



EU Type Examination Certificate CML 16ATEX2132X Issue 0

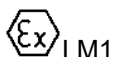
- 1 Equipment intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU
- 2 Equipment **TX2124 Serial to Wi-Fi/Ethernet Interface**
- 3 Manufacturer Trox Limited
- 4 Address Newby Road,
Hazel Grove,
Stockport,
Cheshire,
SK7 5DY, UK
- 5 The equipment is specified in the description of this certificate and the documents to which it refers.
- 6 Certification Management Limited, Unit 1 Newport Business Park, New Port Road, Ellesmere Port CH65 4LZ, UK, Notified Body Number 2503, 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 60079-0:2012+A11:2013

EN 60079-11:2012

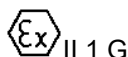
- 10 The equipment shall be marked with the following:



I M1

Ex ia I Ma

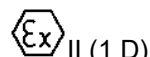
Ta = -40°C to +70°C



II 1 G

Ex ia IIC T4 Ga

Ta = -40°C to +70°C



II (1 D)

[Ex ia Da] IIIC T135°C

Ta = -40°C to +70°C

A Snowden



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11 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	0.48μF	0
IIA/IIIA			
IIB/IIIB			
IIC/IIIC			



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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 (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.

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.



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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 ($\mu\text{H}/\text{Ohm}$)
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	0.48 μF	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 ($\mu\text{H}/\text{Ohm}$)
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.



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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
9468 Ethernet Isolator	Sira 07ATEX2065
9468 Ethernet Isolator (Zone 2)	Sira 08ATEX4130X

12 Certificate history and evaluation reports

Issue	Date	Associated report	Notes
0	28 Feb 2017	R1046B/00	Report for the prime certificate issue

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.

- 13.1 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.
- 13.2 The TX2124 Serial to Wi-Fi/Ethernet Interface modules shall be designed in accordance with the applicable general electrical safety standards, e.g. EN 60950.

14 Special Conditions for Safe Use (Conditions of Certification)

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

- 14.1 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 EN 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 EN 60079-0.
- 14.2 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.
- 14.3 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.
- 14.4 The supply to the modules must be derived from a suitably certified, intrinsically safe supply.



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- 14.5 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.
- 14.6 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 μF for IIB and 600 nF for IIC.
- 14.7 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.

Certificate Annex



Certificate Number CML 16ATEX2132X
Equipment TX2124 Serial to Wi-Fi/Ethernet Interface
Manufacturer Trolex Limited

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

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Drawing No	Sheets	Rev	Approved date	Title
TX2124 ATEX-IECEX Label	1 of 1	1	28 Feb 2017	TX2124 ATEX-IECEX Certification Label Drawing