



AM-GP100 Area Monitors

Features

- Fully tested and calibrated, ready to deploy package ideal for demanding area monitoring applications
- Configurable design enhances operational flexibility and minimizes cost of deployment and retasking of monitors
- Virtual Channel™ capability allows tracking of trends or auxiliary conditions in addition to normal channel monitoring
- Enhanced source check functionality for verification of long-term performance and stability of GP100C2/ GP100C2S check-source enabled detectors
- CANBERRA's unique time-to-count technique eliminates dead time and saturation effects of conventional GM detectors
- GP100 series gamma probes retain probe information in non-volatile memory for seamless interchangeability without the need for field recalibration
- Integrated detachable termination panel simplifies installation and maintenance
- Powerful self-test functionality continuously confirms reliable operation and supports proactive maintenance
- Bright, easy to read color touch screen display with intuitive user interface for simplified operation in harsh environments



Description

CANBERRA's SafePoint AM-GP100 Area Monitor is a technological integration of CANBERRA's powerful iR7040 intelligent ratemeter, proven time-to-count GP100 Series Gamma Probe, with or without an integrated check source, and interconnecting cable in a fully calibrated, tested and ready to deploy package for your demanding radiation monitoring application. The configurable design of the AM-GP100 eliminates the need for costly customization and minimizes maintenance requirements, thus saving time, cost and radiation exposure for users. This versatile package is suitable for use in Nuclear Power Plants, Research Reactors and other facilities that can benefit from advanced radiation monitoring.

The AM-GP100 is available in conventional and SI configurations, incorporating CANBERRA's unique time-to-count GP100 series detectors. The GP100C2/GP100C2S Gamma detector incorporates an integrated (nominal) 3.7 kBq (0.1 µCi) ⁹⁰Sr check source to allow performance testing of the instrument in operation without removing it from service. All span an operating range of 0.1 µSv/h to 100 Sv/h (10 µR/h to 10000 R/h).

The AM-GP100 utilizes the iR7040 advanced digital ratemeter. The Area Monitor comes standard with a single GP100 series Gamma Probe, but is designed to power and control up to four CANBERRA radiation detectors of any style or application. The iR7040 will support any reporting requirement and radiation or activity unit of measure. Its large industrial color touch-screen interface is easily readable under all conditions. An integrated termination panel makes installation and servicing quick and simple. All data is captured and stored in a 2 GB flash memory providing a complete history of all parameters, readings, alarms and functions, source check readings and calibrations. System reliability is enhanced through the iR7040's rigorous self test functionality.

- **Configuration not customization!** The iR7040 set-up is performed through the on-board menu or with a PC-based utility. One hardware configuration accommodates all detectors. Configurations, once established, may be saved to a database for back-up and then used to rapidly configure a replacement should that need arise.
- **Virtual Channels.** A feature unique to the CANBERRA iR series ratemeters is its virtual channel capability. The ratemeter provides up to 32 user configurable channels that can be used to marry any or all of the four probe inputs and external measurement inputs to monitor and control parameters and processes normally done through an attached control system.
- **Termination Panel.** The iR7040 incorporates an integrated, deportable termination panel on the rear of the ratemeter. This unique feature speeds installation and any subsequent maintenance.



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- Unparalleled measurement and data integrity via redundant internal processing and error checking.
- Color touch screen display, provides bright and easy to read display of ratemeter data. The touch screen interface provides a fluid, intuitive interaction without the need for another laptop to interface or the tedium of scrolling through menus.
- Enhanced Calibration Capabilities simplify calibration routines, reduce error-likely situations, improve traceability and maximize equipment availability.
- See iR7040 Intelligent Ratemeter specification sheet for further details.

AM-GP100 Area Monitor Specifications

RANGE

- Dependant on probe(s) attached.
- See Figure 1 Geiger Mueller Detectors – GP Series.

MICROPROCESSORS

- One Embedded PC (EPC) running Windows® CE, display operations.
- One Control Processor, receives and processes probe and analog data from probe processor.
- One Probe Processor, processes probe inputs.

CHANNELS

- Four external detector inputs.
- Thirty-two virtual channels, user configurable incorporating any ratemeter input, external input or algorithm.

USER INPUT/OUTPUT

- User input and communications served by:
 - Direct input from the touch sensitive screen.
 - Via USB, from a laptop computer or keyboard.
 - For Ratemeters integrated into a system, from the system.

CONTROLS

- Easily configured with key switch security.
- Key switch selects ratemeter modes, off/on, remote or maintenance.
- Installed Pulser for test (manual or automatic).

INPUT/OUTPUT

INPUTS

- Optionally up to four detectors (any of CANBERRA's line of RMS detectors including, GM detector, ion chamber, scintillation, neutron, gas proportional and specialty), each with:
 - TTL/current signal.
 - Analog 0-10 V, 10 bit resolution.
 - RS-422 serial.
 - +5 V, ±15 V and 24 V dc power outputs.
 - Switched 24 V dc (check source control).
- Each channel uses a 12-bit DAC capable of high resolution and good linearity.

- Five analog, fully isolated: 4-20 mA or 0-10 V, 12 bit resolution. (Flow measurement, temperature, etc.)
- Eighteen digital (TTL logic) (flow switches, sample changers, etc.).

OUTPUTS

- TEN DIGITAL – TTL, 0-5 V. (Flow control, sample changers, etc.).
- SIX ISOLATED ANALOG – 4-20 mA or 0-10 V. (Data reporting, flow control, temperature, etc.).
- Eight safety relays. One for faults, seven for alarms, test, etc.
- Each safety relay has four contacts that mechanically move together with one monitored to detect failure. Remaining three contacts consist of two normally open (form A) and one normally closed (form B). Form C function is met using one Form A and one Form B. Relays may be configured to be normally energized or deenergized.

COMMUNICATIONS

- One Ethernet (10Base-T).
- Three RS-485 serial ports, two isolated.
- Two RS-232 serial.

DATA HANDLING

- Two External USB ports (for exporting log data, importing and exporting system configuration and for internal firmware updates).
- Two GB Flash Memory (histogram).

DISPLAYS AND ALARMS

- Large, 21 cm (8.25 in.), diagonal industrial, hardened, color touch-screen display.
- Bright, tricolor LED.
- Front panel embedded audible alarm annunciator.
- Tricolor light tower for optimum visibility and indication of status.

POWER

- AC (100 to 240 V, 50 to 60 Hz at 100 VA) or DC, 24 V dc (±10% at 120 W).

PHYSICAL

- CONFIGURATION – wall-mounted.

- CONSTRUCTION – stainless steel, IP65 enclosure, NEMA4X.

- Termination panel for connecting plant wiring interface is located in the rear of the ratemeter in a separate hinged, IP65 enclosure to conserve wall space. Opening the termination panel does not open the main Ratemeter case, which has a separate hinged and sealed door.



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- OPERATING TEMPERATURE RANGE – 0 °C to 60 °C (32 °F to 140 °F).
- SIZE – 320 mm high x 275 mm wide x 250 mm deep (13 x 11 x 10 in.); light tower adds 263 mm (10.4 in.) height.
- WEIGHT – 10 kg (22 lb).

Detector Options

Each GP100 series detector incorporates a pair of rugged halogen-quenched GM detectors to span the 0.1 µSv/h to 100 Sv/h (10 µR/h to 10000 R/h) wide range gamma radiation measurement requirements of the AM-GP100. The GM detectors utilize the unique CANBERRA time-to-count technique which removes many of the limitations associated with the use of GM detectors operated in a conventional mode. The GP Series of detectors are SMART probes, which retain probe information in non-volatile memory. When calibrated, data such as probe calibration constants and identifying information are stored and verified in the EEPROM memory in the probe circuitry. This arrangement allows the CANBERRA GP Series detectors to be interchangeable. The GP100 Series of detectors are “maintenance free” in design and require no routine servicing or preventive maintenance. The GP100C2 and GP100C2S detectors have an internally mounted (nominal) 3.7 kBq (0.1 µCi) ⁹⁰Sr Check Source Assembly.

SPECIFICATIONS

(Applicable to GP100, GP100SI, GP100C2, GP100C2S)

- DETECTOR TYPE – (2 ea) Halogen Quenched GM Detectors.
- DYNAMIC RANGE – 9 decades; 0.1 µSv/h to 100 Sv/h (10 µR/h to 10000 R/h).

- BACKGROUND – less than 5 CPM.
- ENERGY RANGE – ±20% uniform, 80 keV to 3.0 MeV.
- Responsive to energy above 50 keV.
- LINEARITY – ±10%.
- OPERATING TEMPERATURE RANGE – -30 °C to +50 °C (-22 °F to +122 °F).
- OPERATING HUMIDITY – 0-95% non-condensing.
- Meets the environmental conditions specified by EN 61010, Installation Category I, Pollution Degree 2.
- HOUSING – Moisture Proof Aluminum.

The **GP100C2** and **GP100C2S** detectors have an internally mounted (nominal) 3.7 kBq (0.1 µCi) ⁹⁰Sr Check Source Assembly.

This assembly is solenoid actuated and is controlled from the check source function of the iR7040. It will provide an input (nominally) between 6 and 10 mR/h (60 to 100 µSv/h) depending on the age of the source.

QUALITY

AM-GP100:

- SEISMIC – Qualification in accordance with IEEE Std 344-2004, IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations.
- EMC – Tested to IEC 61326-1:2006.
- SAFETY – Tested to IEC 61010-1:2001 (Second Edition)/ EN 61010-1:2001.
- ISO 9001.
- 10CFR21.
- 10CFR50, Appendix “B”.
- IEEE-730.
- ANSI/ASME NQA-1, ANSI/ASME NQA-2, Part 2.7.
- CE.
- TUV SUD America is a listed NRTL.



Geiger Mueller Detectors – GP Series

Type/Characteristics	GP100	GP100SI	GP100C2	GP100C2S
Detector Sensitivities, Low Range	1800 CPM/mR/h	3 CPS/µSv/h	700 CPM/mR/h	1.16 CPS/µSv/h
Detector Sensitivities, High Range	4.2 CPM/mR/h	0.007 CPS/µSv/h	4.2 CPM/mR/h	0.007 CPS/µSv/h
Detector Dynamic, Low Range	10 µR/h	0.1 µSv/h	10 µR/h	0.1 µSv/h
Detector Dynamic, High Range	10 000 R/h	100 Sv/h	10 000 R/h	100 Sv/h
Weight kg (lb)	0.45 kg (1 lb)	0.45 kg (1 lb)	0.68 kg (1.5 lb)	0.68 kg (1.5 lb)
Size, W x H x L or L x Dia. (mm)	38 x 48 x 175 mm	40.64 x 40.64 x 152.4 mm	190.5 x 63.5 mm	190.5 x 63.5 mm
Size, W x H x L or L x Dia. (inch)	1.5 x 1.9 x 6.9 in.	1.6 x 1.6 x 6 in.	7.5 x 2.5 in. dia.	7.5 x 2.5 in. dia.
Operating Temp	-30 °C to +50 °C -22 °F to +122 °F	-30 °C to +50 °C -22 °F to +122 °F	-30 °C to +50 °C -22 °F to +122 °F	-30 °C to +50 °C -22 °F to +122 °F
Built-in Check Source Assembly	No	No	Yes	Yes

Figure 1.

AM-GP100 Area Monitors

MODELS

- **AM-GP100** – includes: iR7040 ratemeter, GP100 Gamma Probe, 6 ft/1.8 m probe to ratemeter cable, mounting bracket, NIST traceable calibration and manuals.
- **AM-GP100SI** – SI, version of AM-GP100, includes: iR7040 ratemeter, GP100SI Gamma Probe, 6 ft/1.8 m probe to ratemeter cable, mounting bracket, NIST traceable calibration and manuals.
- **AM-GP100C2** – includes: iR7040 ratemeter, GP100C2 Gamma Probe with (nominal) 3.7 kBq (0.1 μ Ci) ^{90}Sr check source, 6 ft/1.8 m probe to ratemeter cable, mounting bracket, NIST traceable calibration and manuals.
- **AM-GP100C2S** – SI, version of AM-GP100C, includes: iR7040 ratemeter, GP100C2S Gamma Probe with (nominal) 3.7 kBq ^{90}Sr check source, 6 ft/1.8 m probe to ratemeter cable, mounting bracket, NIST traceable calibration and manuals.

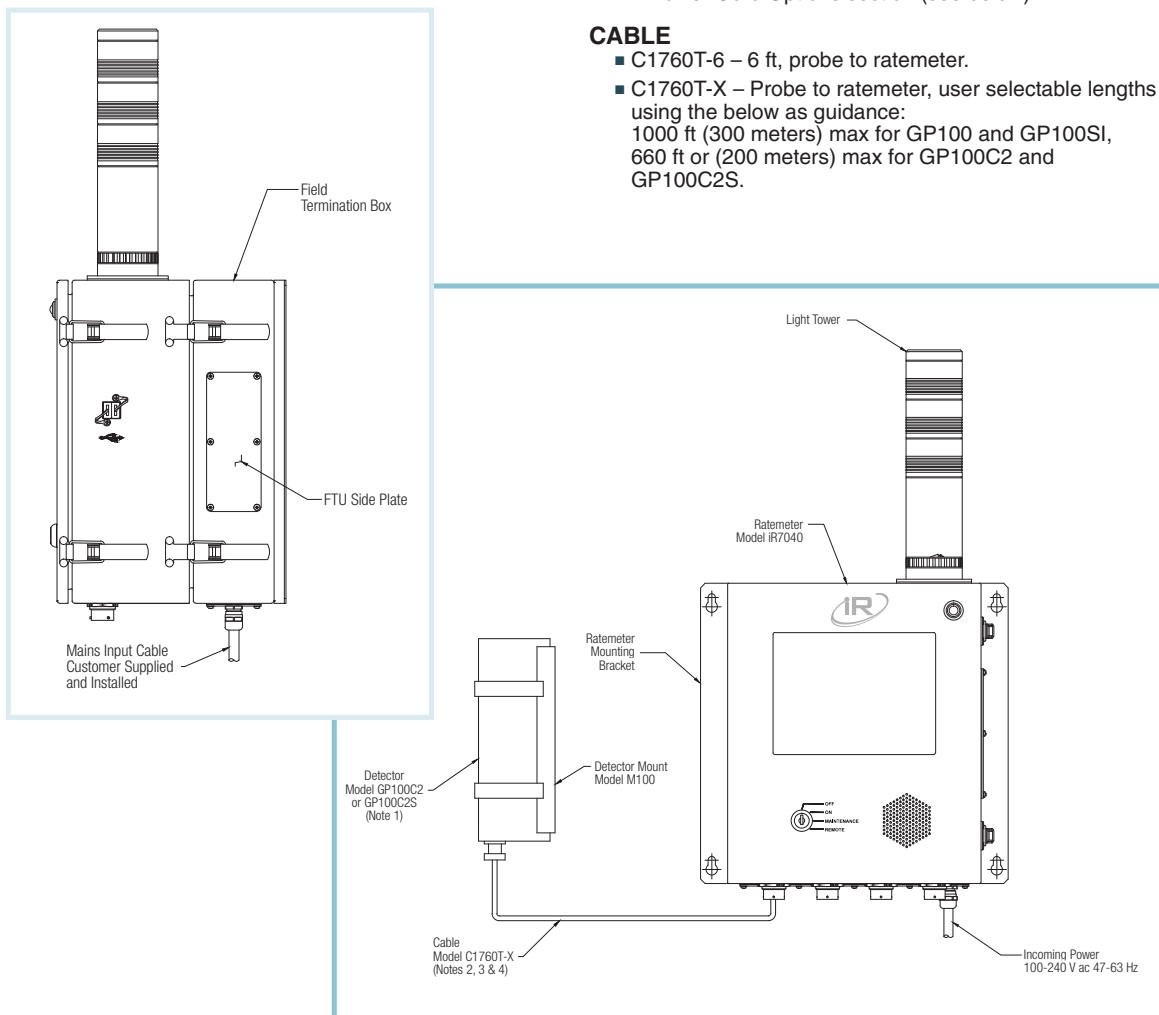
OPTIONS

Additional detectors (up to four total per iR7040)

- GP100 – GM Probe, Dual GM detector, Range: 10 $\mu\text{R/h}$ to 10000 R/h.
- GP100SI – GM Probe, Dual GM detector, SI, Range: 0.1 $\mu\text{Sv/h}$ to 100 Sv/h.
- GP100C2 – GM Probe, Dual GM detector, with (nominal) 0.1 μC Check Source, Range: 10 $\mu\text{R/h}$ to 10000 R/h.
- GP100C2S – GM Probe, Dual GM detector, SI, with (nominal) 3.7 kBq ^{90}Sr , Range: 0.1 $\mu\text{Sv/h}$ to 100 Sv/h.
- iR7040 Intelligent Ratemeter includes the ratemeter, wall mounting bracket and manual.
 - The ratemeter is not supplied with a power cord in its standard configuration. Instead, a gland is incorporated on the termination panel of the ratemeter for the user to route power.
 - If a power cord is desired it may be ordered by selecting the appropriate model number from the Power Cord Options section (see below).

CABLE

- C1760T-6 – 6 ft, probe to ratemeter.
- C1760T-X – Probe to ratemeter, user selectable lengths using the below as guidance: 1000 ft (300 meters) max for GP100 and GP100SI, 660 ft or (200 meters) max for GP100C2 and GP100C2S.



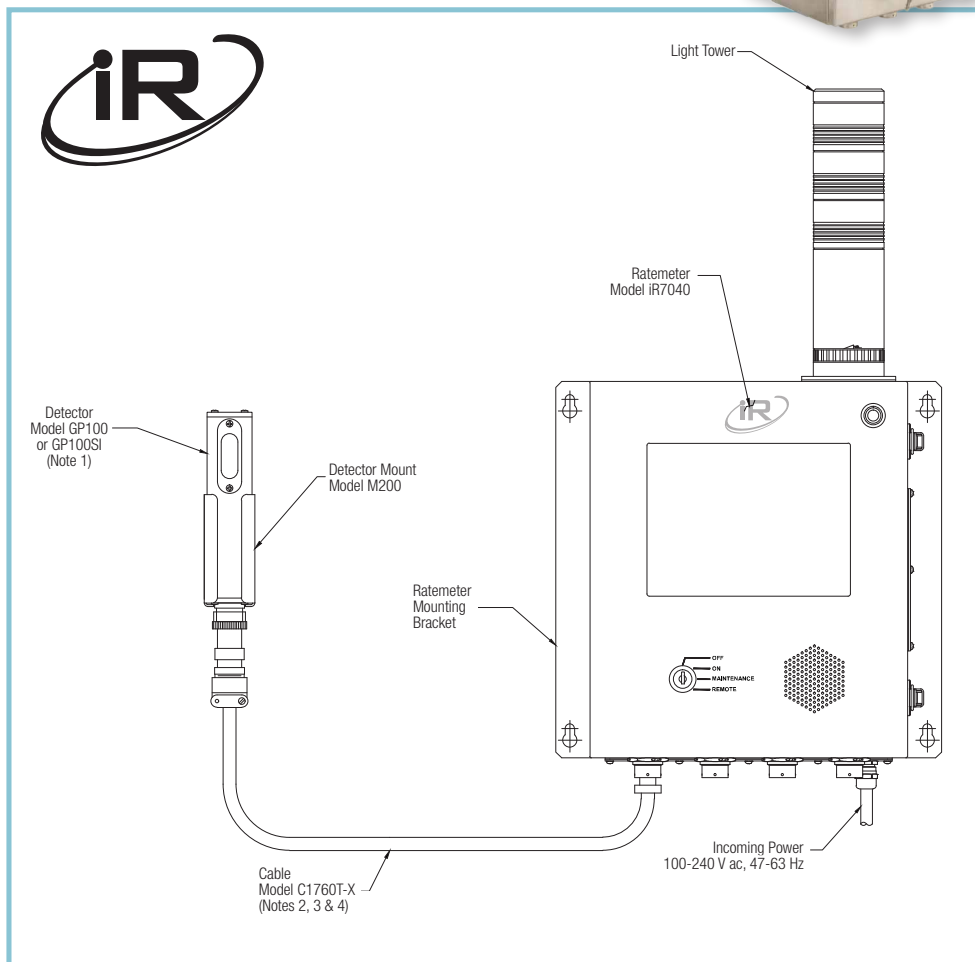
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OTHER

- M100 Probe Holder, Cylindrical GP100C2/GP100C2S.
- M200 Probe Holder, Rectangular GP100/GP100SI.
- IR-TPC – Termination Panel Cover.

POWER CORD OPTIONS

- IR-PCUS – Power cord, US Plug, 6 ft (1.8 m).
- IR-PCUK – Power cord, UK Plug, 6 ft (1.8 m).
- IR-PCEU – Power cord, European Plug, 6 ft (1.8 m).



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