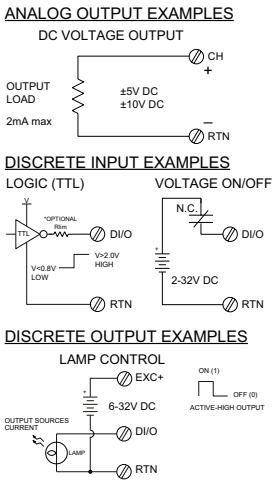
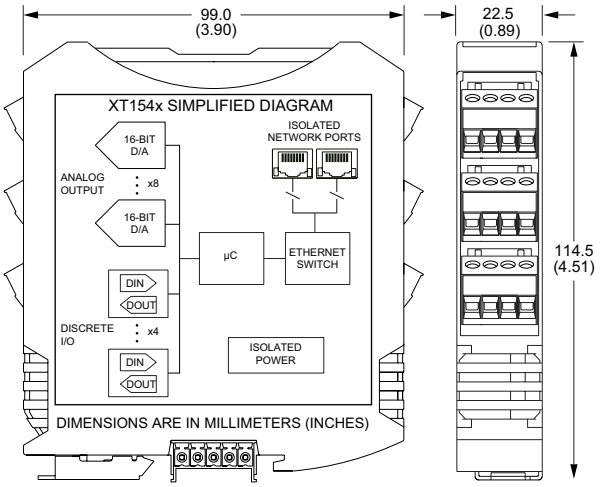
Ethernet I/O: BusWorks® XT Series

XT1540 Ethernet Analog Output & Digital I/O Modules







8 analog voltage outputs, 4 discrete I/O channels ◆ Modbus TCP/IP, Ethernet/IP, Profinet, or i2o communication

Description

The XT1540 interfaces analog output and discrete I/O signals between measurement and control devices over Ethernet. Discrete I/O are individually configurable for input or high-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.

Analog Output Ranges

±5V, ±10V DC

Discrete Input/Output Ranges

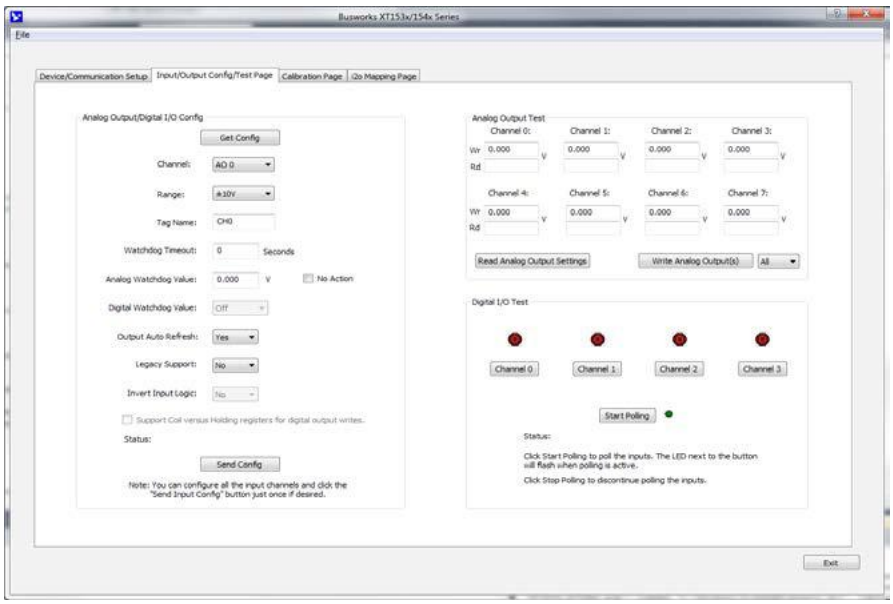
Input: 0-32V DC, TTL thresholds
Output: 0-32V DC, open-source, up to 250mA

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 (2.8W)



BusWorks XT software (download free from 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.

Key Features & Benefits

- Multi-function, multi-channel stand alone module is very economical
- Easy setup with Windows software via USB
- Dual Ethernet 10/100 ports with built-in switch enables daisy-chain networking to reduce costs
- i2o technology for peer-to-peer communication without a network controller
- Eight analog output channels (16-bit DACs) to drive remote instruments, controllers, recorders
- Four discrete input/output channels support loopback monitoring of output levels
- Built-in 10K ohm pull-down resistors for use with 2/3-wire sensors (contacts, proximity, TTL)
- Configurable normal/reverse input logic
- Various diagnostics validate module operation
- 1500V AC isolation (between I/O, power, and network ports) and surge/transient protection
- Slim 22.5mm housing with pluggable terminals
- Supports bussed/rail and redundant power
- -40°C to +65°C wide temperature operation
- CE and UL/cUL Class 1 Div 2 Zone 2 approvals. ATEX Certified.

Acromag® THE LEADER IN INDUSTRIAL I/O

Tel 248-295-0880 ■ Fax 248-624-9234 ■ sales@acromag.com ■ www.acromag.com ■ 30765 Wixom Rd, Wixom, MI 48393 USA

Ethernet I/O: BusWorks® XT Series

XT1540 Ethernet Multi-Function Analog Output & Digital I/O Modules

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.

Analog Output

Configuration
8 output channels, each with a 16-bit D/A converter.

Input Type
±10V or ±5V DC, configurable by channel.

Accuracy
Better than ±0.1% of span.

Discrete Input

Input Type
4 active-high, 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 DC typical with100mV of hysteresis.

Input Resistance
10K ohms, typical.

Input Response Time
10ms, nominal.

Discrete Output

Output Type
4 open-source, smart, p-channel mosfet switches with a common drain connection. Provides high-side (sourcing) switching between the load and return.

Output Signal Voltage Range
0 to 32V DC. 6-32V excitation source required.

Output "ON" Resistance
0.5 ohms typical, 1.0 ohms maximum.

Output "ON" Current Range
0 to 250mA DC, continuous (up to 1A total for all 4 channels combined).

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. 192.168.1.100 default static IP address.

Data Rate
Auto-negotiated, 10Mbps or 100Mbps.

Compliance
IEEE 802.3, 802.3u, 802.3x.

Environmental

Operating and Storage Temperature
Operating: -40 to 65°C (-40 to 149°F).
Storage: -40 to 85°C (-40 to 185°F).

Relative humidity
5 to 95% non-condensing.

Power Requirement
12 to 32V DC (110mA maximum @ 24V).

Isolation
I/O channels (as a group), network (each port), and power circuits isolated from each other.
Peak: 1500V AC, ANSI/ISA-82.01-1988.
Continuous: 250V AC, 354V DC.

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.

MTBF: 457,517 hrs. at 25°C.
339,622 hrs. at 40°C.

Shock and Vibration Immunity
Vibration: 4g, per IEC 60068-2-64.
Shock: 25g, per IEC 60068-2-27.

Approvals
CE compliant. UL/cUL listings. ATEX Certified.
Designed for Class I; Division 2; Groups ABCD; Zone 2.
⟨Ex⟩ 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

XT1541-000
Multi-function 8-ch analog voltage output, 4-ch digital I/O module, Modbus/TCP and i2o protocol.

XT1542-000
Multi-function 8-ch analog voltage output, 4-ch digital I/O module, Ethernet/IP protocol.

XT1543-000
Multi-function 8-ch voltage output, 4-ch 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

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
MADE IN USA

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