CMS Gamma

Continuous gamma monitoring station

Key features

- Installed or transportable area gamma monitor (single or dual channel)
- Wide dynamic range, suitable for variety of applications
- Detector options: GM sensors, ionisation chambers and scintillation
- Full network capability

Overview

The CMS Gamma is a compact, mains-powered, continuous monitoring station for measurement of gamma dose rate, providing essential, reliable information to personnel. It is designed for building, area and process monitoring in nuclear facilities.

The versatile unit can be used in conjunction with the SIL Safeguard Monitor, providing interlock control at a Safety Integrity Level (SIL) 2 rating in hot areas such as fuel stores, caves, glove boxes, and cells as required.

Technical specifications

The CMS Gamma offers all the functionality of its predecessor the CMS-1LG with wide range capability providing measurements from ambient background up to 10 Sv/h (1000 rem/h).

The device is intended for installed applications but can be used with a transportable frame or trolley to provide temporary monitoring or to supplement permanently installed monitors during site maintenance or decommissioning procedures.

The only requirements of the CMS Gamma monitor are that its detector is suitably mounted and it is connected to mains power in the range 110 - 230 Vac.

Operation and security

The CMS gamma performs a brief self-test on power up, then starts continuous monitoring. All system parameters are password and key protected. They can be modified using the local keypad and display. All operating parameters can be read and updated via FTP using a personal computer. Alarm status, parameter settings, recent count and event log data can be read using a web browser, ensuring key personnel have 24-hour access to data.

Actions that can be passcode and key protected:

- Clear historic count data
- Clear event log
- Reset passcodes
- Modify passcodes
- Test/calibrate analogue I/O
- Test digital outputs

Dose rate indicators

The CMS Gamma provides two indications of dose rate. The backlit LCD display shows an analogue vertical graph indicating a percentage of the alarm level selected. A numerical indication of the dose rate and the current alarm level setting is also shown.

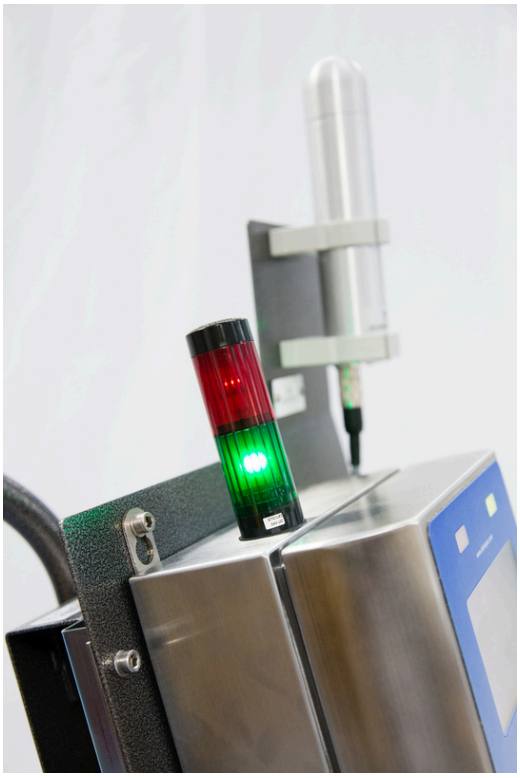
The display enables 16 rows of text to be visible at any one time when a user is changing parameters or viewing historical results.

When the unit is operating normally, a green beacon is constantly illuminated. During alarm conditions, a red beacon flashes. In addition, two LEDs located above the LCD display indicate normal operation or fault.

Alarms and annunciators

The CMS Gamma has four distinct alarms: three dose thresholds and a fail alarm. All are user settable via the display and keypad or ethernet connection.

Technical specifications



The ‘alert’ and ‘high’ alarms are triggered when the ambient radiation level exceeds thresholds. The ‘low’ failure alarm is triggered if radiation falls below this level. Its main purpose is to identify a detector failure.

Alarm annunciation is by means of the red beacon, which can be configured to flash or remain on constantly, or the sounder.

The user may suppress alarm annunciation for any of the activity alarms (this facility is passcode protected).

In the event of a sustained mains failure, dose rate measurement continues under the power of an internal battery for up to one hour.

Outputs and communications

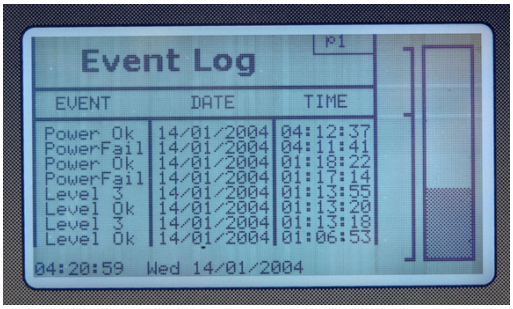
Connections to the unit are located on the underside of the instrument. The CMS Gamma enables the user to control external devices and to transmit data to local (or remote) locations via:

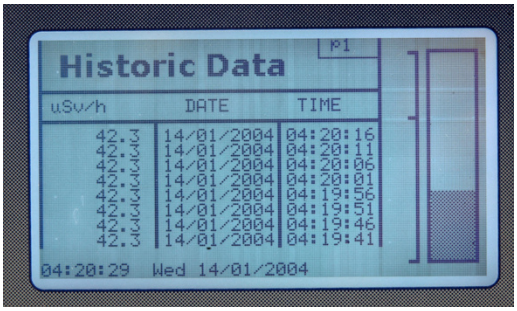
- Four relay outputs (alarm one, two, three and fail). Relays operate in the failsafe mode - they are energised during normal operation
- One RS-485 (or RS-232) serial port for communication with remote monitoring systems
- Ethernet

Safety integrity SIL applications

The CMS Gamma can be used in conjunction with Curtiss-Wright’s SIL Safeguard Monitor (SSM) for both interlock and process applications that require a high level of safety integrity. More information on the CMS Interlock SIL and the CMS Process SIL, both of which meet the specifications of IEC61508.

Technical specifications





Self-diagnostics

The CMS Gamma continuously self-monitors for faults, including:

- Detector failure
- Detector over range
- Alarm beacon failure
- Low battery voltage

The occurrence of any of these conditions will cause the green beacon to flash, with the fault type displayed on the LCD.

Calibration

The CMS Gamma can be calibrated using a suitable gamma source with a traceable dose rate. Curtiss-Wright can supply details of calibration sources on request.

Performance specifications

CMS Gamma performance specifications	
Standard GM detectors measurement range	• GM-1304 or GDI-1304: 0.1 mSv/h - 10 Sv/h (10 mrem/h - 1000 rem/h) • GM-1314 or GDI-1314:10 µSv/h - 3 Sv/h (1 mrem/h - 300 rem/h) • GM-1324 or GDI-1324: 0.3 µSv/h - 0.1 Sv/h (30 µrem/h - 10 rem/h) • GM-1202 or GDI-1202: 0.1 µSv/h - 40 mSv/h (10 µrem/h - 4 rem/h) • GM-1301 or GDI-1301: 0.1 mGy/h - 10 Gy/h (10 mrad/h - 1000 rad/h) • GM-1313 or GDI-1313: 10 µGy/h - 3 Gy/h (1 mrad/h - 300 rad/h) • GM-1321 or GDI-1321: 3 µGy/h - 0.1 Gy/h (300 µrad/h - 10 rad/h)
Detector interface	• Universal detector interface (UDI-1G) required with GM series detectors. Not used with GDI detectors. • Provides a high performance interface between detector and measurement system • The output stage is designed to drive long cables reliably • UDI - detector 10m (33 ft) • CMS - UDI 100m (328 ft) but with the inclusion of a separate external PSU distances greater than 1000m (3281fet) can be achieved
Physical characteristics	• 304 Stainless steel enclosure • Wall, trolley and transport frame • Designed for quick low cost installation with easy access
Dimensions and weight	• Height: 458mm (18") including LED beacon and cable connectors • Depth: 150mm (5.9") including sounder projection • Width: 200mm (7.9") • Weight: approx 7kg (15.4lb)

Performance specifications

CMS Gamma performance specifications	
Environmental protection	• Designed to meet IP54
Display	• Large LCD graphic display (114mm x 64mm, 4.49" x 2.52") with backlight • Fully sealed membrane keypad • Digital and analogue display • Large dose rate range • Key switch • Two layer status light column (red and green LED)
Data storage	• Non-volatile data capability for seven days count history at minimum five-minute data log intervals with historical review on LCD display • Non-volatile data capability for event history (last 100 events) • Non-volatile storage for operating parameters
Operating environment	• Indoor use (or suitably enclosed) • Operating temperature range 10°C to 50°C (14°F - 122°F) • Maximum relative humidity 95% (up to 30°C)
Power	• Mains AC single phase connection (110-230 Vac) • Internal 1hr backup recharging battery, single GM detector option/CMS monitors the battery voltage • Frequency: 50 to 60hz • Max. Current: 500ma • Internal 1a anti surge fuse
Inputs	• 1 x RS232 port (proprietary protocols) • 1 x RS485 port (proprietary protocols) • 1 x Ethernet 10baseT (proprietary protocols, HTTP, FTP) • 2 x counting channels (twin detector, single channel, using • external detectors) • 2 x analogue 4-20ma inputs • Detector Interface rS-422 (balanced differential line)

Performance specifications

CMS Gamma performance specifications	
Outputs	Fail-safe relay contacts for faults and alarms Four relay outputs (Alarm 1, Alarm 2, Alarm 3 and Fault) RS-232/RS-485 2 x analogue outputs configurable 0-5V, 4-20mA, 0-20mA Ethernet 10BaseT (proprietary protocols, HTTP, FTP)
Alarm facilities	• Fast, accurate warning of high activity or faults • Tower light configuration: visual alarm (12V LED) • Audible alarm: two tones alternating at 1.2Hz>100dB (other tones optional) • Alarm clearly visible from 10m (33ft) • Optional relay outputs for remote audible/visual alarms. • Three activity alarm thresholds and other parameters can be set by the user and pass-code protected
Parameters (configurable)	• Alarm levels - ATTN, ALERT, ALARM • Displayed Units i.e. µSv/h, mrem/h etc. • Calibration factor, detector dead time, over-range threshold • Detector count averaging time (time constant low and time constant high)
Security	The following actions may be passcode/keyswitch protected: • Change parameters • Clear historic count data • Clear event log • Reset passcodes • Modify passcodes • Reset instrument • Test/calibrate analogue I/o • Test digital outputs
Web server	• Current alarm status, parameter settings, recent count and event log data readable using a Web browser

Performance specifications

CMS Gamma performance specifications	
Self test facilities	The CMS Gamma continuously self-monitors for faults, with conditions checked including: Detector failure Power failure Detector over-range Lamp failure Battery voltage
Approvals/radiological standards	• Compliant with 2014/30/EU EMC directive • Type approval at HPA • Compliant with 2014/35/EU Low Voltage directive • Designed to IEC 61017-1 - 2016 Environmental Gamma • Designed to IEC 61017-2 - 2016 Transportable Gamma • Designed to IEC 60532 Installed Gamma • Designed to ANSI N42.17 parts A and C • EMC En61326-1 • LVD En61010-1
Accessories	• Transportable stand • Transportable trolley • Adapter backplate (allows fitment for CMS-1 replacements)
Further detector types	• CMS Gamma is also available with a range of Ion Chamber and Scintillator detector options - contact Curtiss-Wright for details

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About Curtiss-Wright

Curtiss-Wright Round Rock and Wimborne have worked with nuclear and industrial customers for over 60 years. We support customers across the world from facilities located in the US and UK. Our solutions are embedded in strategic national infrastructure and our people are active partners in customer programs that are focused on delivering advanced future nuclear and industrial capabilities.

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