

CMS Gamma

Continuous Gamma Monitoring Station



Highlights

- Low cost area gamma monitor :Single or dual detector
- Wide dynamic range (suitable for variety of applications)
- Detector measurement options, including GM sensors, ION chambers and scintillation detectors
- Installed or transportable
- Full network capability

Applications

- Environmental monitoring
- Stand alone gamma monitoring

The CMS-GAMMA is a new generation continuous monitoring station for measurement of gamma radiation providing essential, reliable information to personnel when radiation levels are above normal. The versatile unit can also 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.

The CMS-GAMMA is a compact, mains-powered, gamma monitor designed specifically for building, area and process monitoring in nuclear facilities. The monitor offers all the classic functionality of its predecessor the CMS-1LG with wide range capability providing measurements from ambient background up to 10Sv/h (1000rem/h).

The CMS-GAMMA is intended for installed applications, but can also 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 is that its associated detector is suitably mounted and has mains power supply in the range 85-260 Vac .

Operation and Security

The CMS-GAMMA performs a self-test on power up and then commences continuous monitoring. All system parameters are password and key protected and can be modified using the local keypad and display. In addition to this, all operating parameters can be read and updated via FTP using a personal computer. Current alarm status, parameter settings and recent count and event log data can be read using a web browser ensuring that all key personnel can have 24 hour access to data remotely. The following actions may be passcode/keyswhitch protected:

- Clear Historic Count Data
- Clear Event Log
- Reset Pass Codes
- Modify Pass Code
- Test/Calibrate Analogue I/O
- Test Digital Outputs

Dose rate indicators

The CMS-GAMMA provides two separate indications of dose rate :

- An analogue vertical graph representing the percentage of the alarm level selected on the LCD display (which is visible from a distance of 9m (30 ft.)
- An LCD display with LED backlighting which provides a numerical indication of the dose rate and indicate the current alarm level setting simultaneously. The display (viewing area 114mm x 64mm (4.5" x 2.5") , also allows sixteen rows of text to be visible at any one time when the user is locally changing parameters or viewing historical results.

When the CMS-GAMMA is operating normally, the green beacon is constantly illuminated. During alarm conditions, the red beacon flashes. In addition to the beacon, two LED's located above the display indicate normal operation or fault.

Alarms and Annunciators

The CMS-GAMMA has four alarms (three alarm thresholds and fail alarm), all of which are user settable via the display and keypad or Ethernet connection (TCP/IP). The 'Alert' and 'High' alarms are triggered when the ambient radiation level exceeds these thresholds. The 'Low' failure alarm is triggered if the radiation falls below this level. Its main purpose is to identify a detector failure.

Alarm annunciation is by means of:

- The red beacon (can be configured to flash or remain on constantly)
- The sounder

The user may suppress alarm annunciation for each or all of the activity alarms if required (this facility is passcode protected). In the event of a sustained mains failure, dose rate measurement continues supported by an internal battery for up to 1 hour (when using GM detector).

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Outputs and Communications

Connections to the CMS-GAMMA 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 1, Alarm 2, Alarm 3 and Fault) (NB: Relays operate in the fail-safe mode - they are energised during normal operation)
- One RS-485 (or RS-232) serial port for communication with remote monitoring systems
- Ethernet (TCP/IP)

Safety integrity SIL applications

The CMS Gamma can be used in conjunction with the Lab Impex SIL Safeguard Monitor (SSM) for both interlock and process applications that require a high level of safety integrity . More information on the SSM board, CMS Interlock and the CMS Process, all of which have been designed to meet the specifications of IEC61508, can be obtained by requesting the datasheets L327, L328 and L333 respectively.

Self Test Facilities

The CMS-GAMMA continuously self-monitors for faults. Conditions checked include:-

- Detector Failure
- Power Failure
- Detector Over range
- Alarm Beacon Failure
- Low Battery Voltage

Occurrence of any of these conditions will cause the green beacon to flash and the nature of the fault will be displayed on the LCD.

Calibration

The CMS-GAMMA can be calibrated using a suitable gamma source with a traceable dose rate. LIS can supply details of calibration sources if required

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Standard GM detectors GDI rangd	GM-1304 Range: 0.1mSv/h - 10Sv/h (0.01rem/h - 1000rem/hr) GM-1314 Range: 10 uSv/h - 3Sv/h (0.03mrem/h - 300rem/hr) GM-1324 Range: 0.3 uSv/h - 0.1Sv/h (0.03mrem/h - 10rem/hr) GM-1202 Range: 0.1 uSv/h - 40mSv/h (0.01mrem/h - 4rem/hr) GM-1301 Range: 0.1mGy/h - 10Gy/h (0.01rad/h - 1000rad/h) GM-1313 Range: 10 uGy/h - 3Gy/h (0.001rad/h - 300rad/h) GM-1321 Range: 3 uGy/h - 0.1Gy/h (0.3mrad/h - 10rad/h)	Power Details	<ul style="list-style-type: none"> • Mains AC single phase connection (85-260 V ac) • Battery: Internal 1hr back-up rechargeable battery (facilitates full operation for 1 hour with single GM detector option/ CMS monitors the battery voltage) • Frequency: 47 to 60 Hz • Max. Current: 500mA • Internal 1A anti surge fuse
Physical characteristics	<ul style="list-style-type: none"> • 304 Stainless steel enclosure • Wall, trolley and transport frame • Designed for quick low cost installation with easy access 	Inputs	<ul style="list-style-type: none"> • 1 x RS232 port (LIS protocols). • 1 x RS485 port (LIS protocols). • 1 x Ethernet 10baseT (LIS protocols, HTTP, FTP). • 2 x counting channels (Twin detector, Single channel, using external SGM). • 2 x analogue 4-20mA inputs - with option of hardware dampening • Detector Interface RS-422 (balanced differential line)
Dimensions (HXWXD) & Weight	H : 458 mm (18") including LED beacon and cable connectors D :150mm (5½") including sounder projection W : 200 mm (8") Weight: Approx 7 kg (15 ½ lb)	Outputs	<ul style="list-style-type: none"> • Fail-safe relay contacts for faults and alarms - Four Relay outputs (Alarm1, Alarm2, Alarm3 and Fault) • RS-232/RS-485 • 2 x analogue outputs configurable 0-5V, 4-20mA, 0-20mA • Ethernet 10baseT (LIS protocols, HTTP, FTP).
Environmental protection	P54 (IP65 option available*)	Alarm facilities	<ul style="list-style-type: none"> • Fast, accurate warning of high activity or faults • Tower light configuration: Visual alarm (12v LED totem pole). • Audible alarm sounder: 2 tones alternating at 1.2Hz>100dB (other tones optional) • Alarm clearly visible from 9m (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.
Display	<ul style="list-style-type: none"> • Large LCD graphic display (114mm x 64mm (4.5" x 2.5") with backlight. • Fully sealed membrane keypad • Both digital and analogue display • Large dose range • Key switch • Two layer status light column (Totem Pole, Red + Green LED) 		
Data Storage	<ul style="list-style-type: none"> • Non-volatile data capability for 7 days count history at minimum 5-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	<ul style="list-style-type: none"> • Indoor use (or suitably enclosed) • Operating temperature range -10 to 50°C (-4°F - 122°F) • Maximum relative humidity 95% (up to 30°C) 		

The board used for print is 80% recycled paper and 20% virgin pulp from sustainable forests. Lamination is fully biodegradable.

Lab Impex Systems Ltd
 Impex House, 21 Harwell Road,
 Nuffield Industrial Estate, Poole,
 Dorset, BH17 0GE, UK

North Region
 T +44 (0) 1946 72 11 11

Lab Impex Systems Inc
 Suite 100, 106 Union Valley Road,
 Oak Ridge, TN 37830

Head Office
 T +44 (0) 1202 68 48 48
 F +44 (0) 1202 68 35 71
 E info@labimpex.com

T 1-865-483-2600
 F 1-865-381-1654



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Data storage	<ul style="list-style-type: none"> • Non-volatile data capability for 7 days count history at minimum 5- 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. 	CMS Gamma Accessories	<ul style="list-style-type: none"> • Transportable Stand • Transportable Trolley • Adapter Backplate (allows fitment for CMS-1 replacements)
Parameter (upload/download)	All operating parameters can be read and updated via FTP over Ethernet using a personal computer.		
Web Server	Current alarm status, parameter settings and recent count and event Log data can be read over ethernet using a Web browser.		
Security	<p>The following actions may be passcode/keyswitch protected:</p> <ul style="list-style-type: none"> • Change Parameters • Clear Historic Count data • Clear Event Log • Reset Pass Codes • Modify Pass Codes • Reset Instrument. • Test / Calibrate Analogue I/O. • Test Digital Outputs. 		
Self Test facilities	<ul style="list-style-type: none"> • The CMS-GAMMA continuously self-monitors for faults. Conditions checked include:- • Detector Failure • Power Failure • Detector Over range • Lamp Failure • Battery Voltage • Detector Type 		
Approvals/Radiological Standards	<ul style="list-style-type: none"> • Compliant with 73/23/EEC- EMC Directive • Type approval at NRPB • Compliant with 93/68/EEC Low Voltage Directive • Designed to IEC 61017-1 (Environmental gamma) • Designed to IEC 61017-2 (Transportable gamma) • Designed to IEC 60532 (Installed gamma) • Designed to ANSI N42.17 (parts A and C) 		

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North Region
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Lab Impex Systems Inc
 Suite 100, 106 Union Valley Road,
 Oak Ridge, TN 37830

Head Office
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 F +44 (0) 1202 68 35 71
 E info@labimpex.com

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