ENGINEERING SAFETY CONSULTANTS

The Global Provider of Functional Safety Expertise and Technical Consultancy

Certificate of Conformity to IEC 61508 Safety Integrity Level (SIL) 2

Functional Safety of Safety-Related Programmable Electronic Systems

The **Digital Linear Heat Detection Cable (LHDC) Locator Module (LDM-519-DDL/Z/G) by Patol Ltd** (OEM for the unit), has been assessed and is considered capable for use in a low demand Safety Function up to SIL 2 with regard to random failure rate and architectural constraint.

The function of the LDM-519-DDLZ/G is to monitor a length of LHDC for both fire condition and fault statuses (open circuit). The unit can be configured to operate in a two-wire mode that emulates the operation of conventional heat detectors and can therefore be directly interfaced with fire control panels by connection to fire zone trigger circuits or addressable interfaces.

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

- **ESC Ltd Report: F004_FM001 rev.4;**
- **Renewal Letter from Patol Ltd, signed by Mark Lewis, Product Development Engineer, dated 16th July 2020.**

The system 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:

- LDM-519-DDL Module (Part No. 700-451);
- Linear Heat Detecting Cable (LHDC):
  - 700-070 Digital LHDC. Alarm temperature 70°C, max ambient 45°C;
  - 700-090 Digital LHDC. Alarm temperature 90°C, max ambient 70°C;
  - 700-140 Digital LHDC. Alarm temperature 140°C, max ambient 110°C;
  - 700-180 Digital LHDC. Alarm temperature 180°C, max ambient 150°C;
  - 700-071 Digital LHDC. Alarm temperature 70°C, max ambient 45°C;
  - 700-091 Digital LHDC. Alarm temperature 90°C, max ambient 70°C;
  - 700-141 Digital LHDC. Alarm temperature 140°C, max ambient 110°C;
  - 700-181 Digital LHDC. Alarm temperature 180°C, max ambient 150°C.

It should be noted also that this certificate is applicable to the LDM-519-DDL-Z and LDM-519-DDL-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 Patol 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 Patol Ltd LDM-519-DDL/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 with regards to:

- Random Hardware Failure (Predicted failure rate <2.0E-04 per year);
- Architectural Constraint (Type B, SFF >90%, <99%).

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.

Managing Director: Kenneth G L Simpson
Member of the IEC 61508 committee
Original Assessment Date: March 2016
Renewal Date: July 2020, valid to July 2022
Certificate: F004_CT001 rev.5

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