



ENGINEERING SAFETY CONSULTANTS

The Global Provider of Functional Safety Expertise and Technical Consultancy

Certificate of Conformity to IEC 61508 Safety Integrity Level (SIL) 2 in terms of Random Hardware Requirements

Functional Safety of Safety-Related Programmable Electronic Systems

The **Moto Mecánica Argentina S.A., Printed Circuit Board (PCB) L03-60590-01**, has been assessed and is considered capable for use in a low demand Safety Function up to SIL 2

The assessment was carried out to determine compliance with IEC 61508 with regards to:

- Random Hardware Failure (20% of SIL 2 range);
- Architectural Constraint (HFT = 0)

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

- **ESC Ltd Report: J038_FM001 (Rev.1)**

The product was assessed against the following safety function:

- A 4-20 mA analogue input signal (4-20 mA two-wire interface) is received by microcontroller U5 (LPC1769FBD100) which digitalizes the signal and compares the value to reference values stored in Serial Peripheral Interface (SPI) flash external memory. In case input signal value is outside of the safe range, a digital output signal is activated with a logic "0" value.

The system assessed comprises the following sub-elements / functional blocks:

- Power Supply;
- Analogue Input;
- Micro-controller;
- SPI Flash Memory;
- Digital Outlet.

The assessment results are as follows:

Functional Block	λ_{DU} (/hr)	λ_{DD} (/hr)	λ_s (/hr)	SFF (%)	Component Type	Achieved PFD	Achieved SIL
Power Supply / Analogue Input / Digital Output	2.96E-08	3.83E-08	2.21E-07	90	A	1.30E-04	SIL 2
Microcontroller / Flash Memory	1.50E-08	5.75E-08	8.27E-08	90	B	6.58E-05	
Total PCB	4.47E-08	9.58E-08	3.04E-07	90	B	1.96E-04	

Chairman: Kenneth G L Simpson

Member of the IEC61508 committee

Assessment Date: March 2019, valid to March 2021

Certificate: J038_CT001 (Rev.0)

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