TECHNIS

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CERTIFICATE of RELIABILITY and FUNCTIONAL SAFETY

This is to certify that

The **Distributed Temperature Sensor Fire Detection System – FIRELASER** provided by **Bandweaver Technology Ltd, Clasford Farm Unit 22, Aldershot Road, Guildford GU3 3HQ, UK** has been assessed and is considered suitable for use in a low & high demand safety functions:

- **As an unvoted item (ie hardware fault tolerance of 0) at SIL 2 low demand**
- **As an unvoted item (ie hardware fault tolerance of 0) at SIL 1 high demand**

This claim is based on FMEDA and some warranty based data and is in respect of random hardware failures and architectural constraints (ie safe failure fraction). It is based on the assumptions and recommendations given in Technis Report T926 (Issue 1.0). The product was assessed against the failure modes:

- **Failure to deliver a defined Modbus signal in response to a valid temperature condition**
- **A Spurious Modbus signal despite no temperature change**

The product includes the following:

- 8 printed boards as defined in report T926 Issue 1.0

The assessment was carried out having regard to the guidance in IEC 61508 [2010] and the related body of guidance in respect of Random Hardware Failures and Architectural Constraints [route 1_H]

Integrity in respect of failure to release	**SIL 2 (low)**	**SIL 1 (high)**
Total Failure Rate	7.13 pmh	
"hazardous" failure rate (revealed)	1.96 pmh	
"hazardous" failure rate (unrevealed)	0.13 pmh	
"hazardous" failure rate (total)	2.09 pmh	**$1.8\ 10^{-2}$ pa**
"safe" failure rate (revealed)	0.26pmh	
"safe" failure rate (unrevealed)	0	
Diagnostic Coverage	**>93%**	**>93%**
System Type	B	
Hardware Fault Tolerance	0	
Safe Failure Fraction	>94%	
PFD (hazardous failure)	**6.5×10^{-4}**	
Proof Test Interval	Up to 1 year	

The validity of this certificate requires that: The product is used in accordance with any assumptions, limitations or intervals stipulated in the underpinning reliability/integrity report. The product build state continues to conform to the drawings and issues quoted in the underpinning reliability/integrity report. The product is used having regard to the instructions, limitations of use, intervals etc as outlined in the manufacturer's Safety Manual. The manufacturer maintains a credible level of Functional Safety Management in respect of (for example) design configuration control, procurement, manufacturing and defect analysis. The certificate will not apply to any product variation/modification or to the use of functions not addressed in the original study. It is recommended that the design, defect records and the company FSM procedure are reviewed, at least every 2 years, and should any changes have occurred since the original certification then the manufacture should contact Technis to request re-certification.

Signed:.....(Certificate No T926-140.1) – 26 July 2023)

Dr David J. Smith BSc,PhD,CEng,FIEE,FIQA,HonFSaRS,MIGasE

This certificate does not warrant fitness for any specific applications related purpose and is based on probabilistic and statistical assessment