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## CERTIFICATE of RELIABILITY and FUNCTIONAL SAFETY

**This is to certify that**

The below range of Beacons provided by **European Safety Systems, Impress House, Mansell Road, London W3 7QH UK.** has been assessed and is considered suitable for use in a low demand safety function:

- As an unvoted Type B item (ie hardware fault tolerance of 0) at SIL 2
- As an unvoted Type B item (ie HFT 0) a highly robust claim at SIL 1

This claim is in respect of random hardware failures and systematic failures. The assessment was based on the assumptions, proven-in-use data provided, and recommendations given in Technis Report T900 (Issue 4.0). The product was assessed against the failure modes:

- Failure to respond to an input by illuminating a beacon

The products include the following:

BExBG05D&E	BExBG10D	BExBG10E	BExBG15D
BExBG15E	BExBG21D	BExBGL2D	GNExB1X05
GNExB2X05	GNExB2X10	GNExB2X15	GNExB2X21
STExB2X05	STExB2X10	STExB2X15	STExB2X21
D1xB2X05	D1xB2X10	D1xB2X15	D1xB2X21
GNExB2LD2	STExB2LD2	D1xB2LD2	

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 Systematic Failures [route 2H]

Signed:  (Certificate No T900-123.4) – 8 August 2021)

*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*



Certificate No T900-123.4 Continued

BEACONS

BExBG05D&E	BExBG10D	BExBG10E	BExBG15D
BExBG15E	BExBG21D	BExBGL2D	GNExB1X05
GNExB2X05	GNExB2X10	GNExB2X15	GNExB2X21
STExB2X05	STExB2X10	STExB2X15	STExB2X21
D1xB2X05	D1xB2X10	D1xB2X15	D1xB2X21
GNExB2LD2	STExB2LD2	D1xB2LD2	

Integrity in respect of failure to function	SIL 2 and robust SIL 1
Total Failure Rate	0.48 pmh
“hazardous” failure rate (revealed)	0 pmh
“hazardous” failure rate (unrevealed)	0.48 pmh
“safe” failure rate (revealed)	0 pmh
“safe” failure rate (unrevealed)	0
System Type	B
Hardware Fault Tolerance	0
Diagnostic coverage	>60%
PFD (hazardous failure)	$2.1 \times 10^{-3}$
Proof Test Interval	Up to 1 year

The above supports a SIL2 claim. However, Technis does not recommend SIL2 as a realistic target for E2S clients in respect of functions involving human response.

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.