

Reflex Drive

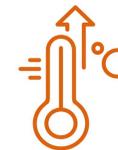
RD T-Series V2 ESC 55A - Product Specification



Over current
Protection



Startup
Protection



Over Temperature
Protection



Stuck Rotor
Protection

Product Description:

RD T-Series V2 ESC 55A is an advanced Electronic Speed Controller (ESC) designed for high-performance applications. **Made in India**, this model significantly enhances thermal and current handling capabilities. Housed in a sleek and durable Aluminum enclosure, the ESC offers excellent heat dissipation and protection against harsh environmental conditions.

Technical Specification

S. No.	Parameter	Value	Remarks
1.	Input Voltage	4 - 12S LiPo	-
2.	Continuous Current	55A (60min , With Active Cooling)	Tested in 12.5 m/s continuous airflow and 28°C ambient Temperature
3.	BEC Output Voltage	No	-
4.	Operating Ambient Temperature	(-20°C) ~(+ 65°C)	-
5.	Standby current (48V)	≤ 30mA	-
6.	Throttle Range (Can't be calibrated)	1050us ~ 1950us	Fixed Range
7.	Recommended Throttle refresh frequency	50Hz	-
8.	Throttle I/P mode	PWM & Dshot300	-
9.	Over Temperature Protection	Yes	-
10.	Overcurrent Protection	Yes	-
11.	Stuck Rotor Protection	Yes	-
12.	Waterproof Rating	IP54	-
13.	Startup Protection	Yes	-
14.	Invert Motor Spin	Yes	Configured using RD GUI
15.	Telemetry	Yes	Voltage, Current, PCB Temperature, Motor eRPM
16.	Braking Feature	No	-

Wire and Enclosure Specification

Seq.	Item	Wire colors / Size	Length	Remarks
1	Input cables	Silicone wires-red/black- 14AWG	10cm	±1cm
2	Output cables	Silicone wires-black(x3) - 14AWG	12cm	±1cm
3	Signal & Telemetry wires	Silicone wires - Black , White(2P),Red(1P) 3P-JR Connector	22cm	±1cm
4	Enclosure	Aerospace grade anodized aluminum		Black

Dimensions & Weight

Seq.	Item	Requirement	Remarks
1	Length	55mm	±0.4mm
2	Width	38.5mm	±1.2mm
3	Height	19.5mm	±0.1mm
4	Weight(Incl. ESC with wire)	82g	±1g

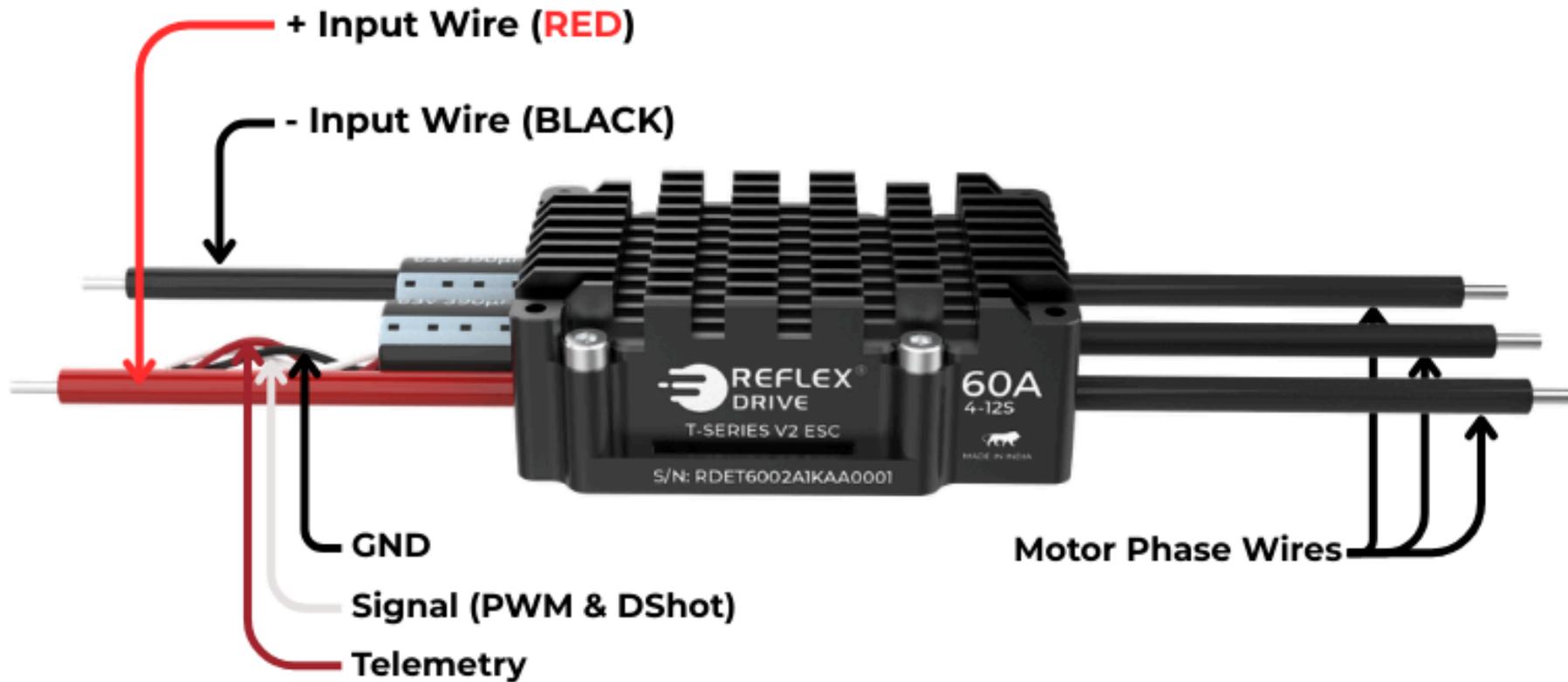
Precautions

- Do not exceed the recommended operating voltage range of the ESC, otherwise it may cause irreversible damage to the ESC.
- This ESC throttle has been solidified and does not require throttle calibration. The throttle stroke is 1050-1950us.
- Ensure adequate cooling for the ESC. Avoid enclosing it in airtight spaces. Overheating can reduce performance and may permanently damage components.
- Do not expose the ESC to water, oil, dust, or conductive particles unless it is properly sealed or coated. This can cause short circuits or corrosion.
- Always double-check battery connections. Reverse polarity can instantly damage the ESC.
- Only use batteries within the specified voltage and current ratings (e.g., LiPo with proper cell count). Over-voltage or unstable supply can damage the ESC.
- Loose connectors or poor soldering may cause arcing, noise, or intermittent failure. Ensure all connections are firm and reliable.

Protection Function Description

- **Stuck Rotor protection**
 - The ESC performs a single startup attempt and terminates operation if no rotor movement is detected. Restart is permitted only after the throttle is reset to minimum. Persistent failure indicates a possible motor or mechanical fault.
- **Over Current Protection:**
 - When the ESC output current exceeds the rated current limit of 55A, The ESC gradually reduces the output current to the rated limit of 55 A immediately.
- **Over Temperature Protection**
 - When the ESC PCB temperature exceeds 110°C, The ESC gradually reduces the max output current to $\frac{2}{3}$ of max rated current of ESC (37A) and ESC current will not exceed 37A. This reduction helps lower the temperature and prevent damage to the ESC components. Power cycle the ESC to continue the normal operation.
- **Low voltage and High voltage protection**
 - This ESC does not provide under-voltage or over-voltage protection. Operation below 18V or above 53V may cause abnormal behavior or malfunction. Ensure operation within specified limits. Immediate landing is recommended in UAV applications if voltage deviates from this range.
- **Throttle signal loss protection**
 - Motor output is disabled immediately upon loss of the throttle input signal.

Wiring Diagram:

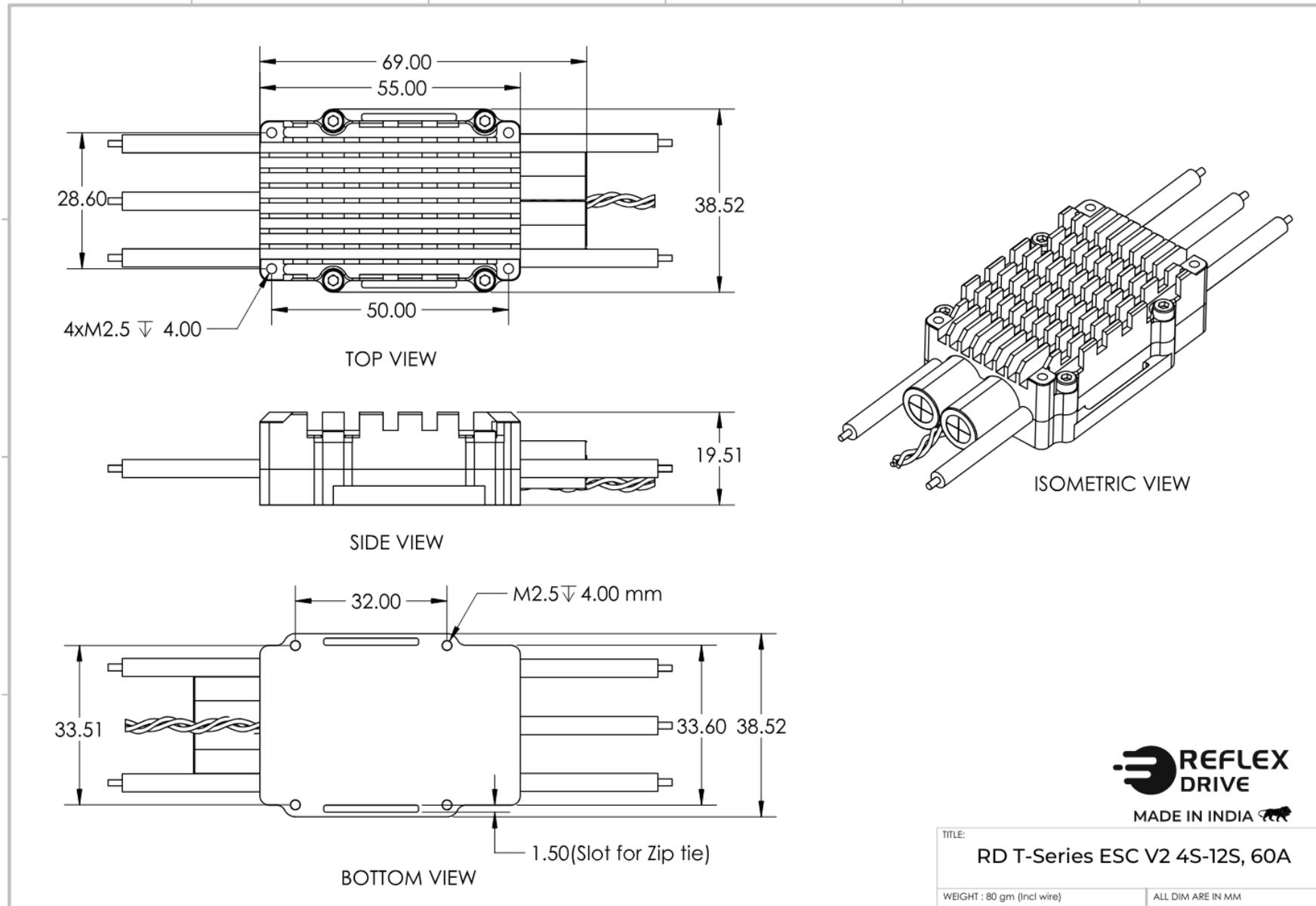


Wire Gauge (AWG)

- 1) **Input Wire: 14 AWG**
- 2) **Motor Phase Wires: 14 AWG**

Note: The ESC uses a single Dupont 2.54mm 3-pin female connector to carry all control and telemetry output signals. In this configuration, the Signal input (white) wire is on one end, Telemetry (red) is in the middle, and Ground (black) is on the opposite end. This eliminates the need for soldering and ensures broad compatibility with standard 2.54mm header interfaces.

Engineering Drawing:



Common Faults and Alert Tones Description

Fault Phenomena	Alarm	Possible Cause	Solution
After powering on, the motor fails to start	"Beep, beep, beep..." (with a 2-second interval between each beep)	The receiver's throttle channel is not outputting a throttle signal	<ul style="list-style-type: none">• Check if the radio and receiver are paired correctly.• Check if the throttle channel wiring is connected properly.• Verify the ESC communication priority (factory default is PWM).

REFLEX ESC CONFIG INSTALLATION

Reflex ESC Config is a desktop-based software utility designed by Reflex Drive to help users view, tune important ESC parameters, and flash firmware.

Note: All the ESCs come pre-installed with the latest firmware, so users don't need to request it separately.

Reflex ESC Config software is available upon request at hello@reflexdrive.in for updates and parameter adjustments. **Customization options are available for OEMs only.**

Reflex ESC Config Version: PFWENL-2025-v1.0.1

System Requirements

Operating System: Windows 10 or Later

Interface: RD Link v1.0

Installation Process

- 1) Run the installer
- 2) Allow Permissions: If Windows prompts "Do you want to allow this app to make Changes? ", click "Yes".
- 3) Accept the License Agreement: select "I Agree" and Press "Next".
- 4) Read Information: A note about software will appear, Read it and click "Next".
- 5) Check "Create Desktop Shortcut" and press "Install"
- 6) Once installed, click "Finish" to launch Reflex ESC Config.

Note: This version (PFWENL-2025-v1.0.1) includes only essential parameters such as Motor KV, Motor Poles, Max PWM, Min PWM, PWM Telemetry, and Invert Motor Spin, along with firmware flashing support.

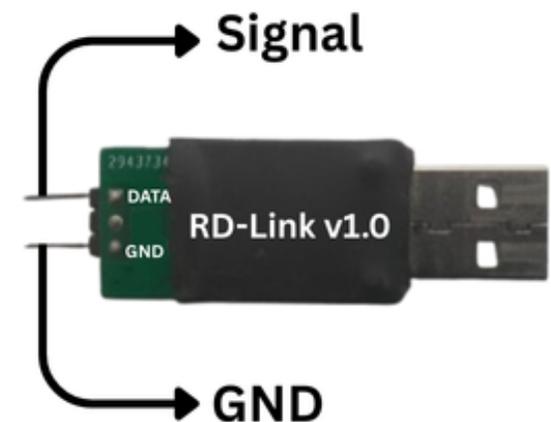
IMPORTANT

We recommend using the **latest available release** of the software for best performance, compatibility, and access to new features.

ESC PROGRAMMING AND FIRMWARE UPDATE

The ESCs interface with Reflex ESC Config through **RD-Link v1.0** developed by Reflex Drive.

Communication occurs over signal wire: the **signal wire connects to RD-Link's Data Pin**, and the ground wire to GND. The ESCs use a 2.54mm Dupont connector, fully compatible with RD-Link. The wiring diagram is provided.



RD T-Series V2 ESC 55A

High Performance Industrial ESC



- ⚠ Ensure all connections are correct and the ESC is powered on; otherwise, Reflex ESC Config will display a connection error.
- ⚠ Always save settings and complete any configuration operations, then close the Reflex ESC Config software before unplugging. Unplugging during flashing may result in incomplete flashing, corrupt the firmware, and render the ESC unusable.
- ⚠ The ESC can be powered with just the minimum rated voltage for flashing firmware or adjusting parameters. Supplying full operational voltage or load is not necessary for these procedures.

IMPORTANT: Only firmware files provided by Reflex Drive are supported. Any attempt to tamper with or flash unauthorized firmware may result in failure and device malfunction. Reflex Drive assumes no responsibility for such actions.

FIRMWARE FLASHING STEPS

Launch the software: Open Reflex ESC Config (Latest Version). You'll start on the Welcome Tab. **Follow the chronological order as shown in the image.**

1) Select COM Port

Use the dropdown to select the correct COM port. If you're unsure of the port number, check your system's Device Manager.

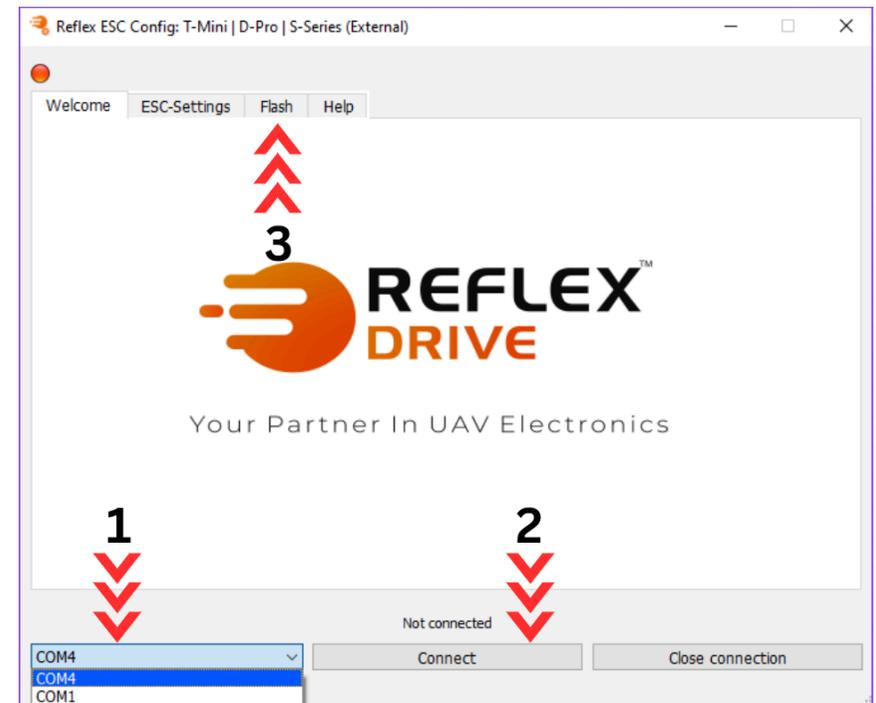
2) Connect to ESC

Click the "Connect" button — the connection status should update to "Connected."

3) Go to the Flash Tab

Click the "Flash" tab on top. You'll see buttons to select and flash firmware.

Note: The **Revert button (bottom-right corner)** restores the settings that were present at the time of the latest connection. **Revert Button is disabled after a fresh firmware flash.**



4) Select Firmware

Click "Select Firmware" and choose the firmware file provided by Reflex Drive. Make sure you are using the latest firmware version compatible with your ESC.

5) Save Settings

Before flashing, ensure appropriate settings are saved.

6) Start Flashing

Click "Flash Firmware" to start.

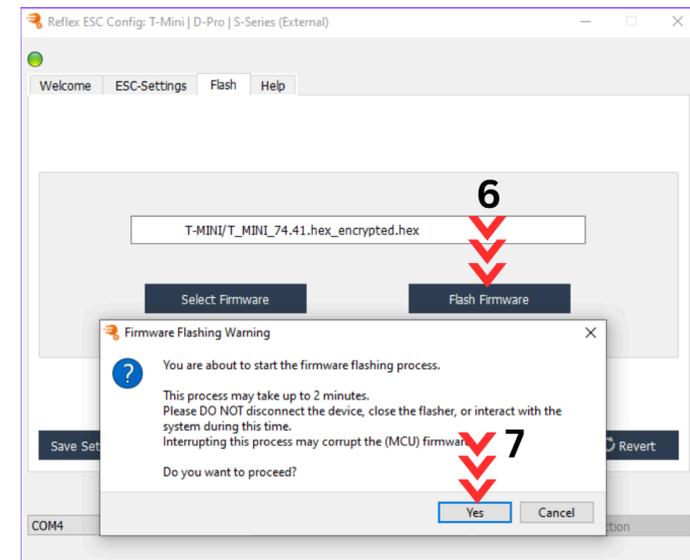
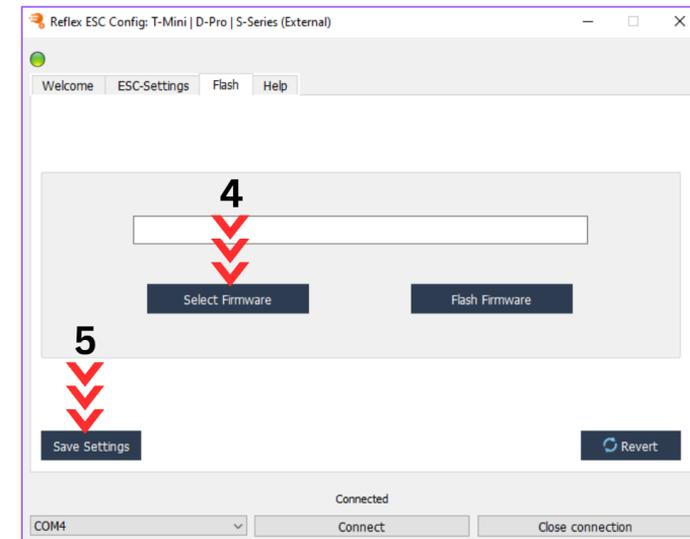
7) Firmware Flashing Warning

Click "Yes" to confirm. "Firmware Flashed successfully" will appear when done, verify and disconnect to complete the firmware update.

8) Procedure to Resolve Flash Failure During ESC Firmware Flashing

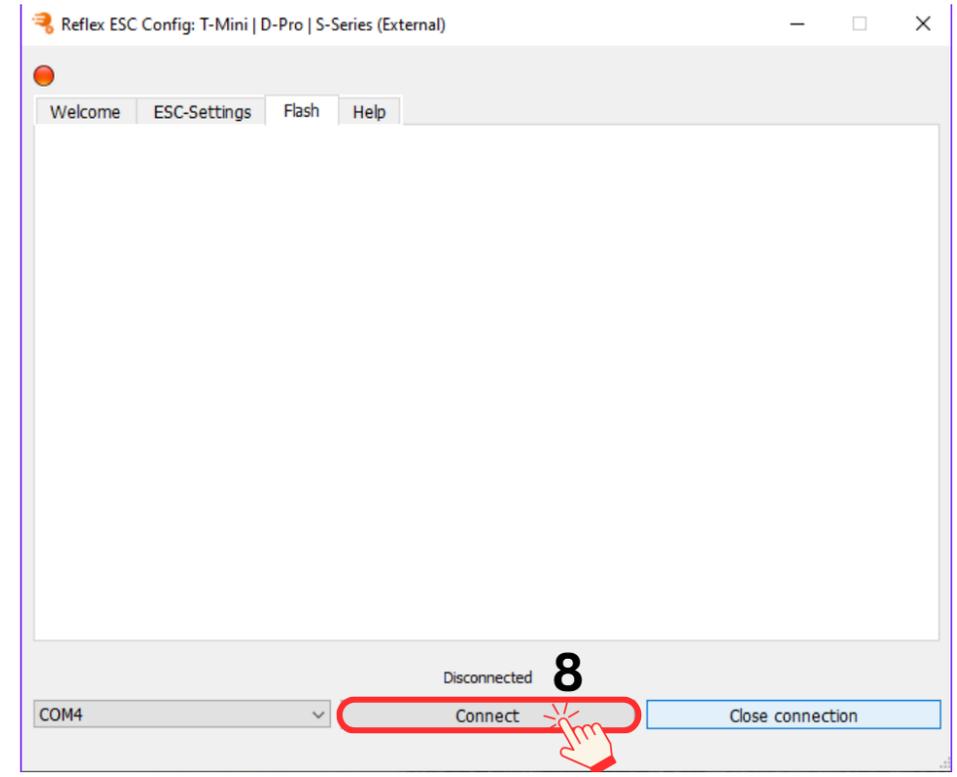
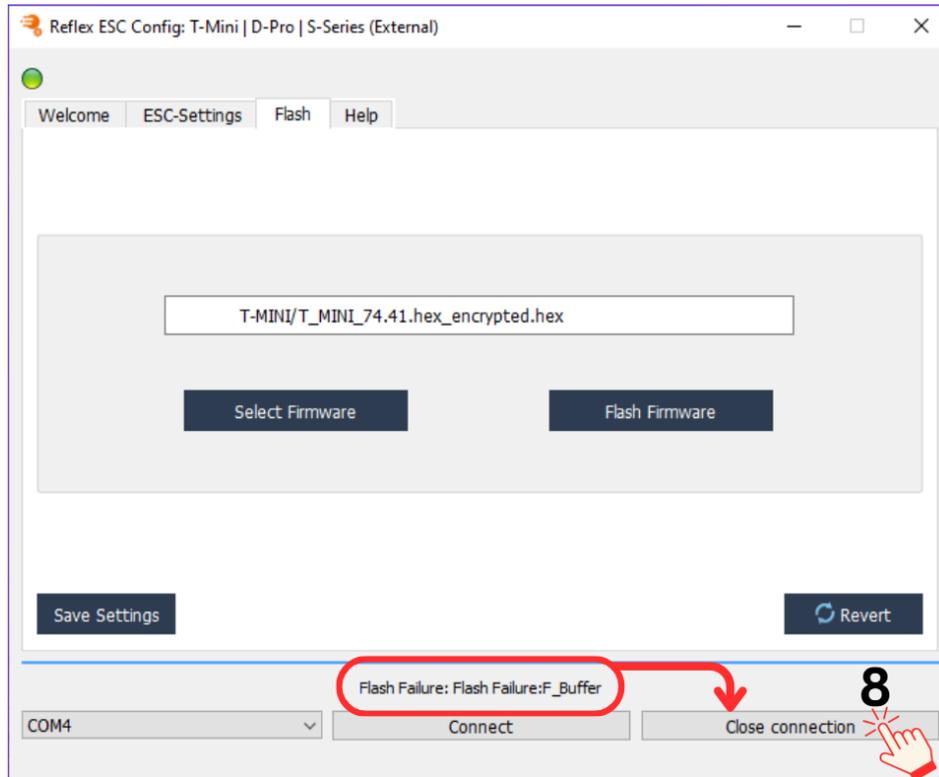
⚠ Do not disrupt power or connection to The ESC or PC during the flashing process, or corruption of the firmware and permanent failure may occur.

⚠ Always close and relaunch the tool if you are going to **flash a different firmware version**. The current flashing method uses **batch flashing**—once settings are saved the first time, the same settings are applied to every flash to avoid the hassle of saving them every time.



Step-by-Step Process

1. If the error **"Flash Failure: F_Buffer"** appears during firmware flashing, stop the flashing process immediately.
2. Click on **"Close Connection"** in the ESC configuration software.
3. Wait for the status to show **Disconnected**.
4. Select the correct **COM Port** again if required.
5. Click on **"Connect"** to reconnect the ESC.
6. Ensure the connection indicator turns **Green (Connected)**.
7. Select the firmware file again if necessary.
8. Click on **"Flash Firmware"** to restart the flashing process.
9. Wait until the flashing process **completes successfully**.



ESC SETTINGS TAB

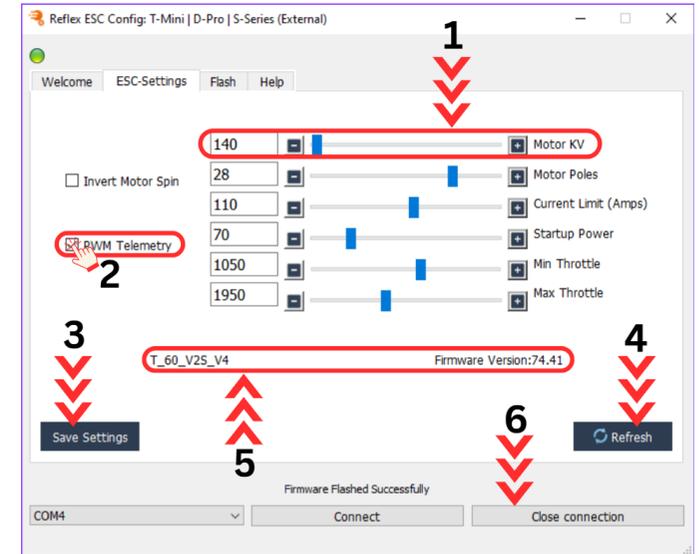
The ESC Settings Tab allows both real-time inspection and modification of core ESC parameters.

Process:

- A)** Modify values in the respective fields.
- B)** Click “Save Settings” to save settings to The ESC
- C)** Use “Refresh” anytime to reload the latest values directly from the ESC.

As shown in the image, the steps to save settings are clearly indicated. (1-4)

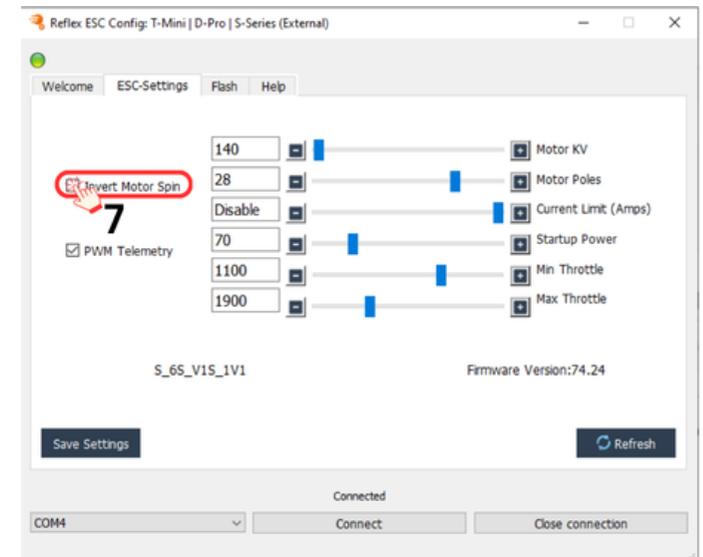
Note: The highlighted portion shows key interface elements. Section 1 includes a display, slider, and adjustment buttons for the same parameter. Section 2 features an enable/disable checkbox, while Section **5 displays the current firmware name and version** and section **6 close connection** of ESC from GUI.



7) Motor Direction Inversion (Optional Setting)

1. If the **motor rotation direction needs to be reversed**, open the **ESC-Settings** tab in the GUI.
2. Locate the “**Invert Motor Spin**” option.
3. **Enable (check) the “Invert Motor Spin” checkbox** to reverse the motor rotation direction.
4. After enabling the option, click “**Save Settings**” to apply the changes to the ESC.

Tip: Use this option only when the **motor rotation direction is opposite to the required direction** for the application.

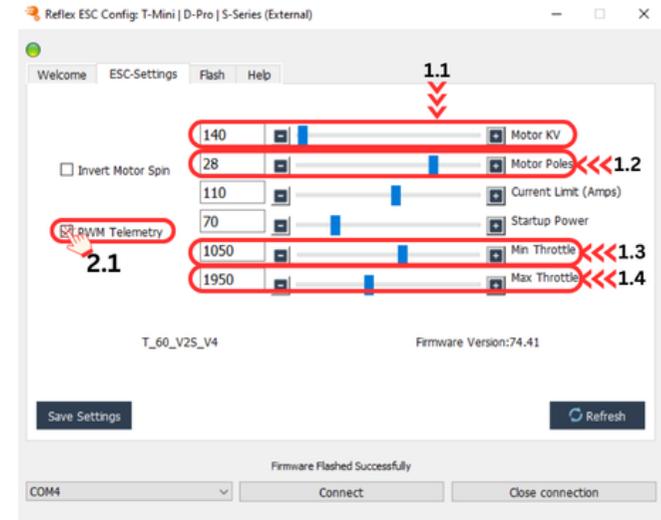


Tip: Always use the **Refresh button to verify saved settings**. After modifying parameters, close (Button Marked 6) and reconnect the software to ensure all changes are fully applied.

⚠ To ensure safe operation, some settings are fixed in the firmware and not user-configurable, as incorrect changes may pose risks. OEMs may request access to the full version, but must have a clear understanding of the implications.

EDITABLE PARAMETERS

Tip: Always match motor poles and KV correctly to avoid wrong Telemetry or unstable control.



1.1. Motor KV	
Motor KV refers to the number of revolutions per minute (RPM) a motor produces per volt of applied voltage under no-load conditions.	
Range	20-10220
Increment	Pressing '+' increases the value by 40 units.

1.2. Motor Poles	
Motor Poles refers to the number of magnetic poles (north and south) in the motor's rotor. This value affects the motor's electrical frequency and determines its relationship between electrical RPM and mechanical RPM.	
Range	2-36
Increment	Pressing '+' increases the value by 1 unit.

Tip: Invert Motor Spin allows you to reverse motor direction without changing phase wires, making the process quick and hassle-free.

2.1. PWM Telemetry	
PWM Telemetry activates the transmission of telemetry data from the ESC. This feature allows the ESC to send real-time information such as motor speed, temperature, voltage, and current back to the controller or monitoring device, enabling more precise monitoring and diagnostics during operation.	
Enable	Activates telemetry data transmission
Disable	Telemetry data transmission is turned off.

⚠ If you are using DSHOT-based telemetry protocol, please ensure that PWM Telemetry is disabled.

TROUBLESHOOTING

Problem	Solution
COM Port not detected	Reconnect the RD-Link, restart app, or check Device Manager
Flash Failed	Verify firmware file, ESC power, and that correct COM port is selected
Wrong Firmware	Use only official firmware files for your ESC model

IMPORTANT

To avoid potential issues, ensure there are no interruptions—whether power loss or connection drops—during the flashing process. While most ESCs can be recovered with a power cycle and re-flashing, successful recovery is not guaranteed.

AFTER SALE MAINTENANCE

If your ESC is damaged, please contact Reflex Drive support before attempting any repair or replacement. Only use the ESC after receiving confirmation. Do not install unofficial components, as this may affect performance or void the warranty.

SUPPORT

For any questions, technical support, or product-related assistance, feel free to reach out to us at: hello@reflexdrive.in, call us at **+91 9151118036**

Visit our website at www.reflexdrive.in for the latest product releases, firmware updates, and helpful resources tailored to your needs. Explore new offerings and stay informed to get the most out of your Reflex Drive experience.