

TECHNIS

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CERTIFICATE of RELIABILITY and FUNCTIONAL SAFETY

This is to certify that

The Sentry IT 32 Channel Gas Detection System Controller provided by Sierra Monitor Corporation 1991, Tarob Court, Milpitas CA95035 USA has been assessed and is considered suitable for use in a low demand safety function:

- As an unvoted item (ie hardware fault tolerance of 0) at SIL 2

This claim is in respect of random hardware failures and architectural constraints (ie safe failure fraction). The assessment was based on the assumptions, proven-in-use data provided, and recommendations given in Technis Report T764 (Issue 1.0). The product was assessed against the failure modes:

- Failure to provide a relay open circuit signal in response to a predetermined RS485 signal
- Spurious o/c output

The product (configuration 1) includes the following:

- The 21847 Field Sensor Interface RS485
 - The 21841 CPU Connect Board
- The 21846 I/O Carrier (Relay Outputs) Board
- The GLO-MATION 9260 Embedded Single Board Computer

The product (configuration 2) includes the following:

- The 21847 Field Sensor Interface RS485
 - The 21841 CPU Connect Board
- Two of the 21846 I/O Carrier (Relay Outputs) Boards
 - The 21848 I/O Expansion Digital Board
- The GLO-MATION 9260 Embedded Single Board Computer

The assessment was carried out having regard to the guidance in IEC 61508 [2010] and the related body of guidance in respect of:

- Random Hardware Failures and Architectural Constraints [route 1_H]

Configuration 1

Integrity in respect of failure to release	SIL 2
Total Failure Rate	0.85 pmh
“hazardous” failure rate (revealed)	0.53 pmh
“hazardous” failure rate (unrevealed)	0.063 pmh
“safe” failure rate (revealed)	0.079 pmh
“safe” failure rate (unrevealed)	0
Diagnostic Coverage	89.3%
System Type	B
Hardware Fault Tolerance	0
Safe Failure Fraction	>90%
PFD (hazardous failure)	3.0×10^{-4}
Proof Test Interval	Up to 1 year

Configuration 2

Integrity in respect of failure to release	SIL 2
Total Failure Rate	1.1 pmh
“hazardous” failure rate (revealed)	0.67 pmh
“hazardous” failure rate (unrevealed)	0.076 pmh
“safe” failure rate (revealed)	0.079 pmh
“safe” failure rate (unrevealed)	0
Diagnostic Coverage	89.9%
System Type	B
Hardware Fault Tolerance	0
Safe Failure Fraction	>90%
PFD (hazardous failure)	3.7×10^{-4}
Proof Test Interval	Up to 1 year

The validity of this certificate requires that:

The product is used in accordance with any assumptions, limitations or intervals stipulated in the underpinning reliability/integrity report. The product build state continues to conform to the drawings and issues quoted in the underpinning reliability/integrity report. The product is used having regard to the instructions, limitations of use, intervals etc as outlined in the manufacturer’s Safety Manual. The manufacturer maintains a credible level of Functional Safety Management in respect of (for example) design configuration control, procurement, manufacturing and defect analysis. The certificate will not apply to any product variation/modification or to the use of functions not addressed in the original study. It is recommended that the design, defect records and the company FSM procedure are reviewed, at least every 2 years, and should any changes have occurred since the original certification then the manufacture should contact Technis to request re-certification.

Signed:  (Certificate No T764-049) – 12 February 2015)

Dr David J. Smith BSc, PhD, CEng, FIEE, FIQA, HonFSaRS, MIGasE

This certificate does not warrant fitness for any specific applications related purpose and is based on probabilistic and statistical assessment