



ENGINEERING SAFETY CONSULTANTS

The Global Provider of Functional Safety Expertise and Technical Consultancy

Safety Integrity Level Capability Certificate

Functional Safety of Safety-Related Programmable Electronic Systems

The **SEFI, LEONIS / DC520 Fire Control Panel (FCP)** has been assessed and is considered capable for use in a low demand Safety Function with a SIL requirement of up to (and including) SIL 2 with regards to systematic, random hardware failures and architectural constraints.

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

- **Engineering Safety Consultants Ltd Report: H187_FM001 rev. 4;**
- **Engineering Safety Consultants Ltd Report: H187_SM001 rev. 3;**
- **Engineering Safety Consultants Ltd Report: H187_SM002 rev. 3;**
- **Engineering Safety Consultants Ltd Report: H187_SM003 rev. 3;**
- **Renewal Letter from SEFI, signed by Aymen Nahdi, Product Manager, Dated 16th June 2022.**

The product was assessed against the following failure mode:

- **Failure to transmit output signal (via relay output) on acquisition of input signal (alarm – fire detection or detection device offline).**

The system assessed comprises the following sub-assemblies:

- M10R;
- MPE;
- ELOT;
- BPS;
- ELFP;
- MPS;
- M1NR.

The assessment was carried out to determine compliance with IEC 61508 route 1_H (2010 Edition) with regards to:

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

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The analysis was conducted on the following versions on the sub-assemblies that make up the Leonis / DC520 FCP:

Module / Card Reference	Description of Module	Hardware Version	Software Version
MPE	Main Control Unit	2H	3.40
ELFP	Front Panel Board	3I	N/A
ELOT	1 TNET Loop Module	7K	2.01
BPS	Backplane Module	1B	3.00
M10R	10 Relays Module	5G	1.09
MPS	Gateway Module	2F	1.14
M1NR	Board used for distributed CIE and Networked CIE with fibre optic link	5J	1.07

The assessment results are as follows:

Device	λ_{DU} (/hr)	λ_{DD} (/hr)	λ_S (/hr)	SFF (%)	Device Type	Estimated SIL Capability
Leonis / DC520 Fire Control Panel – with 1 MPE Board	6.48E-08	2.04E-06	1.89E-07	97.17%	B	SIL 2
Leonis / DC520 Fire Control Panel – with 2 MPE Boards	6.54E-08	2.06E-06	1.89E-07	97.18%	B	SIL 2
Leonis / DC520 Fire Control Panel – with 1 MPE Board + Additional M1NR and MPS Boards	8.97E-08	3.01E-06	3.86E-07	97.43%	B	SIL 2
Leonis / DC520 Fire Control Panel – with 2 MPE Boards + Additional M1NR and MPS Boards	9.02E-08	3.03E-06	3.86E-07	97.43%	B	SIL 2

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.

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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Managing Director: Simon Burwood
Assessment Date: August 2020
Renewal Date: January 2023, valid to January 2025
Certificate: H187_CT001 rev. 6

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