with PriorityChannel™ for determinism at the device regardless of network load.

##### Modbus TCP/IP (slave)

Port 502 reserved. Supports up to 10 sockets.

##### i2o Peer-to-Peer (master/slave)

Can map 4-channel input groups to output groups at two destination IP addresses. Timed or change-of-state updates. Supports GPRS/GSM systems.

##### Ethernet/IP (adapter)

Supports 16 connections. EDS file on website.

##### Profinet (server)

Supports 1 connection. GSDML file on website.

##### Connectors

Two shielded 8-pin RJ-45 sockets, 10BaseT/100BaseTX.

##### Wiring

Auto-crossover for MDI or MDI-X.

##### IP Address

User-configurable. 128.1.1.100 default static IP address.

##### Data Rate

Auto-negotiated, 10Mbps or 100Mbps.

##### Compliance

IEEE 802.3, 802.3u, 802.3x.

#### ■ Environmental

##### Operating temperature

-40 to 70°C (-40 to 158°F). Max temperature derates -0.625°C per output channel at full load (250mA).

##### Storage temperature

-40 to 85°C (-40 to 185°F).

##### Relative humidity

5 to 95% non-condensing.

##### Power Requirement

12 to 32V DC (102mA maximum @ 24V).

##### Isolation

4-way isolation between I/O channels, network (each port), and power.

Peak: 1500V AC, ANSI/ISA-82.01-1988.

Continuous: 250V AC, 354V DC.

##### Shock and Vibration Immunity

Vibration: 4g, per IEC 60068-2-64.

Shock: 25g, per IEC 60068-2-27.

##### Electromagnetic Compatibility (EMC) Compliance

Radiated Emissions: BS EN 61000-6-4, CISPR 16.

RFI: BS EN 61000-6-2, IEC 61000-4-3.

Conducted RFI: BS EN 61000-6-2, IEC 61000-4-6.

ESD: BS EN 61000-6-2, IEC 61000-4-2.

EFT: BS EN 61000-6-2, IEC 61000-4-4.

Surge Immunity: BS EN 61000-6-2, IEC 61000-4-5.

##### Approvals

CE compliant. UL/cUL Class I; Div. 2 Zone 2. ATEX Cert.

Ⓜ II 3 G Ex nA IIC T4 Gc -40°C ≤ Ta ≤ +80°C

#### ■ Physical

##### General

General purpose plastic enclosure for mounting on 35mm "T-type" DIN rail.

##### Case Material

Self-extinguishing polyamide, UL94 V-0 rated, color light gray. General purpose NEMA Type 1 enclosure.

##### Circuit Board

Military grade fire-retardant epoxy glass (IPC-4101/98).

##### I/O Connectors

Removable plug-in type terminal blocks rated for 12A/250V; AWG #26-12, stranded/solid copper wire.

##### Dimensions

Width = 22.5mm (0.9 inches), Length = 114.5mm (4.51 inches), Depth = 99.0mm (3.90 inches).

##### Shipping Weight

0.5 pounds (0.22 Kg) packed.

### Ordering Information

#### ◆ Models

##### XT1111-000

Digital I/O module, Modbus/TCP and i2o protocol.

##### XT1112-000

Digital I/O module, Ethernet/IP protocol.

##### XT1113-000

Digital I/O module, Profinet protocol.

#### ◆ Software

##### XT-SIP (recommend one kit per customer)

Software Interface Package. Includes software (XT-CONFIG), isolator (USB-ISOLATOR), two USB cables (4001-112, 4001-113), Ethernet cable (5035-360).

#### ◆ Accessories

##### XTA-120V-6

##### XTA-240V-3

6-channel 120V AC/DC or 3-channel 240V AC/DC discrete input module with 5V DC logic outputs. Interfaces with sinking/sourcing DC inputs.

##### XTA-MRNO-6

6-ch mechanical relay output module, Form A, SPST normally open 5A relays (5/12/24V DC logic input).

##### XTBUS-KIT

DIN rail bus power/excitation connector kit. Includes one DIN rail bus connector (1005-070), one left-side female connector terminal block (1005-220) and one right side male connector terminal block (1005-221).

##### USB-ISOLATOR

USB-to-USB isolator, includes USB cable (4001-112).

ISO9001  
AS9100



**Acromag**   
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