

RS485 ISOLATOR & REPEATERS



INSTALLATION & OPERATING DATA



ATEX
M1
GROUP I
INTRINSICALLY
SAFE

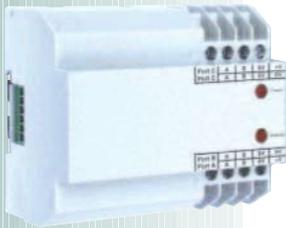
MINING
TUNNELLING



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1 PRINCIPAL OPERATING FEATURES

1.1 TX2121 RS485 SERIAL COMMUNICATIONS LINE ISOLATOR

The TX2121 is an RS485 serial communications line Isolator. It is designed to provide a certified interface between the hazardous Group I area and non-hazardous area. It provides optical isolation between the two areas.

The Isolator must be housed in a non-hazardous area and in an enclosure that offers a degree of ingress protection of at least IP54, category 1 according to IEC 60529 and suitable for a mining environment.

The Isolator has two rows of four terminals, the bottom four for the non I.S. connections and the top four for the I.S. connections.

The unit requires two separate 12V dc power supplies, a standard industrial supply for the safe area and a certified I.S. 12V dc supply for the hazardous side.

NOTE: It is critical to maintain correct segregation and that the two power supplies are never linked out or the incorrect power supply unit used.

There are four LED indicators on the Isolator – two indicating the status of the two separate power supplies and two to indicate the RS485 activity on each port.

On the right hand side of the unit there are eight 'DIP' switches for setting up the various communication settings. The function of these switches is described in more detail elsewhere in this document.

1.2 TX2122 RS485 SERIAL COMMUNICATIONS LINE REPEATER

TX2122.56 Single Repeater for extending the distance of one single RS485 communications line.

TX2122.57 Multiport Repeater for extending and branching the incoming signal in three directions.

TX2122.57.68 Multiport Repeater with optical fibre.

This option is the same as a Multiport Repeater but has two optical ports and two standard copper ports. The optical ports can be switched off and then it has four standard copper ports.

Common features of all the TX2122 Repeaters

The Repeater may be located in a hazardous area and it must be housed in an enclosure suitable for a mining environment.

All use a single 12V dc I.S. power supply.

All ports are I.S. segregated from each other.

All standard ports repeat and 'boost' the incoming signal to enable extended transmission distances of approximately 1km, (cable and baud rate dependant) on all other ports.

There are two LED indicators on the Repeaters - one to indicate the status of the power supply and one to indicate the RS485 activity.

Port A should always be closest to the master station (surface PC).

The system is intended for A to be connected upstream. For the single port repeater, both ports work identically. For the two multi-port devices, there are four ports, A through D.

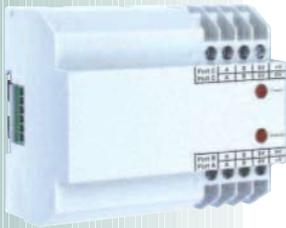
A is effectively on one 'side' and ports B through D, and anything received on ports B through D is only transmitted on port A, i.e. data received on port B is not transmitted on C or D.

On the right hand side of the unit there are eight 'DIP' switches for setting up the various communication settings. The function of these switches is described in more details elsewhere in this document.



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1 PRINCIPAL OPERATING FEATURES *continued*



1.3 Cabling

To comply with I.S. certification each pair of R485 conductors must be individually screened.

More than one pair of RS485 conductors or I.S. power supply conductors may be run in the same multicore cable but each pair must be individually screened.

Only I.S. circuits may be run in the same multicore cable. Non I.S. circuits must not be run in the same multicore cable.

1.4 DIP Switch Settings (common to both TX2121 and TX2122)

Switches 1 – 3 = Baud Rate Settings

000 = 2400

100 = 4800

010 = 9600

110 = 14400

001 = 19200

101 = 38400

011 = 57600

111 = 115200

Switch 4 = Parity

1 = 9 bit data (or 8 bits + parity)

0 = 8 bit data (or 7 bits + parity)

Switch 5 = Not Used (set to 0)

Switch 6 = Port A Optical (optical multipoint version only)

1 = Optical port A active

0 = Optical port A inactive (must be set to OFF in all other cases)

Switch 7 = Port B Optical (optical multipoint version only)

1 = Optical port B active

0 = Optical port B inactive (must be set to OFF in all other cases)

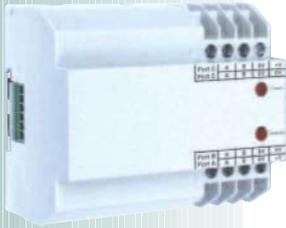
Switch 8 = Not Used (set to 0)



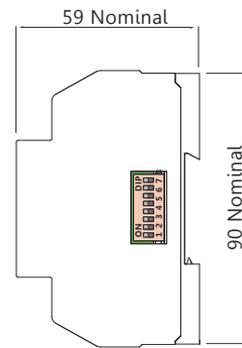
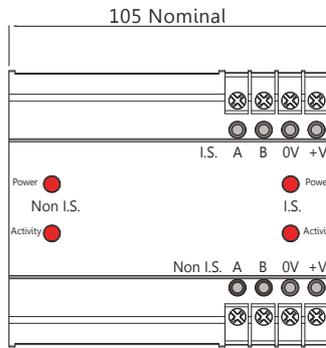
ATEX
M1
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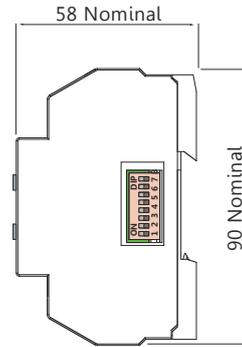
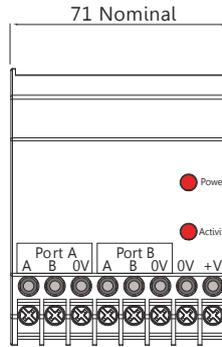
2 DIMENSIONS



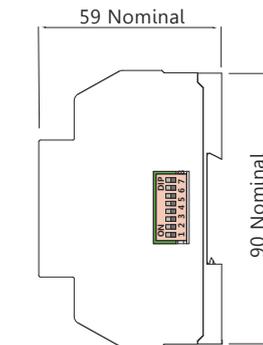
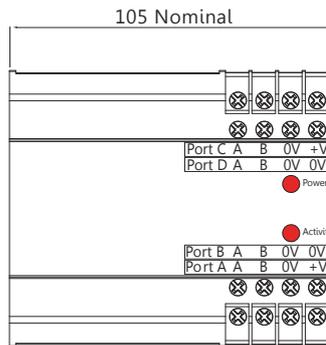
**TX2121
SINGLE PORT
ISOLATOR**



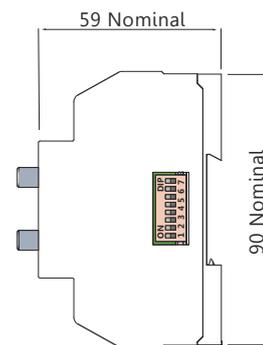
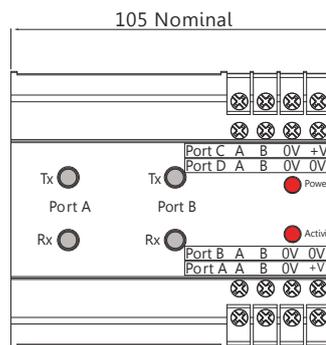
**TX2122.56
SINGLE PORT
REPEATER**



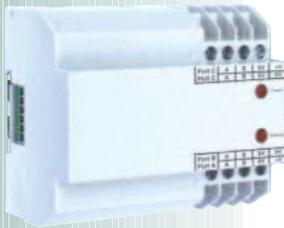
**TX2122.57
MULTIPORT
REPEATER**



**TX2122.57.68
MULTIPORT
REPEATER
with optical option**



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3 TECHNICAL DETAILS

| | | |
|-----------------|-------------|---|
| Supply Voltage: | TX2121: | Non I.S. Side = 10V dc...14.4V dc (Nom 12V dc) Non I.S. |
| | | I.S. Side = 10V dc...14.4V dc (Nom 12V dc) I.S. source |
| | All TX2122: | 10V dc...14.4V dc (Nom 12V dc) I.S. source |

Typical Current Consumptions (whilst transmitting into 2 x 100 Ohms):

| | |
|---------------------|--------------------------------------|
| TX2121: | 27mA @ 12V (each side) |
| TX2122.56: | 30mA @ 12V TX2122.57: 85mA |
| @ 12V TX2122.57.68: | 140mA @ 12V (fibre optics operating) |

| | |
|------------------------|---------------|
| Operating Temperature: | -10°C...+50°C |
| Storage Temperature: | -40°C...70°C |

4 APPROVALS AND CERTIFICATION

4.1 Intrinsically Safe

| | | |
|---------------|--------------------|--|
| TX2121: | Baseefa07ATEX0190 |  Ex I (M1) [Ex ia] I (-20°C ≤ Ta ≤ +50°C) |
| TX2122.56: | Baseefa07ATEX0191X |  Ex I M1 Ex ia I (-20°C ≤ Ta ≤ +50°C) |
| TX2122.57: | Baseefa07ATEX0191X |  Ex I M1 Ex ia I (-20°C ≤ Ta ≤ +50°C) |
| TX2122.57.68: | Baseefa07ATEX0191X |  Ex I M1 Ex ia I (-20°C ≤ Ta ≤ +50°C) Ex op is I Ma |

Special conditions for safe use:

The TX2122 range of Repeaters may be located in a hazardous area but they must be housed in an enclosure that offers a degree of ingress protection of at least IP54, category 1 according to IEC 60529 and suitable for a mining environment. (The TX2121 must NOT be used in the hazardous area).

Notes: Prior to installation it is essential that the user refers to the above certificates to ensure that the termination and cable parameters are fully complied with and are compatible with the application. Copies of the certificates are available on the Trolex website www.trolex.com.

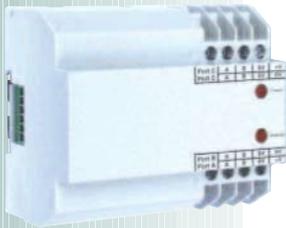
When considering how many pieces of other certified equipment may be connected to the multi-drop serial interface running between either a TX2121 and a TX2122 or two TX2122 Repeaters, you must take into account the specific circuit interface of the other certified equipment. For example, the TX9042 Programmable Sensor Controller would be limited to a maximum of 15 units. The TX2100 Commander would be limited to a maximum of 18.

This apparatus contains no user-serviceable parts and must be returned to the manufacturer for repair.

This apparatus complies with the requirements of clause 6.3.12 of EN 60079-11: 2007.



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PROTECTING THE ENVIRONMENT

Many of our products are often used to monitor the quality of environmental conditions consequently Trolex is also particularly aware of the need to protect human health and the environment in which we live.

The Company has instituted a radical environment protection policy to ensure that all aspects of our manufacturing programme have the minimum possible detrimental impact on the environment. This covers all stages beginning with sustainable product design supported by careful selection of the materials used in their production, through to managed recovery and disposal at the end of the useful life of a product.

This policy also incorporates the principles of the Waste Electrical and Electronics Equipment (WEEE) directive, and the associated Restriction of Hazardous Substances (RoHS) directive, to be implemented in EU countries.

Progress is already well advanced on the introduction of a completely new range of products that maximise the central principle of sustainable design with the intention of reducing the end-of-life cost to the end user.

All Trolex products are manufactured to exacting standards in accordance with our stringent quality control ethos. Having chosen to use one of our products will, in itself, guarantee extended durability and a long operating life, endorsed by our commitment to recycling and recovery.

- All packaging materials are carefully selected to be bio-degradable or re-cycleable where possible.
- All plastic materials are identified for recycling purposes and re-cycled materials are used where it is possible to do so.

- Printing paper and material are sourced from suppliers that have a declared environmental management system.
- Product design centred around high quality and long term durability. Modular architecture both in construction and software design suitable for future upgrades and adaptability to alternative duty.
- Ease of product disassembly, minimisation of fixing devices, and clear separation of functional parts to benefit re-use and re-cycling.
- Control and monitoring of suppliers of components and sub-assemblies. Deal only with suppliers that have a defined commitment to environmental monitoring principles.
- Control the use of restricted substances within the design process. Deal only with suppliers that have a defined commitment to the control of restricted substances.
- Provide an efficient high speed service within Trolex for repair, refurbishing and conversion of products for alternative duty.
- Provision of an end-of-life product Take-back service for recovery, re-use, and recycling of electrical and electronic components. Retain the packaging of a new product and re-use it to return the device to us at the end of its working life. Trolex will guarantee to recover all materials and components, where practicable and arrange for them to be re-cycled in an appropriate and in a safe manner.



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