

# ***FLEX******HANDY***

## Instruction Manual



# 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](http://www.advanced-radiotech.com).

## FCC WARNINGS and CAUTIONS

- This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
  - Reorient or relocate the receiving antenna.
  - Increase the separation between the equipment and receiver.
  - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
  - Consult the dealer or an experienced radio/TV technician for help.
- Any changes or modifications not expressly approved by the party responsible for compliance could void the authority to operate equipment.
- This device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.
- End-users and installers must be provided with antenna installation instructions and

- transmitter operating conditions for satisfying RF exposure compliance.
- For product available in the USA/Canada market, only channel 1~141 can be operated. Selection of other channels is not possible

## **IC WARNINGS**

### **RSS-Gen Issue 4 8.4**

According to RSS-Gen Issue 4 section 8.4, User manuals for licence-exempt radio apparatus shall contain the following text, or an equivalent notice that shall be displayed in a conspicuous location, either in the user manual or on the device, or both:

(English)

This device complies with Industry Canada's licence-exempt RSSs. 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.

(French)

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

### **Industry Canada ICES-003 Compliance Label:**

CAN ICES-3 (B)/NMB-3(B)

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## 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:



**WARNING**

**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:



**CAUTION**

### **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



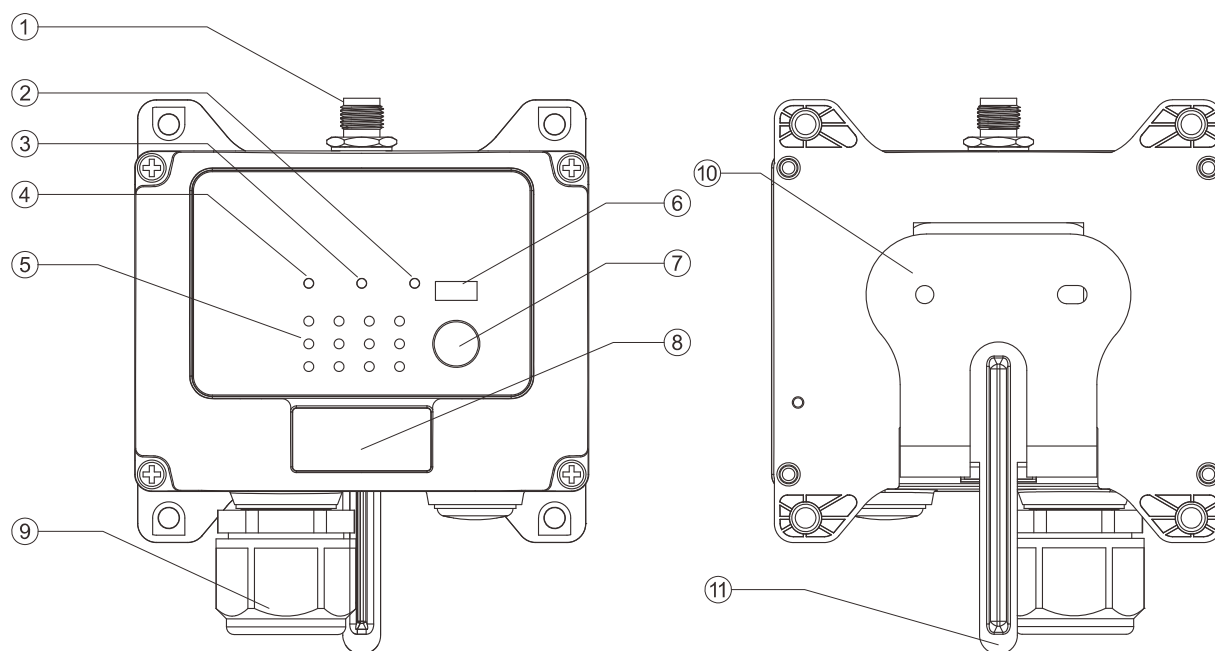
## WARNING

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

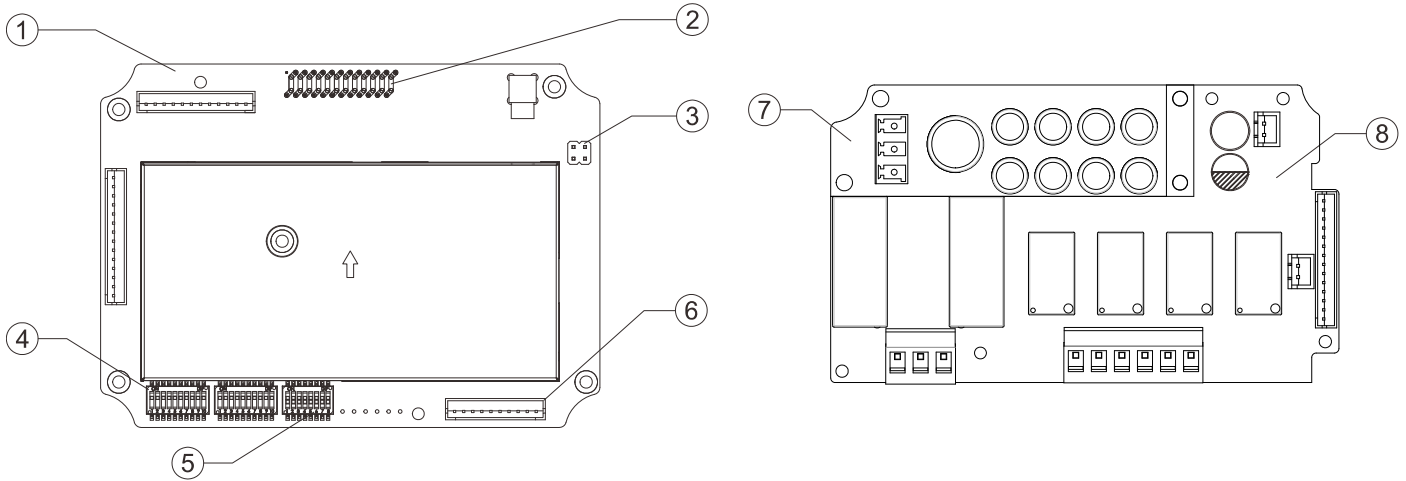
## 3.2 Receiver

### 3.2.1 External Illustration



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

### 3.2.2 Internal Illustration



1. RF/Decoder Board
2. Internal Antenna
3. INT/EXT Antenna Jumpers
4. Function Dipswitches

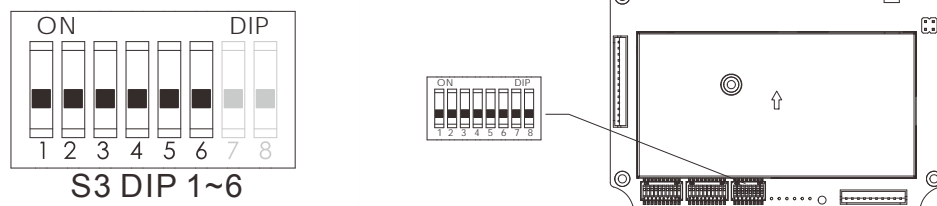
5. Channel Dipswitch
6. Programming Port
7. Power Transformer
8. Relay Board

# 4. Function Settings

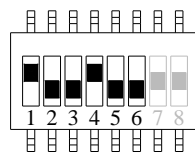
## 4.2 Receiver

### 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 4.2.6 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.



**Example:**



Top position → "1"  
Bottom position → "0"

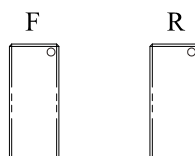
The above dipswitch setting "1 0 0 1 0 0" corresponds to "channel 36" in the system channels table on section 4.2.6.

### 4.2.2 Output Relay Configurations

#### 4.2.2.1 Output Relay Types

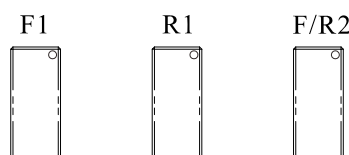
**1. 2 output relays per motion – single speed only**

Output relays with Forward (F) and Reverse (R) 1<sup>st</sup> speed only.



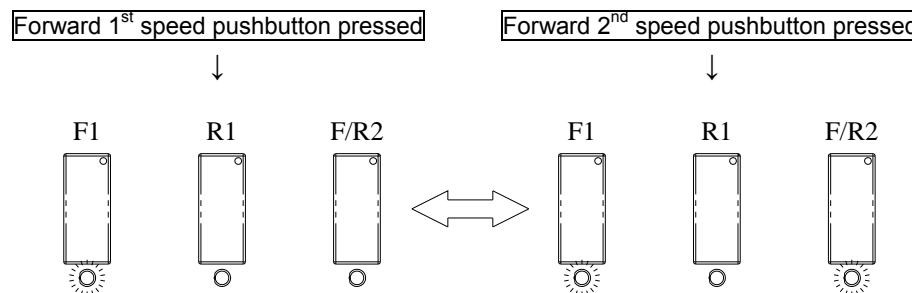
**2. 3 output relays per motion – shared 2<sup>nd</sup> speed output relay**

Output relays with Forward 1<sup>st</sup> speed (F1), Reverse 1<sup>st</sup> speed (R1) and Forward/Reverse 2<sup>nd</sup> speed (F/R2). Forward and Reverse 2<sup>nd</sup> speed (F/R2) shared the same output relay.



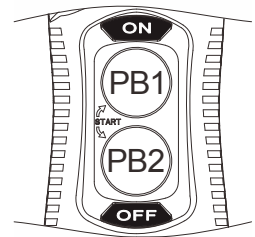
#### 4.2.2.2 Output Relay Actions at 2<sup>nd</sup> Speed

1. **3 output relays configuration with Closed/Closed contact at 2<sup>nd</sup> speed**  
F1 (or R1) output relay closed at 1<sup>st</sup> speed and F1 + F/R2 (or R1 + F/R2) output relays closed at 2<sup>nd</sup> 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 any of the two adjacent 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 any of the two adjacent 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 2<sup>nd</sup> speed up to 1<sup>st</sup> speed, both 1<sup>st</sup> and 2<sup>nd</sup> speed output relays will open for up to 1 second and then with 1<sup>st</sup> 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. The user can choose which pushbutton pair (or pairs) triggers the external warning device when pressed. Refer to section 4.2.3.1 on how to set to this function.

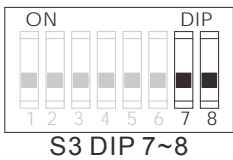
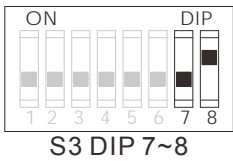
#### 4.2.2.7 Momentary Contact

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)  → "00" manufacture preset (channel X)
- (2)  → "01" scans 2 channels (channel X and channel X+1)

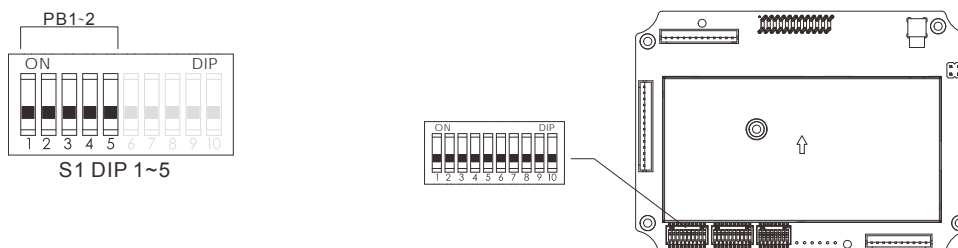
\* Channel X → channel set on the Channel dipswitch.

**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 any pushbutton pair can not be pressed simultaneously 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.



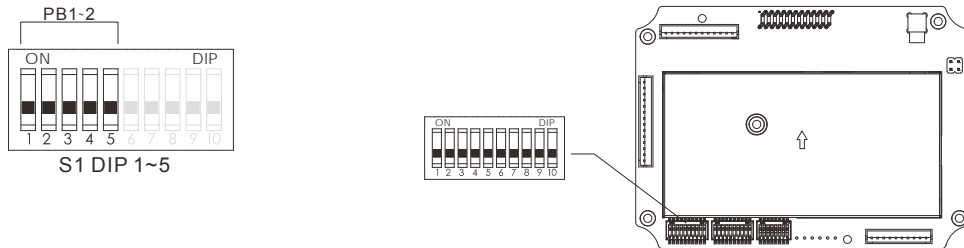
Dip Settings	Function
00000	Single speed only
00001	3 output relays Closed/Closed relay action at 2 <sup>nd</sup> speed (shared 2 <sup>nd</sup> speed output relay)
00010	On (right button) & Off (left button)
00011	Magnet Lift On & Off
00100	On (right button) & Off (left button) (EMS → all relays deactivate when STOP button is pressed)
00110	FWD/REV toggled
00111	FWD/REV toggled (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 None-Interlocked Pushbutton Pair

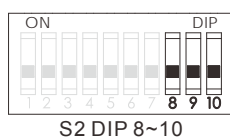
Non-interlocked setting allows the pushbutton pair be pressed simultaneously.  
Five dip positions correspond to a pushbutton pair.



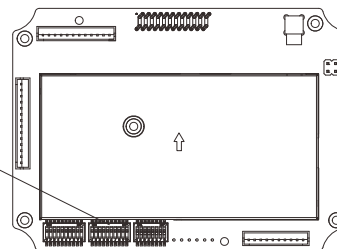
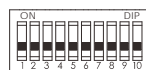
Dip Settings	Left Pushbutton	Right Pushbutton
10000	Normal	Normal
10001	Normal	Toggle
10010	Normal	Toggle (EMS)
10100	Toggle	Normal
10101	Toggle	Toggle
10110	Toggle	Toggle (EMS)
11000	Toggle (EMS)	Normal
11001	Toggle (EMS)	Toggle
11010	Toggle (EMS)	Toggle (EMS)

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

## 4.2.4 Other Dipswitch Settings



S2 DIP 8~10

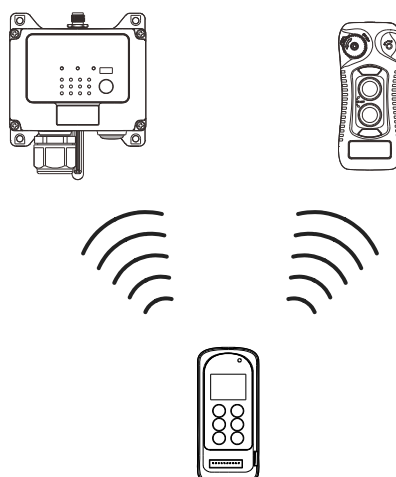


S2 Dip Position 8	Function
Dip set to "0" or down	Normal
Dip set to "1" or up	Display system firmware version
S2 Dip Position 9	Function
Dip set to "0" or down	Normal
Dip set to "1" or up	System testing (receiver MAIN relays disabled)
S2 Dip Position 10	Function
Dip set to "0" or down	Receiver-to-transmitter 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 Function output relay 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.



## 4.2.6 System Channels Table

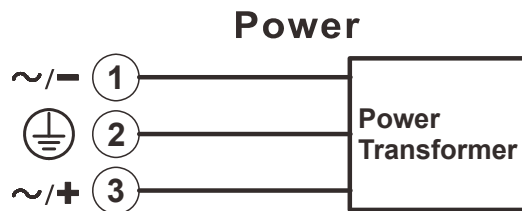
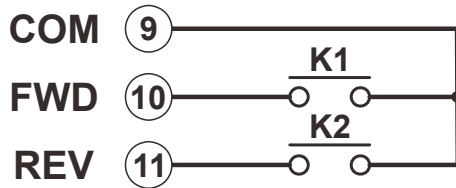
Channel	Dipswitch Setting	Channel	Dipswitch Setting
01	000001	32	100000
02	000010	33	100001
03	000011	34	100010
04	000100	35	100011
05	000101	36	100100
06	000110	37	100101
07	000111	38	100110
08	001000	39	100111
09	001001	40	101000
10	001010	41	101001
11	001011	42	101010
12	001100	43	101011
13	001101	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

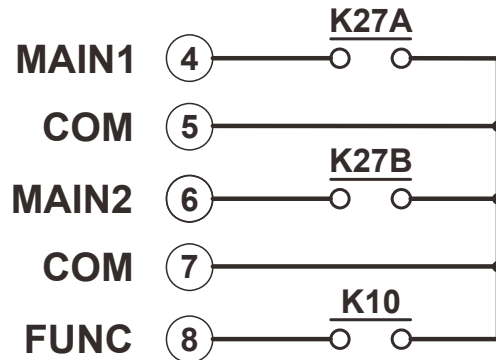
## 5.1 Output Relay Contact Diagrams

Flex HANDY 2S (single speed model)

PUSH BUTTON 1~2

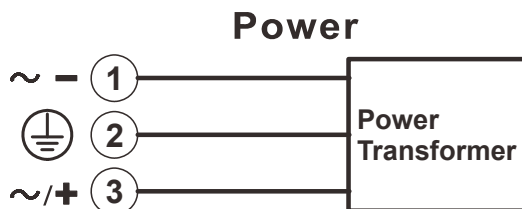
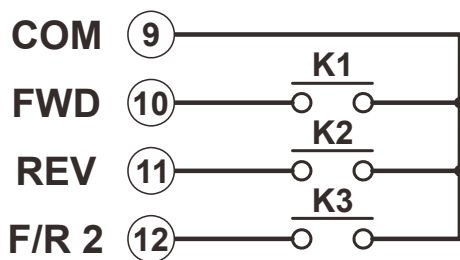


MAIN / FUNC

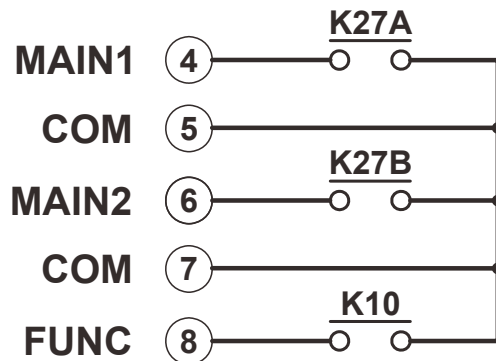


Flex HANDY 2X (dual speed model)

PUSH BUTTON 1~2



MAIN / FUNC

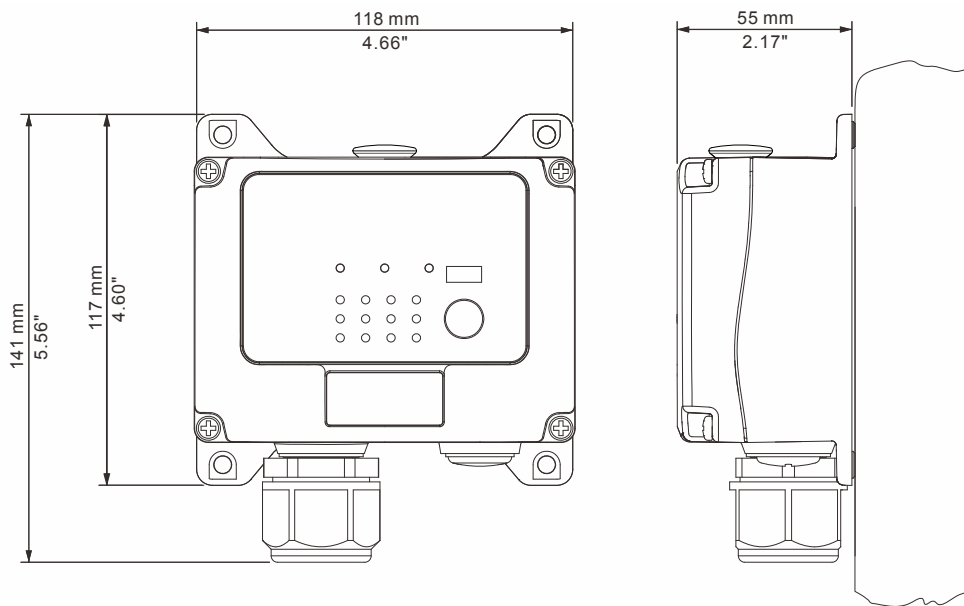


\* For 9~36VDC power supply, wire #1 corresponds to the negative charge (-) and wire #3 corresponds to the positive charge (+), wire #2 is GROUND.

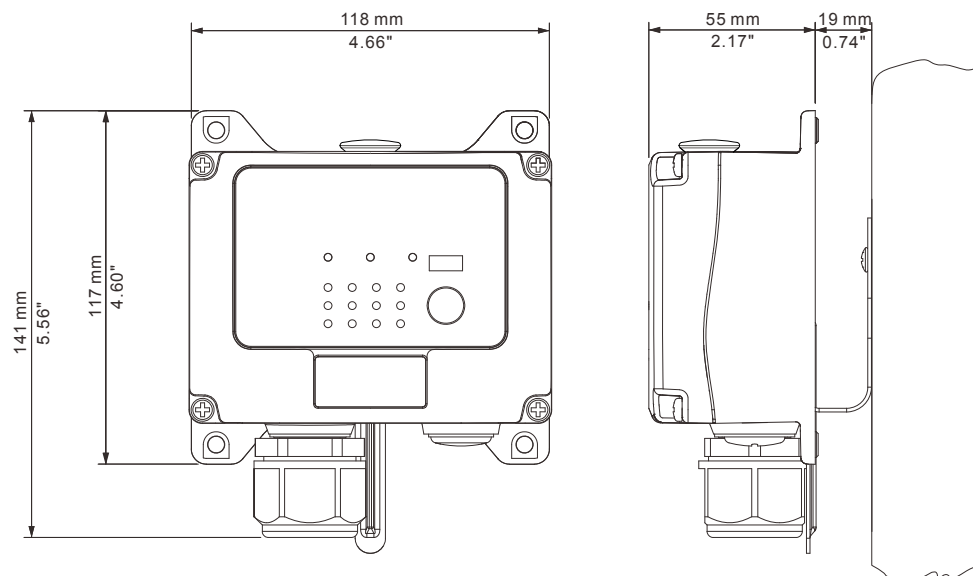
## 5.2 Pre-installation Precautions

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.

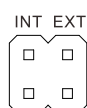
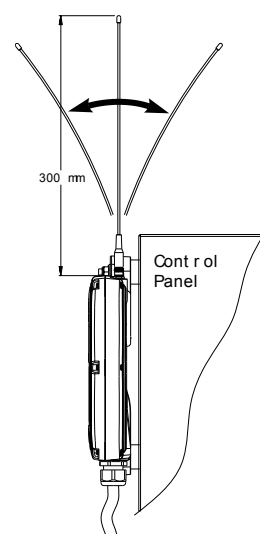
## 5.3 Step-By-Step Installation



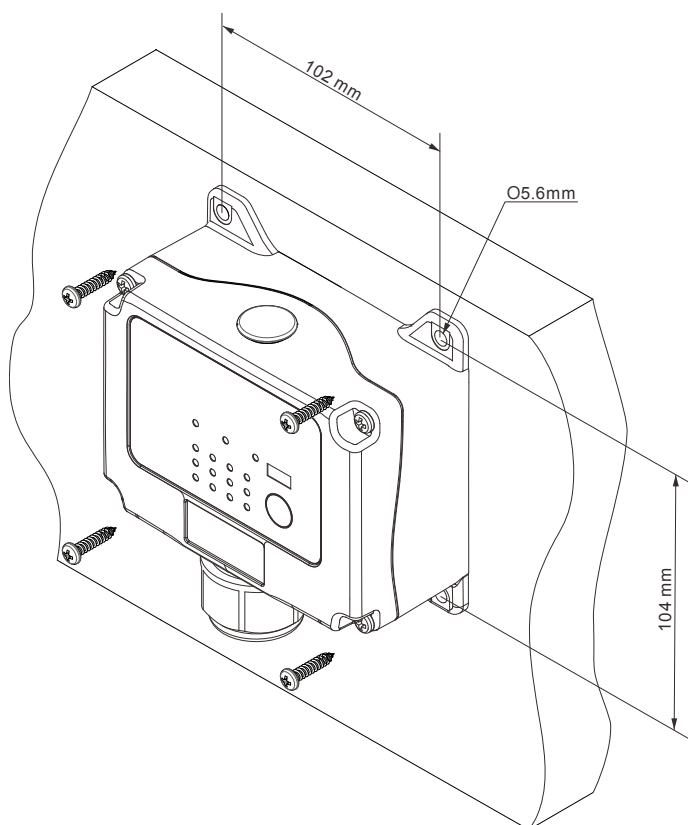
### With Optional Removable Mounting Bracket



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.

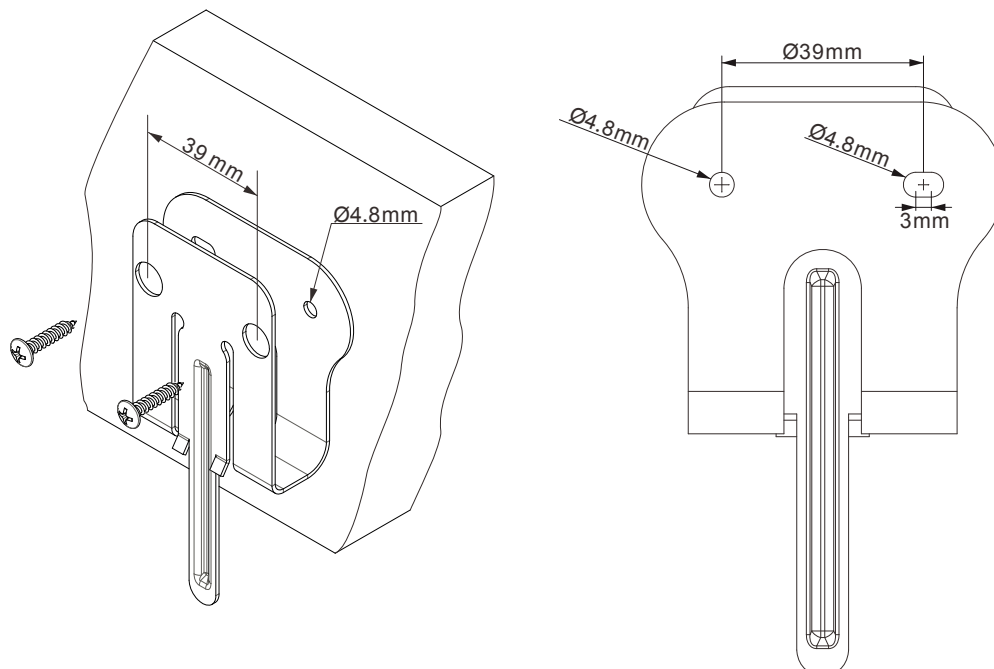


5. For better reception, make sure the receiver is in an upright position.
6. Drill four holes on the control panel, wall or location where the receiver is to be installed.
7. Make sure the screws are tightened after installation (not provided with the system).



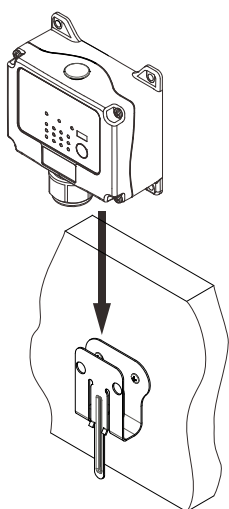
## With Optional Removable Mounting Bracket

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

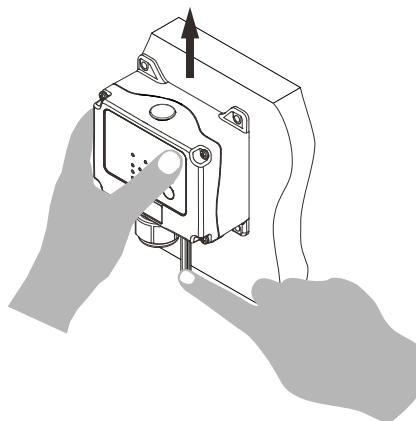


2. Slide down the receiver along the guided track to secure the receiver to the mounting bracket.
3. Remove the receiver by pressing down the bracket release and pull the receiver upward until it clears the guided track.

### Install



### Remove



## 6. Operating Procedures

### 6.3 System Status Light Indications

#### 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
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
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)
Enclosure Type	:	NEMA4
Enclosure Rating	:	IP66
Output Contact Rating	:	250V @ 6 Amps
Receiver Power Consumption	:	7VA (max)
Available Receiver Voltages	:	110~240VAC
Operating Temperature	:	-25°C ~ 75°C / -13°F ~ 167°F
Receiver Dimension	:	120mm (L) x 90mm (W) x 55mm (H)
Receiver Weight	:	900g / 2.0lb (include output cable)