IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	**IECEx CML 19.0095X**	Page 1 of 4	Certificate history:
Status:	**Current**	Issue No: 2	Issue 1 (2020-11-20) Issue 0 (2019-10-31)
Date of Issue:	2023-05-23		
Applicant:	**HMi Elements Limited** Unit A & B, Windmill Industrial Estate Showfield Lane, Malton North Yorkshire YO17 6BT **United Kingdom**		
Equipment:	**1801-Z1 Data Acquisition Unit**		
Optional accessory:			
Type of Protection:	**Flameproof "db", Increased Safety "eb", Intrinsic Safety "ib", Encapsulation "mb"**		
Marking:	Ex db eb ib mb IIC T4 Gb Ta = -40°C to +60°C		

Approved for issue on behalf of the IECEx Certification Body:	**A Snowdon**
Position:	**Certification Manager**
Signature: (for printed version)	A Snowdon
Date: (for printed version)	2023-05-23

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Certificate issued by:

Eurofins E&E CML Limited
Unit 1, Newport Business Park
New Port Road
Ellesmere Port, CH65 4LZ
United Kingdom

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Date of issue: 2023-05-23 Issue No: 2

Manufacturer: **HMI Elements Ltd.**
Unit A & B Windmill Industrial Estate
Showfield Lane
Malton, North Yorkshire, YO17 6BT
United Kingdom

Manufacturing locations:

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements.This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :
The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

IEC 60079-1:2014-06 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
Edition:7.0

IEC 60079-11:2011 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:6.0

IEC 60079-18:2014 Explosive atmospheres – Part 18: Equipment protection by encapsulation “m”
Edition:4.0

IEC 60079-7:2017 Explosive atmospheres - Part 7: Equipment protection by increased safety "e"
Edition:5.1

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Reports:

GB/CML/ExTR19.0119/00 GB/CML/ExTR20.0230/00 GB/CML/ExTR23.0100/00

Quality Assessment Report:

NO/DNV/QAR09.0001/09

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EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

The 1801-Z1 Data Acquisition Unit is an industrial stand alone data acquisition terminal for use in hazardous areas requiring equipment protection level Gb.

The equipment comprises a metallic IP66 rated enclosure with a sealed membrane front panel with OLED display and keypad. An internal flameproof compartment houses the power supply, computer unit, and multiple boards and interfaces. The display and keypad are intrinsically safe and are connected to circuits within the flameproof compartment via intrinsically safe barrier circuits.

Refer to Annex for full description and conditions of manufacture.

SPECIFIC CONDITIONS OF USE: YES as shown below:
Refer to Annex for specific conditions of use.

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)
Issue 1

This issue introduced the following changes:

1. Changes to circuits and PCB layouts
2. The use of alternative wire types

Issue 2

This issue introduced the following changes:

1. The introduction of new intrinsically safe I/O interfaces
2. The introduction of a heater mat
3. The introduction of an alternative dump valve power supply
4. The introduction of flexible build options

Annex:

Certificate Annex IECEx CML 19.0095X Iss 2.pdf

Annexe to: **IECEx CML 19.0095X, Issue 2**

Applicant: **HMi Elements Ltd.**

Apparatus: **1801-Z1 Data Acquisition Unit**

Description

The 1801-Z1 Data Acquisition Unit is an industrial standalone data acquisition terminal for use in hazardous areas requiring equipment protection level Gb.

The equipment comprises a metallic IP66 rated enclosure with a sealed membrane front panel with OLED display and keypad. An internal flameproof compartment houses the power supply, computer unit, and multiple boards and interfaces. The display and keypad are intrinsically safe and are connected to circuits within the flameproof compartment via intrinsically safe barrier circuits.

Multiple wired and wireless outputs are provided for the connection of external equipment, including intrinsically safe connections which are connected to circuits within the flameproof compartment via intrinsically safe barrier circuits.

The equipment may be fitted with any number of intrinsically safe connectors, as detailed in the user instructions. The intrinsically safe connections may be any of the following types:

Circuit type	Description	Output parameters
Rotary Encoder SA1236	One power and two signal outputs.	All pins combined w.r.t. 0V Uo = 5.88V Io = 194mA Po = 0.283W Ci = 0 Li = 0
Load cell SA1239 or SA1916	6 off outputs	Between any two outputs Uo = 5.88V Io = 59mA Po = 0.09W Ci = 0 Li = 0
Servo SA1240	2 off AC outputs	For each AC output (between pins) Uo = 15.42V Io = 24mA Po = 0.091W Ci = 0 Li = 0

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Circuit type	Description	Output parameters
Dual horn SA1235	Two 24V switched outputs	For each output (w.r.t. 0V) Uo = 26.0V Io = 88mA Po = 0.57W Ci = 0 Li = 0
Digital buttons SA1242	3 off switch inputs	For each input (between pins) Uo = 9.14V Io = 9.1mA Po = 0.021W Ci = 0 Li = 0
4-20mA loop and switches SA1238	2 off 4-20mA loop connections	For each loop Uo = 29.4V Io = 65mA Po = 0.48W Ci = 0 Li = 0
	2 off switch inputs	For each switch Uo = 29.4V Io = 33mA Po = 0.24W Ci = 0 Li = 0
NAMUR and Encoder SA1806	3 off NAMUR compatible switch inputs	For each input (between pins) Uo = 9.14V Io = 9.1mA Po = 0.021W Ci = 0 Li = 0
	One power and two signal outputs.	All pins combined w.r.t. 0V Uo = 5.88V Io = 195mA Po = 0.285W Ci = 0 Li = 0

Circuit type	Description	Output parameters
4-20mA loop SA1909	2 off 4-20mA loop connections	For each loop Uo = 27.3V Io = 61mA Po = 0.41W Ci = 0 Li = 0
WIFI	N/A	Capacitively coupled
Antenna	N/A	Capacitively coupled

The following electrical connections to the equipment are not intrinsically safe and are made via cable glands or separately certified connectors:

Connector/entry	Rating
AC supply in	100Vac – 240Vac 50/60Hz, 1.0A
AC supply out	100Vac – 240Vac 50/60Hz, 1.0A
LAN	100Vac – 240Vac 50/60Hz, 1.0A
Dump	100Vac – 240Vac 50/60Hz, 1.0A

Conditions of Manufacture

The following conditions are required of the manufacturing process for compliance with the certification.

i. Where the product incorporates certified parts or safety critical components, the manufacturer of the product defined on this certificate shall continually monitor these parts/components for any modifications introduced by the manufacturer(s) of these constituent parts. If the manufacturer of any constituent part introduces any changes which affect the compliance of the certified product that is the subject of this certificate, the manufacturer is required to have this certificate updated.

ii. The flameproof enclosure, complete with blanking plugs, shall be subjected to an overpressure test at a minimum pressure of 25 bar in accordance with IEC 60079-1:2014 clause 16. There shall be no damage or permanent deformation of the enclosure nor shall there be any leakage through the enclosure walls. The lid and base of the flameproof enclosure may be tested separately.

iii. Each fuse assembly shall be visually inspected. No damage shall be evident, such as cracks in the compound, exposure of encapsulated parts, flaking, inadmissible shrinkage, swelling, decomposition, failure of adhesion, or softening.

iv. Each fuse assembly shall be subjected to an electric strength test in accordance with IEC 60079-18 Clause 9.2 using a test voltage of 1500Vac applied between the terminals and the surface of the encapsulant (covered in foil), for a period of 1 second.
Alternatively:
    a) a voltage of 20% higher may be applied for 0.1 second
    b) a d.c. test voltage is allowed as an alternative to the a.c. test voltage and shall be 170% of the specified a.c. r.m.s. test voltage.

    Alternatively, the equipment may be subjected to batch testing in accordance with IEC 60079-18 Ed.4.1 Annex C.

v. The equipment shall be subjected to an electric strength test in accordance with the requirements of IEC 60079-7 Clause 6.1 using a test voltage of 1500Vac applied between the supply terminals and frame, for a period of 1 second.
Alternatively, a d.c. test voltage is allowed as an alternative to the a.c. test voltage and shall be 170% of the specified a.c. r.m.s. test voltage.

vi. The manufacturer shall ensure that any equipment certified cable glands, bushings, breather drains, and connectors fitted to the equipment meet the requirements of IEC 60079-0 Ed. 7, IEC 60079-1 Ed. 7, and IEC 60079-7 Ed. 5 as appropriate, and that all conditions of use and relevant ratings are adhered to. All such parts shall be suitable for use at a service temperature range -40°C to 70°C. Any such parts fitted to the exterior of the equipment enclosure shall provide a minimum ingress protection of IP66.

vii. Entries into the equipment for all non intrinsically safe connections shall be via suitably certified cable glands or via suitably certified Ex d e plugs and sockets.

viii. The manufacturer shall ensure that the customer specific instructions provide details of the circuits and applicable intrinsically safe parameters for each of the intrinsically safe connections.

Specific Conditions of Use

The following conditions relate to safe installation and/or use of the equipment.

i. Under certain extreme circumstances, the non-metallic parts incorporated in the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore, the equipment shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces e.g. where a charge-generating mechanism (such as wind-blown dust) is possible. In addition, the equipment shall only be cleaned with a damp cloth.

ii. The bolts securing the lid of the flameproof compartment shall be M6 x 24 mm (min) to 36 mm (max) alloy steel hexagon socket head types with a material grade of 12.9 or better.

iii. The user shall refer to the user specific instructions for details of the intrinsically safe parameters applicable to their equipment.

Components covered by Ex Certificates issued to older editions of Standards

Certificate number	Standards (incl Ed)	Assessment result
IECEx KEM 10.0093U	IEC 60079-0 Ed. 6 IEC 60079-7 Ed. 4	Technical differences evaluated and found satisfactory. For detail see ExTR
IECEx SEV 14.0010U	IEC 60079-0 Ed. 6 IEC 60079-7 Ed. 4	
IECEx UL 13.0077U	IEC 60079-0 Ed.6	