



ENGINEERING SAFETY CONSULTANTS

The Global Provider of Functional Safety Expertise and Technical Consultancy

IEC 61508 Safety Integrity Level Capability Certificate

Functional Safety of Safety-Related Programmable Electronic Systems

Manufacturer: Tyco Fire & Security GmbH (TFSG)
Victor Von Bruns-Strasse 21
8212 Neuhausen am Rheinfall
Schaffhausen
Switzerland

The **TFSG, IOB800 Expansion Board**, which allows discrete input / outputs to be connected to the MX Fire Panel, has been assessed and is considered capable for use in a low demand Safety Function up to (and including) SIL 2 with regard to systematic capability (assessed under the Prior Use route), random failure rate and architectural constraint in conjunction with the **T2000, MX & ZX Fire Panel**.

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

- **Technis Report No. T432, Issue 4.0;**
- **Engineering Safety Consultants Ltd Report: D152_SV010 rev.4, which includes details associated with the Safety Manual requirements in Appendix B;**
- **Engineering Safety Consultants Ltd Report: D152_PU001 rev.4;**
- **Renewal Letter from Tyco Fire & Security GmbH, signed by Deepika Sahni, Principal Regulatory Engineer, Dated 27th April 2023.**

The use of the IOB800 Expansion Board in conjunction with the MX Fire Panel can meet the SIL 2 capability, in terms of hardware reliability, however, a complete analysis of the total safety function will need to be undertaken.

The product was assessed against the following failure modes:

- **Failure to respond (executive output);**
- **Failure to respond (audible output).**

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

- SIL 2 with a HFT = 0 via Route 1_H;
- Architectural Constraint (Type A, SFF >60% <90%);
- Systematic Capability against IEC 61508 (2010 Edition) via Route 2s.

Device	λ_{DU} (/hr)	λ_{DD} (/hr)	λ_S (/hr)	SFF (%)	Device Type	Estimated SIL Capability
IOB800 Expansion Board	7.9E-08	9.9E-08	6.6E-08	67	A	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 devices. 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: Simon Burwood
Assessment Date: April 2015
Renewal Date: April 2023, valid to April 2025
Certificate: D152_CT010 rev. 7

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