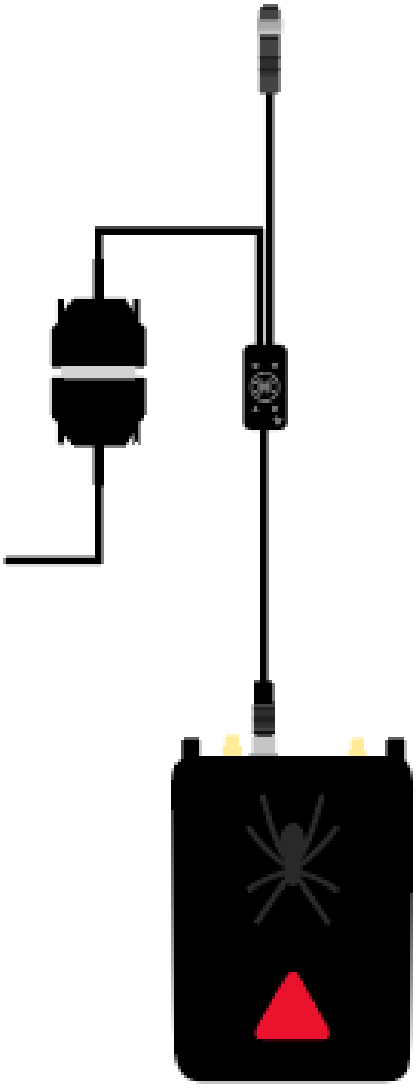
spidertracks



INSTALLATION MANUAL

# Spider X Input Cable Kit

Revision 1.0, 6 Mar 2023

# Safety & Regulatory Information

Please read this guide carefully. It is important that all installation requirements are followed.

Installation must be completed by a suitably qualified person (check your local regulatory requirements).

Refer all servicing to Spidertracks qualified service personnel. Servicing is required when the apparatus has been damaged in any way. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

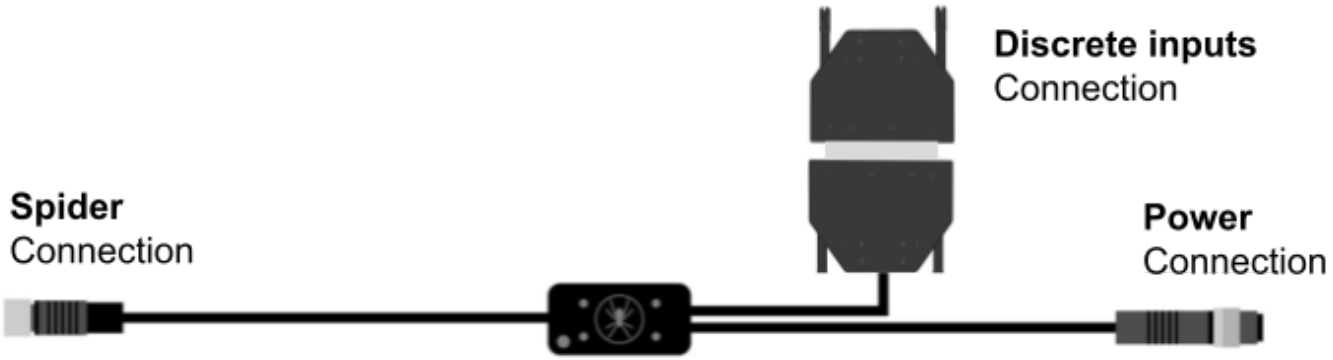
# Contents

# 1 Getting Started

## 1.1 Overview

This optional cable kit enables up to four discrete digital (high/low) inputs to be connected to the Spider X telemetry solution. These inputs can be used to detect different states of the aircraft. A typical application has two inputs; an oil pressure input to detect engine state and a collective/weight-on-wheels input to detect takeoff/landing. This cable is simply connected in line with the power lead (2000PWR602) supplied with the Spider X. A field wireable 25 D-sub connector provides options for a qualified avionics engineer to wire discrete signals from digital high/low aircraft sensors or switches.

⚠ ***NOTE:*** *The Spider X Input Cable is not supported if a Spider X Keypad is already in use. The Spider X only supports one external peripheral at a time.*




## 1.2 What's included?

The following items are included

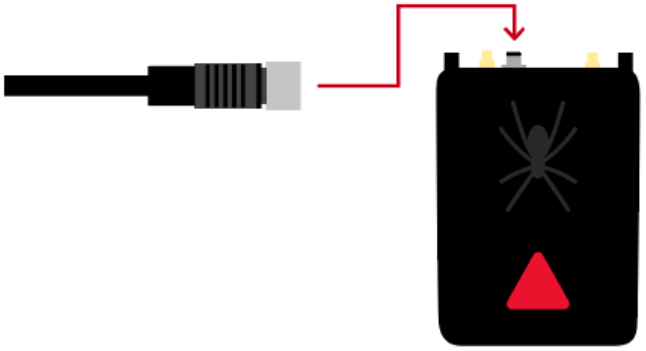
**1x Spider X breakout cable assembly (Two M8 and one 25 D-Sub Male connectors)**

**1x 25 D-Sub Female with backshell for field wiring**

# 2 Install

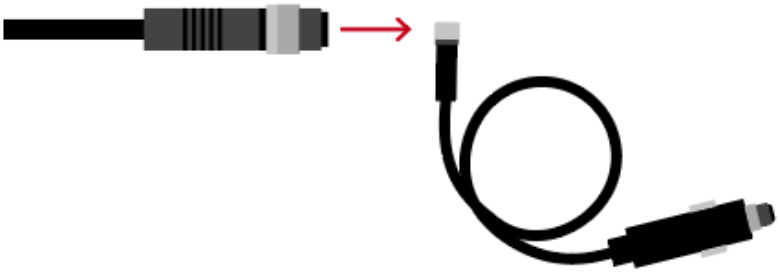
## 2.1 Connect to Spider X

Connect to Spider X power input.



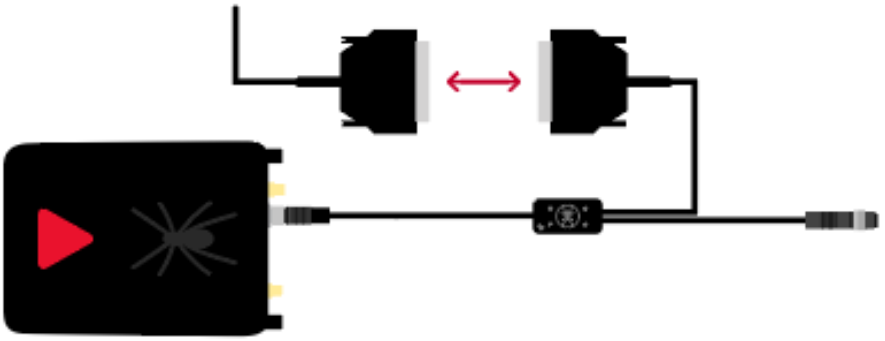
## 2.2 Connect to power lead

Connect to Spider X power lead (2000PWR102 or 2000PWR105).



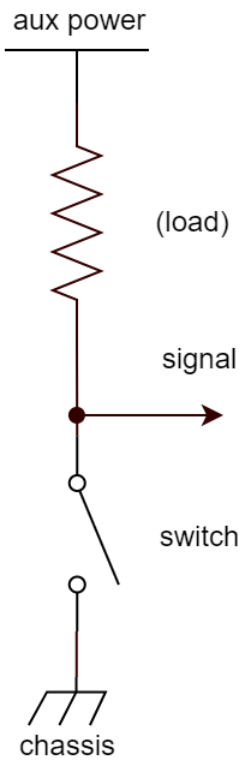
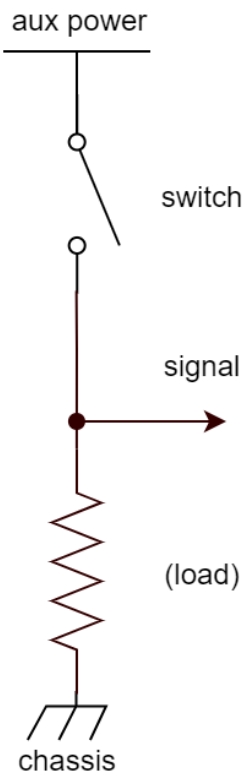
## 2.3 Wire discrete inputs

The supplied 25 D-Sub Female Socket Connector with backshell includes a breakout board for technician field wiring. The following sections detail how to wire inputs into this board.



### 2.3.1 Circuit Identification

Identify the circuit type that is generating the signal from the table below:

| **Low side switch**<br>(Signal switched to chassis) | **High side switch**<br>(Signal switched to aircraft power rail) |
|---|---|
|  |  |
| Switch **open**: Signal **'High'** (>10 V)<br>Switch **closed**: Signal **'Low'** (<7 V) | Switch **open**: Signal **'Low'** (<7 V)<br>Switch **closed**: Signal **'High'** (>10 V) |

**Other Scenarios**

If the switch is isolated (dry contact), one of the switch contacts must be connected to a reference potential (auxiliary power rail or chassis). After this is implemented, the circuit will now match one of the above scenarios.

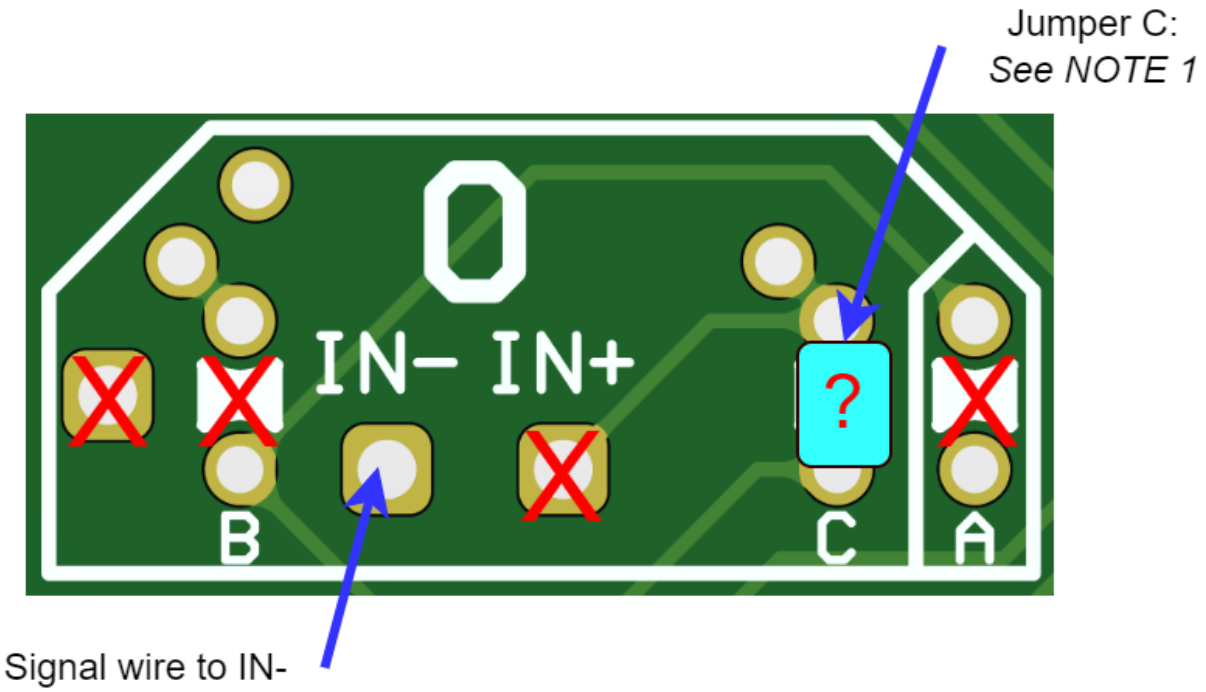
Please contact Spidertracks support for further guidance on other scenarios, including where electrical isolation needs to be achieved.

## 2.3.2 Wiring Guide

The four input channels are electrically isolated and functionally identical. Each can be configured independently.

The included breakout board simplifies correct termination of wires coming from aircraft input circuits. The breakout board is arranged in four regular sections (one per input channel). Follow the sections below according to the signal type identified in 2.3.1 to correctly wire a signal into the Input Cable (shown for Channel 0):

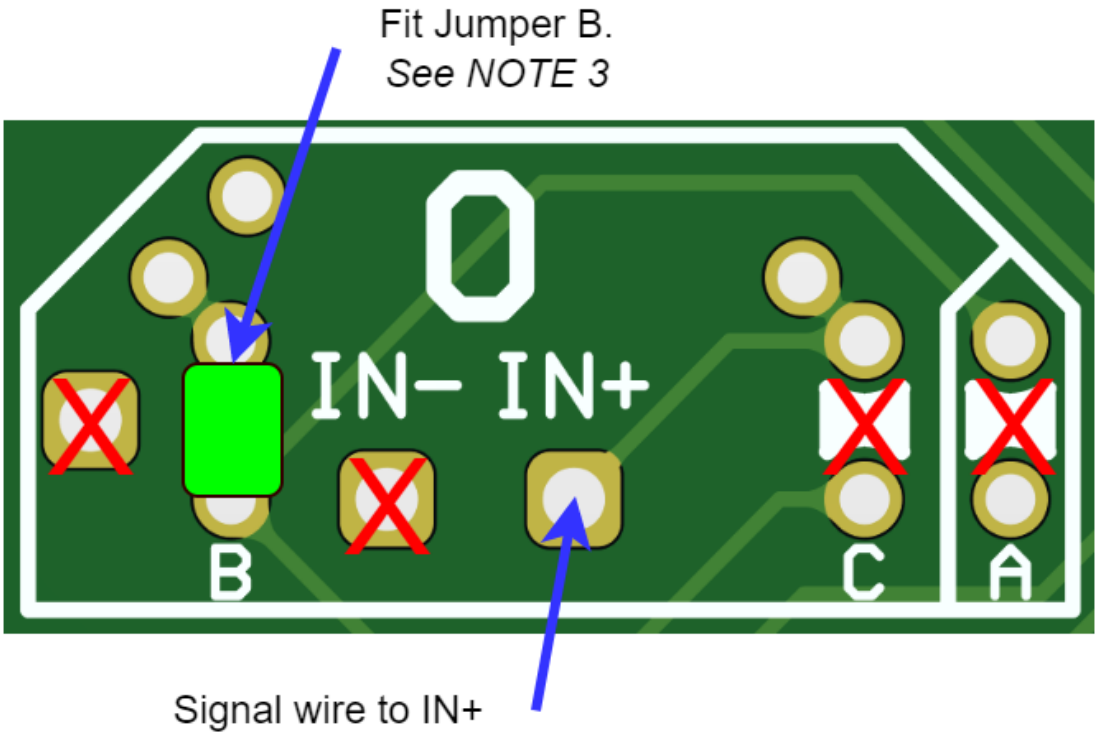
**Low side switch** (Signal switched to chassis)




⚠ ***NOTE 1:*** *If the same switch is powering a load (e.g. indicator, instrument) then Jumper C should NOT be fitted. If there is no load, Jumper C should be fitted.*

⚠ ***NOTE 2:*** *When **Jumper C** is fitted, **signals should NOT be wired to IN+** of the same channel to avoid unexpected circuit operation caused by protection circuits.*

**High side switch** (Signal switched to aircraft power rail)




⚠ ***NOTE 3:*** *When **Jumper B** is fitted, **signals must NOT be connected to IN-** of the same channel to avoid shorting signals to aircraft chassis/ground via the Spider X power supply.*

### 2.3.3 Cautions and Limits

Each channel has **IN+** and **IN-** terminals. The Input Cable recognises signals as either 'Low' or 'High' according to the voltage measured across these terminal pairs.

- **<7 V** between IN+ and IN- is interpreted as a **'Low' signal level**
- **>10 V** between IN+ and IN- is interpreted as a **'High' signal level**
- **+/- 36 V is the max voltage** between IN+ and IN- before surge protection is activated

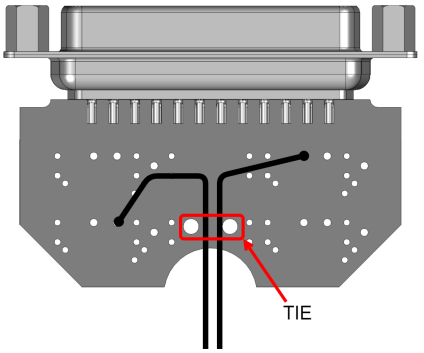
All signals wired from the aircraft must be able to sink or source 3 mA to ensure the input channel operates within specification.

The breakout board pre-assembly is RoHS compliant. Terminations should **use lead free solder** for compatibility.

## 2.3.4 Final Assembly

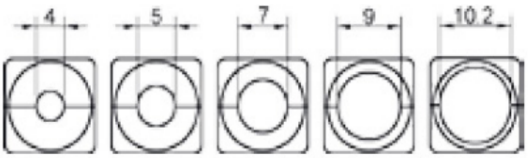
After configuration is complete (Refer section 3), finish the physical installation as follows:

1. Fit a cable tie (not included) to secure the signal wires.

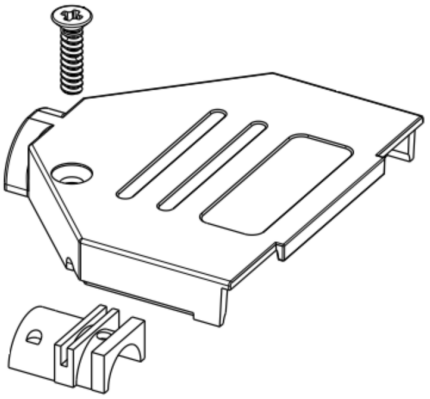



2. Select the appropriate cable entry grommet.

   The included selection spans diameters from 4 mm to 10.2 mm as shown on the right:

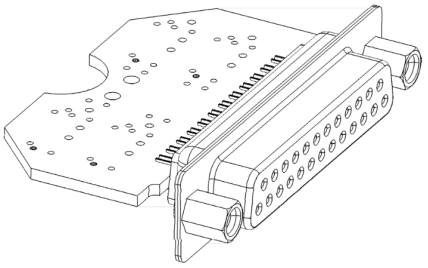



3. Fit half of the grommet into one half of the 25 D-sub backshell.



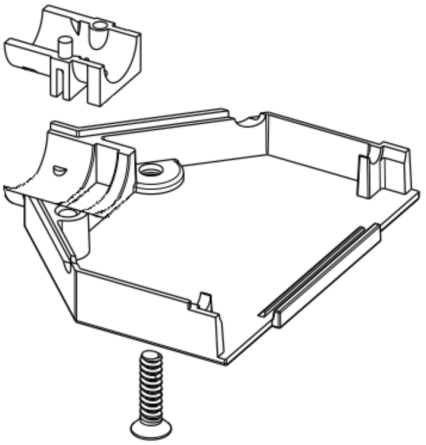
4. Place the breakout board into the backshell.

5. Attach the top half of the grommet over the wires (or cable).



6. Fit the top half of the backshell. Check the wires are suitably restrained.

7. Apply Loctite 222 or similar (not included) to the screw threads, then install and tighten to with 60 cN.m of torque.



# 3 Configure

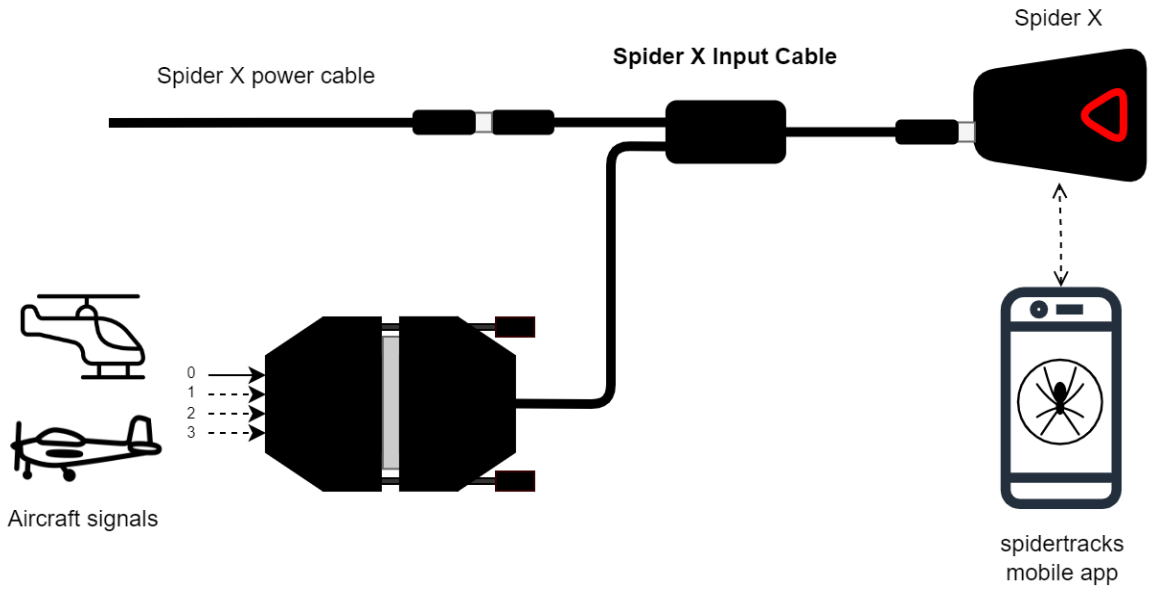
## 3.1 Prepare to Configure

All input channels (0-3) are configured to ‘Unused’ by default.

Channels must be configured to match the installation to enable correct event type and state detection.

Before configuring channels, please ensure:

- The Input Cable is connected to a Spider X and powered on
- You have installed and logged into the Spidertracks mobile app
- You have paired the mobile app with the Spider that the Input Cable is connected to




For support with pairing to your Spider, see:

https://support.spidertracks.com/knowledge/pairing-your-phone-with-a-spider

Under the Spider Connection page, navigate to the Advanced Setup page.

The **Input Cable** will be automatically detected as an attached peripheral if there is no other peripheral already selected.

Press the icon next to the **Input Cable** device name (ⓘ for iOS, ⚙ for Android) to enter the channel configuration screen.

## 3.2 Update and Confirm Configuration

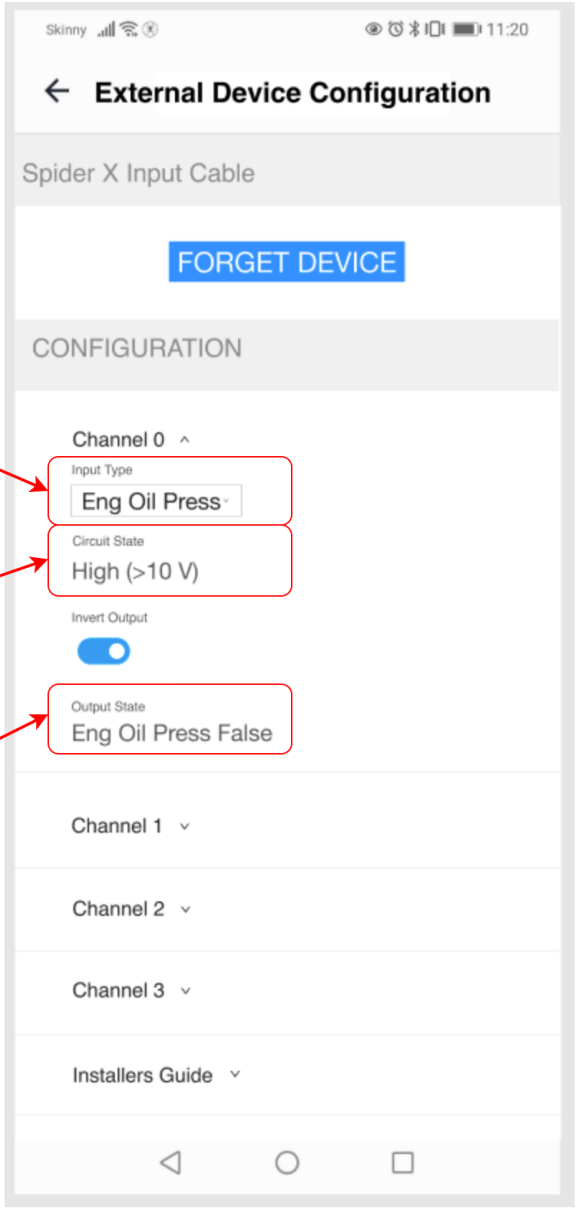
Expand each channel (press v), review the current configuration and update as needed:

Select the installed **Input Type** from the drop down list for each channel. Leave unused channels as ‘Unused’.

Use the **Circuit State** real-time feedback to confirm the Input Cable channel is detecting changes as expected when the switch/sensor is toggled.

Use the **Output State** real-time feedback to review how the current circuit state is being interpreted by the Spider X.

The Output State should match the real world state. Invert any incorrect outputs using the **Invert Output** setting.




**NOTE:** Configuration changes are saved in real-time and stored in the Input Cable.

# 4 Help

## 4.1 Contact

For service and support:

| | | | |
|---|---|---|---|
| Support Documentation: | | https://support.spidertracks.com | |
| Email: | | support@spidertracks.com | |
| Phone: |  | Australia | +61 1800 461 776 |
| |  | Canada | +1 800 491 2895 |
| |  | Mexico | +52 55 4169 3149 |
| |  | New Zealand | +64 9 222 0016 |
| |  | South Africa | +27 87 550 3970 |
| |  | United Kingdom | +44 20033 31519 |
| |  | United States | +1 800 491 2895 |

Address:

Spidertracks
205/150 Karangahape Road
Auckland, 1010
New Zealand

## 4.2 Warranty

This item comes with a 12 month warranty from date of purchase. You must notify Spidertracks as soon as a defect is discovered. If the device needs to be returned for repair, a return merchandise authorisation (RMA) will be issued. Spidertracks will replace your item with a new or refurbished item . You are responsible for all return shipping costs of the device under RMA. Any attempt to repair or open the device, water damage, or physical damage beyond normal wear and tear will void the warranty.

**Australia**

Our goods and services come with guarantees that cannot be excluded under the Australian Consumer Law. For major failures with the service, you are entitled:

- to cancel your service contract with us; and
- to a refund for the unused portion, or to compensation for its reduced value.

You are also entitled to choose a refund or replacement for major failures with goods. If a failure with the goods or a service does not amount to a major failure, you are entitled to have the failure rectified in a reasonable time. If this is not done you are entitled to a refund for the goods and to cancel the contract for the service and obtain a refund of any unused portion. You are also entitled to be compensated for any other reasonably foreseeable loss or damage from a failure in the goods or service.

## 4.3 Disposal and Returns

Spidertracks is committed to reducing waste.

**EU**

Contact our support team on how to return or dispose of your device.

The European Union (EU) has developed the WEEE (Waste Electrical and Electronic Equipment) Directive to ensure that systems for collection, treatment and recycling of electronic waste will be in place throughout the European Union.

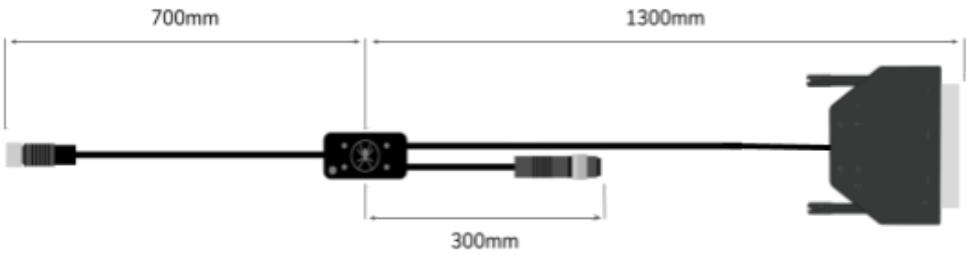
This directive requires manufacturers of electrical and electronic equipment who sell into EU countries to encourage consumers of such equipment to appropriately recycle the equipment at the end of their lifespan.

**Global**

Contact our support team on how to return or dispose of your device.

# 5 Specifications

| | |
|---|---|
| Part number | **2000GPI102** |
| Weight | 400 g (14.1 Oz) |
| Length | 2 m (6’ 6.75”) |




| | |
|---|---|
| **Interfaces** | |
| M8 Male 4-pin | Connection only to Spider X Power lead (2000PWR102 or 2000PWR105) |
| M8 Female 4-pin | Connection only to Spider X (6000SX) |
| 25 Male D-Sub | Discrete digital inputs for Spider X |
| **Power** | |
| Voltage | Class 1 energy source<br>14 VDC ±15%  or 28 VDC ±15% |
| Consumption | 400mW nominal (3A. max) |
| Protection | Spider X power cable includes 3A normal (fast) blow fuse. Only use approved spare parts. |
| **Inputs** | |
| Max Rating | +/- 60 V |
| Operating Voltage | 12 V to 36 V |
| Switching Threshold | 10 V Low to High, 7 V High to Low |
| Current Sink/Source | 3 mA excluding customer-fitted impedance |
| **Environmental** | |
| Operating temperature | -30°C to +60°C (-22°F to 140°F) |
| Storage temperature | -40°C to +85°C (-40°F to 185°F) |
| Operation and storage | Indoor, not water resistant |