EU Type Examination Certificate CML 15ATEX2016X Issue 3

1 Equipment intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU

2 Equipment **RugiCAM-IP Network Camera**

3 Manufacturer **Controlled Systems Ltd**

4 Address **Ryder Close,**
Swadlincote,
Derbyshire,
DE11 9EU
UK

5 The equipment is specified in the description of this certificate and the documents to which it refers.

6 CML B.V., Chamber of Commerce No 6738671, Koopvaardijweg 32, 4906CV Oosterhout, The Netherlands, Notified Body Number 2776, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential reports listed in Section 12.

7 If an 'X' suffix appears after the certificate number, it indicates that the equipment is subject to conditions of safe use (affecting correct installation or safe use). These are specified in Section 14.

8 This EU Type Examination certificate relates only to the design and construction of the specified equipment or component. Further requirements of Directive 2014/34/EU Article 13 apply to the manufacture of the equipment or component and are separately certified.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the confidential report, has been demonstrated through compliance with the following documents:

EN IEC 60079-0:2018 EN 60079-11:2012

10 The equipment shall be marked with the following:

Ex II 1 G D	Ex I M1
Ex ia IIB T4 Ga Ex ia IIIC T135°C Da	Ex ia I Ma
Ta= -40°C to +60°C	Ta= -40°C to +60°C
Ta= -20°C to +60°C*	Ta= -20°C to +60°C*

* When the KROTT type connector is used

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11 Description

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	15.4 Vdc	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

Variation 1

This variation introduces the following modifications:

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

Variation 2

This variation introduces the following modifications:

i. To permit alternative camera and Wi-fi modules to be fitted to the existing RugiCAM-IP Network Camera.
ii. To permit an integral Wi-Fi antenna ‘Puck’ to be fitted as an alternative to the existing TNC screw-on antenna.
iii. To permit the inclusion of three optional indicating LEDs at the rear of the enclosure in place of two connectors.
iv. 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.
v. To permit various changes to the RugiCAM-IP-BD1, the RugiCAM-IP-BD2 and the RugiCAM-LED-BD1 circuit board.
vi. To amend the value of Ui applied to the LAN port.

Variation 3

This variation introduces the following modifications:

i. To update the standards to the latest edition.
ii. To add alternative Ethernet/Power 7-pin Connector.
iii. To add internal microphone.
iv. Input parameter change for the Ui. The description of the product on the certificate has been updated accordingly.
v. To recognise the previous transfer of the certification from CML UK to CML B.V., on the certificate.

12 Certificate history and evaluation reports

Issue	Date	Associated report	Notes
0	20/03/2015	R211A/00	Issue of prime certificate
1	18/09/2017	R11295A/00	Introduction of Variation 1
2	14/08/2018	R11839A/00	Introduction of Variation 2
3	27/04/2021	R14037A/00	Introduction of Variation 3

Note: Drawings that describe the equipment or component are listed in the Annex.

13 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 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.

ii. 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.

14 Specific Conditions of Use (Special Conditions)

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.

Certificate Annex

Certificate Number	CML 15ATEX2016X
Equipment	RugiCAM-IP Network Camera
Manufacturer	Controlled Systems Ltd

The following documents describe the equipment or component defined in this certificate:

Issue 0

Drawing No	Sheets	Rev	Approved date	Title
RugiCAM-IP Network Camera (IP Camera)				
RugiCAM-IP-BD1	1 of 1	1	10 Mar 15	IP Camera Board 1 – Circuit Diagram
RugiCAM-IP-BD2	1 of 1	1	10 Mar 15	IP Camera Board 2 – Circuit Diagram
M12-FLEX-FE	1 of 1	1	10 Mar 15	M12 X-Code Connector Flex Circuit Diagram
RugiCAM-IP-BD1 PCB	1 of 1	1	10 Mar 15	IP Camera Board 1 – Art Work
RugiCAM-IP-BD2 PCB	1 of 1	1	10 Mar 15	IP Camera Board 2 – Art Work
M12-FLEX-FE PCB	1 of 1	1	10 Mar 15	M12-FLEX-FE Art Work
RugiCAM-IP Network Camera (LED Lighting Module)				
RugiCAM-LED1	1 of 1	1	10 Mar 15	IP Camera Board 1 – Circuit Diagram
RugiCAM-LED2	1 of 1	1	10 Mar 15	IP Camera Board 2 + 3 – Circuit Diagram
RugiCAM-LED-BD1 PCB	1 of 1	1	10 Mar 15	IP Camera Board 1 – Art Work
RugiCAM-LED-BD2 PCB	1 of 1	1	10 Mar 15	IP Camera Board 2 – Art Work
RugiCAM-LED-BD3 PCB	1 of 1	1A	10 Mar 15	IP Camera Board 3 – Art Work
RugiCAM-IP Network Camera Common Drawings				
RugiCAM-IP-ASSY	1 to 2	1	10 Mar 15	Camera + LED Assembly Drawing
RugiCAM-IP ATEX IECEx Label	1 of 1	1	10 Mar 15	RugiCAM-IP Label Drawing

Issue 1

Drawing No	Sheets	Rev	Approved date	Title
RugiCAM-IP Network Camera (IP Camera)				
RugiCAM-IP-BD2	1 of 1	2	18/09/2017	IP Camera Board 2 – Circuit Diagram
RugiCAM-IP-BD2 PCB	1 of 1	2	18/09/2017	IP Camera Board 2 – Art Work
RugiCAM-IP Network Camera (LED Lighting Module)				
RugiCAM-LED1	1 of 1	2	18/09/2017	IP Camera Board 1 – Circuit Diagram
RugiCAM-LED-BD1 PCB	1 of 1	2	18/09/2017	IP Camera Board 1 – Art Work
RugiCAM-IP Network Camera Common Drawings				
RugiCAM-IP-ASSY	1 to 2	2	18/09/2017	Camera + LED Assembly Drawing

Certificate Annex

Certificate Number CML 15ATEX2016X

Equipment RugiCAM-IP Network Camera

Manufacturer Controlled Systems Ltd

Issue 2

Drawing No	Sheets	Rev	Approved date	Title
RugiCAM-IP Network Camera (IP Camera)				
RugiCAM-IP-BD1	1 of 1	2	14/08/2018	IP Camera Board 1 – Circuit Diagram
RugiCAM-IP-BD2	1 of 1	3	14/08/2018	IP Camera Board 2 – Circuit Diagram
RugiCAM-IP-BD1 PCB	1 of 1	2	14/08/2018	IP Camera Board 1 – Art Work
RugiCAM-IP-BD2 PCB	1 of 1	3	14/08/2018	IP Camera Board 2 – Art Work
RugiCAM-IP Network Camera (LED Lighting Module)				
RugiCAM-LED1	1 of 1	3	14/08/2018	RugiCAM LED1 – Circuit Diagram
RugiCAM-LED-BD1 PCB	1 of 1	3	14/08/2018	RugiCAM LED1 – Art Work
RugiCAM-IP Network Camera Common Drawings				
RugiCAM-IP-ASSY	1 to 3	3	14/08/2018	Camera + LED Assembly Drawing

Issue 3

Drawing No	Sheets	Rev	Approved date	Title
RUGICAM-IP-BD1	1 of 1	2A	16 Apr 2021	IP Camera Board 1 circuit diagram
RugiCAM-IP Assy	1 to 3	5	16 Apr 2021	CSL RugiCAM-IP Camera + LED Unit Assembly Drawing
RugiCAM-IP ATEX-IECEx Label	1 of 1	2	16 Apr 2021	RugiCAM-IP ATEX-IECEx Certification label Drawing