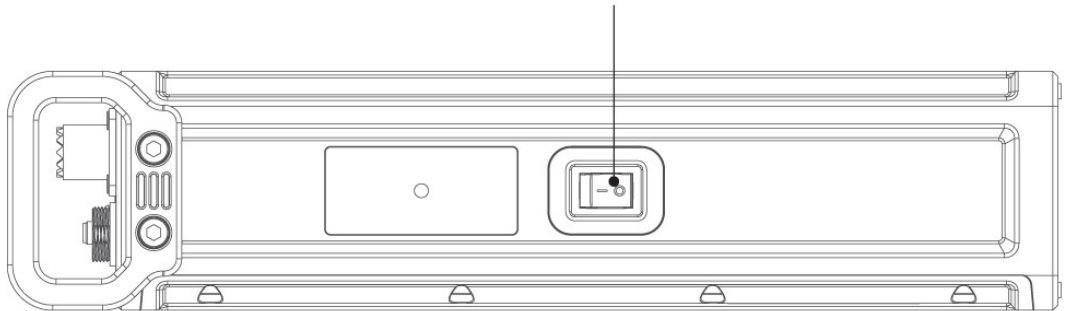


FDP PAR (Portable Analogue Repeater) Operational Guidelines

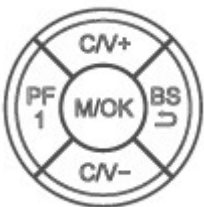
Control Interface & Key Functions

To turn on the repeater, the side power switch must be in the ON position first. Then the unit can be turned on or off with the front panel power key/button. For optimal battery conservation, please return the side switch to the OFF position when the device is not in use for long periods.

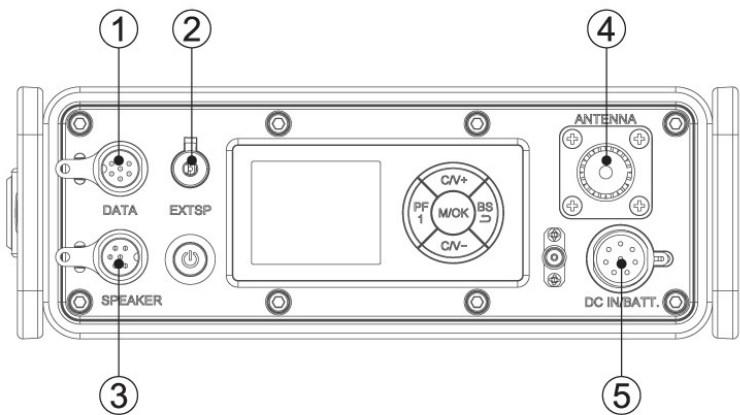


While front function keys are programmable, the standard configuration is as follows:

- **PF1:** Monitor (Open Squelch)
- **BS:** Back Step and Toggles between Channel/Volume control modes.
- **C/V+ / C/V-:** To change the Channel or Volume.
- **M/OK:** Short press for Menu access; long press to engage the Menu Lock.



Accessories Connections



①	Data port: Connect the programming cable with this port to program radio
②	Extsp: External speaker port, connect external speaker with this port
③	Speaker port: Connect microphone with this port
④	Antenna: Install the antenna in this port
⑤	DC IN/BATT: Charge the battery by this port

Antenna & Duplexer Optimisation

Operate the FDP PAR strictly within the calibrated bounds of the internal duplexer. Ensure the antenna is specifically tuned to the transmit (TX) frequency. While the unit features automated power reduction to mitigate high VSWR, prolonged exposure to mismatched loads may cause permanent hardware damage.

The FDP PAR is approved for 400–500MHz use in narrowband and wideband. Internal duplexers are available in two variants: **400–470MHz** and **450–520MHz** (standard). Duplexers must be tuned to your specific TX/RX frequency pair prior to operation. A 9-10MHz separation is highly recommended.

Power Management & Thermal Regulation

The unit supports power outputs of 5W, 10W, and 15W. For 15W operation, a minimum duplexer offset of 9-10MHz is recommended; **for narrower offsets, reduce the power output**. When operating at maximum power under high duty cycles or elevated ambient temperatures, supplemental external cooling (such as a fan) is advised to maintain optimal performance.

Deployment & Positioning

When deploying the unit vertically, ensure it is secured against wind or accidentally being knocked over. *Duplexers are precision-tuned components; significant shock or vibration could shift their alignment.*

If stability is a concern, the unit may be operated horizontally. In this orientation, a right-angle adapter should be used with directly attached antennas to maintain vertical polarisation. If operating horizontally at medium to high power, slightly elevating the front of the chassis will facilitate necessary airflow for cooling.

Operational Modes

The FDP PAR can operate as a duplex base/mobile station, featuring a selectable repeater mode (if menu key access has been set). Engaging the Push-to-Talk (PTT) function on the Remote Speaker Microphone (RSM) initiates immediate transmission, bypassing active repeater mode operations. Please note that the unit does not support simplex transceiver configurations or receive-only (RX) dedicated channels. However, when repeater mode is deactivated and the RSM is disconnected, the FDP PAR functions effectively for RX monitoring with an external speaker.

The repeater features three speaker settings: Off, Speaker Microphone, and External Speaker. Following programming, the device defaults to the Speaker Microphone setting. Changing the configuration to External Speaker or Off requires menu access. The front panel includes a 3.5mm jack for an external speaker. If disconnecting the RSM to manually mute the audio, it is best practice to first lower the volume to the minimum setting.

When using the speaker microphones PTT to call, any squelch tail settings (if set) will not be evident.

Signal Integrity (CTCSS/DCS)

For optimal performance and to minimise interference, the use of CTCSS or DCS tones is strongly recommended. CTCSS is **preferred** for this hardware (and most duplex repeaters). The unit

supports 51 CTCSS tones and 104 (plus Inverse) DCS tones, with active values displayed on the colour LCD screen.

Due to duplex operation, squelch level settings are **essential** to correct function.

Recommended minimum thresholds are:

- **CTCSS:** Squelch Level 4
- **DCS:** Squelch Level 5
- **Open Channel:** Squelch Level 6

Squelch levels may need to be increased if the unit is deployed in high-RF environments.

If your dealer enabled a squelch tail or release click on your repeater, increasing your squelch level by one to two unit above minimum (if menu enabled) may be required. We generally recommend disabling the squelch tail, though some setups may benefit from it.

Lower squelch thresholds may be achieved when operating with an external antenna, configuring the device as a duplex base radio with repeater mode disabled, or utilising reduced power settings.

TOT

We normally set all *FDP* radios with a TOT (time out timer) of 60 seconds and that is our recommendation with this repeater as well. Up to 180 seconds is available.

Power Supply & Battery Longevity

The included external AC power supply facilitates both battery charging and direct operation at 5W. At the 10W and 15W setting, the unit draws supplementary power from the internal battery.

In the event of a mains failure or portable deployment, the battery provides up to 9 hours of service (at 10W with a 50% duty cycle), depending on the programmed Battery Save settings (OFF, 1:1, 1:2, or 1:4).

Typically, repeaters configured for primary operation via the external AC power supply have the battery save function disabled. If the device is programmed mostly for portable use, battery saving mode may be active to preserve battery longevity.

Please note that when battery save is used - transceivers transitioning from standby mode, after a period of inactivity, may experience inherent initial receive latency. To ensure seamless communication, operators should be instructed to press their radios PTT (push-to-talk) key, pause for approximately one second to allow the link to stabilise, and then commence speaking (old-school radio protocol). Using DCS, regardless of battery save setting, will have a one second RX/TX latency.

To preserve battery health, avoid total discharge. Charging the unit from a critically low battery state will cause the AC power supply to generate significant heat; maintaining a partial charge is recommended for cooler operation. While the Li-ion Battery Pack has a nominal voltage of 14.4V, it can reach nearly 17V when fully charged. Note that the repeater will automatically shut down if the battery voltage drops below 12.25V, as there is no longer enough power to support transmissions, should you try to transmit.

IP Rating

The *FDP* PAR is rated IP67 waterproof, provided it is in good condition and all screw-on accessory caps - excluding the antenna socket - are correctly fitted. Additionally, the PAR RSM features a dedicated rubber seal on its connector for enhanced protection.

Optional Accessories

A dedicated antenna package is available as a separate purchase to compliment the *FDP* PAR. It features a 2.2 - 3dBi tuned single-element antenna of approximately 37cm length (varies with tuning) with both straight and right-angled adapters.

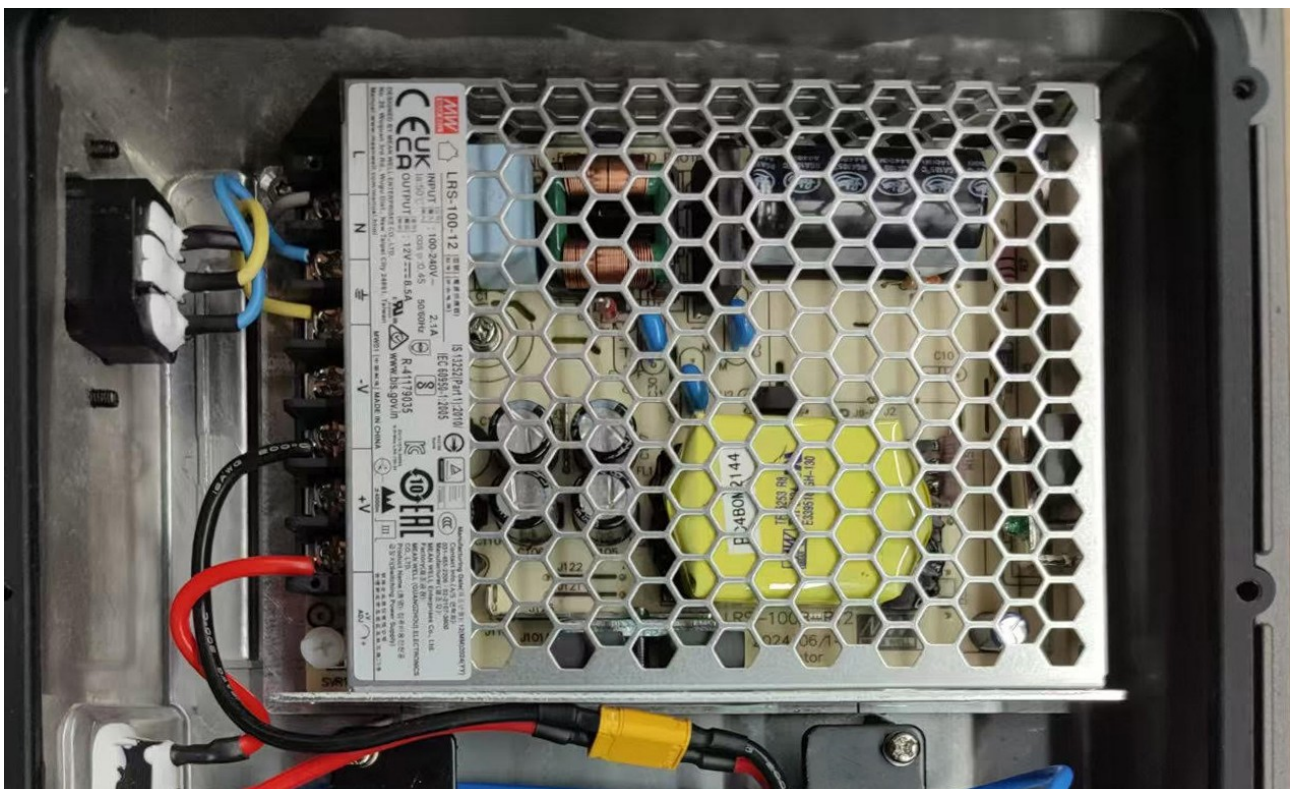
External Power Supply (other)

The *FDP* PAR operates via its internal battery or the provided AC power adapter. For applications involving external battery systems, we recommend using a clean inverter of sufficient capacity ($\geq 500W$ pure sine wave) to connect to the AC power adapter.

If an inverter is not feasible, the external battery may be connected directly using a compatible DIN plug; however, the internal battery **must be** disconnected prior to use. This precaution is necessary as the internal battery system operates at a higher voltage than standard lead-acid or AGM batteries.

Alternative Internal Power Supply

In some instances an internal mains powered supply can be installed in place of the integral battery pack. An example of this is a Mean Well LRS-100-12 with 12VDC 8.5A output. This is a specialised custom option.



Base Plate Removal

Please refrain from removing the base plate for casual inspection. Improper reassembly may compromise the integrity of the rubber seal and diminish the unit's water resistance. Servicing should be reserved for qualified professionals and performed only when strictly necessary.

Please be advised that any unauthorised removal of the base plate or tampering with internal components by non-approved personnel shall void the manufacturer's warranty in its entirety.

Accessories Removal

When disconnecting accessories - including the power supply, data, and RSM cords - make sure the threaded collar is completely undone first and always grasp the plug directly rather than pulling the cable. Pulling the cord can cause internal damage to the wires and compromise the function of the accessory.

Transport and Storage

For optimal protection and to mitigate the risk of duplexer misalignment, the FDP PAR should be transported and stored in its original padded packaging. Alternatively, a padded equipment case (such as a Pelican™ case) is recommended.

EME Notice

The antenna of the transceiver, under normal use condition is to be at least 55cm away from the body of the user. This is based on 32W EIRP at 50% duty cycle.