

# OPERATING INSTRUCTIONS

## ERGO F 2.4 GHZ



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# TABLE OF CONTENTS

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<b>Safety</b> .....	<b>1</b>	<b>Changing Your Battery</b> .....	<b>7</b>
Safety Alerts .....	1	Disposable Batteries: .....	7
Notations .....	1	Rechargeable Batteries: .....	7
Practices and Laws .....	1	Recharging Your Batteries (Optional) .....	7
Required Operator Training .....	1	Fast Charge .....	8
Possible Sources of Danger .....	1	Battery disposal .....	8
Protective Features .....	1	<b>Operating Your Transmitter</b> .....	<b>9</b>
To Stop In An Emergency .....	1	Holding Your Transmitter .....	9
Maintenance .....	1	Visually Checking Your Transmitter .....	9
<b>Introduction</b> .....	<b>2</b>	Starting Your Transmitter .....	9
Your Manuals .....	2	Stopping the Radio Control .....	9
Production and System Numbers .....	2	<b>Troubleshooting</b> .....	<b>10</b>
Before Operating Your System .....	2	<b>Specifications</b> .....	<b>12</b>
<b>About Your Transmitter</b> .....	<b>3</b>		
Description and Features .....	3		
General Description .....	3		
Ergo F 2.4 GHz Features .....	3		
H-Link .....	3		
Standard Ergo F 2.4 GHz			
Configurations .....	3		
Ergo F 2.4 GHz-V1 .....	3		
Ergo F 2.4 GHz-V2 .....	3		
Ergo F 2.4 GHz-V3 .....	3		
<b>Theory of Operation</b> .....	<b>6</b>		
Stop Function .....	6		

# SAFETY

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## SAFETY ALERTS

The safety alert symbol is used in decals on the unit and with proper operation procedures in this manual.

Understand the safety message. It contains important information about personal safety on or near the unit.



**DANGER:IMMINENTLY HAZARDOUS SITUATION!** *If not avoided, WILL RESULT in death or serious injury.*



**WARNING: POTENTIALLY HAZARDOUS SITUATION!** *If not avoided, COULD RESULT in death or serious injury.*



**CAUTION: POTENTIALLY HAZARDOUS SITUATION!** *If not avoided, MAY RESULT in minor or moderate injury. It may also be used to alert against unsafe practices.*

## NOTATIONS

**NOTE:** General reference information for proper operation and maintenance practices.

**IMPORTANT:** Specific procedures or information required to prevent damage to unit or attachment.

## PRACTICES AND LAWS

Practice usual and customary safe working precautions for the benefit of yourself and others. Be alert to unsafe conditions and the possibility of minor, moderate, or serious injury or death. Learn applicable rules and laws in your area.

## REQUIRED OPERATOR TRAINING

Original purchaser of this unit was instructed by the seller on safe and proper operation. If unit is to be used by someone other than original purchaser; loaned, rented or sold, **ALWAYS** provide this manual and any needed safety training before operation.

**ALWAYS** read and understand the documentation for any machine to be controlled by radio remote control.

## POSSIBLE SOURCES OF DANGER

This device is part of a system that makes remote control via radio signals possible. However, the transmission of control commands can take place around obstacles and out of the operator's direct sight. Take the following precautions to prevent accidental start-up and possible injury or damage:

1. Switch "OFF" the transmitter when it is not in use. If equipped, remove the key if the unit is placed any distance away from the operator.
2. Disconnect the power supply from the receiver before any assembly, maintenance or repair work is done.

**IMPORTANT:** AVOID SYSTEM DAMAGE - **ALWAYS** disconnect receiver power supply and control wiring before welding on any part of the machine

3. Never remove or alter any of the safety features.
4. **ALWAYS** confirm that the machine and radio remote control Stop functions work properly **BEFORE** beginning any machine operation.

## PROTECTIVE FEATURES

This system is equipped with electronic and mechanical safety features. Control signals from other transmitters cannot be processed because transmission coding is unique to each system

## TO STOP IN AN EMERGENCY

Push the emergency stop on the machine.

## MAINTENANCE

Always shut off power to the machine, transmitter and receiver before any assembly, maintenance or repair.

**NOTE:** Operation is subject to the following two conditions:(1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device. **NOTE:** The user is cautioned that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

# INTRODUCTION

Thank you for purchasing the Hetronic radio remote control system. Hetronic radio remote controls provide outstanding remote control value, quality, performance, and safety.

## YOUR MANUALS

Before operating your machine and radio remote control system, read and understand the manuals for all of your system components.

## PRODUCTION AND SYSTEM NUMBERS

Before contacting your dealer or Hetronic about service, repair or replacement parts, note the equipment Production and System numbers. These numbers are located on the label affixed to the unit.

## BEFORE OPERATING YOUR SYSTEM

Confirm that installation of all your system components has been properly completed.

Before start up, **ALWAYS** confirm that the machine and radio remote control Stop functions work properly.

Understand all Safety Precautions provided in the manuals and review control functions and operation of the machine and this radio remote control system.

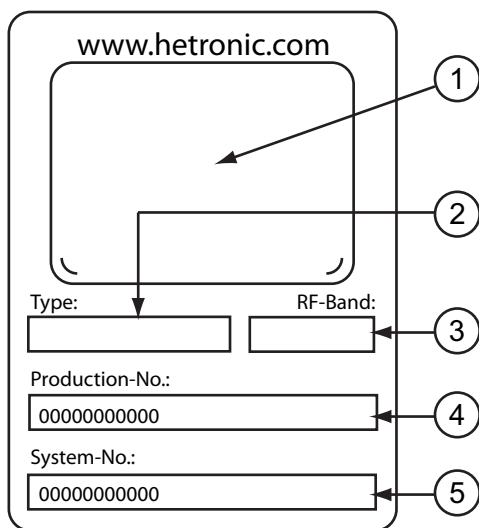
When not in use, turn the transmitter off and store in a safe place to prevent unauthorized use.

If the machine does not respond properly, immediately stop operation. Turn off the transmitter and report the condition to your supervisor.

Turn off the transmitter and remove the key (if so equipped) before any maintenance work is done.

Always have fresh batteries on hand or an optional rechargeable battery pack in the battery charger to ensure the availability of a fully charged battery.

Installation, setup and service must be performed by authorized and qualified personnel only.



## Unit Label Areas and Meanings

1. Specific approvals, such as BTZ, FCC, CE, etc.
2. Type of transmitter or receiver.
3. Frequency and RF unit.
4. Eleven-digit Production Number.
5. Eleven-digit System Number.

## Unit Label Areas and Meanings

# ABOUT YOUR TRANSMITTER

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## DESCRIPTION AND FEATURES

### GENERAL DESCRIPTION

The Ergo F 2.4 GHz is an ergonomically-designed, programmable radio control transmitter capable of transmitting up to 32 on/off functions to control a machine.

A Diagnostic LED Status Light on the face of the unit provides continuous operating status information:

- Green (Flashing) - transmitting telegram
- Red (Flashing) - transmitting STOP telegram
- Red (Steady) - Low Battery
- Red (slowly pulsing) - Invalid Memory Key

Your transmitter is encased in a rugged IP65 rated housing, is battery-powered, and comes equipped with built-in low battery detection.

Standard equipment includes a battery adapter case for 3 size AA alkaline batteries. For your convenience, there are optional rechargeable battery systems available.

### ERGO F 2.4 GHZ FEATURES

- Fully programmable via H-Link
- Memory Key
- 12 pushbuttons with up to three detents
- One 3-position maintained toggle switch
- Up to 70 m (230 ft.) Range
- Internal Antenna
- Wrist Strap
- Hand strap
- Auto power off feature
- Low Battery detection
- Diagnostic LED

**NOTE:** Operation is subject to the following two conditions:(1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device. **NOTE:** The user is cautioned that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment

### H-LINK

H-Link is an exciting new technology that allows users to access and configure Hetronic remote radio controls without having to open them up!

What used to be accomplished by setting jumpers and switches is now easily accomplished via a wireless data link between Hetronic equipment and an H-Link programmer.

H-Link can access and set functions such as system address, transmission frequency channel, auto shut-off features, interlocking, output assignments, and much more. See the Ergo F Programming Manual for more information.

## STANDARD ERGO F 2.4 GHZ CONFIGURATIONS

Your Ergo F 2.4 GHz transmitter is factory programmed to one of the following configurations:

### ERGO F 2.4 GHZ-V1

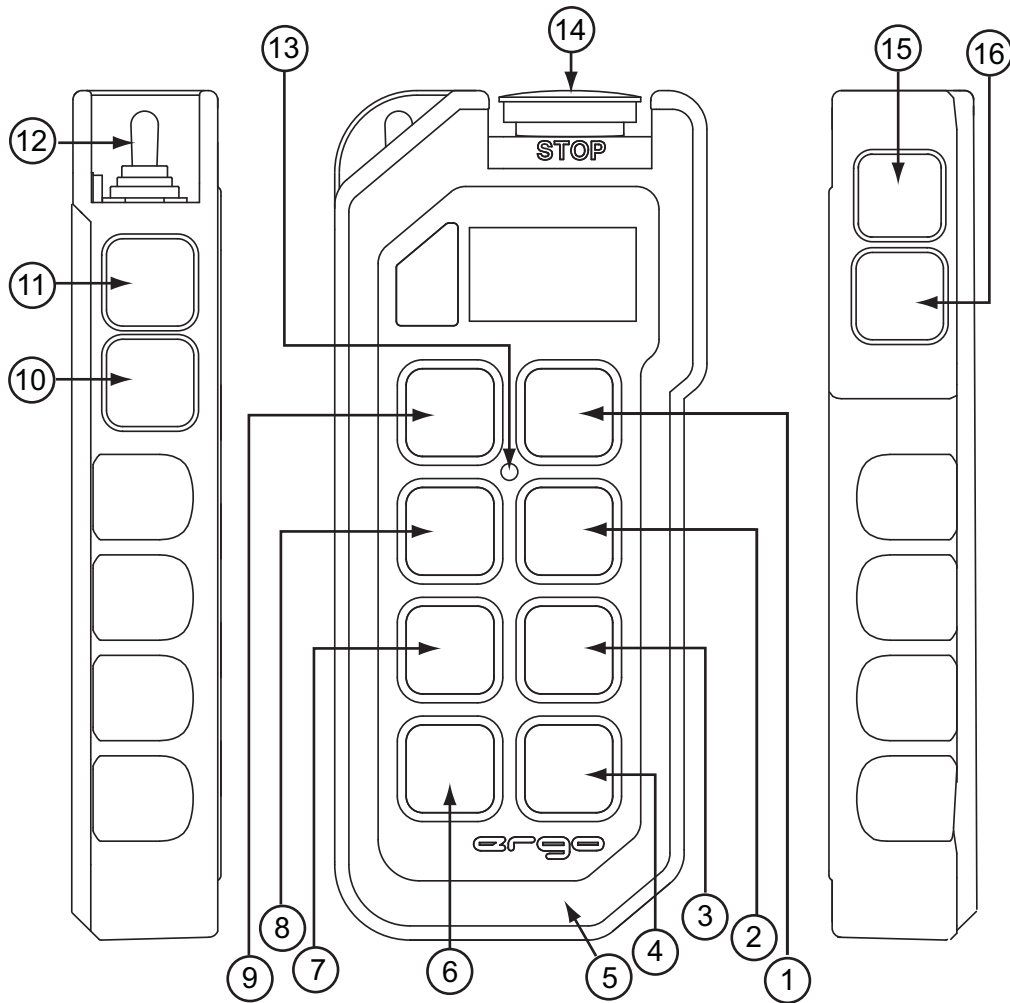
- 11 single detent pushbutton
- 1 single detent START pushbutton
- 1 three position maintained toggle switch
- 1 Memory Key

### ERGO F 2.4 GHZ-V2

- 8 two detent pushbuttons
- 3 single detent pushbuttons
- 1 single detent START pushbutton
- 1 three position maintained toggle switch
- 1 Memory Key

### ERGO F 2.4 GHZ-V3

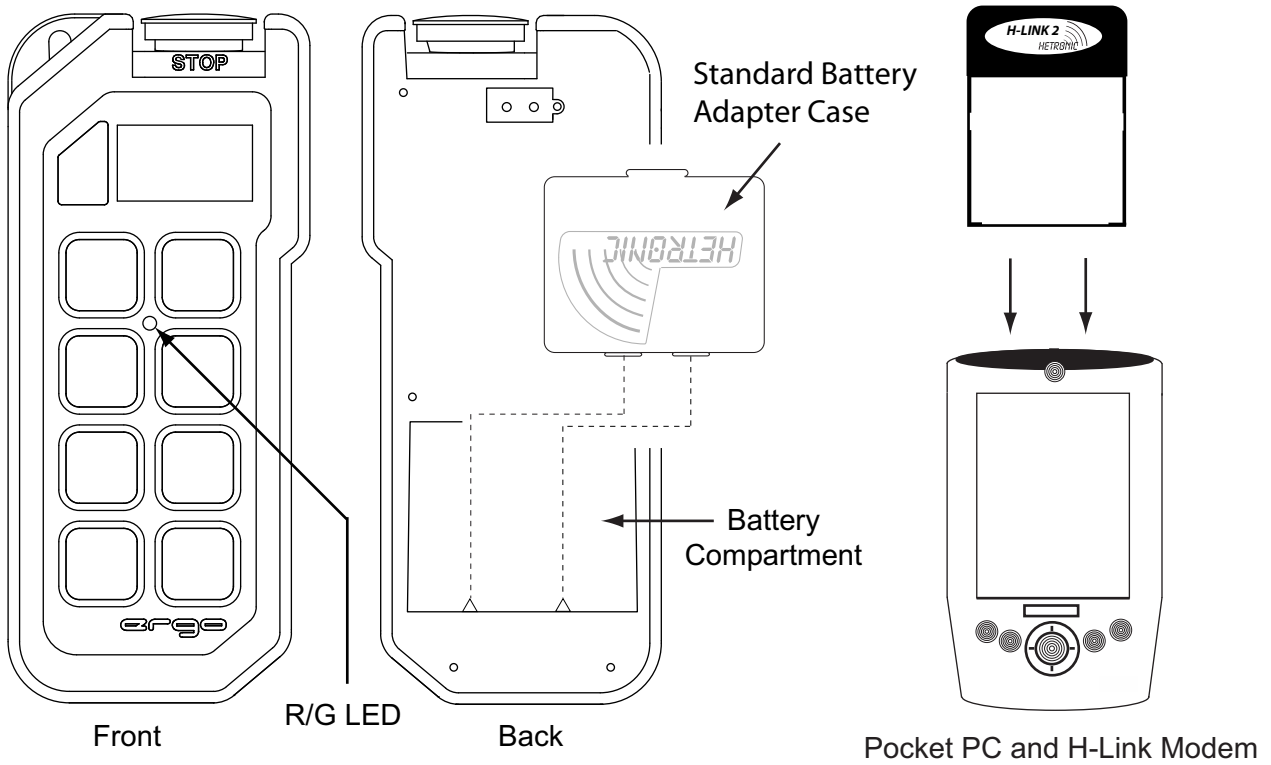
- 6 three detent pushbuttons
- 2 two detent pushbuttons
- 3 single detent pushbuttons
- 1 single detent START pushbutton
- 1 three position maintained toggle switch
- 1 Memory Key



**Ergo F 2.4 GHz Transmitter (Left, Front, Right)**

**Table 1: Ergo F 2.4 GHz Transmitter (Left, Front, Right)**

1	Up to 3 Detent Momentary Pushbutton (S4)	9	Up to 3 Detent Momentary Pushbutton (S3)
2	Up to 3 Detent Momentary Pushbutton (S6)	10	Single Detent Momentary Pushbutton (S12)
3	Up to 3 Detent Momentary Pushbutton (S8)	11	Single Detent Momentary Pushbutton (S11)
4	Up to 2 Detent Momentary Pushbutton (S10)	12	Three Position Maintained Toggle Switch, S13 Left and S14 Right
5	Battery Compartment (located in the back)	13	Diagnostic LED
6	Up to 2 Detent Momentary Pushbutton (S9)	14	Memory Key / STOP Pushbutton (S15)
7	Up to 3 Detent Momentary Pushbutton (S7)	15	Single Detent Momentary START Pushbutton (S1)
8	Up to 3 Detent Momentary Pushbutton (S5)	16	Single Detent Momentary Pushbutton (S2)



**Ergo F 2.4 GHz Transmitter and Programming Components**

# THEORY OF OPERATION

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Your transmitter works with a receiving device to transfer machine control commands via radio frequency to your machine.

The transmitter electronically generates a carrier frequency that allows it to communicate with the receiver without the use of cables or wires. The receiver then converts the carrier frequency information into discrete machine control outputs that interface with your machine's controls.

Each transmitter and receiver that comprises a system is programmed with a unique address code. This code ensures that machine operations are safe, and that other remote control equipment cannot unintentionally control your machine.

The receiver only accepts commands from the transmitter with the same address code. The receiver and transmitter have the address code set at the factory.

**NOTE:** Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device. **NOTE:** The user is cautioned that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment

## STOP FUNCTION

The most important feature of the radio remote control system is the Stop function. When the transmitter is turned on, it performs a self-test to confirm that communications are within designated parameters. If an error is detected, the transmitter will not transmit any signals.

The transmitter sends the STOP pushbutton status along with the specified machine functions. This method confirms that ongoing operations are safe.

If the STOP pushbutton is pressed, the data telegram changes so that only the stop command is transmitted. No other motion command data is sent.

This special data telegram places the receiver in Safe Mode, and the STOP relay in the receiver opens. All other machine functions are disabled in the receiver.

When the receiver is properly installed the STOP pushbutton will shut down the machine.



***DANGER: Pressing the STOP pushbutton does not ensure the machine will stop.***

***ALWAYS test the STOP function at the beginning of every operation session or when there is a change of operator.***



# CHANGING YOUR BATTERY

You may power your transmitter with disposable or rechargeable batteries. Both types use adapter cases that are inserted into the back of the transmitter.

Follow the instructions below for your battery type.

## DISPOSABLE BATTERIES:

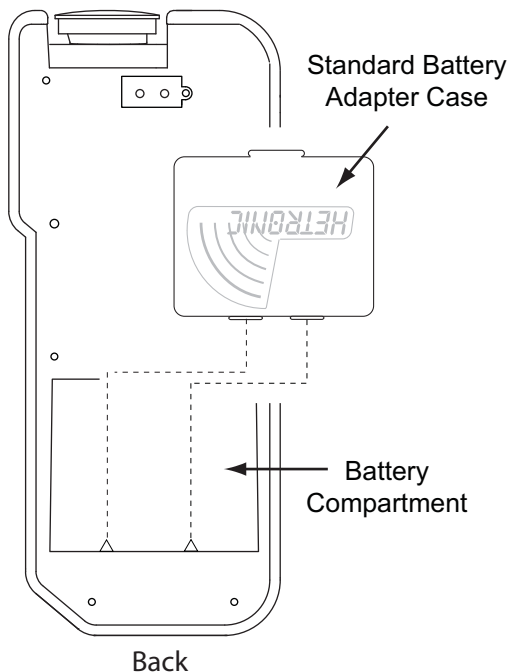
1. Insert 3 AA batteries into the back of the Standard Battery Adapter Case.

**NOTE:** Battery positions are shown in the battery slots on the back of the Standard Battery Adapter Case housing.

2. Slide the loaded Standard Battery Adapter Case into the battery compartment on the back of the transmitter housing and snap into place.

## RECHARGEABLE BATTERIES:

1. Confirm that your batteries are fully-charged. See “Recharging Your Batteries (Optional)” on page 7.
2. Slide a fully-charged battery into the battery compartment on the back of the transmitter as shown, and snap it into place.



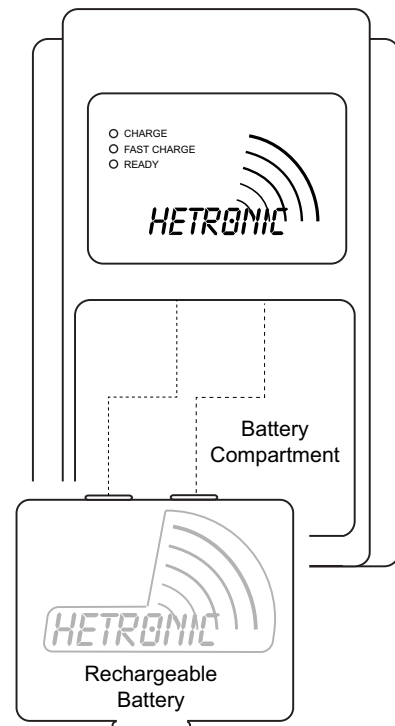
**Inserting Battery**

## RECHARGING YOUR BATTERIES (OPTIONAL)



**DANGER:EXPLOSIVE GASES AND FLYING DEBRIS** can cause death or serious injury. Use only Hetronic replacement rechargeable batteries. Use of unauthorized replacement batteries can cause a battery explosion, resulting in injury or death of the operator or other people in the work area.

1. Insert the spent optional rechargeable battery adapter case into the battery charger and snap into place as shown.



### Charger and Rechargeable Battery Adapter Case

The LED labeled “CHARGE” flashes for two seconds, then stays lit during the charging process. When the battery is fully charged, the “READY” LED lights up and the “CHARGE” LED goes off.

**NOTE:** Charging time could take up to 5 hours, depending on the condition of the battery.

Leave the battery in the charger until it is needed. The charger supplies a “trickle” charge but will not over-charge the battery.

**FAST CHARGE**

Insert the battery into the charger as described above. The LED labeled "CHARGE" flashes for two seconds, then stays lit.

Press the "FAST CHARGE" button. The FAST CHARGE LED lights also and stays lit during the charge process.

When the battery is fully charged, the "READY" LED lights up and the "CHARGE" and "FAST CHARGE" LEDs turn off.

**BATTERY DISPOSAL**

AVOID ENVIRONMENTAL POLLUTION. Recycle your rechargeable batteries according to local recycling rules and regulations.

If you have questions or problems operating your battery charger, please contact your dealer or Hetronic.

Standard Hetronic rechargeable batteries are the nickel metal hydride type. These batteries have no "memory effect" when charging a battery that is not fully discharged.

# OPERATING YOUR TRANSMITTER

## HOLDING YOUR TRANSMITTER

Hold the transmitter upright with the front facing you. Confirm that you are able to easily read and understand any operation text or symbols.



**WARNING:** Holding the transmitter improperly while operating your machine could result in unexpected machine response.

Complete the following procedures once a day, before the start of an operation and at all shift changes.



**WARNING:** Test the stop function as described in the machine manufacturer's operator manual before beginning any operation.

## VISUALLY CHECKING YOUR TRANSMITTER

Always check the transmitter for any physical damage before any operation.

Check equipment for wear or damage.

Confirm that you can read and understand all of the safety labels.

Never operate a transmitter with worn or damaged parts. Replace immediately with only Hetronic parts. Contact Hetronic or your Dealer.

## STARTING YOUR TRANSMITTER



**WARNING:** To avoid accidental start-up, always press the STOP pushbutton (Memory Key) when not in use.

*Turn OFF your machine if there is a fault or problem with the safety check.*

*NEVER operate the machine if the stop function does not work properly.*

**NOTE:** When the transmitter is not attached to the operator, remove and store the Memory Key (red cap) in a secure place.



**WARNING:** Improper operation, maintenance or adjustment may cause serious injury or damage to equipment and may void the warranty.

1. Confirm that all safety measures required by the equipment manufacturer have been followed.
  2. Turn ON the receiver.
  3. Insert a battery adapter with fresh AA alkaline batteries into the battery compartment.
- NOTE:** If using rechargeable batteries, confirm that they are fully charged.
4. Press and release **START** (S1) to turn ON the transmitter.
  5. After the green LED starts blinking, press **START** (S1) again.

The following results quickly appear as follows:

**Table 1: Transmitter Results and Meanings**

Result	Meaning
Diagnostic LEDs turn ON.	Checking for Memory Key.
LEDs turn OFF.	Memory Key check is complete.
Green LED starts blinking	Transmitter data is being transmitted.

## STOPPING THE RADIO CONTROL

Press **STOP**.

The transmitter sends the STOP telegram to the receiver for two seconds minimum.

Upon receiving the STOP telegram, the receiver goes into Safe Mode and turns OFF all of the receiver outputs.

The transmitter shuts off in about 2 seconds.

# TROUBLESHOOTING

If the system does not operate after normal start-up, follow the recommended troubleshooting sequence to help isolate the cause and determine corrective action.

If you need more information, contact your dealer or Hetronic.

PROBLEM	PROBABLE CAUSE	CORRECTION
Transmitter won't start	Missing Memory Key	Insert Memory key
	Batteries fully discharged	Replace with fully charged batteries if needed
The transmitter is turned on, but does not transmit (Power LED not flashing)	Battery is discharged	Replace battery with a fully charged battery
	Component failure	Contact your supervisor.
Transmitter is transmitting (Power LED flashing), but machine will not respond	No power to the receiver	Check the diagnostic LEDs in the receiver to be sure power is applied. Ensure that the system is properly grounded
	Transmitter/receiver frequency channels do not match	Contact your supervisor
	Transmitter out of range	Take the transmitter back into the range of the receiver, press START
	Receiver power off	Turn on power to receiver
	Blown fuse in receiver	Check all fuses and replace if needed
	STOP failure in receiver. Red STOP LED on PC board is illuminated	Contact your supervisor
All machine motions operate intermittently	Receiver antenna connection is loose or missing	Tighten or replace antenna
	External antenna (if used) has loose connection, poor grounding or interference	Tighten antenna and ground connection. Contact Hetronic or your Dealer for more information
	Control wiring too close to high power machine wiring	Contact your supervisor
	Connector inside receiver is loose	Check all connectors, reseal if needed
	Another frequency may be interfering with the system	Contact your supervisor

Some machine motions operate intermittently	Loose machine motion wiring	Check wiring from receiver to plug and plug to machine motion actuator
	Loose connector inside receiver	Check all connectors, reseal if needed
	Surge suppressors not installed on contactors	Contact your supervisor
	Control wiring too close to high power machine wiring	Control wiring must be run separately from high power machine wiring

# SPECIFICATIONS

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Housing:	Ergonomically designed Impact Resistant Polymer Composite
Environmental Protection:	IP 65 (Exceeds Nema 12/13)
Weight:	261 g (9 oz), not including battery
Dimensions:	Height: 186 mm (7.3 in.)
	Width: 82 mm (3.2 in.)
	Depth: 33 mm (1.3 in.)
Antenna:	Internal
Power Supply:	3 AA batteries (3 Mignon LR6-AA 1.5V)
	Optional 3.6v NiMH rechargeable battery
Diagnostics:	Status LED for operation and standard/advanced low battery detection
Operation Time:	Up to 100 h continuous transmission
Control Configuration:	V1 - 11 Single detent push buttons, 1 three position maintained toggle switch, start + stop
	V2 - 8 Two detent push buttons, 3 single detent push buttons, 1 three position maintained toggle switch, start + stop
	V3 - 6 Three detent push buttons, 2 Two detent push buttons, 3 single detent push buttons, 1 3-position maintained toggle switch, start + stop
Frequency Range:	2.4GHz
Power (RF Output):	< 10 mW
Typical Operating Range:	Approximately 70 m. (230 ft.)
Safety:	20-bit programmable address concept with up to 1,000,000 combinations
	Hamming Distance 3
Temperature Range:	-20 C . . . 70 C (-4 F . . . 158 F)
Humidity Range:	0 - 97% maximum non-condensing
Response Time:	Approx. 100 msec.
Duty Cycle:	1-10%
Standard Features:	Fully programmable via pocket PC with H-Link modem
	Combination Stop/Memory Key cap that stores configuration settings
	Hand and wrist strap



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