

# ***Xtreme Power Systems***

# **XtremeLink®**

**NANO RECEIVER**

## ***Installation And Usage Manual***

XtremeLink® is a registered trademark of Xtreme Power Systems, LLC.

**Firmware v 1.9**

Manual v 1.9

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**DUE TO FREQUENT CHANGES IN THIS MANUAL, PLEASE DO NOT POST, UPLOAD, OR OTHERWISE PROVIDE THIS INFORMATION VIA ANY MEANS!**

## **Introduction**

Thank you for purchasing the RX6 Nano or Pico receiver for the XtremeLink® system.

## **Warranty Information**

The XtremeLink® system carries a limited lifetime warranty. Units subject to improper installation, misuse, abuse, or modifications will not be covered under this warranty.

Xtreme Power Systems may at its discretion either repair or replace the unit covered under warranty. The customer will pay all freight charges to and from Xtreme Power Systems. Xtreme Power Systems must be contacted to obtain a return authorization. Any product returned without authorization will be returned without repair or replacement.

## **Liability**

By using this product, you agree to hold Xtreme Power Systems free from any type of liability either directly or indirectly while using this product.

## **Legal Information**

The 'look and feel' and functionality of this product are protected by U.S. copyright laws. Various terminology and feature names are protected under U.S. trademark laws.

## Mounting the receiver

No matter which XtremeLink® receiver you use, the mounting procedure is the same. The most important thing to remember is that you must keep the antenna portion of receiver no less than 2 inches from any type of large metal or wiring that is not directly coming out of the receiver. This includes steel, carbon fiber, servos, fuel pumps, any type of wiring, etc. The best method of mounting is to show it off! Mount the receiver as high and out in the open as possible so you can easily see it and get access to. Under no circumstance can you wrap or pass servo wires around the antenna wires!

**Remember that wires can move under g-force, so make sure that wires can not move *at all* around the receiver. Moving wires can cause intermittent radio control.**

The servo connection ports on the XtremeLink® receivers are numbered. There is a port that is labeled "B". This is for a battery connection, and is also used for the binding plug.

Power and ground are available on every numbered slot. "Signal" is the pin nearest the number. The function for each channel is determined by the transmitter in use, and not the receiver itself. For example, throttle control with most JR radios is on channel 1, while throttle control on most Futaba radios is on channel 3. Throttle output would be determined by the radio and will change with brands. Keep this mind when setting up a different transmitter.

## **SECTION 1 – RECEIVER SETUP**

After powering on your XtremeLink® receiver, the STATUS LED will begin flashing red. Flashing red means that the receiver is waiting to connect with an XtremeLink® transmitter module.

When a connection is established, the STATUS LED will light solid red.

### Advanced Programming Features

Unlike other XtremeLink® receivers, there are no advanced programming features available.

## **XDP (COMPUTER) INTERFACE**

To put the receiver into computer programming mode first make sure power is not connected to the receiver. Now, insert a binding plug into the channel port marked "B" and then connect power to the receiver (on any servo port). After the LED starts rapidly flashing red, immediately remove the binding plug. The LED will then turn solid red. The system is now ready for use with the XDP.

## **RESET TO DEFAULTS**

It is possible to reset all of the settings to the factory defaults. When a reset is performed, ALL settings, including the binding information will be reset. This means that the receiver will have to be bound again to the XtremeLink® transmitter module. To perform a RESET first make sure power is not connected to the receiver. Now, insert a binding plug into the channel port marked "B" and then connect power to the receiver (on any servo port). The LED will rapidly flash red. After about 7 seconds, the LED will begin to slow flash red and then turn off. Remove the binding plug and power. The system reset has occurred.

Before the XtremeLink® system can be used, the XtremeLink® receiver(s) must be instructed to communicate only with a single XtremeLink® RF module (transmitter). This process, known as "binding", is required only once for each new XtremeLink® receiver.

Note: when binding your system you must put your receiver in binding mode BEFORE putting the transmitter module in binding mode.

## **Binding the XtremeLink® System**

**Master Receiver** – Power on your XtremeLink® receiver by plugging power into any open port, except the port labeled "B". Wait for the STATUS LED to begin flashing red. Now, connect the binding plug to the port labeled "B". When the STATUS LED turns solid red, remove the binding plug. The STATUS LED will then flash red at fast rate, indicating that it is in MASTER binding mode. If the receiver is not going to be a slave, then binding is ready. The MASTER receiver must always be the LAST receiver that is put into binding mode.

**Slave Receiver(s)** – Put the receiver into MASTER binding mode as described above. Now, again connect the binding plug to the port labeled “B”. When the STATUS LED turns solid red, remove the binding plug. The STATUS LED will remain solid red, indicating that it is in SLAVE binding mode. Put all SLAVE receivers into binding mode BEFORE the MASTER. Starting with v1.7 firmware, any slave receiver will automatically have its channels remapped to be 7 through 12. So a master Nano would be channels 1-6, and slave(s) would be 7 through 12.

**Transmitter** – The transmitter modulation **must** be set to PPM, MPX, PPM18 or PPM24 prior to using this product. Switch to one of these modes before any use. Press and hold the PROG button on the XtremeLink® RF module while powering on the transmitter. Wait until the STATUS LED changes from off to green, and then release the button.

Once the button has been released, the units should bind. The STATUS LED on the transmitter module will turn green and the STATUS LED on the receiver will turn off when a successful bind has occurred.

**PWM/PPM Selection** – starting with v1.7 firmware, it is possible to change the output of the receiver from the normal PWM (servo) output to a PPM data stream. The default is PWM output. After the binding of the receiver has been completed (LED is off), placing the binding plug back onto the binding port will cause the LED to turn on, and select the PPM output mode.

PPM output is used on Mikrokopters, 3-axis gyros (like Beast-X), and flight simulator inputs (emulating a transmitter). Outputs 1,3,5 are positive going PPM, and channels 2,4,6 are negative going PPM.

**PWM/PPM/Xtreme1/Xtreme2 Selection** - Starting with v1.9 firmware, it is possible to change the output of the receiver to PWM, PPM, Xtreme 1, or Xtreme 2 modes. Xtreme mode is used with the X10+ Channel Expander. Placing the jumper on the binding port and removing it will change the output mode, and the LED will change to represent the mode you are in:

LED OFF = PWM (normal servo outputs)

LED ON = PPM mode (positive on ports 1/3/5, negative on ports 2/4/6)

LED Flashing Slowly = Xtreme mode 1, Xtreme output on all ports

LED Flashing Fast = Xtreme mode 2, Xtreme output on port 6, ports 1-5 mapped as channels 12-16.

Note: if you select and use Xtreme mode 2, you **MUST** do a RESET or use the XDP to restore the channel mapping back to the normal 1-6 outputs. A simple bind does NOT reset the channel mapping!

**YOU MUST power off your transmitter and receiver(s) after binding!  
Your XtremeLink® system is now ready for use!**

**YOU MUST SET THE TRANSMITTER MODULE HOPPING MODE PRIOR TO BINDING. THE HOPPING INFORMATION IS TRANSFERRED DURING THE BINDING PROCESS. IF YOU CHANGE HOPPING MODES, YOU MUST REBIND ALL RECEIVERS.**

**MULTIPLE RECEIVER SUPPORT IS NOT AVAILABLE IN HOPPING MODE 1. ONLY MODES 2-5 SUPPORT MULTIPLE SLAVE RECEIVERS!**

**\*\*\* HOPPING MODES 2-5 WARNING! \*\*\***

IF TWO OR MORE MASTER RECEIVERS ARE TURNED ON AT THE SAME TIME, AND THE TRANSMITTER IS THEN TURNED ON, \*ANY\* OF THE MASTER RECEIVERS MAY LOCK ON TO THE TRANSMITTER. THE OTHER RECEIVERS WILL NOT LOCK (UNLESS SET AS A SLAVE). TURNING ON AND OFF YOUR TRANSMITTER WILL CAUSE RECEIVERS TO LOCK AND UNLOCK! FOR THIS REASON, PLEASE MAKE SURE THAT YOUR LAST MODEL IS TURNED OFF BEFORE FLYING THE NEXT MODEL

## Nano Range Testing

To perform a range test of the XtremeLink® system, follow the instructions below. Have someone help you during this procedure.

### Range test for full range receivers:

1. Install the receiver in the R/C device as it will be used.
2. Turn on the radio system so servo movement can be observed.
3. Using flat ground (pavement, low cut grass, or dirt) place the R/C device so that the receiver antenna is no less than 6" from the ground. This might require you elevating the R/C device during the testing.
4. Position the antenna on the transmitter at 45 degree angle, pointing left or right (not towards or away from the front of the transmitter).
5. Hold your transmitter waist high, away from your body, with the module towards your model.
6. Press and **hold** the PROG button on the transmitter module.
7. Walk to a distance of at least 125 feet. If at any time you experience a pause in controls, try to reproduce it again and release the button to see if the pause no longer occurs. If the problem does not occur now, check to make sure that your receiver is at least 6" from the ground while testing.
8. With the PROG button still pressed down, walk away from the R/C device while moving the sticks until there is intermittent control. Releasing the PROG button should restore 100% control. If it does not, **do not use the system and contact Xtreme Power Systems for assistance!**
9. Test complete.

**WARNING! DO NOT PRESS AND HOLD THE PROG BUTTON DURING THE NORMAL OPERATION (FLYING, DRIVING, ETC.) OF YOUR R/C DEVICE!**

## **Setting the Failsafe**

If no failsafe is programmed, the servos will hold their last known valid state when a failsafe condition occurs. The default failsafe time is 2 seconds.

You can program the failsafe condition for each channel using the XDP or Telemetry Station devices. Once you have set the failsafe map conditions, you can then set the user defined channels. To do this, turn on the XtremeLink® system so that servos can be moved. Now, connect the binding plug to the port labeled "B". After the STATUS LED starts flashing, remove the binding plug. The STATUS LED will flash for about 8 seconds. During this time, move your sticks and switches to where you would like them during a failsafe condition. NOTE - Only those channels programmed in the failsafe map will change to a user defined position. All other channels will hold their last positions when a failsafe occurs.



## SECTION 2 – POWERING THE SYSTEM

The XtremeLink® system is a computer controlled device. Just like your home PC, power is the most critical link to success or failure.

XtremeLink® transmitter modules can use the standard transmitter battery. Nothing else is required.

XtremeLink® receivers must be powered properly! With today's high torque digital servos, the load on the flight battery can be extreme. It is not uncommon to see many amps of current draw during flight. You must use a power source that can provide the proper voltage when there is a heavy load. Even small servos like the Hitec HS-55 can draw up to  $\frac{3}{4}$  of an amp when stalled. Four of these servos in a "foamie" can technically draw 3 amps of current, not including the current required for the receiver. For years people have been claiming radio "failures" or "hits" with their 35MHz/36MHz/72MHz/75MHz systems that have actually been power related and not due to signal loss. The Nano and Pico receivers use the latest technology to safely operate down to 2.0v, well below the operating voltage of any servo.

### **Recommend Power Setups for XtremeLink® Receivers**

4 cell packs. 4 cell packs will work fine with XtremeLink® receivers providing you have adequate capacity. The rule that we use is no less than 350mAh for each analog servo and no less than 500mAh for each digital servo. So, in a typical 4 servo analog setup, a 1400mAh 4 cell flight pack would be the absolute minimum we would recommend. Yes, you could probably get by with a lower capacity pack, but then you have to ask yourself "what is my model worth to me, and am I willing to take a chance with an improper power setup?"

5 cell packs. 5 cell packs offer additional voltage headroom. These are a better choice than a 4 cell pack. Note that some servos will not handle the voltage of a 5 cell pack. Please consult the specifications of your servos before using a 5 cell pack.

A123 flight packs. These are the best choice. They provide a voltage higher than a 4 cell pack, but less than a 5 cell pack. The current capabilities of these batteries exceed what any 4 or 5 cell Nimh or Nicad pack can provide.

2 cell Lipo packs. Newer high voltage servos can use a 2 cell Lipo pack. This works fine as the XtremeLink® receivers can handle voltage up to 30 volts. Just please note that the input voltage to the XtremeLink® receiver is not regulated, so the full input voltage is passed to the servos.

Please remember that wall chargers included with most radio systems are designed only for 4 cell packs. These chargers are typically 50ma, meaning that 50mAh of current is put back into the pack every hour. A 2000mAh pack would require 40 hours to charge from a completely drained state and 20 hours if the pack was half way discharged. An overnight charge would not work in either of these cases!

### **Load Testing, BECs, and Switches**

We recommend that you always load test your power system using at least a 1.5amp load before every flight. Several companies make inexpensive load and voltage testing devices. These will determine if your battery pack has the capacity required to fly your setup.

Battery Eliminator Circuits (BECs) are great for small aircraft where loads are very light. However, beware of ANY "linear" regulators, even the so called "high current" versions. "Switching" regulators are far more reliable and generally do not get hot or change output voltages with heat or load. BECs built into Electronic Speed Controllers (ESCs) must have enough current capacity to properly power the XtremeLink® receiver

Although switches make it convenient to turn our R/C systems on and off, they can be the cause of system failures. Even heavy duty switches typically have a .2 volt drop across them when brand new. As switches age they oxidize, and constant vibration wears the metal contact plates. We have seen ¾ volt drop with a heavy duty switch after one season of flying.

### **Charge, Charge, Charge!**

You can never have a flight pack that is too full. We recommend "topping off" your flight packs between flights. Often times you don't fly back to back flights and there is ample time to do this, especially when using A123 flight packs where a "top off" could literally be just a few minutes.

## **Keep Your Setups Simple**

Although modelers love to have the latest and greatest toys, there are some products that can introduce new potential failure points when installed. For this reason, we recommend that you keep your setups as simple as possible. Instead of using "power expansion" type devices, we recommend using power inputs to both ends of the XtremeLink® receiver's servo connection bus. For example, when using an XtremeLink® 10 channel receiver, power should be connected to the B/T port and channel 10 (even if a Y-cable is required). Using two separate flight packs on each end of the servo bus will give you double the current capacity and a functioning system if one pack were to fail.

## **Reboot Indicator**

Starting with firmware version 1.3 and later, there is a reboot indicator. After connecting with the transmitter the receiver LED will be solid red. If power is lost and restored to the receiver (a reboot), the LED will flash slowly to indicate that a reboot has occurred. Note: if you change batteries without turning off your transmitter, the receiver reboot indicator will occur! You must power off the transmitter and receiver to reset this condition.



Model: Micro Rx  
FCC ID: X5L-XPSRX6NP  
IC ID: 8829A-XPSRX6NP

The enclosed device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: *(i.)* this device may not cause harmful interference and *(ii.)* this device must accept any interference received, including interference that may cause undesired operation.

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



**WARNING:** To satisfy FCC RF exposure requirements for mobile transmitting devices, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operations at closer than this distance is not recommended. The antenna used for this transmitter must not be co-located in conjunction with any other antenna or transmitter.



This device complies with ETSI EN-300-328 v1.71 rules.