FLEXHANDY

Instruction Manual

ARC
ADVANCED RADIOTECH CORPORATION

Service Information

Your New Radio Remote Control System

Thank you for your purchase of ARC Flex HANDY radio remote control system. Without a doubt, our Flex HANDY system is the ultimate solution for providing precise, undeterred, and safe control of your material.

If your product ever needs modification or service, please contact our representative in your country or at the following location:

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PRODUCT MANUAL SAFETY INFORMATION

Advanced Radiotech Corporation (ARC) offers a broad range of radio remote control product for material handling applications. This manual has been prepared by ARC to provide information and recommendations for the installation, use, operation and service of ARC's material handling products and systems (ARC Products). Anyone who uses, operates, maintains, services, installs or owns ARC Products should know, understand, and follow the instructions and safety recommendations in this manual for ARC Products.

The recommendations in this manual do not take precedence over any of the following requirements relating to cranes, hoists lifting devices or other material handling equipment which use or include ARC Products:

- Instructions, manuals, and safety warnings of the manufacturers of the equipment where the radio system is used.
- Plant safety rules and procedures of the employers and the owners of facilities where the ARC Products are being used.
- Safety standards and practices for the industries in which ARC Products are used.

This manual does not include or address the specific instructions and safety warnings of these manufacturers or any of the other requirements listed above. It is the responsibility of the owners, users and operators of the ARC Products to know, understand and follow all of these requirements. It is the responsibility of the employer to make its employees aware of all of the above listed requirements and to make certain that all operators are properly trained. **No one should use ARC Products prior to becoming familiar with and being trained in these requirements and the instructions and safety recommendations in this manual**.

WARRANTY INFORMATION

For information on ARC's product warranties, please contact ARC representative nearest to you or visit www.advanced-radiotech.com.

Table of Contents

1. Introduction

The **Flex HANDY** radio remote control systems are designed for control of industrial equipment and machinery such as electric chain hoists, winches, conveyor belts, and all other material handling equipment where wireless control is preferred.

Each **Flex HANDY** system consists of a transmitter handset and a receiver unit. Other standard-equipped accessories include transmitter lanyard, vinyl pouch, pushbutton labels, output cable, and instruction manual CD.

List of notable features include:

* **62 User-programmable Channels** – advanced synthesized RF controls with 62 built-in programmable channels set via pushbuttons and dipswitches.
* **Wireless Remote Pairing Function** – system pairing and cloning can be done easily and wirelessly.
* **Over One Million Unique Address Codes** – each and every Flex HANDY system has its own address code and serial number, never repeats.
* **Advanced Controls** – the Flex HANDY system utilizes dual advanced microprocessor controls with 32bit CRC and Hamming Code, which provide ultra fast, safe, precise, and error-free encoding and decoding.
* **Two-way Transmission** – transmitter and receiver communicate with one another for safe, precise and uninterrupted operation (e.g., receiver status feedbacks).
* **Reliable Pushbuttons** – the pushbuttons are rated for more than one million press cycles.
* **Low Power Consumption** – requires only two “AA” alkaline batteries for more than 150 hours of uninterrupted operation between replacements.
* **Durable Nylon and Fiberglass Composite Enclosures** – highly resistance to breakage and deformation even in the most abusive environments. The receiver enclosures and output cables are UL94-V0 rated.
* **Fully Sealed Enclosures** – the transmitter and receiver enclosures are IP66 rated.
* **Full Compliance** – all systems are fully complied with the FCC Part-15 Rules and European Safety Standards.
* **Other Optional Accessories and Features** – transmitter magnet mount, transmitter belt clip, transmitter waist belt, ring hook, transmitter rubber guards, charging station, miniature light and buzzer kit, external antenna kit, removable mounting bracket, and many others.

2. Radio Controlled Safety

WARNINGS and CAUTIONS

Throughout this document WARNING and CAUTION statements have been deliberately placed to highlight items critical to the protection of personnel and equipment.

WARNING – A warning highlights an essential operating or maintenance procedure, practice, etc. which if not strictly observed, could result in injury or death of personnel, or long term physical hazards. Warnings are highlighted as shown below:

CAUTION – A caution highlights an essential operating or maintenance procedure, practice, etc. which if not strictly observed, could result in damage to, or destruction of equipment, or loss of functional effectiveness. Cautions are highlighted as shown below:

WARNINGS and CAUTIONS SHOULD NEVER BE DISREGARDED.

The safety rules in this section are not intended to replace any rules or regulations of any applicable local, state, or federal governing organizations. Always follow your local lockout and tagout procedure when maintaining any radio equipment. The following information is intended to be used in conjunction with other rules or regulations already in existence. It is important to read all of the safety information contained in this section before installing or operating the Radio Control System.

2.1 CRITICAL INSTALLATION CONSIDERATIONS

WARNING

PRIOR TO INSTALLATION AND OPERATION OF THIS EQUIPMENT, READ AND DEVELOP AN UNDERSTANDING OF THE CONTENTS OF THIS MANUAL AND THE OPERATION MANUAL OF THE EQUIPMENT OR DEVICE TO WHICH THIS EQUIPMENT WILL BE INTERFACED. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

ALL EQUIPMENT MUST HAVE A MAINLINE CONTACTOR INSTALLED AND ALL TRACKED CRANES, HOISTS, LIFTING DEVICES AND SIMILAR EQUIPMENT MUST HAVE A BRAKE INSTALLED. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

AN AUDIBLE AND/OR VISUAL WARNING MEANS MUST BE PROVIDED ON ALL REMOTE-CONTROLLED EQUIPMENT AS REQUIRED BY CODE, REGULATION, OR INDUSTRY STANDARD. THESE AUDIBLE AND/OR VISUAL WARNING DEVICES MUST MEET ALL GOVERNMENTAL REQUIREMENTS. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

FOLLOW YOUR LOCAL LOCKOUT TAGOUT PROCEDURE BEFORE MAINTAINING ANY REMOTE-CONTROLLED EQUIPMENT. ALWAYS REMOVE ALL ELECTRICAL POWER FROM THE CRANE, HOIST, LIFTING DEVICE OR SIMILAR EQUIPMENT BEFORE ATTEMPTING ANY INSTALLATION PROCEDURES. DE-ENERGIZE AND TAGOUT ALL SOURCES OF ELECTRICAL POWER BEFORE TOUCH-TESTING ANY EQUIPMENT. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

THE DIRECT OUTPUTS OF THIS PRODUCT ARE NOT DESIGNED TO INTERFACE DIRECTLY TO TWO STATE SAFETY CRITICAL MAINTAINED FUNCTIONS, I.E., MAGNETS, VACUUM LIFTS, PUMPS, EMERGENCY EQUIPMENT, ETC. A MECHANICALLY LOCKING INTERMEDIATE RELAY SYSTEM WITH SEPARATE POWER CONSIDERATIONS MUST BE PROVIDED. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH OR DAMAGE TO EQUIPMENT.

2.2 GENERAL

Radio controlled material handling equipment operates in several directions. Cranes, hoists, lifting devices and other material handling equipment can be large, and operate at high speeds. Quite frequently, the equipment is operated in areas where people are working in close proximity to the material handling equipment. **The operator must exercise extreme caution at all times**. Workers must constantly be alert to avoid accidents. The following recommendations have been included to indicate how careful and thoughtful actions may prevent injuries, damage to equipment, or even save a life.

2.3 PERSONS AUTHORIZED TO OPERATE RADIO CONTROLLED CRANES

Only properly trained persons designated by management should be permitted to operate radio controlled equipment.

Radio controlled cranes, hoists, lifting devices and other material handling equipment should not be operated by any person who cannot read or understand signs, notices and operating instructions that pertain to the equipment.

Radio controlled equipment should not be operated by any person with insufficient eyesight or hearing or by any person who may be suffering from a disorder or illness, is taking any medication that may cause loss of equipment control, or is under the influence of alcohol or drugs.

2.4 SAFETY INFORMATION AND RECOMMENDED TRAINING FOR RADIO CONTROLLED EQUIPMENT OPERATORS

Anyone being trained to operate radio controlled equipment should possess as a minimum the following knowledge and skills before using the radio-controlled equipment.

The operator should:

- have knowledge of hazards pertaining to equipment operation
- have knowledge of safety rules for radio-controlled equipment
- have the ability to judge distance of moving objects
- know how to properly test prior to operation
- be trained in the safe operation of the radio transmitter as it pertains to the crane, hoist, lifting device or other material handling equipment being operated
- have knowledge of the use of equipment warning lights and alarms
- have knowledge of the proper storage space for a radio control transmitter when not in use
- be trained in transferring a radio control transmitter to another person
- be trained how and when to report unsafe or unusual operating conditions
- test the transmitter emergency stop and all warning devices prior to operation; testing should be done on each shift, without a load
- be thoroughly trained and knowledgeable in proper and safe operation of the crane, hoist, lifting device, or other material handling equipment that utilizes the radio control
- know how to keep the operator and other people clear of lifted loads and to avoid “pinch” points
- continuously watch and monitor status of lifted loads
- know and follow cable and hook inspection procedures
- know and follow the local lockout and tagout procedures when servicing radio-controlled equipment
- know and follow all applicable operating and maintenance manuals, safety procedures, regulatory requirements, and industry standards and codes

The operator shall not:

- lift or move more than the rated load
- operate the material handling equipment if the direction of travel or function engaged does not agree with what is indicated on the controller
- use the crane, hoist or lifting device to lift, support or transport people
- lift or carry any loads over people
- operate the crane, hoist or lifting device unless all persons, including the operator, are and remain clear of the supported load and any potential pinch points
- operate a crane, hoist or lifting device when the device is not centered over the load
- operate a crane, hoist or lifting device if the chain or wire rope is not seated properly in the sprockets, drum or sheave
- operate any damaged or malfunctioning crane, hoist, lifting device or other material handling equipment

- change any settings or controls without authorization and proper training
- remove or obscure any warning or safety labels or tags
- leave any load unattended while lifted
- leave power on the radio-controlled equipment when the equipment is not in operation
- operate any material handling equipment using a damaged controller because the unit may be unsafe
- operate manual motions with other than manual power
- operate radio-controlled equipment when low battery indicator is on

WARNING

THE OPERATOR SHOULD NOT ATTEMPT TO REPAIR ANY RADIO CONTROLLER. IF ANY PRODUCT PERFORMANCE OR SAFETY CONCERNS ARE OBSERVED, THE EQUIPMENT SHOULD IMMEDIATELY BE TAKEN OUT OF SERVICE AND BE REPORTED TO THE SUPERVISOR. DAMAGED AND INOPERABLE RADIO CONTROLLER EQUIPMENT SHOULD BE RETURNED TO ARC FOR EVALUATION AND REPAIR. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

2.5 TRANSMITTER UNIT

Transmitter switches should never be mechanically blocked ON or OFF. When not in use, the operator should turn the transmitter OFF. A secure storage space should be provided for the transmitter unit, and the transmitter unit should always be placed there when not in use. This precaution will help prevent unauthorized people from operating the material handling equipment.

Spare transmitters should be stored in a secure storage space and only removed from the storage space after the current transmitter in use has been turned OFF, taken out of the service area and secured.

2.6 PRE-OPERATION TEST

At the start of each work shift, or when a new operator takes control of the crane, operators should do, as a minimum, the following steps before making lifts with any crane or hoist:

Test all warning devices.

Test all direction and speed controls.

Test the transmitter emergency stop.

2.7 BATTERIES

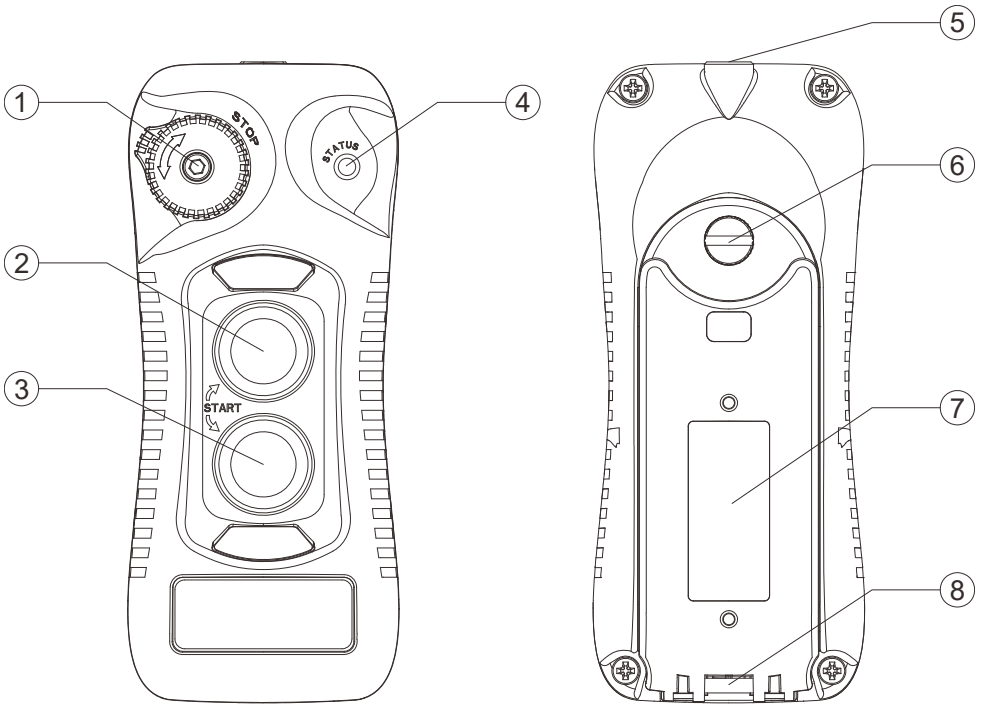
WARNING

KNOW AND FOLLOW PROPER BATTERY HANDLING, CHARGING AND DISPOSAL PROCEDURES. IMPROPER BATTERY PROCEDURES CAN CAUSE BATTERIES TO EXPLODE OR DO OTHER SERIOUS DAMAGE. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

3. General System Information

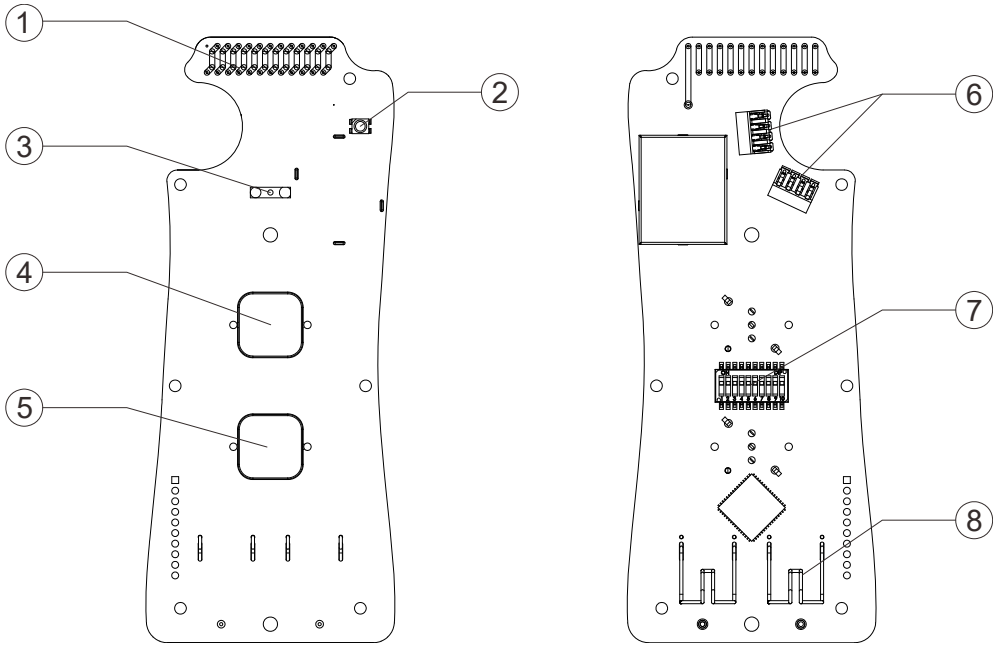
3.1 Transmitter

3.1.1 External Illustration



1. STOP Button
2. Pushbutton 1 (PB1)
3. Pushbutton 2 (PB2)
4. Status LED Indicator
5. Ring Hook Attachment Slot
6. Battery Cover Screw
7. System Information
8. Lanyard and Waist Belt Attachment Slot

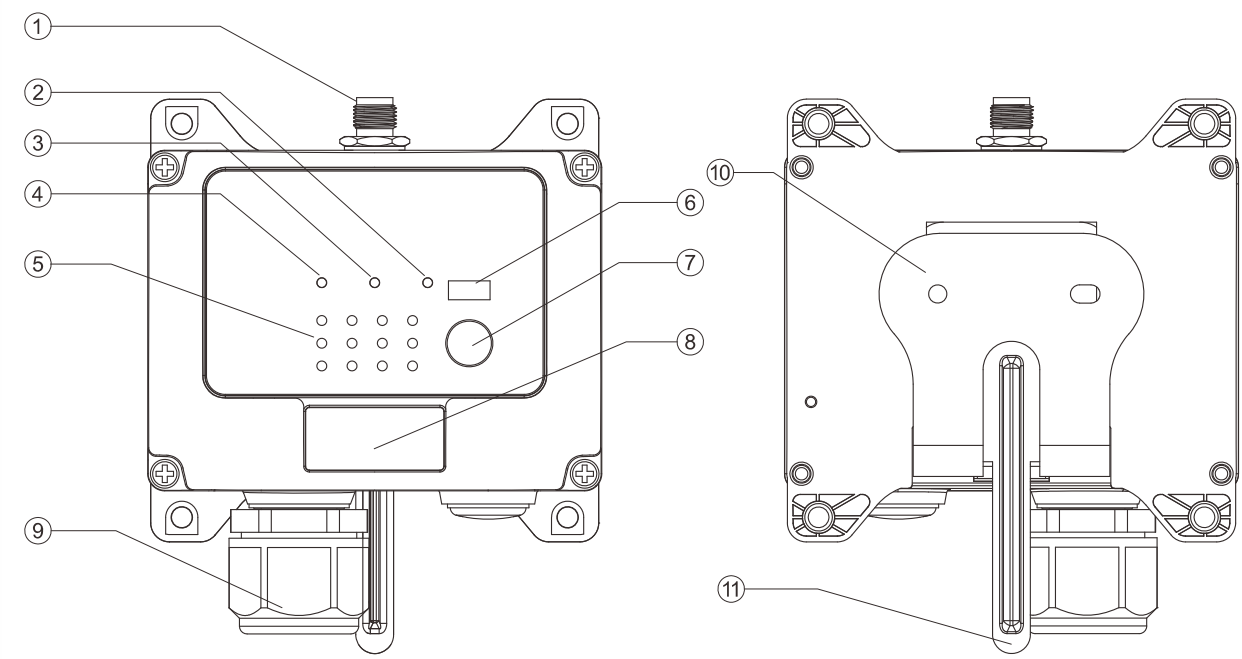
3.1.2 Internal Illustration



1. RF/Encoder Board
2. Status LED Indicator
3. Infrared Sensors
4. Pushbutton 1 (PB1)
5. Pushbutton 2 (PB2)
6. STOP Button Contacts
7. Function Dipswitch
8. Battery Contacts

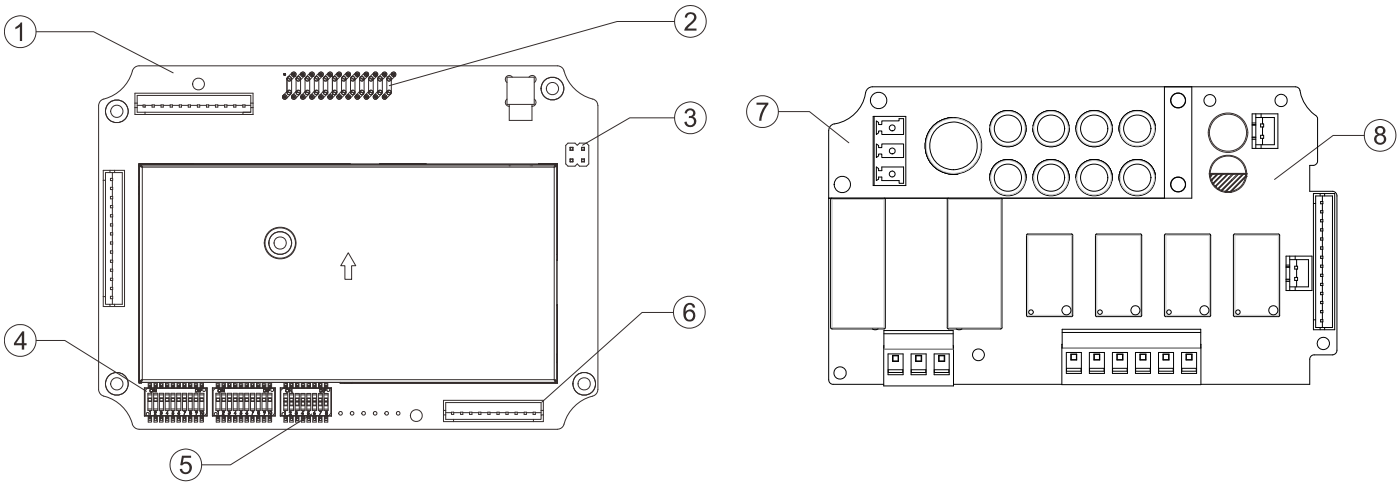
3.2 Receiver

3.2.1 External Illustration



1. External Antenna Port (optional)
2. COM LED Indicator
3. Status LED Indicator
4. Power LED Indicator
5. Output Relay LED Indicators
6. Infrared Sensors
7. Remote Pairing Button
8. System Information
9. Cord Grip
10. Mounting Bracket (optional)
11. Mounting Bracket Release

3.2.2 Internal Illustration

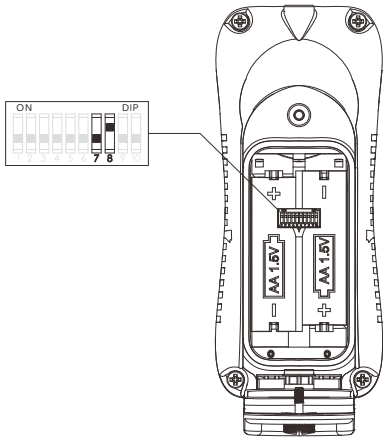


1. RF/Decoder Board
2. Internal Antenna
3. INT/EXT Antenna Jumpers
4. Function Dipswitches
5. Channel Dipswitch
6. Programming Port
7. Power Transformer
8. Relay Board

4. Function Settings

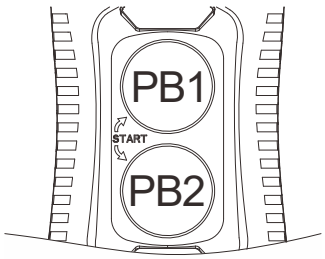
4.1 Transmitter

4.1.1 Transmitter Firmware Version



1) Press down the STOP button (transmitter power off).
2) Set dipswitch position #7 to “0” (down) and #8 to “1” (up).
3) Reset the STOP button by rotating it clockwise or counter clockwise, it will pop up (transmitter power on).
4) The Status LED displays firmware version with red, green and orange blinks.
5) Exit Firmware Version mode by resetting the dipswitch position #7 and #8 back to “00” (both down) and press down the STOP button (transmitter power off).

4.1.2 Transmitter Channel Settings



1) Press down the STOP button (transmitter power off).
2) Press and hold PB1 and PB2 at the same time.
3) Reset the STOP button by rotating it clockwise or counter clockwise, it will pop up (transmitter power on).
4) Let go PB1 and PB2 at the same time. The Status LED displays current channel setting with red and green blinks. A green blink represents the ten s (+10) and a red blink represents the units (+1). For example, 1 green blink followed by 5 red blinks is channel 15.
5) Change transmitter channel by pressing PB1 to increment the units (+1) and PB2 to increment the tens (+10). For example, press PB2 two times and then PB1 four times is channel 24 (Status LED blinks 2 greens and 4 reds). Make sure the newly selected channel is shown on the Status LED before proceeding to the next step below.
6) Transfer the newly selected channel to the receiver by press and hold both PB1 and PB2 at the same time until the Status LED turns to constant green (transfer complete). Press down the STOP button if constant green is not shown on the Status LED after more than 10 seconds (transfer incomplete); the transmitter will revert back to its previous channel setting. Make sure the receiver power is turned on and within the operating distance during the entire process. **Skip step 6 if changing receiver channel is not required.**
7) Exit Channel Setting mode by pressing down the STOP button (transmitter power off).

Note: *When selecting a new channel, make sure each button press does not exceed 3 seconds.*

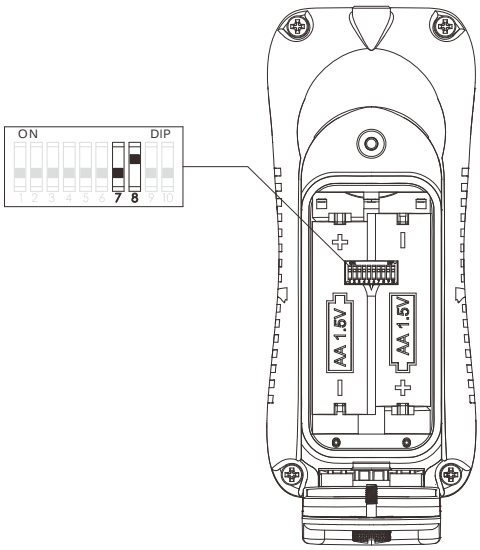
Important Note:

Step 6 illustrated above is strictly required if you are intending to change the entire system channel (both transmitter and receiver). The entire system no longer works if step 6 is skipped because the transmitter and receiver channels are now different (new vs. old). In this case you would have to redo step 1~4 and step 6 to transfer the newly selected transmitter channel to the receiver.

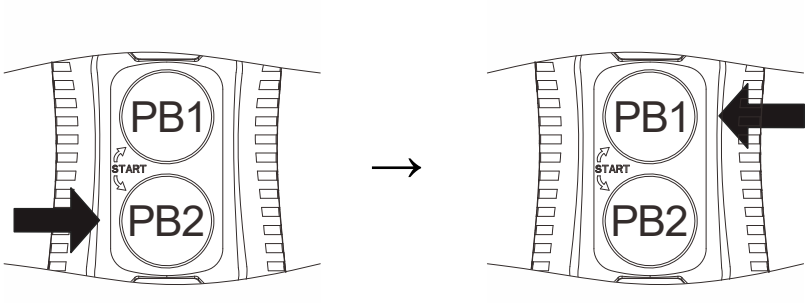
4.1.3 Remote Pairing

A. Transmitter-to-Transmitter Pairing:

1) Press down the STOP button (transmitter power off).
2) Set dipswitch position #7 to “0” (down) and #8 to “1” (up).



3) Reset the STOP button by rotating it clockwise or counter clockwise, it will pop up (transmitter power on).
4) The Status LED displays firmware version with red, green and orange blinks.
5) Output data (original transmitter) by press and hold PB2 (Status LED off).
6) Receive data (new transmitter) by press and hold PB1 (Status LED blinks green).
7) When the Status LED (receiving data end) turns to constant green while both pushbuttons are still pressed down, the pairing is completed.
8) Exit Remote Pairing mode by resetting the dipswitch position #7 and #8 back to “00” (both down) and press down the STOP button (transmitter power off).



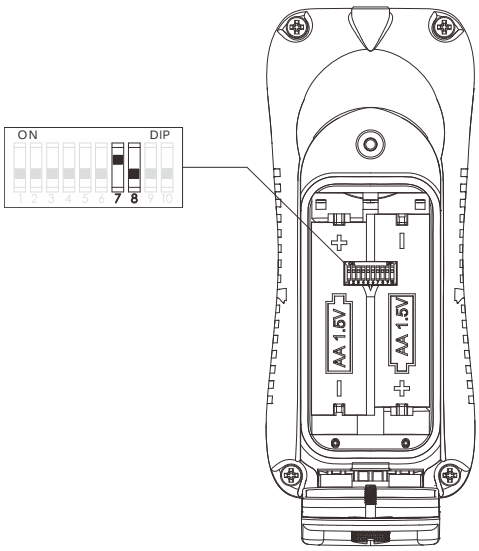
Output data – original transmitter
(press and hold PB2)

Receive data – new transmitter
(press and hold PB1)

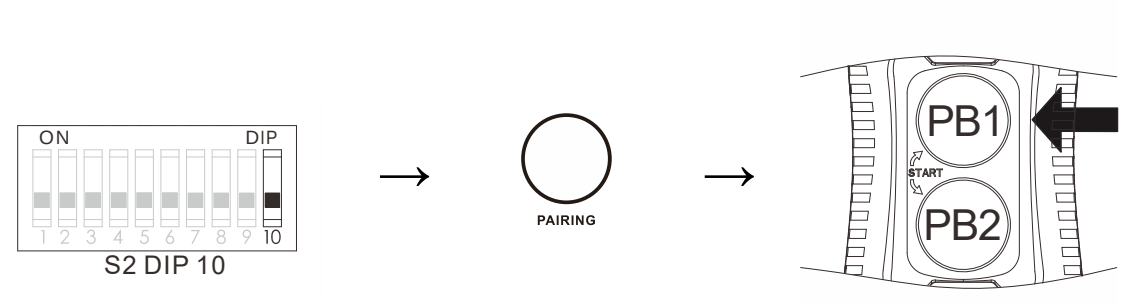
Note: *During remote pairing make sure the distance between the two transmitters is within 1 meter.*

B. Receiver-to-Transmitter Pairing **(Press PAIRING button required):**

1) Press down the STOP button (transmitter power off).
2) Set dipswitch position #7 to “1” (up) and #8 to “0” (down).



3) Reset the STOP button by rotating it clockwise or counter clockwise, it will pop up (transmitter power on).
4) The Status LED displays firmware version with red, green and orange blinks.
5) S2 dipswitch position #10 in receiver set to “0” (down).
6) Output data by press and hold the PAIRING button on receiver.
7) Receive data by press and hold PB1 on the transmitter (Status LED blinks green).
8) When the transmitter Status LED (receiving data end) turns to constant green while both pushbuttons are still pressed down, the pairing is completed. During pairing process, the receiver MAIN relays must be deactivated (relay open).
9) Exit Remote Pairing mode by resetting the transmitter dipswitch position #7 and #8 back to “00” (both down) and press down the STOP button (transmitter power off).

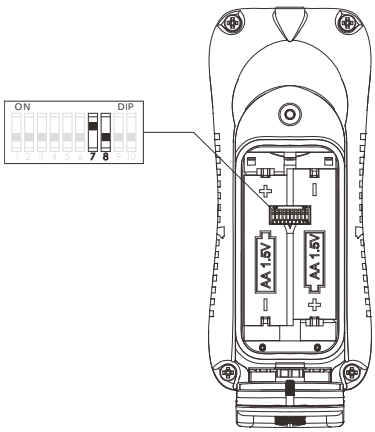


S2 dipswitch position 10 set to “0”

Output data – receiver
(press and hold the Pairing button)

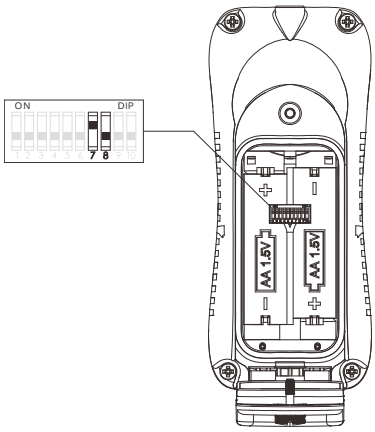
Receiving data – transmitter
(press and hold PB1)

C. Receiver-to-Transmitter Pairing **(Press PAIRING button not required):**

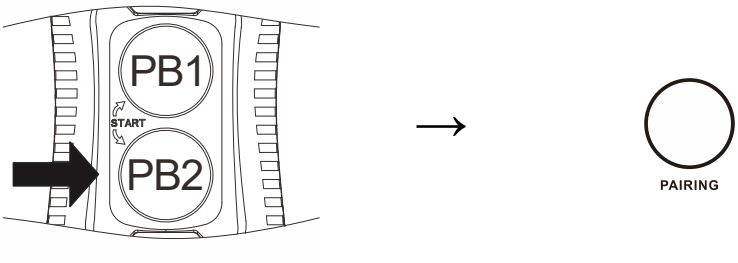


1) Press down the STOP button (transmitter power off).
2) Set dipswitch position #7 to “1” (up) and #8 to “0” (down).
3) Reset the STOP button by rotating it clockwise or counter clockwise, it will pop up (transmitter power on).
4) The Status LED displays firmware version with red, green and orange blinks.
5) S2 dipswitch position #10 in receiver set to “1” (up).
6) Receive data by press and hold PB1 on the transmitter (Status LED blinks) until the Status LED turns to constant green, the pairing is completed.
7) Make sure the pairing process is executed within distance of 10 meters from one another and no other active receivers nearby. During pairing process, the receiver MAIN relays must be deactivated (relay open).
8) Exit Remote Pairing mode by resetting the transmitter dipswitch position #7 and #8 back to “00” (both down) and press down the STOP button (transmitter power off).

D. Transmitter-to-Receiver Pairing **(Press PAIRING button required):**



1) Press down the STOP button (transmitter power off).
2) Set dipswitch position #7 to “1” (up) and #8 to “0” (down).
3) Reset the STOP button by rotating it clockwise or counter clockwise, it will pop up (transmitter power on).
4) The Status LED displays firmware version with red, green and orange blinks.
5) Output data by press and hold PB2 on the transmitter (Status LED off)
6) Receive data by press and hold the PAIRING button on receiver.
7) When the transmitter Status LED turns to constant green while both pushbuttons are still pressed down, the pairing is completed. During pairing process, the receiver MAIN relays must be deactivated (relay open).
8) Exit Remote Pairing mode by resetting the transmitter dipswitch position #7 and #8 back to “00” (both down) and press down the STOP button (transmitter power off).



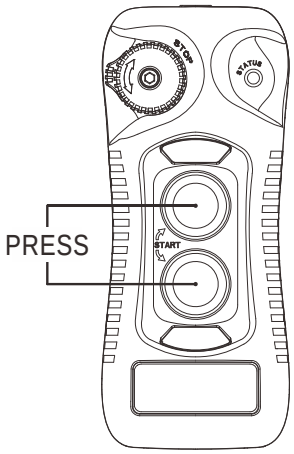
Output data – transmitter
(press and hold PB2)

Receiving data – receiver
(press and hold the Pairing button)

4.1.4 Transmitter Start Function Settings

4.1.4.1 During Initial Transmitter Power On

When transmitter is powered on (Stop button elevated), press both PB1 and PB2 at the same time or any pushbutton to activate the receiver (MAIN relays closed).



	Dipswitch Settings	Function
1	Xxxxxxxx**0**x	PB1 + PB2 Activation
2	xxxxxxxx**1**x	Any Pushbutton Activation

** When set to any pushbutton activation, the system startup time is 3 seconds after transmitter power on (Stop button elevated). Pressing any pushbutton within this 3-sscond startup time is ineffective.*

4.1.4.2 During Sleep Mode

When transmitter goes into sleep mode the system is temporarily deactivated (MAIN relays opened). Press both PB1 and PB2 at the same time or any pushbutton to wake up the system (MAIN relays closed).

	Dipswitch Settings	Function
1	xxxxxxxxx**0**	PB1 + PB2 Reactivation
2	xxxxxxxxx**1**	Any Pushbutton Reactivation

4.1.5 Transmitter Inactivity Timer Settings

Set how long the system enters the sleep mode when the transmitter is not in use (pushbutton not pressed). When transmitter goes into sleep mode the receiver MAIN relays are deactivated.

	Dipswitch Settings	Time		Dipswitch Settings	Time
1	xxx**000**xxxx	1 minute	**5**	xxx**100**xxxx	10 minutes
2	xxx**001**xxxx	20 seconds	**6**	xxx**101**xxxx	30 minutes
3	xxx**010**xxxx	3 minutes	**7**	xxx**110**xxxx	60 minutes
4	xxx**011**xxxx	5 minutes	**8**	xxx**111**xxxx	Constant On (sleep mode disabled)

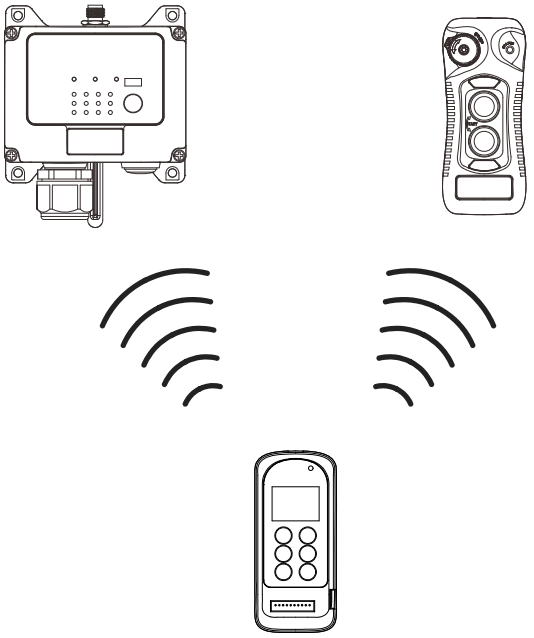
4.1.6 Transmitter Output Power Settings

1mW offers the shortest operating range with lowest battery consumption while 10mW offers the longest operating range with highest battery consumption (manufacture preset at 2mW).

	Dipswitch Settings	Output Power		Dipswitch Settings	Output Power
1	**000**xxxxxxx	1mW	**5**	**100**xxxxxxx	5mW
2	**001**xxxxxxx	2mW	**6**	**101**xxxxxxx	6mW
3	**010**xxxxxxx	3mW	**7**	**110**xxxxxxx	8mW
4	**011**xxxxxxx	4mW	**8**	**111**xxxxxxx	10mW

4.1.7 Infrared Programming

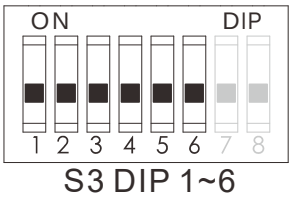
Other custom functions and settings not listed in this manual can be programmed via the infrared IR programmer unit, such as the system serial number, frequency range, new and updated functions, plus many others. Please contact ARC representative for more details.

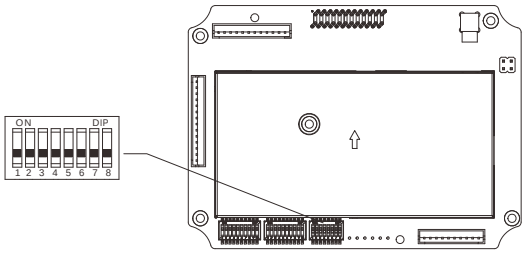


4.2 Receiver

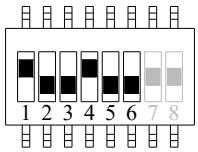
4.2.1 Receiver Channel Settings

Set the receiver channel by configuring the S3 channel dipswitch located on the RF/decoder board, only the first 6 dip positions are used for channel programming. The system channels table on section 4.2.7 illustrates which dipswitch setting corresponds to which channel. Once the receiver channel is altered, do make sure to change the transmitter channel as well. The channel on both transmitter and receiver must be identical in order for the system to work (refer to section 4.1.2 Transmitter Channel Settings).





Example:



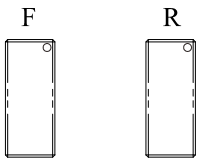
Top position → “1”
Bottom position → “0”

*The above dipswitch setting **“1 0 0 1 0 0”** corresponds to “channel 36” in the system channels table on section 4.2.7.*

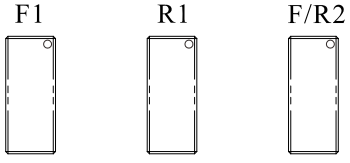
4.2.2 Output Relay Configurations

4.2.2.1 Output Relay Types

1. **2 output relays per motion – single speed only**
   Output relays with Forward (F) and Reverse (R) 1st speed only.

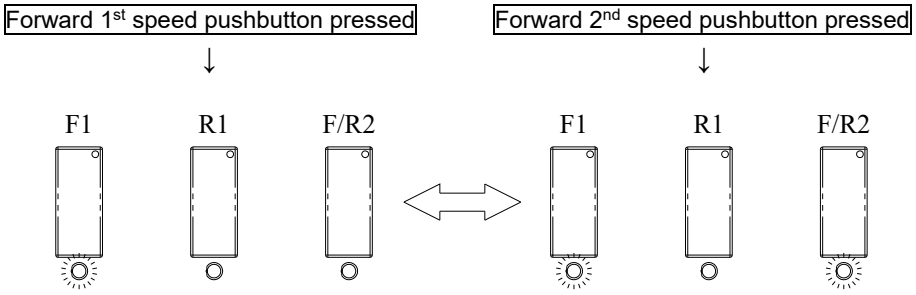


2. **3 output relays per motion – shared 2nd speed output relay**
   Output relays with Forward 1st speed (F1), Reverse 1st speed (R1) and Forward/Reverse 2nd speed (F/R2). Forward and Reverse 2nd speed (F/R2) shared the same output relay.



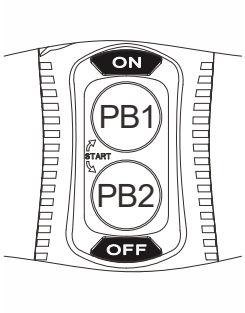
4.2.2.2 Output Relay Actions at 2nd Speed

1. **3 output relays configuration with Closed/Closed contact at 2nd speed**
   F1 (or R1) output relay closed at 1st speed and F1 + F/R2 (or R1 + F/R2) output relays closed at 2nd speed. Refer to section 4.2.3.1 on how to set to this function.



4.2.2.3 ON/OFF Pushbutton Function

The user can set the two pushbuttons on the transmitter to behave like a mechanical ON & OFF rocker or toggle switch. ON output relay closes when ON pushbutton is pressed (OFF output relay opens) and OFF output relay closes when OFF pushbutton is pressed (ON output relay opens). Refer to section 4.2.3.1 on how to set to this function.



4.2.2.4 Magnet ON/OFF Pushbutton Function

The user can set the two pushbuttons on the transmitter to control industrial magnet lift. Activate the magnet by pressing the Magnet ON pushbutton. Deactivate the magnet by first press and hold the Magnet ON pushbutton and then press the Magnet OFF pushbutton. Pressing the Magnet OFF pushbutton alone is unable to deactivate the magnet. Refer to section 4.2.3.1 on how to set to this function.

4.2.2.5 Brake Function

When the transmitter pushbutton is released from 2nd speed up to 1st speed, both 1st and 2nd speed output relays will open for up to 1 second and then with 1st speed output relay closed thereafter. Refer to section 4.2.3.1 on how to set to this function.

4.2.2.6 External Warning Function

The user can install an external warning device (rotating lights, horn, etc…) to the K10 Function output relay located inside the receiver. Press the pushbutton will trigger the external warning device. Refer to section 4.2.3.1 on how to set to this function.

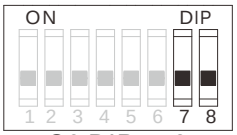
4.2.2.7 Momentary Contact

When pushbutton is released, the corresponding output relay will open or deactivate. This type of relay action usually applies to external applications such as horn and buzzer. Refer to section 4.2.3.2 on how to set to this function.

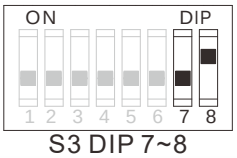
4.2.2.8 Toggled Contact

When pushbutton is released, the corresponding output relay will maintain contact or closure until next time the user presses the same pushbutton again. This type of relay action usually applies to external application such as lights. Refer to section 4.2.3.2 on how to set to this function.

4.2.2.9 Receiver Channel Scanning Function

(1) 

S3 DIP 7~8 → “00” manufacture preset (channel X)

(2) 

S3 DIP 7~8 → “01” scans 2 channels (channel X and channel X+1)

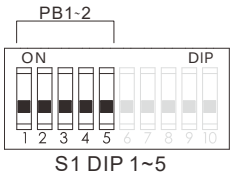
** Channel X → channel set on the Channel dipswitch.*

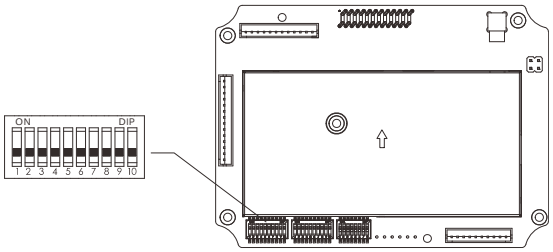
Example: *If the first 6 dipswitch positions are set to channel 01 (000001), when set to 2-channel scanning (type-2 above) the receiver will only scan channel 01 and 02.*

4.2.3 Dipswitch Settings

4.2.3.1 Interlocked Pushbutton Pair

Interlocked means the two pushbuttons cannot be pressed simultaneously at the same time as it will cancel each other out. Interlocked setting usually applies to electric motor's forward & reverse motion and On & Off switches. Five dip positions correspond to a pushbutton pair.



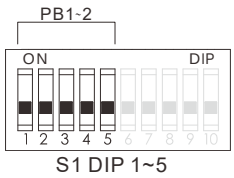


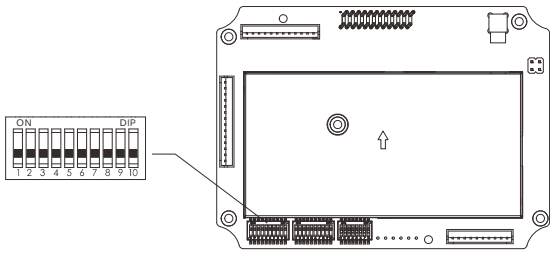
Dip Settings	Function
00000	Single speed only
00001	3 output relays Closed/Closed relay action at 2nd speed (shared 2nd speed output relay)
00010	On (PB1) & Off (PB2)
00011	Magnet Lift On (PB1) & Off (PB2)
00100	On (PB1) & Off (PB2) (EMS → all relays deactivate when STOP button is pressed)
00110	FWD toggle (PB1) / REV toggled (PB2)
00111	FWD toggle (PB1) / REV toggled (PB2) (EMS → all relays deactivate when STOP button is pressed)
01000	Single speed + External warning*
01001	3 output relays Closed/Closed relay action + External warning*
01010	3 output relays Closed/Closed relay action + Brake
01011	3 output relays Closed/Closed relay action + Brake + External warning*

* *External warning function requires installing an external warning device such as horn and lights to the K10 Function output relay.*

4.2.3.2 Non-Interlocked Pushbutton Pair

Non-interlocked setting allows the two pushbuttons be pressed simultaneously. Five dip positions correspond to a pushbutton pair.

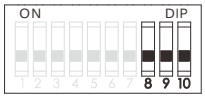




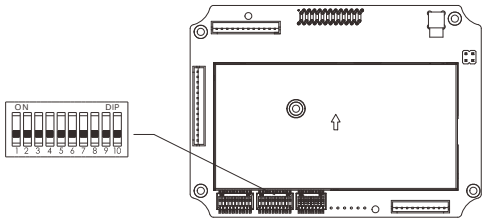
Dip Settings	PB2	PB1
10000	Normal	Normal
10001	Normal	Toggle
10010	Normal	Toggle (EMS)
10100	Toggle	Normal
10101	Toggle	Toggle
10110	Toggle	Toggle (EMS)
11000	Toggle (EMS)	Normal
11001	Toggle (EMS)	Toggle
11010	Toggle (EMS)	Toggle (EMS)

** EMS → all relays deactivate when STOP button is pressed*

4.2.4 Other Dipswitch Settings



S2 DIP 8~10



S2 Dip Position 8	Function
Dip set to “1” or up	Display system firmware version
S2 Dip Position 9	**Function**
Dip set to “1” or up	System testing (receiver MAIN relays disabled)
S2 Dip Position 10	**Function**
Dip set to “0” or down	Receiver-to-transmitter remote pairing (pressing the Pairing button required)
Dip set to “1” or up	Receiver-to-transmitter remote pairing (pressing the Pairing button not required)

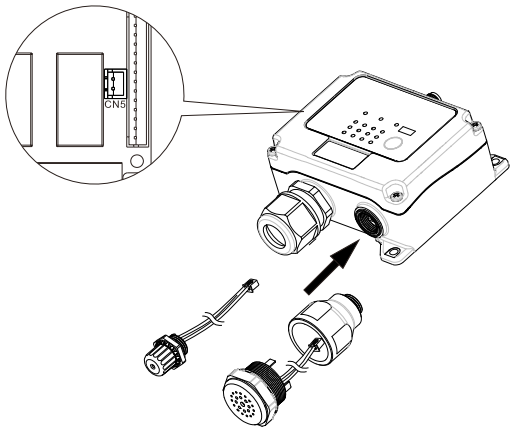
4.2.5 Other Function Output Relay Settings

Listed below are other types of functions that can be outputted through the K10 and CN5 Function outputs via the infrared IR programmer unit. Please contact ARC representative for more details.

LV	:	Function relay closes when receiver voltage is low.
ID	:	Function relay works simultaneously with all motion commands.
EXT	:	Function relay works simultaneously with the receiver MAIN relays.
HORN	:	Function relay closes for up to 3 seconds when START command is initiated during transmitter startup.
RESET	:	Function relay closes when START command is initiated and opens when let go. Works during initial transmitter startup and inactivity timer START reset.

4.2.6 Indicator Light and Buzzer Installation

The indicator light or the buzzer can be easily fitted onto the receiver enclosure. The indicator light or the buzzer works simultaneously with the receiver MAIN relays. The indicator light or the buzzer is connected to the CN5 port located inside the receiver. Please contact ARC representative if you would like this indicator light work differently than described above.



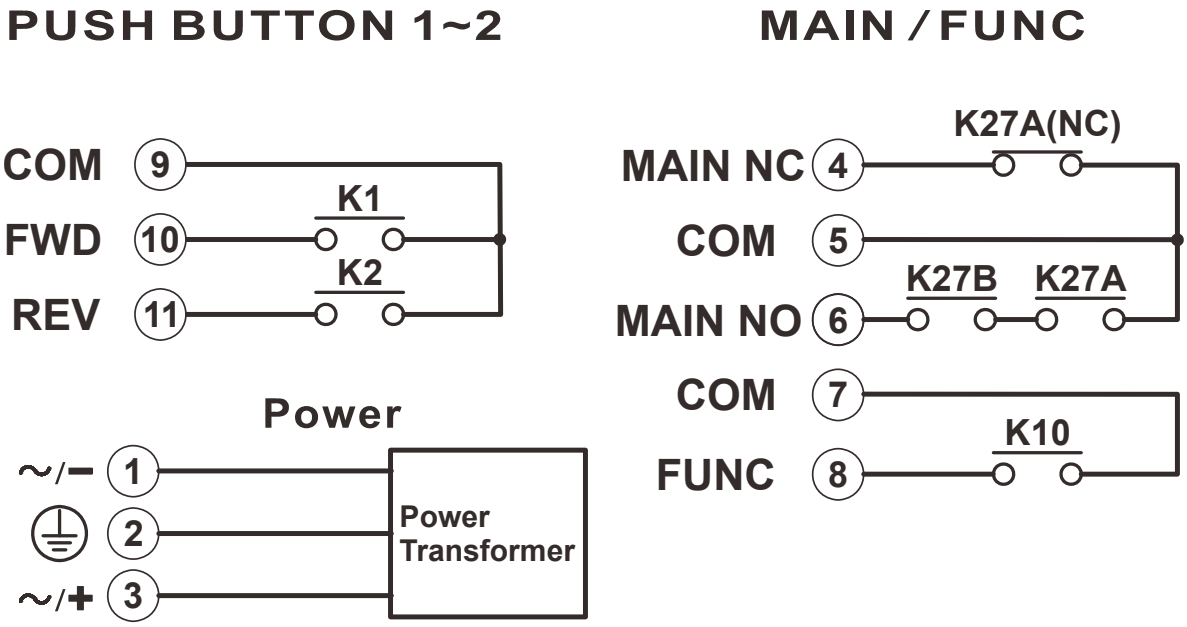
4.2.7 System Channels Table

Channel	Dipswitch Setting	Channel	Dipswitch Setting
01	000001	**32**	100000
02	000010	**33**	100001
03	000011	**34**	100010
04	000100	**35**	100011
05	000101	**36**	100100
06	000110	**37**	100101
07	000111	**38**	100110
08	001000	**39**	100111
09	001001	**40**	101000
10	001010	**41**	101001
11	001011	**42**	101010
12	001100	**43**	101011
13	001101	**44**	101100
14	001110	**45**	101101
15	001111	**46**	101110
16	010000	**47**	101111
17	010001	**48**	110000
18	010010	**49**	110001
19	010011	**50**	110010
20	010100	**51**	110011
21	010101	**52**	110100
22	010110	**53**	110101
23	010111	**54**	110110
24	011000	**55**	110111
25	011001	**56**	111000
26	011010	**57**	111001
27	011011	**58**	111010
28	011100	**59**	111011
29	011101	**60**	111100
30	011110	**61**	111101
31	011111	**62**	111110

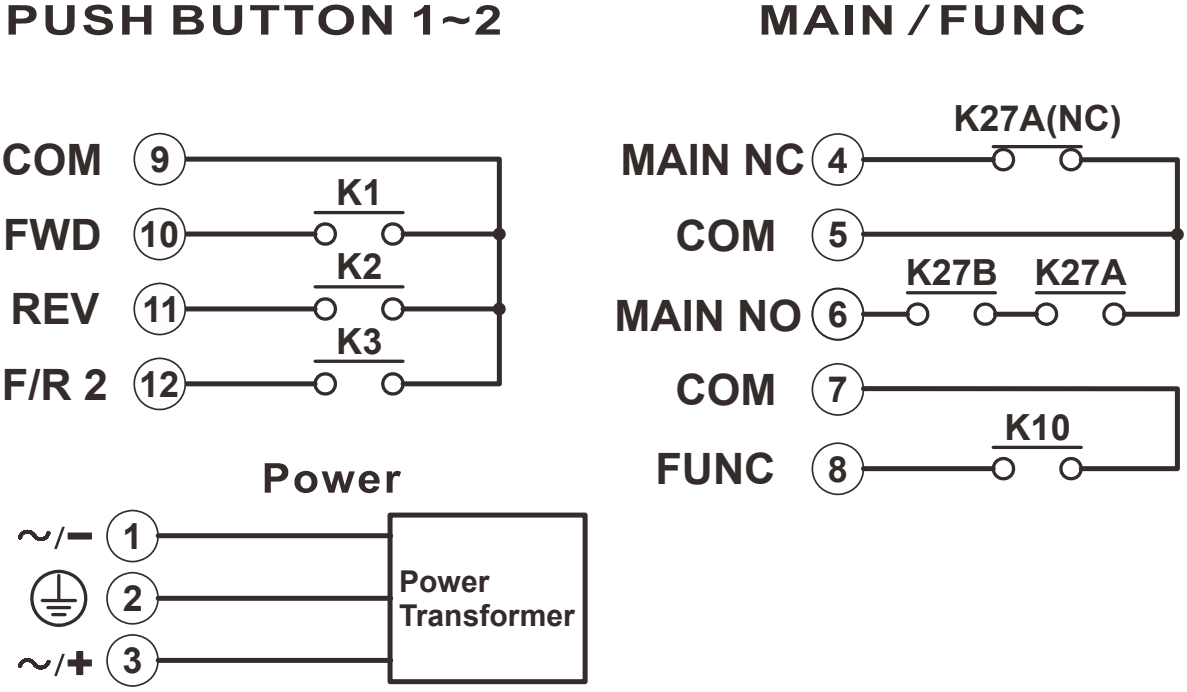
5. Receiver Installation

5.1 Output Relay Contact Diagrams

Flex HANDY 2S (single-speed model)



Flex HANDY 2X (dual-speed model)

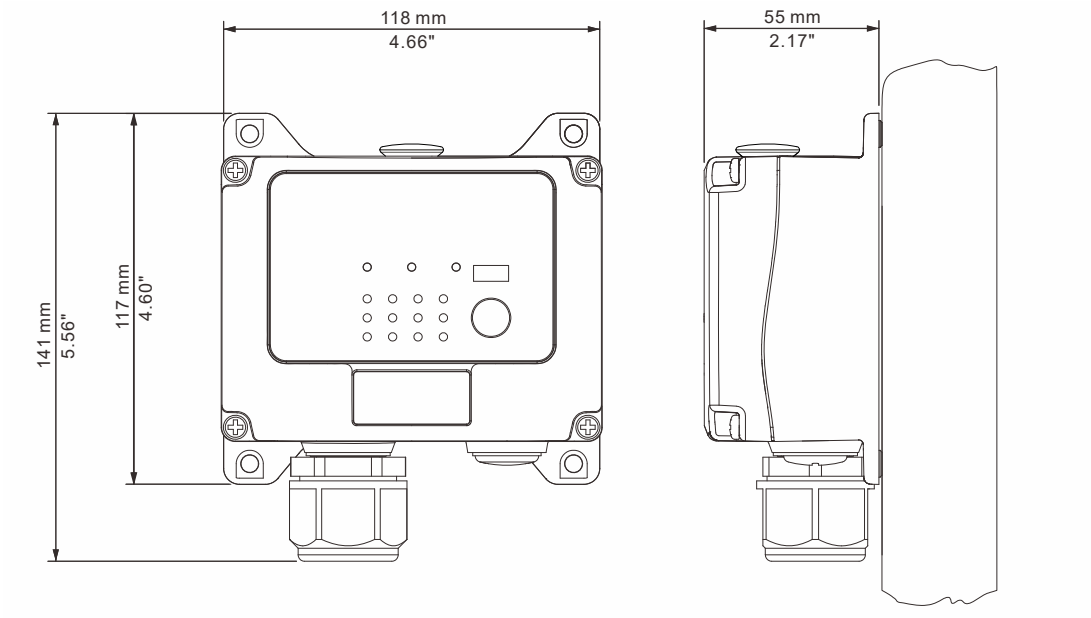


** For 9~36VDC power supply, wire #1 corresponds to the negative charge (-) and wire #3 corresponds to the positive charge (+). Wire #2 or green/yellow wire is for AC ground.*

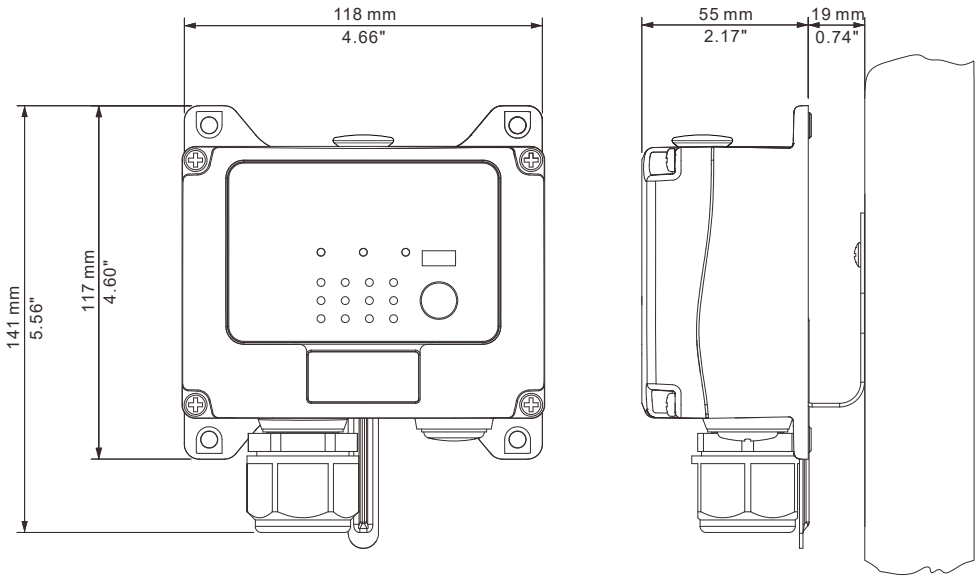
5.2 Pre-installation Precautions

1. Make sure the transmitter and receiver are with identical serial number and channel.
2. Make sure the receiver is not set to the same channel as any other systems in use in the surrounding area.
3. Make sure the hoist or equipment is working properly prior to installation.
4. Make sure the power source to the receiver is set correctly.
5. Switch off the main power source to the hoist or equipment prior to installation.

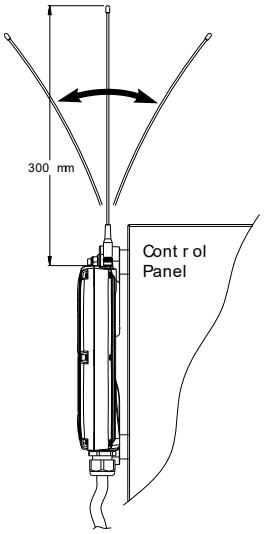
5.3 Step-By-Step Installation

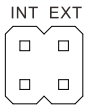


With Optional Removable Mounting Bracket

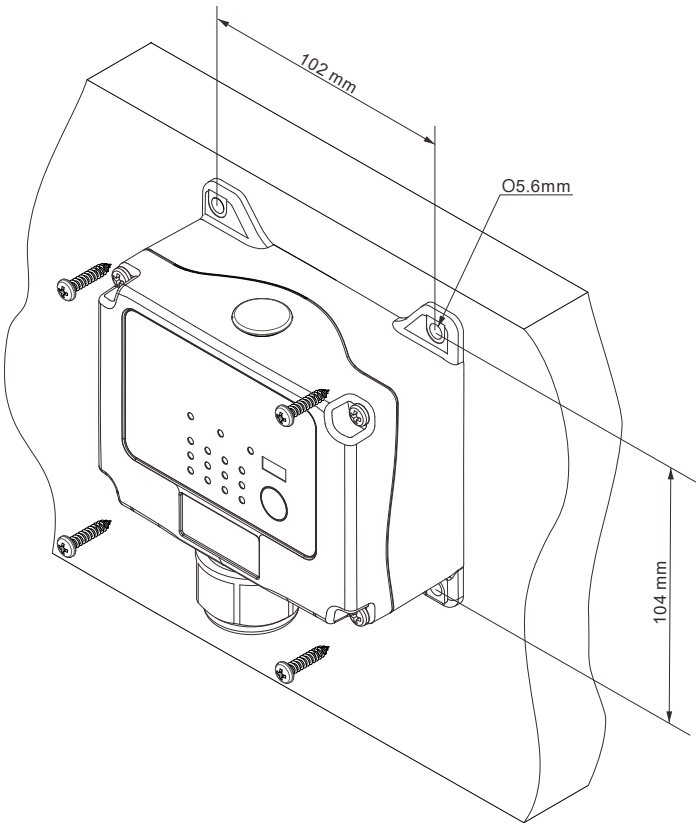


1. For best reception the location of the receiver should be visible to the operator at all time.
2. The location selected should not be exposed to high levels of electric noise. Mounting the receiver next to an unshielded variable frequency drive may cause radio interference. Always locate the receiver as far away from variable frequency drive and electric motor as possible.
3. Ensure the selected location has adequate space to accommodate the receiver. If an external antenna is used, to avoid the possibility of antenna damage always locate the receiver where the antenna is free from any obstacles.
4. When installing an external antenna make sure the MCX jack located on the RF/decoder board inside the receiver is connected and jumper set to “EXT” position.



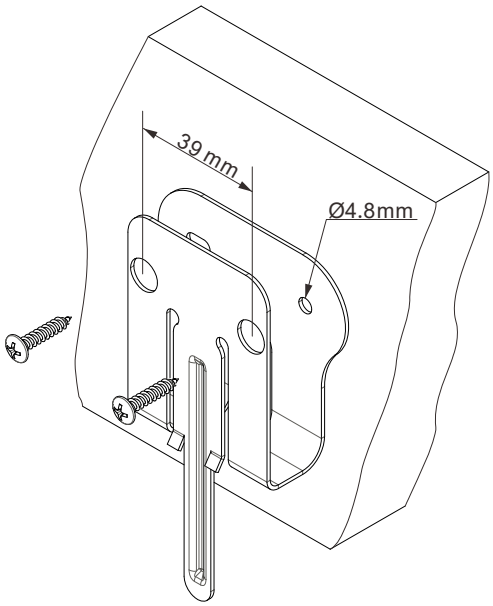


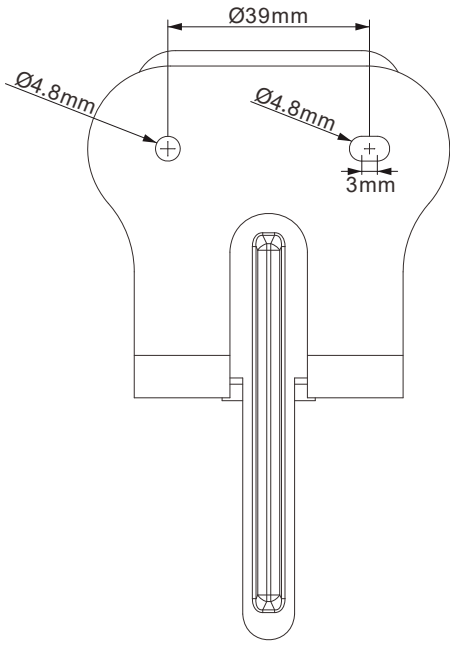
5. For better reception, make sure the receiver is in an upright position.
6. Drill four holes on the control panel, wall or location where the receiver is to be installed.
7. Make sure the screws are tightened after installation (not provided with the system).



With Optional Removable Mounting Bracket

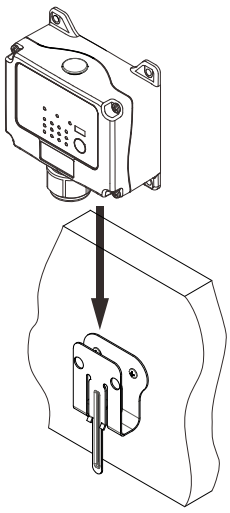
1. Drill two holes on the control panel, wall or location where the receiver is to be installed.



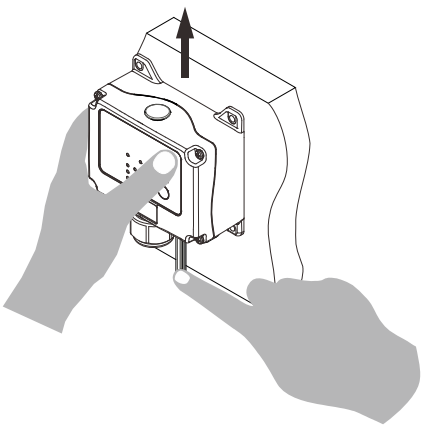


2. Slide down the receiver along the guided track to secure the receiver to the mounting bracket.
3. Remove the receiver by pressing down the bracket release and pull the receiver upward until it clears the guided track.

Install



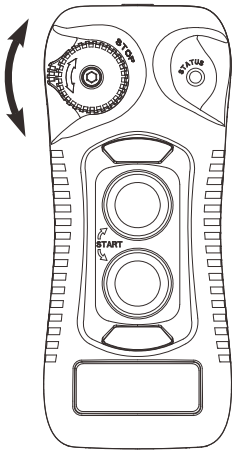
Remove



6. Operating Procedures

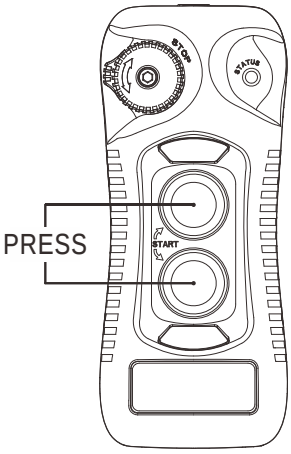
6.1 General Operation

a. Reset the STOP button located on the top left-hand corner of the transmitter by rotating it clockwise or counter clockwise, the button will pop up. Transmitter is powered on when the STOP button is elevated.



b. After turning on the transmitter power, check the Status LED on the transmitter for any sign of system irregularities (refer to section 6.3.1 Transmitter Status Indications). If the transmitter is in good working order the Status LED will display constant green for up to 2 seconds at power on (no faults detected).

c. Press and hold both PB1 & PB2 pushbuttons at the same time for up to 1 second to activate the receiver MAIN relays (Status LED constant green). When the receiver MAIN relays are activated the Status LED will change from constant green to constant orange (system on). Then press any pushbutton on the transmitter to begin operation. Pressing any pushbutton prior to executing the START command at startup will result in no signals transmitted (Status LED blinks orange). Refer to section 4.1.4 Start Function Settings to cancel START activation.



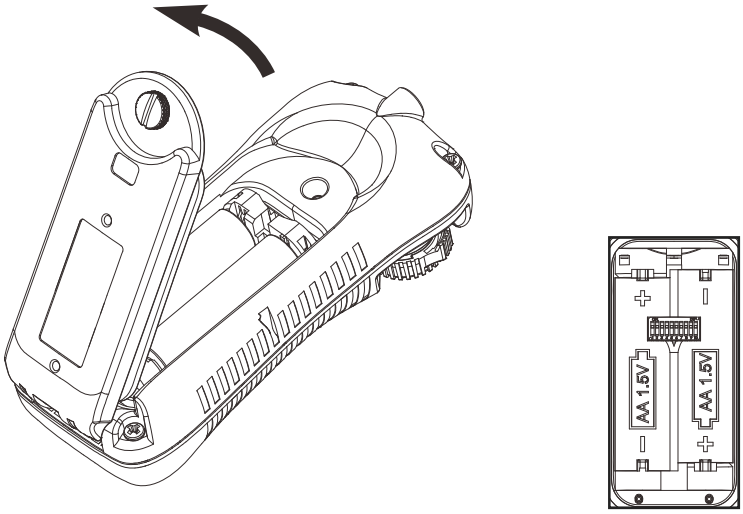
d. In case of an emergency, press down the STOP button to disconnect the receiver MAIN relays and the transmitter power (Status LED blinks 3 reds and then shuts off). To resume operation, rotate the STOP button clockwise or counter clockwise, the button will pop up. Then press and hold both PB1 & PB2 pushbuttons at the same time for up to 1 second to reconnect the receiver MAIN relays. Refer to section 4.1.4 Start Function Settings to cancel START activation.

e. After 5 or 30 minutes of inactivity (pushbutton not pressed) the receiver MAIN relays are temporarily disconnected (refer to section 4.1.5 Inactivity Timer Settings). The Status LED blinks 3 reds and then shuts off. Press any pushbutton to resume operation (refer to section 4.1.4 Start Function Settings).

f. Turn off the transmitter power by pressing down the STOP button, it will disconnect the transmitter power and the receiver MAIN relays altogether (Status LED blinks 3 reds and then shuts off).

6.2 Changing Batteries

Changing transmitter batteries (“AA” alkaline battery x 2) by unscrewing the battery cover located on the backside of the transmitter. During battery installation make sure the batteries are installed correctly, with “+” to “+” charge and “–” to “–” charge. Also make sure the screw is tightened after battery installation to avoid water, moisture, dirt, grease, and other liquid penetration. ***Please refer to the charging station instruction manual if this system is equipped with one.***



6.3 System Status Light Indications

6.3.1 Transmitter Status Indications

Type	Display Type	Indication
1	Constant red	Voltage below 1.8V at initial power on or during operation
2	Constant red → 3 red blinks → off	Voltage below 1.75V during operation (receiver MAIN relays shut off)
3	1 red blink followed by a 2-second pause	Voltage below 1.85V during operation (change batteries suggested)
4A	2 red blinks followed by a 2-second pause	Defective or jammed pushbutton detected at initial power on
4B	No light displayed	When defective pushbutton condition occurs (2 red blinks, type 4A above), find out which pushbutton is defective by pressing all of them one at a time. If the pushbutton is in good working order when pressed, the Status LED is off. If the Status LED maintained 2 red blinks, then the pushbutton is defective.
5	4 red blinks followed by a 2-second pause	Transmitter is unable to lock onto the assigned channel
6	Constant green for up to 2 seconds	Transmitter power on with no faults detected
7	Blinking green	Transmission in progress
8	Blinking orange	Pressing any pushbutton prior to executing the START command at power on
9	3 slow red blinks → off	STOP button pressed down
10	2 orange blinks followed by a 2-second pause	Receiver MAIN relays jammed or defective
11	3 orange blinks followed by a 2-second pause	Decoding processors defective
12	Constant orange when the START button is pressed and hold at initial system startup	Receiver MAIN relays activated

6.3.2 Receiver Status Indications

Type	Display Type (Green & Red)	Indication
1	Fast green blinks	Decoding in process
2	Slow green blinks	Decoding on standby
3	2 red blinks	Receiver MAIN relays jammed or defective
4	3 red blinks	Decoding processors defective
5	4 red blinks	Receiving RF defective
6	Fast red blinks	Incorrect transmitter serial number
7	Constant red	Receiver low voltage
8	No light displayed	Decoding processors defective
9	3 slow red blinks followed by slow green blinks	STOP button pressed down

6.3.3 Receiver Power Indications

Type	Display Type (Red)	Indication
1	On	Power to receiver
2	Off	No power to receiver

6.3.4 Receiver COM Indications

Type	Display Type (Red)	Indication
1	On	Power to relay Board
2	Off	No power to relay board

7. General Specifications

Frequency Range	:	433.050MHz ~ 434.575MHz 480.050MHz ~ 481.575MHz
Number of Channels	:	62 channels
Channel Spacing	:	25 KHz
Modulation	:	Digital Frequency Modulation based on Manchester Code, 20bit address, 32bit CRC and Hamming Code.
Encoder & Decoder	:	Microprocessor-controlled
Transmitting Range	:	＞100 Meters (300 feet)
Hamming Distance	:	＞6
Frequency Control	:	Synthesized PLL
Receiver Type	:	Frequency Auto Scanning
Receiver Sensitivity	:	-116dBm
Spurious Emission	:	-50dB
Antenna Impedance	:	50 ohms
Responding Time	:	40mS (average)
Transmitting Power	:	2.0mW
Enclosure Type	:	NEMA4
Enclosure Rating	:	IP66
Output Contact Rating	:	250V @ 6 Amps
Transmitter Operating Voltage	:	3.0VDC
Receiver Power Consumption	:	7VA (max)
Available Receiver Voltages	:	9~36VDC 24~48VAC 48~440VAC
Operating Temperature	:	-25°C ~ 75°C / -13°F ~ 167°F
Transmitter Dimension	:	130mm (L) x 55mm (W) x 40mm (H)
Receiver Dimension	:	120mm (L) x 90mm (W) x 55mm (H)
Transmitter Weight	:	183g / 6.4oz (include batteries)
Receiver Weight	:	900g / 2.0lb (include output cable)

CE EU Declaration of Conformity CE
(RED, LVD & Machinery)

For the following equipment:

Product	:	Flex Handy Series Radio Remote Control System
Multiple Listee Model No.	:	Flex Handy 2S and Flex Handy 2X
Manufacturer's Name	:	Advanced Radiotech Corporation
Manufacturer's Address	:	No.3, South 1st Road, Chien Chen District, Kaohsiung, Taiwan

We hereby declare, that all major safety requirements, concerning the CE Mark Machinery Directive 2006/42/EC, Low Voltage Directive 2014/35/EU (LVD) and Radio Equipment Directive of 2014/53/EU (RED) are fulfilled, as laid out in the guideline set down by the member states of the EEC Commission.

The standards relevant for the evaluation of the electrical safety requirements are as follow:

RED (EMC)	:	EN 301 489-1 V2.2.0 + EN 301 489-3 V2.1.1
RED (RF)	:	EN 300 220-1 V3.1.1 + EN 300 220-2 V3.1.1
LVD	:	EN 60950:2006+A1+A11+A12
MACHINERY	:	EN 60204-32:2008, EN ISO 13849-1:2015 (PLd) EN 13557:2003+A2:2008
OTHERS	:	EN 60529 (IP66), EN 62479, EN 55032 + EN 55024

Test reports issued by:

RED (EMC)	:	SGS
RED (RF)	:	SGS
LVD	:	SGS
MACHINERY	:	SGS
OTHERS	:	SGS

Person responsible for making this declaration:

Tom Jou / President

Name and signature of authorized person