



IEC 61508 Safety Integrity Level Capability Certificate

Functional Safety of Safety-Related Programmable Electronic Systems

The **Linesense Fire Detection Ltd, Digital Location Interface (Part No: 52100-005/Z/G)** has been assessed and is considered capable for use in a low demand Safety Function up to (and including) SIL 2, with regards to random hardware failures and architectural constraints. Systematic Capability (SC) was not addressed.

The assessment was based on the assumptions, data provided, and recommendations given in:

- **Environmental Resources Management Ltd Report: M092_FM002 rev. 1.**

The product was assessed against the following failure mode:

- **A fault causing a failure of the fire detection unit to identify a genuine high temperature alarm.**

The system assessed comprises the following modules;

- 52100-005 Module;
- Linear Heat Detecting Cable:
 - 51100-068 Model H8040N Digital LHDC. Alarm temperature 68°C, max ambient 45°C. Black nylon outer sheath;
 - 51100-085 Model H8045N Digital LHDC Alarm temperature 85°C, max ambient 45°C. Black nylon outer sheath;
 - 51100-105 Model H8028 Digital LHDC. Alarm temperature 105°C, max ambient 70°C. Black PVC outer sheath;
 - 51100-176 Model H8069 Digital LHDC. Alarm temperature 176°C, max ambient 105°C. Red PVC outer sheath;
 - 51100-240 Model H9650 Digital LHDC. Alarm temperature 240°C, max ambient 200°C. White fluoropolymer outer sheath.

It should be noted also that this certificate is applicable to the 52100-005-Z and 52100-005-G, with the letter prefix at the end indicating that these devices are to be used to monitor a hazardous environment from a safe area via zener barrier or a galvanic barrier.

This FMEA analysis has been conducted on the listed device manufactured by Linesense Fire Detection Ltd and not on any external equipment (i.e. the zener / galvanic barriers). Therefore, it is recommended that any external equipment to be used with the Linesense Fire Detection Ltd 52100-005/Z/G for hazardous areas must be assessed with regards to its suitability for use as a Safety Function with these devices.



The assessment was carried out to determine compliance with IEC 61508 (2010 Edition) with regards to:

- SIL 2 with a HFT = 0 via Route 1_H;
- Architectural Constraint (Type B, SFF >90%, <99%), HFT = 0.

Note 1: The SIL of a complete SIF (sensor, logic solver and final element subsystems) must be verified to calculate the required PFD / PFH, considering any redundancy, Proof Test Interval (PTI), Proof Test Coverage (PTC), Mission Time and Mean Time To Restoration (MTTR) for all elements included in the SIF. Each subsystem should be verified to ensure compliance with the minimum HFT requirements.

Device	λ_S (/hr)	λ_{DD} (/hr)	λ_{DU} (/hr)	SFF	Type	Estimated SIL Capability (Arch. Constraints)
52100-005/Z/G	2.5E-07	7.3E-08	1.2E-08	96.4%	B	2

IMPORTANT: It should be noted that this assessment does not include confirmation of the response time of the device. For response times (along with any relevant assumptions) reference should be made to the Safety Manual of each device and the total SIF response time **MUST** be compared against the process safety time for the specific application.

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Certificate: M092_CT002 rev. 1