ORANGE R620X – R1220X SERIES RECEIVERS

INSTRUCTION MANUAL

FEATURES:
• Compatible with DSM2/DSMX 1024/2048 aircraft radio and module systems
• cPPM and s.BUS output allowing for single line connection with compatible devices (protocol depends on your model)
• True diversity long antennas that you can place in convenient location in the aircraft
• Ultra fast brownout recovery and programmed fail safe mode
• Wide input voltage: 3.7~9.6V
• 6-12 Channels PWM (depends on your model)
• 12 channels cPPM or s.BUS on all receivers (from 6 to 12 channels)
• Integrated telemetry for real time readings:
   - Temperature
   - Voltage
   - motor RPM
   - Current
If required, integrated telemetry can be disabled during binding procedure.
Range:up to 1Km
Telemetry range – up to 100m.
Current consumption: 55mA

RECEIVER INSTALLATION
The **R620x – R1220x** incorporates diversity antennas, offering the security of dual path RF redundancy
By locating these antennas in slightly different locations in the aircraft, each antenna is exposed to its own RF environment,
greatly improving path diversity (the ability for the receiver to see the signal in all conditions).

ANTENNA POLARIZATION
For optimum RF link performance it's important that the antennas be mounted in an orientation
that allows for the best possible signal reception when the aircraft is in all possible attitudes and
positions. This is known as antenna polarization. The antennas should be oriented perpendicular to
each other; typically vertical and horizontal and at different angles.

MORE DIVERSITY AND BETTER SIGNAL RECEPTION
For bigger aircrafts, 600 and more size helicopters, gas aircrafts or long range projects you don't want to give a chance for a signal loss.
To improve the reception and reduce risks of signal loss you can attach up to two satellite receivers to the main receiver.
Using two additional OrangeRx R110XL 2.4Ghz Satellite Receivers you will get 6(six!!) antennas receiving the signal at the same time.
The antennas should be oriented in different directions and satellites placed at the different sides of the aircraft.

RECEIVER INSTALLATION IN AIRCRAFT
In gas and glow aircraft install the main receiver using the same method you would use to install
a conventional receiver in your aircraft. Typically, wrap the main receiver in protective foam and
fasten it in place using rubber bands or hook and loop straps. Alternately, in electric airplanes
or helicopters, it's acceptable to use thick double-sided foam tape to fasten the receiver in
place. Mounting receiver antennas and satellites (if used) in slightly different locations,
gives tremendous improvements in path diversity. Essentially, each receiver/satellite sees
a different RF environment and this is key to maintaining a solid RF link, even in aircraft that have
substantial conductive materials (e.g. larger gas engines, carbon fiber, pipes, etc.), which can weaken
the signal.

BINDING PROCEDURE
1. Install a bind plug into BIND connector. **In case if you want to disable telemetry function on the receiver, install second bind plug into THRO connector.**
2. Apply power to the receiver. It can be from 3.7 to 9.6 volts DC. Please refer to picture on the side of the receiver for the correct pinout (GND, VCC, SIGNAL)
3. You will see the orange LED rapidly blinking. That means the receiver is in Bind mode.
   Please note: If you installed second bind plug into THRO connector, both Orange LED and Red LED will blink simultaneously. That means that the receiver is in BIND mode and TM function is disabled.

4. Follow the procedures of your specific transmitter to enter Bind Mode, the system will connect within a few seconds. Once connected, the orange LED on the receiver will blink several times and go solid indicating the system is connected.
5. Remove the bind plug from the BIND and THRO ports on the receiver before you power off the transmitter and store it in a convenient place.

After you've set up your model, it's important to rebind the system so the true low throttle and neutral control surface positions are set.
NOTICE:
Remove the bind plug to prevent the system from entering bind mode the next time the power is turned on.

SMART FAILSAFE FEATURE

The **R620x – R1220x** features advanced failsafe. Advanced FailSafe is ideal for most types of aircraft. With advanced FailSafe, when signal is lost for the short time (less than 1 second) all channels will hold last command. If the signal loss occurs for more than 1 second all channels go to predefined position according to transmitters sticks and switches` positions remembered during binding procedure. That is why it is important to set a throttle channel at zero and other channels (switches and sticks) to your preferable hold position during binding procedure.
When the signal is regained, the system immediately regains control.
When the receiver only is turned on (no transmitter signal is present), the throttle channel has no output, to avoid operating or arming the electronic speed control. All other channels are driven to their preset failsafe positions set during binding.

FAST BROWNOUT RECOVERY FEATURE

Sometimes a short power loss happens in the flight. It can happen if your BEC is not powerful enough and servos consume high current or receiver pack is weak or discharged. It causes a short voltage drop. The event when receiver suddenly loses power in the flight is called a brownout. When power comes back it takes time for the receiver to reconnect to transmitter. During this time (up to 1 second, depends on the environment conditions) some analog servos may coast to their extremes even though no signal is present. This may lead to crash due to unexpected servo moves. To avoid this a new feature Fast Brownout Recovery is introduced. With this feature analog servos will have only a minor glitch during the recovery time.

CHANNEL CONNECTOR DESCRIPTION

BIND - Triggers binding procedure if receiver is powered with the bind plug inserted in this port. In normal operation it is a 12 channel cPPM or s.Bus output (depends on the model of the receiver you purchased)
THRO – During binding procedure if a bind plug is inserted in this port – turns telemetry function OFF In normal operation – PWM throttle output
AILE - PWM aileron output
ELEV - PWM elevator output
RUDD - PWM rudder output
GEAR - PWM gear output
AUX1…AUX7 - PWM auxiliary outputs. Number of outputs depends on the receiver you purchased.

SATELLITE CONNECTORS DESCRIPTION

SAT1 - main satellite port. **If you connect only one satellite please use this port.**
SAT2 - secondary satellite port.
Satellite port is fully compatible with all JR and Spektrum satellites as well as all Orange satellites.
Recommended satellites:
OrangeRx R110XL 2.4Ghz Satellite Receiver (long antenna version) (PRODUCT ID: R110IPX)
OrangeRx R110X DSMX/DSM2 Satellite Receiver (PRODUCT ID: 9171000299-0)
OrangeRx R111xn 2.4GHz DSMx/DSM2 compatible nano satellite (coming soon)

TELEMETRY CONNECTORS DESCRIPTION

RPM – RPM sensor input. You can use Orange RPM Sensor (PRODUCT ID: 9020000008-0) connecting it directly to this port.
-(A)- – Current sensor input. You can use Orange Current Sensor (coming soon) connecting it directly to this port.
Vb t° - Vattery voltage and temperature sensor. You can use Flight Pack Voltage & Temperature Sensor for OrangeRx Telemetry system (PRODUCT ID: 9171000551-0) connecting directly to this port.

RED AND ORANGE LED INDICATIONS

During binding procedure:
If telemetry function is enabled – Orange LED is blinking rapidly. After receiving binding signal from the transmitter blinks slowly for several seconds and then becomes solid if connection is correct.
If telemetry function is disabled – both Orange and Red LED-s blink rapidly. After receiving binding signal from the transmitter Red LED turns off and Orange LED blinks slowly for several seconds and then becomes solid if connection is correct.
In normal operation
In presence of transmitter signal: Orange LED is solid. If the transmitter signal is lost Orange LED is OFF.

Red LED blinks number of holds(up to 256) – signal losses with more than 1 second when receiver had to trigger a fail safe event. The LED will flash the number of holds then pause (e.g., flash, flash, flash, pause, flash, flash, flash, pause indicates three holds occurred since the receiver was last turned on). Note that holds are reset to zero when the receiver is turned off. During the first flights of a new airplane, it's recommended to check the red LED hold indicator. If it's flashing, it's important to optimize the installation (move or reposition antennas) until no hold occurs. On later flights, the LED Hold Indicator can be used to confirm RF link performance.

RANGE TESTING

Before each flying session and especially with a new model, it is important to perform a range check. Please use instructions of your transmitter to perform a range test.

INTEGRATED TELEMETRY FUNCTION

Integrated telemetry (TM) function was tested on Spektrum and Turnigy 9XR Pro transmitters and confirmed that it works correct on both systems.

Integrated TM measures data in-flight on the aircraft and transmits it back to transmitter to display or/and trigger sound and visual alarms if they are set. Please refer to your transmitter manual to see how to see the telemetry connection indicator, display telemetry data and set up alarms (current, battery voltage, motor RPM, temperature).

Telemetry Data:
- **Battery voltage (up to 52VDC)** – connect directly to the battery pack up to 12S
- **Temperature (-15℃~120℃)**. Use Flight Pack Voltage & Temperature Sensor for OrangeRx Telemetry system. (ID: 9171000551-0)
- **Current (up to 100A)** – please use current sensor (ID:)
- **RPM (1000~300000rpm)** – please use RPM sensor (ID: 9020000008-0)
  Due to hardware limitations TM doesn`t provide receiver pack voltage. It will always show 4.8VDC regardless of the acctual receiver voltage. Please keep this in mind. In glow and gas applications Battery voltage can be used as receiver pack voltage.

Telemetry sensors:
  Flight Pack Voltage & Temperature Sensor for OrangeRx Telemetry system.(PRODUCT ID: 9171000551-0)
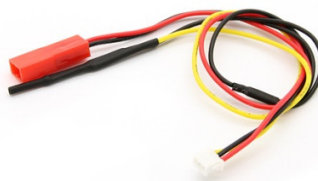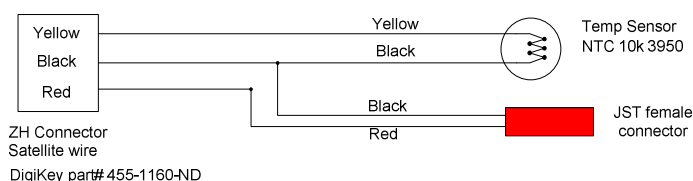
Orange RPM Sensor (PRODUCT ID: 9020000008-0)
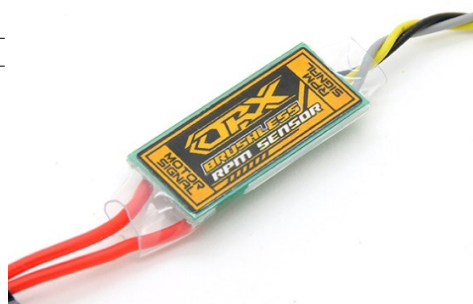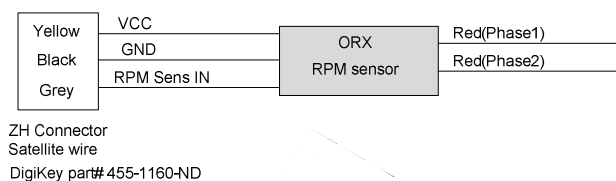
Orange Current Sensor (PRODUCT ID: xxxxxxxxx-0)