



Users Guide

Version 1.1

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Product Website: www.fieldhawkradio.com
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Limited Warranty and Disclaimer

FieldHawk has been designed to the highest of standards. JP Works Consulting (hereinafter referred to as JP WORKS) warrants this product to the original purchaser to be free from defects in material and workmanship, under normal conditions, for a period of ninety (90) days from the date of the original purchase. JP Works Consulting assumes NO LIABILITY for your use or misuse of this product, nor for any application, system, or other use to which the product is put.

This warranty is limited to the repair and/or replacement, at JP WORKS discretion, of the defective or non-conforming Product. Under no circumstances will JP WORKS replace the Product if it has been found to have been abused, misused, or neglected.

Hardware Product Warranty Details

WARRANTY PERIOD: JP WORKS warrants the Product for a period of ninety (90) days from the date the product is purchased.

WARRANTY PROCEDURE: Before any Product can be repaired under the limited warranty, the Customer must request an RMA number from JP WORKS. The Customer understands that any Product received without an RMA number will not be accepted. The Customer will be responsible for all shipping charges to get the Product to JP WORKS for repair. Upon inspection, JP WORKS will at its discretion either replace the Product, or individual components of the Product using new or reconditioned parts. All replaced Products, components and parts become the property of JP WORKS.

If JP WORKS determines that the Product is not under warranty, it will, at the Customers option, repair the Product using current JP WORKS' standard rates for parts and labour, and return the Product to the customer. Before repairing the Product, JP Works will send a quote to the customer outlining the cost of the repair.

WARRANTY EXCLUSIONS: The Product will not be covered under warranty if any of the following are found to be the cause of the Damage or Failure:

- Accidents, falls, objects striking the JP WORKS product,
- Operating the Product in environments that exceed JP WORKS temperature and humidity specifications,
- Power fluctuations, high voltage discharges,
- Improper grounding, incorrect cabling,
- Misuse, negligence by the customer or any other third party,
- Failure to install or operate the Product (s) in accordance to their JP WORKS User Manual,
- Failure caused by improper or inadequate maintenance by the customer or any other third party,
- Floods, lightning, earthquakes,
- Water spills,
- Replacement of parts due to normal wear and tear,
- Hardware has been altered in any way,
- Product that has been exposed to repair attempts by a third party without JP WORKS written consent,
- Battery component capacity degradation due to usage, aging, or lack of maintenance.
- Batteries will only be replaced under warranty if the battery doesn't hold an operating charge for 8 continuous hours. If the battery runs for more than 8 hours, it will be considered to be in working order.

Third-Party Software Product Warranty Details

The warranty policy of the third-party software is conformed to the policy of the corresponding vendor.

Limitation of Liability

JP WORKS ALSO EXCLUDES ANY LIABILITY, WHETHER BASED IN CONTRACT OR TORT (INCLUDING NEGLIGENCE), FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL, OR PUNITIVE DAMAGES OF ANY KIND, OR COSTS OF PROCUREMENT OF SUBSTITUTE PRODUCTS BY CUSTOMER, OR FOR THE LOSS OF REVENUE OR PROFITS, LOSS OF BUSINESS, LOSS OF INFORMATION OR DATA, OR OTHER INFORMATION OR FINANCIAL LOSS ARISING OUT OF OR IN CONSEQUENCE WITH THE SALE, INSTALLATION, MAINTENANCE, USE, PERFORMANCE, FAILURE, OR INTERRUPTION OF THIS PRODUCT, EVEN IF JP WORKS OR ITS DISTRIBUTORS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, AND LIMITS ITS LIABILITY TO REPLACEMENT, REPAIR, OR REFUND OF THE PURCHASE PRICE PAID, AT JP WORKS' OPTION. THIS LIMITATION OF LIABILITY FOR DAMAGES WILL NOT BE AFFECTED IF ANY REMEDY PROVIDED HEREIN SHALL FAIL OF ITS ESSENTIAL PURPOSE.

Specifications

Bluetooth Class

- FieldHawk Dual: Class I
- FieldHawk Single: Class II
- Bluetooth v1.2

Range

- FieldHawk Single (One Radio): +/- 30 meters (100 feet) dependent on the radio used in the data collector.
- FieldHawk Dual (Two Paired Radios): +/-365 meters (1200 feet).

Power

- Internal 2400 Li-Ion Battery
- External 9 Volt battery
- Inline DB-9 via pin 9

Battery Power

Internal Battery:

- FieldHawk Single: 35 - 40 Hours on internal Battery
- FieldHawk Dual: 25 - 35 Hours on internal Battery

External 9 Volt:

- FieldHawk Single: +/- 6 Hours
- FieldHawk Dual: +/- 5 Hours

Environmental

- Includes a soft case to protect it from rain and dust.
- Operating Temperature: -10 °C to 55 °C (14 °F to 131 °F)
- Storage Temperature: -20 °C to 70 °C (-4 °F to 158 °F)
- Humidity: 90% Non-condensing

Diagnostic LED

- Power
- Standby
- Connect
- RS232-Tx
- RS232-Rx

Regulatory Approvals

- FCC Part 15 Subpart C Section 15.247
- FCC Part 15 Subpart B
- TSI EN 300 328
- TSI EN 301 489-1

- ETSI EN 301 489-17
- EN61000-3-2, EN61000-3-3
- EN60950-1
- MIC
- TELEC

RF Information

- Frequency: 2.402 - 2.480 GHz
- Channels: 79
- Transmission Method: FHSS (Frequency Hopping Spread Spectrum)
- Modulation Method: GFSK (Gaussian-filtered Frequency Shift Keying)

Output Power

- FieldHawk Dual: 18 dBm
- FieldHawk Single: 4 dBm

Antenna

- Internal
- Dipole (Omni-directional)

Dimensions

- Length: 7.2" x Width: 3.65" x Height: 1.2"

FieldHawk Single – Operation

Overview

When you use a single FieldHawk radio, it can be used to provide a wireless connection between a total station and a Bluetooth capable data collector.

Instead of connecting your instrument cable into your data collector, you simply connect it to a FieldHawk radio. Then using a Bluetooth enabled data collector, you can connect it to FieldHawk and enjoy freedom.

The FieldHawk Single kit uses a Class II Bluetooth radio that will give you approximately 30 m or 100 feet of reception around your instrument.

With this type of configuration, you will have the following benefits.

- Freedom - Since you are no longer physically connected to the instrument with a cable, you can easily walk around your instrument with ease.
- Cable Stress - Save money on cable replacement because you will no longer be stressing your cables as you move around your instrument.
- Modernize - Modernize your old equipment and make them Bluetooth enabled.



Connecting – Baud Rate

By default, the FieldHawk Single radio will have been configured with a baud rate of 9600-N-8-1 and in some situation might be configured with a different baud rate if requested by the user prior to shipment.

It is very important that the baud rate be consistent. You need to have the same baud rate set on your instrument, the FieldHawk Radio and on your data collector otherwise you will not be able to establish a connection.

Connecting – Change Baud Rate

If you don't want to use the default 9600 baud rate you can change it by downloading a configuration program from the FieldHawk website. Please refer to the **Configuration Software** section for more information.

Connecting – Power

Every FieldHawk radio included an internal rechargeable batter plus an external 9V battery compartment. Most of the time you will use the internal battery but if needed, you can resort to the 9V system.

Internal Battery

To use the internal battery simply flip the switch towards the double vertical symbol on the switch.

External Battery

To use the 9V system, insert a 9V battery and flip the switch towards the single vertical symbol on the switch.

When you power on the radio using either the internal or 9V system, you should see a solid green power light. You will also see a flashing green connect light which means the radio is ready for connection.

Connecting – Status

Power

When you power on the radio using either the internal or 9V system, you should see a solid green power light.

If you don't see the power light you should check to make sure your battery is fully charged or that you inserted the 9V battery correctly. Plus the obvious – make sure you flipped the switch on!

Standby

The Standby mode will have a solid orange light. You will only see standby mode if the radio has been reset to factory default. Radios that are in Standby mode have to be configured with the configuration software before it can be used.

Normally you will only see this if you are manually changing baud rates, or pairing radios with the configuration program.

Connect

This is one of the most important status indicators! When you power on a radio you will see this indicator blinking green. Once a connection is successfully made you will see the connect light turn solid green.

RX and TX

These lights help indicate the movement of data through a successful connection. You will see these indicators flashing very quickly during use which is normal.

Connecting – Data Collector

Once you turn the power on you can try connecting to your FieldHawk radio from your data collector. Because there are so many different Bluetooth managers available this guide will not go into very much detail about connecting to the FieldHawk radio from your data collector. Please review the documentation that came with your data collector to learn how to search for other Bluetooth devices and connect to them.

Finding the Radio

From your data collector you will need to search for the FieldHawk radio. Once you do find it, try pairing or bonding with the radio. You will know if you've successfully connected if you see a solid connect light on the FieldHawk radio.

On the FieldHawk website you can find more information about connecting to specific devices plus online movies that show you step by step how to make a connection. Here is the web link:

<http://www.fieldhawkradio.com/index.php/support/getting-help.html>

FieldHawk Dual – Operation

Overview

When you pair two FieldHawk radios to one another, you end up with a long range wireless link. Our FieldHawk Dual kit uses high powered class I Bluetooth radios for superior performance.

Depending on your equipment and needs, this type of link can be used in the following ways.

Conventional Total Station

If you are using a conventional total station, you can use two radios to provide a wireless link for remote control of the instrument from the prism pole. The more experienced surveyor or party chief can run the data collector at the pole, while the less experienced helper can operate the instrument.

Robotic Total Station

If you use a robotic total station you can use two radios to provide your wireless link. FieldHawk is light and easy to carry around compared to other radio technologies. The long range capabilities of FieldHawk will help you get those long shots; no more walking closer to the instrument to regain a connection.



Benefits

- Weight - Our FieldHawk radios are light. Less weight at the rod decreases user fatigue meaning more productivity in the field.
- Configurable - With two FieldHawk radios, you can configure them so they can be used as cable replacement radios when not needed for robotic or remote use.
- Reliable - FieldHawk includes a high capacity internal battery plus has an external battery compartment. You will never have to worry about not having enough battery life to finish a job.

Connecting – Baud Rate

By default, the FieldHawk Single radio will have been configured with a baud rate of 9600-N-8-1 and in some situation might be configured with a different baud rate if requested by the user prior to shipment.

It is very important that the baud rate be consistent. You need to have the same baud rate set on your instrument, the FieldHawk Radio and on your data collector otherwise you will not be able to establish a connection.

Connecting – Change Baud Rate

If you don't want to use the default 9600 baud rate you can change it by downloading a configuration program from the FieldHawk website. Please refer to the Configuration Software section for more information.

Connecting – Power

Every FieldHawk radio included an internal rechargeable battery plus an external 9V battery compartment. Most of the time you will use the internal battery but if needed, you can resort to the 9V system.

Internal Battery

To use the internal battery simply flip the switch towards the double vertical symbol on the switch.

External Battery

To use the 9V system, insert a 9V battery and flip the switch towards the single vertical symbol on the switch.

When you power on the radio using either the internal or 9V system, you should see a solid green power light. You will also see a flashing green connect light which means the radio is ready for connection.

Connecting – Status

Power

When you power on the radio using either the internal or 9V system, you should see a solid green power light.

If you don't see the power light you should check to make sure your battery is fully charged or that you inserted the 9V battery correctly. Plus the obvious – make sure you flipped the switch on!

Standby

The Standby mode will have a solid orange light. You will only see standby mode if the radio has been reset to factory default. Radios that are in Standby mode have to be configured with the configuration software before it can be used.

Normally you will only see this if you are manually changing baud rates, or pairing radios with the configuration program.

Connect

This is one of the most important status indicators! When you power on a radio you will see this indicator blinking green. To make the connection between the two FieldHawk radios you must turn the power on for both radios. The FieldHawk Dual radios are paired to one another and will find and automatically make a "bond" or connection. If the connection is successfully made you will see the connect light turn solid green.

RX and TX

These lights help indicate the movement of data through a successful connection. You will see these indicators flashing very quickly during use which is normal.

Connecting – Data Collector

After turning on the power for the FieldHawk radios and confirming a successful connection, you can connect your data collector. Simply use your normal download cable (Female | Female DB9) and connect one end to your data collector and one into the FieldHawk radio.

Please make sure you use a straight through cable, not a null modem cable.

The FieldHawk radio that you decide to use at the prism pole should be put in the field pouch that has a pole clamp. Attach this pouch to your prism pole in a convenient spot.

Connecting – Total Station

After turning on the power for the FieldHawk radios and confirming a successful connection, you can connect your total station. Simply use your instrument cable and connect one end to your instrument and one into a FieldHawk radio.

The FieldHawk radio that you decide to use at the total station should be put in the field pouch that has two Velcro straps. Attach the pouch to your tripod leg in a convenient spot.

On the FieldHawk website you can find more information about connecting to specific devices plus online movies that show you step by step how to make a connection. Here is the web link:

<http://www.fieldhawkradio.com/index.php/support/getting-help.html>

FieldHawk Dual – Extra Features

Every FieldHawk Dual kit is shipped setup and ready for use. Normally you will use your FieldHawk dual radio together and this is referred to as a “Paired” connection.

When two radios are paired together, it means that the unique address of the last connection is stored. Once two radios are paired they can only connect to one another, which is what you want anyways if you are using them for remote or robotic control.

An important feature of the FieldHawk Dual system is the fact that the radios can be un-paired so they can be used individually as cable replacement systems. Once the radios have been un-paired, you can easily pair them again for normal use as a robotic or remote link.

On the FieldHawk website you can find more information about pairing and un-pairing your radios. Here is the web link:

<http://www.fieldhawkradio.com/index.php/support/getting-help.html>

FieldHawk Charging

Charging FieldHawk is quite simple. Just connect the FieldHawk charger into a standard AC outlet, and connect FieldHawk to the charging jack.

Operating Instructions

1. Connect the charger to an AC power source.
2. You will see the LED turn green. This means the charger is ready.
3. Connect the FieldHawk radio to the charging jack. Please make sure that the power switch is turned off, and that you remove any 9v batteries from the kit.
4. You will see the LED turn solid red which indicates that it is charging. Charging will normally take about two hours.
5. Once the FieldHawk battery is fully charged you will see a solid green light. In this mode the charger switches to a trickle charge.
6. You can now disconnect the charging jack from FieldHawk.
7. Unplug the charger from the AC power source when not in use.

Important Notes

- The charger is designed for indoor use only.
- Batteries during charging can explode or catch fire, never charge batteries unattended.
- The charger is designed for dry conditions.
- Don't cover the charger as it could cause it to overheat.
- Always charge batteries in a well ventilated area.
- Always charge batteries away from flammable liquids or materials.
- Never disassemble the charger for any reason.
- Never charge batteries for more than 12 hours at a time.
- Unplug the charger from the AC power source when not in use.

FieldHawk Battery Care

FieldHawk uses internal Li-Ion batteries for long lasting power. FieldHawk doesn't have a low battery warning light, but you can gauge battery consumption by the hours of use since the last full charge.

Since FieldHawk uses Li-Ion batteries they can be charged at anytime with no memory effect. At normal temperatures (above 40°F) you can expect 30 – 40 hours of use, but in colder temperatures you can see this time decrease by as much as 20 to 30 percent.

On cold days we suggest charging the radios every second day to ensure you have full battery power.

Storing

Never store your FieldHawk radios if the battery has been drained. Always fully charge your radios before storing for extended periods such as a month or two.

It is suggested that you always top up the batteries every couple of months if not being used.

Over Charging

FieldHawk uses a smart charger that is specifically designed to not over charge the batteries. Once your batteries are fully charged you will see a solid green light on the charger. Once fully charged the charger switches to a trickle charge.

Under normal use you do not need to leave the charger connected once the indicator indicates a full charge state.

Over Discharge

FieldHawk has a built in cut off system when the battery level reaches a low voltage state and will automatically shut off.

This built in system ensures that the batteries don't get damaged from over draining the battery. Once the automatic cut off has been triggered you will need to charge the battery or switch to a 9V battery.

Software Configuration

The FieldHawk Single and Dual systems can be configured with desktop software. You can use the configuration software to change baud rates, un-pair or pair radios together and change other parameters.

For most of you, you will not need to configure the radios as they are pre-configured prior to shipping.

Install ParaniWin

To configure a FieldHawk radio you will need to download and install a program named **ParaniWin**. You can download the program from the FieldHawk website using the following link.

<http://www.fieldhawkradio.com/index.php/support/downloads.html>

Using ParaniWin

The best way to learn how to use this program is to watch the tutorial movies on the FieldHawk website. Visit the Tutorial section to learn more.

You require a serial port on your computer and a serial (straight through) cable.

Simply turn on your FieldHawk radio and connect it to your computer.

Configuring Radios

We suggest configuring the radios only after you have fully charged them.