Document number:	K155_CT002 rev. 4
Dated:	31-Aug-26
Expiry date:	31-Aug-29

IEC 61508 Hardware Safety Integrity Assessment

Linesense Fire Detection Ltd, Digital Linear Heat Detection Interface 52101-001-28

Manufacturer:	Linesense Fire Detection Ltd Archway House, Bath Rd, Reading RG7 5HR
Product:	Digital Linear Heat Detection Interface
Model:	52101-001-28
Application:	Low Demand Mode Safety Instrumented Function
Safety Function:	Upon detection of high temperature, action is initiated (Logic solver and final element subsystems not part of this analysis)
Applied standard:	IEC 61508 Ed2 2010 Parts 1-3 (Partial)
Systematic Capability:	Not Assessed
Applicable report:	Environmental Resources Management Ltd Report: K155_FM002 rev. 4
Assessment Route:	1_H
Hardware Fault Tolerance:	0
Type:	A
Application restrictions:	None identified
System Modules:	52101-001-28 digital interface module Linear Heat Detecting Cables: 51100-068 Model H8040N Digital LHDC. Alarm temperature 68°C, max ambient 45°C. Black nylon outer sheath 51100-085 Model H8045N 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

Model No.	λDU (/hr)	λDD (/hr)	λS (/hr)	SFF	SIL AC (HFT = 0)
52101-001-28	7.9E-08	1.5E-07	2.3E-07	83%	SIL 2

SIL AC (Architectural Constraints): Represents the maximum allowable SIL of each hardware element, assuming Hardware Fault Tolerance (HFT) = 0.

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It should be noted that for a device to claim compliance with a specified SIL, the SIL AC and SC of the device needs to both be met. In addition to this, the required Average Probability of Failure on Demand (PFDavg) value for the complete Safety Instrumented Function (SIF) needs to adhere to the SIL PFDavg ranges.

IMPORTANT: It should be noted that this assessment considers only the Linesense Fire Detection Ltd, Digital Linear Heat Detection Interface 52101-001-28. It does not cover opening and closing time requirements and a random hardware failures assessment must be conducted for the entire safety function for each application as per the appropriate Safety Requirements Specification.

The Linesense Fire Detection Ltd, Digital Linear Heat Detection Interface 52101-001-28 has been assessed and is considered capable for use in a low demand mode safety function up to (and including) SIL 2 with regards to random hardware failures and architectural constraints.

Note 1: The SIL of a complete SIF (sensor, logic solver and final element subsystems) must be verified to calculate the required PFD / Probability of Failure per Hour (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.

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