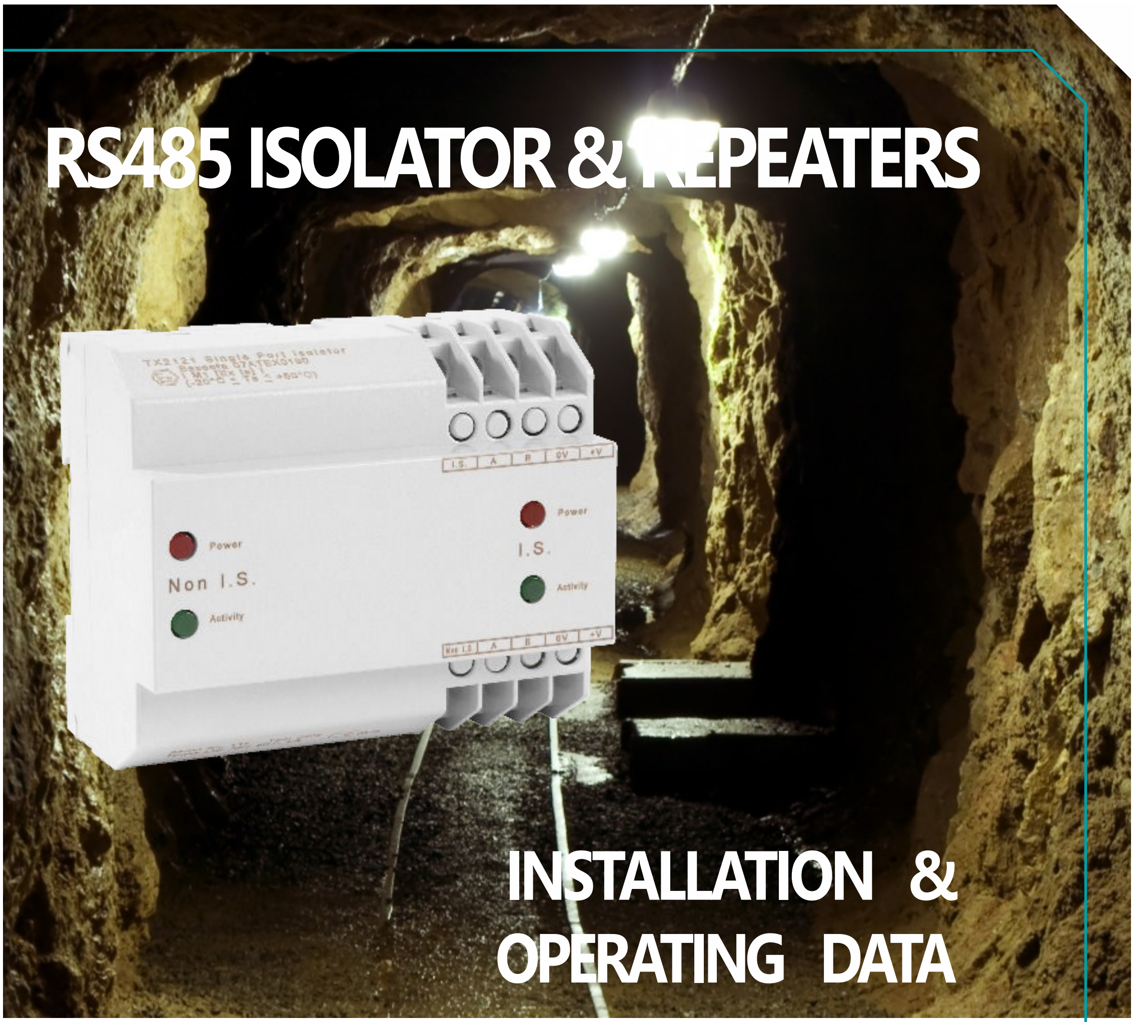


RS485 ISOLATOR & REPEATERS

INSTALLATION & OPERATING DATA

TX2121 Single Port Isolator
Power
Non I.S.
Activity
Power
I.S.
Activity
I.S.
A
B
0V
+V
Non I.S.

ERTL

MINING

TUNNELLING

contents...

page

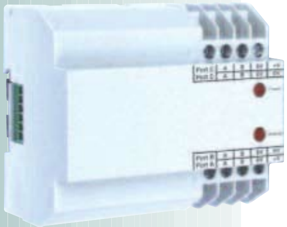
1 PRINCIPAL OPERATING FEATURES 2

2 DIMENSIONS 4

3 TECHNICAL DETAILS 5

4 APPROVALS AND CERTIFICATION 5

ISSUE F 06/15



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 12 V dc power supplies, a standard industrial supply for the safe area and a certified I.S. 12 V 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.

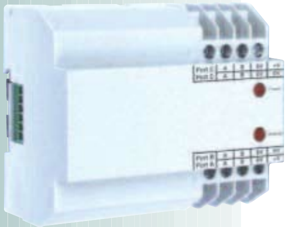
1.2 TX2122 RS485 SERIAL COMMUNICATIONS LINE REPEATER

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 12 V 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 1 km, (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.



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

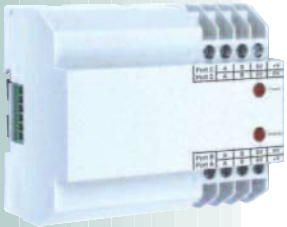
Switch 4 = Parity
1 = 9 bit data (or 8 bits + parity)
0 = 8 bit data (or 7 bits + parity)

Switch 5 = Not Used (set to 0)

Switch 6 = Port A Optical (optical multiport 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 multiport version only)
1 = Optical port B active
0 = Optical port B inactive (must be set to OFF in all other cases)

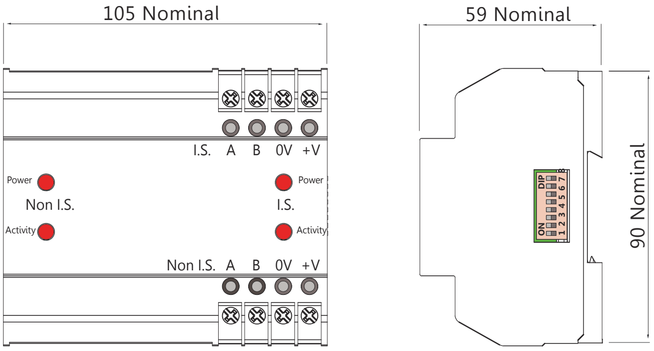
Switch 8 = Not Used (set to 0)



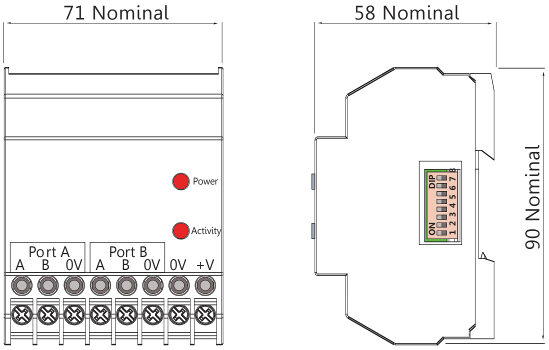
ERTL

2 DIMENSIONS

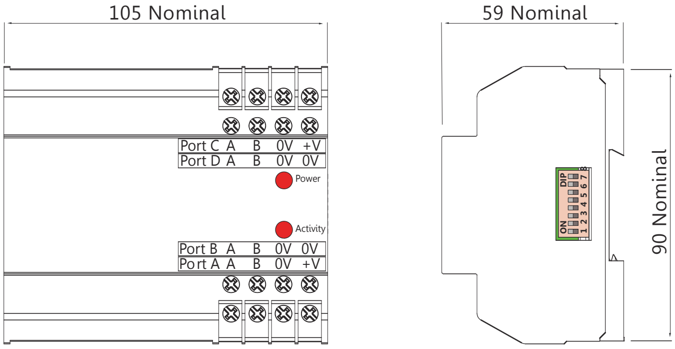
TX2121
SINGLE PORT
ISOLATOR


105 Nominal
59 Nominal
I.S. A B 0V +V
Power
Non I.S.
Activity
Power
I.S.
Activity
Non I.S. A B 0V +V
DIP
ON 1 2 3 4 5 6 7 8
90 Nominal

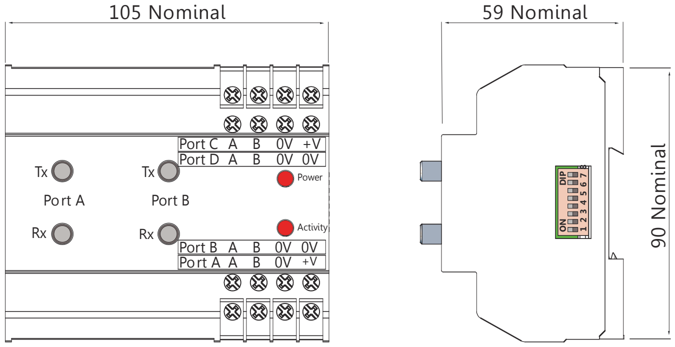
TX2122.56
SINGLE PORT
REPEATER


71 Nominal
58 Nominal
Power
Activity
Port A
A B 0V
Port B
A B 0V
0V +V
DIP
ON 1 2 3 4 5 6 7 8
90 Nominal

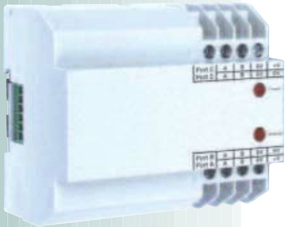
TX2122.57
MULTIPORT
REPEATER


105 Nominal
59 Nominal
Port C A B 0V +V
Port D A B 0V 0V
Power
Activity
Port B A B 0V 0V
Port A A B 0V +V
DIP
ON 1 2 3 4 5 6 7 8
90 Nominal

TX2122.57.68
MULTIPORT
REPEATER
with optical option


105 Nominal
59 Nominal
Port C A B 0V +V
Port D A B 0V 0V
Tx
Port A
Rx
Tx
Port B
Rx
Power
Activity
Port B A B 0V 0V
Port A A B 0V +V
DIP
ON 1 2 3 4 5 6 7 8
90 Nominal

ALL DIMENSIONS IN MM



3 TECHNICAL DETAILS

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

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

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

Operating Temperature:	–10 to +50°C
Storage Temperature:	–40 to +70°C

4 APPROVALS AND CERTIFICATION

4.1 TX2121

4.1.2 Europe (ATEX)

Certificate number: Baseefa 07ATEX0190

Ex Certification code: I (M1) [Ex ia] I (-20°C ≤ Ta ≤ +50°C)

Notes: The TX2121 must NOT be installed in the Hazardous area

General Conditions of Use:

Prior to installation, it is essential that the user refers to the above certificate to ensure that the termination and cable parameters are fully complied with and are compatible with the application. Copies of certificates are available from Trolex.

ATEX Directive (94/9/EC)

EMC Directive (2004/108/EC)

4.1.2 USA (MSHA)

MSHA IS Evaluation no: I8-ISA120004-0

Conditions of Use:

Prior to installation, it is essential that user refers to the above document for any specific conditions of use. The user must ensure that the termination and cable parameters are fully complied with and are compatible with the application. Copies of certificates are available from Trolex.

4.1.3 Russia (Customs Union)

Ex Certificate number: TC RU C-GB.ГБ05.B.00359

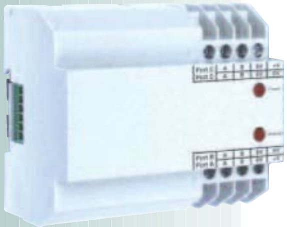
Ex certification code: PO Ex ia I Ma X

General Conditions of Use:

Prior to installation, it is essential that user refers to the above certificate for any special conditions for safe use. The user must ensure that the termination and cable parameters are fully complied with and are compatible with the application. Copies of certificates are available from Trolex.

4.1.4 India (ERTL)

Test report number: ERTL/TES/T238/0031/02-15



4.2 TX2122

4.2.1 Europe (ATEX)

Ex Certificate number: Baseefa 07ATEX0191X

Ex Certification codes: TX2122.56 Single Port Repeater:

I M1 Ex ia I (-20°C ≤ Ta ≤ +50°C)

TX2122.57 Multi Port Repeater:

I M1 Ex ia I (-20°C ≤ Ta ≤ +50°C)

TX2122.57.68 Multi Port Repeater with fibre-optic interface:
I M1 Ex ia I (-20°C ≤ Ta ≤ +50°C) Ex op is I Ma

Specific Conditions of Use:

The apparatus must be mounted inside an enclosure that offers a degree of ingress protection of at least IP54 according to IEC 60529 and be suitable for a mining environment.

General Conditions of Use:

Prior to installation, it is essential that user refers to the above certificate to ensure that the termination and cable parameters are fully complied with and are compatible with the application. Copies of certificates are available from Trolex.

ATEX Directive (94/9/EC)

EMC Directive (2004/108/EC)

4.2.2 Russia (Customs Union)

Ex Certificate number: TC RU C-GB.ГБ05.B.00359

Ex certification code: PO Ex ia I Ma X

General Conditions of Use:

Prior to installation, it is essential that user refers to the above certificate for any special conditions for safe use. The user must ensure that the termination and cable parameters are fully complied with and are compatible with the application. Copies of certificates are available from Trolex.

4.2.3 India (ERTL)

Test report number: ERTL/TES/T238/0029/02-15