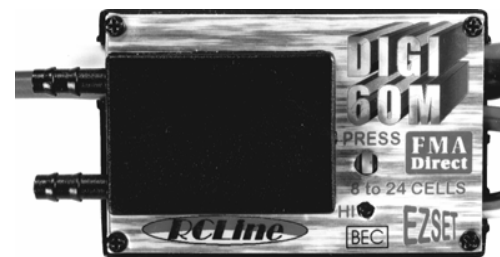


- motor lower.
2. **WATER COOLING** - Should you elect to take advantage of the water cooling feature of the DIGI 60M, it will be necessary to connect surgical tubing to the input and output of the water-tight, water tank on the top of the unit. In some applications, forward progress of the boat is enough to push water through the water tank. Be certain to position the input tube facing toward the front of the boat. The output tube should face the back of the boat and be positioned above the water level. An even more efficient means of pushing water through the water tank is to attach a small pump to the input line feeding the water tank.

ACCESSORIES:

Various rapid chargers, battery conditioning systems, SANYO batteries, receivers as well as a full line of standard and coreless servos are available for use with your FMA / RCLine DIGI 60M either direct or from your local FMA dealer.



**DIGI
60M**

**MODEL SC800 HIGH OUTPUT
MICROPROCESSOR-
CONTROLLED, WATER COOLED
MARINE SPEED CONTROLLER**

OWNER'S MANUAL

NOTE: PLEASE READ MANUAL COMPLETELY BEFORE OPERATION

INTRODUCTION:

Thank you for purchasing the FMA Direct / RCLine DIGI 60M high frequency, high output, water cooled marine speed controller (ESC). The DIGI 60M is one product in a family of quality ESC devices available from FMA, Inc. Designed from the ground up to offer fast and efficient throttle control, prop brake, and high current capacity, the DIGI 60M is designed around state-of-the-art, high current / low loss *HYPERFETS*. Capable of delivering 50 amps continuous power, the DIGI 60M is ideally suited to high current drain, performance electric and scale boats. Featuring high-frequency operation and opto-coupled receiver output, this microprocessor-controlled ESC will provide smoother throttle response, longer run times, and improved radio reception through lower noise. Packed with extra features like EZ SETUP, which makes it a snap to optimize your ESC with any R/C system, and over-temperature safety cut-out, the affordably-priced DIGI 60M will provide hours of trouble-free operation and enjoyment!

SPECIFICATIONS:

SIZE:	2.20"L X 1.38"W X 0.47"H
WEIGHT:	2.0 OUNCES
FUNCTION:	FORWARD, PROP BRAKE
INPUTS / CONNECTIONS:	8 TO 24 CELL NICAD BATTERY 1 R/C RECEIVER
OUTPUT CAPABILITIES:	1 D.C. MOTOR - DOWN TO 12 TURNS
MAIN CONTROL:	MICROPROCESSOR
SECONDARY CIRCUITRY:	OVER TEMPERATURE SAFETY CUTOFF
FREQUENCY:	1.3 kHz
CONTINUOUS CURRENT:	256 AMP (FET RATING) - 50 AMP (TESTED)
PEAK CURRENT:	840 AMP (FET RATING)
RDS:	.004 OHM

FMA LIMITED WARRANTY ON ELECTRONIC SPEED CONTROLLER PRODUCTS

THE WARRANTY

FMA, Inc. warrants this speed controller to be free of manufacturing defects for the term of 90 days from the date of purchase. Should any defects covered by this warranty occur, the speed controller shall be repaired or replaced with a unit of equal performance by FMA, Inc., or an authorized FMA service station.

LIMITS AND EXCLUSIONS

This warranty may be enforced only by the original purchaser, who uses this speed controller in its original condition as purchased, in strict accordance with the DIGI 60M owner's manual. Speed controllers returned for warranty service to an FMA service center will be accepted for service when shipped post-paid, with a copy of the original sales slip or warranty registration form, to the service station advised by FMA, Inc.

THIS WARRANTY DOES NOT APPLY TO

1. Consequential or incidental losses resulting from the use of this speed controller.
2. Damage resulting from accident, misuse, abuse, neglect, electrical surges, reversed polarity on connectors, lightning or other acts of God.
3. Damage from failure to follow instructions supplied with the product.
4. Damage occurring during shipment of the product either to the customer or from the customer for service (claims must be presented to the carrier).
5. Damage resulting from repair, adjustment, or any alteration to product by any one other than an authorized FMA technician.
6. Installation or removal charges, or damage caused by improper installation or removal.

CALL (301) 668-7614 FOR INFORMATION ABOUT SERVICE AND WARRANTY REPAIRS.

FMA, Inc.
5716A Industry Lane
Frederick, MD 21704
Sales: (800) 343-2934 -Technical: (301) 668-7614



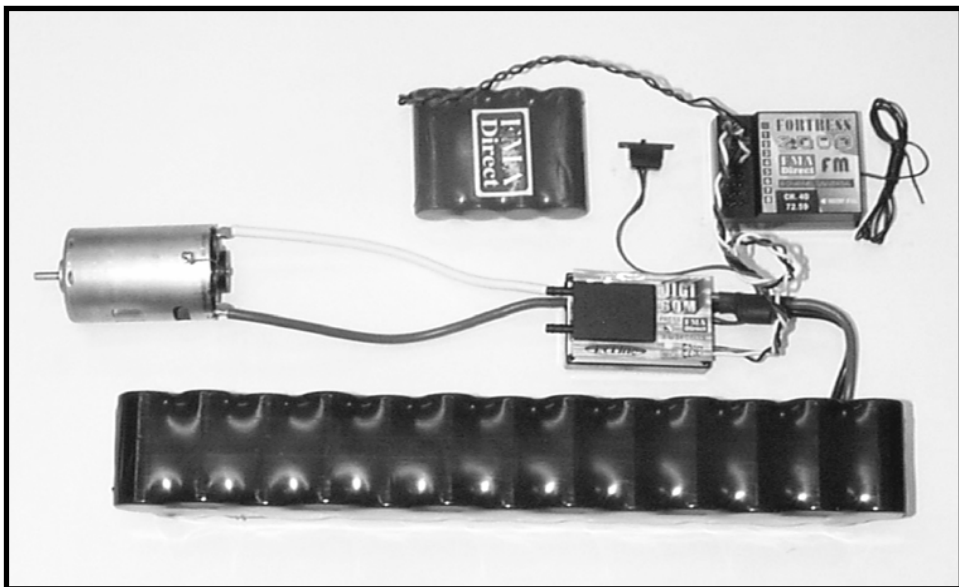


Figure 1 - ESC Installation

INSTALLATION: RECEIVER / MOTOR / BATTERY CONNECTIONS

Refer to figure 1 when connecting the DIGI 60M to your R/C receiver, motor, and battery pack. Please read the following section completely making certain to follow the directions in the proper order before applying power to the unit.

1. Plug the three wire servo type connector into the throttle output on your receiver. The DIGI 60M comes equipped with a "JR" style connector making it automatically compatible with any standard servo configuration whereby the battery and signal polarity is negative, plus, signal. **CAUTION: DO NOT ATTEMPT TO INTERFACE THE STANDARD CONNECTOR PROVIDED WITH THE UNIT TO AN "OLD STYLE" AIRTRONICS RECEIVER OR DAMAGE WILL RESULT TO THE SPEED CONTROLLER AND THE RECEIVER NOT COVERED BY WARRANTY!** Should you elect to interface the DIGI 60M to an "old style" Airtronics receiver, the proper connector shell is provided for this purpose. Follow the directions included with the shell to replace the standard JR type connector shell with the Airtronics shell. Make certain to maintain the proper polarity as indicated in the illustration. Remember, "old style" Airtronics connectors are the reverse polarity of industry standard and are wired positive, negative, signal! If you are unsure of the polarity of your receiver, contact your local dealer or phone FMA Direct immediately at (301) 831-8980 for assistance!
2. Connect a standard receiver battery pack to the receiver. The DIGI 60M does not include a battery eliminator circuit due to its high current / high voltage capabilities. A separate flight pack is required.
3. Connect the heavy, WHITE wire from the ESC to the positive (+) solder terminal on your motor. Connect the BLUE wire from the ESC to the negative (-) solder terminal on your motor. Typically, the peak current produced by the DIGI 60M in conjunction with a high output motor is enough to cause most connectors including the "bullet" type to fuse together. For this reason, it is recommended that you avoid using any connectors when connecting the motor to the DIGI 60M and instead solder the wires directly to the motor terminals.
4. Care must be taken when connecting a battery to the DIGI 60M. Because of the high current consumption in high output motors, it is recommended that you avoid using standard "TAMIYA" type connectors in line with the battery connected to the DIGI 60M. Depending on your current requirements, your best bet is to use high capacity connectors (see your local dealer) between the DIGI 60M and the battery terminals or solder the wiring directly to the battery pack. A "TAMIYA" or "SERMOS" type connector (not shown in Figure 1) *may* be attached to the battery pack *in parallel* to the battery leads to facilitate charging. Make certain that the ESC switch is in the off position. Connect the heavy, RED wire from the ESC to the

positive (+) solder terminal on your battery. Connect the heavy, BLACK wire from the ESC to the negative (-) solder terminal of the battery. Be certain to maintain proper polarity between the battery and the DIGI 60M. Failure to do so will result in damage to the unit not covered by warranty!

5. Secure all wiring appropriately. Wrap the ESC in foam rubber before installing it in the boat hull.

EZ SETUP OF THE DIGI 60M TO YOUR RADIO SYSTEM

OVERVIEW

The EZ SETUP feature of your DIGI 60M enables it to interface properly with your radio equipment. Performing the following EZ SETUP steps with your specific transmitter/receiver/ESC combination will: **1) SET NEUTRAL AND PROP BRAKE** (no motor movement); **2) SET FULL THROTTLE** (full current will be applied to the motor). You may choose to complete either of the steps outlined above sequentially while within EZ SETUP as many times as needed to assure proper setup of your vehicle. Each time you enter EZ SETUP, the new configuration changes you make will replace the current settings. You will also need to perform *all* EZ SETUP steps each time you use a different receiver/transmitter combination with the DIGI 60M. **NOTE:** EZ SETUP is initiated by pressing the EZ SETUP button until the RED LED begins flashing. If the RED LED stops flashing, you are no longer in EZ SETUP mode, you are in RUN mode. If the motor responds to your throttle commands, you are no longer in EZ SETUP mode. For each EZ SETUP step, it is important that you know what the flashing RED LED indicates and that you respond with the proper inputs on the transmitter. EZ SETUP progresses rapidly once it is initialized, so it is important that you read the following descriptions of each step several times until you get the hang of it. Then it will become second nature.

EZ SETUP PREPARATION

5. Verify that the DIGI 60M is connected as illustrated in Figure 1 and described in the previous section, INSTALLATION: RECEIVER / MOTOR / BATTERY CONNECTIONS.
6. Make certain the power and receiver battery packs connected are fully charged.
7. **CAUTION: Before you attempt EZ SETUP of the DIGI 60M, elevate the boat's hull above the bench so the prop is free of obstructions (including body parts).** Although no power is applied to the motor while EZ SETUP is commencing, it will take a little practice before you know when you are in or out of EZ SETUP mode and you will wish to test your settings after you complete any portion of EZ SETUP.
8. Turn ON your transmitter making certain 1) the throttle stick is all the way OFF and 2) the throttle trim is reset to neutral.
9. Turn ON your receiver pack switch if installed.
10. Turn ON the ESC power switch. With battery power applied to the DIGI 60M and the transmitter on, the RED indicator LED should glow continuously. **NOTE:** If this is the first time you have used EZ SETUP, the RED LED may not glow at all.

EZ SETUP STEPS

5. **SET NEUTRAL AND PROP BRAKE** - With the transmitter throttle OFF, press and hold the EZ SETUP button until the RED LED begins flashing. Neutral and prop brake are now set.
6. **SET FULL THROTTLE** - Make certain you are in EZ SETUP mode; i.e. the RED LED is flashing. Push the throttle stick to any position you wish to be full throttle and hold it there for 3 seconds. The microprocessor will memorize the full throttle position and the RED LED will glow continuously. Note: If the RED LED does not light when you push the throttle to your full throttle setting for 3 seconds, you must set the throttle channel reverse switch on your transmitter to the opposite position and begin this portion of EZ SETUP again.
7. **EZ SETUP** is complete when the RED LED lights continuously. You may test your settings now.

OVER-TEMPERATURE SAFETY CUT-OUT OF THE DIGI 60M DESCRIBED

1. **OVER-TEMPERATURE SAFETY CUT-OUT** - If at any time the temperature of the DIGI 60M exceeds maximum ratings, the OVER TEMPERATURE SAFETY CUTOFF will temporarily shut off power to the motor to prevent permanent damage to the unit. If this happens repeatedly, make certain that your boat's prop is free of binding or obstructions. If this does not solve the problem, verify that your motor is in good working order and that the brushes are seated properly. Finally, make certain your motor's current requirements do not exceed the DIGI 60M'S maximum limits. You may need to increase the number of windings or gear the