

## Ionization Chamber Controller with Integrated HV Supply



**Features**

- Dynamic range <1 pA to 200  $\mu$ A
- Integrated digitization and filtering
- Fiber-optic, RS-232 and RS-485 interfaces.
- Integrated calibration test source
- Full control provided of integration modes
- External trigger capability
- Analog monitor output with linear and log modes.
- Frequency monitor output (VFC).
- Optional 3 kV high voltage output for ionization chamber biasing.

|                     |  |
|---------------------|--|
| <b>Applications</b> | <ul style="list-style-type: none"> <li>• Ionization chamber readout</li> <li>• Low current and charge measurement</li> </ul> |
| <b>Options</b>      | <ul style="list-style-type: none"> <li>• Auxiliary HV output 200, 500, 1000, 2000, 3000V, positive or negative</li> </ul>    |

**Specifications**

|                       |  |
|-----------------------|--|
| Operating principle   | Gated integrator (charge integrating amplifier)  |
| Integration capacitor | Dual, software selectable. Default values 100 pF and 3300 pF.  |
| Input noise           | < 200 fA rms unloaded.<br>(1 second integration, 10 pF capacitor at $\leq$ 25 C ambient)                                       |
| Input offset          | < 10 pA , 15 to 25 C, < 3 pA typical. Offset can be removed by zero subtraction.   |
| Input impedance       | < 3 kohm   |
| Input protection      | Back to back fast diodes, spark gap  |
| Stability             | Output drift < 200 fA / hour at 25 +/- 1 C ambient after stabilization   |
| External accuracy     | Better than 0.5% of full scale in use, integration time 500 $\mu$ sec to 1 sec, after calibration with built-in current source |



**Specifications (continued)**

|                                  |  |
|----------------------------------|--|
| Pre-defined current ranges       | 1 nA, 8 nA, 10 nA, 100 nA, 1 $\mu$ A, 10 $\mu$ A, 100 $\mu$ A, 200 $\mu$ A   |
| Integration time                 | User selectable, 100 $\mu$ sec to 10 sec.  |
| External gate input              | TTL 10 kohm impedance  |
| Trigger modes                    | Internal (autorun), external.  |
| Digitization                     | 16 bit bipolar over +/- 10 V integrator output range   |
| Averaging modes                  | Multiple conversions per integration; multiple integrations per reading to increase digital resolution up to 20 bits.  |
| Auxiliary HV PSU                 | (Factory option) 0 to 3000V programmable (polarity and maximum voltage factory selectable), 1 watt max at full voltage and current. Noise and ripple < 0.01%.  |
| Power input                      | +24V (+/- 2V) DC, 300mA typ, 500mA max.  |
| Controls                         | Two rotary switches for loop address and comms mode/ baud rate.  |
| Displays                         | Six status LEDs (power, comms mode, device status).<br>"HV on" LED.  |
| Case material                    | Stainless steel sheet  |
| Weight                           | 0.7 kg (1.5 lb).   |
| Operating environment            | 10 to 35C (15 to 25 C recommended to reduce drift and offset) , < 70% humidity, non-condensing, vibration < 0.1g all axes (1 to 100Hz)<br>Vibration must be as low as possible to measure at the lower limit of the dynamic range. |
| Shipping and storage environment | -10 to 50C, < 80% humidity, non-condensing, vibration < 2g all axes, 1 to 100Hz  |

**Interfacing**

|               |  |
|---------------|--|
| Interfaces    | RS-232 or RS-485, 8-bit ASCII. Selectable baud rate up to 115 kbps. The electrical interface can be set to be RS-232 levels, or full-duplex differential RS-485. |
|               | Fiber-optic loop, 10 Mbit/sec serial, 9-bit asynchronous binary. Ethernet connection to host through A300 or A500 loop controllers.                              |
| Host computer | ASCII communications based on SCPI.<br>Diagnostic host program supplied for Microsoft® Windows.<br>IG2 interface layer to EPICS .                                |



**Monitor outputs**

|             |  |
|-------------|--|
| Number      | One, analog voltage (linear or logarithmic scaling)<br>One, frequency  |
| Signal type | Analog voltage +/- 10 V into 10 kohm.<br>Frequency 0 to 1 MHz TTL into 50 ohm.                               |
| Mapping     | Signals map the selected nominal full scale current range.<br>Mappings can be scaled under software control. |

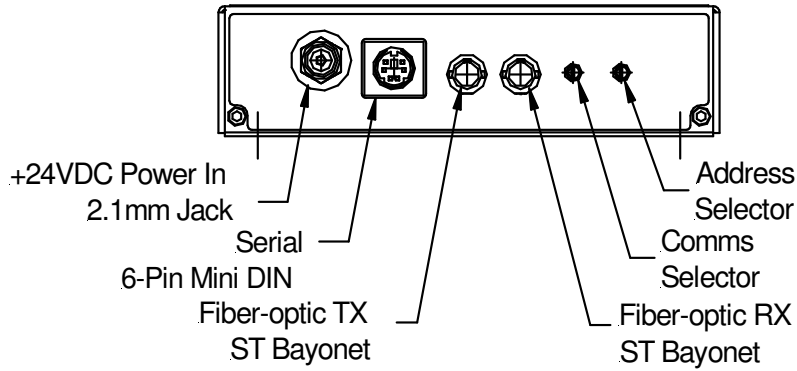
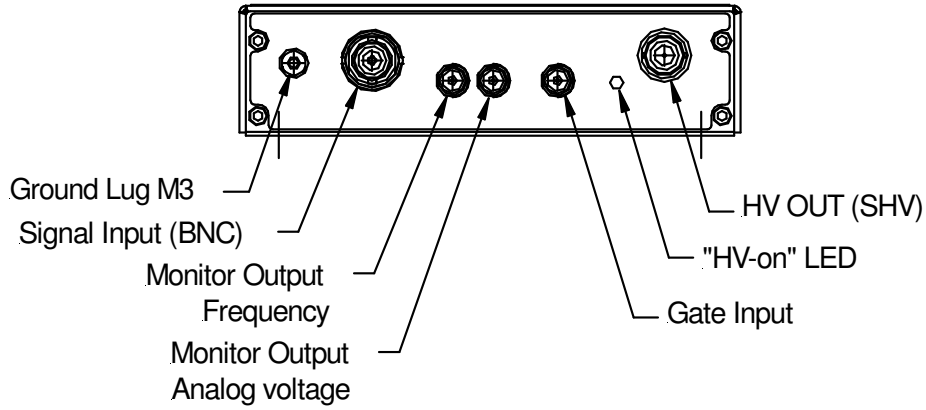
**Connectors**

|                  |   |   |                 |   |     |   |                 |   |            |   |     |   |            |
|------------------|---|---|-----------------|---|-----|---|-----------------|---|------------|---|-----|---|------------|
| Signal input     | BNC jack.   |   |                 |   |     |   |                 |   |            |   |     |   |            |
| HV out           | SHV   |   |                 |   |     |   |                 |   |            |   |     |   |            |
| External gate in | Lemo coax size 00   |   |                 |   |     |   |                 |   |            |   |     |   |            |
| Monitor outputs  | Lemo coax size 00 for analog voltage<br>Lemo coax size 00 for frequency (TTL levels)  |   |                 |   |     |   |                 |   |            |   |     |   |            |
| RS-232 / RS485   | Six pin mini-DIN ("PS/2")<br><table border="1" data-bbox="553 1041 1307 1182"><tr><td>1</td><td>Tx / RS-485 Tx-</td><td>4</td><td>n/c</td></tr><tr><td>2</td><td>Rx / RS-485 Rx+</td><td>5</td><td>RS-485 Tx+</td></tr><tr><td>3</td><td>Gnd</td><td>6</td><td>RS-485 Rx-</td></tr></table> | 1 | Tx / RS-485 Tx- | 4 | n/c | 2 | Rx / RS-485 Rx+ | 5 | RS-485 Tx+ | 3 | Gnd | 6 | RS-485 Rx- |
| 1                | Tx / RS-485 Tx-   | 4 | n/c             |   |     |   |                 |   |            |   |     |   |            |
| 2                | Rx / RS-485 Rx+   | 5 | RS-485 Tx+      |   |     |   |                 |   |            |   |     |   |            |
| 3                | Gnd   | 6 | RS-485 Rx-      |   |     |   |                 |   |            |   |     |   |            |
| Fiber optics     | TX & RX ST bayonet, suitable for 1mm plastic fiber or 200 µm HCS fiber.   |   |                 |   |     |   |                 |   |            |   |     |   |            |
| Power in         | 2.1mm threaded jack. Mates with Switchcraft S761K or equivalent.  |   |                 |   |     |   |                 |   |            |   |     |   |            |
| Ground           | M3 threaded stud  |   |                 |   |     |   |                 |   |            |   |     |   |            |

**Ordering information**

|  |   |
|--|---|
| IC101                                    | IC101 electrometer with user manuals, PSI Diagnostic host software for Windows PCs, calibration data. |
| -XP30/20/10/05/02<br>(-XN30/20/10/05/02) | Add auxiliary HV supply positive 3000/2000/1000/500/200 V<br>(negative 3000/2000/1000/500/200 V)      |





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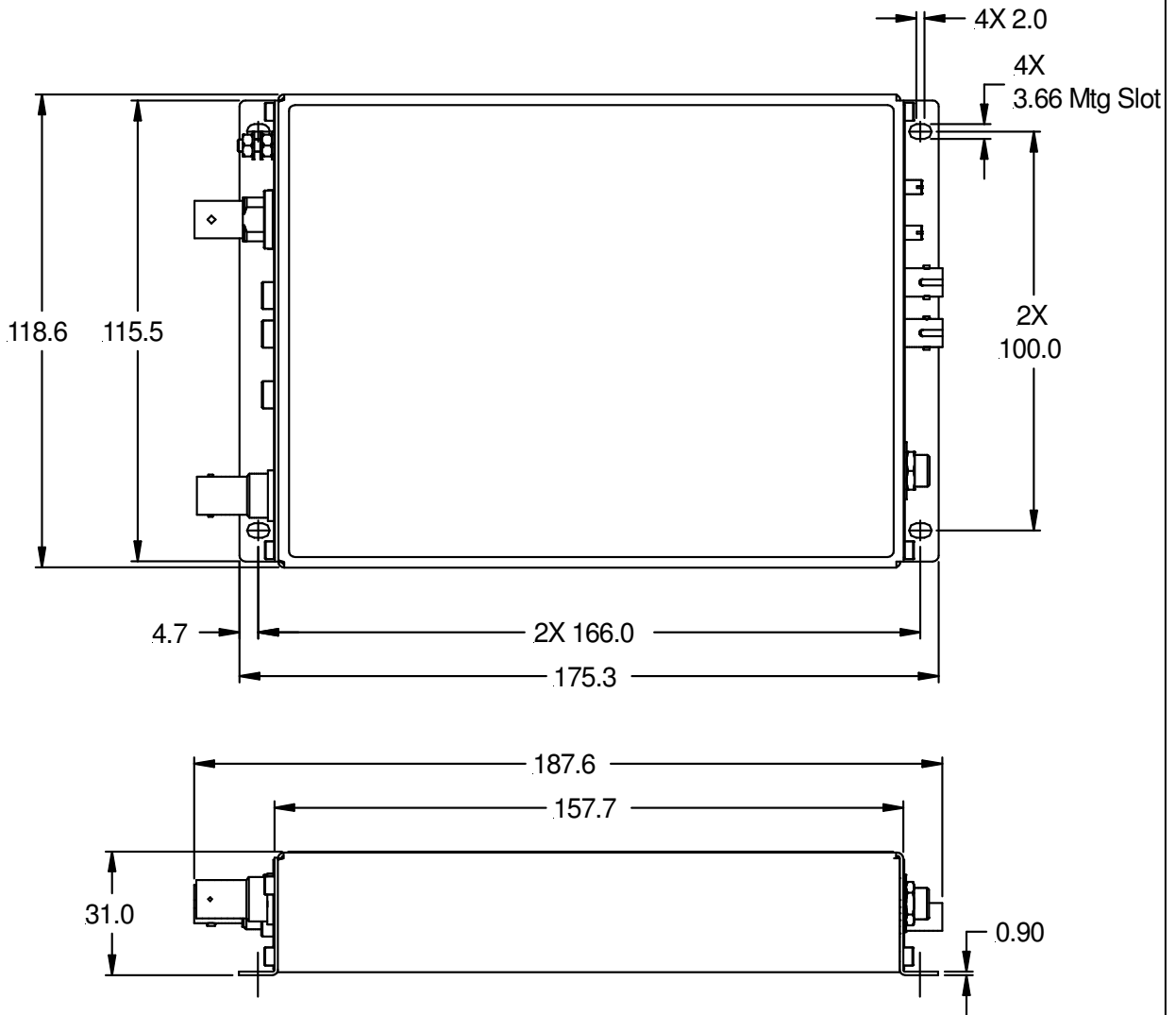
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IC101\_DS\_141016





Dims mm

