# CONTROLLERS
OpenLine® Ethernet 586

FEATURES
- 586-based CPU
- Each Unit Controls/Monitors up to 128 Local I/O Channels
- Any Mix of Analog or Digital I/O
- Executes On-Board Programs Written in Borland or Microsoft C++, Flow Chart, Ladder Logic, Function Block Diagrams, or Sequential Function Charts
- 10 MB per Second Communications Speed
- Modbus TCP Protocol Running Over TCP/IP
- CE Certified
- Operates in CSA Class I, Div 2 Environments
- DIN Rail or Panel Mount
- Redundant Operation
- Real Time Clock (Y2K Compliant)
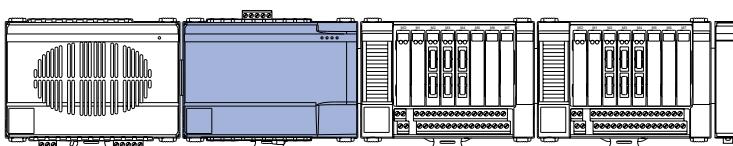
ETHERNET CONTROLLER UNIT ON OPENLINE® SYSTEM

APPLICATIONS

- Stand Alone Control
- Local Control & I/O
- Remote I/O
- Distributed I/O
- SCADA
- RTU
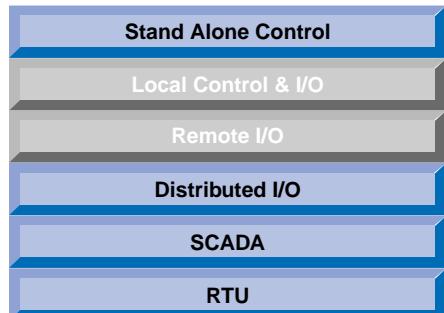
GENERAL DESCRIPTION
Ethernet OpenLine® controllers plug directly into OpenLine® dual point module I/O bases. Any combination of 128 analog or digital I/O can be installed in the bases. The Ethernet ports on the controller support direct 10 Base-T connection using the RJ-45 connector or indirect AUI connections through a media access unit (MAU). The controllers IP address is stored on the FLASH disk. OpenLine® controllers share information with other OpenLine® controllers, third party devices and networked PCs using Modbus TCP/IP.

CPUs
The OpenLine® controllers are truly industrialized PCs. The controllers are powered by an AMD 586 processor. All controllers are presently shipped with a multi-threaded embedded DOS operating system. The rugged FLASH disk stores files exactly the same as a hard disk on a PC. DRAM is provided standard at 4MB. This can be expanded to 64MB on some of the models.

PC104 FORM FACTOR
The internal construction of the Ethernet controller is based on the PC104 stack. This permits future CPU upgrades and expansion of the controller capabilities using add-in cards such as video cards, additional serial ports, quadrature decoder cards, etc.

EMBEDDED CONTROL PROGRAMS
ECPs can be uploaded and downloaded over the network. Once downloaded, ECPs execute as they would on a PC to service the communications ports and process I/O information. Executing local control programs result in much faster response times than are achievable over a network. In an OpenLine® system, the status of all 128 I/O channels are scanned and stored every 500 microseconds. The OpenLine® controllers can instantly access this data over the internal address/data bus using memory reads and writes.

In addition to faster response to I/O status changes, ECPs reduce the amount of network traffic, facilitate concurrent software development and simplify troubleshooting.

For C/C++ programmers, ECPs may be written and compiled with either Borland C++ or Microsoft C++ and downloaded to the controller. All compiler debugging tools can be used.

If you prefer to develop ECPs using Flow Charts, Ladder Logic, Function Block Diagrams, or Sequential Function Charts, we provide the ISaGRAF programming package. ISaGRAF is an IEC 1131 compliant software workbench which is easy to learn and use. Programs can be tested and debugged using ISaGRAF simulation prior to downloading the program into the OpenLine® controller. While the program is executing in the controller, the ISaGRAF monitoring application may be run to monitor the program execution and troubleshoot any remaining problems. Programming using ISaGRAF will save countless hours of development time. The programs are self-documenting, making it easier to troubleshoot or modify existing programs.

HOT BACKUP
OpenLine® systems are able to have two power supplies and controllers on the same I/O stack for applications requiring redundancy. One controller would be the primary and the other the secondary. Controllers and power supplies can be hot-swapped without disrupting the system's performance.

OTHER FEATURES
COM1 on the controller is an auxiliary RS-232 port that can be used for interrogating the CPU or talking to other RS-232 devices such as operator interface panels, printers, bar code readers, etc.

OpenLine® Control System

DIMENSIONS In inches (and millimeters)

5.9 (149.73)

AUI CONNECTOR

10BaseT CONNECTOR

POWER CONNECTION

I/O BUS 3.9 (99.86)

4.4 (111.56)

DIN RAIL CLIP

PC104 EXPANSION KNOCKOUTS

2.9 (73.48)

2.4 (60.21) TO CENTERLINE OF DIN RAIL CHANNEL

AUXILIARY RS-232 PORT

RESET SWITCH
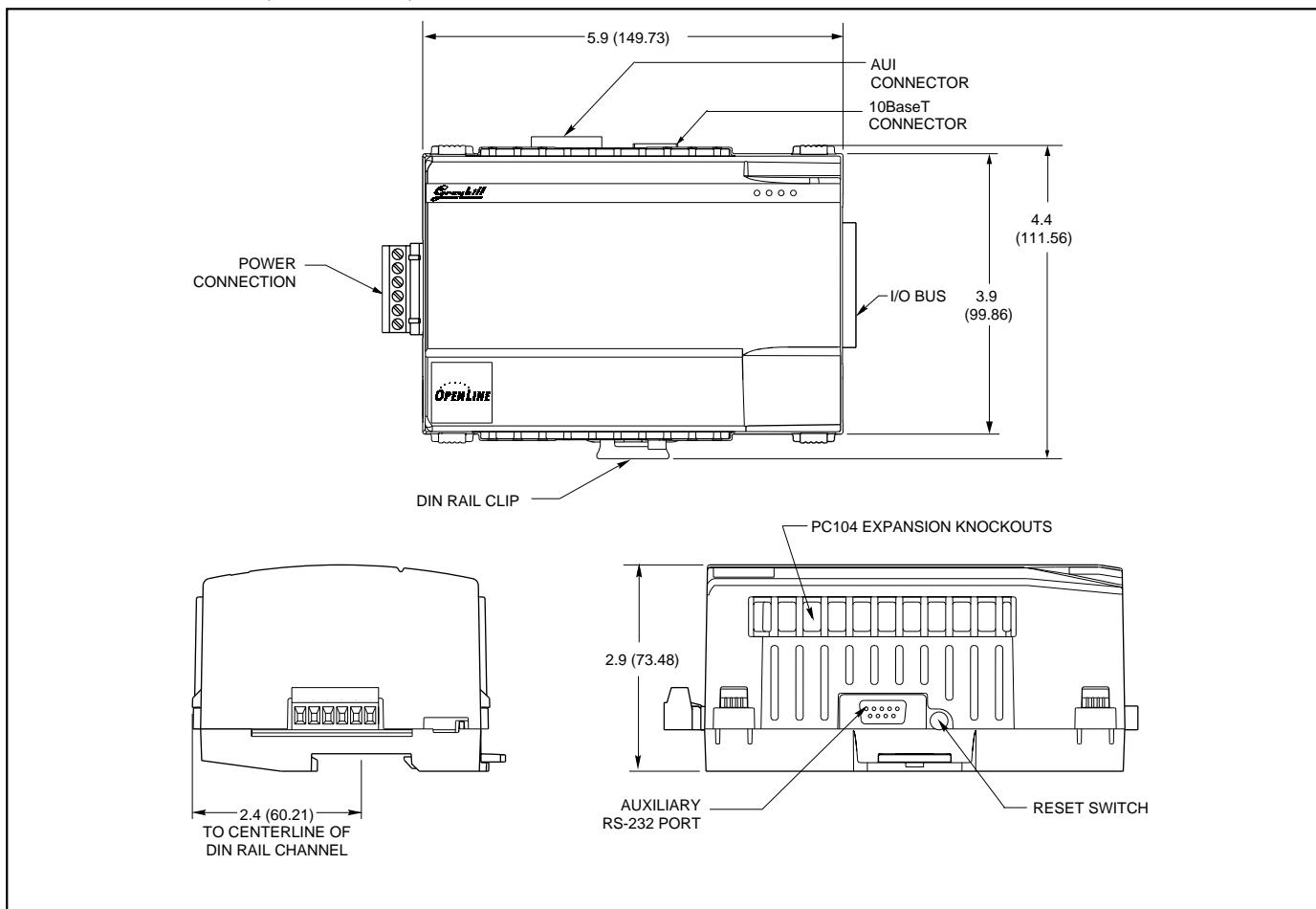
SPECIFICATIONS

Power Supply: 4.75 to 5.25 Vdc
Supply Current (less modules): 1.5A maximum
Humidity: 5 to 95% non-condensing
Housing Material: ABS/Polycarbonate blend
CPU: 133 MHz AMD 586
Connections:
Ethernet: RJ-45 for 10Base-T 15-pin D-Sub (female) AUI for other media types (fiber, coax)
RS-232 (DCE or DTE): 9-pin D-Sub (male)
PC104: 104-pin, all supported
Base: 48-pin Euro DIN (see Bulletin #741)
Serial Data:
Application Format: Modbus TCP
Transport: TCP/IP
Integrity: Ethernet CRC Modbus Checksum
Range of Network: 10Base-T 100m length per segment without repeaters

Available from your local authorized Grayhill Distributor. For prices and discounts, contact your local sales office, an authorized Distributor, or Grayhill.

ACCESSORIES

ORDERING INFORMATION

Part Number	Description
OpenLine® Controllers	
72-ETH-T400 **72-ETH-T500** **72-ETH-T550**	4MB DRAM, 4MB flash disk, 0° to 60°C 4MB DRAM, 4MB flash disk, -40° to 60°C 4MB DRAM (expandable to 64MB), 12MB flash disk, -40° to 60°C
OpenLine® User's Manuals and Utilities	
72-UM-ETH **7W-UM-ISA** **72-UM-OLAPI** **72-UOL**	Ethernet controller user's manual OpenLine® ISaGRAF user's manual OpenLine® controller API for creating ECPs OpenLine® configuration and product data
Software	
7W-WD2-32 **7W-WD16-256** **7W-WDL-UL** **72-UME-DLL32**	ISaGRAF 32 variable editor and debugger ISaGRAF 256 variable editor and debugger ISaGRAF unlimited variable editor and debugger Ethernet/Modbus DLL for Windows 95/98/NT
Compatible Components	
OpenLine® I/O bases OpenLine® I/O modules OpenLine® analog I/O modules OpenLine® power supply OpenLine® terminators Cable extenders	