
Random Hardware Reliability and Systematic Assessment Certificate

Functional Safety of Safety-Related Programmable Electronic Systems

The **Imtex Controls Ltd, Position Monitors Type IQ, AQ, DQ, SRX, SRA, SLR and V Series** have been assessed and are considered capable for use in a low demand Safety Function up to (and including) SIL 3 capability with regards to systematic, random hardware failures and architectural constraints.

As these devices are used as part of the diagnostic circuit for the final element and as these devices only form part of the diagnostics, the random failure rate SIL integrity must be verified for each application configuration.

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

- **Technic Report: T917 Issue 1.0** – (Failure Rate Assessment);
- **ESC Ltd Report: B134_FSA001 rev. 6** – (Systematic);
- **Renewal Letter from Imtex Controls Ltd, signed by John Rolton, Company Functional Safety Engineer, Dated 09th August 2022.**

The product was assessed against the following failure modes:

- Micro Switch:
 - **Failure to open (normally closed contact);**
 - **Failure to close (normally open contact).**
- Reed Switch:
 - **Failure to open (normally closed contact);**
 - **Failure to close (normally open contact).**
- Inductive Switch:
 - **Failure to output a current.**
- Potentiometer Device:
 - **Failure to output + / - 10% change in resistance.**
- Zettlex Transmitter:
 - **Failure to output + / - 5% of appropriate current.**

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

- Random Hardware Failures against IEC 61508:
 - Predicted failure rate:
 - Micro Switch dangerous failure <0.05E-06 /hr;
 - Reed Switch dangerous failure <0.5E-06 /hr;
 - Inductive Switch dangerous failure <0.05E-06 /hr;
 - Potentiometer dangerous failure <0.7E-06 /hr;
 - Zettlex Transmitter dangerous failure <0.5E-06 /hr.
- Architectural Constraints: Type A;
- Systematic against IEC 61511, prior use, suitable up to SIL 3.

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.



ENGINEERING SAFETY CONSULTANTS

The Global Provider of Functional Safety Expertise and Technical Consultancy

Managing Director: Simon Burwood
Member of IEC 61508 (MT61808-1-2) & IEC 61511 (MT61511) Maintenance Committees
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ENGINEERING SAFETY CONSULTANTS LTD
2nd Floor, Exchequer Court, 33 St. Mary Axe,
London, EC3A 8AA UK
Telephone/Fax: +44 (0)20 8542 2807
E-Mail: info@esc.uk.net Web: www.esc.uk.net
Registered in England and Wales: 7006868
Registered Office: 33 St. Mary Axe, London, EC3A 8AA