

128 channel electrometer



Features

- 128 parallel integrator channels for strip or wire readout.
- External trigger input and trigger passthrough
- Integrated digitization and readout in amps or coulombs through Ethernet interface
- Automatic self-calibration using precision current source
- Fast Ethernet connection and internal buffering allows contiguous data at high rates
- Integrated HV supply option with loopback verification
- Integrated pneumatic actuator control
- Multiple host software options

Applications

- Multilayer Faraday collector (range verifier) readout.
- Multistrip ionization chamber readout.
- Multiwire ionization chamber readout
- Pixel sensor readout
- Position-sensing detector readout
- Particle therapy beam position measurement
- General multichannel low-current measurement.

Options

- HV range and polarity selections



Specifications

Signal inputs	
Number	128, parallel independent
Signal type	Current, 0 to +600 nA (higher ranges can be specified).
Circuit type	No-lost charge switched integrators
Input impedance	< 2 kohm
Input noise charge	< 10 fC one sigma
Input offset current	< +/-0.5 pA typical, less than +/- 6 pA maximum (before zero correction)
Digitization	20 bit delta-sigma
Charge integration time	55 usec to 1000 usec. Longer integrations are achieved by on-board numerical averaging of up to 255 integrations.
Actuator control	
Solenoid control	24 VDC output, 200 mA fused, plus relay contact pair
Limit switch sense	Two, opto-isolated, active low.
Measurement gates	
Gate in (trigger)	TTL levels 2.5 kohm input impedance
Gate out	TTL levels Able to drive 50 ohm load < 50 nsec latency in to out
High voltage	
Voltage range options	20 V to 200 V. Line <0.01%, Load <0.05%, Ripple <0.01% 50 to 500 V. Line <0.01%, Load <0.01%, Ripple <0.01% 100 to 1250 V. Line <0.001%, Load <0.005%, Ripple <0.001% 200 to 2000 V Line <0.01%, Load <0.01%, Ripple <0.001% Supplies can be either polarity (specify at time of order)
Output power	1 watt
Line regulation	< 0.001%



Specifications (continued)

General	
Power input	+24V (+/- 2V) DC, 750 mA typ, 1500 mA max.
Displays	Front panel indicator for power on Front panel LED for HV on Four rear panel LEDs for device status
Case	1U 19" rack mounting steel chassis with Al alloy front panel Filtered cooling fan fitted to rear panel. Ventilation outlet holes on rear panel 4.8 mm diameter.
Weight	3.5 kg (7.7 lb)
Operating environment	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 100 Hz)
Shipping and storage environment	-10 to 50 C, < 80% humidity, non-condensing, vibration < 1g all axes, 1 to 100 Hz

Interfacing

Interfaces	Ethernet 10/100/1000 Mbps. UDP and TCP/IP. Auto MDIX.
Host software	PTC DiagnosticG2 for Windows. PTC DiagnosticG2 for Linux (Debian, Ubuntu) available on request. IG2 software for control and readout via EPICS Custom host applications such as Pyramid Beam Analyzer for MLFC.



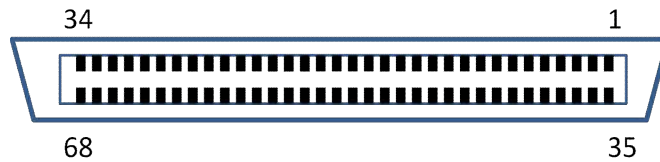
Connectors

Signal inputs

One of two Centronics VHDCI 68 way receptacle (SCPI-style) for current signal inputs. Gold-Inputd contacts. Mating connector Molex VHDCI 0.8MM plug.

VHDCI # 1 Inputs 1 to 64

Top row				Bottom row			
1	Gnd1	18	Input 16	35	Gnd1	52	Input 48
2	Input 32	19	Input 15	36	Input 64	53	Input 46
3	Input 31	20	Input 14	37	Input 63	54	Input 46
4	Input 30	21	Input 13	38	Input 62	55	Input 45
5	Input 29	22	Input 12	39	Input 61	56	Input 44
6	Input 28	23	Input 11	40	Input 60	57	Input 43
7	Input 27	24	Input 10	41	Input 59	58	Input 42
8	Input 26	25	Input 09	42	Input 58	59	Input 41
9	Input 25	26	Input 08	43	Input 57	60	Input 40
10	Input 24	27	Input 07	44	Input 56	61	Input 39
11	Input 23	28	Input 06	45	Input 55	62	Input 38
12	Input 22	29	Input 05	46	Input 54	63	Input 37
13	Input 21	30	Input 04	47	Input 53	64	Input 36
14	Input 20	31	Input 03	48	Input 52	65	Input 35
15	Input 19	32	Input 02	49	Input 51	66	Input 34
16	Input 18	33	Input 01	50	Input 50	67	Input 33
17	Input 17	34	Gnd2	51	Input 49	68	Gnd2



Suitable for direct connection to Pyramid MLFC devices.

When viewing schematic drawings, note that channels are numbered I0 to I63 on this connector.



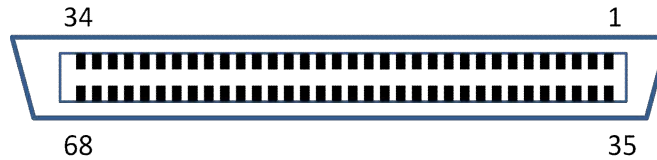
Connectors

Signal inputs
(continued)

Two of two Centronics VHDCI 68 way receptacle (SCPI-style) for current signal inputs. Gold-Inputd contacts. Mating connector Molex VHDCI 0.8MM plug.

VHDCI # 2 Inputs 65 to 128

Top row				Bottom row			
1	Gnd1	18	Input 80	35	Gnd1	52	Input 112
2	Input 96	19	Input 79	36	Input 128	53	Input 111
3	Input 95	20	Input 78	37	Input 127	54	Input 110
4	Input 94	21	Input 77	38	Input 126	55	Input 109
5	Input 93	22	Input 76	39	Input 125	56	Input 108
6	Input 92	23	Input 75	40	Input 124	57	Input 107
7	Input 91	24	Input 74	41	Input 123	58	Input 106
8	Input 90	25	Input 73	42	Input 122	59	Input 105
9	Input 89	26	Input 72	43	Input 121	60	Input 104
10	Input 88	27	Input 71	44	Input 120	61	Input 103
11	Input 87	28	Input 70	45	Input 119	62	Input 102
12	Input 86	29	Input 69	46	Input 118	63	Input 101
13	Input 85	30	Input 68	47	Input 117	64	Input 100
14	Input 84	31	Input 67	48	Input 116	65	Input 99
15	Input 83	32	Input 66	49	Input 115	66	Input 98
16	Input 82	33	Input 65	50	Input 114	67	Input 97
17	Input 81	34	Gnd2	51	Input 113	68	Gnd2



Suitable for direct connection to Pyramid MLFC devices.

When viewing schematic drawings, note that channels are numbered I64 to I127 on this connector.



Connectors

Actuator control	9 pin DSub female			
	1	Relay pole A	6	Relay pole B
	2	24 V rtn	7	Opto in 2
	3	n/c	8	24 V rtn
	4	24 VDC out fused	9	24 VDC out fused
	5	Opto in 1		
High voltage out	SHV			
High voltage sense	SHV			
Gate in	Lemo 00 coaxial			
Gate out	Lemo 00 coaxial			
Ethernet	RJ-45 jack			
Power in	Lemo Redel PXG			
	1	+24 VDC in		
	2	24 V rtn		
Ground	M4 threaded stud			



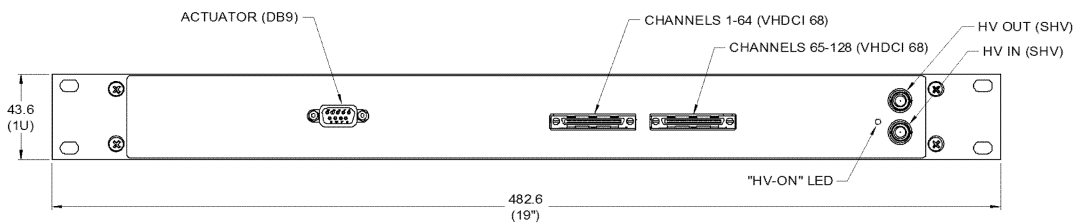
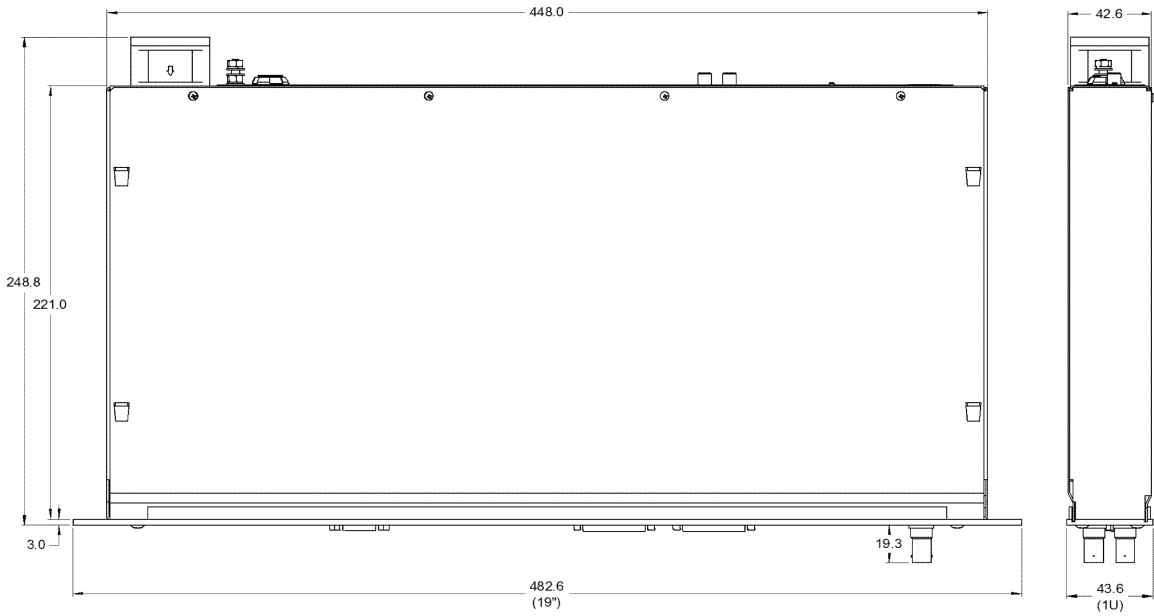
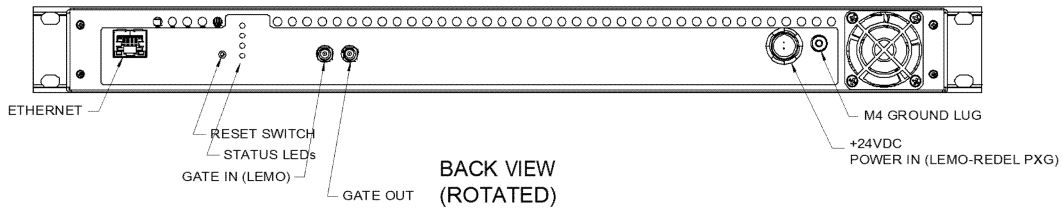
Connectors

High voltage out	SHV
High voltage sense	SHV
Ethernet	RJ-45 jack
Power in	Lemo Redel PXG
Ground	M4 threaded stud

Ordering information

I128S	I128 position sensing ionization chamber controller with 128 electrometer channels plus actuator control and HV bias output options..
-XP20/12/05/02	Add HV supplies positive 2000/1250/500/200 volts
-XN20/12/05/02	Add HV supply negative 2000/1250/500/200 volts





Dims mm

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