

Four Channel Pulse Counting Detector Controller

Features

- Four independent channels with fast discriminators, scalars, pre-amp power and high voltage.
- Able to control photomultipliers and APDs.
- 10 nsec pulse pair resolution
- 150 MHz discriminator bandwidth
- Trigger distribution facility for large detector arrays
- Quadrature encoder input
- Multiple host interface options



Applications

- Fast scintillator readout, NaI, LaCl₃, LaBr₃ and YAP crystals.
- Avalanche photodiode readout
- Detector array readout for area and position sensing detectors.
- Diffraction experiments

Options

- HV range and polarity selections
- Matching pre-amplifiers to suit supported detector types

Specifications

Input signals	Pulse amplitude -4 V to +4V (up to 80mA into 50 ohms) Suitable for typical photomultiplier pre-amplifier output pulses for NaI, LaCl and YAP scintillators, and avalanche photodiodes.
Disriminators	Window comparator. Lower and upper thresholds independently adjustable from -5 V to + 5V, 16 bit resolution. Automated pulse height scan facility to assist setup.
Input impedance	50 ohm
Resolution	Minimum detectable pulse width 10 nsec Pulse pair resolution 10 nsec
Scalars	32 bit scalars with transparent background readout Pulse integration period 100 μsec to 1000 sec.
Triggers	TTL gate/trigger input to synchronize scalars. Gate input is mirrored to gate output to allow multiple C400s to be operated together with daisy-chain configuration.



Specifications (continued)

Control outputs	<p>+/- 12 VDC / 100 mA fused outputs for pre-amp power.</p> <p>-5 to +5 VDC 16 bit analog output for control of remote HV supply or other function.</p> <p>LED drive 5V pulsed for scintillator test pulser LEDs. Adjustable frequency and pulse duration.</p>
HV output options	<p>20 to 200 V. Line <0.01%, Load <0.05%, Ripple <0.01%</p> <p>50 to 500 V. Line <0.01%, Load <0.01%, Ripple <0.01%</p> <p>100 to 1250 V. Line <0.001%, Load <0.005%, Ripple <0.001%</p> <p>200 to 2000 V Line <0.01%, Load <0.01%, Ripple <0.001%</p> <p>All supply options 1 W maximum output power.</p> <p>Supplies can be in any combination on the four channels. 200 and 500 V suitable for APDs, 1250 and 2000 suitable for PMTs.</p> <p>Supplies can be either polarity (specify at time of order)</p> <p>Line regulation < 0.001%</p>
Monitor out	<p>Discriminated pulse output. TTL levels into 50 ohm impedance.</p> <p>Minimum pulse width 10 nsec typical.</p>
Encoder in	<p>Complementary quadrature encoder input, TTL levels.</p> <p>Maximum encoder count rate 1 MHz.</p> <p>Integration period 100 μsec to 1000 sec</p> <p>Counter depth 32 bits.</p>
Trigger in	<p>TTL levels. 10k ohm input impedance</p>
Trigger out	<p>TTL levels into 50 ohm impedance</p>
Power input	<p>+24V (+/- 2V) DC, 750 mA typ, 1500 mA max.</p>
Controls	<p>Two rotary switches for loop address and comms mode/ baud rate (for fiber-optic communications)</p>
Displays	<p>Four front panel LEDs for HV on per channel</p> <p>Eight rear panel LEDs for power, device status, communications.</p>
Case	<p>1U 19" steel chassis with Al alloy front panel</p>
Weight	<p>3.5 kg (7.7 lb)</p>
Operating environment	<p>10 to 35 C (15 to 25 C recommended to reduce drift and offset) , < 70% humidity, non-condensing, vibration < 0.1g all axes (1 to 1000 Hz)</p>
Shipping and storage environment	<p>-10 to 50 C, < 80% humidity, non-condensing, vibration < 1g all axes, 1 to 1000 Hz</p>



Datasheet

C400

Interfacing

Interfaces	RS-232 or RS-485, 8-bit ASCII. Selectable baud rate up to 115 kbps. The electrical interface can be set to RS-232 or full duplex differential RS-485. Ethernet 10/100 Mbps. UDP and TCP/IP. Fiber-optic loop, 10 Mbit/sec serial, 9-bit asynchronous binary. Loop is able to support connection of slave devices to the C400 such as M10 general purpose I/O unit .
Host computer	Diagnostic host program supplied. C++ libraries available for Microsoft® Windows and Linux. ASCII communications based on SCPI via RS-232/RS-485 for legacy system integration.

Ordering information

C400	C400 four channel scintillation detector controller with user manuals, software drivers, calibration data.
-nXP20/12/05/02	Add n HV supplies positive 2000/1250/500/200 volts.
-nXN20/12/05/02	Add n HV supply negative 2000/1250/500/200 volts.

Pre-amplifiers

CP10-A	Matching pre-amplifier suitable for LaCl ₃ , LaBr ₃ and YAP scintillator / photomultipliers. DC input coupling.
CP10-B	Matching pre-amplifier suitable for plastic scintillator photomultipliers, continuous dynode electron multipliers, channel plates and silicon photomultipliers (APD arrays). DC input coupling.



Pyramid Technical Consultants

Datasheet

C400

Connectors

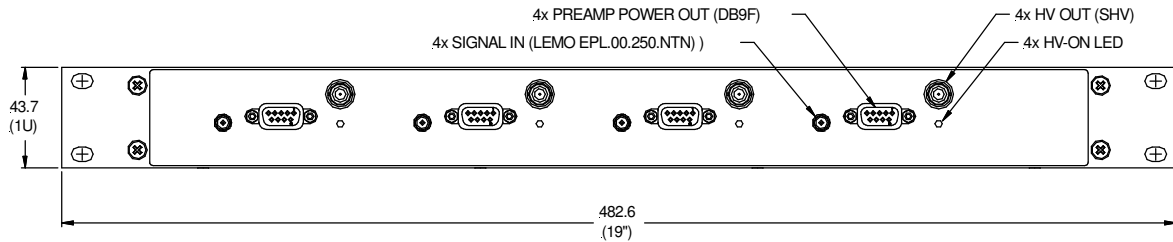
Signal inputs	Four Lemo coaxial size 00.																				
Preamp	Four D9 socket. <table><tr><td>1</td><td>DGnd</td><td>6</td><td>DGnd</td></tr><tr><td>2</td><td>Pulser out</td><td>7</td><td>DGnd</td></tr><tr><td>3</td><td>AGnd</td><td>8</td><td>+12 V out</td></tr><tr><td>4</td><td>-12 V out</td><td>9</td><td>AGnd</td></tr><tr><td>5</td><td>DAC out</td><td></td><td></td></tr></table>	1	DGnd	6	DGnd	2	Pulser out	7	DGnd	3	AGnd	8	+12 V out	4	-12 V out	9	AGnd	5	DAC out		
1	DGnd	6	DGnd																		
2	Pulser out	7	DGnd																		
3	AGnd	8	+12 V out																		
4	-12 V out	9	AGnd																		
5	DAC out																				
HV out	Four SHV																				
Ethernet	RJ-45																				
Fiber optics	Two Avago ST bayonet (compatible with 1 mm POF and 200 μ m HCS fiber)																				
RS-232 / RS-485	Six pin mini-DIN ("PS/2") <table><tr><td>1</td><td>Tx / RS-485 Tx+</td><td>4</td><td>n/c</td></tr><tr><td>2</td><td>Rx / RS-485 Rx+</td><td>5</td><td>RS-485 Tx-</td></tr><tr><td>3</td><td>Gnd</td><td>6</td><td>RS-485 Rx+</td></tr></table>	1	Tx / RS-485 Tx+	4	n/c	2	Rx / RS-485 Rx+	5	RS-485 Tx-	3	Gnd	6	RS-485 Rx+								
1	Tx / RS-485 Tx+	4	n/c																		
2	Rx / RS-485 Rx+	5	RS-485 Tx-																		
3	Gnd	6	RS-485 Rx+																		
Gate in	BNC (isolated from case) TTL levels																				
Gate out	BNC (isolated from case) TTL levels																				
Encoder in	D9 socket <table><tr><td>1</td><td>Enc A+</td><td>6</td><td>+5V out</td></tr><tr><td>2</td><td>Enc A-</td><td>7</td><td>DGnd</td></tr><tr><td>3</td><td>Enc B+</td><td>8</td><td>DGnd</td></tr><tr><td>4</td><td>Enc B-</td><td>9</td><td>Enc Z+</td></tr><tr><td>5</td><td>Enc Z-</td><td></td><td></td></tr></table>	1	Enc A+	6	+5V out	2	Enc A-	7	DGnd	3	Enc B+	8	DGnd	4	Enc B-	9	Enc Z+	5	Enc Z-		
1	Enc A+	6	+5V out																		
2	Enc A-	7	DGnd																		
3	Enc B+	8	DGnd																		
4	Enc B-	9	Enc Z+																		
5	Enc Z-																				
Monitor outputs	Four Lemo coaxial size 00																				
Power in	2.1mm threaded jack. Mates with Switchcraft S761K or equivalent.																				
Ground	M4 threaded stud																				



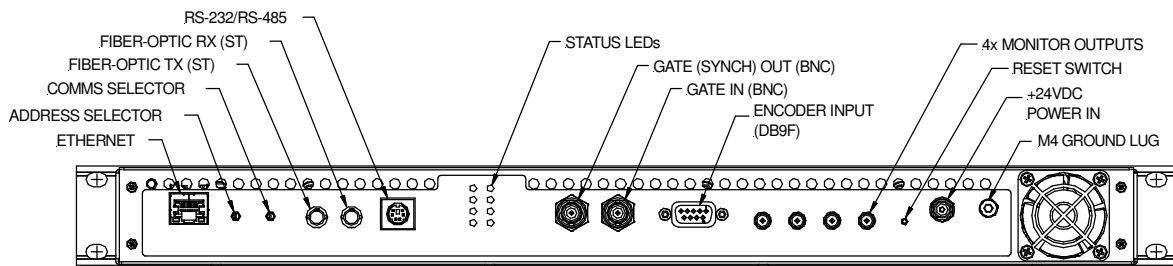
Pyramid Technical Consultants

Datasheet

C400



FRONT VIEW



REAR VIEW

Dims mm

Pyramid Technical Consultants, Inc.,
 1050 Waltham Street Suite 200
 Lexington MA 02421 USA
 Tel: +1 781 402 1700 (USA),
 +44 1273 493590 (UK)

Email: support@ptcusa.com

www.ptcusa.com

The information herein is believed accurate at time of publication, but no specific warranty is given regarding its use. All specifications are subject to change.

All trademarks and names acknowledged.

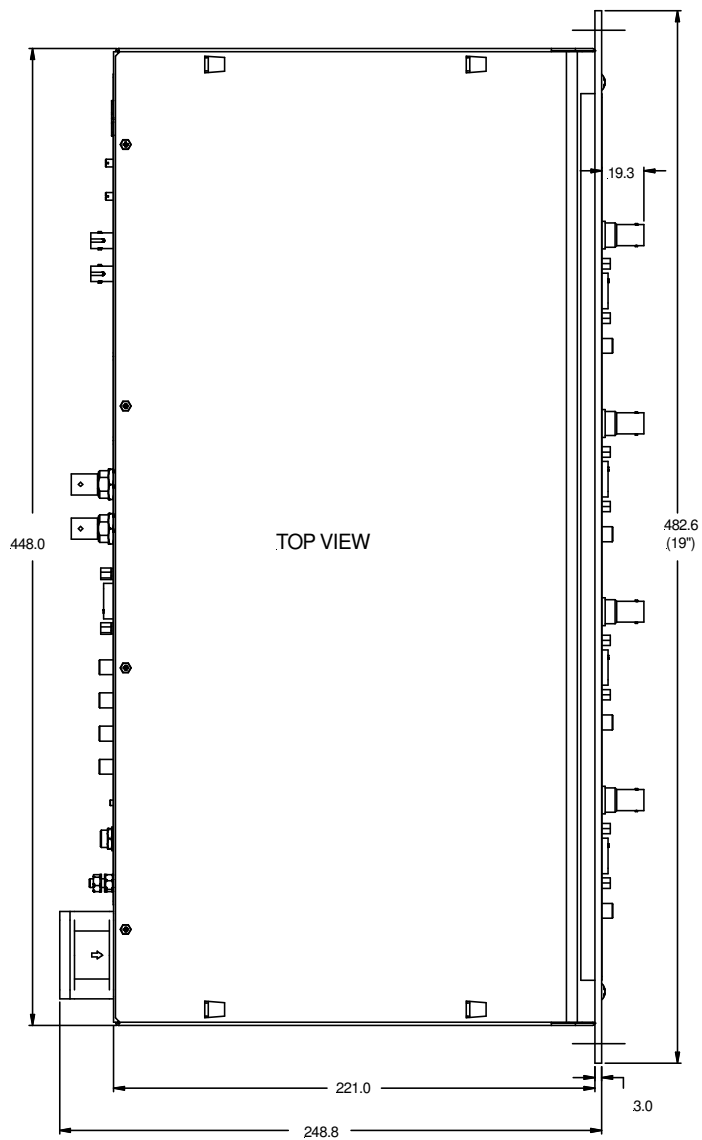
C400_DS_11040401



Pyramid Technical Consultants

Datasheet

C400



Dims mm



Pyramid Technical Consultants

PSI System Controls and Diagnostics