RSW

Auto Switching Redundancy System
User Guide

Fretronics Engineering Limited
Unit 37 Elderpark Workspace
Glasgow, Scotland
G51 3TR

www.fretronics.com

Warning: To reduce risk of fire or electric shock, do not expose this appliance to rain or moisture or objects filled with liquids. Do not place objects containing liquids on the RSW™.

Caution: To reduce risk of fire or electric shock, do not remove screws. The RSW™ has no user serviceable parts inside. Refer all servicing to qualified personnel.

IMPORTANT SAFETY INSTRUCTIONS

Read the following information and instructions carefully. Keep and save all instructions for future reference.

Danger! High Internal Operating Voltages!

- Obey all warnings, instructions, and cautions in this User Guide and marked on the product.
- Do not open the equipment case. There are no user-serviceable parts inside. Refer servicing to qualified personnel only.
- Install in accordance with the manufacturer's instructions.
- Only use attachments and accessories specified by the manufacturer.
- Keep the RSW™ away from any appliances that produce heat, such as radiators, heat registers, stoves, or other heating appliances. If the RSW™ has been stored in an extreme temperature environment, allow it to come to room temperature before use.
- Do not cover or block any ventilation openings, and do not insert objects of any kind into the ventilation slots/openings.
- Connect only to a standard grounded AC outlet of 100-240VAC, 50-60Hz. Do not defeat or disconnect the protective mains earth connection on the power cable or plug. Use only the supplied power cord, which is compatible with the mains supply in your area.
- Ensure all power cords are in good condition (not kinked or pinched). If a cord becomes damaged, discard it and replace it.
- During a lightning storm or if the RSW™ will not be used for extended periods, disconnect from AC power by removing the power cable.
- Do not expose the unit to rain or moisture and keep all liquids away from the unit.
- Clean only with a dry cloth.
- Unauthorised modification of this equipment is expressly forbidden by Fretronics Engineering Limited.
- Stop operation of the unit and seek service if liquid or moisture enters the unit, if the unit operates inconsistently, incorrectly, or erratically, or if the unit has been dropped or the enclosure is damaged.
- Prolonged exposure to high volume levels can cause hearing damage. Use hearing protection in high volume situations.

Manufacturer's Name: **Fretronics Engineering Limited**
Manufacturer's Address: **Unit 37 Elderpark Workspace, Glasgow, Scotland, G51 3TR**
Declares that the product: **RSW™**
Conforms to the following Product Specifications:
EN 62368-1, EN 61204-3, EN 55032, EN 55035, EN61000-6-1, EN 61000-6-4

Supplementary Information:
The product herewith complies with the requirements of the Low Voltage Directive 2014/35/EU and the EMC Directive 2014/30/EU. Full test reports are available upon request.

Oliver Warner, Director – October 24th, 2024

Note:
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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Introduction

Hello and welcome! Thank you for purchasing the RSW™ – Auto Switching Redundancy System. Through discussions with Konvikt Kustoms, the idea for an auto-switching redundancy system was born, and it has since evolved into a fully manufactured product, designed and made in Scotland.

The RSW™ takes the next step forward in providing a complete audio redundancy solution for guitar and bass systems. With the press of a single button, the instrument signal, multipurpose switches, and line outputs can be seamlessly switched between modellers. The RSW™ also transmits MIDI data to both modellers, ensuring that any preset changes made via MIDI are always up to date. Built to accommodate universal input voltages, the RSW™ can be used anywhere in the world.

It includes two high quality, dedicated 12V locking power supplies (with 3A available per supply) for units requiring this power (such as the Neural DSP™ Quad Cortex™), eliminating the need for extra AC/DC adapters. Additionally, it features two IEC feedthroughs to power mains operated units (such as the Fractal Audio™ Axe-FX™ III).

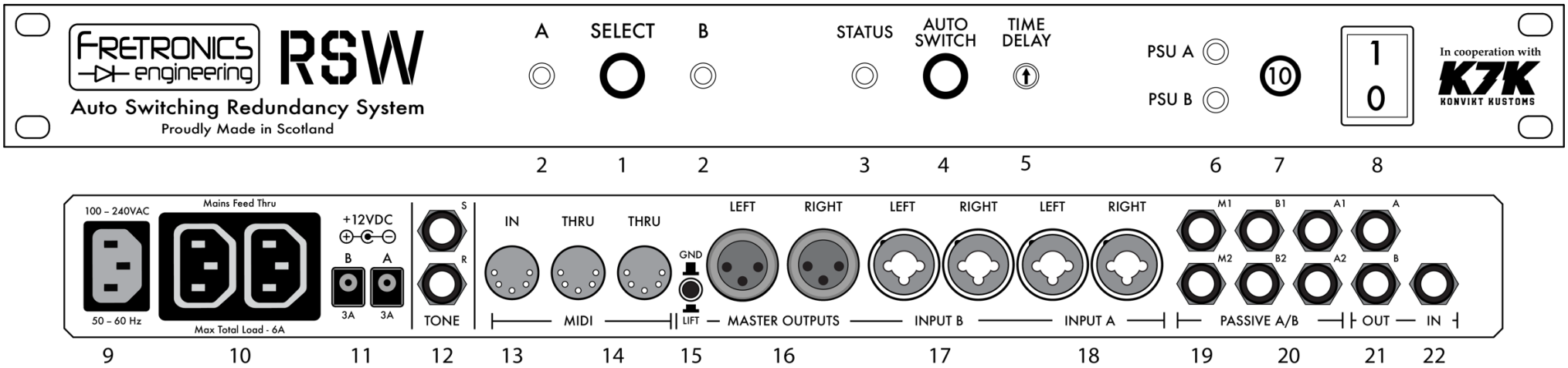
The key difference between the RSW™ and other A/B switchers on the market is its expansive IO and auto-switching capability. Using a tone generator and monitoring circuit, the system can detect if your main modeller loses power or becomes unresponsive (or 'bricked'), automatically switching to the backup unit. This ensures uninterrupted performance, with no need for the technician or artist to intervene manually in the event of an issue.

The RSW™ revolutionises the redundancy market. By eliminating the need for multiple individual devices and their individual power supplies, you save on costs, weight and time by reducing the labour involved with wiring a complex, manual redundancy system that still needs to be operated by a tech. The RSW™ has been designed with sustainability at the forefront, using premium and readily available components.

Box Contents:

- RSW Auto Switching Redundancy System
- Manual
- Mains Cable
- 2x DC Cables
- 5 pack of nuts

Panel Layout



Front Panel

1. Select button – to select between device A and device B
2. Selected device indicator LED
3. Auto Switching Status LED
4. Auto Switching function switch
5. Time delay control
6. 12VDC PSU indicator LEDs (shows PSUs are operational)
7. Circuit breaker - protecting the entire device and connected power supplies/mains-through devices, labelled with maximum current.
8. Power switch

Rear Panel

9. Universal Mains power input (IEC C14)
10. Mains Voltage Feed Through
11. 12VDC Centre Negative 2.1mm DC Jack (locking). Maximum 3A per connector. Each connector is powered from an independent, filtered power supply.
12. Auto Switch Tone Detection Send/Return
13. MIDI Input
14. MIDI Thru x2
15. Ground lift for XLR Master Outputs (disconnects pin 1 on XLRs)
16. Master Outputs – transformer balanced & isolated
17. Stereo XLR Combo Input B (XLR/Jack outputs from device B)
18. Stereo XLR Combo Input A (XLR/Jack outputs from device A)
19. Isolated Passive A/B "Master" - TRS
20. Isolated Passive A/B inputs/outputs - TRS
21. Balanced outputs to device A & B inputs (buffered) from the main input (22). Note: only balanced output if input is balanced
22. Input (balanced instrument/line level), sends to the outputs (21)

Auto Switching Explained

You're in the middle of a live show, and your main modeller goes down. Normally, that would be panic stations! Of course, the artist or technician can manually switch between the two devices using the "SELECT" button, but what if the artist is running without a technician or the technician is busy with something else? Introducing the auto-switching feature!

How to hook it up

Auto switching works with tone send and tone return monitoring. There are full example connection diagrams on the following pages.

1. Connect the Tone Send to a spare input on your main modeller with instrument (TS) cable. The tone send is a -10dBV tone (so it can connect to any instrument/line in jack).
2. Connect the Tone Return to a spare output on your main modeller with instrument (TS) cable.
3. In your main modeller's presets, directly connect the chosen input to the chosen output. This connection needs to be independent and free of any signal processing/conditioning. This setting must be made on every preset you will be using on the device. Fig 1 below shows this as an example on FM3™ Edit software.
4. Make sure the volume for the chosen output is turned up to a reasonable level.
5. Press the "AUTO SW" button to turn it on.
6. Under normal circumstances, the "STATUS" LED should be green, if it is orange then the return level is too high, so turn down the output level until it just comes off orange and back to green.

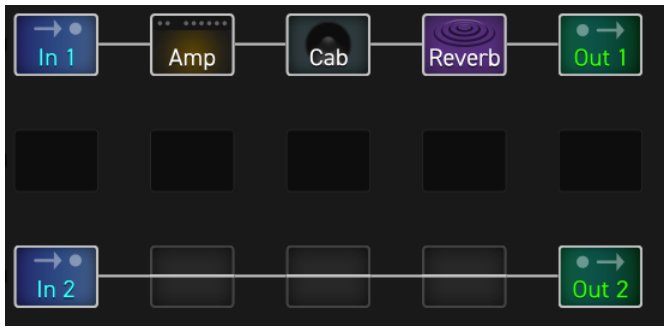


Fig 1 – Using In 1 as the main signal flow to Out 1 and In 2 & Out 2 on FM3™ Edit to route the tone send/return for auto switching

Auto Switching Status & Switching Lockup

The "STATUS" LED shows the current status of the return signal:

- Green – the return signal is good
- Amber – the return signal is too hot (greater than 0dBU). Reduce the level of the output on your device until the LED returns to green
- Flashing Red – Error, auto switching has been enabled and has switched over to device B and the unit is temporarily locked

If the return signal drops below -20dBV, the RSW™ will switch over to device B and lock, preventing switching back to device A (which has an error). This "locking" feature is designed to prevent accidentally switching back to device A without addressing and remedying the source of the problem, such as a bricked/locked-up modeller or a failed power supply.
To return the RSW™ to normal operating mode and unlock the switching capabilities, hold both the "SELECT" and "AUTO SW" buttons for 5 seconds. The LED will go solid red, flash red several times, and then flash green to indicate it is unlocked. The RSW™ will remain set to device B until device A is manually selected (either via MIDI or with the select switch).
To turn off the auto-switching feature while it is operational, hold the "AUTO SW" button until the LED flashes green, then amber, then red, and then turns off to indicate it is turned off.
Note: The tone send and return jacks are internally switched. If a cable is not inserted into either jack, the tone feeds into the return signal. This is to prevent the RSW™ from going into an error state if the auto-switching feature is not connected and is turned on by accident.

Time Delay Control

To account for a gap in signal when switching presets, there is a time delay before the auto-switching feature kicks in. This delay is adjustable with a small flat-head screwdriver using the hidden potentiometer on the front panel. It can be adjusted from 100 milliseconds (fully counterclockwise) to 2 seconds (fully clockwise). When measured, most presets have a switching gap of around 50 milliseconds or less, depending on the complexity of the preset, so it is preset to 100 milliseconds from the factory. If the modeller takes longer to switch presets, use the time delay control to prevent "false" errors.

MIDI Setup

The RSW™ not only feeds incoming MIDI to both devices but can also switch between them via MIDI. The MIDI receive channel is preset internally to Channel 10. This is so the artist or technician could switch devices using a MIDI foot controller.
To select between device A and device B, simply send a MIDI control change to **Channel 10, CC80**. A data value of **0** (or < 63) selects device A, and a value of **127** (or => 64) selects device B. Please note that if the auto-switching feature goes into an "error" state causing the RSW™ to "lock," it will not respond to changes until it is reset, similar to the front panel "SELECT" switch.

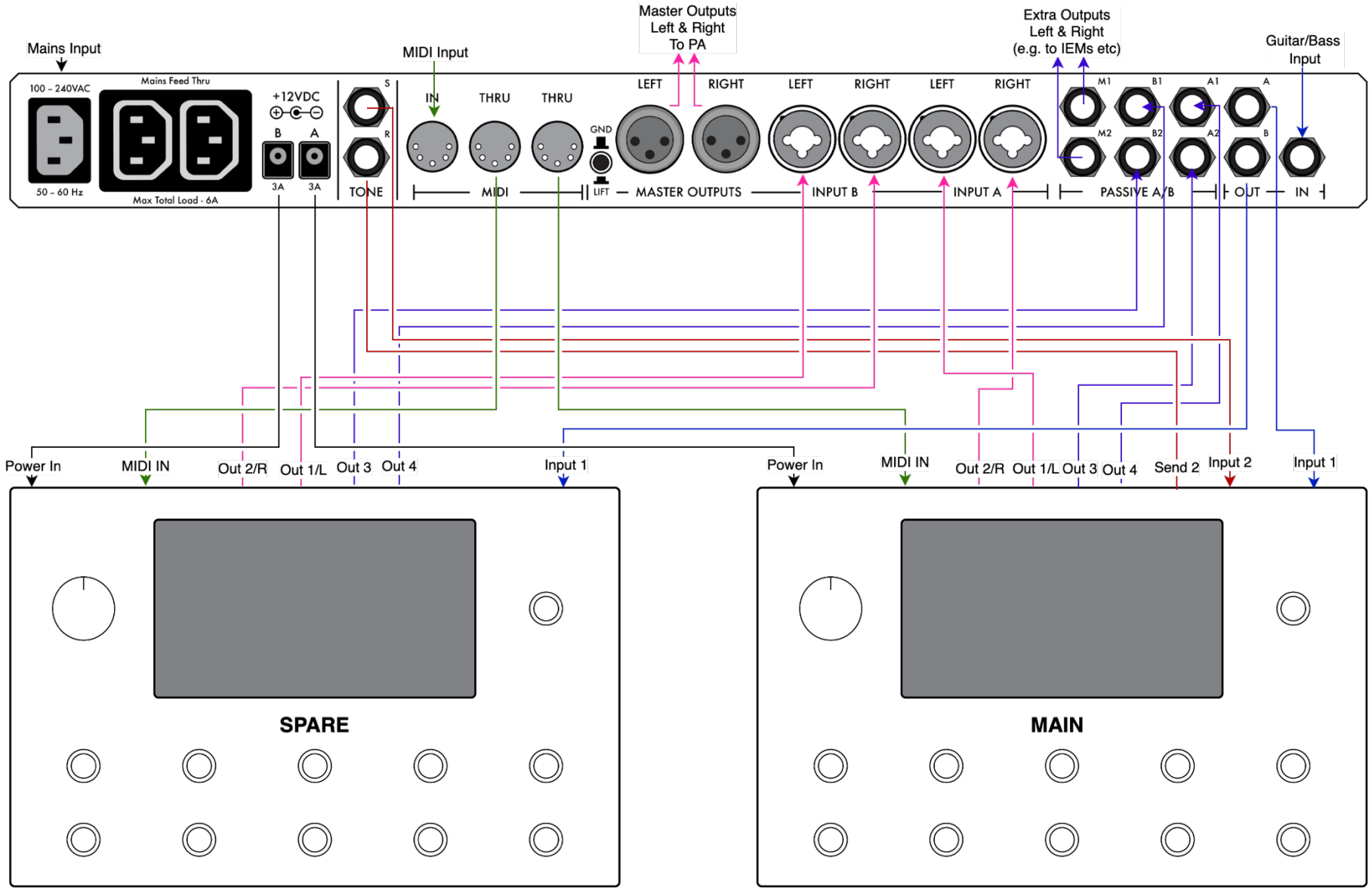
Power Supplies

The power input for the RSW™ is an IEC C14 connector (the power cable is commonly known as a "kettle lead"). The maximum current specification for this connector is 10A at 250VAC. To protect the RSW™ and any devices connected, if more than 10A is being drawn, the circuit breaker on the front panel will trip.
Due to the current draw of the RSW™ itself, as well as the two 12VDC power supplies, the maximum current that should be drawn from the IEC feed-through connector is 6A (e.g. 3A per outlet).
This provides plenty of power to use with modellers such as the Fractal Audio™ FM3™, FM9™, Axe-FX 3™, Line 6™ Helix Rack™, and Kemper™ Profiler Rack™, but check your device's power requirements first before using.
These outlets should not be used to supply power to power amplifiers or any devices that draw significantly more power (e.g. Kemper™ Profiler Power Head™), and such devices should have their own dedicated supply.
The two 12VDC outlets are powered by individual dedicated and filtered power supplies. The two LEDs on the front panel indicate they are operating correctly and will illuminate under normal operating conditions. No LED = No Power, which means either the power supply or, more likely, the unit they are connected to, has a fault. The power supplies for the RSW's internal circuits and the two 12VDC sockets all have short circuit, overload, and over-voltage protection.

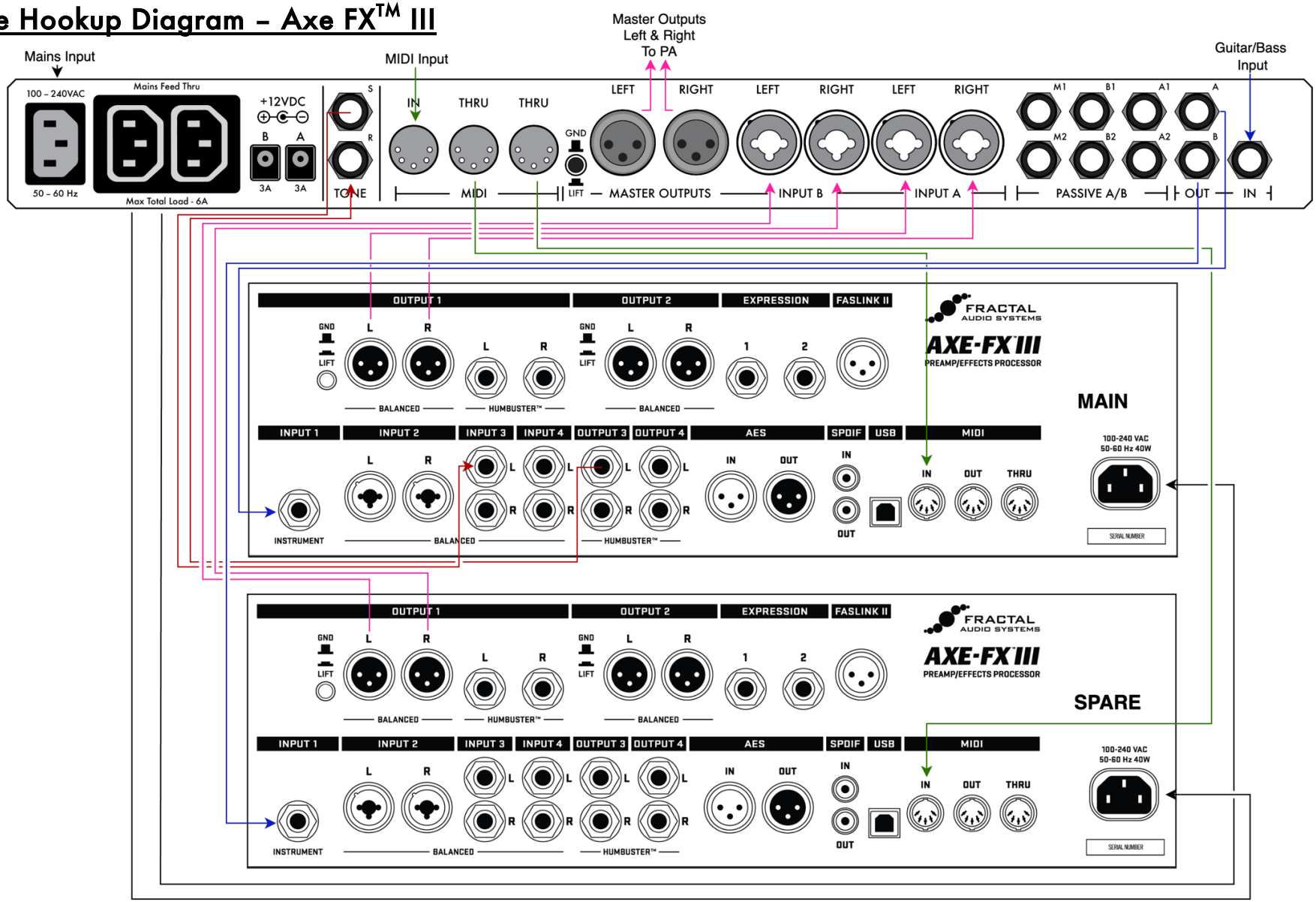
Passive A/B Jacks

These jacks and their switching are unbuffered and completely isolated from the rest of the circuit and from each other (e.g., "A1" and "A2"), meaning they can be used for many purposes. The sleeve of each A/B jack in that section (e.g., A1, B1, M1) is connected, and the tip and ring of the jacks are switched between A and B.

Example Hookup Diagram – Quad Cortex™

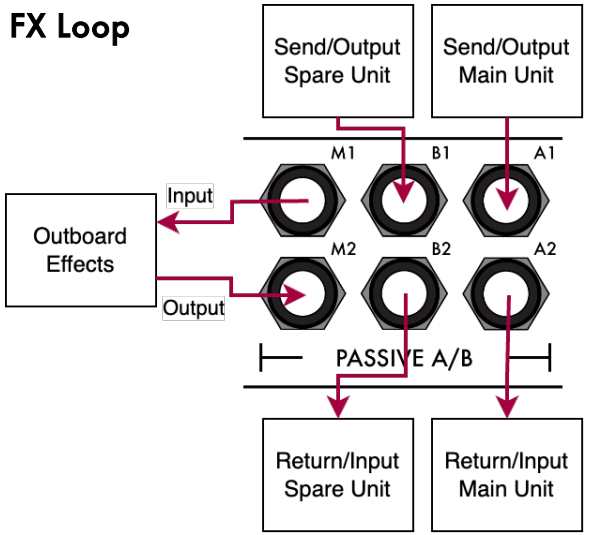


Example Hookup Diagram – Axe FX™ III

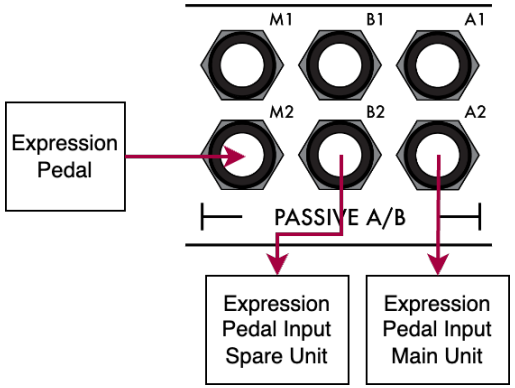


Expanded Uses of the Passive A/B Section

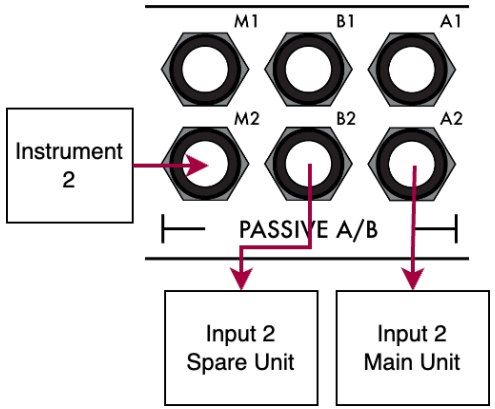
FX Loop



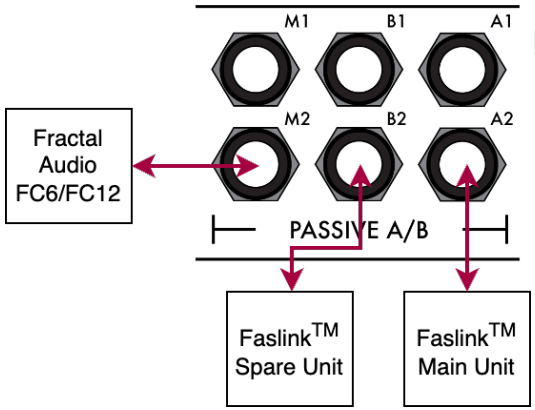
Expression Pedals



Extra Inputs



Faslink™



Note: This is switching the power supply for the FC6/12 from one unit to another, the FC6/12 will reboot during this process. This is the same as disconnecting and reconnecting the power.
This configuration would also require an XLR to TRS cable.
Please email info@fretronics.com for the wiring information

Specifications

Power

Power input	100-240VAC 50-60Hz IEC C14, 1500W Max
Power output	• IEC Feed Thru (Outlet F acc. to IEC 60320-3) x2 • 12VDC 2.1mm Centre Negative 3A x2 • Indicator LEDs for 12VDC outlets only

Size

Dimensions	1U x 230mm deep (9”)
Weight	2.3Kg (5.1lbs)

Audio

Input & Output	Instrument/Line Input – TRS – Balanced (Max input 18dBU) – Impedance 1MΩ
XLR	Balanced Line (Max input 18dBU). Wiring: Pin 2/T = Hot, Pin 3/R = Cold, 1/S = Circuit Ground, Shell = Earth Ground lift switch disconnects Pin 1 of the output XLRs from the circuit ground Output Impedance 600Ω

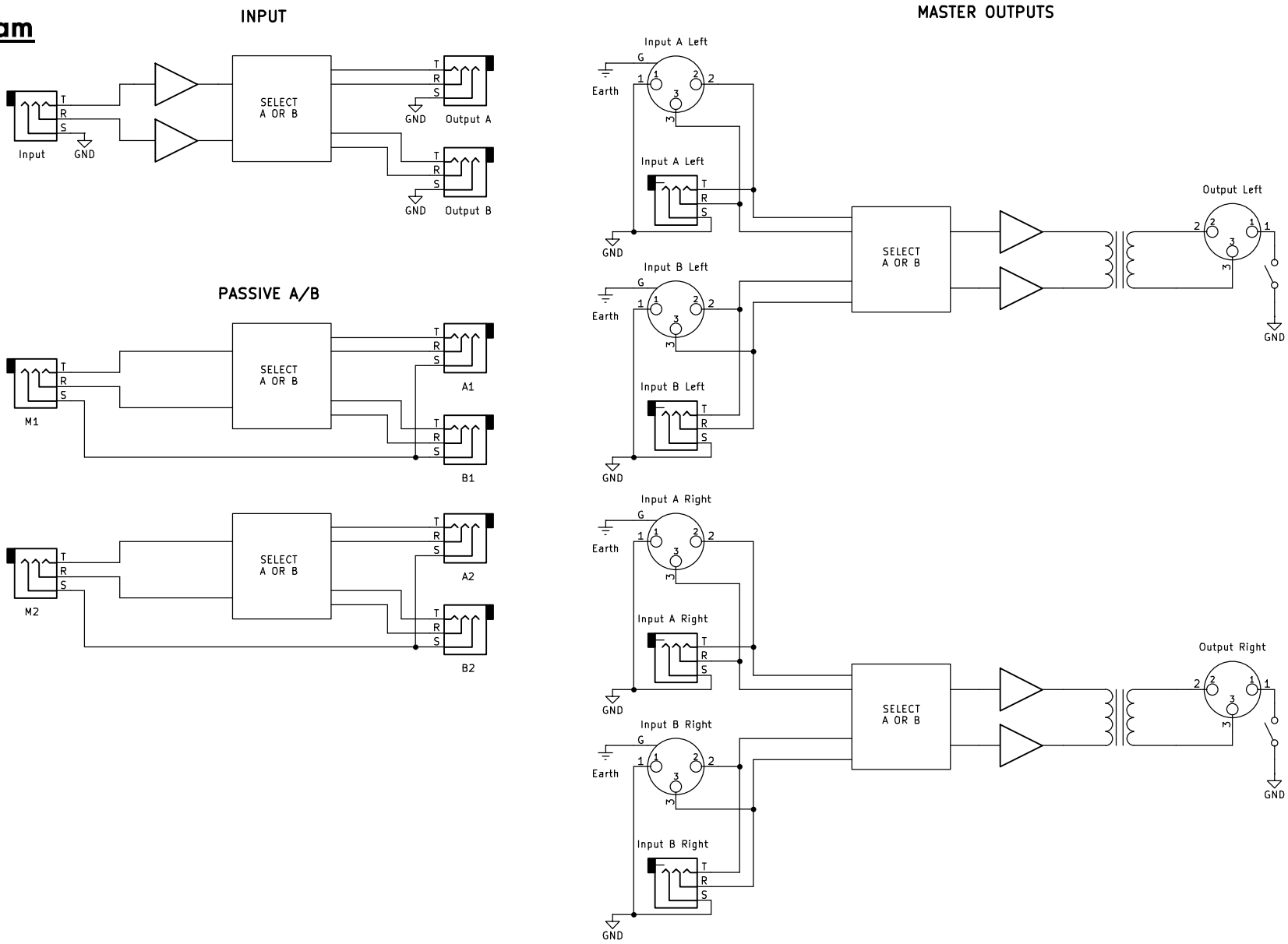
Misc.

Passive A/B	TRS all connectors These are isolated from the rest of the circuit and passive, meaning they can each be used like a normal bidirectional A/B switcher e.g. 2 inputs (A/B) to 1 output (M) or 1 input (M) to 2 outputs (A/B).

MIDI.

In/Thru/Thru	5 pin DIN

Block Diagram



Everything Else:

Troubleshooting

If any part of the RSW™ does not work as expected, please reboot the system and check all cabling first. If that is unsuccessful, please create a support ticket through our website or email us – service@fretronics.com.

Warranty

The RSW™ comes with a 12-month manufacturer's warranty ("**Limited Warranty**") as standard. The Limited Warranty covers only the original purchaser of the product from Fretronics Engineering Limited ("**Manufacturer**") or one of the Manufacturer's authorised resellers (an "**Authorised Fretronics Reseller**").

The Limited Warranty covers any defects in the parts and workmanship in the RSW™ for 12 months from the original date of purchase, subject to the below exceptions.
The Limited Warranty does not cover:

- Ordinary wear and tear in the course of normal and intended use or arising with age.
- Accidental damage, including by dropping, spillage, improper handling or storage, fire, flood, earthquake etc.
- Any use of the RSW™ which is not in accordance with Manufacturer's installation, operation and/or maintenance instructions or not in accordance with the specification provided by the Manufacturer.
- Repairs carried out to the RSW™ by any person other than by the Manufacturer or an Authorised Fretronics Reseller or any modifications undertaken without the Manufacturer's permission.
- Cosmetic defects.

If you wish to make a claim under the Limited Warranty, please contact the Manufacturer at service@fretronics.com and we will help you to process your claim. Please retain your proof of purchase or order number for the RSW™ as we will need this to verify your claim. The Manufacturer will, at its option, repair or replace the parts of the RSW™ covered under the warranty or provide a refund of the price paid. All repair or replacement parts shall be subject to the remainder of the Limited Warranty. This warranty is governed by and shall be construed in accordance with the laws of Scotland and any dispute arising in connection therewith is subject to the exclusive jurisdiction of the courts of Scotland.

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Thank you

The concept for the RSW™ is based on a need identified by some of the best backline technicians in the business and would not have been possible to design without their input.

Company Details

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Support Phone Number: +44(0)141 316 3967

Open 9am to 6pm (GMT/BST) Monday to Friday

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For the latest information, or to find this manual in other languages, go to: www.fretronics.com

Whilst the information contained herein is correct at the time of publication, due to our policy of constant improvement and development, Fretronics Engineering Limited reserves the right to alter specifications without prior notice.