



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 CML 16.0054X	Issue No: 0	Certificate history: Issue No. 0 (2017-02-28)
Status:	Current	Page 1 of 4	
Date of Issue:	2017-02-28		
Applicant:	Trex Limited Newby Road Hazel Grove Stockport Cheshire SK7 5DY United Kingdom		
Equipment:	TX2124 Serial to Wi-Fi/Ethernet Interface		
Optional accessory:			
Type of Protection:	Intrinsic Safety		
Marking:	Ex ia I Ma Ex ia IIC T4 Ga [Ex ia Da] IIC T135°C Tamb = -40°C to +70°C		

Approved for issue on behalf of the IECEx
Certification Body:

A Snowden

Position:

Certification Officer

Signature:
(for printed version)

A Snowden

Date:

February 28, 2017

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:



IECEx Certificate of Conformity

Certificate No: IECEx CML 16.0054X

Issue No: 0

Date of Issue: 2017-02-28

Page 2 of 4

Certification Management Limited
Unit 1, Newport Business Park
New Port Road
Ellesmere Port
CH65 4LZ
United Kingdom





IECEx Certificate of Conformity

Certificate No: IECEx CML 16.0054X

Issue No: 0

Date of Issue: 2017-02-28

Page 3 of 4

Manufacturer: **Trox Limited**
Newby Road
Hazel Grove
Stockport
Cheshire
SK7 5DY
United Kingdom

Additional Manufacturing location(s):

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 : 2011 Explosive atmospheres - Part 0: General requirements
Edition:6.0

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

*This Certificate **does not** indicate compliance with 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/CML/ExTR17.0025/00](#)

Quality Assessment Report:

[GB/SIR/QAR07.0017/06](#)



IECEx Certificate of Conformity

Certificate No: IECEx CML 16.0054X

Issue No: 0

Date of Issue: 2017-02-28

Page 4 of 4

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

TX2124 Serial to Wi-Fi/Ethernet Interface.

Refer to Annex for full description.

CONDITIONS OF CERTIFICATION: YES as shown below:

Refer to Annex for Specific Conditions of Use and Conditions of Manufacture

Annex:

[IECEx CML 16.0054X Certificate Annex Iss 0.pdf](#)

Annexe to: IECEx CML 16.0054X Issue 0
Applicant: Trolex Limited
Apparatus: TX2124 Serial to Wi-Fi/Ethernet Interface



Description

The TX2124 Serial to Wi-Fi/Ethernet Interface is intended to be located in the hazardous area.

The TX2124 Serial to Wi-Fi/Ethernet Interface allows existing Intrinsically Safe equipment with an RS485/RS422 or RS232/TTL port to become Ethernet Enabled via either Wi-Fi (WLAN) or a Cat5/6 cable connection into an IS Ethernet Network (LAN). The unit has 4 serial ports, each one supporting either RS485/RS422 or RS232/TTL depending upon the configuration required. There are two RJ45 (LAN) ports that support 10/100 IS Ethernet connections - these allow 'daisy-chaining' of units together.

The modules consist of two printed circuit boards (PCBs) for the user connections and LEDs, onto which is mounted an encapsulated assembly containing the electronics. The complete assembly is fitted inside a plastic housing suitable for DIN rail mounting. One or more modules are intended to be mounted inside an enclosure having a minimum protection level equivalent to or exceeding IP54.

Electrical connections are made via cage-clamp and/or screw type plug/socket terminals along with a dual RJ45 type connector for the Ethernet LAN ports. Twin SMA style RF connectors (if fitted) allow one or two antenna to be connected as required.

Power (7.5VDC or 12VDC) is supplied to the module either locally or using Power over Ethernet (PoEx) from the LAN port - This requires the PoEx output to be wired to the Supply Input terminals by the user.

The module is fed from a single intrinsically safe 7.5VDC or 12VDC supply or PoEx and incorporates up to four RS485/422/232/TTL ports, up to two LAN Ethernet outputs and WLAN + Bluetooth transmitter circuit (including dual antenna), housed in a plastic enclosure. The module comprises of two 9600 Series Carrier Boards 'A' & 'B' that provide the necessary connections to the module together with LED indicators. An encapsulated 9600 Module, which comprises of two boards, the 9600-CPU board and the 9661-IF interface board are attached to the Carrier Board A

The equipment has the following safety description:

12Vdc POWER IN (Connector 3, Pin 1 wrt Pin 3 (0V))

Group	Ui	Ci	Li
I	14.4Vdc	0	0
IIA/IIIA			
IIB/IIIB			
IIC/IIIC			



PoEx (Connector 5, Pin 1 wrt Pin 3 (0V))

Group	Uo	Co	Lo
I	14.4Vdc	0.48 μ F	0
IIA/IIIA			
IIB/IIIB			
IIC/IIIC			

Note: PoEx (Connector 5) may be linked to 12Vdc POWER IN (Connector 3) when power is via the LAN-2 port.

RS485/RS422 COMMS (Connector 6, Pin1 to 4 and 9 to 12 wrt Pin 6,8,14,16 (0V) – Ports 1 and 2)

RS485/RS422 COMMS (Connector 7, Pin1 to 4 and 9 to 12 wrt Pin 6,8,14,16 (0V) – Ports 3 and 4)

Group	Ui	Uo	Io	Po	Ci	Li
I	7.2V	5.88V	221mA	325mW	0	0
IIA/IIIA						
IIB/IIIB						
IIC/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 (μ F)	Inductance (mH)	or	L/R Ratio (μ H/Ohm)
I	1000	9.55		1436
IIA	1000	5.82		875
IIB	1000	2.91		438
IIC	43	0.73		109

The above figures are based on the output parameters only and may need to be recalculated based on the input parameters.

RS232/TTL COMMS (Connector 6, Pin 5,13 (TX) wrt Pin 6, 8, 14, 16 (0V) – Ports 1 and 2)

RS232/TTL COMMS (Connector 7, Pin 5,13 (TX) wrt – Pin 6, 8, 14, 16 (0V) Ports 3 and 4)

Group	Ui	Uo	Io	Po	Ci	Li
I	5.88V	5.88V	221mA	325mW	0	0
IIA/IIIA						
IIB/IIIB						
IIC/IIIC						

RS232/TTL COMMS (Connector 6, Pin 7,15 (RX) wrt Pin 6,8,14,16 (0V)–Ports 1 and 2)
RS232/TTL COMMS (Connector 7, Pin 7, 15 (RX) wrt Pin 6,8,14,16 (0V) – Ports 3 and 4)

Group	Ui	Uo	Io	Po	Ci	Li
I	12.5V* 5.88V*	5.88V	221mA	325mW	0	0
IIA/IIIA						
IIB/IIIB						
IIC/IIIC						

* If the transmit TX line within both the cable and the other certified equipment can be shown to be suitably segregated from the receive line RX, then the Ui of the RX can be specified as 12.5V. If the segregation cannot be proved, then Ui of RX must be specified as 5.88V.

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
IIC	43	0.73		109

The above figures are based on the output parameters only and may need to be recalculated based on the input parameters.

Wi-Fi ANTENNA (SK2 & SK4: SMA Connector)

Group	Po (RF)
I	500mW each
IIA/IIIA	
IIB/IIIB	
IIC/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 Port 1 or LAN Port 2 (10/100 Ethernet) (SK3 – RJ45)

Group	Ui	Uo	Io	Ci	Li
I	14.4V	5.88V	2.18A	0.48μF	0
IIA/IIIA					
IIB/IIIB					
IIC/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
IIC	43	7.5		11

If PoEx is used, then the parameters of the PoEx power supply must also be considered
(The above capacitance figures are based on 5.88V)

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	IECEX SIR 07.0042X
9468 Ethernet Isolator	IECEX SIR 07.0043
9468 Ethernet Isolator (Zone 2)	IECEX SIR 08.0032X



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. The TX2124 Serial to Wi-Fi/Ethernet Interface modules shall be designed in accordance with the applicable general electrical safety standards, e.g. IEC 60950.

Conditions of Certification (IECEx Specific Conditions of Use)

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

- i. When used with Group I gases and Group III dust, the modules shall each be mounted within an enclosure providing a degree of protection of at least IP54.
This shall be in accordance with IEC 60529, and the mounting arrangement shall not impair the existing creepage and clearance distances. The enclosure shall also comply with the appropriate requirements of Clauses 7 and 8 of IEC 60079-0.
- ii. The RJ45 connectors do not meet the ingress protection rating of IP20, when they are not fitted with either a connector or blanking plug. For Group II, the RJ45 connectors must be fitted with either a plug or blanking plug or the module shall be mounted in an enclosure meeting IP20.
- iii. When used in Group II, 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. In addition, the equipment shall only be cleaned with a damp cloth.
- iv. The supply to the modules must be derived from a suitably certified, intrinsically safe supply.
- v. In the case of any connection to the RS232/TTL circuits, if the transmit 'TX' line within both the cable and the other certified equipment can be shown to be suitably segregated from the receive line, 'RX', then U_i can be specified as 12.5 V. If the segregation cannot be proved, then U_i for both TX and RX must be specified as 5.88 V.

- vi. The values of C_o and L_o shall apply when one of the two conditions below is given:
- The total L_i of the external circuit (excluding the cable) is $< 1\%$ of the L_o value, or,
 - The total C_i of the external circuit (excluding the cable) is $< 1\%$ of the C_o value.
- The above parameters are reduced to 50% when both of the two conditions below are given:
- The total L_i of the external circuit (excluding the cable) $> 1\%$ of the L_o , and
 - The total C_i of the external circuit (excluding the cable) $> 1\%$ of the C_o .
- Note: the reduced capacitance of the external circuit (including cable) shall not be greater than $1\ \mu\text{F}$ for IIB and $600\ \text{nF}$ for IIC.
- vii. The equipment shall be capable of withstanding an electric strength test using a test voltage of 500 Vac applied between the circuit and earth for 60 s. Alternatively, a voltage of 20% higher may be applied for 1 s. There shall be no evidence of flashover or breakdown and the maximum current flowing shall not exceed 5 mA.