



ONYX® Programmable Brushless Air ESCs

**ONXM2112 12 amp, ONXM2120 20 amp,
ONXM2130 30 amp, ONXM2150 50 amp,
ONXM2160 60 amp, ONXM2180 80 amp**

NOTICE

All instructions, warranties and other collateral documents are subject to change at the sole discretion of Horizon Hobby, LLC. For up-to-date product literature, visit horizonhobby.com or towerhobbies.com and click on the support or resources tab for this product.

Meaning of Special Language

The following terms are used throughout the product literature to indicate various levels of potential harm when operating this product:

WARNING: Procedures, which if not properly followed, create the probability of property damage, collateral damage, and serious injury OR create a high probability of superficial injury.

CAUTION: Procedures, which if not properly followed, create the probability of physical property damage AND a possibility of serious injury.

NOTICE: Procedures, which if not properly followed, create a possibility of physical property damage AND a little or no possibility of injury.



WARNING: Read the ENTIRE instruction manual to become familiar with the features of the product before operating. Failure to operate the product correctly can result in damage to the product, personal property and cause serious injury.

This is a sophisticated hobby product. It must be operated with caution and common sense and requires some basic mechanical ability. Failure to operate this Product in a safe and responsible manner could result in injury or damage to the product or other property. This product is not intended for use by children without direct adult supervision. Do not attempt disassembly, use with incompatible components or augment product in any way without the approval of Horizon Hobby, LLC. This manual contains instructions for safety, operation and maintenance. It is essential to read and follow all the instructions and warnings in the manual, prior to assembly, setup or use, in order to operate correctly and avoid damage or serious injury.

**Age Recommendation: Not for children under 14 years.
This is not a toy.**

NOTICE: This product is only intended for use with unmanned, hobby-grade, remote-controlled vehicles and aircraft. Horizon Hobby disclaims all liability outside of the intended purpose and will not provide warranty service related thereto.

SKU	Current (Continuous/Burst)	Voltage	BEC
ONXM2112	12A/18A	2-3S LiPo 4-9 Cell NiMH	1A/5V
ONXM2120	20A/25A	2-3S LiPo 6-10 Cell NiMH	2A/5V
ONXM2130	30A/40A	2-4S LiPo 6-12 Cell NiMH	2A/5V
ONXM2150	50A/65A	2-4S LiPo 6-12 Cell NiMH	5A/5V
ONXM2160	60A/80A	2-6S LiPo 6-18 Cell NiMH	5A/5V
ONXM2180	80A/100A	3-6S LiPo 8-18 Cell NiMH	5A/5V

ESC Features

Start-Up Protection

Thermal Protection: If the internal temperature of the ESC reaches 230°F/110°C, the ESC will reduce output power

Lost Signal Protection: The ESC will stop the motor if throttle signal is lost

3 start modes: Normal/ Soft/ Super-Soft

Works with LiPo, NiCd and NiMH batteries

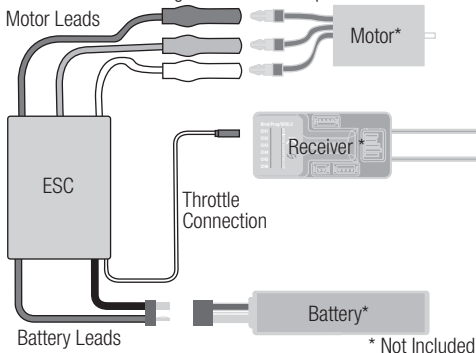
Auto-Senses the number of cells in your battery pack

Compatible with fixed-wing aircraft and helicopters

Brake and timing adjustments

Connection and Installation

Mount the ESC so it cannot move around inside the aircraft and in a location where it can receive free-flowing air during operation. It is normal for the ESC to get warm while in operation.



Motor Direction

If the motor turns the wrong direction you can reverse the direction by swapping any two of the three wires between the motor and ESC.

NOTICE: Always disconnect the battery from the ESC when you have finished operating your vehicle. If you leave the battery connected, the ESC will continue to draw current, resulting in possible damage to the battery through over-discharge.

NOTICE: Do not connect a dedicated receiver battery or external BEC to the receiver along with the ESC. When the ESC/Receiver is powered ON, it will provide the servo ports with regulated power from the main battery. If an external power source is connected to the receiver in addition to the ESC, the ESC and/or receiver may be damaged.

Throttle Range Calibration

When you first install the ESC, you will need to calibrate the throttle range.



WARNING: Remove the propeller from the aircraft for safety during setup. Removing the propeller from the motor enables the operation to be tested safely.



WARNING: For some radio control systems (Futaba and Tactic in particular), you will need to reverse the throttle channel for normal operation where OFF is with the stick at the low position. If you do not verify correct operation before installing the propeller, the motor could power ON in a manner you don't expect.

1. Power on the transmitter then move the throttle stick to full. (prevents throttle high warning).
2. Connect a battery pack to the ESC.
3. Wait for 2 seconds. The motor will emit a double tone which indicates the high throttle point has been set.
4. Move the throttle stick to zero throttle. The motor will emit a series of short tones and then a long tone.
5. Disconnect the battery, the ESC is calibrated and ready for operation.

Operating Your ESC



CAUTION: For safety, always assume the propeller could spin any time the battery is plugged in.

1. Move the throttle stick to zero throttle and power ON your the transmitter.
2. Connect the battery pack to the ESC.
3. A series of tones ending in one long tone indicates the ESC is ready for flight.

If the motor fails to start within 2 seconds, then the ESC will stop trying to power the motor. If this happens, the throttle stick must be moved to zero throttle to reset and start again.

The ESC will stop the motor if the throttle signal is lost. If the signal is regained, throttle control will be restored immediately.

Programmable Items

1. Brake: Enabled/Disabled. Default is Disabled
2. Battery Type: Lithium (Lilon or LiPo)/Nickel based (NiMH or NiCd). Default is LiPo
3. Low Voltage Cutoff Reaction. Default is Soft Cut-Off.
4. Low Voltage Cutoff (LVC): Low/Medium/High. Default is Medium. LVC behavior is different for different battery types is and based on the battery type selected.
If Lithium battery type is selected, the cell count of the battery pack is calculated automatically. The cutoff voltage (per cell) is; Low - 2.85V, Medium - 3.15V, High - 3.3V
Example: If Lithium battery type is selected with High LVC and a 3 cell LiPo battery is connected, the ESC will detect the cell count and set the LVC at 9.9V (3.3V per cell x 3 cells).
If NiCd/NiMH battery type is selected, low/medium/high settings represent 0%/50%/65% of the initial pack voltage. 0% means the low voltage cut-off function is disabled.
5. Start Mode: Normal/Soft/Super-Soft. Default is Normal. Normal is preferred for fixed-wing aircraft. Soft or Super-soft are preferred for helicopters.
IMPORTANT: If the throttle is lowered and brought up again within 3 seconds after the initial startup, the restart will be temporarily changed to normal mode.
6. Timing: Low/Medium/High (3.75°/15°/26.25°). Default is Low. Low timing or medium timing is suitable for most motors. High timing values can be attempted on your power system to maximize power, but may result in excess heat or erratic behavior. Be sure to complete thorough ground tests if you increase the timing, and lower the timing value if the motor screeches or stutters, or if testing results in temps over 180 degrees (F) on the motor.

Entering Programming Mode

1. Remove the propeller.
2. If you haven't already, calibrate the throttle range.
3. Power on the transmitter then move the throttle stick to full. (prevents throttle high warning).
4. Connect the battery pack to the ESC.
5. Shortly after your transmitter and receiver begin to operate, the motor will emit a double tone. This confirms the throttle is at the high setting.
6. Wait for another five seconds and you will hear a series of tones which indicates you are in the program mode.

Select Programmable Item:

Once in the programming mode, you will hear eight series of tones, each one in reference to one of the programmable items.

Tone	Programmable Item
1. One short tone	Brake
2. Two short tones	Battery Type
3. Three short tones	Low Voltage Cutoff Reaction
4. Four short tones	Low Voltage Cutoff
5. One long tone	Start Mode
6. One long tone, one short tone	Timing
7. One long tone, two short tones	Reset default
8. Two medium tones	Exit Programming

To select one of the features for changes, move the throttle stick down within three seconds of the related tone. After a pause, the motor will emit a tone which indicates the ESC is entering the sub-menu so you can select the values you want to use.

Sub-Menu Within Each Programmable Item:

Set the value by moving throttle stick to the top position when you hear the tones that indicate the value you want. A tone will indicate the value is set and saved.

Feature	One Short Tone	Two Short Tones	Three Short Tones
1. Brake	Off	On	
2. Battery Type	LiPo/Lilon	NiMH/NiCd	
3. Low Voltage Cutoff Reaction	Soft Cut-Off	Hard Cut-Off	
4. Low Voltage Cutoff	Low	Medium	High
5. Start Mode	Normal	Soft	Super Soft
6. Timing	Low	Medium	High

IMPORTANT: If you do not make a selection, leaving the throttle at high will now keep the throttle stick at the top position, you will go back to the programming menu and you can select other items to program. However, if you move the stick to the bottom position within 2 seconds, you will exit the program mode.

Exit Programming Mode:

There are three ways to exit programming mode.

1. Select the last option in programming; When the motor emits two tones, move the throttle stick down within three seconds.
2. After setting the value for a programmable item, move the stick to the bottom within 2 seconds after selecting the value.
3. After setting a value, unplug the battery. The new settings will be saved.

Warning Tones

The ESC begins to check the voltage when the battery pack is connected.

1. If the ESC does not arm normally the motor will emit a series of tones.

TONES	SCENARIO
Repeating double tone	Voltage outside of acceptable range when the power is connected
Repeating single tone	The ESC cannot detect a normal throttle signal
Repeating rapid single tone	The throttle is not at its lowest position
A double tone followed by a pattern of tones	The ESC has entered the programming mode. If the throttle is at the low position when this happens, disconnect the power, reverse the throttle channel and try again

2. If nothing happens, verify the battery pack is charged and inspect all wiring connections.

ESC Troubleshooting Guide

Problem	Possible Cause	Solution
Calibration not working	Throttle reversed	Reverse the throttle setting in your transmitter
	Throttle travel reduced in transmitter	Reset throttle travel to 100% in your transmitter
Motor stops during operation	Throttle signal lost	Check all wiring connections and range check your RC system. Refer to your transmitter and/or receiver manual for troubleshooting radio link issues
	Battery voltage is too low and ESC entered LVC mode	Land the aircraft as soon as possible and recharge or replace the battery
	Worn or damaged motor	Repair/replace motor
Motor Does not turn continuously in response to throttle	ESC/motor damaged	Repair/replace wiring or motor/ESC
	Battery cannot sustain the current demand of your power system because of a system imbalance.	Change to a smaller propeller, change to a lower cell count battery, change to a lower Kv motor, or change the gear ratio to lower the current draw
	Battery cannot sustain the current demands of your power system because it is damaged	Replace the battery
Motor Slows but will not stop	Incorrect transmitter/ESC calibration	Adjust throttle travel/ other throttle settings on the transmitter/ESC. Repeat the ESC Calibration Procedure

1-YEAR LIMITED WARRANTY

What this Warranty Covers - Horizon Hobby, LLC, (Horizon) warrants to the original purchaser that the product purchased (the "Product") will be free from defects in materials and workmanship for a period of 1 year from the date of purchase.

What is Not Covered

This warranty is not transferable and does not cover (i) cosmetic damage, (ii) damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or due to improper use, installation, operation or maintenance, (iii) modification of or to any part of the Product, (iv) attempted service by anyone other than a Horizon Hobby authorized service center, (v) Product not purchased from an authorized Horizon dealer, (vi) Product not compliant with applicable technical regulations, or (vii) use that violates any applicable laws, rules, or regulations.

OTHER THAN THE EXPRESS WARRANTY ABOVE, HORIZON MAKES NO OTHER WARRANTY OR REPRESENTATION, AND HEREBY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE PURCHASER ACKNOWLEDGES THAT THEY ALONE HAVE DETERMINED THAT THE PRODUCT WILL SUITABLY MEET THE REQUIREMENTS OF THE PURCHASER'S INTENDED USE.

Purchaser's Remedy

Horizon's sole obligation and purchaser's sole and exclusive remedy shall be that Horizon will, at its option, either (i) service, or (ii) replace, any Product determined by Horizon to be defective. Horizon reserves the right to inspect any and all Product(s) involved in a warranty claim. Service or replacement decisions are at the sole discretion of Horizon. Proof of purchase is required for all warranty claims. SERVICE OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE PURCHASER'S SOLE AND EXCLUSIVE REMEDY.

Limitation of Liability

HORIZON SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY, REGARDLESS OF WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, TORT, NEGLIGENCE, STRICT LIABILITY OR ANY OTHER THEORY OF LIABILITY, EVEN IF HORIZON HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. Further, in no event shall the liability of Horizon exceed the individual price of the Product on which liability is asserted. As Horizon has no control over use, setup, final assembly, modification or misuse, no liability shall be assumed nor accepted for any resulting damage or injury. By the act of use, setup or assembly, the user accepts all resulting liability. If you as the purchaser or user are not prepared to accept the liability associated with the use of the Product, purchaser is advised to return the Product immediately in new and unused condition to the place of purchase.

Law

These terms are governed by Illinois law (without regard to conflict of law principals). This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Horizon reserves the right to change or modify this warranty at any time without notice.

WARRANTY SERVICES

Questions, Assistance, and Services

Your local hobby store and/or place of purchase cannot provide warranty support or service. Once assembly, setup or use of the Product has been started, you must contact your local distributor or Horizon directly. This will enable Horizon to better answer your questions and service you in the event that you may need any assistance. For questions or assistance, please visit our website at www.horizonhobby.com, submit a Product Support Inquiry, or call the toll free telephone number referenced in the Warranty and Service Contact Information section to speak with a Product Support representative.

Inspection or Services

If this Product needs to be inspected or serviced and is compliant in the country you live and use the Product in, please use the Horizon Online Service Request submission process found on our website or call Horizon to obtain a Return Merchandise Authorization (RMA) number. Pack the Product securely using a shipping carton. Please note that original boxes may be included, but are not designed to withstand the rigors of shipping without additional protection. Ship via a carrier that provides tracking and insurance for lost or damaged parcels, as Horizon is not responsible for merchandise until it arrives and is accepted at our facility. An Online Service Request is available at <http://www.horizonhobby.com/content/service-center-render-service-center>. If you do not have internet access, please contact Horizon Product Support to obtain a RMA number along with instructions for submitting your product for service. When calling Horizon, you will be asked to provide your complete name, street address, email address and phone number where you can be reached during business hours. When sending product into Horizon, please include your RMA number, a list of the included items, and a brief summary of the problem. A copy of your original sales receipt must be included for warranty consideration. Be sure your name, address, and RMA number are clearly written on the outside of the shipping carton.

NOTICE: Do not ship LiPo batteries to Horizon. If you have any issue with a LiPo battery, please contact the appropriate Horizon Product Support office.

Warranty Requirements

For Warranty consideration, you must include your original sales receipt verifying the proof-of-purchase date. Provided warranty conditions have been met, your Product will be serviced or replaced free of charge. Service or replacement decisions are at the sole discretion of Horizon.

Non-Warranty Service

Should your service not be covered by warranty, service will be completed and payment will be required without notification or estimate of the expense unless the expense exceeds 50% of the retail purchase cost. By submitting the item for service you are agreeing to payment of the service without notification. Service estimates are available upon request. You must include this request with your item submitted for service. Non-warranty service estimates will be billed a minimum of ½ hour of labor. In addition you will be billed for return freight. Horizon accepts money orders and cashier's checks, as well as Visa, MasterCard, American Express, and Discover cards. By submitting any item to Horizon for service, you are agreeing to Horizon's Terms and Conditions found on our website <http://www.horizonhobby.com/content/service-center-render-service-center>.

ATTENTION: Horizon service is limited to Product compliant in the country of use and ownership. If received, a non-compliant Product will not be serviced. Further, the sender will be responsible for arranging return shipment of the un-serviced Product, through a carrier of the sender's choice and at the sender's expense. Horizon will hold non-compliant Product for a period of 60 days from notification, after which it will be discarded.

10/15

Warranty and Service Contact Information


Country of Purchase	Horizon Hobby	Contact Information	Address
United States of America	Horizon Service Center (Repairs and Repair Requests)	servicecenter.horizonhobby.com/RequestForm/	2904 Research Rd. Champaign, Illinois, 61822 USA
	Horizon Product Support (Product Technical Assistance)	productsupport@horizonhobby.com.	
		877-504-0233	
	Sales	websales@horizonhobby.com	
800-338-4639			

FCC Information

Supplier's Declaration of Conformity

**ONXM2160, ONXM2150, ONXM2130,
ONXM2120, ONXM2112, ONXM2180**

FC This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

 **CAUTION:** changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and

used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Horizon Hobby, LLC

2904 Research Rd.,

Champaign, IL 61822

Email: compliance@horizonhobby.com

Web: HorizonHobby.com



© 2020 Horizon Hobby, LLC.

Onyx, the Onxy logo, and the Horizon Hobby logo are trademarks or registered trademarks of Horizon Hobby, LLC.

All other trademarks, service marks and logos are property of their respective owners.

Created 03/20

64436
ONXM2160, ONXM2150, ONXM2130,
ONXM2120, ONXM2112, ONXM2180