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Product Range – Electronic Units

Charge measurement



<i>Product</i>	<i>Image</i>	<i>Chan</i>	<i>Features & applications</i>	<i>Communications</i>
IC101		1	http://www.ptcusa.com/products/17 Measurement range 1 pA to 200 μA bipolar. Built-in bias supply options up to 3 kV. Gated charge integrator design. Built-in digitization, calibration current source, analog voltage and VFC emulation monitor outputs including log mode. Trigger input. Charge readout of ionization chambers, diodes, Faraday collectors, scintillators, secondary electron detectors.	RS232 and RS485 ASCII and binary direct to PC. Fiber-optic binary to loop controller then Ethernet to PC.
I200		2	http://www.ptcusa.com/products/19 Measurement range 0.1 pA to 80 μA bipolar. Built-in bias supply options up to 1 kV. Gated charge integrator design. Built-in digitization, calibration source, trigger input. Pneumatic actuator control. Servo option for stabilizing beamline elements. Charge readout of ionization chambers, diodes, scintillators, secondary electron detectors.	RS232 ASCII and binary direct to PC. USB direct to PC. Fiber-optic binary to loop controller then Ethernet to PC.


I404		<p>4 http://www.ptcusa.com/products/18 Measurement range 1 pA to 200 μA bipolar. Built-in bias supply options up to 3 kV. Gated charge integrator design. Built-in digitization, calibration current source, analog voltage and VFC emulation monitor outputs, trigger input. Built-in real-time position readout for quadrant detectors.</p> <p>Charge readout of ionization chambers, diodes, Faraday collectors, scintillators, secondary electron detectors. Quadrant position sensor readout.</p>	<p>RS232 and RS485 ASCII and binary direct to PC.</p> <p>Fiber-optic binary to loop controller then Ethernet to PC.</p>
I400		<p>4 http://www.ptcusa.com/products/20 Measurement range 0.1 pA to 80 μA bipolar. Built-in bias supply options up to 2 kV. Bias of input circuitry up to 400 V. Gated charge integrator design. Built-in digitization, calibration source, trigger input. Temperature and pressure measurement option.</p> <p>Charge readout of sensors where the signal must sit on bias voltage up to 400V such as Farmer-type ionization chambers. Ionization chambers, diodes, Faraday collectors, scintillators, secondary electron detectors. Quadrant position sensor readout.</p>	<p>RS232 and RS485 ASCII and binary direct to PC.</p> <p>Fiber-optic binary to loop controller then Ethernet to PC.</p>

I3200		32	<p>http://www.ptcusa.com/products/21 Measurement range 0.5 pA to 80 μA bipolar. Built-in bias supply options up to 2 kV. Gated charge integrator design. Built-in digitization, calibration source, trigger input. Pneumatic actuator control.</p> <p>Charge readout of position-sensing ionization chambers, diodes, Faraday collector arrays, scintillators, wire arrays, secondary electron detectors.</p>	<p>RS232 ASCII and binary direct to PC.</p> <p>USB direct to PC.</p> <p>Fiber-optic binary to loop controller then Ethernet to PC.</p>
I6400		64 + 1	<p>http://www.ptcusa.com/products/48 Measurement range 0.5 pA to 80 μA bipolar (64 channels). 0.1 nA to 100 μA bipolar (1 channel). Built-in bias supply option with loopback validation, options up to 2 kV. Gated charge integrator design (64 channels) and I-V converter design (1 channel). Built-in digitization, calibration source, trigger input and trigger passthrough. Pneumatic actuator control. General purpose I/O port (2 AO, 4 AI, 4 DO, 4 DI). Process control relays. Fiber optic process control outputs.</p> <p>Charge readout of position-sensing ionization chambers, diode arrays, Faraday collector arrays, scintillators, wire arrays, secondary electron detectors. Control of dose delivery in proton therapy.</p>	<p>Ethernet TCP/IP 10/100.</p> <p>Device can act as a loop controller (two loop ports).</p>




I128		128 + 1	<p>http://www.ptcusa.com/products/22 Measurement range 0.5 pA to 600 nA (128 channels). 0.1 nA to 100 μA bipolar (1 channel). Built-in bias supply option with loopback validation, options up to 2 kV. Charge integrator design (128 channels) and switchable I-V converter or gated integrator design (1 channel). Built-in digitization, calibration source, trigger input and trigger passthrough. Pneumatic actuator control. General purpose I/O port (2 AO, 4 AI, 4 DO, 4 DI). Process control relays. Fiber optic process control outputs.</p> <p>Charge readout of large position-sensing ionization chambers, diode arrays, scintillators, wire arrays, secondary electron detectors. Control of dose delivery in proton therapy.</p>	<p>Ethernet TCP/IP 10/100.</p> <p>Device can act as a loop controller (two loop ports).</p>
I128S		128	<p>http://www.ptcusa.com/products/49 Measurement range 0.5 pA to +600 nA. Built-in bias supply option with loopback validation, options up to 2 kV. Charge integrator design. Built-in digitization. Calibration source, trigger input.</p> <p>Charge readout, particularly low current, of large position-sensing ionization chambers, diode arrays, Faraday collector arrays, scintillators, wire arrays, secondary electron detectors.</p>	<p>Ethernet TCP/IP 10/100.</p>


Current measurement

F100	 <p>The image shows a small, rectangular, black and blue electronic device labeled 'F-100' and 'Pyramid'. It has several ports on the front panel, including a BNC connector and a D-sub connector.</p>	<p>1</p> <p>http://www.ptcusa.com/products/8</p> <p>Measurement range 100 pA to 10 mA bipolar. Option up to 200 mA. Built-in bias supply options up to 2 kV. Multi-range I-V converter design. Built-in digitization. Calibration current sources with external loopback. Pneumatic actuator control. Trigger input.</p> <p>Faraday cup current readout.</p>	<p>RS232 ASCII and binary direct to PC.</p> <p>USB direct to PC.</p> <p>Fiber-optic binary to loop controller then Ethernet to PC.</p>
F460	 <p>The image shows a larger, rectangular, black and blue electronic device labeled 'F-460' and '4-Channel Current Monitor' and 'Pyramid'. It has multiple ports on the front panel, including BNC connectors and a D-sub connector.</p>	<p>4</p> <p>http://www.ptcusa.com/products/15</p> <p>Measurement range 100 pA to 1 mA bipolar. Built-in bias supply options up to 3 kV. Multi-range I-V converter design, range can be selected individually for each channel. Monitor outputs (VFC emulation). Built-in digitization. Calibration current source. Servo control option.</p> <p>Current readout of diode, secondary electron detectors, ionization chambers.</p>	<p>Ethernet TCP/IP 10/100.</p> <p>Device can act as a loop controller (one loop port).</p> <p>Fiber-optic binary to loop controller then Ethernet to PC.</p> <p>RS232/485.</p>



F3200E		<p>32 http://www.ptcusa.com/products/16</p> <p>Measurement range 500 pA to 10 mA bipolar. Built-in bias supply options up to 2 kV with loopback validation.</p> <p>Multi-range I-V converter design. Monitor outputs (VFC emulation). Built-in fast digitization. Calibration current sources. Trigger input and trigger passthrough. Pneumatic actuator control. General purpose I/O port (3 AO, 4 AI, 4 DO, 4 DI). Fiber optic process control outputs.</p> <p>Fast readout of Faraday cup arrays, wire arrays. Features to support scanned beam systems.</p>	<p>Ethernet TCP/IP 10/100.</p> <p>Device can act as a loop controller (two loop ports).</p>
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Pulse counting and pulse height analysis




<i>Product</i>	<i>Image</i>	<i>Chan</i>	<i>Features & applications</i>	<i>Communications</i>
C400		4	<p>http://www.ptcusa.com/products/23</p> <p>Multichannel pulse processing and detector control. Pulse counting range 0 to >50 MHz. Pulse pair resolution 10 nsec. Independent signal input, HV bias options up to 2 kV, pre-amp power, test pulse and monitor output for each channel. Trigger input and passthrough. Test pulser outputs. Monitor outputs. Quadrature encoder input.</p> <p>Pulse counting detector applications, diffraction experiments, fast radiation monitoring systems.</p>	<p>Ethernet TCP/IP 10/100.</p> <p>Device can act as a loop controller (one loop port).</p> <p>Fiber-optic binary to loop controller then Ethernet to PC.</p> <p>RS232/485.</p>
CP10A		1	<p>http://www.ptcusa.com/products/24</p> <p>Fast preamplifier, very compact, DC-coupled, DC to 10 MHz BW, +30 dB into 50 ohms.</p> <p>Signal conditioning for high speed scintillation detectors (LaCl3, LaBr3, plastic scintillators).</p>	Connection to C400
CP10B		1	<p>http://www.ptcusa.com/products/24</p> <p>Fast preamplifier, very compact, DC-coupled, DC to 200 MHz BW, +30 dB into 50 ohms.</p> <p>Signal conditioning for very high speed detectors (channel electron multipliers, channel plates, plastic scintillators).</p>	Connection to C400

CR10		1	<p>http://www.ptcusa.com/products/42</p> <p>Integrated charge-sensitive pre-amplifier and Gaussian shaping amplifier. Conversion gain and shaping time constant options. Baseline restoration option. Detector bias input. Test pulse input. Able to drive 50 ohm loads.</p> <p>Signal conditioning for diode detectors, scintillation detectors, proportional counters. Pulse height analysis applications.</p>	<p>Connection to C400 or to third party multi-channel analyser.</p>
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Magnetic field measurement


<i>Product</i>	<i>Image</i>	<i>Chan</i>	<i>Features</i>	<i>Communications</i>
H20		2	<p>http://www.ptcusa.com/products/26 High-precision Hall sensor (MFP-30) and dual channel control unit (H20) system, monitor outputs, field servo option.</p> <p>DC and AC magnetic field measurement up to +/- 2.5 tesla. Beamline electromagnet monitoring and control, scan magnet monitoring and control, particle energy spectrometers.</p>	Fiber-optic binary to loop controller then Ethernet to PC.
H01		1	<p>Fast, high precision analog electronics, alternative interface for the MFP-30 probe.</p> <p>AC field measurements, readout of MFP-30 Hall probe to voltmeters, oscilloscopes, third party ADCs.</p>	Analog voltage output to fast voltage measurement device.

General-purpose I/O




Product	Type	Chan	Features	Communications
M10		2 AI, 2 AO, 4 DI, 4 DO	http://www.ptcusa.com/products/5 Compact high-performance general purpose I/O unit with analog voltage and digital channels. Differential analog inputs, low-transition glitch analog outputs, built-in selectable slew rate limiting. Power supply control and monitoring. General purpose I/O in noisy environments.	Fiber-optic binary to loop controller then Ethernet to PC.
M40		8 AI, 8 AO 8 DI, 8 DO	http://www.ptcusa.com/products/14 Compact high-density, high-performance general purpose I/O unit with analog voltage and digital channels. Low-transition glitch analog outputs. Power supply control and monitoring. General purpose I/O in noisy environments.	Fiber-optic binary to loop controller then Ethernet to PC.
N2400		24	http://www.ptcusa.com/products/6 Multichannel pneumatic actuator controller for 24 VDC solenoids. Front-panel switches and remote control, opto-coupled limit switch readback. Large beamline system diagnostics. Insertable BPM and Faraday cup actuation.	RS232 ASCII and binary direct to PC. USB direct to PC. Fiber-optic binary to loop controller then Ethernet to PC.


Fiber optic loop control (real-time controllers)

<i>Product</i>	<i>Image</i>	<i>Ports</i>	<i>Features</i>	<i>Communications</i>
A360		2	<p>http://www.ptcusa.com/products/12 Two fiber-optic loop control ports. Ability to run process control scripts. 24 V power passthrough. Static and DHCP addressing.</p> <p>Integration of medium-sized systems (up to thirty devices maximum). Connecting Pyramid fiber optic communication devices to host computers and to EPICS.</p>	<p>Ethernet (UDP, TCP/IP)</p> <p>Fiber optic connections to slave devices.</p>
A560		10	<p>http://www.ptcusa.com/products/13 Ten fiber-optic loop control ports. Ability to run process control scripts. Static and DHCP addressing. Process control relays and</p> <p>Integration of medium-sized and large systems (up to 150 devices maximum). Control of particle therapy dose delivery (together with I128 electrometers and peripheral devices). Interlock systems. Connecting Pyramid fiber optic communication devices to host computers and to EPICS.</p>	<p>Ethernet (UDP, TCP/IP)</p> <p>Fiber optic connections to slave devices and fiber optic control lines.</p>

A500		5	<p>http://www.ptcusa.com/products/3</p> <p>Five fiber-optic loop control ports. Static addressing. Gate and gate-counter options (ten counters). Option for ten loop control ports. Compatible with G1 and G2 software systems.</p> <p>Integration of medium-sized and large systems (up to 150 devices maximum with ten loop ports). Connecting Pyramid fiber optic communication devices to host computers and to EPICS. Trigger distribution via fiber optics (gate option). Fast pulse counting (gate-counter option)</p>	Ethernet (UDP)
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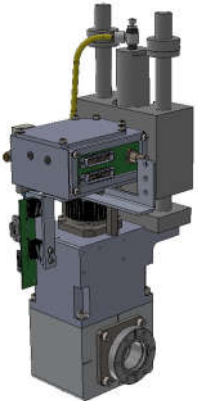


Accessories



Product	Image	Chan	Features	Communications
HVI-4		4	<p>http://www.ptcusa.com/products/10 High-reliability hardware-only monitoring of HV levels up to 3 kV, series or “snoop” connection to HV. Independent comparator and safety-rated interlock relay on each channel.</p> <p>Validation of bias voltage applied to safety-critical detectors.</p>	Monitor output port (suitable for M40).
X14		1 in, 4 out	<p>http://www.ptcusa.com/products/28 Low-latency fiber optic trigger fanout.</p> <p>Trigger distribution in noisy environments.</p>	n/a
X22		1 + 1	<p>http://www.ptcusa.com/products/29 Fiber optic to TTL and TTL to fiber optic conversion. Switchable invert on both channels.</p> <p>Digital signal distribution in noisy environments and across high voltage barriers.</p>	n/a

PD-8		8	http://www.ptcusa.com/products/27 Eight individually fused 24 V DC outputs. Multichannel power supply for Pyramid electronics.	n/a
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Product Range – Sensors, Diagnostics and Accessories

Selected beam diagnostics and accessories for proton therapy

<i>Product</i>	<i>Image</i>	<i>Readouts</i>	<i>Features</i>
BPM16-38		16 x 16 strips	<p>http://www.ptcusa.com/products/1 Position-sensing ionization chamber mounted on a pneumatic actuator for use in a vacuum beamline. Choice of mounting flanges.</p> <p>Beam transport setup and tuning in proton beamlines.</p>
BC-75		Copper beam stop	<p>http://www.ptcusa.com/products/36 In-air beam stop / Faraday collector for proton beams. No vacuum or bias voltage required.</p> <p>Beam current measurement of proton beams in air, 30 to 250 MeV.</p>
MLFC-128		128 readout plates	<p>http://www.ptcusa.com/products/35 In-air range verifier (energy verifier) for proton beams. No vacuum or bias voltage required. Versions for 125 MeV maximum energy and 250 MeV maximum energy.</p> <p>Beam energy verification of proton beams in air, 30 to 250 MeV.</p>

IC256-45		256 x 256 strips	<p>http://www.ptcusa.com/products/46</p> <p>Large area, high spatial resolution isocentre diagnostic ionization chamber. Sensing area 45 cm by 45 cm sufficient to cover the largest scan field in a single setup. Optical alignment features. Choice of electronic readout options.</p> <p>Beam spot position calibration and quality assurance on scanned particle beam therapy systems.</p>
PX-2-TS		2 x 120 pixels	<p>http://www.ptcusa.com/products/33</p> <p>Pair of PX-2 pixelated ionization chambers arranged in telescope configuration. Application software provides trajectory, divergence and beam shape information.</p> <p>Beam trajectory validation and quality assurance at isocentre on scanned particle beam therapy systems.</p>
VWIN		n/a	<p>http://www.ptcusa.com/products/43</p> <p>Vacuum windows with choice of window material and flange types.</p> <p>Bring high energy (30 to 330 MeV) proton beams from a vacuum beamline into air.</p>