Thank you for your purchase of the Hitec Adaptive Frequency Hopping Spread Spectrum (AFHSS) 2.4GHz module and receiver system. This manual contains the complete directions on how to use the Optima series of receivers (version 3.0.0). We encourage you to review the entire manual before using these products.

Hitec Customer Service
Help is available from the Hitec office through phone support and e-mail inquiries. Our US office is generally open Monday through Friday, 8:00AM to 4:30PM PST. These hours and days may vary by season. Every attempt is made to answer every incoming service call. Should you reach our voicemail, leave your name and number and a staff member will return your call.

Hitec Website
Make plans to visit the Hitec website, www.hitecrcd.com, on a regular basis. Not only is it full of specific and other information about the entire Hitec product line, our website’s FAQ pages will eventually hold valuable information and program updates for the Spectra 2.4 module and Optima series of receivers.

The On-Line Community
One of the benefits of the extensive R/C online community is the vast wealth of archived knowledge available. Hitec sponsors forums on most of the popular R/C websites where a Hitec staff member or representative tries to answer all manner of product related questions. Bringing together strangers with common interests is proving to be one of the greatest gifts of the internet. If past history is any guide to the future, we are certain that forums will be started about the Hitec 2.4 system and several are certain to stand out as valuable archives of information.

Warranty and Non-Warranty Service
All Hitec products carry a two year from date-of-purchase warranty against manufacturer’s defects. Our trained and professional service representatives will determine if the item will be repaired or replaced. To provide all the necessary information we need to administer your repair, visit our website at www.hitecrcd.com and download the repair form, fill it out and send in your item for repair.

Introduction

Warning!

1. For maximum performance, it is recommended to position the antenna at a 90 degree angle as shown in the picture below.

Recommended Position

2. The receiver antenna should not be placed near the engine, metal parts or high current batteries.

3. When using a large number of high-power digital servos in a model, it is highly recommended to use the SPC feature to insure the receiver always gets the power it needs in high load conditions. If not, use the system with enough receiver battery capacity.

4. There could be a possible time delay in receiving telemetry data from the HTS-SS (sensor-station) depending on the conditions in the area you fly.

5. It is strongly recommended that you use Hitec’s genuine Heavy Duty High Channel Switch Harness with Receiver Charger Card (Stock# 544075) for all of our Optima series of receivers.

HITECTIC 2.4GHz Receiver Instruction

version 1.0

Receiver Connection Diagrams

1. Function Button
   - Used for binding the receiver to a module or Hitec 2.4 built-in transmitters, entering the FAIL-SAFE or Hold feature.

2. Dual LED Status Indicator
   - Indicates the set-up process codes and current status of the receiver.

3. Channel Output and Battery Input Ports
   - The ports for battery power input and servos, gyros and other accessories output port are located at the side end of the Optima receivers.

4. SPC (Supplementary Power Connection)*
   - Power the Optima receiver function with up to a 35V electric aircraft motor battery. Details about the SPC system can be found on page 2.

5. Telemetry Sensor and Data Port*
   - A three pin servo plug connector port is featured on the Optima 7 and Optima 9 (not applicable on Optima 6). Using the HPP-22 PC interface accessory, this part serves to facilitate upgrading the device software and interfacing the optional onboard sensor station.

6. BODA (Boosted Omni-Directional Antenna) System*
   - Hitec’s exclusive 2.4GHz BODA System will show you another means of using the 2.4GHz system. This single antenna with omni-directional booster makes it a whole lot easier to install the 2.4GHz antenna. Extensive tests have proven that the single BODA system in our 6 & 7 channel systems is better than or equal to our competitor’s dual antenna systems. Our Optima 9 receiver features a dual BODA system to give the added security that larger models need. Installation is easy and simple, just insert the antenna into the supported antenna holder and stick it to the desired spot you wish to install.

Compatibility
- The OPTIMA & MINIMA series of receivers are compatible with transmitters using Hitec’s AFHSS 2.4GHz system such as Spectra 2.4 module or dedicated built-in module AFHSS 2.4 Hitec transmitters.

FAIL-SAFE/ Hold Mode Selectable
- The positions of the servos and other accessories can be set with a FAIL-SAFE point, if power to the receiver is lost. See page 2 for details.

Low Onboard Battery Warning Function
While you are flying, you will know when the on-board battery is low with a warning alarm from the transmitter. Review the Low Battery alarm features that use direct telemetry feedback to your transmitter on page 2.

Jumper*
- The jumper is installed at the factory and is used when the receiver is powered by an electronic speed control, a commercially available ESC (battery eliminator circuit), dedicated 4-6V NiMH battery pack or a regulated Lipo battery. The jumper is removed when the receiver is powered using the SPC feature as described in more detail on page 2.

*These functions/features are only for the OPTIMA series of receivers.

Receiver Connection Diagrams

Note
To see a receiver connection diagram for the SPC feature, see page 2.

Electric powered aircraft with Electronic Speed Control
Use this method on electric planes using ESCs providing power to the receiver and servos functions.

Glow, gas or electric powered aircraft using a separate receiver battery supply
Follow this connection diagram when using a regulated LiPo or 4.8 to 6V receiver battery.
SPC (Supplementary Power Connection) System

Hitec’s exclusive optional receiver power system allows you to directly power the receiver from the main motor power battery of an electric powered aircraft. Up to 35 volts can be fed directly into the receiver to power the servos. Almost all servos will burn up if more than 6 volts are used over a short period of time.

**Non-telemetry REX (MINIMA & MICRO Series) | Telemetry REX (OPTIMA Series)**

1. Press and hold the button on the module, and turn on the transmitter.
2. Release the link button.
3. Check if the BLUE LED is blinking.
4. Press and hold the link button on the receiver and turn on the power.
5. Both RED and BLUE LEDs will blink rapidly to find the transmitter signal.
6. Release the link button.
7. When the link is completed, the BLUE LED on the module will blink while the RED LED on the module goes steady.
8. Release the link button.
9. When the link is completed, the BLUE LED on the module will blink while the RED LED on the receiver goes steady.
10. Release the link button.
11. When they are turned on again, the RED LED on the module will go steady.
12. When the receiver signal somehow becomes interrupted or interference occurs, the servos will move to the pre-set FAIL-SAFE point you previously stored in the FAIL-SAFE set-up. Make sure you set the FAIL-SAFE function properly.
13. If FAIL-SAFE has not been activated, the signal will switch off after the HOLD period of one second. This means that the servos become "sick" and remain in their last commanded position under no load (this may equate to full-throttle), until a valid signal is picked up again.
14. In the interest of safety, we recommend that the FAIL-SAFE function should always be activated, and the FAIL-SAFE settings should be selected so as to bring the model to a non-critical situation (e.g. motor idle / electric motor OFF, control surfaces neutral, airbrakes extended, aero-tow release open, etc.).

Testing the FAIL-SAFE Setting

a. Move the sticks to positions other than the FAIL-SAFE settings and then switch off the transmitter. The servos should now move to the FAIL-SAFE positions previously stored, after the one second HOLD period.

How to turn FAIL-SAFE Off and reactivate the Hold Mode

a. Switch on the transmitter then the receiver. Wait for the system to boot and you have control over the model.
b. Press and hold the receiver function button for 6 seconds and release. After 2 seconds, the RED and BLUE LEDs will blink rapidly.
c. Immediately press the button once.
d. FAIL-SAFE Mode is now deactivated and HOLD mode is activated.
e. Turn the transmitter off then the receiver off.
f. Turn the system back on to use it.

Link (ID-Setting)

Your Hitec AFHSS system uses a communication protocol that links and binds the Hitec 2.4GHz receiver to your transmitter. Once the receiver and module are bound, no other transmitter can interfere with your receiver during its operation. In the case of multiple model memory transmitters, you can bind as many Hitec 2.4GHz receivers to your transmitter, one per model memory as necessary. Each module and receiver set is paired at the factory for your convenience.

Use one of the following binding methods to bind additional Hitec 2.4GHz receivers to your transmitter.

- **Link must be done within 15ft. (5m) of the transmitter and receiver.**
- **Transmitter and receiver need to be at least 18in. (50cm) from each other to link properly.**

Telemetry System

The Hitec Spectra 2.4 Module and Optima Series of receivers feature full telemetry capabilities (except Optima 6) and include a Low Receiver Battery Warning as a basic function.

I. Basic Function: Low Onboard Battery Warning - for All Optima Receivers

When the Optima series of receivers is powered up, it will automatically detect the battery voltage level and recognize between 4-cell or 5-cell NiMH and NiCd batteries (4-cell > 5.8V < 5 cell).

- In case a 2-cell LiPo battery is being used, you can customize the battery warning level by using the HPP-22 PC program.

II. Optional Functions:

- GPS, FUEL, TEMP, O-RPM, M-RPM, VOLT, Amp Sensors - Applicable for Optima 7 & 9 Only

Many devices will be available in the future. Check the Hitec website at www.hitecrcd.com for more up-to-date information.