

# CMS PROCESS SIL

## ADVANCED PROCESS MONITOR

FAST ALARM  
SIMPLE/SAFE HARDWARE ONLY  
SAFEGUARD MONITOR  
IEC 61508 COMPLIANT:  
SUITABLE FOR SIL 2  
APPLICATIONS; INDEPENDENTLY  
CERTIFIED BY SIRA/CASS  
PROVEN DETECTORS AND  
AMPLIFIER ELECTRONICS

The CMS Process SIL is a highly reliable, advanced monitor, that has been designed to be operated during process operations when gamma radiation levels are above a specified level. The unit has the capability of providing interlock or safety integral protection via the SIL Safeguard Monitor (SSM) and the ability to transfer and record event data via the CMS Gamma monitor.

The CMS Process SIL combines two very important gamma monitoring applications; to provide a highly reliable, inherently safe interlock monitor with the ability to transfer data results via the CMS Gamma.

The SIL Safeguard Monitor and CMS Gamma monitors are provided as two independent systems using one detector channel. The SSM monitor has been designed, manufactured, commissioned and is maintained to IEC61508, and is the first of its type to achieve SIRA and CASS independent product certification.

The monitor offers fast alarm, security of operation and SIL2 compliance on the system, high activity alarm and relay outputs. Housed within a rugged stainless steel enclosure the CMS Gamma element provides further digital and analogue outputs in order to transfer information from the monitor to a centralised location. The LCD display provides an indication of dose equivalent levels and any alarm or fault conditions that may occur. Fault conditions are controlled by the SIL Safeguard Monitor (SSM), providing the high level and fault alarms.

### RELAY OUTPUTS

External connections to the CMS Process SIL monitor are via a separate but integral terminal box at the base of the instrument. The unit contains two external relays for the SSM, one for 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.



# THE CMS PROCESS SIL IS A HIGHLY RELIABLE, ADVANCED MONITOR, THAT HAS BEEN DESIGNED TO BE OPERATED DURING PROCESS OPERATIONS WHEN GAMMA RADIATION LEVELS ARE ABOVE A SPECIFIED LEVEL

**NB:** Relays operate in the fail-safe mode: energised during normal operation; SIL2 compliant. Relays conform to EN50205 (force guided as required for diagnostics).

The unit also contains two non-SIL rated relays for the CMS Gamma portion of the monitor. Again each relay contains three sets of contacts, two 2 pole change-over and one single pole N/O contact set.

## **ANALOGUE CONNECTIONS**

The CMS Process SIL can be provided with a 4-20mA analogue output.

## **DOSE RATE INDICATORS**

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

## **CALIBRATION**

The CMS Process SIL Monitor can be calibrated using a suitable gamma source providing a known dose rate. LIS can supply details of calibration sources as required.

## **INSTALLATION**

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

## **SUPPORT TOOL**

To further reduce errors, a PC support tool is provided to confirm manual setting of the equipment.

## **SELF TEST FACILITIES**

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

- 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 a red LED for SSM failure and alarm. Failure indications include mains failure, detector failure and SSM failure. The type of failure is also displayed on the LCD screen.

The monitor provides visual SIL2 alarms (high and fail alarm) using an LED located on the front panel.

## **CMS PROCESS SIL ACCESSORIES**

An adapter back plate allows CMS GAMMA series to be mounted onto the same fixings as the CMS-1.

## THE CMS PROCESS SIL COMBINES TWO VERY IMPORTANT GAMMA MONITORING APPLICATIONS; TO PROVIDE A HIGHLY RELIABLE, INHERENTLY SAFE INTERLOCK MONITOR WITH THE ABILITY TO TRANSFER DATA RESULTS VIA THE CMS GAMMA

### CMS PROCESS SIL PERFORMANCE SPECIFICATION:

#### DETECTORS

- 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)

#### OUTPUTS (OPTIONAL)

- 2 Fail-safe relays, each with 3 sets of contacts for faults and alarms
- Ethernet 10BaseT (LIS protocols, HTTP, FTP)
- 4-20mA Analogue output
- 2 non-SIL relays, each with 3 sets of contacts

#### DETECTOR INTERFACE

- Universal Detector Interface (UDI-1G)
- Provides a high performance interface between detector and measurement system
- Maximum probe separation is 100m (330ft) directly from the UDI and >1100m (3600ft) with external power unit

#### ALARM FACILITIES

Fast, valid warning of high activity or fault. Three activity alarm thresholds and other parameters can be set by the user and passcode protected.

#### COMMUNICATION (NON-SIL) - OPTIONAL

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

#### ENVIRONMENTAL PROTECTION

IP54 (IP65 detector option available\*)

#### WEIGHT

Approx. 7 kg (15 ½ lb)

#### OPERATING ENVIRONMENT

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

#### POWER DETAILS

- Mains AC single phase connection 110-230 VAC
- Frequency: 50 or 60 Hz
- 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

#### DIMENSIONS (HxDxW)

- Height: 458 mm (18")
- Depth: 150mm (5½")
- Width: 200 mm (8")

#### 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 passcode/keyswitch 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 Process SIL continuously self-monitors for faults. Conditions checked include:-

- Detector Failure
- Power Failure
- Detector Over-range

#### APPROVAL & STANDARDS

- SIL IEC61508
- EMC EN61326-1
- LUD EN61010-1
- IEC60532



**making a difference**

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