Real-time Controller with Multiple Fiber-Optic Loop Control

Features

- Standard 100BaseT Ethernet interface.
- Allows over 100 devices to be connected to a standard PC through a single Ethernet port
- PSI Diagnostic host software allows all PTC devices to be connected through the A500
- High performance on-board DSP and memory for data buffering and real-time calculations.
- Software interfaces available for various host systems.

Applications

- Applications that require real-time deterministic control of multiple devices and/or real-time data processing.
- Systems requiring real-time trigger distribution.
- High performance, fiber-optic loop systems.
- Large-scale fiber optic loop systems.
- Data acquisition and control systems for noisy environments.

Specifications

Processor	ADSP 21160 high performance DSP
	Internal clock 80 MHz, external bus speed 20 MHz
	480 MFlops peak, 320 MFlops sustained.
Memory	On chip 4 Mb program and data
	SRAM 8 Mb x 32, zero wait
	NVR 512 kb x 8 battery-backed
	Program memory 4 Mb x 16 flash
	Bootloader 512 kb x 8 demountable PLCC32 flash device
Operating system	Analog Devices VDK real time
	Analog Devices Visual DSP C++ development environment
Ethernet	Baud rates 100 Mbps, 10 Mbps (auto-select during negotiation)
	User Datagram Protocol (UDP)
	Any valid IP address selectable via values stored in NV memory and rear panel switches. Port 100.

Specifications (continued)

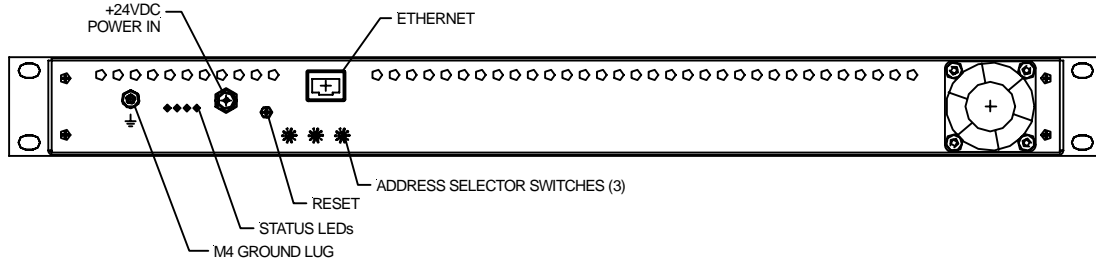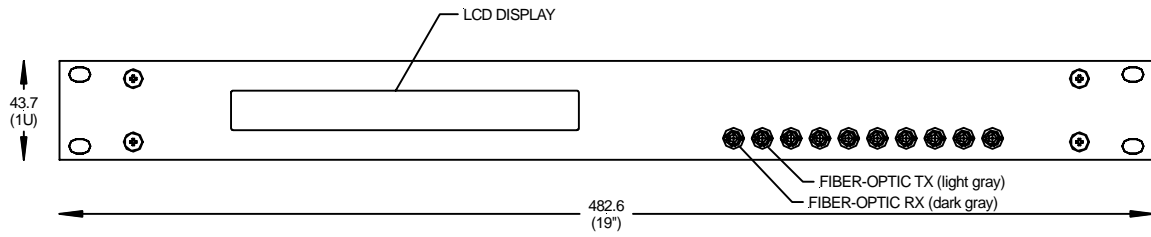|	
Fiber-optic ports	Five loop ports, each a transmitter / receiver pair. Expandable to ten ports with –R5T5 option..
	Up to fifteen devices per port.
	Peer-to-peer A500 communication available through loop ports.
Power input	+24V (+/- 2V) DC, 500 mA (up to maximum 1000 mA depending on expansion boards).
Controls	Three 10 position rotary switches for setting last byte of IP address. Processor reset button.
Displays	2 by 40 character backlit LCD on front panel for POST messages and connection status.
	Status LEDs on rear panel for power, device status and Ethernet baud rate.
Case	19" rack mounting, 1U. Stainless steel sheet, with aluminium front panel,
Weight	2.0 kg (4.4 lb)
Operating environment	10 to 35C, < 80% humidity, non-condensing, vibration < 0.1g all axes, 1 to 1000Hz
Storage environment	0 to 50C, < 80% humidity, non-condensing, vibration < 2g all axes, 1 to 1000Hz

Interfacing

Interfaces	To host system: Ethernet 10/100baseT, UDP messaging.
	To front-end devices: Fiber-optic loop, 10 Mbit/sec serial, 9 bit asynchronous binary.
Host computer	PSI Diagnostic host software recommended.
	Libraries available for Microsoft® .NET 2.0, Win32 and LabVIEW.

Connectors

Ethernet	RJ-45 socket, suitable standard Ethernet 8-way plug and CAT5 or higher cable. Fully transformer isolated
	Auto MDIX capability: The A500 negotiates TX and RX lines when making a connection. Either crossover or non-crossover cables may therefore be used.
Fiber optics	Five pairs (in base A500), 1mm Avago HFBR ST bayonet.
Power in	2.1mm threaded jack. Mates with Switchcraft S761K or equivalent.

LCD DISPLAY

43.7
(1U)

FIBER-OPTIC TX (light gray)
FIBER-OPTIC RX (dark gray)

482.6
(19")

+24VDC
POWER IN

ETHERNET

ADDRESS SELECTOR SWITCHES (3)

RESET

STATUS LEDs

M4 GROUND LUG

Dims mm

Ordering information

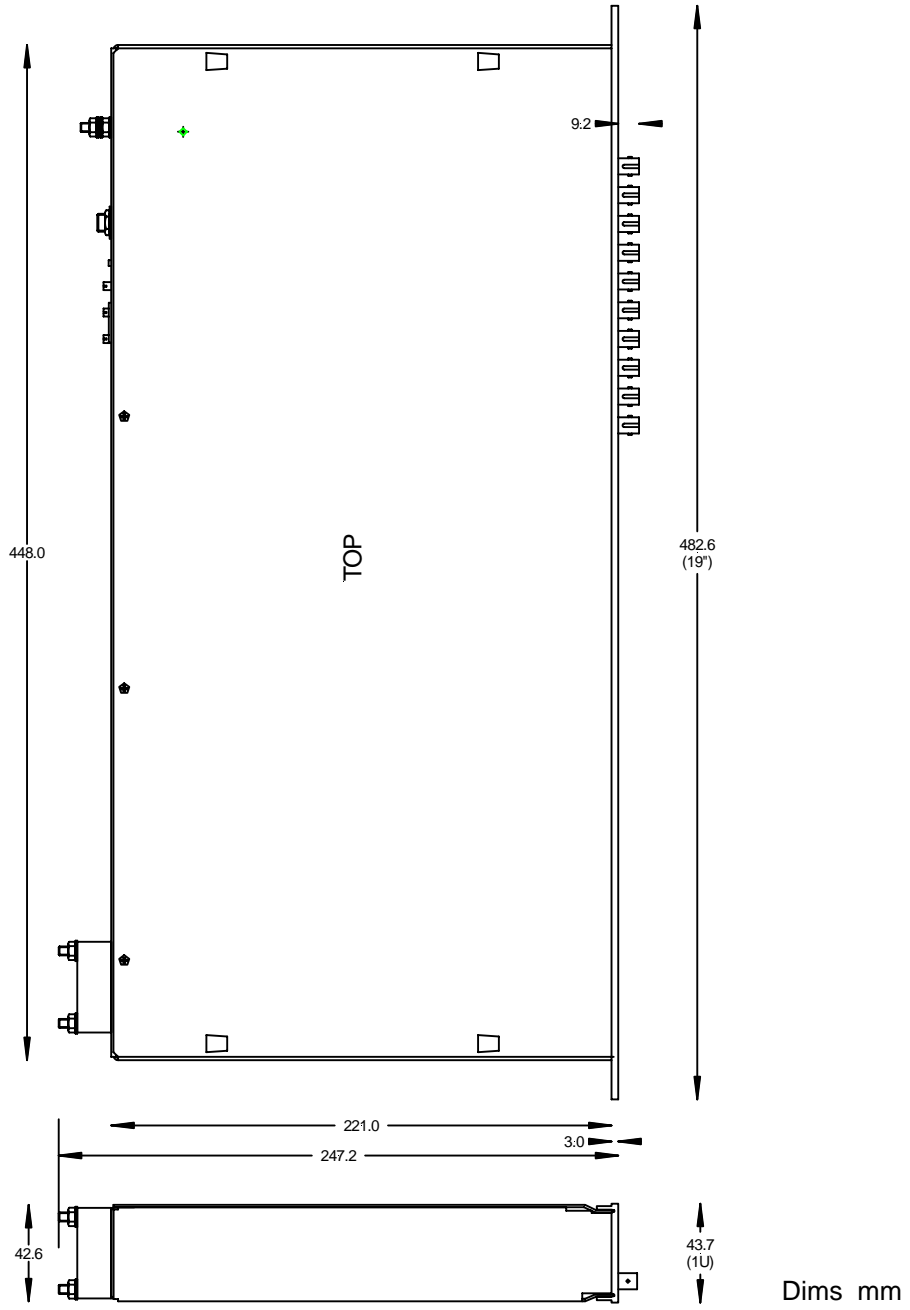|	
A500	A500 with PSI Diagnostic host software
-R5T5	Add mezzanine board with five additional fiber optic receiver / transmitter pairs
-R10	Add mezzanine board with the additional fiber optic receivers
-G	Add expansion board with four TTL trigger/gate inputs
-GC	Add expansion board with four TTL trigger/gate inputs and ten fast scaler inputs

A500_DS_090813

PSI System Controls and Diagnostics   **Pyramid Technical Consultants**

TOP

448.0

482.6
(19")

9.2

221.0
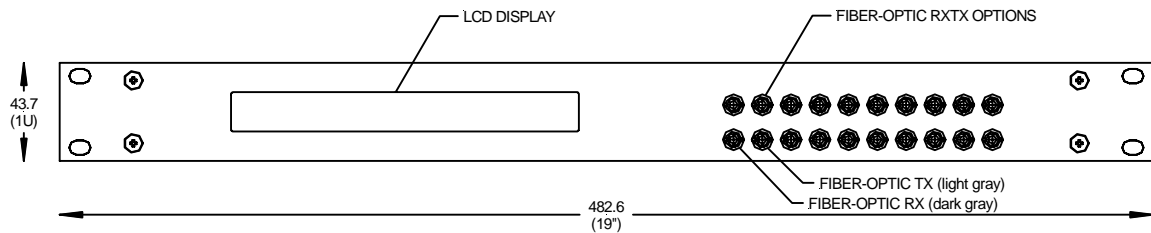
247.2

3.0

42.6

43.7
(1U)

Dims mm

Mezzanine board options

-R5T5 Additional five pairs of receiver / transmitter pairs.

     Available to provide another five fiber-optic loops, or to provide dedicated functions such as optical trigger distribution.

-R10   Additional ten fiber-optic receivers.

     Available for incoming data streams in special applications.

LCD DISPLAY

FIBER-OPTIC RXTX OPTIONS

43.7
(1U)

FIBER-OPTIC TX (light gray)
FIBER-OPTIC RX (dark gray)

482.6
(19")

Expansion board options

-G   Four independent TTL gate trigger inputs, 50 ohm terminated.

The A500 can be software configured to distribute these signals to fiber-optic transmitters on the –R5T5 or –T10 mezzanine board with any mapping.

Propagation from input to optical output < 150 nsec.
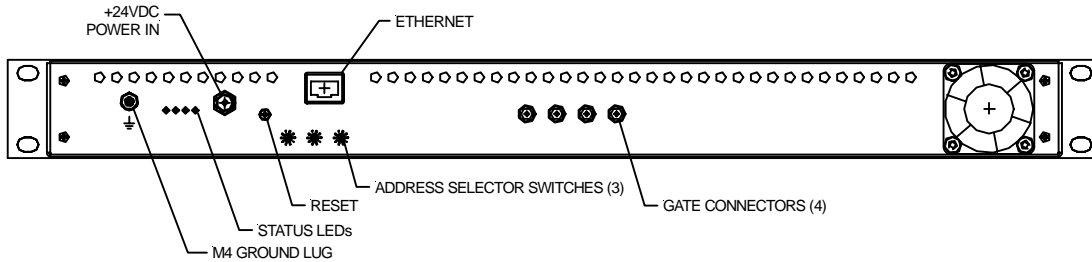
-GC   Four independent TTL gate trigger inputs (as –G option) plus ten fast pulse counter-scaler channels, suitable for discriminated pulses from photomultipliers and similar devices.

Counter-scaler inputs 50 ohm terminated, suitable for –1.6 V NIM pulses (32 mA).

Smallest detectable pulse height –0.45 V.

Minimum detectable pulse width 5 nsec.

Pulse pair resolution 10 nsec.

Scaler depth 32 bits (background readout possible).

Integration period adjustable 100 µsec to 60 sec.

Multiple integration trigger modes.
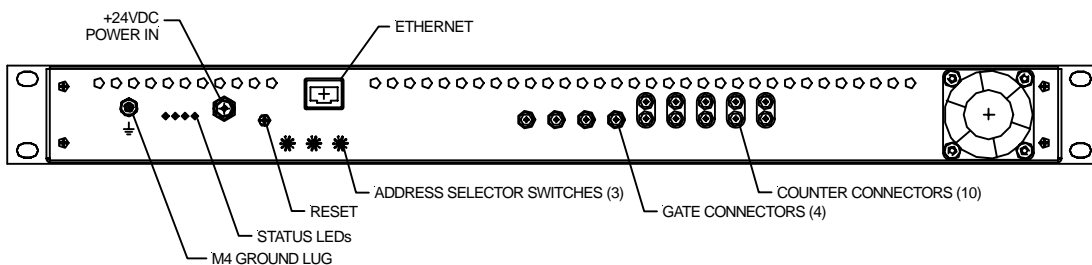
-xxx   New expansion boards can be designed to particular customer requirements. Please contact Pyramid Technical Consultants to discuss you application.