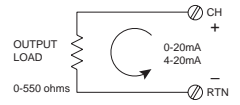# Ethernet I/O: BusWorks® XT Series
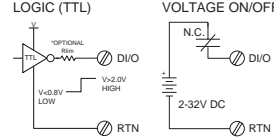
XT1530 Ethernet Analog Output & Digital I/O Modules
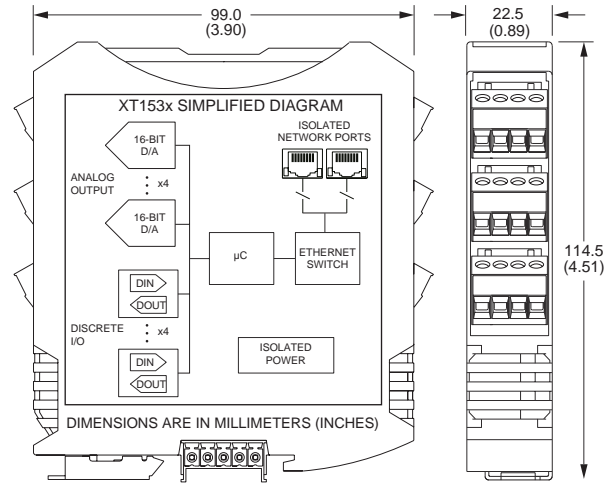
ANALOG OUTPUT EXAMPLES
DC CURRENT OUTPUT

CH +
OUTPUT LOAD
0-20mA
4-20mA
0-550 ohms
RTN

DISCRETE INPUT EXAMPLES
LOGIC (TTL)   VOLTAGE ON/OFF

TTL   *OPTIONAL Rtrim   DI/O
V<0.8V LOW   V>2.0V HIGH
RTN

N.C.   DI/O
2-32V DC   RTN

DISCRETE OUTPUT EXAMPLES
LAMP CONTROL

EXC+
6-32V DC
OUTPUT SOURCES CURRENT   DI/O
LAMP   RTN

ON (1)   OFF (0)
ACTIVE-HIGH OUTPUT

99.0 (3.90)   22.5 (0.89)   114.5 (4.51)

XT153x SIMPLIFIED DIAGRAM

ANALOG OUTPUT
16-BIT D/A ... x4
16-BIT D/A
DISCRETE I/O
DIN / DOUT ... x4
DIN / DOUT
µC
ETHERNET SWITCH
ISOLATED NETWORK PORTS
ISOLATED POWER

DIMENSIONS ARE IN MILLIMETERS (INCHES)

Modbus TCP/IP
EtherNet/IP conformance tested
PROFINET
with PriorityChannel™ Technology

USB Configured

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

Description

The XT1530 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
0-20mA DC, 4-20mA 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)

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
- Four 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 +60°C wide temperature operation
- CE and UL/cUL Class 1 Div 2 Zone 2 approvals. ATEX Certified.
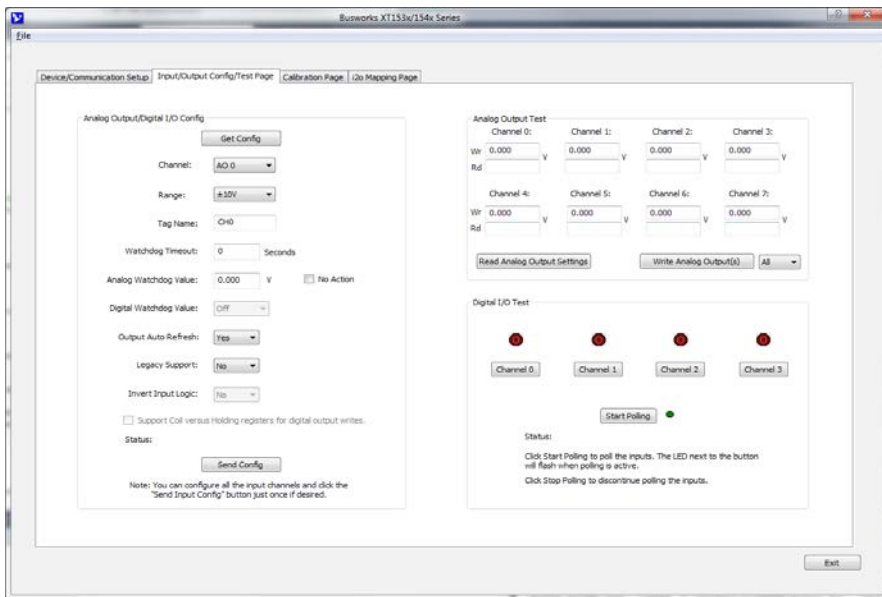
BusWorks XT software (download free from www.acromag.com) allows you to configure I/O modules offline with USB, save the file, and download settings into units later, at your convenience.

Acromag
THE LEADER IN INDUSTRIAL I/O

877-214-6267 ■ sales@acromag.com ■ www.acromag.com ■ 30765 Wixom Rd, Wixom, MI 48393 USA

XT1530 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
4 output channels, each with a 16-bit D/A converter

Output Type
0-20mA DC or 4-20mA DC, configurable by channel

Accuracy
Better than ±0.1% of span

Output Excitation
Separate inputs for 12V (10-15V) and 24V (20-28V) power sources. Diode-coupled to support redundancy.

■ 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 60°C (-40 to 140°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
445,034 hrs. at 25°C
335,836 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.

■ 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

XT1531-000
Multi-function 4-ch analog current output, 4-ch digital I/O module, Modbus/TCP and i2o protocol

XT1532-000
Multi-function 4-ch analog current output, 4-ch digital I/O module, Ethernet/IP protocol

XT1533-000
Multi-function 4-ch analog current 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

XT BUS-KIT
DIN rail bus power/excitation connector kit.
Includes DIN rail bus connector (1005-070), left-side female connector terminal block (1005-220) and 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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