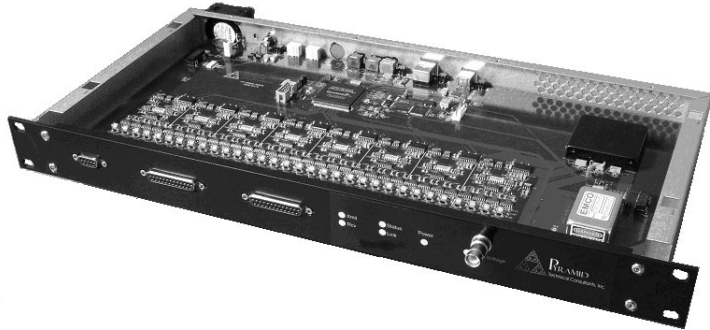


## Thirty-two Channel Digital Electrometer

**Features**

- Thirty-two gated integrator channels
- Dynamic range 0.1pA to 100  $\mu$ A
- Optional integrated HV supply
- Integrated actuator solenoid control
- Integrated digitization and communications
- Integrated calibration test source
- Selection of current and charge integration modes



<b>Applications</b>	<ul style="list-style-type: none"> <li>• Multi-electrode ionization chambers and ionization chamber arrays</li> <li>• Multiwire proportional chambers operating in current mode</li> <li>• Multiwire beam profile grids</li> <li>• Multi-segment photodiode arrays</li> </ul>
<b>Options</b>	<ul style="list-style-type: none"> <li>• Auxiliary HV output for detector bias</li> <li>• Alternative feedback capacitor options</li> </ul>

**Specifications**

Integration capacitors	Each channel has dual, selectable capacitors
Input noise	< 10 fA rms + 1 fA rms per pF input load up to 100 pF (1 second integration, 10 pF capacitor)
Input offset current	< 1 pA at 25 C < 3 pA at 35 C Input offset current can be subtracted in software.
Stability	Output drift < 5 ppm / C / hour
Integration time	User selectable, 20 $\mu$ sec minimum.
Integration modes	Continuous current; continuous charge; lossless charge accumulation; external gate integration; triggered burst mode
Input protection	Back to back fast diode pair and spark gap on each input
Digitization	Eight ADCs reading groups of four inputs, 16 bit bipolar, 250 kHz
Data readout time	32 channels are converted and copied to internal memory in $\leq$ 10 $\mu$ sec



**Specifications (continued)**

Digitization	Eight 1 MHz ADCs reading groups of four inputs, 16 bit bipolar, 250 kHz effective per channel.
Data capture time	32 channels are converted and copied to internal memory in $\leq 10 \mu\text{sec}$
Data rate to host	$> 1 \text{ kHz}$ typical for 32 channels, 10 kHz maximum Data masking allows reduced number of channels to be transmitted.
Calibration source	Precision 500 nA current source can be switched to any channel. Used by automatic calibration routine to obtain individual gain and offset values for each channel.
Test voltage	Switched 5V test voltage provided on connector for external circuit continuity test (via external resistors)
External gate	0/+5 V, 50 ohm or fibre-optic logic level input
Actuator control	Switched 24 VDC for actuator solenoid, in/out limit switch sense
HV PSU	0 to 1000 V programmable, (polarity factory selectable), 1 mA max. Noise and ripple $< 0.1\%$ . Other voltages available.
Power input	+24V (+/- 2V) DC, 750 mA typ, 1200 mA max. excluding actuator
Controls	Two rotary switches for loop address and comms mode/ baud rate.
Displays	Status LEDs (power, device status, comms mode, data transmission rcv/xmit). "HV on" LED.
Case	1U 19" galvanized steel chassis with Al alloy front panel
Weight	2.7 kg ( 6.0 lb)
Operating environment	10 to 35 C (15 to 25 C recommended to reduce drift and offset) , $< 70\%$ humidity, non-condensing, vibration $< 0.1\text{g}$ all axes (1 to 1000 Hz)
Shipping and storage environment	-10 to 50 C, $< 80\%$ humidity, non-condensing, vibration $< 2\text{g}$ all axes, 1 to 1000 Hz

**Interfacing**

Interfaces	RS-232, 8-bit ASCII. Selectable baud rate. USB, 8-bit ASCII 3 Mbit/sec Fiber-optic loop, 10 Mbit/sec serial, 9-bit asynchronous binary. Ethernet connection to host through A300 or A400 loop controllers.
Host computer	ASCII communications based on SCPI. Diagnostic host program supplied for Microsoft® .net framework. DLLs available for Microsoft® .net, National Instruments™ Labview™ and Microsoft® C++. Class library available for Linux.



**Connectors**

Signal inputs

Two D25 sockets. Channels 1-16, channels 17-32.

1	In 02 (In 18)	14	In 01 (In 17)
2	In 03 (In 19)	15	+5V switched
3	In 04 (In 20)	16	AGND
4	In 05 (In 21)	17	AGND
5	In 06 (In 22)	18	AGND
6	In 07 (In 23)	19	AGND
7	In 08 (In 24)	20	AGND
8	In 09 (In 25)	21	AGND
9	In 10 (In 26)	22	AGND
10	In 11 (In 27)	23	AGND
11	In 12 (In 28)	24	In 16 (In 32)
12	In 13 (In 29)	25	In 15 (In 31)
13	In 14 (In 30)		

Actuator control

D9 socket.

1	Relay n/o	6	+24 VDC out
2	PSU GND	7	Opto in B
3	+5V switched	8	Screen
4	+24 VDC out	9	Screen
5	Opto in A		

HV out

SHV

External gate in

BNC (isolated from case) or Avago HFBR ST bayonet

USB

USB B type female.

RS-232

Six pin mini-DIN ("PS/2")

1	Tx	4	n/c
2	Rx	5	n/c
3	Gnd	6	n/c

Fiber optics

Two Avago HFBR ST bayonet (compatible with 1 mm POF and 200 μm HCS fiber)

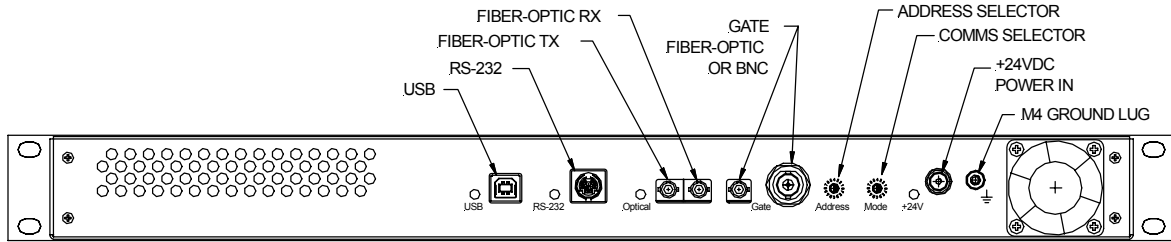
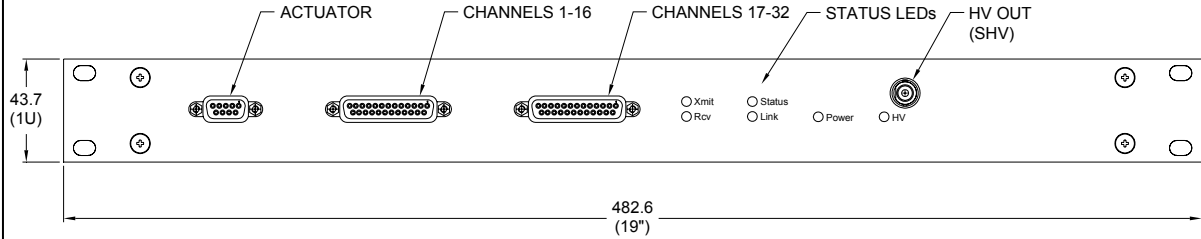
Power in

2.1mm threaded jack. Mates with Switchcraft S761K or equivalent.

Ground

M4 threaded stud





BACK VIEW (ROTATED)

Dims mm

**Ordering information**

- I3200 I3200 thirty-two channel electrometer with user manuals, software drivers, calibration data.
- XP20/10/5/2 Add HV supply positive 2000/1000/500/200 volts
- XN20/10/5/2 Add HV supply negative 2000/1000/500/200 volts
- Cx/y Specify feedback capacitors x pF, y pF. (Default is 10 pF, 1000 pF.)

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Lexington MA 02421 USA  
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+44 1273 493590 (UK)

Email: support@ptcusa.com

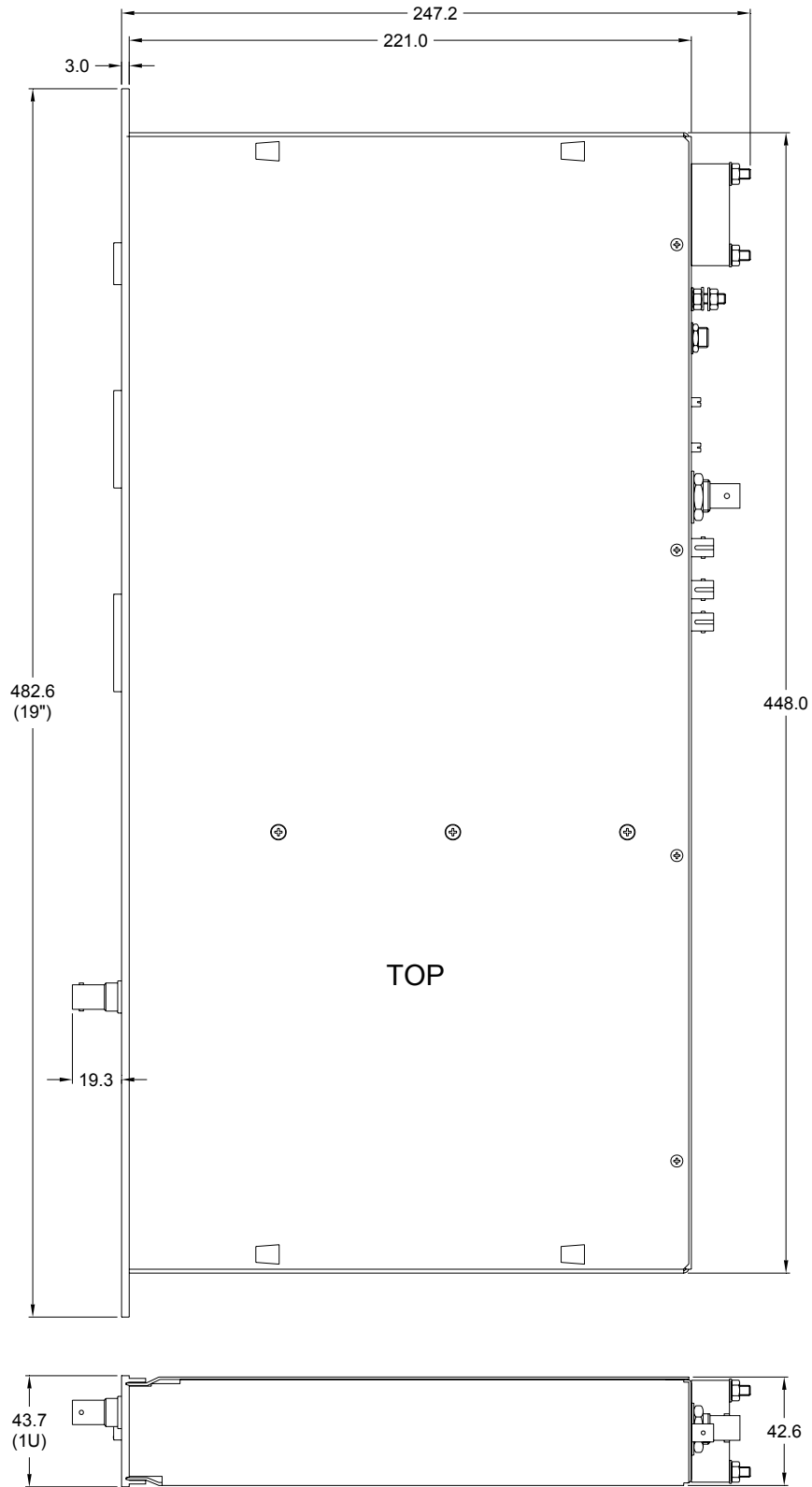
www.ptcusa.com

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.

I3200\_DS\_081119





Dims mm

