

Functional Safety of Electrical/
Electronic/Programmable Electronic
Safety Systems



Certificate No. BAS01SP9258X
Dated 22 August 2001
Page 1 of 4

Certificate No. BAS01SP9258X

This Certificate is issued for : The MTL 5042 Repeater Power Supply

This Certificate is issued to : Measurement Technology Limited

of Power Court
Luton LU1 3JJ

Provided that the manufacturer maintains a production system in accordance with the requirements of the Certification Mark Licensing Scheme and holds a current licence, the equipment may be marked with the Baseefa IEC 61508 Product Certification Mark reproduced above.

This certificate is issued in respect of the conformance of the equipment as a sub-system for use in a Safety System intended to conform with the requirements of IEC 61508.

In particular, the performance of the equipment as a safety related sub-system is evaluated in the terms expressed in IEC 61508 Part 2 Clause 7.4.7.3 and is summarised in the attached Schedule.

In accordance with 7.4.7.3 (m), the highest Safety Integrity Level (SIL) that can be claimed for a safety function using this sub-system in single channel is SIL 2.

Note that the SIL of the Safety System in which this equipment is integrated may vary from that indicated for the equipment alone, according to the method of integration and other factors.

If the letter X is added after the Certificate Number, this indicates that there is particular information contained in the Schedule concerning the use of the equipment.

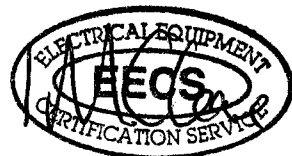
This certificate is issued in accordance with the applicable rules of the certification service. It does not necessarily indicate that the equipment may be lawfully used in particular industries or circumstances.

This certificate may be reproduced only in its entirety, without change, schedule included.

Report Reference 00(C)6116/3

File Reference EECS 0703/44/005

Baseefa Certification from
The Electrical Equipment Certification Service
The Health and Safety Executive
Harpur Hill, Buxton, Derbyshire SK17 9JN United Kingdom
Tel: +44 (0) 1298 28000 Fax: +44 (0) 1298 28244
baseefa.info.eecs@hsl.gov.uk www.baseefa.com



I M Cleare
Director

Functional Safety of Electrical/
Electronic/Programmable Electronic
Safety Systems



Certificate No. BAS01SP9258X
Dated 22 August 2001
Page 2 of 4

Schedule

Equipment :

The MTL 5042 Repeater Power Supply provides a fully floating d.c. supply for energising a 2- or 3-wire 4/20 mA transmitter (optionally with "smart" communications) located in a hazardous area, and repeats the current in another floating circuit to drive a safe area load.

For smart transmitters, the unit allows bi-directional transmission of digital communication signals superimposed on the 4/20 mA signal so that the transmitter can be interrogated either from the operator station or by a hand held communicator (HHC).

The module is intended to be mounted with other similar units from the MTL 5000 series range on a standard TS 35 mounting rail. Connections for wiring to the transmitter and to the safe area circuits are provided on the top of each module, via removable plugs.

For information and circuit parameters relating to the intrinsically safe performance of this module, see Baseefa Certificate No. BAS01ATEX7153.

Documentation :

Item	Number	Issue	Date	Description
1	TC5042-1	10	3.01	Circuit Schematic
2	AD5042-3	2	1.96	PCB Component Layout
3	PLE5042-3	9	3.01	Component Schedule
4	CI5042-1	3	8.96	PCB Artwork
5	INM5000-1	-	March 1996	Instruction Manual

Items 1 to 4 define the certified product. Item 5, together with this certificate, provide the necessary information for integration of the certified product as a sub-system within a safety system in accordance with IEC 61508.

Information relating to IEC 61508 Part 2 Clause 7.4.7.3 :

a) Functional specification of interfaces :

See Equipment Description, above. Connection information and physical installation information is given in the Instruction Manual.

The following Specifications apply in Safety Related Applications and may differ from catalogue values:

Supply Voltage Range	20 to 35 Vdc
Safe Area Load Resistance	0 to 300 ohms

**Functional Safety of Electrical/
Electronic/Programmable Electronic
Safety Systems**



**Certificate No. BAS01SP9258X
Dated 22 August 2001
Page 3 of 4**

Transfer Accuracy at 20°C	Better than 100µA
Temperature Drift	<1µA/°C

b) Estimated rates of failure in dangerous mode detected by diagnostic tests :

1.6E-07 per hour (1.4E-03 per year) This figure applies when the module is used in a system which detects output currents less than 3.6 mA and greater than 21 mA and recognises those conditions as a system failure.

c) Estimated rates of failure in dangerous mode undetected by diagnostic tests :

1.6E-08 per hour (1.4E-04 per year) This figure applies to failures which result in a wrong output within the range 3.6 mA to 21 mA which cannot be diagnosed by external equipment.

d) Environmental limits :

i) Protection against the effects of dust and water. The modules are intended to be mounted in an enclosure which provides at least IP 54 protection. Alternatively, equivalent protection may be provided by the location of mounting.

ii) Protection against the effects of vibration. The modules are intended to be mounted in a normal industrial environment without undue vibration. Type tests have been carried out in accordance with Lloyds Register Type Approval specification Standard Test 1 dated 1996 paragraph 12, Vibration Test 1, from 5 Hz to 100 Hz. From 5 Hz to 13.2 Hz the displacement was ±1.0 mm. From 13.2 Hz to 100 Hz the acceleration was ±0.7 g. For continued reliability, the level of vibration at the place of installation should normally be significantly below this value.

iii) Immunity from Electromagnetic Interference. The modules are intended to be mounted in a normal industrial environment without subjection to undue conducted or radiated interference. Type tests have shown compliance with EN 61326 "Electrical equipment for measurement, control and laboratory use - EMC requirements". For continued reliability, the level of conducted or radiated interference should not approach the values specified in that standard.

iv) Ambient Temperature Limits. -20 to +60°C continuous working
 -40 to +80°C storage

e) Lifetime limits :

There is no defined lifetime limit for safety purposes.

f) Periodic proof test and maintenance :

The instruction manual indicates a method of test that may be performed on a unit extracted from its safety system in order to confirm the accuracy of the current replication from the hazardous area loop to the safe area loop. Alternative in-situ tests may be used. In order to maintain the SIL 2 rating of the module in single channel use, it is necessary to perform this test at least once a year. Consideration should be given to more frequent testing for particularly harsh environments. The test frequency may also be varied according to the requirements of the safety system into which this sub-system is integrated.

Functional Safety of Electrical/
Electronic/Programmable Electronic
Safety Systems



Certificate No. BAS01SP9258X
Dated 22 August 2001
Page 4 of 4

g) Diagnostic coverage :

External equipment must diagnose outputs below 3.6 mA and above 21 mA as dangerous failures and take appropriate action.

h) Diagnostic test interval :

Out of range failures shall be detected on a continuous basis. In range failures are detected by performing the test at (f) above.

i) Additional information regarding Mean Time to Restoration :

Not applicable.

j) Safe failure fraction :

The safe failure fraction is 92.5%.

k) Hardware fault tolerance :

The hardware fault tolerance is 0.

l) Application limits to avoid systematic failures :

See environmental recommendations at (d) above.

m) Highest safety integrity level that can be claimed for a safety function using this sub-system :

SIL 2 may be claimed for a safety system using this subsystem subject to compliance with the diagnostic test interval. See (h) above.

n) Hardware configuration :

The hardware is identified by the documentation listed above which is applicable to all manufacture with a date code of 0120 onwards. Applicability of the certificate to future modifications will be confirmed by the issue of supplementary certification listing updated documentation.

o) Evidence of validation :

This certificate provides documentary evidence of validation. Associated confidential Certification Report No. 00(C)6116/3 details the evidence used in the validation process.

Special Information concerning the use of the equipment :

- a) The Safety Integrity Level is defined only in respect of the 4 - 20 mA analogue signal.
- b) In respect of the smart communications, the unit may be considered as non-interfering of the digital signal, provided that messages are checked for corruption by the receiving device.