

CMS INTERLOCK SIL

INTERLOCK GAMMA MONITOR

FAST ALARM
SIMPLE/SAFE HARDWARE
ONLY SAFEGUARD MONITOR
IEC 61508 COMPLIANT
SIL2 INDEPENDENTLY
CERTIFIED BY SIRA AND CASS
PROVEN DETECTORS AND
AMPLIFIER ELECTRONICS

The CMS Interlock SIL is a safety related gamma monitor intended to be installed where interlock control is required to restrict access to high dose areas.

The device may be used with a range of sensor options including GM and Ion chamber. Typical applications include the use within accelerator facilities or nuclear cell containment areas where high levels of activity are present.

The CMS Interlock SIL is based on the standard Lab Impex Systems area monitor, the Continuous Monitoring System. While retaining all the features and functionality of the CMS, the CMS Interlock SIL also includes an additional counting circuit called the SIL Safeguard Monitor (SSM). The SSM works in parallel with the CMS, and provides safety related interlock relays.

SSM and IEC61508

This SSM has been designed, manufactured, commissioned and is maintained to IEC61508. The SSM is also the first of its type to achieve SIRA and CASS independent product certification. The monitor offers fast alarm, security of operation and SIL 2 compliance on the system relay outputs.

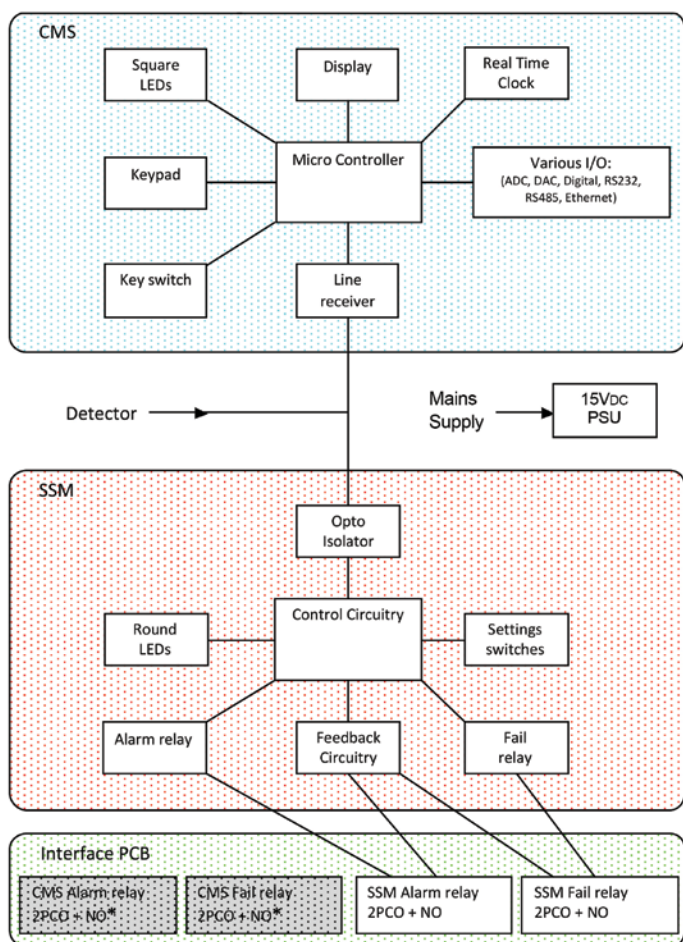
Housed within a rugged stainless steel enclosure, the CMS element provides an indication of dose equivalent levels via a large LCD. Fault conditions are controlled by the SSM, providing the high level and fault alarms.

SSM and IEC61508

The monitor has a SIL2 Alarm (SIL2 high alarm) and one fail diagnostic alarm. The 'high' alarm is triggered when the ambient radiation level exceeds the preset threshold. The 'fail' alarm is set when the count-rate falls below the preset level for the detector (detector in failure).



THE CMS INTERLOCK SIL IS A SAFETY RELATED GAMMA MONITOR INTENDED TO BE INSTALLED WHERE INTERLOCK CONTROL IS REQUIRED TO RESTRICT ACCESS TO HIGH DOSE AREAS



*CMS Alarm and Fail relays are not installed in the CMS Interlock SIL

OUTPUTS AND COMMUNICATIONS

External connections to the CMS Interlock SIL are via a separate but integral terminal box at the base of the instrument. The unit contains two external relays, one for the alarm and one for the fault function. Each relay contains three sets of contacts, two 2 pole change-over and one single pole N/O contact set.

NB: Relays operate in the fail-safe mode; i.e. energised during normal operation.

The separate termination box is provided to isolate external terminations from the main instrument electronics to ensure SIL 2 integrity is maintained during the installation process.

DOSE RATE INDICATORS

The monitor's LCD display with LED backlighting provides two separate indications of dose rate. One is an analogue type vertical graph representing the percentage of the alarm level selected and the second is numerical indication

CALIBRATION

The CMS Interlock SIL monitor can be calibrated using a suitable gamma source providing a traceable dose rate. Ultra Electronics NCS can supply details of calibration sources if required.

SELF TEST FACILITIES

The CMS SIL Interlock continuously self monitors for faults.

- Detector failure
- Power failure

Occurrence of any of these conditions will cause the failure condition and trip the Fault relay. The nature of the fault will be displayed on the LCD.

VISUAL ALARMS

A visual indication is provided in the form of two LED's for SSM failure and alarm. Failure indications include mains failure, and SSM failure. The type of failure is also displayed on the LCD screen.

It is also possible to provide attention, alert and alarm visual indications for the CMS portion of the Interlock SIL monitor via red and green LEDs located on the front panel.



CMS INTERLOCK SIL: INTERLOCK GAMMA MONITOR

PERFORMANCE SPECIFICATION:

GM DETECTORS

- GM-1304 Range:
0.1 mSv/h - 10 Sv/h
(0.01 rem/h - 1000 rem/hr)
- GM-1314 Range:
10 μ Sv/h - 3 Sv/h
(0.03 mrem/h - 300 rem/hr)
- GM-1324 Range:
0.3 μ Sv/h - 0.1 Sv/h
(0.03 mrem/h - 10 rem/hr)
- GM-1202 Range:
0.1 μ Sv/h - 40 mSv/h
(0.01 mrem/h - 4 rem/hr)
- GM-1301 Range:
0.1 mGy/h - 10 Gy/
(0.01 rad/h - 1000 rad/h)
- GM-1313 Range:
10 μ Gy/h - 3 Gy/h
(0.001 rad/h - 300 rad/h)
- GM-1321 Range:
3 μ Gy/h - 0.1 Gy/h
(0.3 mrad/h - 10 rad/h)

DETECTOR INTERFACE

- Universal Detector Interface (UDI-1G)
- Provides a high performance interface between detector and measurement system
- The output stage is designed to drive long cables reliably
- UDI - Detector 10m
- CMS - UDI 100m but with the inclusion of a separate external PSU distances greater than 1000m can be achieved

ALARM FACILITIES

- Fast, valid warning of high activity or fault

OUTPUTS

- Fail-safe relay contacts for faults and alarms
- Ethernet 10BaseT (Lab Impex Systems protocols, HTTP, FTP)

COMMUNICATIONS (NON SIL) (OPTIONAL)

- 1 x RS232 port (Lab Impex Systems protocols)
- 1 x RS485 port (Lab Impex Systems protocols)
- Ethernet 10BaseT (Lab Impex Systems protocols, HTTP, FTP)
- Detector Interface RS-422 (balanced differential line)

DATA STORAGE

- 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

ENVIRONMENTAL

- IP54 (IP65 detector option available)

OPERATING ENVIRONMENT

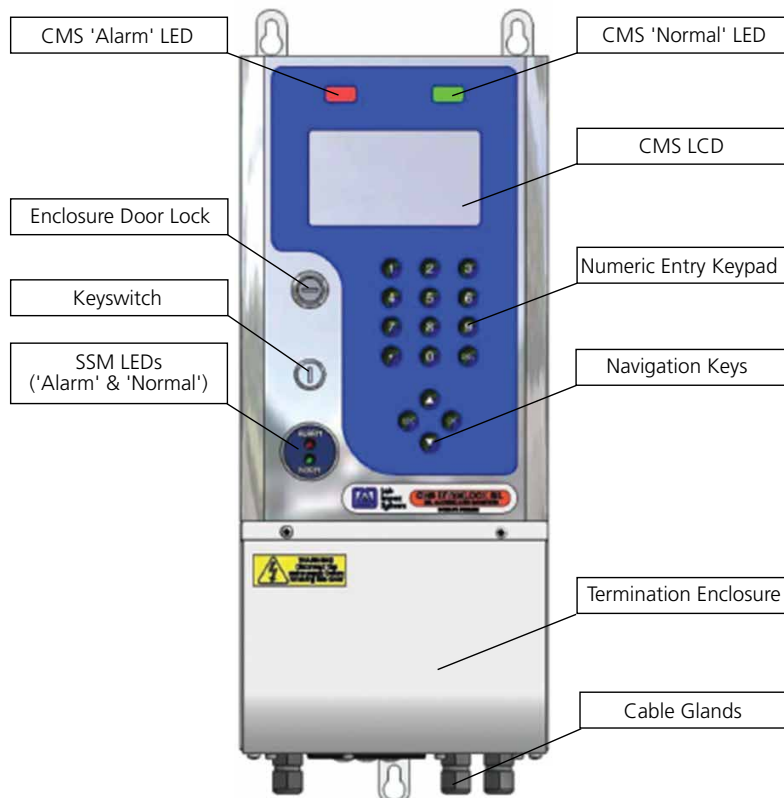
- Indoor use (or suitably enclosed) designed to IP54
- Operating temperature range -10 to 50°C (-4°F to 122°F)
- Maximum relative humidity 95%(up to 30°C)

POWER DETAILS

- Mains AC single phase connection 110-230VAC
- Frequency: 50 or 60Hz
- Max. Current: 100mA
- Internal 1A anti surge fuse

PHYSICAL CHARACTERISTICS

- Stainless steel enclosure
- Wall, trolley and transport frame
- Designed for quick, low cost installation with easy access



CMS INTERLOCK SIL: INTERLOCK GAMMA MONITOR

PERFORMANCE SPECIFICATION CONTINUED:

DIMENSIONS (HxWxD) AND WEIGHT

- Height: 458mm (18")
- Depth: 150mm (5.5")
- Width: 200mm (8")
- Weight: Approx 7kg (15.5lb)

VISUAL DISPLAY

- Large LCD graphic display
114mm x 64mm (4.5" x 2.5")
with backlight
- Fully sealed membrane keypad
- Both digital and analogue display
- Key switch

SECURITY

The following actions may be pass code/key switch protected:

- 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

The CMS Interlock SIL continuously self monitors for faults. Conditions checked include:

- Detector failure
- Power failure
- Detector over range

APPROVALS & STANDARDS

- IEC 61508 Safety Integrity Systems
- Compliant with 73/23/EEC- EMC Directive
- Type approval at HPA
- Compliant with 93/68/EEC Low Voltage Directive
- Designed to IEC 60532 (Installed Gamma)
- EMC EN61326-1
- LVD EN61010-1



making a difference

Ultra Electronics

NUCLEAR CONTROL SYSTEMS
Innovation House, Lancaster Road
Ferndown Industrial Estate
Wimborne, Dorset, BH21 7SQ, England
Tel: +44 1202 850450
Fax: +44 1202 850451
Email: information@ultra-ncs.com
www.ultra-ncs.com
www.ultra-electronics.com

Ultra Electronics reserves the right to vary these specifications without notice.
© Ultra Electronics Limited 2016.
Produced in England
UENCS-L328E