



Features

- Ratemeter powers and controls up to four CANBERRA radiation detectors for thorough, cost-effective monitoring in all 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
- Integrated detachable termination panel simplifies installation and maintenance
- Powerful self-test functionality continuously confirms reliable operation and supports proactive maintenance
- Enhanced source check functionality for verification of long-term performance and stability of check-source enabled detectors
- Bright, easy to read color touch screen display with intuitive user interface for simplified operation in harsh environments



iR7040 Intelligent Ratemeter

Description

CANBERRA's SafePoint iR7040 intelligent, wall-mounted ratemeter is a digital ratemeter ideal for use in a variety of inplant area and process monitoring applications. The configurable and versatile design of the iR7040 eliminates the need for costly customization and minimizes maintenance requirements, thus saving time, expense and radiation exposure for users. The iR7040 can be configured to operate autonomously, or as part of an integrated monitoring system. This versatile unit is designed to power and control up to four CANBERRA radiation detectors of any style or application, making it suitable for use in Nuclear Power Plants, Research Reactors, Fuel Cycle Facilities and other facilities that can benefit from advanced radiation monitoring.

The ratemeter connects with inputs such as pressure, temperature, and flowrate used to generate corrected data such as total dose, activity concentration, filter activity loading, and activity discharge rates. The iR7040 will support any reporting requirement and radiation or activity unit of measure.

The iR7040 has been designed to simplify operation and maintenance for the user. Its large industrial color touch-screen interface is readable under adverse lighting conditions and provides the user with enhanced field functionality. The detachable termination panel of the iR7040 can be easily separated from the ratemeter for convenient interconnection to plant systems as well as quick and easy ratemeter exchange.

The iR7040 ratemeter logs all data; Alarms, Probe outputs, Probe parameters, conditioned outputs, source check responses, and out-of-parameter conditions to its internal histogram for plotting and enhanced performance monitoring. Performance and reliability are assured through the ratemeter's rigorous self test functionality.

The ratemeter serial number and manufacturing date are burned-in at the time of manufacture. All measurements and log data are tagged with it. This feature makes supporting the traceability of calibrations, testing, performance plotting, measurements and trending an automatic affair. Configuration management and Maintenance rule requirements become much easier when the iR7040 is used.

The iR Ratemeter supports an enhanced Source check functionality, allowing the user to manually or automatically perform source checks of attached probes and detectors with that capability. The source check results can be plotted for long term performance and stability verification. Individual tests can also be compared to the expected value to alarm on out of specification responses.



Model iR7040 wall-mount ratemeter

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The iR7040 also offers greatly simplified calibration routines and software/database tools. Access to Calibration statistics is readily available, and the system tracks calibration sources, activity (original and decay corrected to time of test). Automated Chi-Square functionality is also available.

Features

- **Configuration not customization!** The iR7040 operates with any CANBERRA radiation detector without the need for special firmware or hardware. Set-up is performed through the on-board menu or with a PC-based utility. One hardware configuration accommodates all detectors and applications, no special hardware, boards or jumpers are required simplifying maintenance, configuration management and minimizing the number of spare parts needed to be stocked. 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. Examples include:
 1. Monitoring the radiation doserates of the inlet and outlet of a clean-up filter or resin bed and comparing them to determine the decontamination factor (DF) in real time and set-up alarming conditions to warn of breakthrough or loss of clean-up effectiveness.
 2. Monitoring effluent discharge totals in real time and setting up a controlling function to insure regulatory limits are not reached.
 3. Monitoring post-shutdown reactor coolant clean-up to establish monitor effectiveness of the clean-up and the method in use (e.g., soluble vs. insoluble cobalt) to warn operators of any change, allowing the switch-over to a more effective method quickly to reduce overall clean-up time and the costs and radiation exposure incurred.



- **Termination Panel.** The iR7040 incorporates an integrated, de portable termination panel on the rear of the ratemeter. This unique feature speeds installation and any subsequent maintenance. When installing the iR7040, the ratemeter can be separated from the termination panel, allowing the termination panel to be installed in the desired location while the ratemeter and its associated probes can be stored safely and even configured, calibrated and tested concurrent to the termination panel's installation. This leaves an easy to access panel for wiring. When ready, the user just needs to hang the iR7040 on the termination panel and make-up a few fast connectors before turning the ratemeter on, and into full operation. This same feature can speed trouble shooting and repair should the need arise. The user can easily configure a replacement ratemeter with the previously stored configuration of the ratemeter to be replaced and then in a matter of minutes, swap the units and restore the channel(s) to operation. Trouble shooting and repair of the questionable ratemeter then can be done in the repair shop rather than in the field. A significant savings of time, radiation exposure and money!
- Flexible design supports any applications.
- 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.



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Specifications

RANGE

- Dependant on probe(s) attached.

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 configurations 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 Pulsar for test (manual or automatic).

ACTIVATES AND LOGS TESTS

- Internal or external check source.
- Scintillator LED test rate.
- Adjustable pulser.
- Adjusts regions of interest for MD series scintillators.

INPUT/OUTPUT

INPUTS

- 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. (Pump/purge/heat trace 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, 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; red, amber and green.
- Front panel embedded audible alarm annunciator with adjustable volume and local or remote silencing.
- Tricolor light tower for optimum visibility and indication of status; red, amber and green.

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.
- 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).

ENVIRONMENTAL

- OPERATING TEMPERATURE RANGE – 0 °C to 60 °C (32 °F to 140 °F).
- Meets the environmental conditions specified by EN 61010, Installation Category I, Pollution Degree 2.
- HUMIDITY – 95%, non-condensing.
- SEISMIC – Qualification in accordance with IEEE Std 344-2004, IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations.
- SAFETY – Tested to IEC 61010-1:2001 (Second Edition) /EN 61010-1:2001.
- EMC – Tested to IEC 61326-1:2006.

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QUALITY

iR series ratemeters are designed and manufactured under a quality system in compliance with the following standards and requirements:

- 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.
- IEC 60532
- IEC 61513, class 2 and 3

Optional versions available for safety-related, SIL2, safety category B.

ORDERING INFORMATION

- 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.

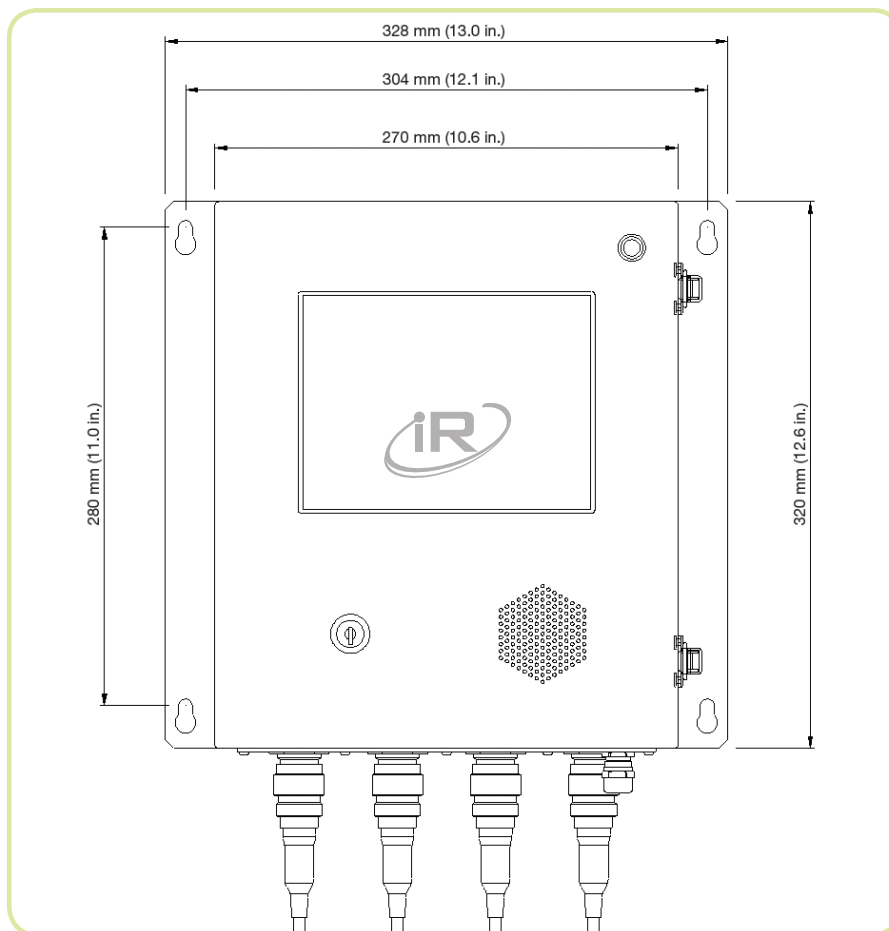
If a power cord is desired it may be ordered by selecting the appropriate model number from the power cord options listed below.

OPTIONS

- IR-TPC – Termination Panel Cover.

POWER CORD OPTIONS

- IR-PCUS – Power cord, US Plug, 5 ft (1.5 m).
- IR-PCUK – Power cord, UK Plug, 5 ft (1.5 m).
- IR-PCEU – Power cord, European Plug, 5 ft (1.5 m).



Dimensions shown in mm (inches).

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