Manual for ESC with F3A Governor V2.0

Specifications

> **Voltage:** 5-12s of Lipo (max 50.4V)
> **Current**: up to 120A with proper cooling
> **Weight**: 85g with 150mm long battery and motor 12AWG cables
> **Features**: real OPTO isolation (no ferrite ring needed), temperature protection (ESC will will shut down and restart at 100C), programming interface.
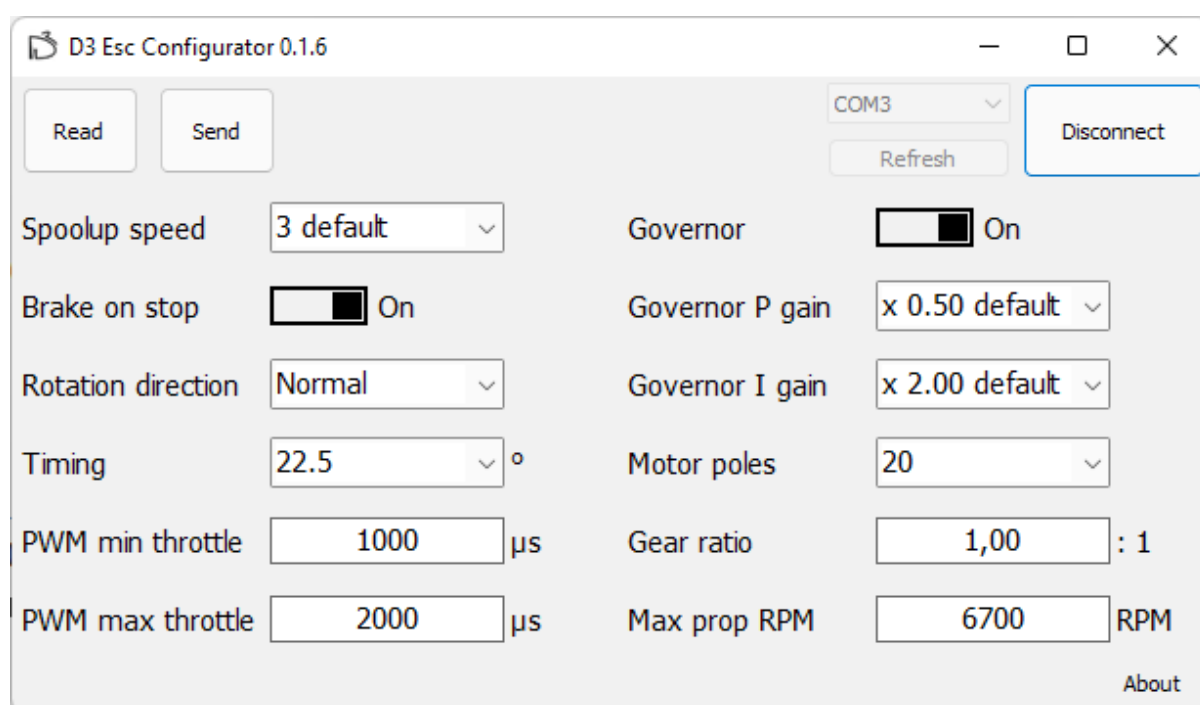
Limitations

This is a small ESC with a small heatsink. You can't hide this ESC deep inside the fuselage. You must provide direct air flow to the heatsink. Best practice is to place the ESC just behind the air intake (2-5cm), perpendicularly to the air flow. If you provide good cooling this ESC will work up to 120A. Without direct cooling it will fry at 50A. Don't cut additional venting holes on heat shrink tube! You can make cables shorter if needed. You should keep cables short as possible.

Settings

The ESC is shipped with settings for Plettenberg Advance 30-10 motor. For other drives you need to change configuration with USB programming interface, which is available as an accessories. You will need D3EscConfigurator program. You can download this Windows application from:

https://www.d3motors.com/download/D3EscConfigurator.zip

Spoolup speed – this setting change speed of motor reaction for new throttle position. Please remember, fastest setting may overstress drive with abrupt accelerating and braking.
Brake on stop – you can switch off braking on motor stop.
Rotation direction – normal/reversed.
Timing – you can change motor timing settings.
PWM min/max throttle – you can change default throttle signal for closed/fully open throttle.
Governor – you can switch off governor, for example when you wish to measure max in flight rpm with external telemetry.
Governor P and I gain – if you don't know what is that for, just leave it with default values.
Motor poles – motor poles value. That's governor setting.
Gear ratio – gear ratio of the drive. Set 1,00:1 for direct drive.
Max prop RPM – max in flight rpm of propeller.

Connecting procedure:

> You need a Win 7/8/10/11 PC to run D3 Esc Configurator.
> **Plug in USB programming interface**. Find it in *Device Manager*, it should be visible as USB-SERIAL CH340 COM device. Check what is a number of this COM port: COM1, COM2 or COM3 etc.
> **Run D3 Esc Configurator**. There's no need to install this small program. Just unpack it and run. If you will run this application for the first time, Windows may warn you about unknown source of application. In that case click on "more details" and then "run".

Select COM port from the list.
Safety first! Remove propellers or at least disconnect one or two cables between ESC and motor.
Connect ESC to USB programming interface. Use short cable. The long cable is for RX connection.
Switch of RX. Or disconnect long cable.
Connect main battery to ESC. You can use flight battery or smaller pack. 4S works as well.
Click "Connect".
Change settings.
Click Send.
Disconnect everything.

TX setting:
It is important your transmitter is set up as follows. If you decide to leave a default PWM signal width values, the receiver should output a pulse width of 1000µs for closed throttle and 2000µs for full throttle. For some transmitters (eg Graupner MZ) this corresponds to an ATV of 125%. For other transmitters (eg Jeti) this corresponds to an ATV of 100%. For Futaba transmitters the throttle channel must be reversed. You should check the actual receiver pulse width output using a JetiBox or similar detection device.

PLEASE – REMOVE THE PROPELLERS!!!!

Connect the ESC to the receiver and motor. Close the throttle, power up the receiver, and then connect the motor battery.
First you will hear 3 beeps – indicating the ESC has received power.
Then you will hear 1 low beep – indicating the ESC is connected to a working receiver.
Then you will hear 1 higher beep – indicating the ESC sees a closed throttle position (receiver pulse width of 1000µs).

If you don't hear the final fifth beep you may need set a higher ATV (smaller pulse width), change the throttle trim to a lower setting, or fully close the throttle, etc.

Everything is now set. When you will open the throttle, the motor will start. You next need to check the direction of rotation of the motor. If the motor runs backwards, disconnect the battery and swap over any two of the wires between the ESC and the motor. Already you will have noticed just how quickly this ESC changes motor rpm!

You will need to set different throttle curves for ground, normal and spin and landing conditions. The difference is the idle rpm. This is important, and different from a typical setup.

Condition	Idle rpm (throttle stick full low)	Mid stick rpm	Full throttle rpm
Ground (arming, takeoff, and after landing)	0	3100-3300	Max
Normal flight	1300-1500	3100-3300	Max
Spin	300	3100-3300	Max
Landing	100-200	3100-3300	Max

Cruise and max rpm are the same for each throttle curve. I set cruise rpm to 3100-3300rpm (for contra rotor setup). And max to 100% of course. I use a simple 3-point throttle curve.

For a single prop setup like Plettenberg Advance or Hacker Q80 idle and mid-stick rpm are higher. I set cruise rpm to 4400-5000rpm and idle to 2500rpm.

How to measure rpm? I have a Jeti telemetry system connected directly to the motor cables. You can measure rpm with an ordinary optical tachometer if you remove one of the propellers. The rpm will be the same even with one propeller removed. Of course, this method doesn't work with Brenner contra type.

Please be careful! This ESC is powerful. It can stop propellers from full power in a flash. But it can also set full power just as quickly!

Test everything on the ground with both propellers removed to make sure everything works with acceptable acceleration. We would recommend using the transmitter servo slow function – typically 0.8sec – and some delay on flight condition switching to prevent sudden rpm changes, which may overstress your drive system.

Double check your flight condition rpm at low throttle before flying. An idle set to 1300rpm for normal flight is too much for landing. You will need 100-200rpm for landing, and 0rpm for ground handling. Check everything carefully before the first flight.

Most popular drive settings:

Drive	Pole number	Gear ratio	Max RPM	Timing
Plettenberg Advance 30-10	20	1:1	6300-6700	22.5-30
Adverrun contra with pyro 650	10	4:1	4100-4400	22.5
Adverrun contra with Kondor	14	4:1	4100-4400	15-22.5
Dualsky motors	14	1:1	6300-6700	22.5-30
Hacker C50 with original drive	2	6,7:1	6300-6700	0
Brenner V4 with pyro 600	10 (or sometimes 14, you need to check your motor)	7,06:1	4100-4400	22.5

Please let me know if you have any questions. I hope you will love this ESC as much as I do :))
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