

Four-channel Digital Electrometer with Biased Inputs



Features

- Four gated integrator channels with adjustable bias voltage to to 400V
- Dynamic range <math><0.1 \text{ pA}</math> to $>70 \text{ uA}$
- Integrated digitization and communications
- Integrated calibration test source
- Selection of current and charge integration modes
- External triggering capability
- Diagnostic host software with position algorithms and multiple display options.

Applications	Ionization chambers Beam position monitors Photodiodes Diamond detectors Ultra-low current and charge measurement
Options	Auxiliary HV output 0 to 1000V Pressure and temperature inputs Alternative feedback capacitor options Dose monitor unit pulse output

Specifications

Integration capacitor	Dual, selectable
Input noise	<math>< 10 \text{ fA rms}</math> + 1 fA rms per pF input load up to 100 pF (1 second integration, 10 pF capacitor, 0 V bias)
Input offset current	<math>< 100 \text{ fA}</math> at 0V bias, 25 C <math>< 600 \text{ fA}</math> at 0V bias, 50 C <math>< 200 \text{ fA}</math> at 400V bias, 25 C
Stability	Output drift <math>< 5 \text{ ppm / C / hour}</math>
Integration time	User selectable, 100 μsec minimum.
Integration modes	Charge, current, total dose accumulation
Digitization	Four independent ADCs, 16 bit bipolar, 200kHz

Specifications (continued)

External gate	TTL level, 1k8 ohm impedance
Bias HV PSU	0 to 400V programmable, (polarity factory selectable), 2mA max. Noise and ripple < 0.1%
Auxiliary HV PSU	(Factory option) 0 to 1000V programmable (polarity factory selectable), 1mA max. Noise and ripple < 0.1%
Temperature sensor (option)	Thermistor type B57703, -55 to +125C, read by 10 bit ADC
Pressure sensor (option)	Internal barometer, 600 mbar to 1100 mbar, temperature compensated 5 to 50 C, read by 10 bit ADC.
Analog input	Uncommitted analog input, 0 to 5V, 10 bit.
Pulse output (option)	TTL pulse output for dose monitor unit counters
Power input	+24V (+/- 2V) DC, 350mA typ, 500mA max.
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 material	Stainless steel sheet with polycarbonate decals.
Weight	1.2 kg (2.63 lb)
Shipping and storage environment	-10 to 50C, < 80% humidity, non-condensing, vibration < 2g all axes, 1 to 1000Hz

Interfacing

Interfaces	RS-232, 8-bit ASCII. Selectable baud rate.
	RS-485, 8 bit ASCII. Selectable baud rate.
	Fiber-optic loop, 10 Mbit/sec serial, 9-bit asynchronous binary. Ethernet connection to host through A200, A300 or A500 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++.

Connectors

Signal inputs Four triaxial three-lug bayonet. Mates with Trompeter PL75-32 or equivalent.

Core	Signal (at bias potential)
Inner screen	Guard (at bias potential)
Outer screen	Screen (at chassis ground potential)

1	Thermistor input	3	Analog input (spare)
2	DGnd	4	TTL out (option)

Auxiliary HV out SHV

External gate in BNC (isolated from case)

RS-232 / RS485 Six 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+

Fiber optics Two 1mm Avago ST bayonet

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

Ground M3 threaded stud

Ordering information

I400-P04 (-N04) I400 four channel electrometer with 400V positive (negative) input bias voltage, user manuals, software drivers, calibration data.

-XP10 (-XN10) Add auxiliary HV supply positive (negative) 1000V

-TP Add temperature and pressure inputs for ion chambers

-C100/3300 Specify feedback capacitors 100pF, 3300pF. (Default is 10pF, 1000pF.)

-MU Add monitor unit output.

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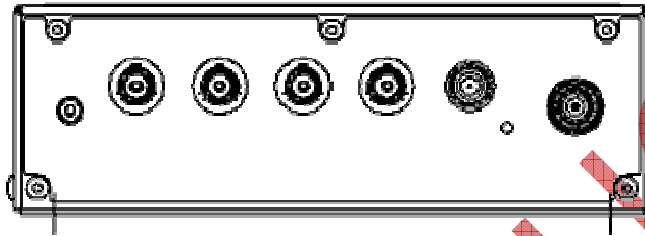
The information herein is believed accurate at time of publication, but no specific warranty is given regarding its use. All specifications are subject to change.

I400_DS_100412

4X SIGNAL-IN
3-LUG TRIAX

AUX HV (SHV)

GATE (BNC)



M3 GROUND LUG

"HV-ON" LED

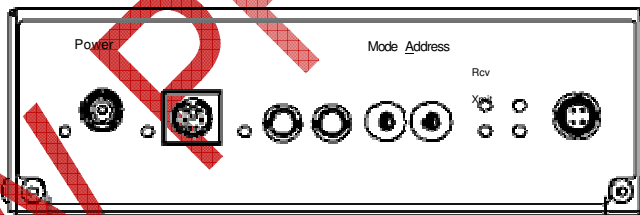
FIBER-OPTIC TX

FIBER-OPTIC RX

+24VDC
POWER IN

RS-232
RS-485

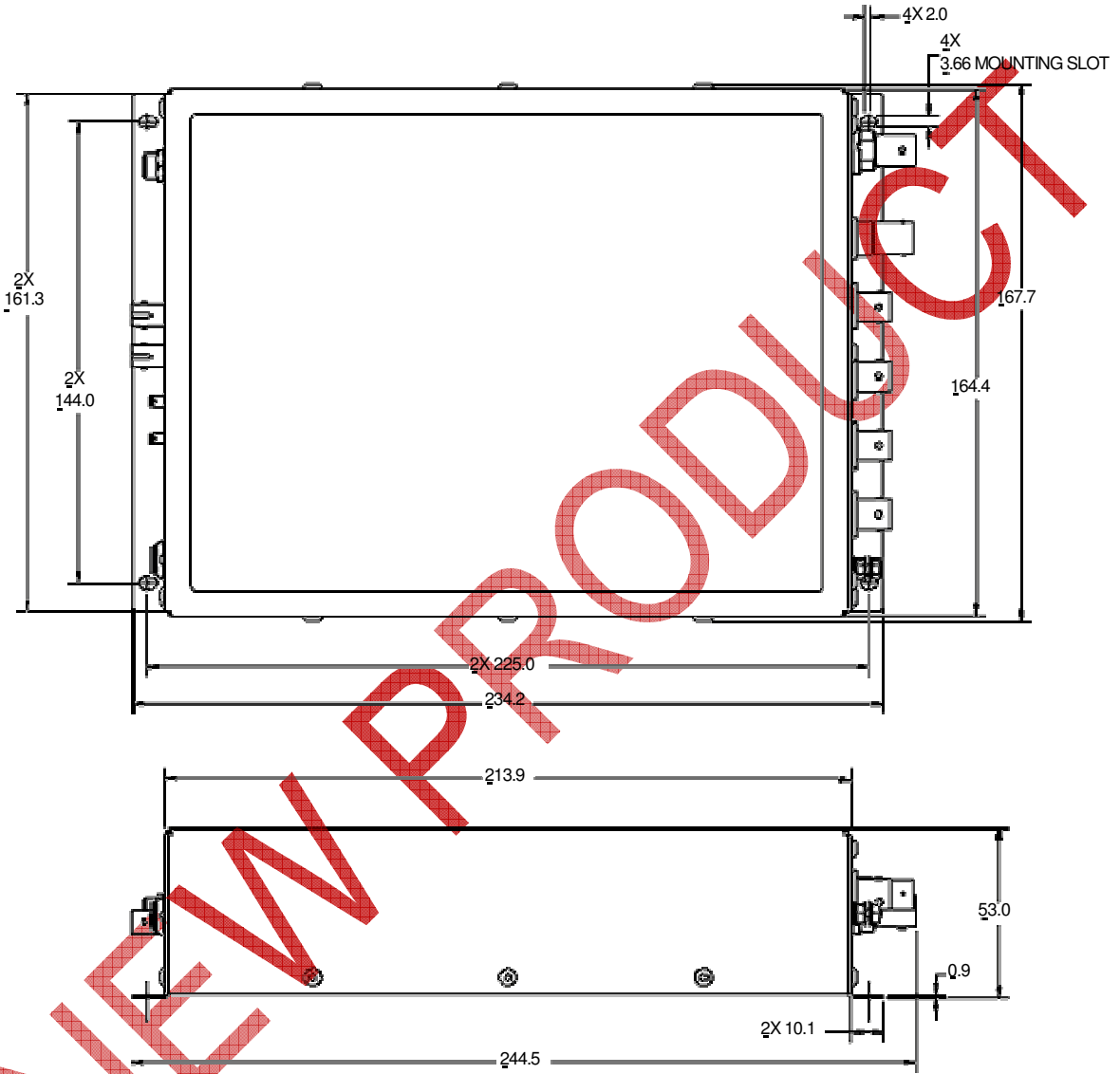
STATUS LEDs
TEMPERATURE
PROBE



COMMS MODE
SELECTOR

ADDRESS
SELECTOR

NEW PRODUCT



Dims mm