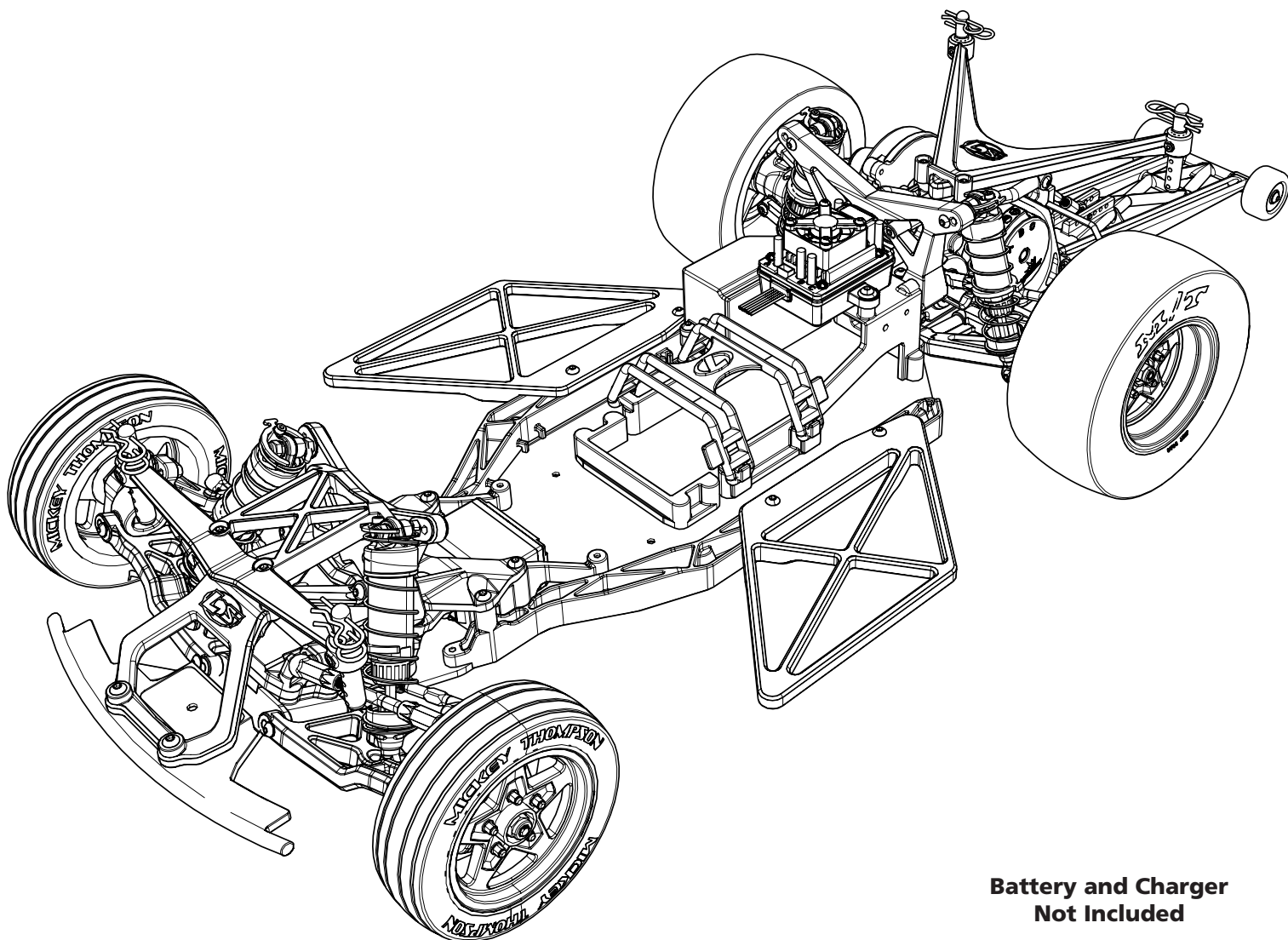


RTR
READY-TO-RUN

HORIZON[®]
H O B B Y



***PPS* NO PREP DRAG 1/10 2WD RTR**



**Battery and Charger
Not Included**

**INSTRUCTION MANUAL
BEDIENUNGSANLEITUNG
MANUEL D'UTILISATION
MANUALE DI ISTRUZIONI**

Before operating this vehicle, please read all printed materials thoroughly.
Horizon Hobby is not responsible for inadvertent errors in this manual.

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 use with incompatible components or alter this product in any way outside of the instructions provided by 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.

 **WARNING AGAINST COUNTERFEIT PRODUCTS** Always purchase from a Horizon Hobby, LLC authorized dealer to ensure authentic high-quality Spektrum product. Horizon Hobby, LLC disclaims all support and warranty with regards, but not limited to, compatibility and performance of counterfeit products or products claiming compatibility with DSM or Spektrum.

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

SAFETY PRECAUTIONS AND WARNINGS

As the user of this product, you are solely responsible for operating in a manner that does not endanger yourself and others or result in damage to the product or property of others.

This model is controlled by a radio signal subject to interference from many sources outside your control. This interference can cause momentary loss of control, so it is advisable to always keep a safe distance in all directions around your model as this margin will help avoid collisions or injury.

- Never operate your model with low transmitter batteries.
- Always operate your model in open spaces away from full-size vehicles, traffic and people.
- Never operate the model in the street or in populated areas for any reason.
- Carefully follow the directions and warnings for this and any optional support equipment (chargers, rechargeable battery packs, etc.) you use.
- Keep all chemicals, small parts and anything electrical out of the reach of children.

- Never lick or place any portion of the model in your mouth as it could cause serious injury or even death.
- Exercise caution when using tools and sharp instruments.
- Take care during maintenance as some parts may have sharp edges.
- Immediately after using your model, do NOT touch equipment such as the motor, electronic speed control and battery, because they generate high temperatures. You may burn yourself seriously touching them.
- Do not put fingers or any objects inside rotating and moving parts, as this may cause damage or serious injury.
- Always turn on your transmitter before you turn on the receiver in the car. Always turn off the receiver before turning your transmitter off.
- Keep the wheels of the model off the ground when checking the operation of the radio equipment.

TABLE OF CONTENTS

REGISTER YOUR LOSI PRODUCT ONLINE	2	TO IMPROVE RUN TIMES	6
BOX CONTENTS	3	PERFORMING A CONTROL DIRECTION TEST	6
COMPONENTS	3	SPEKTRUM™ FIRMA100A 2-3S BRUSHLESS SMART ESC (SPMXSE1100)	6
WATER-RESISTANT VEHICLE WITH WATERPROOF ELECTRONICS	3	ESC CALIBRATION PROCEDURE	6
GENERAL PRECAUTIONS	3	FIRMA 100A PROGRAMMABLE OPTIONS	6
WET CONDITIONS MAINTENANCE	3	DESCRIPTIONS	7
QUICK START	3	ESC PROGRAMMING PROCEDURE	7
CHARGING THE BATTERY	3	SPEKTRUM™ 3652 4-POLE 6500KV BRUSHLESS MOTOR (SPMXSM2800)	8
INSTALLING THE BATTERY	4	PRECAUTIONS	8
TRANSMITTER FUNCTIONS	4	GEARING	8
INSTALLING THE TRANSMITTER BATTERIES	4	CHANGING THE PINION GEAR/GEAR RATIO	8
SPMSR315 DUAL PROTOCOL RECEIVER	5	SETTING THE GEAR MESH	8
RECEIVER ANTENNA	5	TROUBLESHOOTING GUIDE	8
BINDING	5	2-YEAR LIMITED WARRANTY	9
SERVO TRAVEL	5	WARRANTY AND SERVICE CONTACT INFORMATION	9
DRIVING PRECAUTIONS	5	FCC AND CANADA COMPLIANCE INFORMATION	10
POWERING ON THE VEHICLE	5	IC INFORMATION	10
BEFORE RUNNING YOUR VEHICLE	6	COMPLIANCE INFORMATION FOR THE EUROPEAN UNION	10
RUN TIME	6		

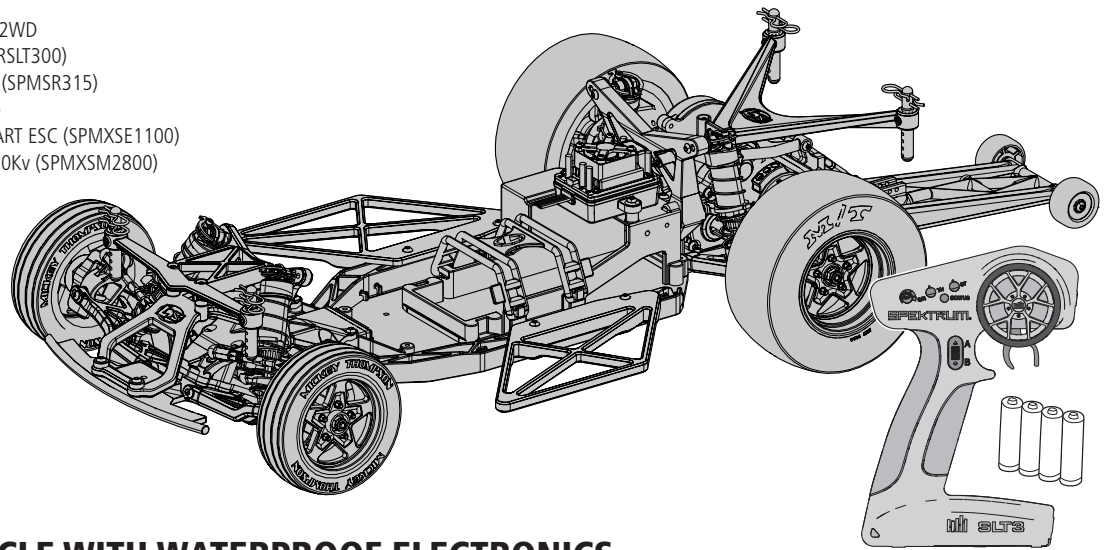
REGISTER YOUR LOSI PRODUCT ONLINE

Register your vehicle now and be the first to find out about the latest option parts, product updates and more. Click on the Support tab at WWW.LOSI.COM and follow the product registration link to stay connected.

BOX CONTENTS

COMPONENTS

- Losi® Brushless No Prep Drag RTR: 1/10-Scale 2WD
- Spektrum™ SLT3 3-Channel Transmitter (SPMRSLT300)
- Spektrum™ Dual Protocol DMSR/SLT Receiver (SPMSR315)
- Spektrum™ 6KG Waterproof Servo (SPMS606)
- Spektrum™ FIRMA 100A 2–3S Brushless SMART ESC (SPMXSE1100)
- Spektrum™ 3652 4-Pole Brushless Motor 6500Kv (SPMXSM2800)
- 4 AA batteries (for transmitter)



WATER-RESISTANT VEHICLE WITH WATERPROOF ELECTRONICS

Your new Horizon Hobby vehicle has been designed and built with a combination of waterproof and water-resistant components to allow you to operate the product in many “wet conditions,” including puddles, creeks, wet grass, snow and even rain.

While the entire vehicle is highly water-resistant, it is not completely waterproof and your vehicle should NOT be treated like a submarine. The various electronic components used in the vehicle, such as the Electronic Speed Control (ESC), servo(s) and receiver are waterproof, however, most of the mechanical components are water-resistant and should not be submerged.

Metal parts, including the bearings, hinge pins, screws and nuts, as well as the contacts in the electrical cables, will be susceptible to corrosion if additional maintenance is not performed after running in wet conditions. To maximize the long-term performance of your vehicle and to keep the warranty intact, the procedures described in the “Wet Conditions Maintenance” section below must be performed regularly if you choose to run in wet conditions. If you are not willing to perform the additional care and maintenance required, then you should not operate the vehicle in those conditions.

CAUTION: Failure to exercise caution while using this product and complying with the following precautions could result in product malfunction and/or void the warranty.

GENERAL PRECAUTIONS

- Read through the wet conditions maintenance procedures and make sure that you have all the tools you will need to properly maintain your vehicle.
- Not all batteries can be used in wet conditions. Consult the battery manufacturer before use. Caution should be taken when using Li-Po batteries in wet conditions.
- Most transmitters are not water-resistant. Consult your transmitter’s manual or the manufacturer before operation.
- Never operate your transmitter or vehicle where lightning may be present.
- Do not operate your vehicle where it could come in contact with salt water (ocean water or water on salt-covered roads), contaminated or polluted water. Salt water is very conductive and highly corrosive, so use caution.
- Even minimal water contact can reduce the life of your motor if it has not been certified as water-resistant or waterproof. If the motor becomes excessively wet, apply very light throttle until the water is mostly removed from the motor. Running a wet motor at high speeds may rapidly damage the motor.
- Driving in wet conditions can reduce the life of the motor. The additional resistance of operating in water causes excess strain. Alter the gear ratio by using a smaller pinion or larger spur gear. This will increase torque (and motor life) when running in mud, deeper puddles, or any wet conditions that will increase the load on the motor for an extended period of time.

QUICK START

Please read the entire manual to gain a full understanding of the 22S RTR vehicle, fine-tuning the setup and performing maintenance.

1. Read the safety precautions found in this manual.
2. Charge a battery for the vehicle. Refer to the included charging warnings and instructions for battery charging information.
3. Install the AA batteries in the transmitter. Only use alkaline or rechargeable batteries.
4. Install the fully charged battery in the vehicle.
5. Power ON the transmitter and then the vehicle. Wait 5 seconds for the ESC to initialize. Always power the transmitter ON before the vehicle and power it OFF after the vehicle has been powered OFF.
6. Check the steering and throttle control directions. Verify that the servos are moving in the correct direction.
7. Drive your vehicle.
8. Power OFF the vehicle and then the transmitter.
9. Unplug the battery and remove it from the vehicle.
10. Perform any necessary maintenance.

CHARGING THE BATTERY

Choose a battery designed to work with the Spektrum™ FIRMA 100A 2–3S Brushless SMART ESC. We recommend the Spektrum™ 7.4V 5000mAh 2S 100C Smart Hardcase LiPo Battery with IC5 connector (SPMX50002S100H5). Choose a charger designed to charge 2S and/

WET CONDITIONS MAINTENANCE

- Drain any water that has collected in the tires by spinning them at high speed. With the body removed, place the vehicle upside down and pull full throttle for a few short bursts until the water has been removed.

CAUTION: Always keep hands, fingers, tools and any loose or hanging objects away from rotating parts when performing the above drying technique.

- Remove the battery pack(s) and dry the contacts. If you have an air compressor or a can of compressed air, blow out any water that may be inside the recessed connector housing.
- Remove the tires/wheels from the vehicle and gently rinse the mud and dirt off with a garden hose. Avoid rinsing the bearings and transmission.

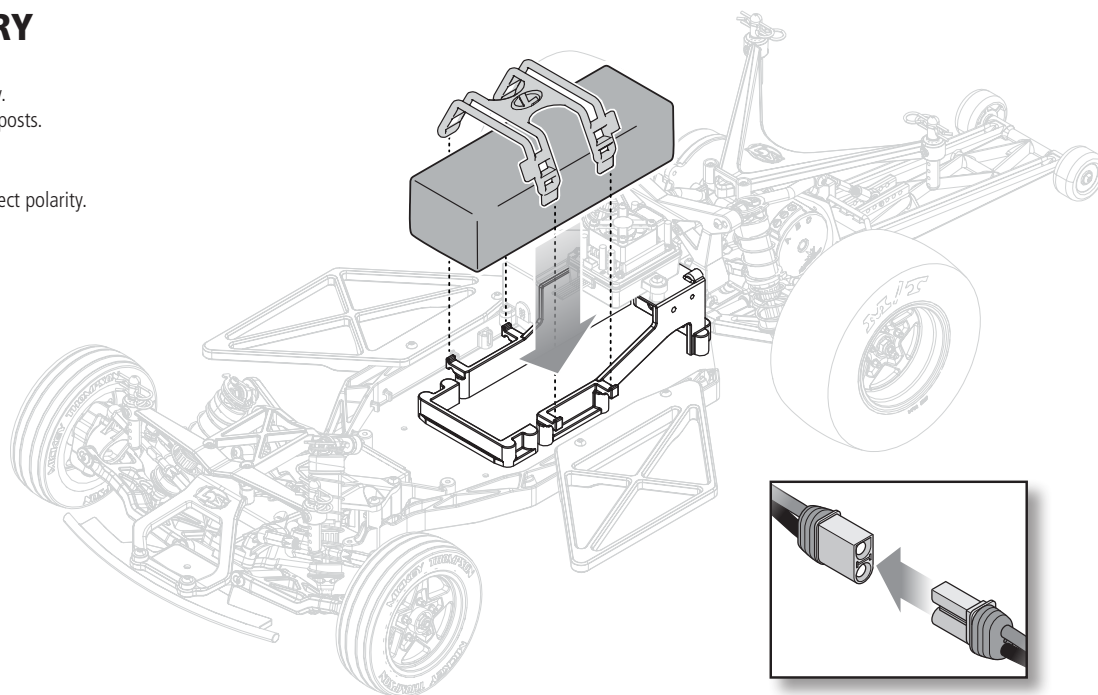
NOTICE: Never use a pressure washer to clean your vehicle.

- Use an air compressor or a can of compressed air to dry the vehicle and help remove any water that may have gotten into small crevices or corners.
- Spray the bearings, drive train, fasteners and other metal parts with a water-displacing light oil. Do not spray the motor.
- Let the vehicle air dry before you store it. Water (and oil) may continue to drip for a few hours.
- Increase the frequency of disassembly, inspection and lubrication of the following:
 - Front and rear axle hub assembly bearings.
 - All transmission cases, gears and differentials.
 - Motor—clean with an aerosol motor cleaner and re-oil the bushings with lightweight motor oil.

or 3S Li-Po batteries. We recommend the Spektrum™ SMART S1200 DC Charger, 1x200W (SPMXC1000). Refer to your battery and charger manuals for usage, safety, and charging information.

INSTALLING THE BATTERY

1. Ensure the ESC is powered OFF.
2. Remove the body clips and lift the vehicle body.
3. Remove the elastomer straps from the battery posts.
4. Install the fully charged battery in the vehicle.
5. Resecure the elastomer straps.
6. Connect the battery to the ESC noting the correct polarity.
7. Power ON the transmitter, then the vehicle.



TRANSMITTER FUNCTIONS

Specifications

Power Supply: 4 AA Batteries

Operating Frequency: 2.4GHz

Transmit Power: <100mw

Control Protocol: SLT

Control: Proportional Steering and Throttle/Brake with Trim Knobs, Third Channel with 3 Position Momentary Switch

Auxiliary Functions: 3 Position Throttle Limit Switch, Steering Rate Knob to Change Steering Travel on-the-fly, Programmable Servo Travel for Steering and Throttle/Brake

A. Throttle Trim

Adjusts the throttle neutral point

B. Steering Trim

Adjusts the steering center point. Normally, the steering trim is adjusted until the vehicle tracks straight.

C. LED

- **Solid red lights:** Indicates the power is ON and adequate battery power
- **Flashing red lights:** Indicates the battery voltage is critically low. Replace batteries

D. Steering Wheel

E. Throttle/Brake

F. Steering Rate

On-The-Fly knob for travel adjustment on the steering

G. Channel 3

3 position momentary switch, middle position is neutral
For programming press up for A button, press down for B button

H. Throttle Limit

Limits throttle output to 50/75/100%
Select 50% or 75% for less experienced drivers or when you are driving the vehicle in a small area.

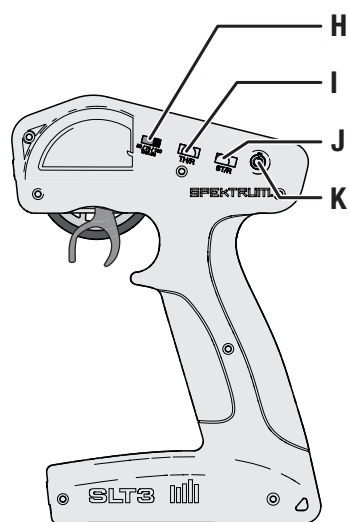
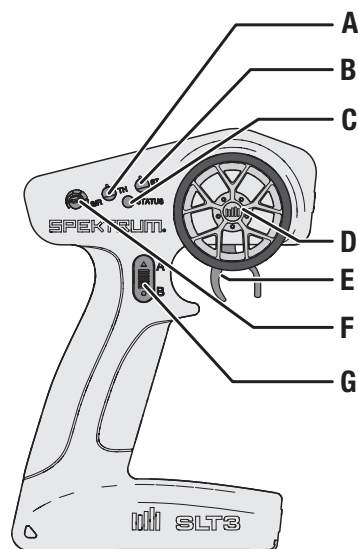
I. Throttle (TH) Servo Reversing

Move the switch to reverse the throttle channel

J. Steering (ST) Servo Reversing

Move the switch to reverse the steering channel

K. Power Button



INSTALLING THE TRANSMITTER BATTERIES

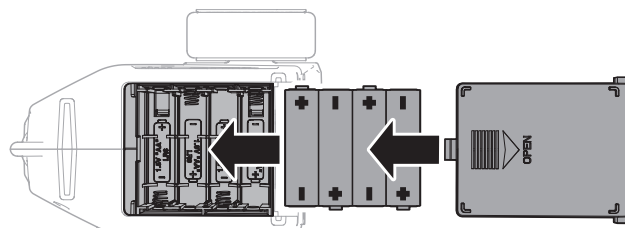
This transmitter requires 4 AA batteries.

1. Remove the battery cover from the transmitter.
2. Install the batteries as shown.
3. Install the battery cover.

CAUTION: Never remove the transmitter batteries while the model is powered ON. Loss of model control, damage, or injury may occur.

CAUTION: If using rechargeable batteries, charge only rechargeable batteries. Charging non-rechargeable batteries may cause the batteries to burst, resulting in injury to persons and/or damage to property.

CAUTION: Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to national regulations.



SPMSR315 DUAL PROTOCOL RECEIVER

Specifications

Type: Dual Protocol 3 Ch Receiver* (SLT/DSMR)

Dimensions (LxWxH): 32.5 x 21.5 x 12.4mm

Antenna Length: 90mm

Channels: 3

Weight: 6g

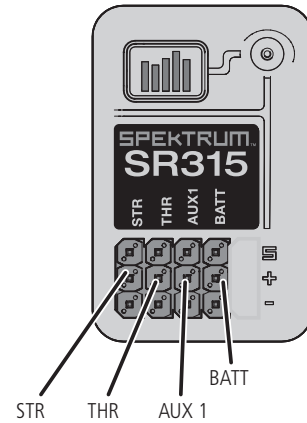
Band: 2.4GHz

Voltage Range: 3.5–9.6V

Bind Type: Bind Button

Failsafe: Hold the steering wheel and throttle trigger in the desired failsafe positions during binding

*SPMSR315 receivers included with the SLT3 transmitter include SLT and DSMR compatibility. If you have an SR315 receiver that was purchased by itself, you may need to install a firmware update to make your SR315 SLT compatible.



RECEIVER ANTENNA

The SR315 receivers feature a coaxial antenna design for easy installation in almost any model. Think of the last 1 inch (32mm) on the tip of the antenna as the active portion of the antenna, the coaxial portion leading up to it is just an extension. Install the antenna so the active portion is positioned as high as possible in the vehicle, and not "in the shadow" of any carbon fiber or metal. The case of the receiver can accept an antenna tube directly, making optimal antenna placement easy (antenna tube not included).



WARNING: Do not kink, cut or damage the antenna wire. The antenna is made of a coaxial wire; if the outer sheath becomes damaged, the receiver will not work properly. If the antenna is damaged in any way, replace the antenna before attempting to use the receiver.

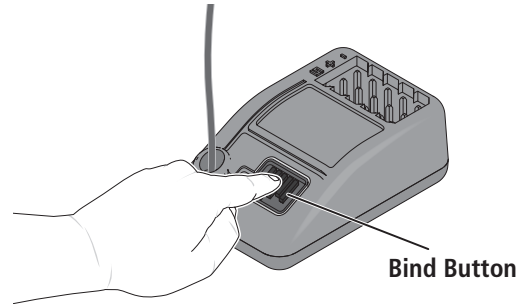
BINDING

Binding is the process of programming the receiver to recognize the GUID (Globally Unique Identifier) code of a single specific transmitter.

1. Press and hold the bind button.
2. Power ON the receiver. The orange LED will begin to flash.
3. Set the trims and control positions at the desired failsafe settings.
4. Power ON the SLT3 transmitter.
5. When the transmitter's orange LED remains lit, it is connected to SR315 receiver.

You must rebind when:

- Different failsafe positions are desired (e.g., when throttle or steering reversing has changed).
- Binding the receiver to a different transmitter.



SERVO TRAVEL

The servo travel on the Steering and Throttle channels can be adjusted through a special programming mode in the transmitter.

1. Begin with the transmitter binding process to the receiver complete. Power ON the receiver.
2. Hold full right and full brake while powering the transmitter ON to put the transmitter into programming mode. The LED on the transmitter will flash 4 times to indicate it is in programming mode.
3. Turn and hold the wheel full left to set the travel limit for that direction. Press the A button to increase travel, press the B button to reduce travel. The LED will flash once with every change. Return the wheel to center to set the travel value.

IMPORTANT: If the value has reached the maximum or minimum that can be accepted, the LED will not flash with further input.

4. Turn the wheel to the right and repeat the process to set the steering travel to the right.
5. For electric vehicles, power the Transmitter OFF to save the settings. Calibrate your ESC to the default throttle travel.
6. For fuel powered vehicles, set the throttle travel without the engine running; After setting steering travel, you can set throttle travel with the same process. Pull and hold full throttle, adjust travel with the A and B buttons, return to center to set the value.
7. Push full brake, adjust travel with the A and B buttons, return to center
8. Power the transmitter OFF to save the values.

DRIVING PRECAUTIONS

- Maintain sight of the vehicle at all times.
- Routinely inspect the vehicle for loose wheel hardware.
- Routinely inspect the steering assembly for any loose hardware. Driving the vehicle off-road can cause fasteners to loosen over time.
- Do not drive the vehicle in tall grass. Doing so can damage the vehicle or electronics.
- Stop driving the vehicle when you notice a lack of power. Driving the vehicle when the battery is discharged can cause the receiver to power off. If the receiver loses power, you will lose control of the vehicle. Damage due to an over-discharged Li-Po battery is not covered under warranty.



CAUTION: Do not discharge a Li-Po battery below 3V per cell. Batteries discharged to a voltage lower than the lowest approved voltage may become damaged, resulting in loss of performance and potential fire when batteries are charged.

- Do not apply forward or reverse throttle if the vehicle is stuck. Applying throttle in this instance can damage the motor or ESC.
- After driving the vehicle, allow the electronics to cool before driving the vehicle again.

IMPORTANT: Keep wires away from all moving parts.

POWERING ON THE VEHICLE

1. Center the ST TRIM and TH TRIM dials on the transmitter.
2. Power on the transmitter.
3. Install a fully charged battery pack per the *Installing the Battery* section.
4. Power on the ESC.

IMPORTANT: The vehicle **MUST** remain on a flat, level surface and motionless for at least 5 seconds.

BEFORE RUNNING YOUR VEHICLE

1. Check for free suspension movement. All suspension arms and steering components should move freely. Any binds will cause the vehicle to handle poorly.
Tip: To increase the ride height and ground clearance of your vehicle, install the included shock spacers.
2. Charge a battery pack. Always charge the battery pack as per the battery and/or charger manufacturers' instructions.
3. Set the transmitter steering trim. Follow the instructions to set the steering trim/subtrim so that the vehicle drives straight with no input to the steering.
4. Perform a Control Direction Test.

RUN TIME

The largest factor in run time is the capacity of the battery pack. A larger mAh rating increases the amount of run time experienced.

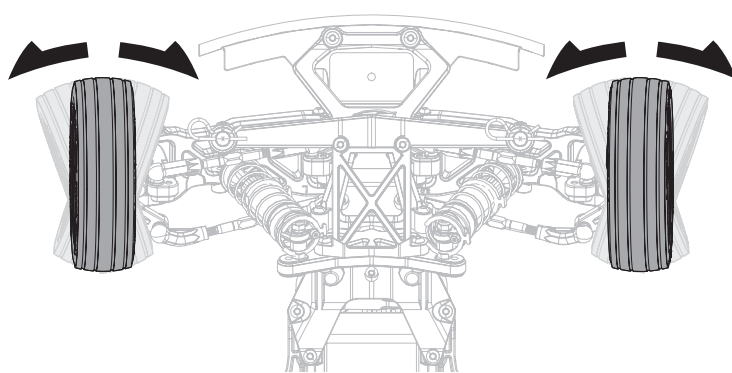
The condition of a battery pack is also an important factor in both run time and speed. The battery connectors may become hot during driving. Batteries will lose performance and capacity over time.

Driving the vehicle from a stop to full speed repeatedly will damage the batteries and electronics over time. Sudden acceleration will also lead to shorter run times.

TO IMPROVE RUN TIMES

- Keep your vehicle clean and well maintained.
- Allow more airflow to the ESC and motor.
- Change the gearing to a lower ratio. A lower ratio decreases the operating temperature of the electronics. Use a smaller pinion gear or larger spur gear to lower the gear ratio.
- Use a battery pack with a higher mAh rating.
- Use the optimum charger to charge battery packs (Visit your local hobby dealer for more information).

PERFORMING A CONTROL DIRECTION TEST



Perform a control test with the vehicle wheels off the ground. If the wheels rotate after the vehicle is powered ON, adjust the TH Trim knob until they stop. To make the wheels move forward, pull the trigger. To reverse them, wait for the wheels to stop, then push the trigger. When moving forward, the wheels should maintain a straight line without any steering wheel input. If not, adjust the ST Trim knob, so the wheels maintain a straight line without having to turn the steering wheel.

SPEKTRUM FIRMA100A 2-3S BRUSHLESS SMART ESC (SPMXSE1100)

ESC CALIBRATION PROCEDURE

1. Begin with the transmitter and receiver binding complete.
2. Set your transmitter's throttle channel to 100% travel and trim to neutral.
3. Turn on your transmitter and connect a battery to the ESC but don't power it on.
4. Press and hold the Set button while turning on the ESC. When the red LED begins to flash, release the Set button. The ESC will enter programming mode if the button is pressed for more than three seconds.

TIP: The red LED should be flashing when the ESC enters calibration mode. If the green LED is flashing the ESC is in programming mode.

5. Leave the throttle trigger at the neutral position, then press and release the Set button. The red LED will stop flashing, the green LED will flash one time and the motor will make a tone to indicate the neutral position has been accepted.
6. Hold the throttle trigger at the full throttle position then press and release the Set button. The green LED will flash twice and the motor will make two tones to indicate the full throttle position has been accepted.
7. Hold the throttle trigger at the full brake position then press and release the Set button. The green LED will flash three times and the motor will make three tones to indicate the full brake position has been accepted.

The motor will operate normally after calibration is completed.

FIRMA 100A PROGRAMMABLE OPTIONS

PROGRAMMABLE ITEMS	PROGRAMMABLE VALUE							
	1	2	3	4	5	6	7	8
1 Battery Type	LiPo	NiMh						
2 Start Mode (Punch)	Level 1	Level 2	Level 3	Level 4	Level 5			
3 Max Brake Force	25%	37.50%	50%	62.50%	75%	87.50%	100%	
4 Running Mode	Forward/Reverse w/ Brake	Forward with Brake						
5 Motor Rotation	CCW	CW						
6 BEC Voltage	6.0V	7.4V						
7 Timing	0°	3.75°	7.5°	11.25°	15°	18.75°	22.5°	26.25°

■ Default Settings

DESCRIPTIONS

Battery Type

This setting allows you to change the battery chemistry. Changing this setting only changes the cut off voltage. Selecting LiPo will prevent over discharge of your LiPo battery. Selecting NiMH will remove LVC and allow the battery to be drained much further. This setting is critical when using a LiPo battery with NiMH selected. This can cause serious damage to a LiPo battery and or cause a fire. Only use LiPo batteries in LiPo mode.

Start Mode

Sets the initial throttle punch when the car accelerates. Level 1 gives a very soft initial acceleration and Level 4 gives a stronger initial acceleration.

Punch

Select from start mode Level 1 (Soft) to Level 9 (Very aggressive). If you choose Levels 7–9, use a high quality battery pack with powerful discharge ability. Without a high quality battery pack, the modes will not give a bursting start effect. If the motor does not run smoothly (i.e., trembling), choose a better battery or increase the gear rate.

Max Brake Force

Adjust the amount of maximum brake force that is applied to the motor. This force determines the resistance of movement when the brakes are fully applied. Setting this value will help the vehicle slow down. If the setting is too high, the tires may lock up, causing the vehicle to spin out of control. If the setting is too low, the car will take a long time to slow.

Running Mode

- *Forward Only with Brake*
Intended for competition use, this mode allows only forward and brake controls.
- *Forward/Reverse with Brake*
This mode is the basic all-around mode, allowing forward, reverse and brake controls. To engage reverse while moving forward, apply the brake until the vehicle has come to a complete stop, release brake, then apply the brake again. While braking or in reverse, engaging the throttle will result in the vehicle immediately accelerating forward.

Motor Rotation

Adjusting motor rotation in the ESC allows the motor to operate clockwise and anti clockwise. This setting allows quick installation of the motor and ESC without having to swap motor wires to achieve forward drive. If your car is moving backward when forward throttle is applied, switch this setting to achieve required results.

BEC Voltage

Adjusts the voltage that is delivered to the receiver. The BEC (battery eliminator circuit) allows for a single battery to power both the motor and radio gear. The voltage output can be adjusted to accommodate components that utilize 6.0–7.4 volts.

Timing

ESC motor timing is adjusted using the ESC programmer or manual adjustment using the transmitter. Timing is a setting that determines many factors, including efficiency, torque, RPM, and temperature. Increasing the timing generally means you are adding RPM, Punch Acceleration, and Current while adding heat, reducing torque, and lowering efficiency. Lowering the timing generally means higher efficiency, less heat, and additional torque while lowering RPM and punch acceleration.

Low Voltage Cutoff

This function helps to prevent battery over-discharge. The ESC continuously monitors the battery's voltage. If the voltage falls below the voltage threshold for 2 seconds, the output power shuts off and the red LED flashes twice repeatedly.

The cutoff threshold calculation is based on individual Li-Po cell voltage. For Ni-MH batteries, if the voltage battery pack is higher than 9.0V, it will be treated as a 3-cell Li-Po battery pack; if it is lower than 9.0V, it will be treated as a 2-cell Li-Po battery pack. Example: for a 8.0V Ni-MH battery pack used with a 2.6V/cell threshold, it will be treated as a 2-cell Li-Po battery pack and the low-voltage cut-off threshold will be 5.2V (2.6 x 2=5.2).

Neutral Range

Adjust this setting when changing the transmitter or the ESC. This setting is programmed in the ESC and registers the default neutral of the signal coming from the transmitter. If the car is moving forward or does not respond quickly to transmitter throttle change, adjust this setting. See your ESC manual for detailed instructions on how to set the neutral position.

LED Indicator	LED Code
ESC turned ON, LED indicator is OFF	Throttle trigger is in the neutral zone
Red LED illuminated	ESC is operating in forward, reverse or brake
Red and Green LED illuminated	ESC is at full throttle, full brake, or full reverse
LED flashes red with short single pulses	LVC protection activated
LED flashes green with short single pulses	The ESC is in thermal shutoff mode
LED flashes green with three short pulses repeating	The ESC has exceeded the continuous current limit
LED flashes green with four short pulses repeating	The ESC has failed the self test
LED flashes green with five short pulses repeating	Capacitor temp has been exceeded

ESC PROGRAMMING PROCEDURE

Programming is accomplished using the SET button on the ON/OFF switch.

1. Connect a fully charged battery to the ESC.
2. Power ON the ESC using the ESC switch.
3. Press and hold the SET button for 3 seconds until the green LED flashes, then release the SET button.
4. Press the SET button once until the green LED blinks once in sequence, indicating programmable value 1 is currently selected.

Tip: Pressing the setup button once more moves to programmable value 2, etc. until the desired programmable value is reached. The system continues in a 'loop'.

5. When at the desired menu item, hold the SET button for 3 seconds until the red LED blinks.

Tip: The RED flashing sequence indicates the actual setting; for example one flash indicates value 1 is selected, two flashes indicates value 2, etc.

6. Press the setup button in sequence to select the desired programmable value. The system continues in a "loop."
7. Save the setting by holding the SET button for 3 seconds. The motor beeps once.
8. Power OFF the ESC then immediately power it ON. The setting change is stored.

Tip: Only one setting can be stored/saved at a time.

SPEKTRUM 3652 4-POLE 6500KV BRUSHLESS MOTOR (SPMXSM2800)

PRECAUTIONS

- Never touch moving parts.
- Never disassemble while the batteries are installed.
- Always let parts cool before touching.

GEARING

The vehicle is equipped with optimal gearing for 2S batteries. When using 3S batteries, Use alternate gearing to optimize speed, power and efficiency.

Installing a pinion gear with fewer teeth or a spur gear with more teeth will increase torque and reduce top speed. Likewise, a pinion gear with more teeth or a spur gear with fewer teeth will reduce torque and increase top speed. Take care when installing larger pinion gears as this can "overgear" the vehicle, resulting in an overheated motor and ESC. When testing different gearing options, pay close attention to the temperature of the motor and speed control to ensure you are operating within the correct temperature range. If the motor is too hot, switch to a lower pinion gear and/or higher spur gear combination.

CAUTION: Do not touch the ESC or motor after use or personal injury may result. Do not allow the ESC or motor to exceed 160°F (71°C). A temperature gun (recommended DYNF1055) can be used to safely monitor the temperature before handling.

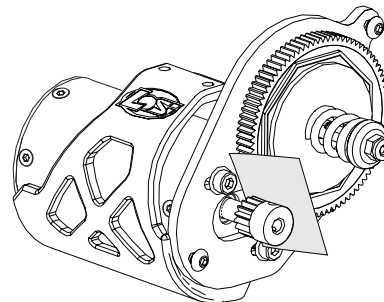
CHANGING THE PINION GEAR/GEAR RATIO

1. Remove the screws holding the gear cover in place.
2. Loosen the set screw and remove the installed pinion gear.
3. Loosen the motor screws and slide the motor back.
4. Place the new pinion on the end of the motor shaft so the set screw is located over the flat on the shaft.
5. Position it so the teeth line up with the spur gear and secure the pinion by tightening the set screw.
6. Set the gear mesh.

SETTING THE GEAR MESH

The gear mesh has already been set at the factory. Setting it is only necessary when changing motors or gears.

Proper gear mesh (how gear teeth meet) is important to the performance of the vehicle. When the gear mesh is too loose, the spur gear could be damaged by the pinion gear of the motor. If the mesh is too tight, speed could be limited and the motor and ESC will overheat.



1. Loosen the motor screws and slide the motor back.
2. Put a small piece of paper between the pinion and spur gears.
3. Push the gears together while tightening the motor screws.
4. Remove the paper. Check the mesh at 3–5 different locations around the spur gear for a small amount of movement.
5. Install gear cover.

TROUBLESHOOTING GUIDE

PROBLEM	POSSIBLE CAUSE	SOLUTION
Vehicle does not operate	Battery not charged or plugged in	Charge battery/plug in
	ESC switch not "ON"	Turn on ESC switch
	Transmitter not "ON" or low battery	Turn on/replace batteries
Motor runs but wheels do not rotate	Pinion not meshing with spur gear	Adjust pinion/spur mesh
	Pinion spinning on motor shaft	Tighten pinion gear setscrew on motor shaft flat spot
	Transmission gears stripped	Replace transmission gears
	Drive pin broken	Check and replace drive pin
Steering does not work	Servo plug not in receiver properly	Make sure the steering servo plug is connected to the receiver steering channel, noting proper polarity
	Servo gears or motor damaged	Replace or repair servo
Will not turn one direction	Servo gears damaged	Replace or repair servo
Motor does not run	Motor wire solder joint is damaged	Resolder the motor wire with the proper equipment
	Motor wire broken	Repair or replace as needed
	ESC damaged	Contact Horizon Hobby Product Support
ESC gets hot	Motor over-gearred	Use smaller pinion or larger spur gear
	Driveline bound up	Check wheels and transmission for binding
Poor run time and/or sluggish acceleration	Battery pack not fully charged	Recharge battery
	Charger not allowing full charge	Try another charger
	Driveline bound up	Check wheels, transmission for binding
Poor range and/or glitching	Transmitter batteries low	Check and replace
	Vehicle battery low	Recharge battery
	Loose plugs or wires	Check all wire connections and plugs

2-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 2-years 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, or (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 Li-Po batteries to Horizon. If you have any issue with a Li-Po 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	
European Union	Horizon Technischer Service	service@horizonhobby.eu +49 (0) 4121 2655 100	Hanskampring 9 D 22885 Barsbüttel, Germany
	Sales: Horizon Hobby GmbH		

*For the most up-to-date customer service contact information, please visit: www.horizonhobby.com/content/service-center-render-service-center

FCC AND CANADA COMPLIANCE INFORMATION

FCC FCC ID: BRWSPMSLT300
FCC ID: BRWSRIRVINGV1

This equipment complies with FCC and IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and/or antenna and your body (excluding fingers, hands, wrists, ankles and feet). This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Supplier's Declaration of Conformity

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

COMPLIANCE INFORMATION FOR THE EUROPEAN UNION

CE **EU Compliance Statement:**

Hereby, Horizon Hobby, LLC declares that the device is in compliance with the following: EU Radio Equipment Directive 2014/53/EU; RoHS 2 Directive 2011/65/EU; RoHS 3 Directive - Amending 2011/65/EU Annex II 2015/863.

The full text of the EU declaration of conformity is available at the following internet address: <https://www.horizonhobby.com/content/support-render-compliance>.

NOTE: This product contains batteries that are covered under the 2006/66/EC European Directive, which cannot be disposed of with normal household waste. Please follow local regulations.

Wireless Frequency Range and Wireless Output Power:

Transmitter:
2403–2480MHz
16.3dBm
Receiver:
2404–2476MHz
-1.33dBm

Australia/New Zealand



IC INFORMATION

CAN ICES-3 (B)/NMB-3(B)
IC: 6157A-SPMSLT300
IC: 6157A-SRIRVINGV1

This device contains license-exempt transmitter(s)/receivers(s) that comply with Innovation, Science, and Economic Development Canada's license-exempt RSS(s). Operation is subject to the following 2 conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

EU Manufacturer of Record:

Horizon Hobby, LLC
2904 Research Road
Champaign, IL 61822 USA

EU Importer of Record:

Horizon Hobby, GmbH
Hanskampring 9
22885 Barsbüttel Germany

WEEE NOTICE:



This appliance is labeled in accordance with European Directive 2012/19/EU concerning waste of electrical and electronic equipment (WEEE). This label indicates that this product should not be disposed of with household waste. It should be deposited at an appropriate facility to enable recovery and recycling.



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Other patents pending.

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