



Waco RF Module User Manual

Horizon Hobby, LLC
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1. Features

- Operates in the unlicensed worldwide ISM band (2.4 GHz to 2.483.5GHz) band
- Fully integrated power regulation with input unregulated operating range 3V to 5.5V
- Fully integrated local oscillator and 24MHz 10ppm reference crystal
- 400mA operating current
- Receive sensitivity up to -95dBm
- DSSS data rates up to 1Mbps
- 1 mile control operating range
- Full packet assembling and disassembling
- PWM output mode
- SPI, UART bidirectional interfaces

2. Pin description

Pin #	Name	Description
1	RESET	Reset line. Has a 100K pull-up to its regulated 3.0V rail. Pull to GND for a reset.
2	NC	Do not connect
3	GND	Ground
4	NC	Do not connect
5	BIND / SPI_CS	Bind signal line. 100K pull-up to regulated 3.0V rail. Pull to GND for a Bind command.
6	VRAW	Power supply for module. 5.5V MAX
7	GND	Ground
8	OUT5 / SPI_MISO	PWM CH5
9	OUT4 / SPI_MOSI	PWM CH4
10	VBATT	Battery voltage telemetry input 12V MAX
11	OUT3 / SPI_SCK	PWM CH3
12	LED	RF/Bind Status LED signal. 5mA MAX
13	GND	Ground



14	GND	Ground
15	OUT2	PWM CH2
16	OUT1 / SRXL	PWM CH1; SRXL TX/RX Pin

3. Specifications

Parameter	Value	Units
Storage Temp	-65 to 105	Degrees Celsius
VDD	2.4 to 3.6	Volts
Receive Sensitivity	-95	dBm
Transmit power (conducted)	5	dBm MAX
Transmit power (radiated)	5	dBm MAX
Idle current	5	mA
Receive current	22	mA
Transmit current	30	mA



4. Module User Requirements

4.1 This module must be integrated into a device where the user cannot access the antenna connector.

4.2 Only a 1.3dBi antenna can be used with this module. The antenna must meet and not exceed the gain and pattern of the supplied folded dipole antenna.

4.3 The device must contain the following permanent labeling on the exterior of the device as follows:

Contains FCC ID: BRWWACO1T

Contains IC: 6157A-WACO1T

4.4 The user manual of the device must contain the following paragraph:

FCC rules:

FCC part 15C 15.249

Antenna :

Integral Solder 1/4 Wave Antenna

Antenna gain :1.3dBi



FCC Statement

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.

Any 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.

FCC Radiation Exposure Statement

This modular complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

If the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains Transmitter Module FCC ID: BRWWACO1T Or Contains FCC ID: BRWWACO1T"

When the module is installed inside another device, the user manual of the host must contain below warning statements;

1. 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.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

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.

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

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

Any company of the host device which install this modular with limit modular approval should perform the test of radiated & conducted emission and spurious emission, etc. according to FCC part 15C : 15.249 and 15.209 & 15.207 ,15B Class B requirement, Only if the test result comply with FCC part 15C : 15.249 and 15.209 & 15.207 ,15B Class B requirement, then the host can be sold legally.



IC STATEMENT

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two 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
- Cet appareil contient des émetteurs / récepteurs exemptés de licence conformes aux RSS (RSS) d'Innovation, Sciences et Développement économique Canada. Le fonctionnement est soumis aux deux conditions suivantes :

- (1) Cet appareil ne doit pas causer d'interférences.
- (2) Cet appareil doit accepter toutes les interférences, y compris celles susceptibles de provoquer un fonctionnement indésirable de l'appareil.

IC Radiation Exposure Statement

This modular complies with IC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

If the IC number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains IC: 6157A-WACO1T"

when the module is installed inside another device, the user manual of this device must contain below warning statements;

1. This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two 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.

2. Cet appareil contient des émetteurs / récepteurs exemptés de licence conformes aux RSS (RSS) d'Innovation, Sciences et Développement économique Canada. Le fonctionnement est soumis aux deux conditions suivantes :

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