

MMAX PRO 1/10 SCALE COMPETITION ESC

1. MMax Pro Physical Diagram

1 Fan power port

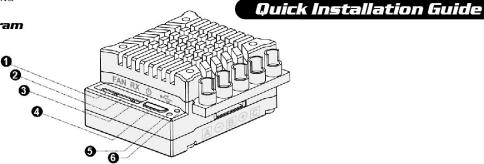
2 RX receiver port

3 Power switch port

4 Micro USB host port

5 LED #1

6 LED #2

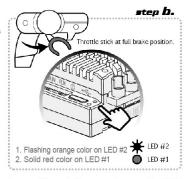


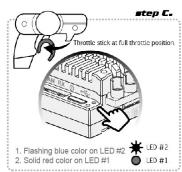
There are 2 ways to power on and off MMax ESC; with the included slide switch plugged into the ESC, it will be controlled by the switch. If the slide switch is not installed, the ESC power is controlled by the battery connection and the ESC will power on as soon as the battery is plugged in. It will then power off when the battery is unplugged.

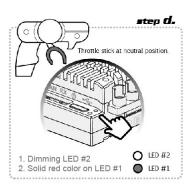
3. Radio Calibratio

a. Power on your transmitted with the ESC off.

2. Power on MMax Pro ESC







- **b**. Hold FULL BRAKE on your transmitter while powering on the ESC. You will get a confirmation tone. You will see a solid RED on LED #1 with flashing ORANGE LED #2. (The flashing ORANGE LED means the ESC is capturing the FULL BRAKE position)
- C. When the ORANGE LED turns solid, you will get a second confirmation tone. The LED #2 will begin flashing BLUE. Apply FULL THROTTLE now. (The flashing BLUE LED #2 means the ESC is capturing the FULL THROTTLE position)
- **d**. When the BLUE LED turns solid, release the throttle to neutral position. The LED #2 will be dimming. (The dimming LED #2 means the ESC is capturing the neutral position)
- $\textbf{e}. \ \textit{You will get a power-on tone to confirm the calibration process is complete}.$

**A complete radio calibration video could be found from Maclan Racing web site and its YouTube channel. Visit the web site to view the complete process

4. Programming MMax Pro ESC

There are 2 options to program your Maclan MMax Pro ESC. You can connect the MMax Pro ESC to Maclan ProLink (sold separately) via the RX (receiver) or micro USB port. You can also connect MMax Pro ESC to a Windows-based PC via its micro USB port to program on MMax Pro PC software.

5. Firmware Update

- 1. Download the latest firmware from www.maclan-racing.com
- 2. Connect MMax Pro USB to a Windows 7 or Windows 10 PC
- 3. Run the firmware updating software and follow the instruction on the screen

6. LED Indicators

	LED 1	LED 2	Actions
Power on & no receiver signal	Red	Blue	LED 1 & 2 flash every sec simotaniously
Power on & ROAR blinky mode	Red	Blue & Orange	LED 1 (solid) + LED 2 (alternating blue & orange)
Power on & race open mode	Red	Blue	LED 1 (solid red) + LED 2 (solid blue)
Power on & vehicle runs forward	Red	Blue	LED 1 (solid Red) + LED 2 flashes blue rapidly to solid (full throttle)
Power on & vehicle brakes	Red	Orange	LED 1 (solid Red) + LED 2 flashes orange rapidly to solid (full brake)
Low voltage cut off	Red	Orange	LED 1 & 2 flash every sec simotaniously with motor beeping
ESC temperature cut off	Red	Orange	LED 1 & 2 flash twice every sec simotaniously with motor beeping
Motor temperature cur off	Red	Orange	LED 1 & 2 flash 3 times every sec simotaniously with motor beeping



in the most demanding R/C conditions. quality and exhaustive track testing ensures that the MMax Pro in engineering design from Maclan Racing. Our commitment to ESC gives you the smoothest power band and reliable performance The MMax Pro sensored Electronic Speed Controller is the ultimate

your new MMax Pro system. Please read the following instructions carefully before installing

- For the best performance, we recommend using MMax Pro ESC with Maclan Racing MRR series motors.
- Never operate your MMax Pro ESC without the capacitor module It will cause permanent damage to the ESC and void factory
- MMax Pro ESC is a high end racing product that offers many need help with detailed settings, please contact Maclan directly for have numerous factory default profiles to get you started. If you tuning parameters. If you are not well versed in ESC setup, we
- Maclan Racing allows control of boost timing set up in the ESC done with EXTREME caution and a good knowledge of boost covered under warranty. This method of tuning the ESC should be Any ESC damage caused from excessive boost will not be
- Do not run "reverse power" on lower turn motors (5.5T and below load. It can cause extreme spikes that can damage both the motor Never "free rev" and brake the motor and ESC system with no and ESC, and moreover, will void the factory warranty.
- reverse function can easily damage the ESC. Lower turn motors have extremely high RPM and using the
- Do not connect reversed voltage. This will damage the ESC and void the
- Pay attention to the motor and ESC timing. More timing will generate more heat on both the ESC and the motor.
- short circuits and over discharging of the battery. Do not leave batteries plugged into the ESC when not in use. This
- them. Temperature should never exceed 180 degrees Fahrenheit. MMax Pro ESC adapts a high performance switching BEC. This Always monitor both the ESC and motor temperature after running
- performance or operation failure of the MMAX Pro system system. AM radio systems can cause noise that results in poor radio systems are the most suitable to work with the MMAX Pro requires a high quality radio system. 2.4G and higher quality FIV

- High performance 32-bit CPU for high speed and accurate
- On board USB host for the ease of connectivity and unlimited New generation firmware algorithms for the strongest ever throttle
- Dual 'power-on' options for the ease of operation. (can be controlled by a switch or direct to battery)
- All aluminum structure with omnidirectional heatsink for maximum airflow and optimum cooling performance.
- Adjustable throttle and brake PWM frequency for fine tuning. All detachable connectors with several optional length cables.
- 12 profiles available from blinky (zero timing) to mod, for on road and off

- Advanced Boost/Turbo/Over-Boost system for top level racing
- Motor/ESC temperature protection and low voltage protection MS Windows compatible software for data logging, programing, and firmware updating.

Continuous Current: 160A Scale: 1/10th Brushless Sensored/Sensorless ESC

MOSFET Rated current: 400A/phase

Power input: 2S Li-Po

BEC output: Linear Mode 6V to 7.4V, 4A

Wire output: Black-12AWG-200mm*3 Wire input: Black-12AWG-200mm*2

Cooling Fan: 30x30x10mm high voltage turbo fan Motor: Brushless Sensored/sensorless motor

Dimension: 40x30x19mm (without fan)

Net Weight: 48g (without wires and capacitor module)

5. MMax Pro Programming Parameters

Parameters	Values
Run Mode	Practice/Race Blinky/Race Mod
SBEC Voltage	5.0V to 7.4V
Forward Power	50% to 100%
Reverse Power	25% to 100%
Sensor Mode	Full Sensored/ Smart Sense
Battery Cut Off	Disable/ 3.0V to 7.4V
Motor Temperature Cut	Disable/ 160 degrees F (71 degress C) to 220 degrees (104 degrees C)
ESC Temperature Cut	Disable/ 160 degrees F (71 degress C) to 220 degrees (104 degrees C)
Quick Boot	0n/ 0ff
Brake Strength	0% (disable) to 100%
Brake PWM	600Hz/1KHz/1.6KHz/2KHz/2.5KHz/3.2Hz/4KHz/5KHz/6.4KHz
Brake Curve	100% ~ 10% / Linear / -10% ~ -100%
Drag Brake	0% to 100%
Initial Brake	0% to 50%
Throttle PWM	1KHz/1.6KHz/2KHz/2.5KHz/3.2KHz/4KHz/6.4KHz/8KHz/9.6KHz/12KHz/16KHz/24K/32KHz
Throttle Punch	1% to 100%
Throttle Curve	100% ~ 10% / Linear / -10% ~ -100%
Dead Band	Off/Narrow/Middle/Wide
Acceleration Boost Timing	0 to 60 Degrees (1 degree incremental)
Acceleration Boost Start RPM	500 to 30000 RPM (500 RPM incremental)
Acceleration Boost Finish RPM	1000 to 50000 RPM (500 RPM incremental)
Turbo Timing	0 to 60 Degrees (1 degree incremental)
Turbo Up Slew Rate	Level 1 to 10
Turbo Down Siwe Rate	Level 1 to 10
Turbo Delay (sec)	0/0.05/0.1/0.15/0.2/0.25/0.3/0.35/0.4/0.45/0.5/0.55/0.6/0.65/0.7/0.75/ 0.8/0.85/0.9
Over Boost	Level 1 to 10

Parameter 1: Run Mode

Options are Practice/Race Blinky/Race Open.

turbo, boost, and over boost adjustability. boost to be enabled. Race Open locks out reverse while maintaining all Race Blinky locks out reverse and does not allow any boost, turbo, or over Practice allows all settings to be adjusted on the ESC. Also, it allows reverse

Parameter 2: SBEC Voltage

Options are from 5.0V to 7.4V in 0.1V Increments

A higher voltage will make servos react faster at the expense of a shorter life recommended voltage span. However, do not set SBEC Voltage above the servo manufacturer's

Parameter 3: Forward Power

limit the forward power Options are from 50% to 100% in 1% Increments. This setting allows you to

Parameter 4: Reverse Power

Options are from 25% to 100% in 1% Increments. This setting allows you to limit the reverse power

Parameter 5: Sensor Mode

Options are Full Sensored and Smart Sense

sensored motor. This option can be helpful in the case of sensor wire provide the highest performance and smoothest power at all times. The Smart Sense mode will allow the Esc to operate with either a sensorless or The Full Sensored mode will operate the ESC in sensored only mode. It will

Parameter 6: Motor Rotation

Options are normal and reverse

require to run a reversed motor rotation This allows for the changing of motor rotation for some specific chassis that

Parameter 7: Battery Cut Off

setup value, the ESC will reduce the power output to the motor to avoid This parameter monitors the Li-Po pack voltage. If the voltage drops to the Options are Disable, 2.9V to 7.4V in 0.1V increments

Parameter 8: Motor Temperature Cut

(110 degrees C). This parameter displays both Fahrenheit and Celsius (${}^\circ\!F$ and ${}^\circ\!C$) for Options are Disable/ 160 degrees F (71 degress C) to 230 degrees

reduce the power output to the motor to 30% to avoid overheat When the motor reaches the setup temperature value, the ESC will easier reading.

you capture on the outside of the motor can and what the sensor motor can. There can be discrepancies between the temperature that Note: This temperature is read from the sensor unit circuit inside the

Parameter 9: Quick Boot

Options are On and Off

racing conditions that require fast stand by sequence. It will by pass This parameter will make boot up time to be 60% faster for some with your radio system if you decide to enable this function. certain safety verification process. Therefore, we'd suggest you to test

Parameter 10: ESC Temperature Cut

(110 degrees C). Options are Disable/ 160 degrees F (71 degress C) to 230 degrees

overheat damage. the ESC will reduce the power output to the motor to 30% to avoid easier reading. When the ESC reaches the setup temperature value This parameter displays both Fahrenheit and Celsius ($^\circ\! F$ and $^\circ\! C$) for

Parameter 11: Brake Strength may be different from the temperature that you capture from the ESC heat sink Note: This temperature is read from the CPU temperature sensor. It

Options are 0% (Disabled) to 100%, in 1% Increments

while a higher percentage will have stronger brakes. A lower Brake Strength percentage will have less powerful brakes.

Parameter 12: Brake PWM

braking feel. A higher frequency results in smoother braking, is more PWM stands for Pulse Width Modulation and is rated in Hertz, meaning precise, and increases the ESC temperature cycles per second. A lower frequency will have a more aggressive Options are 500Hz/1KHz/1.5KHz/2KHz/2.5KHz/3.2KHz/4KHz/5KHz/6.4Hz

Parameter 13: Brake Curve

Options are 100% ~ 10% / Linear / -10% ~ -100%

range. A positive % Brake Curve has strong brakes initially and then A negative % Brake Curve will have a softer brake feel at the beginning of engaged. A linear Brake Curve will be uniform throughout the whole brake the brakes being engaged and get more aggressive as the brake is fully

Parameter 14: Initial Brake

Options are 0% to 50% in 1% increments

provide stronger brake strength when it engages. from neutral point to the initial brake position. A higher value will This will set the minimum brake force when pushing the throttle trigger

will automatically adjust the Initial Brake to be equal to the Drag Brake Note: if initial brake is set at lower than Drag Brake value, the software /alue in order to provide optimize braking performance

Parameter 15: Drag Brake

Options are 0 (disable) to 100% in 1% Increments.

This function will provide a drag force when the throttle is released to

Parameter 16: Throttle PWM Options are 1KHz/1.6KHz/2KHz/2.5KHz/3.2KHz/4KHz/6.4KHz/8K

produces more motor RPM, but will increase ESC temperature RPM. A higher frequency results in smoother throttle, is more precise frequency will have a more aggressive throttle feel and have less motor Modulation and is rated in Hertz, meaning cycles per second. A lower Hz/9.6KHz/12KHz/16KHz/32KHz PWM stands for Pulse Width

Parameter 17: Throttle Punch

Options are 1% to 100% in 1% Increments.

response and feel softer initially. A higher Throttle Punch percentage A lower Throttle Punch percentage will have a slower throttle

Parameter 18: Throttle Curve

Options are 100% ~ 10% / Linear / -10% ~ -100%

throttle initially and then becomes softer. the whole throttle range. A positive % Throttle Curve has strong it is fully engaged. A linear Throttle Curve will be uniform throughout beginning of the throttle being engaged and get more aggressive as A negative % Throttle Curve will have a softer throttle feel at the

Options are Off/Narrow/Middle/Wide Parameter 19: Dead Band

This is the amount of "play" when the throttle is engaged. A setting of 'Off' will make the throttle engage more instantaneously, while 'Wide' vould require more trigger movement

Parameter 20: Acceleration Boost Timing

reaches the user's selected Finish RPM. This sets the maximum advanced boost timing at the time the motor Options are 0 (Disable) to 60 degrees in 1 degree increments

Parameter 21: Acceleration Boost Start RPM

Options are 500 to 30000 RPM in 500 RPM increments.

parameter should be based on the motor KV and the track condition This sets the start RPM that acceleration timing engages. This

Parameter 22: Acceleration Boost Finish RPM

500 to 50000 RPM in 500 RPM increments This sets the start RPM that acceleration timing finishes

Parameter 23: Turbo Timing

often is utilized on long straightaways to reach higher top speed. This sets the maximum advanced timing at the time of full throttle. It Options are 0 (Disable) to 60 degrees in 1 degree increments

Parameter 24: Turbo Up Slew Rate

feeling. speed timing. The larger number will have more aggressive top speed acceleration while the smaller number will have smoother This sets how fast the ESC reaches the maximum advanced top

Parameter 25: Turbo Down Slew Rate

Options are Level 1 to 10.

can potentially cause a rough throttle feeling, it will provide a more released. Instead of completely shutting down the turbo timing that inear throttle when the ESC is backing off from turbo engagement This sets the decreasing turbo rate after the throttle has been

Parameter 26: Turbo Delay

0.65/0.7/0.75/0.8/0.85/0.9 sec Options are 0/0.05/0.1/0.15/0.2/0.25/0.3/0.35/0.4/0.45/0.5/0.55/0.6/

to a value, the turbo will be held for the selected delay period. This will the throttle trigger is moved to the full throttle position. When it is set When this parameter is set to 0, the Turbo will be activated right after provide flexibility for different track layouts.

Parameter 27: Over Boost

Options are Level 1 to 10.

power output at all rpm and track positions. turbo/boost. Over Boost monitors the motor's current rpm, timing maximum performance from your Maclan system when running with evel, and load and constantly adjusts the boost level to maximize This is an intelligent boost function that enables you to get the

boost/turbo/over boost will not be covered by our factory levels in both the speed controller and motor carefully, and for experienced users, and if used incorrectly can damage Warning: Boost/ Turbo/ Over Boost are advanced features adjust gearing as needed. Any system damage caused by the ESC or motor system. Make sure to monitor temperature

6. Factory Profiles

The MMax Pro ESC provides 12 profiles. You can select a corresponding profile for your application. You can also reload factory default settings for each profile via the ProLink or a PC. You can also fine tune all parameters in each profile to meet your needs.

	Profile 1	Profile 2	Profile 3	Profile 4	Profile 5	Profile 6	Profile 7	Profile 8	Profile 9	Profile 10	Profile 11	Profile 12
Parameters	Off Road 2WD Blinky	Off Road 4WD Blinky	Off Road 2WD Mod	Off Road 4WD Mod	TC Blinky	TC 13.5 Boost	TC Mod	Drift	Crawler	Custom 1	Custom 2	Custom 3
Run Mode	Race Blinky	Race Blinky	Race Open	Race Open	Race Blinky	Race Open	Race Open	Race Blinky	Race Blinky	Practice	Practice	Practice
SBEC Voltage	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V
Forward Power	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Reverse Power	-	-	-	-	-	-	-	-	-	50%	50%	50%
Sensor Mode	Full Sensored	Full Sensored	Full Sensored	Full Sensored	Full Sensored	Full Sensored	Full Sensored	Full Sensored	Full Sensored	Smart Sense	Smart Sense	Smart Sense
Motor Rotation	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Battery Cut Off	6.4V	6.4V	6.4V	6.4V	6.4V	6.4V	6.4V	6.4V	6.4V	6.4V	6.4V	6.4V
Motor Temperature Cut	220*F/104*C	220*F/104*C	220*F/104*C	220*F/104*C	220*F/104*C	220*F/104*C	220*F/104*C	220*F/104*C	220*F/104*C	220*F/104*C	220*F/104*C	220*F/104*C
ESC Temperature Cut	220*F/104*C	220*F/104*C	220*F/104*C	220*F/104*C	220*F/104*C	220*F/104*C	220*F/104*C	220*F/104*C	220*F/104*C	220*F/104*C	220*F/104*C	220*F/104*C
Quick Boot	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off
Brake Strength	100%	100%	90%	90%	100%	90%	90%	80%	100%	100%	100%	100%
Brake PWM	1.6KHz	1.6KHz	1.6KHz	1.6KHz	1.6KHz	1.6KHz	1.6KHz	1.6KHz	1.6KHz	1.6KHz	1.6KHz	1.6KHz
Brake Curve	Linear	Linear	Linear	Linear	Linear	EXP 1	EXP 2	Linear	Linear	Linear	Linear	Linear
Drag Brake	0%	0%	5%	5%	0%	5%	10%	0%	100%	0%	0%	0%
Initial Brake	disable	disable	disable	disable	disable	5%	10%	disable	disable	disable	disable	disable
Throttle PWM	2.5KHz	2.5KHz	9.6KHz	9.6KHz	2.5KHz	4KHz	9.6KHz	4KHz	4KHz	4HKz	4HKz	4HKz
Throttle Punch	100%	100%	75%	75%	100%	100%	75%	75%	75%	75%	75%	75%
Throttle Curve	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear
Dead Band	Middle	Middle	Middle	Middle	Middle	Middle	Middle	Middle	Middle	Middle	Middle	Middle
Acceleration Boost Timing	-	-	0	0	-	35	10	-	-	0	0	0
Acceleration Boost Start RPM	-	-	3000	5000	-	3000	5000	-	-	1000	1000	1000
Acceleration Boost Finish RPM	-	-	20000	22000	-	10000	25000	-	-	20000	20000	20000
Turbo Timing	-	-	5	10	-	20	20	-	-	0	0	0
Turbo Up Slew Rate	-	-	3	3	-	5	3	-	-	1	1	1
Turbo Down Slew Rate	-	-	10	10	-	10	10	-	-	1	1	1
Turbo Delay (sec)	-	-	0.05	0.05	-	0.05	0.05	7-	-	0	0	0
Over Boost	-	-	-	-	-	-	-	-	-	1	1	1

7. Service & Warranty

Your Maclan MMax Pro ESC is guaranteed to be free from defects in materials and workmanship for a period of 120 days. Your *original receipt* showing the item and the date and place of purchase is required with your warranty service application. An ESC that is found to have been mishandled, abused or used incorrectly, including use in an application other than that for which the ESC is intended, will not be covered under the warranty. Maclan Racing has no control over the use of the ESC application with other electronic devices such as motors and batteries. Maclan Racing is not liable for any loss or damage, whether direct or indirect, incidental, or consequential, or any situation from the use, misuse or abuse of the product. Your MMax Pro ESC is not a toy. This product is not intended for use by a child under age of 14 without adult supervision. The MMax Pro ESC generates a lot of power that could result in physical injuries. By setting up, connecting or operating the product, the user accepts all related liabilities.

For service, please visit www.hadrma.com and follow the service instructions for the quickest turnaround time. Or call us at 1-866-206-8558.

For all technical questions, please visit www.maclan-racing.com for the corresponding FAQ, or e-mail your question to service@hobbyauthority-dist.com

Maclan Racing offers a product trade-in program and reserves the right for all warranty applications. Please visit www.maclan-racinng.com for details.

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