



C400 FOUR CHANNEL COUNTING DETECTOR CONTROLLER

TECHNICAL DATA SHEET



C400 Four Channel Pulse Counting Detector Controller

Applications

- Fast scintillator readout, NaI, and LaBr₃ crystals
- Detector array readout for area and position sensing detectors
- Diffraction experiments

Features

- Four independent channels with fast discriminators, scalers, pre-amp power and high voltage
- Able to control photomultipliers
- 10ns pulse pair resolution
- 150MHz discriminator bandwidth
- Trigger distribution facility for large detector arrays
- Quadrature encoder input
- Multiple host interface options
- -2kV auxiliary HV supply

Options

- Matching pre-amplifiers to suit supported detector types

Specifications

Input signals	Pulse amplitude -4V to +4V (up to 80mA into 50Ω) Suitable for typical photomultiplier pre-amplifier output pulses for NaI and LaBr ₃ scintillators
Discriminators	Window comparator Lower and upper thresholds independently adjustable from -5V to +5V, 16 bit resolution. Automated pulse height scan facility to assist setup
Input impedance	50Ω
Resolution	Minimum detectable pulse width 10ns Pulse pair resolution 10ns
Scalers	32 bit scalers with transparent background readout Pulse integration period 100μs to 1000s
Triggers	TTL gate/trigger input to synchronize scalers. Gate input is mirrored to gate output to allow multiple C400s to be operated together with daisy-chain configuration.
Control outputs	± 12 VDC / 100 mA fused outputs for pre-amp power - 5VDC to + 5 VDC 16 bit analog output for control of remote HV supply or other function LED drive 5V pulsed for scintillator test pulser LEDs. Adjustable frequency and pulse duration
Monitor out	Discriminated pulse output. TTL levels into 50Ω impedance Minimum pulse width 10ns typical
Encoder in	Complementary quadrature encoder input, TTL levels Maximum encoder count rate 1MHz Integration period 100μs to 1000s Counter depth 32 bits
Trigger in	TTL levels. 10kΩ input impedance
Trigger out	TTL levels. 50Ω impedance
Power input	+24V (± 2V) DC, 750 mA typ, 1500 mA max.
Controls	Two rotary switches for loop address and comms mode/ baud rate (for fibre-optic communications)
Displays	Four front panel LEDs for HV on per channel Eight rear panel LEDs for power, device status, communications
Case	1U 19" steel chassis with Al alloy front panel
Weight	3.5 kg (7.7 lb)
Operating environment	10°C to 35°C (15°C to 25°C recommended to reduce drift and offset) < 70% humidity, non-condensing, vibration < 0.1g all axes (1 to 1000Hz)
Shipping and storage environment	-10°C to 50°C, < 80% humidity, non-condensing, vibration < 1g all axes, 1 to 1000 Hz

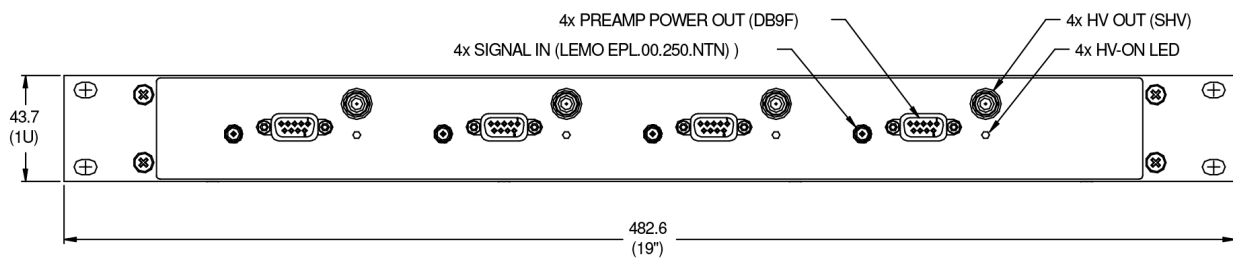
Interfacing

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 Fibre-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

Connectors

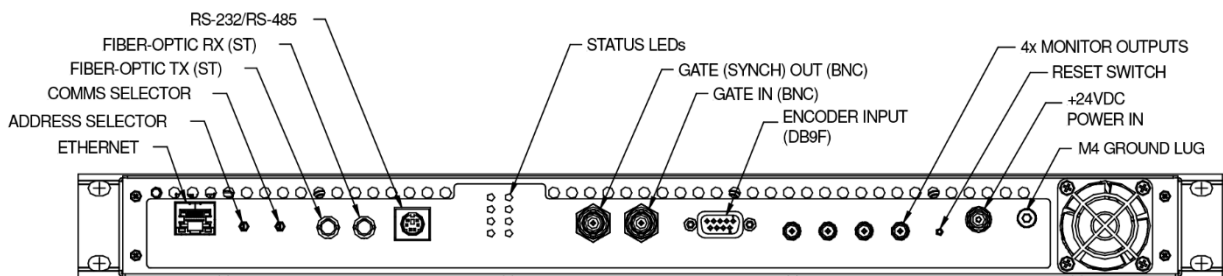
Signal inputs	Four Lemo coaxial size 00		
Preamp	Four D9 socket		
	1. DGnd	4. -12V out	7. DGnd
	2. Pulser out	5. DAC out	8. +12V out
	3. AGnd	6. DGnd	9. AGnd
HV out	Four SHV		
Ethernet	RJ-45		
Fibre-optics	Two Avago ST bayonet (compatible with 1mm POF and 200µm HCS fibre)		
RS-232 / RS-485	6 pin mini-DIN ("PS/2")		
	1. RS-232 Tx / RS-485 Tx	4. n/c	
	2. RS-232 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		
	1. Enc A+	4. Enc B-	7. DGnd
	2. Enc A-	5. Enc Z-	8. DGnd
	3. Enc B+	6. +5V out	9. 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		

Signal inputs and outputs



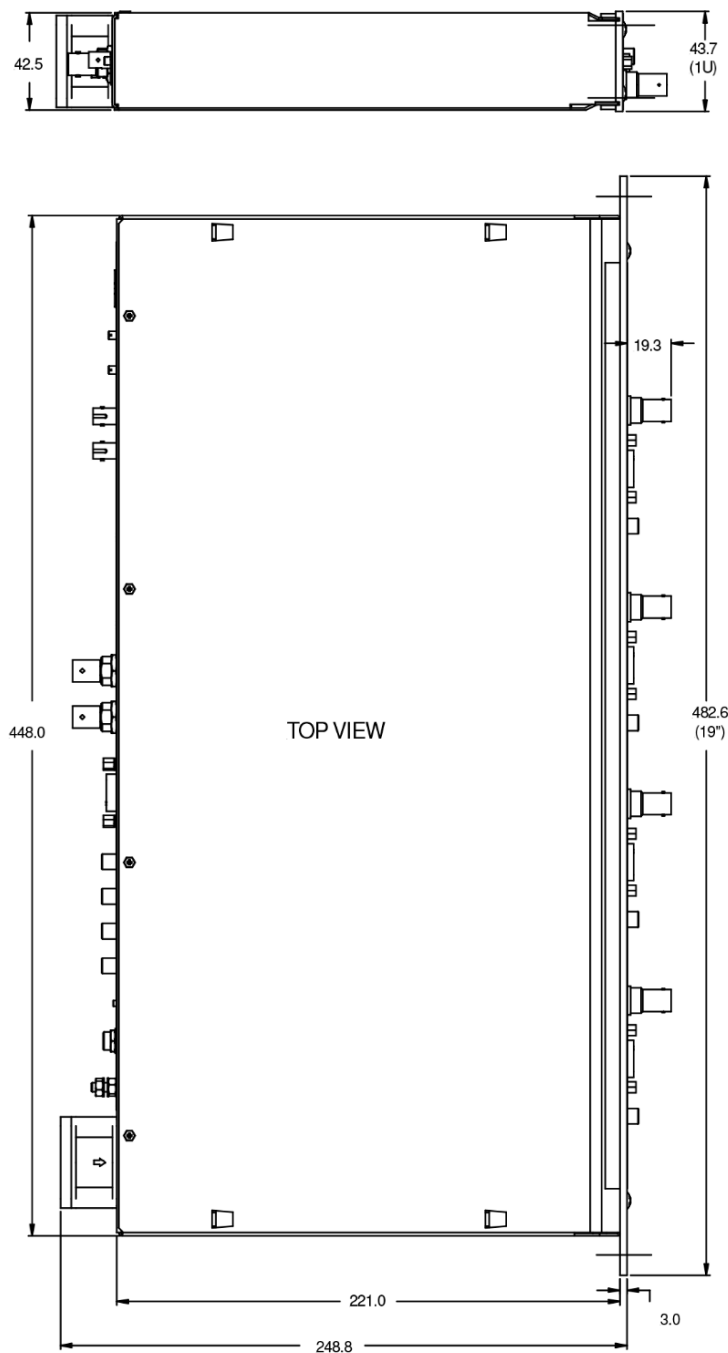
FRONT VIEW

Communications and power



REAR VIEW

C400 Dimensions (mm)



Ordering Information

Part Number	Description
C400-4XN20	C400 four channel scintillation detector controller with -2kV auxiliary HV supply with user manuals, software drivers and calibration data

