



# Sanwa Synchronized Link User's Guide



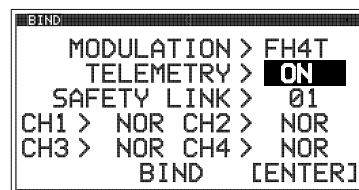
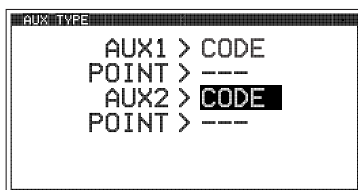
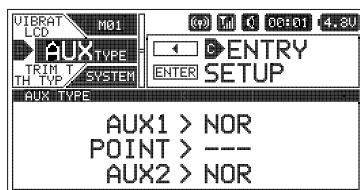
## For Use with the Super Vortex ZERO Brushless Competition ESC

When used with an Airtronics M12 or Sanwa EXZES-Z transmitter, an RX-472 2.4GHz FH4T Super Response 4-channel receiver and the Sanwa Super Vortex ZERO ESC, the Sanwa Synchronized Link (SSL) system allows you to change many ESC programming values directly from the transmitter using the transmitter's CODE AUX function. This saves you the time and hassle of not needing to stop and change programming values manually through the ESC. You can make these changes remotely and in higher resolution increments for improved performance. In addition, telemetry data such as speed or RPM, ESC temperature, motor temperature (if supported), and battery voltage can be read directly from the Super Vortex ZERO ESC and displayed on the transmitter.

**IMPORTANT:** Sanwa Synchronized Link and telemetry features only available when used with an Airtronics M12 or Sanwa EXZES-Z transmitter, Sanwa Super Vortex ZERO ESC and Airtronics/Sanwa RX-472 2.4GHz FH4T Super Response receiver. Before proceeding, read through the User's Guide for each of these products to familiarize yourself with their setup and use.

### M12 AND EXZES-Z TRANSMITTER SETUP

The Sanwa Synchronized Link and telemetry features will not function if the transmitter is not set up correctly. To be able to change Super Vortex ZERO ESC programming values remotely, both Auxiliary Type 1 and Auxiliary Type 2 functions must be programmed to CODE. To be able to view telemetry data from the Super Vortex ZERO ESC on the transmitter, the Telemetry function must be turned ON. For more information, refer to your M12 or EXZES-Z transmitter User's Guide.



#### Changing the Auxiliary Channel Operating Mode:

- 1) From within the SYSTEM menu, scroll UP or DOWN to highlight the AUX TYPE menu. Press the ENTER key to open the AUX TYPE menu. AUX1 > NOR will be highlighted. Change both the AUX1 and AUX2 programming values to CODE.

#### Turning the Telemetry Function ON:

- 1) From within the BIND menu, scroll down to highlight TELEMETRY > ON. Press the ENTER key, then scroll UP or DOWN to choose the desired Telemetry value, either ON or OFF.

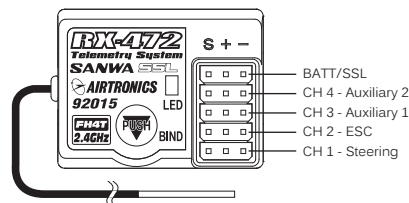
### RX-472 RECEIVER AND SUPER VORTEX ZERO ESC SETUP

The Super Vortex ZERO ESC must be plugged into the BATT/SSL port to be able to change programming values remotely and to be able to view telemetry data from the Super Vortex ZERO ESC.

#### Receiver Connections:

- 1) Plug the Super Vortex ZERO ESC throttle lead into the BATT/SSL port in the receiver. Using the BATT/SSL port enables the ability to change ESC programming values directly from the transmitter and view telemetry data from the Super Vortex ZERO ESC on the transmitter.

**WARNING:** Never plug a non-SSL compatible device into the SSL port in the receiver. If for some reason you don't want to utilize the SSL and telemetry features, or if you're using a non-SSL compatible ESC, plug the ESC throttle lead into the CH2 - ESC port.



#### Enabling and Disabling the Super Vortex ZERO ESC SSL Function:

When enabled, the SSL function allows you to change Super Vortex ZERO ESC programming values remotely and view telemetry data from the ESC on the transmitter. In some cases, you might want to disable the SSL function. For example, during a race you may not be allowed to change ESC programming values remotely. The current status of the SSL function can be determined by looking at the Super Vortex ZERO ESC Setup LED as shown in the table at right.

- 1) To turn the Super Vortex ZERO ESC SSL function ON or OFF, press and hold the ESC's Setup Button for 4 seconds.

**IMPORTANT:** When you disable the SSL function, only the ability to change programming values remotely will be disabled. Telemetry data from the ESC will still be displayed on the transmitter.

SSL Function Condition	ESC Setup LED
SSL Function Enabled	Solid Green
SSL Function Disabled	Flashing Slowly Green
Any Throttle Setting Other Than Neutral	Flashing Quickly Green

#### Viewing Telemetry Data:

When the Super Vortex ZERO ESC is connected to the BATT/SSL port on the RX-472 receiver, speed or RPM, ESC temperature, motor temperature (if supported), and battery voltage telemetry data is read directly from the ESC and displayed on the transmitter in the following format on the transmitter:

- TEMP1 Current Motor Temperature (Motor Must Feature Internal Temperature Sensor)
- TEMP2 Current ESC Temperature
- RPM Current Motor RPM or Speed (Calibrate RPM or Speed Using Transmitter Telemetry Data Display Options)
- VOLT Current Voltage of Motor Battery

### USING THE CODE AUXILIARY FUNCTION TO CHANGE ESC PROGRAMMING VALUES

The M12 and EXZES-Z transmitters feature two Code Auxiliary functions (Code Auxiliary 1 and Code Auxiliary 2) that each feature 5 separate Code functions. A Super Vortex ZERO ESC programming mode is automatically assigned to each of these Code functions (listed to the left of each of the Programming Mode Tables on the back page), allowing you to change programming values remotely by selecting the desired Code and adjusting the value using the Rotary Dial.

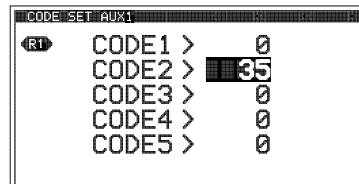
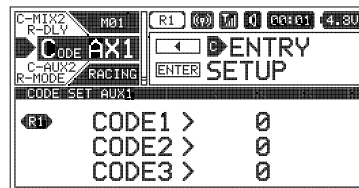
## USING THE CODE AUXILIARY FUNCTION TO CHANGE ESC PROGRAMMING VALUES

- 1) To change programming values remotely, navigate to the desired Code Auxiliary menu (either Code AX1 or Code AX2, then highlight and change the value for the specific Code you want to change Super Vortex ZERO ESC programming values for.

**IMPORTANT:** All programming values can be changed in 1% or 1 step increments, so you are able to fine-tune the settings with much greater resolution than if you were making the same adjustments directly through the ESC manually.

The adjustment range for each programming mode is shown below each of the tables. Programmed values outside of the adjustment range will have no effect, except for MODE 6 Drag Brake.

Although you're generally not allowed to change programming values while you're racing, individual Code functions can be assigned to separate switches, if desired. For more information, see the ASSIGN section of your transmitter User's Guide.



### Programming Mode Tables:

Programming values for the first four modes below are considered 'base' values and are not able to be changed remotely. Changes to these programming values need to be made manually through the ESC. For more information, refer to the Super Vortex ZERO ESC User's Guide.

**MODE 1 (Cut-Off Voltage)** Ensure that the Cut-Off Voltage value you choose matches the battery type you're using.

#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11
OFF	3.0v	3.3v	3.6v	4.0v	4.4v	4.8v	5.2v	5.6v	6.0v	6.4v

**MODE 2 (Reverse)** Enable or Disable Reverse function. Reverse is 50% of speed of forward.

#1	#2
Disabled	Enabled

\*All default values are shown in gray.

**MODE 3 (Thermal Protection)** ESC and motor over-heat protection. Requires motor be equipped with temperature sensor.

#1	#2	#3	#4	#5	#6
120°C/80°C	120°C/90°C	120°C/100°C	120°C/110°C	120°C/120°C	OFF/OFF

**MODE 4 (Timing Advance)** After Enabling, allows adjustment of Boost Rate, Turbo and Power Mode.

#1	#2
Disabled	Enabled

**MODE 5 (Full Brake Rate)** Adjust the maximum brake setting without using transmitter Brake Side EPA.

CODE AUX 1	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11
CODE 1	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%

Code Aux Value Adjustment Range: 0 (100%) to -100 (0%) in 1% Increments

**MODE 6 (Drag Brake)** Changes the braking effectiveness as the throttle trigger is returned to neutral.

CODE AUX 1	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11
CODE 2	0%	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%

Code Aux Value Adjustment Range: 0 (0%) to 50 (50%) and Up to 100 (100%) in 1% Increments

**MODE 7 (Feel)** Higher values increase the smoothness of the throttle in the forward and return to neutral directions.

CODE AUX 1	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11
CODE 3	0	10	20	30	40	50	60	70	80	90	100

Code Aux Value Adjustment Range: 0 (0) to 100 (100) in 1 Step Increments

**MODE 8 (Drag Brake Feel)** Higher values increase the smoothness of the Drag Brake function.

CODE AUX 1	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11
CODE 4	0	10	20	30	40	50	60	70	80	90	100

Code Aux Value Adjustment Range: 0 (0) to 100 (100) in 1 Step Increments

**MODE 9 (Brake Feel)** Higher values increase the smoothness of throttle in the brake and return to neutral directions.

CODE AUX 1	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11
CODE 5	0	10	20	30	40	50	60	70	80	90	100

Code Aux Value Adjustment Range: 0 (0) to 100 (100) in 1 Step Increments

**MODE 10 (Boost Rate/Timing Advance)** Higher values increase motor performance throughout the entire throttle range.

CODE AUX 2	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11
CODE 1	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Code Aux Value Adjustment Range: 0 (0%) to 100 (100%) in 1% Increments

**MODE 11 (Turbo)** Increases the Timing Advance value at only the full throttle position by the percentage chosen.

CODE AUX 2	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11
CODE 2	0%	2%	4%	6%	8%	10%	12%	14%	16%	18%	20%

Code Aux Value Adjustment Range: 0 (0%) to 20 (20%) in 1% Increments

**MODE 12 (Power Mode)** Adjusts the starting position of the Boost function.

CODE AUX 2	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11
CODE 3	P-M0	P-M10	P-M20	P-M30	P-M40	P-M50	P-M60	P-M70	P-M80	P-M90	P-M100

Code Aux Value Adjustment Range: 0 (P-M0) to 100 (P-M100) in 1 Step Increments

### WARNING:

The cut-off voltage you choose should not be set lower than recommended for your battery, particularly when using LiPo batteries. Refer to your battery specifications for the correct cut-off voltage to use. Setting too low a value can damage your battery. For LiPo batteries, 3.2v per cell is a safe value.

The first Thermal Protection temperature value relates to ESC temperature and the second temperature value relates to motor temperature. When the temperature of the ESC and/or motor reaches the specified value, the motor will slow down and the Boost function will not work. Once the temperature cools 20°C below the specified value, the function will return to normal. If the motor does not feature a built-in temperature sensor, motor thermal protection will not work.

Timing Advance must be Enabled to see changes made to Boost Rate/Timing Advance Rate, Turbo and Power Mode settings.

### WARNING:

Increasing Boost Rate/Timing Advance, Turbo and Power Mode values can result in damage to your motor and/or ESC from excessive heat. Values should be adjusted in single increments and you should check the temperature of the ESC and your motor after each adjustment.

Using higher Power Mode values will cause the Boost function to start working at a lower throttle position. When using a modified motor, we don't suggest using a value higher than # 5. When using a stock motor, any value can be used, but you must check your ESC and motor temperatures to ensure they're not overheating.