



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 15.0008X**

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Certificate history:

Status: **Current**

Issue No: 3

Issue 2 (2018-08-14)

Issue 1 (2017-09-18)

Issue 0 (2015-03-20)

Date of Issue: 2021-04-27

Applicant: **Controlled Systems Limited**

Ryder Close

Swadlincote

Derbyshire

DE11 9EU

United Kingdom

Equipment: **RugiCAM-IP and RugiCAM-LED Network Camera**

Optional accessory:

Type of Protection: **Intrinsically Safe**

Marking:

Ex ia I Ma

Ex ia IIB T4 Ga

Ex ia IIIC T135°C Da

Ta = -40°C to +60°C

Ta = -20°C to +60°C (when the KROTT type connector is used)

Approved for issue on behalf of the IECEx
Certification Body:

A Snowdon MIET

Position:

Assistant Certification Manager

Signature:
(for printed version)

A Snowdon

Date:

2021-04-27

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.



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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Manufacturer: **Controlled Systems Limited**
Ryder Close
Swadlincote
Derbyshire.
DE11 9EU.
England
United Kingdom

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

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/ExTR15.0016/00](#)
[GB/CML/ExTR21.0066/00](#)

[GB/CML/ExTR17.0167/00](#)

[GB/CML/ExTR18.0163/00](#)

Quality Assessment Report:

[GB/SIR/QAR07.0023/13](#)



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EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

RugiCAM-IP Network Camera (IP Camera) comprises a rugged metallic enclosure with a toughened glass window. Within the enclosure is installed a small camera and associated electronics that have been encapsulated. The camera is supplied from either a local Intrinsically Safe power supply or a Power over IS Ethernet (PoEx) supply via the LAN connector. The camera unit may communicate as an alternative to the LAN connection via a WiFi interface also. It may connect to other equipment via an RS-485 Comms port and also interfaces to the optional LED Lighting units by a wired 'daisy-chain' connection.

See Annex for full description and Conditions of Manufacture

SPECIFIC CONDITIONS OF USE: YES as shown below:

See Annex for Specific Conditions of Use.



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Issue No: 3

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

Issue 1

This issue introduced the following modifications:

1. To update the certificate reference to the 2014/34/EU Directive.
2. To permit alternative type of Connector X5
3. Addition of Fuse FS1 on RugiCam Board 2 and change of thyristor type
4. Addition of Fuse FS2 on RugiCam LED1 Board and change of thyristor type
5. Correction of parameters associated RugiCAM-IP

Issue 2

This issue introduced the following modifications:

1. To permit alternative camera and Wi-fi modules to be fitted to the existing RugiCAM-IP Network Camera.
2. To permit an integral Wi-Fi antenna 'Puck' to be fitted as an alternative to the existing TNC screw-on antenna.
3. To permit the inclusion of three optional indicating LEDs at the rear of the enclosure in place of two connectors.
4. To permit the RS-485 parameters to be stated as individual lines for the TX/RX lines to bring the output into line with other similar equipment.
5. To permit various changes to the RugiCAM-IP-BD1, the RugiCAM-IP-BD2 and the RugiCAM-LED-BD1 circuit board.
6. To amend the value of Ui applied to the LAN port.

Issue 3

This issue introduced the following modifications:

1. To update the standards to the latest edition.
2. To add alternative Ethernet/Power 7-pin Connector.
3. To add internal microphone.
4. Input parameter change for the Ui. The description of the product on the certificate has been updated accordingly.

Annex:

[Certificate Annex IECEx CML 15_0008X Iss3.pdf](#)

Annexe to: IECEx CML 15.0008X Issue 3
Applicant: Controlled Systems Ltd
Apparatus: RugiCAM-IP Network Camera



Description of Equipment

RugiCAM-IP Network Camera (IP Camera) comprises a rugged metallic enclosure with a toughened glass window. Within the enclosure is installed a small camera and associated electronics that have been encapsulated. The camera is supplied from either a local Intrinsically Safe power supply or a Power over IS Ethernet (PoEx) supply via the LAN connector. The camera unit may communicate as an alternative to the LAN connection via a WiFi interface also. It may connect to other equipment via an RS-485 Comms port and also interfaces to the optional LED Lighting units by a wired 'daisy-chain' connection.

The RugiCAM-IP Network Camera (LED Lighting Module) comprises a rugged metallic enclosure with a toughened glass window. Within the enclosure are printed circuit boards (PCBs) containing either White LED lights or Infrared LED lights, and associated electronic circuitry.

The electronic circuitry is fully encapsulated. The lighting module is supplied from a local Intrinsically Safe power supply and interfaces to the camera and other LED units by a wired 'daisy-chain' connection.

The camera and lighting module(s) may be used together or separately. In both cases the enclosure can be manufactured out of coated/painted steel, stainless steel or aluminium to suit the application and industry.

The camera uses ExLAN, a Component Approved Intrinsically Safe 10/100 Ethernet Interface module which provides an interface for standard Cat 5e/Cat 6 Ethernet cabling systems together with Power over IS Ethernet (PoEx) compatibility.

The ExLAN interface also contains duplicated Over Voltage Protection (OVP) circuitry that limits the supply at 5.88V for the Intrinsically Safe voltage limited circuit. The whole circuit is fully encapsulated within the camera assembly

The equipment has the following safety input parameters that are connected to:

15.4Vdc POWER (X1: 4-Pole M12 Connector)

Pin3 wrt Pin4

Group	Ui	Ci	Li
I	15.4Vdc	0	0
IIA/IIIA			
IIB/IIIB			
IIIC			



RS485 COMMS (X1: 4-Pole M12 Connector)

Pin1 wrt Pin4, Pin2 wrt Pin4

Group	Ui	Uo	Io	Po	Ci	Li
I	7.2V	5.88V	111mA	163mW	0	0
IIA/IIIA						
IIB/IIIB						
IIIC						

The capacitance and either the inductance or the inductance to resistance ratio (L/R) of the load connected to the output terminals must not exceed the following values:

Group	Capacitance (μF)	Inductance (mH)	or	L/R Ratio (μH/Ohm)
I	1000	9.55		1436
IIA	1000	5.82		875
IIB	1000	2.91		438

LED INTERFACE (X2/X3: 4-Pole M12 Connector)

Pin1 wrt Pin4, Pin2 wrt Pin4, Pin1 wrt Pin4, Pin2 wrt Pin4

Group	Ui	Uo	Io	Po	Ci	Li
I	15V	5.88V	52mA	76mW	0	0
IIA/IIIA						
IIB/IIIB						
IIIC						

The capacitance and either the inductance or the inductance to resistance ratio (L/R) of the load connected to the output terminals must not exceed the following values:

Group	Capacitance (μF)	Inductance (mH)	or	L/R Ratio (μH/Ohm)
I	1000	175.4		6154
IIA	1000	106.9		3751
IIB	1000	53.4		1875

Wi-Fi ANTENNA (X4: TNC Connector)

Group	Po (RF)
I	500mW
IIA/IIIA	
IIB/IIIB	
IIIC	

Note: The type and length of any antenna cable and the antenna itself are classified as simple apparatus and are not restricted by the output parameters

LAN (10/100 Ethernet) (X5: 8-Pole M12 Connector)

Group	Ui	Uo	Io	Ci	Li
I	15.4V	5.88V	2.18A	0.48μF	0
IIA/IIIA					
IIB/IIIB					
IIIC					

Note: Io = 2.18A is the total for the 4 Ethernet lines (each line 545mA)

The capacitance and either the inductance or the inductance to resistance ratio (L/R) of the load connected to the output terminals must not exceed the following values:

Group	Capacitance (μF)	Inductance (μH)	or	L/R Ratio (μH/Ohm)
I	1000	97.9		145
IIA	1000	59.9		89
IIB	1000	29.9		44

If PoEx is used, then the parameters of the PoEx power supply must also be considered

The 10/100 Ethernet port may be connected to any other equipment having appropriate Entity parameters.

It is also permissible to be connected to 9400 Ethernet modules covered by these existing certificates (with or without PoEx) –

9400 Ethernet module reference	Certificate No.
9400 Series Ethernet Modules	Sira 07ATEX2064X / IECEx SIR 07.0042X
9468 Ethernet Isolator	Sira 07ATEX2065 / IECEx SIR 07.0043
9468 Ethernet Isolator (Zone 2)	Sira 08ATEX4130X / IECEx SIR 08.0032X

Conditions of Manufacture

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

- Where the product incorporates certified parts or safety critical components, the manufacturer shall ensure that any changes to those parts or components do not affect the compliance of the certified product that is the subject of this certificate.
- When the KROTT type connector is used, the marked IP rating is changed to IP65 and the marked ambient temperature range is changed to -20°C to +60°C.

Specific Conditions of Use

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

- i. Versions of the enclosure can be manufactured from aluminium (part number includes AA – Anodised Aluminium). In rare cases, ignition sources due to impact and friction sparks could occur with this type of enclosure. This shall be considered during installation, particularly if the equipment is installed in a Zone 0 or Group I (mining) location. If in doubt, use a stainless steel (SS) or coated/painted steel (CS) enclosure.
- ii. If the enclosure is coated or painted then it must be installed in such a manner that the danger of ignition of flammable dust due to propagating brush discharges is avoided.
- iii. If a WiFi puck is fitted, under certain extreme circumstances, the non-metallic parts incorporated in the enclosure 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. This is particularly important if the equipment is installed in a zone 0 location. In addition, the equipment shall only be cleaned with a damp cloth.