

# ESC Programmer MCP-1 INSTRUCTION MANUAL



**Corresponding ESC: MC9100A, MC970A, MC951H/A**

Thank you for purchasing an MCP-1 ESC Programmer.

The MCP-1 is a dedicated programmer for the brushless motor ESC given in "Corresponding ESC" above. Quick and accurate setting matched to the characteristics of the model is possible and the brushless motor can be operated at peak performance.

## Usage precautions

### ⚠ WARNING

❗ When setting and operating the ESC be sure that no part of your body touches all the parts which rotate.

The motor may rotate unexpectedly due to erroneous connection and operation of the ESC and is extremely dangerous.

❗ Before flight, always check ESC operation.

If the ESC is not set properly control will be lost and is extremely dangerous.

### ⚠ CAUTION

❗ Do not open the case or disassemble this product.

The interior will be damaged. In addition, repair will become impossible.

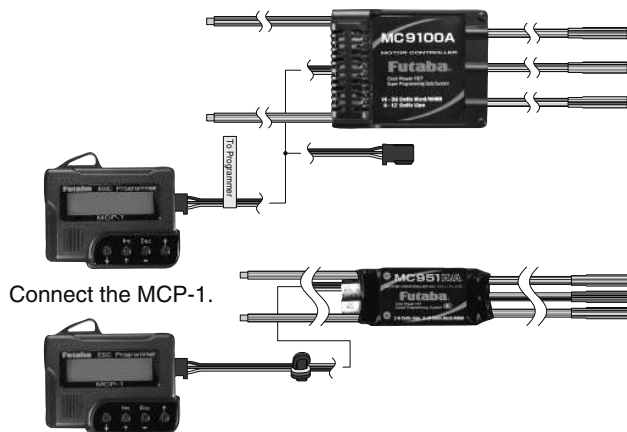
This product is only for use with the "Corresponding ESC" shown above. It cannot be used with other products.

## Usage Method

Set the ESC parameters as follows:

### Programmer connection

Connect the MCP-1 and drive battery to the ESC.



### Edit buttons operation



<b>Setting item selection</b>	Select the setting items with the left and right outside arrow buttons (↓ or ↑).
<b>Setting contents change</b>	The inside INC(+) and DEC(-) buttons are used to select and change the setting contents.
<b>Model type change</b>	The model type can be changed by pressing both arrow buttons simultaneously.

## MCP-1 setting items

\*The setting items for each model type are shown in the table below.

Setting item	Model type		
	AIR	HELI	BOAT/CAR
(1) Battery type selection	Okay	Okay	Okay
(2) Cut off voltage setting	Okay	Okay	Okay
(3) Cut off type selection	Okay	Okay	Okay
(4) Motor direction selection	Okay	Okay	Okay
(5) Advance timing setting	Okay	Okay	Okay
(6) Acceleration setting	Okay	Okay	Okay
(7) Start power setting	Okay	Okay	Okay
(8) Air brake function type selection (AIR only)	Okay	---	---
(9) Air brake function ON/OFF (AIR only)	Okay	---	---
(10) Reverse function selection (BOAT/CAR only)	---	---	Okay
(11) Governor function response setting (HELI only)	---	Okay	---
(12) Governor function ON/OFF (HELI only)	---	Okay	---
(13) Motor poles number setting	Okay	Okay	Okay
(14) Gear ratio setting	Okay	Okay	Okay
(15) Maximum speed display	Okay	Okay	Okay
(16) Average speed display	Okay	Okay	Okay
(17) Writing setting data to ESC	Okay	Okay	Okay
(18) Reading setting data saved at MCP-1	Okay	Okay	Okay
(19) Saving setting data to MCP-1	Okay	Okay	Okay

## Setting method

When the MCP-1 and drive battery are connected to the ESC, the current setting contents of the ESC are automatically read to the MCP-1.

Select the item you want to change with the arrow buttons (↓ or ↑) and change the setting contents with the INC(+) and DEC(-) buttons.

**[IMPORTANT]** At the end of ESC parameters setting with the MCP-1, write the setting data to the ESC with the (17) "Writing setting data to ESC" function. The setting data is not written to the ESC by only setting the parameters.

### (1) Battery type selection

SELECT BATTERY  
LiPo ← Rtl

**Setting range:** LiPo, NiCd  
**Initial setting:** LiPo

Select the type of drive battery used by means of the DEC(-) or INC(+) button.

\* When the battery type changes, the "CUT OFF VOLTAGE" and "CUT OFF TYPE" parameters change.

### (2) Cut off voltage setting

CUT OFF VOLTAGE  
Auto ← Rtl

**Setting range:** Auto (automatic setting), 4.5-50V  
**Initial setting:** Auto

Set the cut off voltage to match the type of battery used. Adjust the voltage with the DEC(-) or INC(+) button.

\* At auto mode (Auto) setting, when the battery type is LiPo, power to the motor is cut off at 3V per cell. For NiCd, power to the motor is cut off when the total voltage is 12V.

### (3) Cut off type selection

CUT OFF TYPE  
Soft Off ← Rtl

**Setting range:** Soft off (soft), Hard off (hard)  
**Initial setting:** Soft off

The cut off method when the battery voltage drops to the set cut off voltage can be selected.

#### (4) Motor direction selection

MOTOR DIRECTION  
Normal 1 1/2

Setting range: Normal (forward rotation), Reverse (reverse rotation)

Initial setting: Normal

The direction of motor rotation is selected here.

\* When the direction of rotation is reversed, change the mode.

\* The direction of rotation can also be changed by changing the motor wiring.

#### (5) Advance timing setting

ADVANCE TIMING  
14 1 1/2

Setting range: 0~25°

Initial setting: 14° (for FMA-50xx Series)

As a setting standard, for an ordinary 2-pole inner rotor motor, a setting of 0~5° is recommended.

When setting to match the motor used, set within the following range:

Setting example: 0~10° (inner rotor), 14~25° (outer rotor)

\* For the FMA-50xx Series, 14° is recommended.

#### (6) Acceleration setting

ACCELERATION  
Normal 1 1/2

Setting range: Lowest/Low/Normal/High/Highest (Slow)←→(Fast)

Initial setting: Normal

The speed of rise until the ESC reaches maximum speed can be set here. (Delay function) Select the acceleration with the DEC(-) or INC(+) button.

This function is mainly set when turning the ESC on and off by switch.

#### (7) Start power setting

START POWER  
Normal 1 1/2

Setting range: Lowest/Low/Normal/High/Highest (Low power)←→(High power)

Initial setting: Normal

The power (torque) level at motor starting can be set here.

\* To avoid rapid and drastic gear wear when using a helicopter, setting the start power to a low level is recommended.

#### (8) Air brake function type selection (AIR mode only)

AIR BRAKE TYPE  
Normal 1 1/2

Setting range: Slow/Normal/Fast/value 5~100% (Slow)←→(Fast)

Initial setting: Normal

When the model type is AIR, the air brake effect can be adjusted. Whether the motor stops gradually or stops immediately can be selected. Select with the DEC(-) or INC(+) button.

\* 100% is immediate stop.

#### (9) Air brake function ON/OFF (AIR mode only)

AIRBRAKE ON/OFF  
Off 1 1/2

Setting range: On/Off

Initial setting: Off

Air brake ON/OFF can be selected here.

#### (10) Reverse function selection (BOAT/CAR modes only)

REVERSE FUNCTION  
One Way 1 1/2

Setting range: One Way/Two Way (forward only)/(forward & reverse)

Initial setting: One Way

When the model type is BOAT or CAR, forward only or forward/reverse operation can be selected.

Note: When making this change, set each point (High/Neutral/Reverse) in accordance with the throttle position setting method of the ESC instruction manual. Other setting contents may also change. Check the setting contents.

#### (11) Governor function response setting (HELI mode only)

RESPONSE OF GOV  
Fastest 1 1/2

Setting range: Slowest/Slow/Normal/Fast/Fastest (Slow)←→(Fast)

Initial setting: Fastest

The governor operation response characteristic can be set.

Note: When a fast value is selected, the current consumption of the battery will increase.

\* To prevent shortening of the life of the ESC and drive battery, setting to Slow is recommended.

#### (12) Governor function ON/OFF (HELI mode only)

GOVERNOR ON/OFF  
On 1 1/2

Setting range: On/Off

Initial value: On

The governor function is switched ON and OFF.

\* The governor function maintains the speed corresponding to the throttle operation position (throttle curve) even when the load is changed by pitch operation and the voltage of the drive battery changes. However, the battery current consumption also becomes large.

#### (13) Motor poles number setting

MOTOR POLE NUM  
14 Pole 1 1/2

Setting range: 2~36 poles

Initial value: 14 (For FMA-50xx Series)

Change the number of poles to match the motor used.

\* This setting is necessary to display the actual speed.

#### (14) Gear ratio setting

GEAR RATIO  
1.0 : 1 1 1/2

Setting range: 1.0:1 ~ 25.0:1

Initial value: 1.0:1

Inputs the gear ratio of the gearbox used.

\* The speed display value is calculated from the number of motor poles and the gear ratio of the gearbox.

#### (15) Maximum speed display

MAXIMUM RPM  
000000 RPM 1 1/2

Displays the maximum speed directly before flight.

\* The speed display value is calculated from the number of motor poles and the gear ratio of the gearbox. The initial value records the factory test value. The maximum speed display value changes when the motor speed changes.

#### (16) Average speed display

AVERAGE RPM  
000000 RPM 1 1/2

Displays the average speed directly before flight.

\* The speed display value is calculated from the number of motor poles and the gear ratio of the gearbox. The initial value records the factory test value. The average speed display changes when the motor speed changes.

#### (17) Writing setting data to ESC

DOWN LOAD  
Really? No 1 1/2

Execute when writing (transferring) the set values to the ESC. Start writing by pressing the INC(+) button.

\* A beep sounds every second until writing is complete. If you want to abort the procedure, press the DEC(-) button.

#### (18) Reading setting data saved at programmer

RESTORE MEMORY  
Really? No 1 1/2

Execute to read the setting data saved at the programmer memory. Start reading by pressing the INC(+) button.

\* A beep sounds every second until reading is complete. If you want to abort the procedure, press the DEC(-) button.

#### (19) Saving setting data to programmer memory

BACKUP MEMORY  
Really? No 1 1/2

Execute to save the setting data to the programmer memory. Start backup by pressing the INC(+) button.

\* A beep sounds every second until backup is complete. If you want to abort the procedure, press the DEC(-) button.