ATLAS
Electronic Speed Controllers

User Guide and Manual

HYPERION

English

1.0 SAFETY
Always remember that an electric motor which is connected to a battery and speed control may start unexpectedly and cause serious injuries. Always keep all body parts away from the disk of spinning propeller or rotor. Do not wear loose clothing, jewelry, or long hair (tie it up!) when near a running motor. Even a small motor and prop can injure you severely. BE CAREFUL!!! We suggest that you remove the propeller (or pinion gear from helicopter) while working on a model. Always range-check your radio set - while the model is grounded with motor running - before flight. Never fly over or even near other people.
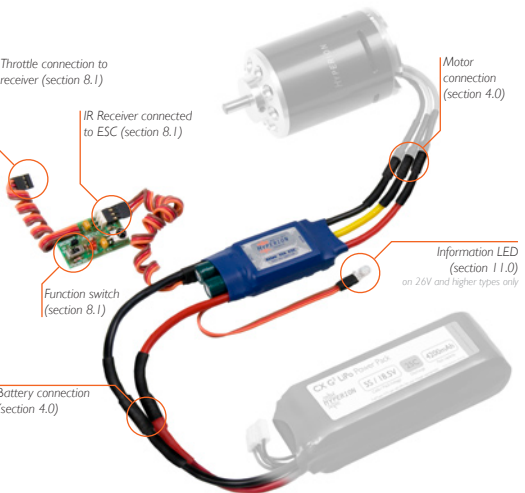
Hyperion Hk Ltd. and their will not accept responsibility for your use of this product, nor for any monetary or physical damage you may cause or sustain during use. If you are not willing to accept full responsibility, please return the product to your retailer immediately - in as-new condition and with all packaging - for a full refund.

2.0 INCLUDED IN THE BOX
- One Hyperion ATLAS Series Electronic Speed Controller (ESC)
- One Infrared (IR) Programming Transmitter (IR Tx)
- One Infrared (IR) Programming Receiver (IR Rx)

3.0 ESC TYPES
Hyperion ATLAS Series ESC differ according to the maximum voltage they accept, type of power circuit to the model's radio system, and maximum continuous current draw they provide. These details can be found printed on the heat sink attached to each ESC.

Throttle connection to receiver (section 8.1)
Motor connection (section 4.0)
IR Receiver connected to ESC (section 8.1)
Information LED (section 11.0) on 26V and higher types only
Function switch (section 8.1)
Battery connection (section 4.0)

3.1 Maximum Voltage: To determine the maximum number of cells in Series (S) you may use with each controller, divide the rated voltage (for example, 26V) by the Max Charge Voltage for the cell type you use and round down. *For example, LiPo at 4.2V/Cell with a 26V ESC: 26/4.2= 6.19 so 6S LiPo is the maximum*

LiPo:	4.2/Cell
LiFePO:	3.6V/Cell
NiMH:	1.4V/Cell
Pb (lead acid):	2.4V/Cell

3.2 Type of Power Circuit:
LBEC (Linear Battery Eliminator Circuit) – Generally intended for lower-voltage systems such as 2S/3S Lipo. As pack voltage rises, load (servos) must be reduced. Do not exceed 4 servos with 3S pack, or 2 servos with 4S. (Atlas 12A 3S max if using BEC). If you need to run more servos, disconnect the RED wire from the Receiver connector, and supply power to the receiver from a separate battery pack (typically 4.8v~6.0v).
SBEC (Switching Battery Eliminator Circuit) – This type allows full servo load regardless of main pack voltage. Up to 6 servos can be supported, but total draw should not exceed 3A continuous or 4A peak.
OPTO (Optical Isolation) – This system isolates the ESC from radio "noise" for increased safety. Typically used on larger models, and requires a separate Receiver power pack attached (4.8v~7.4v depending on servo voltage rating).

3.3 Continuous Current (Amperage) Rating: Your helicopter or
model airplane should be configured such that it draws – at most – the rated maximum continuous current. If current exceeds 110% of rated for a short interval, the ESC Current Overload Protection (COP) will reduce power to 90%. ATLAS ESC are also protected from over-temperature conditions of 85+ Celsius. In that case the ESC will gradually reduce power to the motor by 50%. In either case, you may reset the ESC by moving throttle stick to Zero position for a second, then throttle up only as much as required for landing. Reduce prop size or pack voltage to stay within ratings before next flight, and insure that proper cooling airflow will pass the ESC during flight.

4.0 GENERAL SETUP NOTES
- Wires between Electronic Speed Controller (ESC) and Battery must be as short as possible. Lengthen ESC<>Motor wires if extra length is needed.
- Use only quality Gold connectors of appropriate ampere rating and insure proper solder joints.
- **Do NOT shorten Motor Wires!** Desolder connectors rather than cutting!
- NEVER connect Battery to ESC with reverse polarity (see ESC connection image above sec. 3.1)
- Firmly mount the motor in model before running
- You MUST provide for cooling airflow to ESC and Motor. Do NOT place these parts inside a completely closed fuselage!
- Do NOT exceed your motor's max suggested prop/battery recommendations, unless you confirm current is within spec with accurate ammeter.

5.0 PREPARATION
- Hyperion motors come with "industry standard" 3.5mm or 4.0mm Male gold connectors attached to the motor leads. Matching female connectors and heat shrink – for the three ESC side wires – are also included.
- Solder your chosen connectors to the three motor-side ESC wires, and make sure that the solder joint is strong and penetrates the ESC wires well. Note again that motor wires should never be cut. De-solder the connectors instead, if changing connector type on the motor side.
- You will also need to attach quality connectors with appropriate current rating to your battery pack and ESC RED+/BLACK– wires. NEVER reverse polarity here, as your ESC will be damaged and not covered by warranty in this case. Be sure that the connectors are well insulated, so short-circuit cannot occur.

6.0 INITIAL SETUP with TRANSMITTER
You MUST perform throttle range setup before the first use of the ESC with a particular transmitter. Remove propeller/pinion from motor while performing initial throttle range setup.

- Turn on transmitter and set throttle to maximum position. Transmitter trims must be 0% minimum throttle and 100% at maximum throttle.
- Connect Motor to Controller
- Connect ESC 3-pin connector to Receiver's correct channel (see additional info at end of manual)
- Turn on Transmitter - Set Throttle Stick to "100%" (full throttle position)
- For OPTO ESC only, connect receiver battery pack to receiver
- After few seconds you will hear 2 beeps come from the motor to indicate you are in throttle calibration mode and maximum throttle position has been set. (If at this time the throttle stick remains at maximum position for 10 seconds or more, the ESC will reset itself to Factory default throttle settings)
- Move throttle to ZERO position (minimum) within 10 seconds. 2 beeps will confirm minimum throttle position is set.
- Your ESC now be armed after you have set the minimum position. You only need to do this once as throttle range will be stored in the memory of the speed controller. You can reset the throttle range by performing steps 4.1 to 4.4 again To program any function on the card you must follow the following procedure:

7.0 FLIGHT CONNECTION SEQUENCE
- Connect Motor to Controller
- Connect ESC 3-pin connector to Receiver's correct channel (see additional info at end of manual)
- Turn on Transmitter - Set Throttle Stick to "ZERO" (lowest position)
- Connect Battery to ESC RED/BLACK leads (double check proper polarity first!)
- After a few seconds, you should hear the arming tones (4 beeps) from the motor
- Advance throttle to start motor. Check motor rotation direction.

Viewed from front of an airplane model, motor shaft should turn counter-clockwise and printing on propeller always faces you (true when motor is front or rear "pusher" mounted).
To reverse motor direction, switch connection of **any two** of the three wires **between Motor and Controller**. Never change connection between battery and ESC!

The ESC will not provide any power to the motor if the throttle stick is anywhere higher then zero throttle when the main battery is plugged in. If so, move the throttle stick to zero then disconnect and reconnect the battery.

Always power your radio transmitter before powering up the receiver and ESC. If OPTO Type, power receiver before main pack connection to ESC.. Always keep the aircraft restrained and clear of body parts when the ESC is powered.

If your ESC cannot sense any radio signal it will beep the motor (all types) and flash orange on the LED (26V+ types) continuously . Safe Power Up: If throttle is not at zero at startup, the ESC will not provide any power to the motor. The ESC will also stop the motor as a safety (fail safe) feature when the throttle signal is lost or corrupt for 3 seconds. If a signal is later regained the user will have throttle control again immediately.
See troubleshooting section at end of manual if necessary.

8.0 ATLAS ESC PROGRAMMING
ALL ATLAS ESC programming features are available though the use of the included IR Programming set. There is no need to purchase any other cables or cards to allow you to program your ESC properly. However, the Hyperion Emeter II can also program the ATLAS ESC, with visual feedback of the process, if you prefer.

8.1 Connection:
- First you must connect your IR Receiver to your ESC as pictured.
- Once you have plugged in the IR Receiver push the switch across to IRS.
- Now connect a battery to the ESC. Your motor will emit 3 beeps (26V+ types also flash LED red 3x).
- Your IR Receiver is now ready to receive a signal from the program card.

Note that direct sunlight may interfere, so programming indoors or in the shade is best.
Before flight remember that you will need to place the switch back to PPM mode, or disconnect the IR Receiver from the ESC.

To Receiver *ESC Connector*
Switch: PPM••IRS

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Using the IR Transmitter:
1. Press a function button
2. Set a numeric value
3. Press the ENTER button

For example, to set Low Voltage Cut (LVC) of 9.5V: Press "LVC" Press "0" Press "9" Press "5" then "ENTER" If successful a DI-DOO sound will come from the motor and the IR Rx LED will flash RED. An invalid option will not get any confirmation sound from the motor and the IR Rx LED will not flash. Also note that there is a time limit of about 3 seconds to complete a sequence (Function, Numeric, Enter). If you exceed the time limit no programming will occur.

Numeric Values — Function Buttons
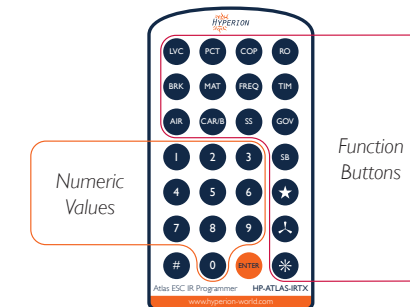
FUNCTION KEY	NUMERIC SETTINGS		DEFAULTS*
LVC: 15V ESC Types	050 (5.0V) to 138 (13.8V)	0.2 volt increments	*060 (6V)
LVC: 26V ESC Types	050 (5.0V) to 230 (23.0V)	0.5 volt increments	*060 (6V)
LVC: 50V ESC Types	120 (12.0V) to 480 (48.0V)	0.5 volt increments	*120 (12V)
LVC: 68V ESC Types	120 (12.0V) to 560 (56.0V)	0.5 volt increments	*120 (12V)
PCT - LVC Program Cut Type	1 50% Power*, 2 NoCut/LED, 3 Pulse Power		
AIR - Airplane Mode	1 Resets all Defaults and Disables Governor mode.		
BRK - Brake Setting	1 None*, 2 Very Soft, 3 Soft, 4 Hard, 5 Very Hard		
COP - Overload Protection	1 ON*, 2 OFF (#2 voids warranty during use)		
MAT - Motor Accel. Delay	1 0.15 second, 2 0.3sec*, 3 0.45sec, 4 0.7sec, 5 1.3 sec		
FREQ - Drive Frequency	1 8khz*		
TIM - Motor Timing	1 Auto Timing*, 2 5°, 3 15°, 4 20°, 5 25°, 6 30°		
SB - Start Boost	1 Soft*, 2 Medium, 3 Strong		
SS - Soft Start / Gov (heli)	1 Soft Start in Gas Mode, 2 Soft Start plus Governor Mode		
SSD - Soft Start Duration (heli)	1 10seconds*, 2 15seconds, 3 20seconds		
GOV - Governor Mode (heli)	1 Soft, 2 Med, 3 Hard (see section 10.0)		

All other buttons reserved for future use

9.0 ADDITIONAL NOTES FOR PROGRAM SETTINGS:

AIR: This basically resets the ESC to all Defaults. If SS has been set for a helicopter, and you want to revert to Airplane mode without soft-start, use this function then reselect your new desired LVC and other settings.

COP: Current Overload Protection, as described earlier, is enabled by default. If you choose to disable this, please note that your warranty is void while the setting is OFF.

MAT: Motor Acceleration Delay. Most often needed with large motors and propellers, which can overload an ESC when throttle stick is moved quickly to full. If you "stall", increase this until the problem disappears.

FREQ: 8khz is recommended. Other settings for experts only.

TIM: AUTO is recommended. Other settings for experts only.

SS: Heli mode with soft start, in either variable throttle ("gas mode") or RPM Control Governor mode.

10.0 GOVERNOR FUNCTION FOR HELICOPTERS (GOV):

ATLAS ESC use complex mathematics and fast processor speeds to provide one of the most user friendly and advanced governors on the market today. No other brand we have tested holds head speed as well. In most cases and with proper setup, the ATLAS Governor can maintain rpm as tight as 5rpm in hover, and 25rpm during high-load maneuvers, when using Scorpion or Hyperion brand helicopter motors, and Hyperion G3 VX LiPo (a great governor needs a great motor and battery for best performance).

A Governor is designed to maintain the desired speed of your main rotor blades. This means that the ESC will keep the rotor blade speed you've chosen, regardless of the amount of pitch on the main blades and load on the motor. To do this the ESC tracks motor speed and will automatically increase or decrease power to maintain constant rpm. This allows you to push 3D performance to the limits, by giving you more power when you need it while keeping the rotor speed constant at other times. It provides a consistent flight feel from start to finish; rpm does not drop as battery voltage drops when using the ATLAS governor mode (as long as the battery can still provide enough current). And it's easy, compared to setting up non-governed throttle curves.

10.1 Programming the Governor:
Before programming the governor you must perform the Initial Setup in section 4.0 in this manual first. You will also need a tachometer to measure head speed. By far the best choice for this is the Hyperion Emeter II, using the Remote Data Unit with Phase RPM sensor. It is much more accurate than optical solutions.
• Insure you have the IR Receiver Plugged in properly (see section 8.0)
• Remove the motor pinion
• Power ESC (for OPTO series Power Receiver then Power ESC)
• Move Switch of IR Receiver to Program mode (see section 8.0)
• 3 beeps will sound you are now in program mode
• Press SS > 2 > Enter. 2 beeps will sound confirming SS 2 mode selected

10.2 Radio Setup:
• Set your throttle hold position in your radio to 0%
• In your radio you need to set your throttle curves to the % of throttle you wish to operate your governor at. It is a good idea to use a head speed calculator first to find out an estimated target HS you wish to achieve. (or ask expert with same heli)
• Once you have estimated the amount of throttle needed to achieve your target head speed enter it into a throttle curve so that it is the same % of throttle across the entire range. E.g. for 80% throttle at all points across the curve you should have flat line at 80%. You can only select values from 50-90% throttle.
• You can have 3 different throttle values for each flight mode and you can flick between them in mid flight with no effect on the governor as long as it has been set properly at initial startup

10.3 Startup Procedure:
• Turn on your radio and place throttle hold switch to ON
• If using the 50V OPTO ESC you will need to power your receiver
• Plug your ESC to the main power battery
• Wait for it to arm (4 beeps "di di dee do")
• Select the flight mode you wish to fly in
• Insure your blades are at 0 degrees pitch (If your blades are not at 0 deg your governor will not get set itself properly
• Turn throttle hold switch OFF
• Soft start will initiate – Depending on the soft start duration you have set (10,15 or 20 seconds) wait on this amount of time for the blades to stabilize speed. (if you have the 26V+ ESC the LED will glow orange during startup and will turn off once the head speed has been set and stabilized)
• Measure the blade speed at 0 deg pitch with a tachometer (Emeter II) to see if you are achieving the desired head speed.
• If the head speed is too high go back into your throttle curve and reduce throttle or if too low increase your throttle curve

10.4 Auto Rotation Bail Out Feature for both SS Heli modes
If you attempt an autorotation, once you have switched your throttle hold switch you have a 12-second time window. If you feel you cannot make the auto rotation you can switch the throttle hold off and your helicopter will instantly regain throttle to either your stick position in Gas-Throttle Mode, or your chosen Governor Throttle %.

10.5 Governor Correction (GOV) Button Settings 1 to 3
All three modes compensate for no load conditions. For example if you are hovering and pitch down (negative pitch) the ESC will apply the necessary amount of brake to keep your rotor blades at desired RPM. Setting 2 is default. As setting goes from 1 to 3, the Governor will pull more deeply from power reserves to compensate for variation in rpm. For 3D using a strong motor and battery, you may prefer setting 3. For flight modes like F3C, you might choose settings 1 or 2. In any case, please do experiment and adjust according to your model, power system, and preferences.

11.0 LIGHTS AND SOUNDS
(LED lights on 26V and higher types only)
Your ESC will emit different lights and sounds under the following conditions:
• No Signal from receiver at startup: LED light will flash orange with constant 2 warning tone. If Using program card, the LED will flash red and emit 3 beep tones then you will enter setup mode.
• Loss of Signal during operation: LED will flash red with a 2 beep warning tone.
• Over Temperature during power up: (>60°C) LED will be constant red with 2 beep warning tone. To restart, disconnect power source, wait for cool down then re-connect.
• Over Heat during operation: (>85 °C) Power reduced to half throttle , red LED will flash. To reset throttle must be put into idle position.
• Low Voltage Warning: LED will flash red quickly with beep warning tone when voltage is lower than the preset cut-off voltage.
• Low Voltage Cut Warning: When voltage is lower than preset cut off voltage, red LED will flash rapidly red.
• Over Amp Protection: Is only activated at over 50% throttle during over-amp protection, LED will flash red rapidly
• Governor Limit Warning: If governor reaches 100% throttle, orange LED light turn on.
• Soft start indication: Orange LED light will turn off automatically when soft start has been deactivated.

12.0 TROUBLE SHOOTING
12.1 After powering up the ESC, you hear a pulsed warning tone and/or see a continuous orange flashing LED:
• Check your transmitter. Is it on? Did you perform initial SETUP in section 6.0?
• Check that your throttle is at its Zero (min) position. Try setting throttle trim down.
• Check the ESC-to-Receiver connection. Connection proper?
• Check the motor connection to the ESC, reconnect them if necessary. Check your battery. Fully charged? Replace battery if necessary. Try another receiver.
• The connector from ESC to Receiver must be connected to the proper channel on the Receiver, with correct polarity.
• Futaba, Hitec, Sanwa, Airtronics: Receiver Ch. 3
• JR: Receiver Ch. 1
• ATLAS Rx Wire Colors: Signal Orange, + Red, - Brown

12.2 Motor starts but cuts out as throttle is advanced
• Speed Controller not set properly: To protect your battery, your speed controller has settings for "Low Voltage Cutoff" battery voltage. Lipo should generally be set to about 3.1V/cell auto cut (so about 9.25V~9.5V LVC setting for a "3S" lipo pack)
• Wrong battery and prop combination: causes current (amps) to rise much too high. This causes the battery to drop voltage, and auto-cut occurs (as it should). If you don't know the prop size to use, ask your vendor. Tell him what battery type and cell count you have, and motor type including "turns" number. For testing this condition, reduce prop size 2 inches in diameter and try again, repeat. Try another battery, as yours may be weak or defective.
• Connector soldering: It is EXTREMELY common to have a cold solder joint in a connector, which causes poor starts, no starts, or rough running and cut outs. Even if you are sure they are fine, RESOLDER all connectors with a HOT iron.

Many problems are due to improper transmitter or receiver setup. Be SURE to read this document carefully, and double check everything. Reset Transmitter to defaults, with no trims. If all fails, borrow a different transmitter and receiver from a friend and try again.
• Futaba transmitters must have Throttle Channel REVERSED. Other brands should be set to NORMAL direction.
• Most aftermarket receivers today are PPM (aka FM) type. Transmitters may be PPM only, or they may have options both PCM or PPM modulation. You must be sure that your transmitter is set properly for the type of receiver you have, PPM (FM) or PCM.
• The connector from ESC to Receiver must be connected to the proper channel on the Receiver, with correct polarity.
• Futaba, Hitec, Sanwa, Airtronics: Receiver Ch. 3
• JR: Receiver Ch. 1
• ATLAS Rx Wire Colors: Signal Orange, + Red, - Brown

Knowledge is power. And the Emeter II and Remote Data Unit (RDU) give it to you. The RDU can ride along in your model, and record extremely accurate data, so you know the exact conditions of your power system in flight. On the ground, that data can be downloaded, saved, and viewed on the Emeter. In fact, we couldn't have made the ATLAS ESC so good without it! The super-steady and accurate phase tachometer and power measurements were invaluable in development of the new Governor system, and motor driver firmware. The Emeter is also the easiest and most sure way to program Atlas ESC.