IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

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

Certificate No.:	IECEx SIR 07.0042X	Issue No: 2	Certificate history:
			Issue No. 2 (2011-07-27)
Status:	**Current**	Page 1 of 5	Issue No. 1 (2009-10-27)
			Issue No. 0 (2008-09-09)
Date of Issue:	**2011-07-27**		

Applicant: **Controlled Systems Limited**
Ryder Close
Cadley Hill
Swadlincote
Derbyshire DE11 9EU
United Kingdom

Equipment: **9400 Ethernet Module**

Optional accessory:

Type of Protection: **Intrinsic safety, Dust and 'op is'**

Marking:
Ma Ex ia I
Ma Ex ia op is I
Ga Ex ia IIC T4
Ga Ex ia op is IIC T4
Ex iaD 20 T135 °C
(Ta = -40 °C to +60 °C or +70 °C)
For markings applicable to specific models, refer to the Certificate Annexe

Approved for issue on behalf of the IECEx Certification Body: D R Stubbings BA MIET

Position: Certification Manager

Signature:
(for printed version)

Date:

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 the Official IECEx Website.

Certificate issued by:

SIRA Certification Service
Rake Lane
Eccleston
Chester
CH4 9JN
United Kingdom

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Manufacturer: **Controlled Systems Limited**
Ryder Close
Cadley Hill
Swadlincote
Derbyshire DE11 9EU
United Kingdom

Additional Manufacturing location(s):

Measurement Technology Ltd
Great Marlings
Butterfield
Luton
Bedfordshire
LU2 8DL
United Kingdom

MTL Instruments Pvt Limited
No 3 Old Mahabalipuram Road
Sholinganallur
Chennai 600119
India

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 electrical apparatus 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 : 2004 Edition:4.0	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
IEC 60079-11 : 2006 Edition:5	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-28 : 2006-08 Edition:1	Explosive atmospheres - Part 28: Protection of equipment and transmission systems using optical radiation
IEC 61241-0 : 2004 Edition:1	Electrical apparatus for use in the presence of combustible dust - Part 0: General requirements
IEC 61241-11 : 2005 Edition:1	Electrical apparatus for use in the presence of combustible dusts - Part 11: Protection by intrinsic safety 'iD'

*This Certificate **does not** indicate compliance with electrical 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 Report:

GB/SIR/ExTR07.0071/00	GB/SIR/ExTR09.0170/00	GB/SIR/ExTR11.0192/00

Quality Assessment Report:

GB/BAS/QAR06.0022/01	GB/BAS/QAR06.0022/02	GB/BAS/QAR06.0022/03
GB/BAS/QAR07.0017/00	GB/BAS/QAR07.0017/01	GB/BAS/QAR07.0017/02
GB/SIR/QAR07.0023/01	GB/SIR/QAR07.0023/02	GB/SIR/QAR07.0023/03

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GB/SIR/QAR07.0023/04

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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The **9400 Series Ethernet Modules** are designed to extend an Ethernet network into a hazardous area and also to act as an interface between an Ethernet network and equipment having a wireless connection or a serial communication port.

There are four types of Modules, these are all intended to be located in the hazardous area and are fully described in the Annexe to this certificate.

CONDITIONS OF CERTIFICATION: YES as shown below:

1. When used with Group I gases, the Modules shall each be mounted within an enclosure providing a degree of protection of at least IP54, in accordance with EN 60529, and in a manner that does not impair the existing creepage and clearance distances. The enclosure shall also comply with the requirements of Clauses 7 and 8 of EN 60079-0:2006.
2. The connectors do not meet the ingress protection rating of IP20, therefore, this shall be taken into consideration during the installation of the 9400 Series Ethernet Modules when used with Group II gases, and each module shall be provided with an enclosure that is commensurate with the environment into which it is installed.
3. The supply to the modules must be derived from a suitably certified, intrinsically safe supply.

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

Issue 1 – this Issue introduced the following changes:	
1.	The original list of standards was corrected.
2.	The address of Measurement Technology Ltd. was changed from Power Court, Luton, Bedfordshire LU1 3JJ, UK to Great Marlings, Butterfield, Luton, Bedfordshire LU2 8DL, UK.
3.	The type 9465-ET Ethernet Module was modified to allow the use of an extended range of fibre optic transmitter and transmitter/receiver devices.
4.	The optical output associated with the type 9465-ET Ethernet Module was assessed against the 'op is' requirements of EN 60079-28:2007 and its marking was modified to show information that is required by this standard.
Issue 2 – this Issue introduced the following changes:	
1	The replacement of the existing TNC antenna connectors with the smaller SMA connectors was allowed. Versions with this new connector will now be designated as a 9469-ETPLUS or 9469-ET+, the + sign signifying the enhance model.
2	The blocking capacitors C13 to C16 were approved to be replaced from the existing 10nF capacitors with 100pF capacitors.
3	The introduction of minor changes not affecting the intrinsic safety assessment, these include changing the type of diode used for D1 & D2 and removing component FB3.
4	PCB layout changes to cover the component changes above were endorsed.
5	The introduction of a note clarifying the situation with the antennae was inserted on page 7 of the annexe associated with this issue.

Annex:

IECEx SIR 07.0042X_Issue2_Annexe.pdf

DESCRIPTION OF EQUIPMENT

The **9400 Series Ethernet Modules** are designed to extend an Ethernet network into a hazardous area and also to act as an interface between an Ethernet network and equipment having a wireless connection or a serial communication port.

The following 4 types of Modules are intended to be located in the hazardous area:

The **9461-ET Module** is configured as an Ethernet gateway to enable existing equipment having a serial communications port to be connected to an Ethernet network.

The **9465-ET Module** is configured as a 10/100 Mbps Fibre to Copper Media Converter to allow an Ethernet network to be extended over a greater distance. The fibre optic link may be up to 2 kilometres in length when running at 100 Mbps and, due to the use of 1300 nm optics, an extended distance of 5 kilometres is achievable at 10 Mbps. Longer distances may be obtained by connecting a **9466-ET** (10/100 Mbps Ethernet Switch) between two **9465-ET** media converters, effectively giving a 'repeater' function (This also provides 3 x UTP ports available for local network connectivity and is the 'typical' configuration encountered). The fibre optics of the **9465-ET Module** also permits 9400 Series Ethernet Modules in the non-hazardous area to communicate with other 9400 Series Ethernet Modules in the hazardous area and vice versa.

The **9466-ET Module** is configured as a 10/100 Mbps Ethernet Switch to allow the interconnection of the 9400 Series Ethernet Modules via its five, Ethernet connectors. The **9466-ET Module** also enables an Ethernet network to span a greater distance when used in conjunction with **9465-ET Module** media converters. This is achieved by the low latency 'store and forward' mechanism integral to the switch that only transmits 'good' packets of data and ensures that the stringent timing associated with Ethernet is maintained. Each connection of the **9466-ET Module** is effectively a 'point-to-point' network segment unlike the older generation hubs that were simple 'dumb' repeaters.

The **9469-ET Module** is configured as a wireless communication unit having a microwave output less than 500 mW. The aerial may be either omnidirectional or unidirectional depending upon application. The **9469-ET Module** also permits communication between a **9469-ET Module** in the non-hazardous area to communicate with a **9469-ET Modules** in the hazardous area.

The **9400 Series Ethernet Modules** comprise electronic components mounted on printed circuit boards all completely encapsulated within a plastic enclosure designed for mounting on a DIN rail. External electrical connections are made via screw type terminals and/or connectors mounted on the front of the enclosure.

Applicable Marking

9461 & 9466 Modules	9465 Module	9469 Module
Ma Ex ia I Ga Ex ia IIC T4 Ex iaD 20 T135°C (Ta = -40°C to +70°C)	Ma Ex ia I Ma Ex ia op is I Ga Ex ia IIC T4 Ga Ex ia op is IIC T4 Ex iaD 20 T135°C (Ta = -40°C to +70°C)	Ma Ex ia I Ga Ex ia IIC T4 Ex iaD 20 T135°C (Ta = -40°C to +60°C)

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Apparatus supply and Input/Output parameters

The **9461 Ethernet Gateway Module** has the following safety description:

(Supply input)
Terminals T1, T2 wrt T3, T4

Ui	=	15.4 V
Ci	=	0
Li	=	0

(RS485/422 Port 3)
Terminals T6 wrt T10, T7 wrt T10, T8 wrt T10, T9 wrt T10

Ui	=	7.2 V
Ci	=	0
Li	=	0
Uo	=	5.88 V
Io	=	111 mA
Po	=	163 mW
Co	=	20 µF
Lo	=	3 mH

(RS485/422 Port 4)
Terminals T11 wrt T15, T12 wrt T15, T13 wrt T15, T14 wrt T15

Ui	=	7.2 V
Ci	=	0
Li	=	0
Uo	=	5.88 V
Io	=	111 mA
Po	=	163 mW
Co	=	20 µF
Lo	=	3 mH

(TTL/RS232 Port 1)
(Connector CON1)
Pin 9 wrt Pin 5

Ui	=	0
Ci	=	0
Li	=	0
Uo	=	5.88 V
Io	=	188 mA
Po	=	276 mW
Co	=	20 µF
Lo	=	2.26 mH

Pin 3 wrt Pin 5, Pin 4 wrt Pin 5, Pin 7 wrt Pin 5

Ui	=	5.88 V
Ci	=	0
Li	=	0
Uo	=	5.88 V
Io	=	16 mA
Po	=	24 mW
Co	=	20 µF
Lo	=	138 mH

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Pin2 wrt Pin 5, Pin 1 wrt Pin 5

Ui	=	12.5 V
Ci	=	0
Li	=	0
Uo	=	3.15 V
Io	=	3.4 mA
Po	=	2.7 mW
Co	=	50 µF
Lo	=	1.0 H

(TTL/RS232 Port 2)
(Connector CON2)
Pin 9 wrt Pin 5

Ui	=	0
Ci	=	0
Li	=	0
Uo	=	5.88 V
Io	=	188 mA
Po	=	276 mW
Co	=	20 µF
Lo	=	2.26 mH

Pin 3 wrt Pin 5, Pin 4 wrt Pin 5, Pin 7 wrt Pin 5

Ui	=	5.88 V
Ci	=	0
Li	=	0
Uo	=	5.88 V
Io	=	16 mA
Po	=	24 mW
Co	=	20 µF
Lo	=	138 mH

Pin 2 wrt Pin 5, Pin 1 wrt Pin 5

Ui	=	12.5 V
Ci	=	0
Li	=	0
Uo	=	3.15 V
Io	=	3.4 mA
Po	=	2.7 mW
Co	=	50 µF
Lo	=	1.0 H

RJ45 Connector
(10/100 Base T)

Uo	=	0
Io	=	0
Po	=	0
Ci	=	0.075µF
Li	=	0
Ui	=	15.4 V Maximum (PoEx)

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The **9465 10/100 Media Converter Module** has the following safety description:

(Supply input)
Terminals T1, T2 wrt T3, T4

Ui = 15.4 V
Ci = 0
Li = 0

Fibre-optic transmitter
(HFBR1312 or AFBR-5803AZ or AFCT-5179CZ)

Po = 5 mW maximum Optical

RJ45 Connector
(10/100 Base T)

Uo = 0
Io = 0
Po = 0
Ci = 0.075µF
Li = 0
Ui = 15.4 V Maximum (PoEx)

The **9466 10/100 5 Port Switch Module** has the following safety description:

(Supply input)
Terminals T1, T2 wrt T3, T4

Ui = 15.4 V
Ci = 0
Li = 0

(PoEx Supply inputs)
Terminals T6 wrt T7, T8 wrt T9, T10 wrt T11, T12 wrt T13, T14 wrt T15

Ui = 15.4 V
Ci = 0.075 µF
Li = 0

mini DIN 8-way connector
(Connector CON1)
(Management Port)
Pin 5 wrt Pins 4 and 8

Ui = 12.5 V
Ci = 0
Li = 0
Uo = 3.15 V
Io = 3.4 mA
Po = 2.7 mW
Co = 50 µF
Lo = 1.0 H

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Pins 1, 3 and 4 wrt Pins 5 and 6

Ui	=	0
Ci	=	0
Li	=	0
Uo	=	5.88 V
Io	=	48 mA
Po	=	72 mW
Co	=	20 µF
Lo	=	15 mH

RJ45 Connector A
(10/100 Base T)

Uo	=	0
Io	=	0
Po	=	0
Ci	=	0.075µF
Li	=	0
Ui	=	0 (PoEx)
Uo	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T6 wrt T7 for the PoEx output parameters
Io	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T6 wrt T7 for the PoEx output parameters
Po	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T6 wrt T7 for the PoEx output parameters
Co	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T6 wrt T7 for the PoEx output parameters
Lo	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T6 wrt T7 for the PoEx output parameters
Lo/Ro	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T6 wrt T7 for the PoEx output parameters

RJ45 Connector B
(10/100 Base T)

Uo	=	0
Io	=	0
Po	=	0
Ci	=	0.075µF
Li	=	0
Ui	=	0 (PoEx)
Uo	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T8 wrt T9 for the PoEx output parameters
Io	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T8 wrt T9 for the PoEx output parameters
Po	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T8 wrt T9 for the PoEx output parameters
Co	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T8 wrt T9 for the PoEx output parameters
Lo	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T8 wrt T9 for the PoEx output parameters
Lo/Ro	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T8 wrt T9 for the PoEx output parameters

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RJ45 Connector C
(10/100 Base T)

Uo	=	0
Io	=	0
Po	=	0
Ci	=	0.075µF
Li	=	0
Ui	=	0 (PoEx)
Uo	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T10 wrt T11 for the PoEx output parameters
Io	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T10 wrt T11 for the PoEx output parameters
Po	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T10 wrt T11 for the PoEx output parameters
Co	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T10 wrt T11 for the PoEx output parameters
Lo	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T10 wrt T11 for the PoEx output parameters
Lo/Ro	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T10 wrt T11 for the PoEx output parameters

RJ45 Connector D
(10/100 Base T)

Uo	=	0
Io	=	0
Po	=	0
Ci	=	0.075µF
Li	=	0
Ui	=	0 (PoEx)
Uo	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T12 wrt T13 for the PoEx output parameters
Io	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T12 wrt T13 for the PoEx output parameters
Po	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T12 wrt T13 for the PoEx output parameters
Co	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T12 wrt T13 for the PoEx output parameters
Lo	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T12 wrt T13 for the PoEx output parameters
Lo/Ro	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T12 wrt T13 for the PoEx output parameters

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RJ45 Connector E
(10/100 Base T)

Uo	=	0
Io	=	0
Po	=	0
Ci	=	0.075µF
Li	=	0
Ui	=	0 (PoEx)
Uo	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T14 wrt T15 for the PoEx output parameters
Io	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T14 wrt T15 for the PoEx output parameters
Po	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T14 wrt T15 for the PoEx output parameters
Co	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T14 wrt T15 for the PoEx output parameters
Lo	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T14 wrt T15 for the PoEx output parameters
Lo/Ro	=	Refer to the certified parameters of the intrinsically safe power supply connected to Terminals T14 wrt T15 for the PoEx output parameters

The **9469 WLAN AP/Bridge Module** has the following safety description:

(Supply input)
Terminals T1, T2 wrt T3, T4

Ui	=	12.8 V
Ci	=	0
Li	=	0

Antenna "A"
TNC Connector

Po = 500 mW maximum RF

Antenna "B"
TNC Connector

Po = 500 mW maximum RF

NOTE: The type and length of the antenna cable and the antenna are classified as simple apparatus, and are not required to be specified by this certificate.

RJ45 Connector
(10/100 Base T)

Uo	=	0
Io	=	0
Po	=	0
Ci	=	0.075µF
Li	=	0
Ui	=	12.8 V Maximum (PoEx)

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Conditions of Manufacture

The manufacturer shall note the following Conditions of Manufacture:

1 The products covered by this certificate incorporate previously certified devices, it is therefore the responsibility of the manufacturer to continually monitor the status of the certification associated with these devices, and the manufacturer shall inform Sira of any modifications of the devices that may impinge upon the explosion safety design of their products.

2 Assembly DB1 shall be constructed from 2 zener diodes type 1N5339B connected in parallel.

3 The manufacturer shall only use the following optical transmitters or combined transmitters/receivers with the type 9465-ET Ethernet Module, these devices are fitted on the media convertor board for the component with designation FO3:

Permitted device types	Device description
Agilent or Avago Technologies HFBR-14x2xx Agilent or Avago Technologies HFBR-14x4xx	Fiber optic transmitter
Agilent or Avago Technologies HFBR-1312T Agilent or Avago Technologies HFBR-1312TZ	Fiber optic transmitter and receiver
Agilent or Avago Technologies AFBR-5803Z Agilent or Avago Technologies AFBR-5803AZ Agilent or Avago Technologies AFBR-5803TZ Agilent or Avago Technologies AFBR-5803ATZ	Fiber optic transmitter and receiver
Agilent or Avago Technologies AFCT-5179xZ	Fiber optic transmitter and receiver

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