

railSplit uno

User Guide



Please read these instructions before using the product.

This product has been designed & manufactured for professional use only. It should only be installed by a suitably qualified technician and in accordance with electrical regulations in the country of use.

Unless directed in the instructions there are no user serviceable parts inside the outer case of this product.

Always disconnect from the power supply when not in use.

Any specific IP rating, where appropriate, is given in the instructions. Unless otherwise stated this product is designed for indoor use only. If used outdoors it **MUST** be installed in an appropriate IP rated cabinet. Do not allow this product to be exposed to rain or moisture. Do not allow liquid to penetrate the product.

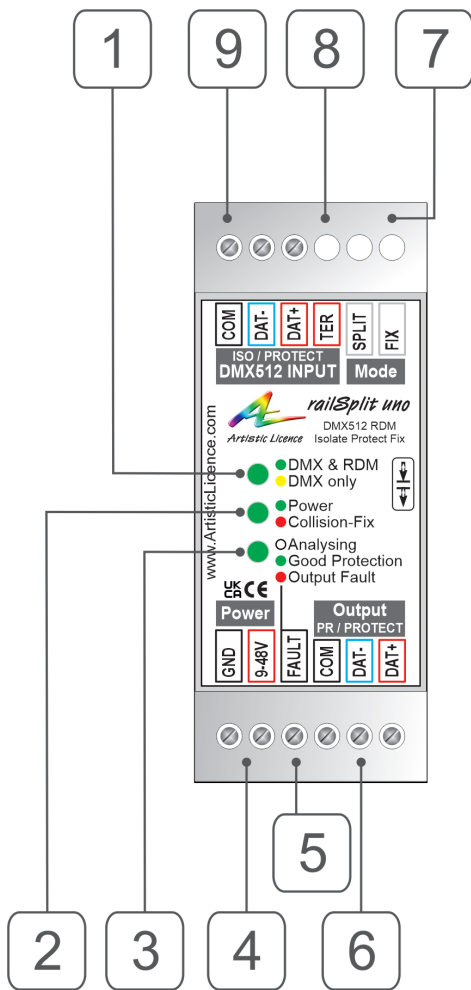
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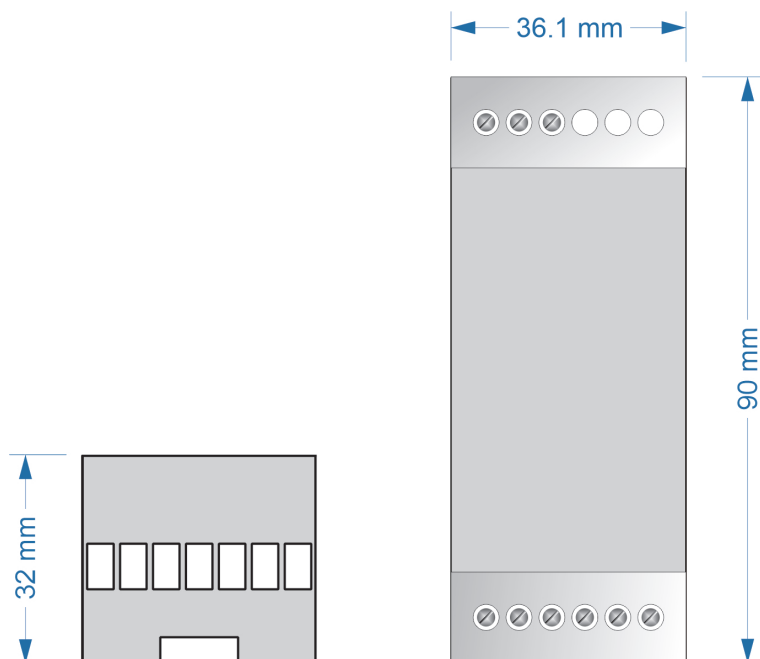
Connections



| Reference | Type | Description |
|-----------|------------|--------------------|
| 1 | LED | Data Good |
| 2 | LED | Power / Fix |
| 3 | LED | Protection / Fault |
| 4 | Connection | Power 9-48 VDC |
| 5 | Connection | Fault tally |
| 6 | Connection | DMX512 Output |
| 7 | Switch | Split/Fix mode |
| 8 | Connection | Input terminate* |
| 9 | Connection | DMX512 input |

* The DMX512 input can also be used as a passive loop-through connection allowing onward connection to other DMX512 devices. If this feature is not required then the signal must be terminated. The product contains an internal termination resistor. This is enabled by fitting the internal jumper under the terminal guard. It is fitted by default.

Mounting Diagram



DMX512 Wiring

| XLR Pin (Convention) | Function | Colour |
|----------------------|----------|--------------|
| 1 | Ground | Black |
| 2 | Data - | Blue |
| 3 | Data + | Red |

Overview

railSplit uno is a fully bi-directional DMX512 isolator and signal booster, with the added feature of a 'data fixer' for DMX. The latter functionality is used for resolving flickering problems arising from product incompatibility issues - see 'Fix Mode' on page 6 for more information.

railSplit uno offers industry leading levels of protection on input, output and power terminals. It features electrocution protection (self-healing) on the DMX512 ports (up to 425 VAC continuous connection).

Additionally, railSplit uno provides surge protection on all terminals. This feature protects the product and connected equipment against voltage surges of the type generated by lightning. The protection is sacrificial which means that after a certain number of protection events, the protection circuitry will fail (see Specification on page 8). When the protection circuitry fails it is guaranteed to fail short-circuit, which continues to provide protection to the DMX512 cables. DMX512 output protection failure or shorted cable is reported with a front panel indicator and via the fault tally output (see Connections diagram on page 3).

Key features

- Input optical isolation
- Bi-directional outputs
- Optimized for electrically noisy environments
- Mains electrocution protection (self-healing) on DMX512 input and output
- Surge protection (sacrificial) on all terminals
- Front panel fault indication
- Fault report tally output for BMS integration
- RDM supported
- Surface mount or DIN rail mounted
- DMX-Fix mode to handle compatibility issues

Connections

Input

The DMX512 input is attached via three screw terminals. Please refer to the Connections diagram.

Loop-Through

The DMX512 input can also be used as a passive loop-through connection allowing onward connection to other DMX512 devices. If this feature is not required then the signal must be terminated. The product contains an internal termination resistor. This is enabled by fitting the internal jumper under the terminal guard. It is fitted by default.

Output

The output is capable of driving 32 additional DMX512 devices. A terminator must be connected to the final DMX512 device.

Internal Earth and Isolation

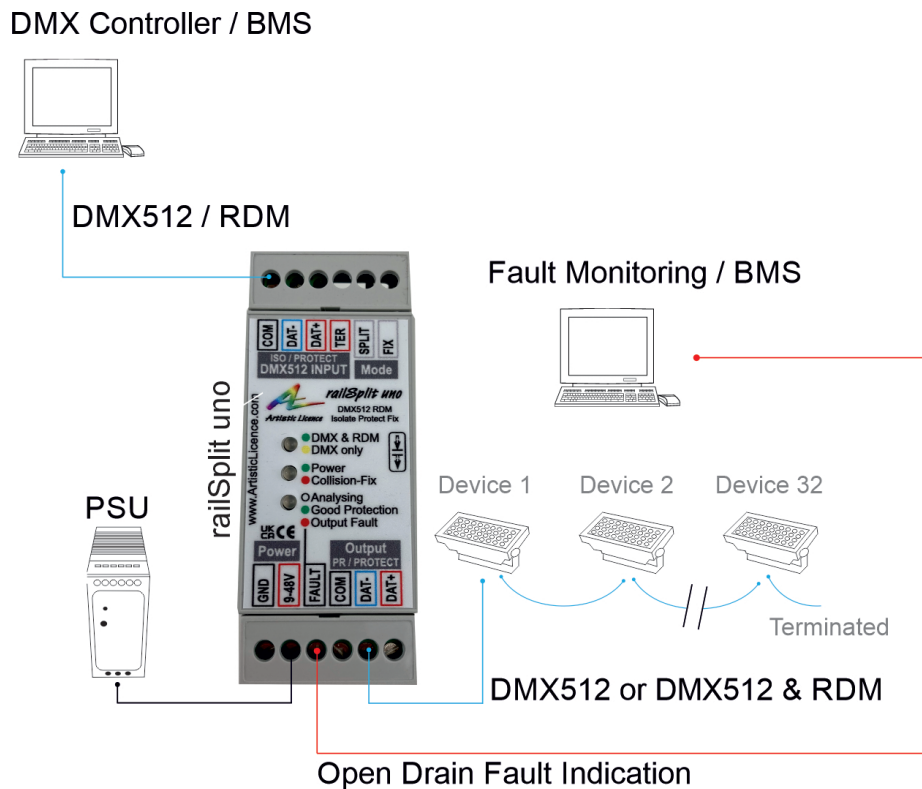
The following table summarises the internal earth interconnection and isolation.

Please note that we use the term Earth-Ground to avoid international confusion. In Europe Earth-Ground is called Earth; in the USA, Earth-Ground is called Ground.

| Circuit | Description | |
|-----------------------|--|---|
| DMX512 Input | Type: | Isolated |
| | Pin 1: | Connects to internal isolated circuit. No connection to Internal Logic Ground |
| DMX512 Output | Type: | PSU referenced |
| | Pin 1: | Connected to Internal Logic Ground |
| Internal Logic Ground | Connected to power supply 0V. If the selected PSU has a connection between Earth-Ground and 0V the DMX outputs become Ground Referenced. Otherwise the DMX outputs are Floating. When the recommended PSU is used, DMX outputs are Floating. | |

Application Diagram

The diagram below shows how railSplit uno could be utilised in a typical application.



Operating Modes

The product can operate in two modes. In its default mode, the product is a fully-featured RDM Splitter. In the second mode, it acts as a DMX Fixer.

Splitter Mode

In splitter mode, the output operates as a bi-directional RDM port and all DMX data received is passed onto the output. The indicators have the following meaning:

Top (Data):

- OFF = no data received
- Green = DMX and RDM received
- Yellow = DMX only received

Middle (Power):

- Green = Power
- Red = Data error or collisions detected

Fix Mode

Fix mode is intended to solve product compatibility problems. Unfortunately, there are numerous products on the market which will not accept the wide range of legal DMX timings and data. Fix mode cleans out any unusual or non-standard timing and data before sending to the output. This includes stripping out all non-zero start codes (including RDM), forcing a 512-channel footprint and calming any timing jitter. Indicators have the following meaning:

Top (Data):

- As above

Middle (Power):

- Green = Power
- Red = I am fixing something

Detailed Fix Specification

Accepts and corrects break in range 56 μ s – 1000 μ s and outputs 250 μ s

Accepts and corrects MaB in range 5 μ s – 1000 μ s and outputs 30 μ s

Accepts and corrects MaB in range 0 μ s – 1000 μ s and outputs 30 μ s

Accepts channel count 1 – 512 and outputs 512

Accepts refresh period from 23 ms – 1000 ms and outputs 30ms

Filters out multiple consecutive breaks

Re-times bytes of 1 stop bit to 2 stop bits

Filters out all non-zero start code packets

Re-times digital signal

Protection and Reporting

The DMX512 output surge protection contains a sacrificial element that will fail after a certain number of protection events (see Specification on page 8). When this failure occurs, the output will short together all 3 terminals.

Output short-circuit is monitored and reported by the product as follows:

Indicator

The bottom LED indicator shows the monitoring status as follows:

- OFF = The product is analysing the output or there is no DMX512 input
- Green = DMX512 output is operating normally
- Red = DMX512 output is short-circuit. This indicates that either there is a short-circuit on the DMX512 output or that the sacrificial protection has failed.

Tally output

A tally output is provided to allow protection status to be monitored remotely. The tally output is open-collector allowing multiple products to connect to a single reporting signal.

The output is designed to drive 12 VDC at 5 mA without an additional external resistor.

- To drive 24 VDC add a 2k2 external resistor.
- To drive 48 VDC add a 5k6 external resistor.

The output is as follows:

- Float = The product is analysing the output or there is no DMX512 input or DMX512 output is operating normally
- Sink = DMX512 output is short-circuit. This indicates that either there is a short-circuit on the DMX512 output or that the sacrificial protection has failed.

railSplit uno Specification

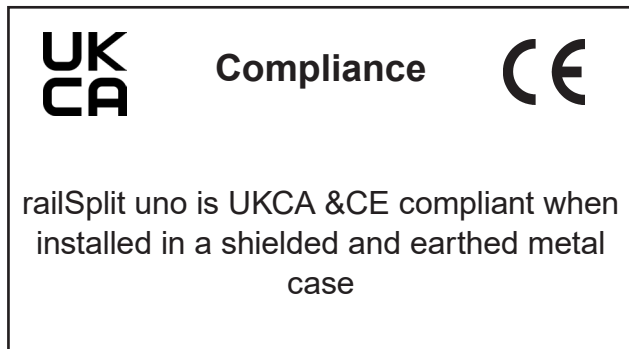
| | |
|---|--|
| Mechanical <ul style="list-style-type: none">• Housing: DIN rail case• Material: Lexan Plastic - UL94-V0 rated• Overall dimensions: 90 mm (H) x 36 mm (W) x 32 mm (D)• Weight: 0.1 kg• Mounting: 35 mm DIN rail or surface mount• Country of manufacture: UK | DMX512 Input <ul style="list-style-type: none">• Mode: Optically isolated• Isolation: 1 kV• Electrocutation protection: Input & Loop protected against continuous connection to 425 VAC (self-healing)• Surge protection (sacrificial):<ul style="list-style-type: none">- IDC 30,000A (8/20uS) 1 operation- IDC 20,000A (8/20uS) 10 operations- IDC 20A (10/1000uS) 1500 operations |
| Environmental <ul style="list-style-type: none">• Operating temperature: 0°C to 40°C• Storage temperature: -10°C to +50°C• Operating relative humidity (max): 80% non-condensing• IP rating: IP20 indoor use only• Certification: UKCA, CE, WEEE, RoHS• Warranty: 2-year (return to base) | Tally Ouput <ul style="list-style-type: none">• Mode: Open collector• Default current 5mA• Surge protection (sacrificial):<ul style="list-style-type: none">- IDC 30,000A (8/20uS) 1 operation- IDC 20,000A (8/20uS) 10 operations- IDC 20A (10/1000uS) 1500 operations |
| Power & Electrical <ul style="list-style-type: none">• Input voltage: 9-48 VDC• Input connector: 2-pin screw terminal (1 no.)• Input power (max): 1.5 W• Duty cycle: 100% @ 25°C• DC fuse: internal resettable fuse for control electronics• Surge protection (sacrificial):<ul style="list-style-type: none">- IDC 30,000A (8/20uS) 1 operation- IDC 20,000A (8/20uS) 10 operations- IDC 20A (10/1000uS) 1500 operations | Control <ul style="list-style-type: none">• Input Protocols: DMX512, DMX512 (1990), DMX512-A, RDM V1.0 (E1.20 - 2006 ESTA Standard)• Output Protocols: Same as input |
| DMX512 Output <ul style="list-style-type: none">• Mode: PSU referenced• Isolation: n/a• Electrocutation protection: output is protected against continuous connection to 425 VAC (self-healing)• Surge protection (sacrificial):<ul style="list-style-type: none">- IDC 30,000A (8/20uS) 1 operation- IDC 20,000A (8/20uS) 10 operations- IDC 20A (10/1000uS) 1500 operations | Data Connections <ul style="list-style-type: none">• 3-pin Screw Terminal DMX Input (1 no.)• 3-pin Screw Terminal DMX Output (1 no.) |
| | LED Indication <ul style="list-style-type: none">• Power / DMX / RDM / Protection |
| | Package Contents <ul style="list-style-type: none">• railSplit uno |
| | Ordering Info <ul style="list-style-type: none">• Product code: railSplit uno |
| | Accessories (not included) <ul style="list-style-type: none">• PSU-24-0.75-FER |

Compliance

All Products manufactured or sold by Artistic Licence Engineering Ltd are fully compliant with the appropriate UKCA, CE and RoHS regulations. Product specific information is available on request.

Waste Electrical & Electronic Equipment (WEEE)

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All products are covered from date of purchase by a two-year return to base warranty.

By return to base, we mean that the customer is responsible for all costs of transport to and from Artistic Licence.

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