CMS ION

ION CHAMBER BASED INTERLOCK SYSTEM

- MEASUREMENT RANGE FROM 100 µSv/h TO 50 Sv/h (ICD-1)
- MAINTAINS SAFETY FUNCTION (OVER-RANGE CONDITION) IN EXCESS OF 25,000 Sv/h (ICD-1)
- AVAILABLE IN A SIL CONFIGURATION ADHEREING TO IEC61508
- INDEPENDENTLY TYPE TESTED
- SATISFIES THE REQUIREMENTS OF IEC60532 AND IEC61010

The CMS-ION is an advanced radiation monitoring system for use within nuclear facilities. The system comprises; CMS Gamma Base station ICI-1 (Ion Chamber Interface) and ICD (Ion Chamber Detector). The system is designed to continuously and accurately monitor gamma dose-rate in an environment and provides a high measurement range of up to 50 Sv/h (5,000 Rem/h).

CMS-GAMMA / CMS INTERLOCK SIL

The CMS Gamma is the standard module that Ultra Electronics Nuclear Control Systems employ for ratemeter radiation detection applications. The CMS Gamma is a mains-powered device which incorporates a display, keypad and microprocessor electronics in a small, rugged stainless steel enclosure. The primary purpose of the device is to monitor and display dose-rate and to warn local personnel in the event of an alarm condition.

For safety related cell interlock applications, a sister device, the CMS Interlock SIL is used as the base station module. Offering the equivalent features and functionality of the CMS Gamma, the CMS Interlock SIL also provides interlock relay outputs independently certifed as SIL 2 (IEC61508).

ICI-1 ION CHAMBER INTERFACE

The ICI-1 is a compact wall mount module. Powered from the CMS host system, the ICI-1 generates a high voltage bias for the ICD and amplifes and conditions the detector signal for transmission onto the CMS. The ICI-1 has been designed specifcally for high dose environments in mind and implements a circuit to prevent common (and potentially) hazardous countrate saturation fall back. To further safeguard the integrity of the measurement, the ICI- 1 performs a number of self diagnostics including detector bias voltage stability and circuit temperature.

CMS ION: ION CHAMBER BASED INTERLOCK SYSTEM

ICD (ION CHAMBER DETECTOR)

Ultra Electronics Nuclear Control Systems currently provide two Lab Impex ICD options.

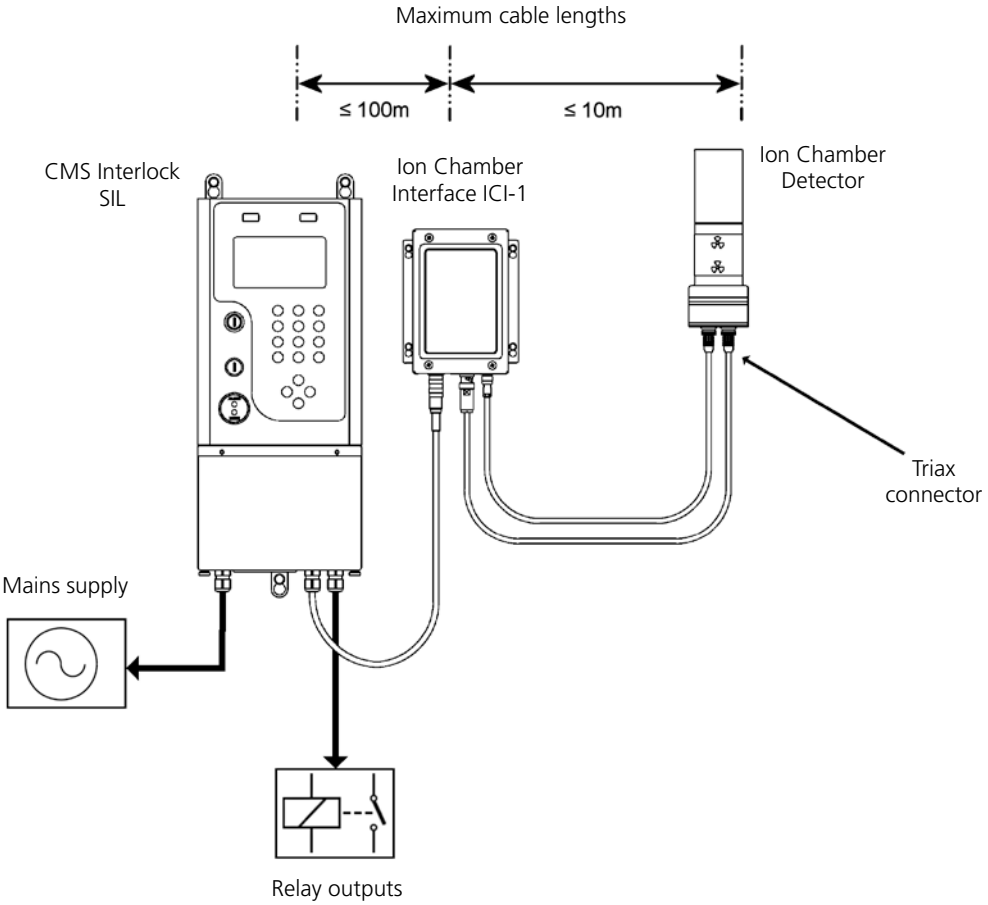
The first, the ICD-1, is a gamma sensor designed for high-dose rate environments such as within a shielded cell.

With an effective volume of 160 cm³, and a fill gas of Argon and Nitrogen, the ICD-1 provides a wide measurement range of 100 µSv/h to 50 Sv/h.

Due to the relative insensitivity of the sensor at normal ambient background levels, the ICD-1 is available with an optional hold-up source to allow the device to be used.

For more sensitive dose-rate measurements 1 µSv/h to 100 Sv/h, the ICD-2 ion chamber detector is recommended.

Using proven electronics and advanced detector design, the CMS Ion solution is ideal for both high and low range area and interlock applications.



CMS ION: ION CHAMBER BASED INTERLOCK SYSTEM

PERFORMANCE SPECIFICATION

Ion Chamber Options	ICD-1: 100 µSv/h to 50 Sv/h ICD-2: 1 µSv/h to 100 mSv/h
Detector Interface	Ion Chamber Interface (ICI-1) Current to frequency convertor designed to produce a digital voltage pulse output that is directly proportional to the ionisation activity.
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).
Outputs	Fail-safe relay contacts for faults and alarms. Ethernet 10baseT (LIS protocols, HTTP, FTP).
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°C to 50°C (14°F to 122°F) Maximum relative humidity 95% (up to 30°C)
Power details	Mains AC single phase connection (110-230 Vac) Frequency: 50 to 60 Hz Max. Current: 100mA Internal 1A anti surge fuse
Dimensions	ICD-1: Ø 60 mm x 180 mm ICD-2 : Ø 186 mm x 551 mm ICI-1 : 141 mm (W) x 187 mm (H) x 73 mm (D)
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 INTERLOCK SIL continuously selfmoni-torsor 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 to IEC60532. Compliant with 93/68/EEC Low Voltage Directive.

Ultra ELECTRONICS

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

Produced in England
UENCS-L102B