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IEC 61508 Hardware Safety Integrity Assessment

Patol Ltd, Digital Linear Heat Detection Interface LDM-519-DIM-28

Manufacturer:	Patol Ltd Archway House, Bath Rd, Reading RG7 5HR
Product:	Digital Linear Heat Detection Interface
Model:	LDM-519-DIM-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_FM001 rev. 5

Assessment Route:	1_H
Hardware Fault Tolerance:	0
Type:	A
Application restrictions:	None identified
System Modules:	LDM-519-DIM module (Part No. 700-442) Linear Heat Detecting Cables: 700-070LS0H Digital LHDC. Standard 70°C max switching temperature 700-071LS0H Digital LHDC. As above, but with additional exterior stainless-steel wire over braid, referred to as "Armoured" Digital LHDC 700-090LS0H Digital LHDC. Standard 90°C max switching temperature 700-091LS0H Digital LHDC. Armoured version 700-070 Digital LHDC. Standard 70°C max switching temperature 700-071 Digital LHDC. As above, but with additional exterior stainless-steel wire over braid, referred to as "Armoured" Digital LHDC 700-090 Digital LHDC. Standard 90°C max switching temperature 700-091 Digital LHDC. Armoured version 700-140 Digital LHDC. Standard 140°C max switching temperature 700-141 Digital LHDC. Armoured version

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700-180 Digital LHDC. Standard 180°C max switching temperature
700-181 Digital LHDC. Armoured version

Model No.	λDU (/hr)	λDD (/hr)	λS (/hr)	SFF	SIL AC (HFT = 0)
LDM-519-DIM-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.

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 Patol Ltd, Digital Linear Heat Detection Interface LDM-519-DIM-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 Patol Ltd, Digital Linear Heat Detection Interface LDM-519-DIM-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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