

# ***FLEX2JB***

---

## ***VRX***

### **Instruction Manual**



# Service Information

## Your New Radio Remote Control System

Thank you for your purchase of ARC Flex 2JB-VRX radio remote control system. Without a doubt, our Flex 2JB-VRX 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 device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference; and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

**(b) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:**

- 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.

**FCC MPE :** This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment for body-worn configuration in direct contact to the phantom.

## **IC WARNINGS**

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

According to RSS-Gen Issue 4 section 8.4, User manuals for license-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 license-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)

**IC MPE:** This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

**Cet équipement est conforme aux limites d'exposition au rayonnement ISED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à une distance minimale de 20 cm entre le radiateur et votre corps**

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# 1. Introduction

The Flex 2JB-VRX joystick and lever radio remote control systems are designed for control of industrial equipment and machinery such as overhead traveling cranes, jib cranes, gantry cranes, tower cranes, electric hoists, winches, monorails, conveyor belts, mining equipment, and all other material handling equipment where wireless control is preferred.

Each Flex 2JB-VRX joystick and lever system consists of a transmitter bellybox and a receiver unit. Other standard-equipped accessories include transmitter waist belt, shoulder strap, compass direction label sheets, output cable and instruction manual CD.

List of notable features include:

- \* **Advanced Controls** – the system utilizes dual advanced microprocessor controls with 32bit CRC and Hamming Code, providing ultra fast, safe, precise, and error-free encoding and decoding.
- \* **Frequency Hopping RF Transceiver** – the system automatically search-and-lock onto a free and uninterrupted channel at every system startup or during operation when encountering radio interference. The system is also capable of two-way communication between the transmitter and receiver and as well as receiver to receiver with system status and relay output feedbacks.
- \* **Programmable Transmitter Access Card (TAC)** – the optional transmitter access card feature (TAC) further guard against any unauthorized personnel from operating the transmitter. The TAC can also be individually programmed unlocking any specific function or functions on the transmitter allowing a more experienced or qualified user to operate.
- \* **Zero-G Sensor Imbedded** – the transmitter is embedded with a Zero-G sensor to guard against any unintended control of the crane or equipment when transmitter is thrown or dropped.
- \* **Wireless Remote Pairing Function** – system information can be transferred wirelessly between two transmitters or between a transmitter and a receiver without the hassle of resetting the spares.
- \* **Reliable Joysticks and Switches** – the in-house designed joysticks and levers are rated for more than five million operating cycles.
- \* **Low Power Consumption** – requires only four “AA” alkaline batteries for more than 100 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. The transmitter and receiver enclosures are IP66 rated.
- \* **Full Compliance** – all systems are fully complied with the FCC Part-15 Rules, IC and European Safety Standards.

## 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.

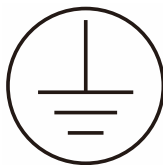
## 2.8 USED SYMBOL DESCRIPTION



Danger electric shock risk



Equipment Recycling: The production and operation of this equipment requires the recycling and utilization of natural resources. There are substances that are harmful to the environment or human health. To avoid the release of such substances into the environment and to reduce the use of natural resources, it is recommended that you recycle this product through a suitable system to ensure that most of the materials are properly recycled or reused.



Earth; ground protection against electric shock in case of a fault, or the terminal of a protective earth (ground) electrode.

## 2.9 METHOD CLEANING PRODUCTS

Wipe the dust, smudges and stains on the surface of the product with a damp, lint-free cloth.

## 2.10 PRODUCT MAINTENANCE

Do not drop or damage the controller. Drop controllers can cause delicate electronic parts to loosen and affect the use of functions.

## 2.11 POWER SUPPLY

The POWER front end must be equipped with circuit breaker as the way to power off the product.

## 2.12 ENVIRONMENT CONDITION

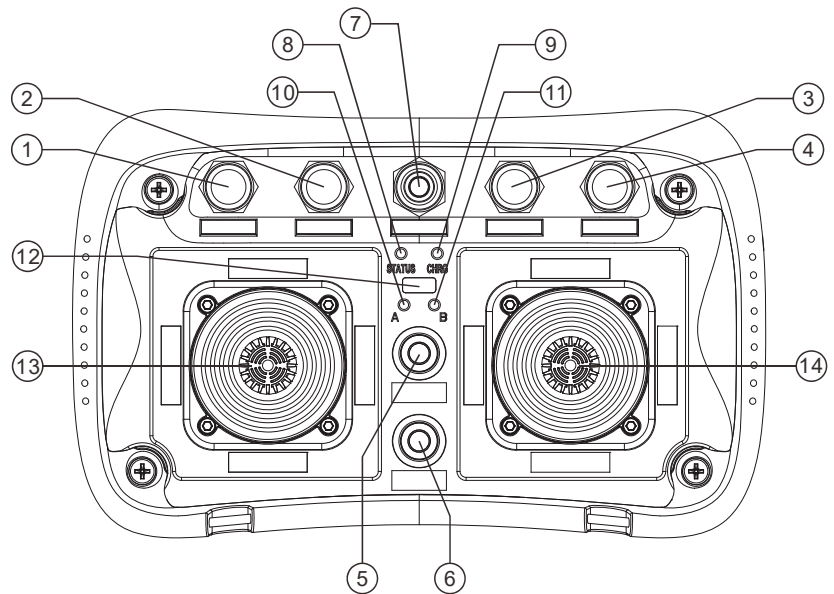
- Outdoor use.
- Altitude up to 2000 Meters (6500 feet).
- Maximum Relative Humidity 90%.
- MAINS supply voltage fluctuations up to  $\pm 10\%$ .
- OVERVOLTAGE CATEGORY II.
- WET LOCATION, applicable.
- Applicable POLLUTION DEGREE 2 of the intended environment (in most cases).

## 3. General System Information

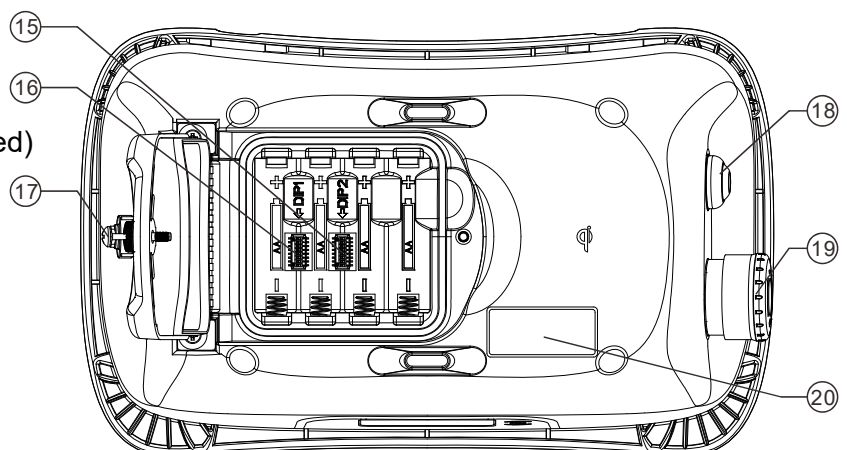
### 3.1 Transmitter

#### 3.1.1 Flex 2JB-VRX Joystick Transmitter Illustration

1. PB1 / SW1
2. PB2 / SW2
3. PB3 / SW3
4. PB4 / SW4
5. PB5
6. PB6
7. PB7 / SW7
8. System Status LED
9. Battery Charging LED
10. Function LED-A
11. Function LED-B
12. Infrared Sensors
13. Left Joystick (LX and LY)
14. Right Joystick (RX and RY)

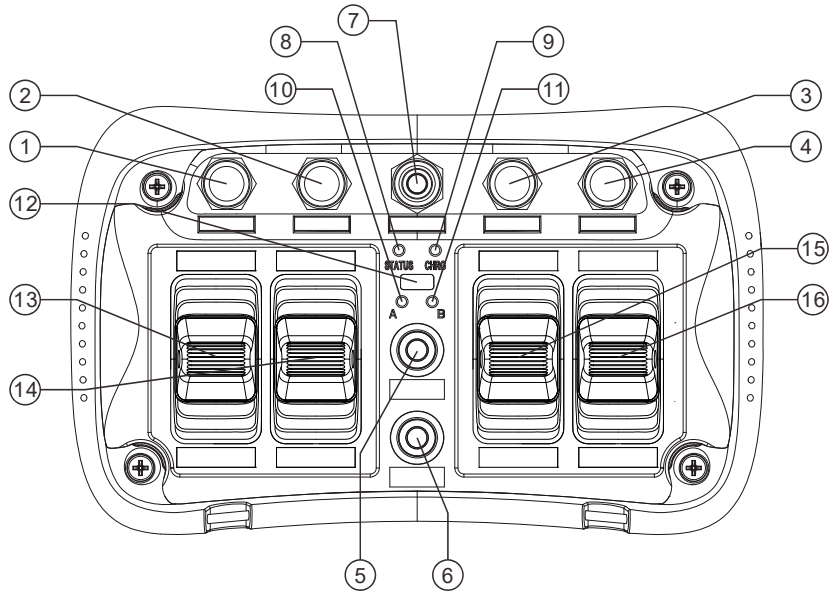


15. Function Dipswitch-2 (reserved)
16. Function Dipswitch-1
17. Plugin Charging Port
18. START button
19. STOP button
20. System Information

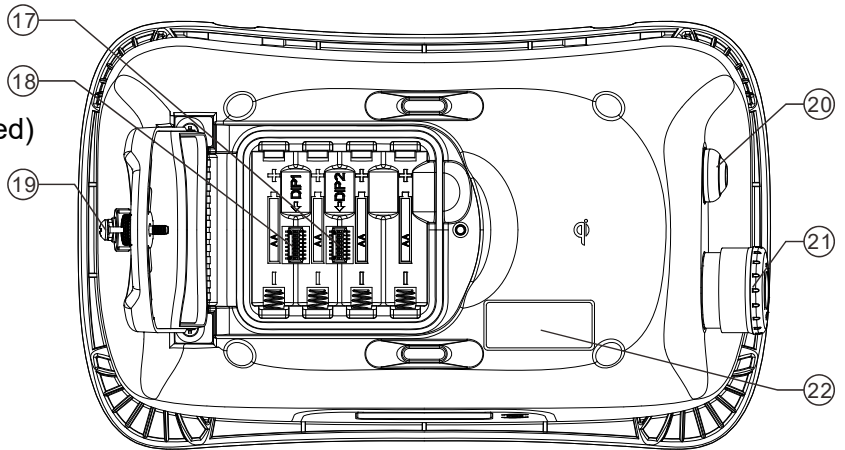


### 3.1.2 Flex 2JB-VRX Lever Transmitter Illustration

1. PB1 / SW1
2. PB2 / SW2
3. PB3 / SW3
4. PB4 / SW4
5. PB5
6. PB6
7. PB7 / SW7
8. System Status LED
9. Battery Charging LED
10. Function LED-A
11. Function LED-B
12. Infrared Sensors
13. Lever-1 (L1)
14. Lever-2 (L2)
15. Lever-3 (L3)
16. Lever-4 (L4)

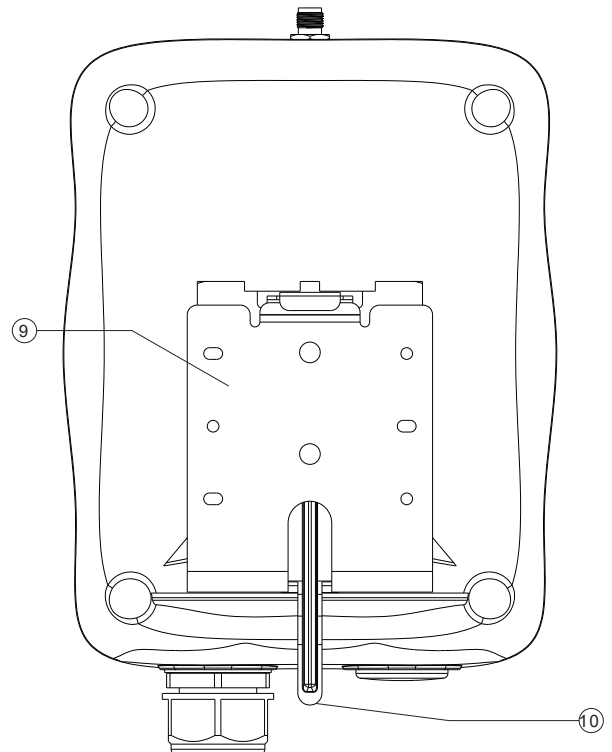
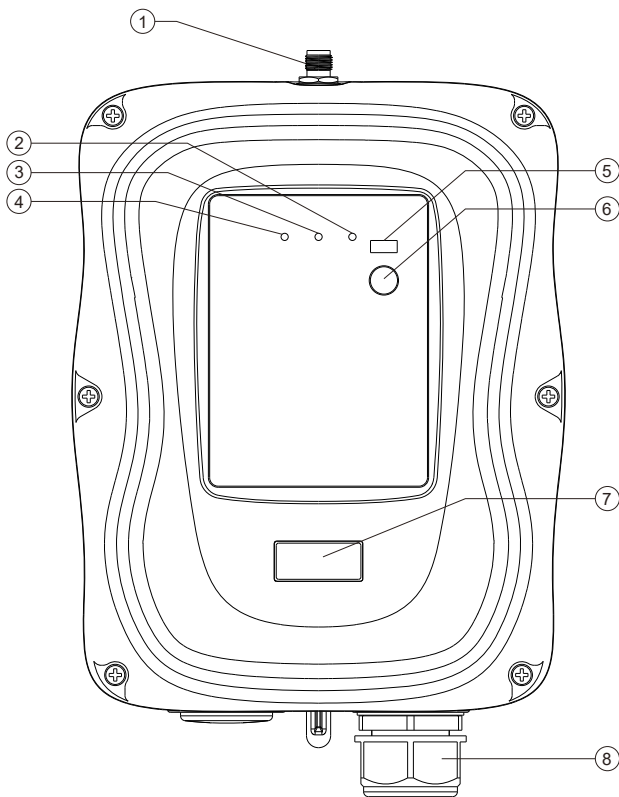


17. Function Dipswitch-2 (reserved)
18. Function Dipswitch-1
19. Plugin Charging Port
20. START button
21. STOP button
22. System Information



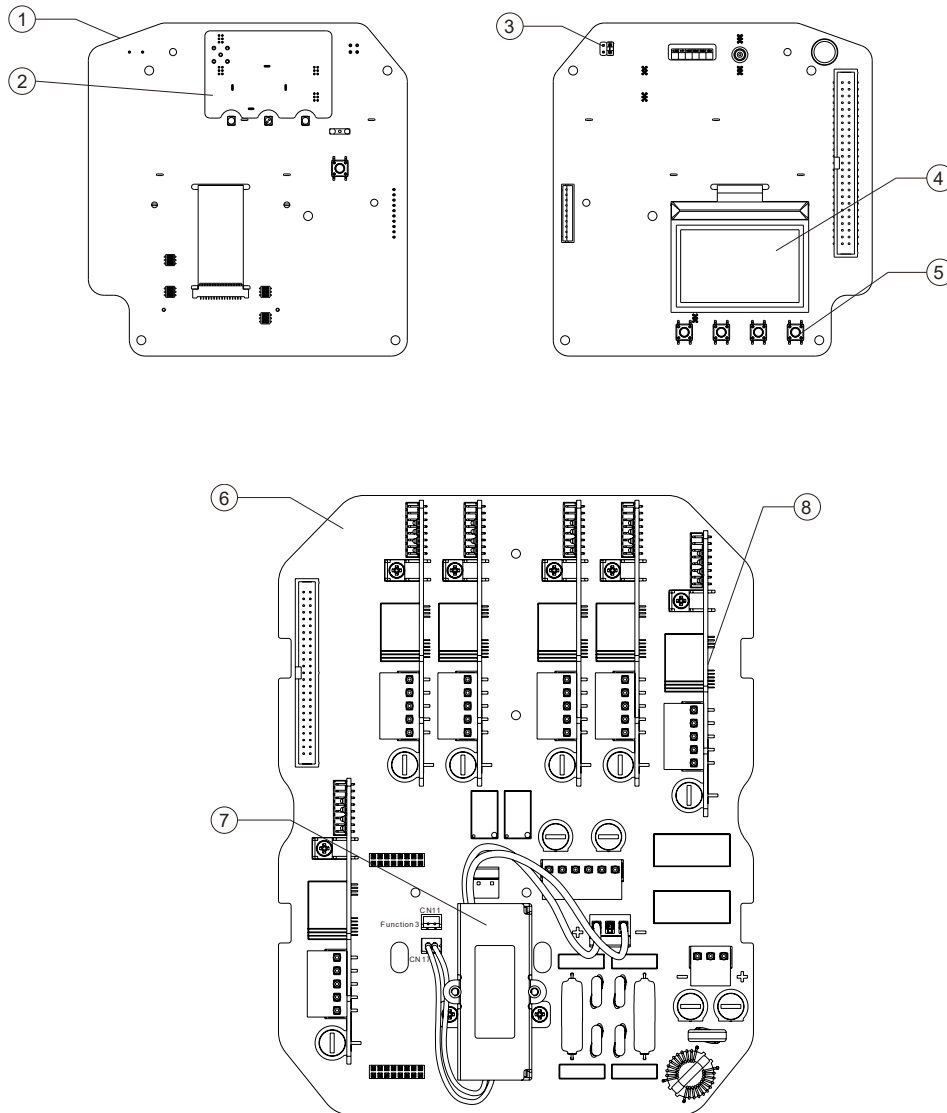
## 3.2 Receiver

### 3.2.1 External Illustration



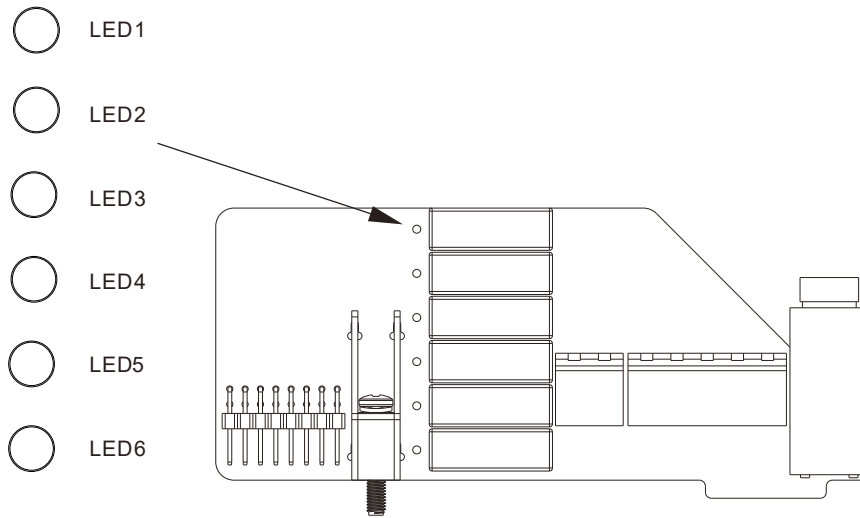
- |    |                                  |     |                          |
|----|----------------------------------|-----|--------------------------|
| 1. | External Antenna Port (optional) | 6.  | Remote Pairing Button    |
| 2. | COM LED                          | 7.  | System Information       |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

### 3.2.2 Internal Illustration

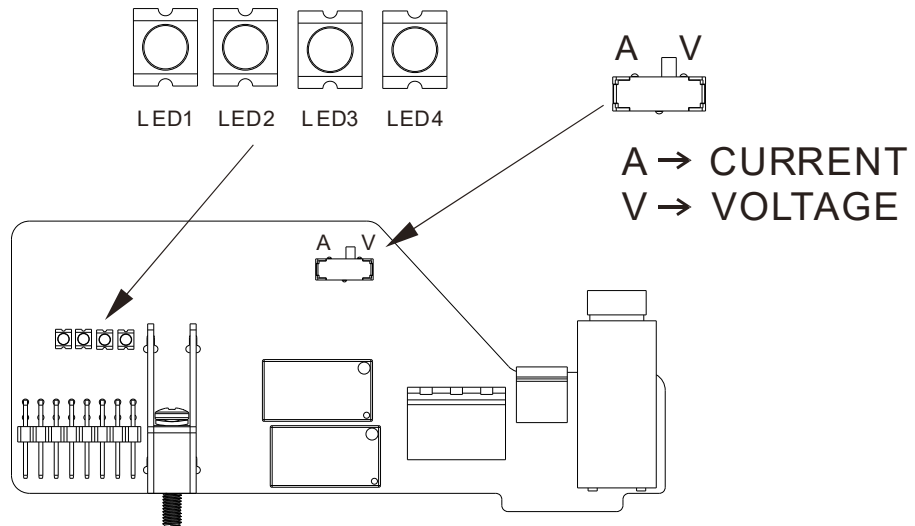


- |    |                         |    |                                         |
|----|-------------------------|----|-----------------------------------------|
| 1. | Decoder Board           | 5. | Programming Buttons                     |
| 2. | Receiving RF Board      | 6. | Line Filter/Digital/Analog Mother Board |
| 3. | INT/EXT Antenna Jumpers | 7. | Power Transformer                       |
| 4. | LCD Screen              | 8. | Digital & Analog Output Modules         |

## Digital Relay Module (K1~K6)



## Analog Module

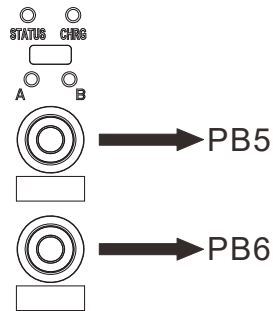


# 4. Function Settings

## 4.1 Transmitter

### 4.1.1 Transmitter Firmware Version

- 1) Reset the STOP button (Status LED turned green for up to 2.0 seconds, transmitter power on).
- 2) Press and hold both PB5 and PB6 at the same time for up to 3.0 seconds (Status LED blinks orange). Let go of both PB5 and PB6 when LED-A and LED-B turned red.



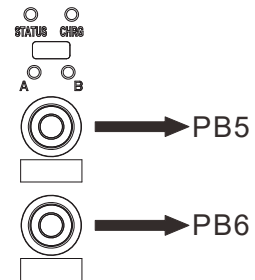
- 3) Entered programming mode with Status LED displays 1x orange blink for **firmware version**, remote pairing and IR programming. 2x orange blinks for transmitter channel programming, 3x orange blinks for PB1~PB7 function programming, 4x orange blinks for frequency range indication, 5x orange blinks for TAC programming.
- 4) Press and hold both PB5 and PB6 at the same time for up to 3.0 seconds (LED-A and LED-B turned red). Let go of both PB5 and PB6 when Status LED turned orange.
- 5) The Status LED now displays the transmitter firmware version with red, green and orange blinks.
- 6) Exit firmware version mode by pressing down the STOP button (transmitter power off).

## 4.1.2 Transmitter Channel Programming

### A. Unassigned Channel Scheme (no preset system channel)

When both transmitter and receiver is set to unassigned channel scheme (no preset channel), the system automatically search and lock onto a free and uninterrupted channel at every transmitter startup. Tandem, random access and pitch & catch configurations “cannot” set to unassigned channel scheme.

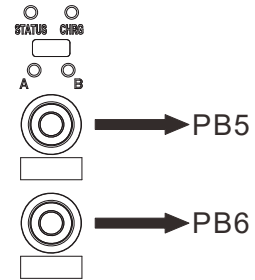
- 1) Reset the STOP button (Status LED turned green for up to 2.0 seconds, transmitter power on).
- 2) Press and hold both PB5 and PB6 at the same time for up to 3.0 seconds (Status LED blinks orange). Let go of both PB5 and PB6 when LED-A and LED-B turned red.
- 3) Entered programming mode with Status LED displays 1x orange blink for firmware version, remote pairing and IR programming. **2x orange blinks for transmitter channel programming**, 3x orange blinks for PB1~PB7 function programming, 4x orange blinks for frequency range indication, 5x orange blinks for TAC programming.
- 4) Select transmitter channel programming mode (Status LED 2x orange blinks) by press and hold PB6 for up to 3.0 seconds (LED-B turned red). Let go PB6 when Status LED turns to 2x orange blinks.
- 5) Enter transmitter channel programming mode by press and hold both PB5 and PB6 at the same time for up to 3.0 seconds (LED-A and LED-B turned red). Let go of both PB5 and PB6 when Status LED displays the current transmitter channel setting. A green blink represents the tens (+10), a red blink represents the units (+1) and constant orange represents unassigned channel. For example, 1x green blink followed by 5x red blinks is channel 15.
- 6) Change transmitter channel to “unassigned channel” by press and hold both PB5 and PB6 at the same time (Status LED displays constant orange for unassigned channel). Make sure constant orange is shown on the Status LED before proceeding to the next step.
- 7) Transfer the unassigned channel setting to the receiver by pressing the green START button until the Status LED turns to constant green (transfer complete). Turn off the transmitter power if constant green is not shown on the Status LED after more than 5.0 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. When transmitter is set to “unassigned channel”, the receiver must also set to “unassigned channel” in order for the entire system to work.
- 8) Exit transmitter channel programming mode by pressing down the STOP button (transmitter power off).



## B. Assigned Channel Scheme (preset system channel)

Both transmitter and receiver is assigned with a matching preset channel (channel 01~62). Tandem, random access and pitch & catch configurations “must” set to assigned channel scheme.

- 1) Reset the STOP button (Status LED turned green for up to 2.0 seconds, transmitter power on).
- 2) Press and hold both PB5 and PB6 at the same time for up to 3.0 seconds (Status LED blinks orange). Let go of both PB5 and PB6 when LED-A and LED-B turned red.
- 3) Entered programming mode with Status LED displays 1x orange blink for firmware version, remote pairing and IR programming. **2x orange blinks for transmitter channel programming**, 3x orange blinks for PB1~PB7 function programming, 4x orange blinks for frequency range indication, 5x orange blinks for TAC programming.
- 4) Enter transmitter channel programming mode by press and hold both PB5 and PB6 at the same time for up to 3.0 seconds (LED-A and LED-B turned red). Let go of both PB5 and PB6 when Status LED displays the current transmitter channel setting. A green blink represents the tens (+10), a red blink represents the units (+1) and constant orange represents unassigned channel. For example, 1x green blink followed by 5x red blinks is channel 15.
- 5) Change transmitter channel by pressing PB5 for up to 2.0 seconds (Status LED turns red during each press) to increment the units (+1) and press PB6 for up to 2.0 seconds (Status LED turns green during each press) to increment the tens (+10). For example, press PB6 two times and then PB5 four times is channel 24 (Status LED blinks 2 greens and 4 reds). Make sure each button press does not exceed 3.0 seconds after release. Also make sure the newly selected channel indication is shown on the Status LED before proceeding to the next step.
- 6) Transfer the newly selected channel to the receiver by pressing the green START button until the Status LED turns to constant green (transfer complete). Turn off the transmitter power if constant green is not shown on the Status LED after more than 5.0 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. The transmitter and receiver channel must be the same in order for the entire system to work.
- 7) Exit transmitter channel programming mode by pressing down the STOP button (transmitter power off).



### Important Note:

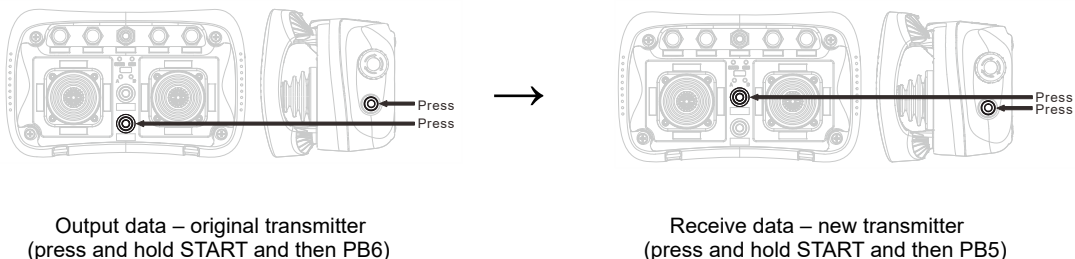
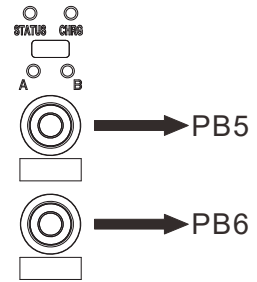
Step 6 illustrated above is strictly required if you are intending to change the entire system channel (both transmitter and receiver). The entire system no longer works if step 6 is skipped because the transmitter and receiver channels are now different (new vs. old). In this case you would have to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

### 4.1.3 Remote Pairing

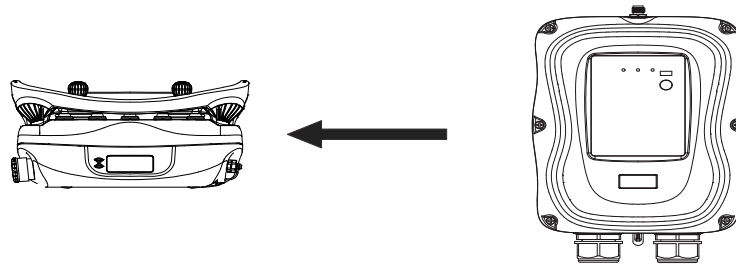
#### A. Transmitter-to-Transmitter Pairing:



- 1) Reset the STOP button on both transmitters (Status LED turned green for up to 2.0 seconds, transmitter power on).
- 2) Press and hold both PB5 and PB6 at the same time for up to 3.0 seconds on both transmitters (Status LED blinks orange). Let go of both PB5 and PB6 when LED-A and LED-B turned red.
- 3) Entered programming mode with Status LED displays 1x orange blink for firmware version, **remote pairing** and IR programming. 2x orange blinks for transmitter channel programming, 3x orange blinks for PB1~PB7 function programming, 4x orange blinks for frequency range indication, 5x orange blinks for TAC programming.
- 4) Press and hold both PB5 and PB6 at the same time for up to 3.0 seconds (LED-A and LED-B turned red). Let go of both PB5 and PB6 when Status LED turned orange.
- 5) The Status LED now displays the transmitter firmware version with red, green and orange blinks.
- 6) Output data (original transmitter) by first press and hold the green START button for up to 1.0 second and then press and hold PB6 (Status LED off).
- 7) Receive data (new transmitter) by first press and hold the green START button for up to 1.0 second and then press and hold PB5 (Status LED blinks green).
- 8) The pairing is completed when the Status LED on the new transmitter (receiving data end) turns to constant green while the two buttons on both transmitters are still pressed down. Let go all buttons when done.
- 9) Exit remote pairing mode by pressing down the STOP button (transmitter power off).

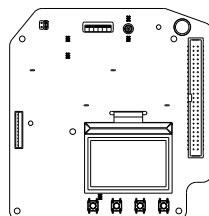
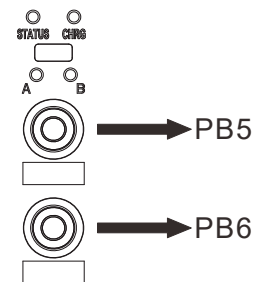


## B. Receiver-to-Transmitter Pairing:

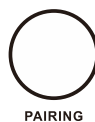


### JP8 Open Method (require pressing the PAIRING button on receiver):

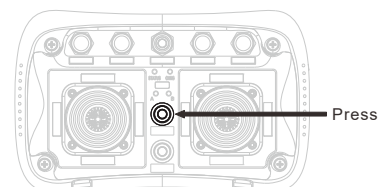
- 1) Reset the STOP button on both transmitters (Status LED turned green for up to 2.0 seconds, transmitter power on).
- 2) Press and hold both PB5 and PB6 at the same time for up to 3.0 seconds on both transmitters (Status LED blinks orange). Let go of both PB5 and PB6 when LED-A and LED-B turned red.
- 3) Entered programming mode with Status LED displays 1x orange blink for firmware version, **remote pairing** and IR programming. 2x orange blinks for transmitter channel programming, 3x orange blinks for PB1~PB7 function programming, 4x orange blinks for frequency range indication, 5x orange blinks for TAC programming.
- 4) Press and hold both PB5 and PB6 at the same time for up to 3.0 seconds (LED-A and LED-B turned red). Let go of both PB5 and PB6 when Status LED turned orange.
- 5) The Status LED now displays the transmitter firmware version with red, green and orange blinks.
- 6) Output data (receiver) by press and hold the PAIRING button on the receiver cover.
- 7) Receive data (transmitter) by press and hold PB5 (Status LED blinks green).
- 8) The pairing is completed when the Status LED on the transmitter (receiving data end) turns to constant green while PB5 on transmitter and PAIRING button on receiver are still pressed down. Let go all buttons when done.
- 9) The receiver MAIN relays must be deactivated (relay open) during remote pairing.
- 10) Exit remote pairing mode by pressing down the STOP button (transmitter power off).



Set JP8 to "Open"



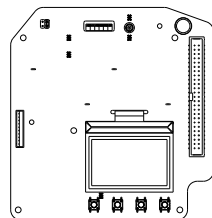
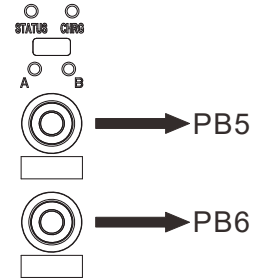
PAIRING



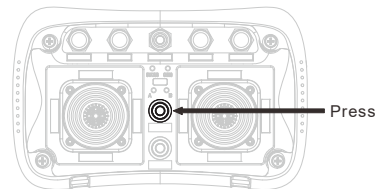
Receive data – transmitter  
(press and hold PB5)

**JP8 Short Method (do not require pressing the PAIRING button on receiver):**

- 1) Reset the STOP button on both transmitters (Status LED turned green for up to 2.0 seconds, transmitter power on).
- 2) Press and hold both PB5 and PB6 at the same time for up to 3.0 seconds on both transmitters (Status LED blinks orange). Let go of both PB5 and PB6 when LED-A and LED-B turned red.
- 3) Entered programming mode with Status LED displays 1x orange blink for firmware version, **remote pairing** and IR programming. 2x orange blinks for transmitter channel programming, 3x orange blinks for PB1~PB7 function programming, 4x orange blinks for frequency range indication, 5x orange blinks for TAC programming.
- 4) Press and hold both PB5 and PB6 at the same time for up to 3.0 seconds (LED-A and LED-B turned red). Let go of both PB5 and PB6 when Status LED turned orange.
- 5) The Status LED now displays the transmitter firmware version with red, green and orange blinks.
- 6) Receive data (transmitter) by press and hold PB5 (Status LED blinks green).
- 7) The pairing is completed when the Status LED on the transmitter (receiving data end) turns to constant green while PB5 on transmitter is still pressed down. Let go the button when done.
- 8) The receiver MAIN relays must be deactivated (relay open) during remote pairing.
- 9) Exit remote pairing mode by pressing down the STOP button (transmitter power off).

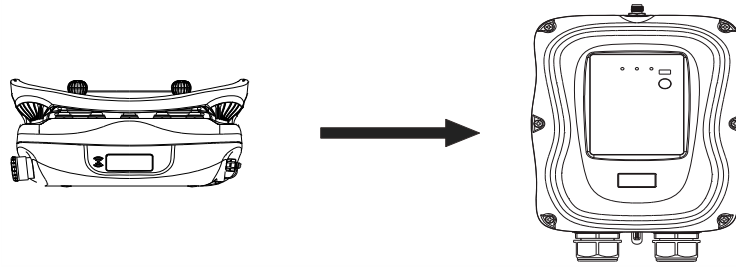


Set JP8 to "Short"



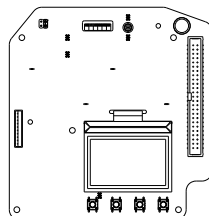
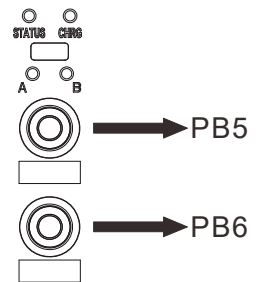
Receive data – transmitter  
(press and hold PB5)

## C. Transmitter-to-Receiver Pairing:



### JP8 Open Method (require pressing the PAIRING button on receiver):

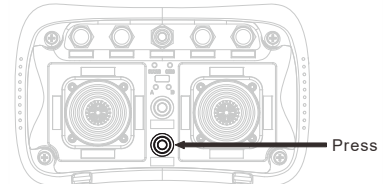
- 1) Reset the STOP button on both transmitters (Status LED turned green for up to 2.0 seconds, transmitter power on).
- 2) Press and hold both PB5 and PB6 at the same time for up to 3.0 seconds on both transmitters (Status LED blinks orange). Let go of both PB5 and PB6 when LED-A and LED-B turned red.
- 3) Entered programming mode with Status LED displays 1x orange blink for firmware version, **remote pairing** and IR programming. 2x orange blinks for transmitter channel programming, 3x orange blinks for PB1~PB7 function programming, 4x orange blinks for frequency range indication, 5x orange blinks for TAC programming.
- 4) Press and hold both PB5 and PB6 at the same time for up to 3.0 seconds (LED-A and LED-B turned red). Let go of both PB5 and PB6 when Status LED turned orange.
- 5) The Status LED now displays the transmitter firmware version with red, green and orange blinks.
- 6) Receive data (receiver) by press and hold the PAIRING button on receiver cover.
- 7) Output data (transmitter) by press and hold PB6 (Status LED blinks green).
- 8) The pairing is completed when the Status LED on the transmitter turns to constant green while PB6 on transmitter and PAIRING button on receiver are still pressed down. Let go all buttons when done.
- 9) The receiver MAIN relays must be deactivated (relay open) during remote pairing.
- 10) Exit remote pairing mode by pressing down the STOP button (transmitter power off).



Set JP8 to "Open"



Receive data – receiver  
(press and hold the PAIRING button)

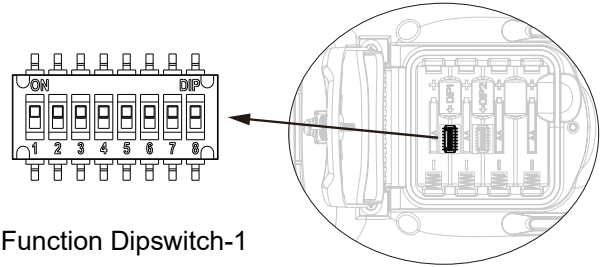


Output data – transmitter  
(press and hold PB6)

## 4.1.4 Transmitter Start Function Settings

When transmitter goes into sleep mode the system is temporarily deactivated (MAIN relays opened). Initiate the START command or any command to wake up the system (MAIN relays closed).

|   | Dipswitch Settings | Function                   |
|---|--------------------|----------------------------|
| 1 | xxxxxxx0           | START Command Reactivation |
| 2 | xxxxxxx1           | Any Command Reactivation   |



## 4.1.5 Transmitter Inactivity Timer Settings

Set how long the transmitter enters the sleep mode when not in use (no command initiated). When transmitter goes into sleep mode the receiver MAIN relays are deactivated.

|   | Dipswitch Settings | Time       |   | Dipswitch Settings | Time                                 |
|---|--------------------|------------|---|--------------------|--------------------------------------|
| 1 | xxx000xx           | 1 minute   | 5 | xxx100xx           | 10 minutes                           |
| 2 | xxx001xx           | 20 seconds | 6 | xxx101xx           | 30 minutes                           |
| 3 | xxx010xx           | 3 minutes  | 7 | xxx110xx           | 60 minutes                           |
| 4 | xxx011xx           | 5 minutes  | 8 | xxx111xx           | Constant On<br>(sleep mode disabled) |

## 4.1.6 Transmitter Output Power Settings

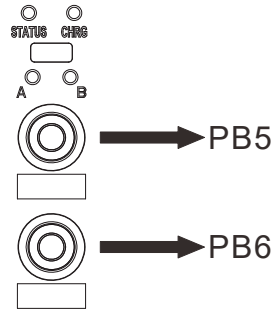
1mW offers the shortest operating range with lowest battery consumption while 10mW offers the longest operating range with highest battery consumption (manufacture preset at 6mW).

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

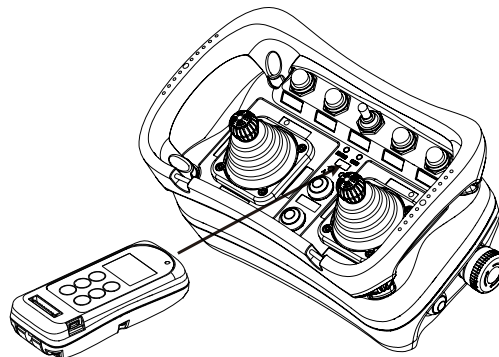
## 4.1.7 Infrared (IR) Programming

Other transmitter functions and settings not listed in this manual can be programmed via the IR programmer unit, such as the system serial number, frequency range, TAC, relay output status feedback, receiver input status feedback, infrared start function, buttons and switches configurations and many others. Please contact ARC representative for more details.

- 1) Reset the STOP button (Status LED turned green for up to 2.0 seconds, transmitter power on).
- 2) Press and hold both PB5 and PB6 at the same time for up to 3.0 seconds (Status LED blinks orange). Let go of both PB5 and PB6 when LED-A and LED-B turned red.

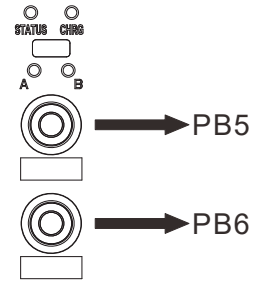


- 3) Entered programming mode with Status LED displays 1x orange blink for firmware version, remote pairing and **IR programming**. 2x orange blinks for transmitter channel programming, 3x orange blinks for PB1~PB7 button function programming, 4x orange blinks for frequency range indication, 5x orange blinks for TAC programming.
- 4) Press and hold both PB5 and PB6 at the same time for up to 3.0 seconds (LED-A and LED-B turned red). Let go of both PB5 and PB6 when Status LED turned orange.
- 5) The Status LED now displays the transmitter firmware version with red, green and orange blinks.
- 6) Proceed to infrared transmitter programming using the IR programmer unit.
- 7) Exit infrared programming mode by pressing down the STOP button (transmitter power off).



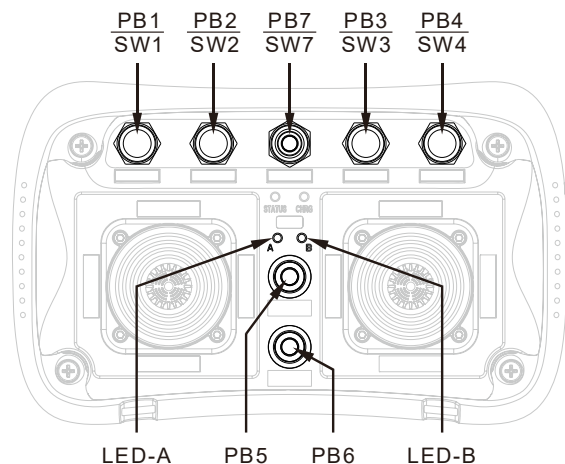
## 4.1.8 PB1 ~ PB7 Function Programming

- 1) Reset the STOP button (Status LED turned green for up to 2.0 seconds, transmitter power on).
- 2) Press and hold both PB5 and PB6 at the same time for up to 3.0 seconds (Status LED blinks orange). Let go of both PB5 and PB6 when LED-A and LED-B turned red.
- 3) Entered programming mode with Status LED displays 1x orange blink for firmware version, remote pairing and IR programming. 2x orange blinks for transmitter channel programming, **3x orange blinks for PB1~PB7 function programming**, 4x orange blinks for frequency range indication, 5x orange blinks for TAC programming.
- 4) Select PB1~PB7 function programming mode (Status LED 3x orange blinks) by press and hold PB6 for up to 3.0 seconds twice (LED-B turned red). Let go PB6 when Status LED turns to 3x orange blinks.
- 5) Enter PB1~PB7 function programming mode by press and hold both PB5 and PB6 at the same time for up to 3.0 seconds (LED-A and LED-B turned red). Let go of both PB5 and PB6 when Status LED displays the current PB1~PB7 function settings. The Status LED displays current PB1~PB7 function setting with orange, green and red blinks. An orange blink represents the hundreds (+**1**00), a green blink represents the tens (+0**1**0) and a red blink represents the units (+00**1**), and constant orange represents no function (000). For example, 1 orange blink followed by 2 green blinks and 5 red blinks is pushbutton function no.**125**. Button function number with "0" is represented by no orange, green or red blink. For example, 1 orange blink followed by 5 red blinks is pushbutton function no.**105**.
- 6) Set PB1~PB7 function number by pressing the green START button to increment the hundreds (+**1**00), PB6 to increment the tens (+0**1**0), PB5 to increment the units (+00**1**), and PB5+PB6 to no function (000 - constant orange). For example, press the green START button one time, PB6 four times, PB5 six times is PB1~PB7 function no.**146** (Status LED blinks **1** orange, **4** greens and **6** reds)
- 7) Exit PB1~PB7 function programming mode by pressing down the STOP button (transmitter power off).



### 4.1.8.1 Toggled Button with LED Indication

Set toggled button function with LED indications. LED-A and LED-B shown inside the shaded box illustrates which LED on the transmitter lights up when the designated button is pressed.



| Function Number | Display Type    | PB1    | PB2    | PB3    | PB4    | PB5    | PB6    | PB7    |
|-----------------|-----------------|--------|--------|--------|--------|--------|--------|--------|
| 1               | 1 Red           | LED-A  | Normal | Normal | Normal | Normal | Normal | Normal |
| 2               | 2 Reds          | Normal | LED-A  | Normal | Normal | Normal | Normal | Normal |
| 3               | 3 Reds          | Normal | Normal | LED-A  | Normal | Normal | Normal | Normal |
| 4               | 4 Reds          | Normal | Normal | Normal | LED-A  | Normal | Normal | Normal |
| 5               | 5 Reds          | Normal | Normal | Normal | Normal | LED-A  | Normal | Normal |
| 6               | 6 Reds          | Normal | Normal | Normal | Normal | Normal | LED-A  | Normal |
| 7               | 7 Reds          | Normal | Normal | Normal | Normal | Normal | Normal | LED-A  |
| 8               | 8 Reds          | LED-B  | Normal | Normal | Normal | Normal | Normal | Normal |
| 9               | 9 Reds          | Normal | LED-B  | Normal | Normal | Normal | Normal | Normal |
| 10              | 1 Green         | Normal | Normal | LED-B  | Normal | Normal | Normal | Normal |
| 11              | 1 Green 1 Red   | Normal | Normal | Normal | LED-B  | Normal | Normal | Normal |
| 12              | 1 Green 2 Reds  | Normal | Normal | Normal | Normal | LED-B  | Normal | Normal |
| 13              | 1 Green 3 Reds  | Normal | Normal | Normal | Normal | Normal | LED-B  | Normal |
| 14              | 1 Green 4 Reds  | Normal | Normal | Normal | Normal | Normal | Normal | LED-B  |
| 15              | 1 Green 5 Reds  | LED-A  | LED-B  | Normal | Normal | Normal | Normal | Normal |
| 16              | 1 Green 6 Reds  | Normal | LED-A  | LED-B  | Normal | Normal | Normal | Normal |
| 17              | 1 Green 7 Reds  | Normal | Normal | LED-A  | LED-B  | Normal | Normal | Normal |
| 18              | 1 Green 8 Reds  | Normal | Normal | Normal | LED-A  | LED-B  | Normal | Normal |
| 19              | 1 Green 9 Reds  | Normal | Normal | Normal | Normal | LED-A  | LED-B  | Normal |
| 20              | 2 Greens        | Normal | Normal | Normal | Normal | Normal | LED-A  | LED-B  |
| 21              | 2 Greens 1 Red  | LED-A  | Normal | LED-B  | Normal | Normal | Normal | Normal |
| 22              | 2 Greens 2 Reds | Normal | LED-A  | Normal | LED-B  | Normal | Normal | Normal |
| 23              | 2 Greens 3 Reds | Normal | Normal | LED-A  | Normal | LED-B  | Normal | Normal |
| 24              | 2 Greens 4 Reds | Normal | Normal | Normal | LED-A  | Normal | LED-B  | Normal |
| 25              | 2 Greens 5 Reds | Normal | Normal | Normal | Normal | LED-A  | Normal | LED-B  |

\* Normal → Normal button function without LED indication.

\* LED-A & LED-B → Transmitter toggled button with LED indication.

### 4.1.8.2 A/B Button Select with LED Indication

There are 5 different types of A/B select sequence available for PB1~PB4 and PB7 with LED indications. Choose one that is most suitable for your application.

Type-A select sequence: A → B → A → B

Type-B select sequence: Off → A → B → Off → A → B

Type-C select sequence: A → B → A+B or A → B → C (refer to section 4.2.5 SW ABC setting)

Type-D select sequence: Off → A → B → A+B → Off → A → B → A+B

Type-E select sequence: A+B → A → B → A+B → A → B

| Function Number | Display Type    | PB1    | PB2    | PB3    | PB4    | PB7    |
|-----------------|-----------------|--------|--------|--------|--------|--------|
| 50              | 5 Greens        | Type-A | Normal | Normal | Normal | Normal |
| 51              | 5 Greens 1 Red  | Type-B | Normal | Normal | Normal | Normal |
| 52              | 5 Greens 2 Reds | Type-C | Normal | Normal | Normal | Normal |
| 53              | 5 Greens 3 Reds | Type-D | Normal | Normal | Normal | Normal |
| 54              | 5 Greens 4 Reds | Type-E | Normal | Normal | Normal | Normal |
| 55              | 5 Greens 5 Reds | Normal | Type-A | Normal | Normal | Normal |
| 56              | 5 Greens 6 Reds | Normal | Type-B | Normal | Normal | Normal |
| 57              | 5 Greens 7 Reds | Normal | Type-C | Normal | Normal | Normal |
| 58              | 5 Greens 8 Reds | Normal | Type-D | Normal | Normal | Normal |
| 59              | 5 Greens 9 Reds | Normal | Type-E | Normal | Normal | Normal |
| 60              | 6 Greens        | Normal | Normal | Type-A | Normal | Normal |
| 61              | 6 Greens 1 Red  | Normal | Normal | Type-B | Normal | Normal |
| 62              | 6 Greens 2 Reds | Normal | Normal | Type-C | Normal | Normal |
| 63              | 6 Greens 3 Reds | Normal | Normal | Type-D | Normal | Normal |
| 64              | 6 Greens 4 Reds | Normal | Normal | Type-E | Normal | Normal |
| 65              | 6 Greens 5 Reds | Normal | Normal | Normal | Type-A | Normal |
| 66              | 6 Greens 6 Reds | Normal | Normal | Normal | Type-B | Normal |
| 67              | 6 Greens 7 Reds | Normal | Normal | Normal | Type-C | Normal |
| 68              | 6 Greens 8 Reds | Normal | Normal | Normal | Type-D | Normal |
| 69              | 6 Greens 9 Reds | Normal | Normal | Normal | Type-E | Normal |
| 70              | 7 Greens        | Normal | Normal | Normal | Normal | Type-A |
| 71              | 7 Greens 1 Red  | Normal | Normal | Normal | Normal | Type-B |
| 72              | 7 Greens 2 Reds | Normal | Normal | Normal | Normal | Type-C |
| 73              | 7 Greens 3 Reds | Normal | Normal | Normal | Normal | Type-D |
| 74              | 7 Greens 4 Reds | Normal | Normal | Normal | Normal | Type-E |

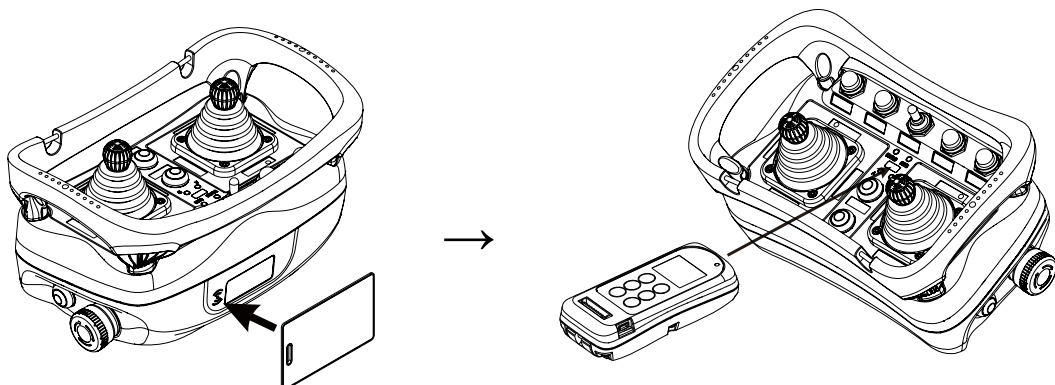
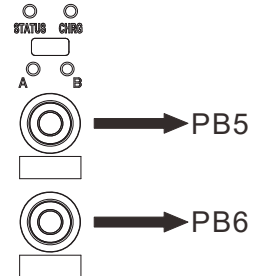
\* Normal → Normal button function without LED indication.

\* Type A ~ E → Type of A/B select sequence with LED indication.

## 4.1.9 Transmitter Access Card (TAC) Programming

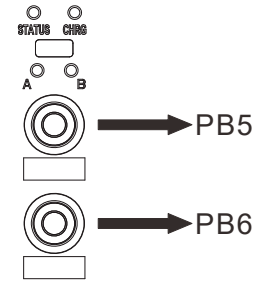
Follow the instruction below on how to program the TAC into the transmitter. The infrared IR programmer unit is required to complete the programming. Please contact ARC representative for more details.

- 1) Reset the STOP button (Status LED turned green for up to 2.0 seconds, transmitter power on).
- 2) Press and hold both PB5 and PB6 at the same time for up to 3.0 seconds (Status LED blinks orange). Let go of both PB5 and PB6 when LED-A and LED-B turned red.
- 3) Entered programming mode with Status LED displays 1x orange blink for firmware version, remote pairing and IR programming. 2x orange blinks for transmitter channel programming, 3x orange blinks for PB1~PB7 function programming, 4x orange blinks for frequency range indication, **5x orange blinks for TAC programming**.
- 4) Select TAC programming mode (Status LED 5x orange blinks) by press and hold PB6 for up to 3.0 seconds five times (LED-B turned red). Let go PB6 when Status LED turns to 5x orange blinks.
- 5) Enter TAC programming mode by press and hold both PB5 and PB6 at the same time for up to 3.0 seconds (LED-A and LED-B turned red). Let go of both PB5 and PB6 when Status LED displays fast orange blinks (entered TAC programming mode).
- 6) Placed the access card over the RFID marking located on the frontside of the transmitter.
- 7) Status LED with green blink means the access card is being programmed into the transmitter.
- 8) Status LED with orange blink means the access card is already programmed into the transmitter.
- 9) Status LED with red blink means unable to store any more access cards. Each transmitter can only store up to 16 access cards.
- 10) Use the IR programmer unit to extract all access card information stored inside the transmitter for further programming. Other than restricting any unauthorized personnel from using the transmitter, it can also be individually programmed unlocking any specific function or functions on the transmitter allowing a more experienced or qualified user to operate, such as the magnet lift, tandem operation, entering restricted areas, etc...
- 11) Exit TAC programming mode by pressing down the STOP button (transmitter power off).



## 4.1.10 Display Frequency Band

- 1) Reset the STOP button (Status LED turned green for up to 2.0 seconds, transmitter power on).
- 2) Press and hold both PB5 and PB6 at the same time for up to 3.0 seconds (Status LED blinks orange). Let go of both PB5 and PB6 when LED-A and LED-B turned red.
- 3) Entered programming mode with Status LED displays 1x orange blink for firmware version, remote pairing and IR programming. 2x orange blinks for transmitter channel programming, 3x orange blinks for PB1~PB7 function programming, **4x orange blinks for frequency range indication**, 5x orange blinks for TAC programming.
- 4) Select frequency range indication (Status LED 4x orange blinks) by press and hold PB6 for up to 3.0 seconds four times (LED-B turned red). Let go PB6 when Status LED turns to 4x orange blinks.
- 5) Enter frequency range indication mode by press and hold both PB5 and PB6 at the same time for up to 3.0 seconds (LED-A and LED-B turned red). Let go of both PB5 and PB6 when Status LED displays the transmitter frequency band with orange, green and red blinks. An orange blink represents the hundreds (+100), a green blink represents the tens (+010) and a red blink represents the units (+001). For example, 8 orange blinks followed by 6 green blinks and 3 red blinks is 863MHz.
- 6) Exit frequency range indication mode by pressing down the STOP button (transmitter power off).



## 4.1.11 Input and Output Feedback Settings

Up to 2 assignable relay outputs or 2 external inputs can be programmed into the system and feedback to the transmitter LED indicators during operation. These settings require using the IR programmer unit. Please contact ARC representative for more details.

## 4.1.12 Infrared Function Settings

The transmitter is embedded with infrared sensors for infrared start function. These settings require using the IR programmer unit. Please contact ARC representative for more details.

## 4.1.13 Zero-G Sensor Settings

The transmitter is embedded with a Zero-G sensor to guard against any unintended control of the crane or equipment when transmitter is thrown or dropped. When triggered, the receiver MAIN relays are deactivated with the exception of the horn output that can be assigned to any of the Function output relays (K25, K26 or K30). This horn output setting requires the IR programmer unit. Zero-G sensor trigger delay can also be set to either 0.5 second or 1.0 second. Please contact ARC representative for more details.

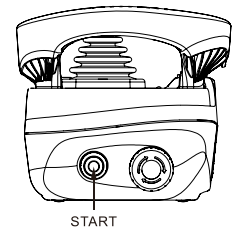
|   | Dipswitch Settings | Function        |
|---|--------------------|-----------------|
| 1 | xxxxxx0x           | Sensor Disabled |
| 2 | xxxxxx1x           | Sensor Enabled  |

## 4.2 Receiver

### 4.2.1 Button Output Functions

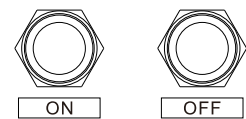
#### 4.2.1.1 START + AUX Function

After executing the START command at transmitter startup, the same START button becomes an auxiliary function with momentary contact connected through K25 Function output relay. There are other types of auxiliary functions made available for K25, K26 and K30 Function output relays. Refer to section 4.2.5 and section 4.2.6.6 ~ 4.2.6.8 Function output descriptions and programming. Please contact ARC representative if your application requires other types of auxiliary function connected to these Function output relays.



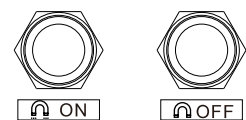
#### 4.2.1.2 ON/OFF Button Function

The user can set PB1+PB2, PB3+PB4 or PB5+PB6 on the transmitter to behave like a mechanical ON & OFF rocker or toggle switch. ON output relay closes when ON button is pressed (OFF output relay opens) and OFF output relay closes when OFF button is pressed (ON output relay opens). Refer to section 4.2.2.1 and section 4.2.6.13 ~ 4.2.6.15 output descriptions and programming.



#### 4.2.1.3 Magnet ON/OFF Button Function

The user can set PB1+PB2, PB3+PB4 or PB5+PB6 on the transmitter to control industrial magnet lift. Activate the magnet by pressing the Magnet ON button. Deactivate the magnet by first press and hold the Magnet ON button and then press the Magnet OFF button. Pressing the Magnet OFF button alone is unable to deactivate the magnet. Refer to section 4.2.2.1 and section 4.2.6.13 ~ 4.2.6.15 output descriptions and programming.



#### 4.2.1.4 External Warning Function

The user can install an external warning device (rotating lights, horn, etc...) to the K26 Function output relay located inside the receiver. The user can choose which joystick direction or directions triggers the external warning device when moved beyond 0 speed or neutral position. Refer to section 4.2.3.1 and section 4.2.6.9 ~ 4.2.6.12 output descriptions and programming.

#### 4.2.1.5 Momentary Contact

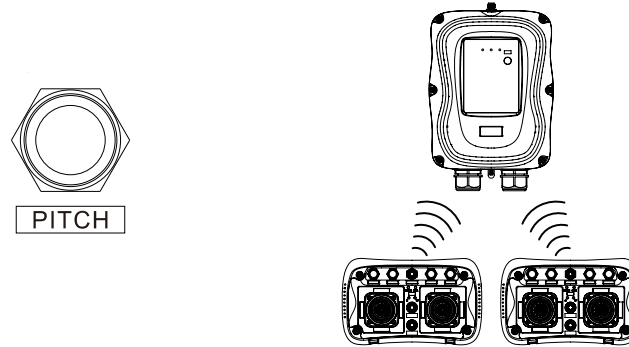
When button is released the corresponding output relay will open or deactivate. This type of relay action usually applies to external applications such as horn or buzzer. Refer to section 4.2.2.1 ~ 4.2.2.3 and section 4.2.6.13 ~ 4.2.6.16 output descriptions and programming.

#### 4.2.1.6 Toggled Contact

When button is released the corresponding output relay will maintain contact or closure until next time the user presses the same button again. This type of relay action usually applies to external application such as lights. Refer to section 4.2.2.1 ~ 4.2.2.3 and section 4.2.6.13 ~ 4.2.6.16 output descriptions and programming.

### 4.2.1.7 Pitch & Catch Function

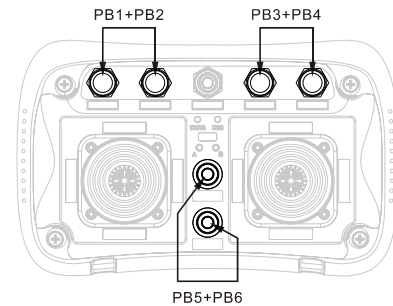
This function allows two operators controlling from opposite ends of a crane or equipment. When set to "Pitch & Catch" make sure the 2<sup>nd</sup> transmitter is set to the next upper channel (channel X+1). For example, if the system is set to channel 01 then the newly added 2<sup>nd</sup> transmitter must be set to channel 02 with identical serial number. Furthermore, the receiver auto-scanning function must set to 2-channel scanning (scans channel 01 and 02). Refer to section 4.2.2.2, section 4.2.6.5 and section 4.2.6.13 ~ 4.2.6.16 output descriptions and programming. Pitch & Catch function must set to assigned channel scheme (refer to section 4.1.2 part B).



## 4.2.2 Button Output Settings

### 4.2.2.1 Interlocking Button Outputs

Interlocking button pair cannot be pressed simultaneously as it will cancel each other out. Refer to section 4.2.1 and section 4.2.6.13 ~ 4.2.6.15 output descriptions and programming.

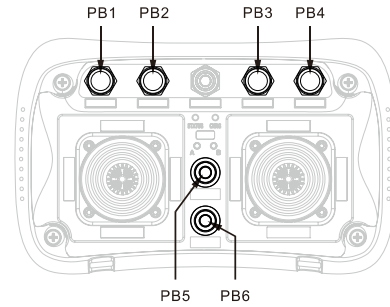


| Function # | Function Descriptions (left button / right button)                                                                                                          | # of Relays Used |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| 00000000   | Normal momentary output<br>(all contacts open when both buttons are pressed simultaneously or one after another)                                            | 2                |
| 00011000   | Normal momentary output<br>(1 <sup>st</sup> button pressed maintain contact when both buttons are pressed one after another)                                | 2                |
| 00001100   | OFF / ON                                                                                                                                                    | 2                |
| 00010010   | On + Start/Off + Start - For added safety, you must first press and hold the green START button and then the On or Off button to activate the output relay. | 2                |
| 00001110   | Magnet Lift On & Off                                                                                                                                        | 2                |
| 00010000   | OFF / ON (EMS)**                                                                                                                                            | 2                |
| 00010100   | Toggled / Toggled                                                                                                                                           | 2                |
| 00010110   | Toggled / Toggled (EMS)**                                                                                                                                   | 2                |
| 00011110   | Toggled / Normal (EMS)**                                                                                                                                    | 2                |

\* EMS: Relay opens when STOP button is pressed down.

#### 4.2.2.2 Non-Interlocking Button Outputs

Non-interlocking button pair or adjacent button can be pressed simultaneously. It usually applies to equipment's auxiliary functions such as lights, horn or buzzer. Refer to section 4.2.1 and section 4.2.6.13 ~ 4.2.6.15 output descriptions and programming.



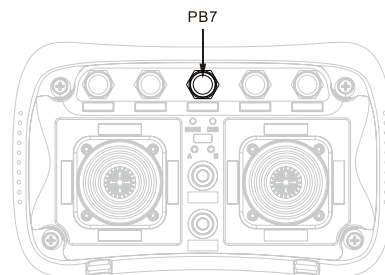
| Function # | Function Descriptions (left button / right button) | # of Relays Used |
|------------|----------------------------------------------------|------------------|
| 10000000   | Normal / Normal                                    | 2                |
| 10000010   | Normal / Toggled                                   | 2                |
| 10000110   | Normal / Toggled (EMS)**                           | 2                |
| 10001000   | Normal / Normal + Start*                           | 2                |
| 10001100   | Normal / Pitch & Catch                             | 2                |
| 10010000   | Toggled / Normal                                   | 2                |
| 10010010   | Toggled / Toggled                                  | 2                |
| 10010110   | Toggled / Toggled (EMS)**                          | 2                |
| 10011000   | Toggled / Normal + Start*                          | 2                |
| 10011100   | Toggled / Pitch & Catch                            | 2                |
| 10110000   | Toggled (EMS**) / Normal                           | 2                |
| 10110010   | Toggled (EMS)** / Toggled                          | 2                |
| 10110110   | Toggled (EMS)** / Toggled (EMS)**                  | 2                |
| 10111000   | Toggled (EMS)** / Normal + Start*                  | 2                |
| 10111100   | Toggled (EMS)** / Pitch & Catch                    | 2                |
| 11000000   | Normal + Start* / Normal                           | 2                |
| 11000010   | Normal + Start* / Toggled                          | 2                |
| 11000110   | Normal + Start* / Toggled (EMS)**                  | 2                |
| 11001000   | Normal + Start* / Normal + Start*                  | 2                |
| 11001100   | Normal + Start* / Pitch & Catch                    | 2                |
| 11100000   | Pitch & Catch / Normal                             | 2                |
| 11100010   | Pitch & Catch / Toggled                            | 2                |
| 11100110   | Pitch & Catch / Toggled (EMS)**                    | 2                |
| 11101000   | Pitch & Catch / Normal + Start*                    | 2                |

\* Normal + Start: For added safety, you must first press and hold the green START button and then the intended button to activate the output relay.

\*\* EMS: Relay opens when STOP button is pressed down.

### 4.2.2.3 PB7 Button Outputs

Usually applies to equipment's auxiliary functions such as lights, horn or buzzer. Refer to section 4.2.1 and section 4.2.6.16 output descriptions and programming.



| Function # | Function Descriptions | # of Relays Used |
|------------|-----------------------|------------------|
| 10000000   | Normal                | 1                |
| 10010000   | Toggled               | 1                |
| 10110000   | Toggled (EMS)**       | 1                |
| 11000000   | Normal + Start*       | 1                |
| 11100000   | Pitch & Catch         | 1                |

\* Normal + Start: For added safety, must first press and hold the green START button and then press the intended button to activate the output relay.

\*\* EMS: Relay opens when STOP button is pressed down.

## 4.2.3 Joystick and Lever Output Settings

### 4.2.3.1 Joystick and Lever Stepped Relay Outputs

Refer to section 4.2.6.9 ~ 4.2.6.12 relay output programming.

| Output Relay<br>Function  | CN1 ~ CN6                                                                                                                           | K1                         | K2                                        | K3                               | K4                           | K5                       | K6                   |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-------------------------------------------|----------------------------------|------------------------------|--------------------------|----------------------|
| <b>Type A</b><br>00000001 | at 1 <sup>st</sup> Step<br>at 2 <sup>nd</sup> Step<br>at 3 <sup>rd</sup> Step<br>at 4 <sup>th</sup> Step<br>at 5 <sup>th</sup> Step | F1<br>F1<br>F1<br>F1<br>F1 | or R1<br>or R1<br>or R1<br>or R1<br>or R1 | <br>F/R2<br>F/R2<br>F/R2<br>F/R2 | <br><br>F/R3<br>F/R3<br>F/R3 | <br><br><br>F/R4<br>F/R4 | <br><br><br><br>F/R5 |
| <b>Type B</b><br>00000011 | at 1 <sup>st</sup> Step<br>at 2 <sup>nd</sup> Step<br>at 3 <sup>rd</sup> Step<br>at 4 <sup>th</sup> Step<br>at 5 <sup>th</sup> Step | F1<br>F1<br>F1<br>F1<br>F1 | or R1<br>or R1<br>or R1<br>or R1<br>or R1 | <br>F/R2<br><br><br><br>         | <br><br>F/R3<br><br><br>     | <br><br><br>F/R4<br><br> | <br><br><br><br>F/R5 |
| <b>Type C</b><br>00000101 | at 1 <sup>st</sup> Step<br>at 2 <sup>nd</sup> Step<br>at 3 <sup>rd</sup> Step<br>at 4 <sup>th</sup> Step                            | F<br>F<br>F<br>F           | or R<br>or R<br>or R<br>or R              | F/R1<br>F/R1<br>F/R1<br>F/R1     | <br>F/R2<br>F/R2<br>F/R2     | <br><br>F/R3<br>F/R3     | <br><br><br>F/R4     |
| <b>Type C</b><br>00000111 | at 1 <sup>st</sup> Step<br>at 2 <sup>nd</sup> Step<br>at 3 <sup>rd</sup> Step<br>at 4 <sup>th</sup> Step                            | F<br>F<br>F<br>F           | or R<br>or R<br>or R<br>or R              | F/R1<br><br><br>                 | <br>F/R2<br><br>             | <br><br>F/R3<br><br>     | <br><br><br>F/R4     |
| <b>Type D</b><br>00001001 | at 1 <sup>st</sup> Step<br>at 2 <sup>nd</sup> Step<br>at 3 <sup>rd</sup> Step                                                       | F1<br>F1<br>F1             | or R1<br>or R1<br>or R1                   | <br>F2<br>F2                     | <br>or R2<br>or R2           | <br><br>F3               | <br><br>or R3        |
| <b>Type E</b><br>00001011 | at 1 <sup>st</sup> Step<br>at 2 <sup>nd</sup> Step<br>at 3 <sup>rd</sup> Step                                                       | F1<br><br>                 | or R1<br><br>                             | <br>F2<br><br>                   | <br>or R2<br><br>            | <br><br>F3               | <br><br>or R3        |

**F** → Forward    **F1** → Forward 1<sup>st</sup> step    **F2** → Forward 2<sup>nd</sup> step    **F3** → Forward 3<sup>rd</sup> step

**R** → Reverse    **R1** → Reverse 1<sup>st</sup> step    **R2** → Reverse 2<sup>nd</sup> step    **R3** → Reverse 3<sup>rd</sup> step

**F/R1** → Forward and Reverse shared 1<sup>st</sup> step    **F/R2** → Forward and Reverse shared 2<sup>nd</sup> step

**F/R3** → Forward and Reverse shared 3<sup>rd</sup> step    **F/R4** → Forward and Reverse shared 4<sup>th</sup> step

**F/R5** → Forward and Reverse shared 5<sup>th</sup> step

**Dipswitch setting with the added external warning function: XX1XXXXX**

### 4.2.3.2 Joystick and Lever Stepless Analog Outputs

Refer to section 4.2.6.16 ~ 4.2.6.19 analog output programming.

|         | Minimum     | Neutral     | Maximum     |
|---------|-------------|-------------|-------------|
| Voltage | From 0~10V  | From 0~10V  | From 0~10V  |
| Current | From 0~20mA | From 0~20mA | From 0~20mA |

\* No external warning function available for stepless analog outputs.

## 4.2.4 Jumper Functions

Refer to section 4.2.6.20 jumper function programming.

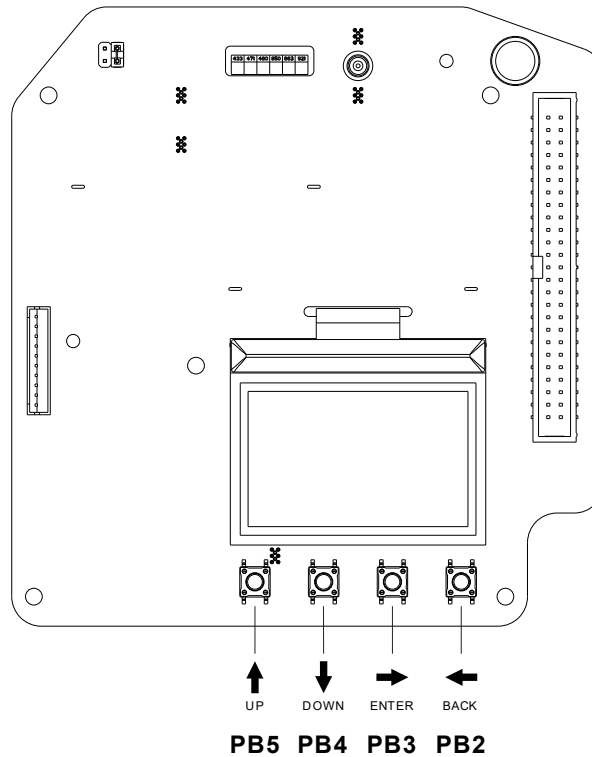
| Jumper Settings | Function                                                                                                                                                               |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| JP3<br>(Open)   | <b>Standard A/B selector sequence</b> - Output relay A activated at A position, output relay B activated at B position, both relays activated at A+B position.         |
| JP3<br>(Short)  | <b>Reversed logic A/B selector sequence</b> - Output relay B activated at A position, output relay A activated at B position, both relays deactivated at A+B position. |
| JP6<br>(Short)  | System firmware version                                                                                                                                                |
| JP7<br>(Short)  | For system testing only (receiver MAIN relays disabled)                                                                                                                |
| JP8<br>(Open)   | Receiver-to-transmitter remote pairing<br>(pressing the Pairing button required)                                                                                       |
| JP8<br>(Short)  | Receiver-to-transmitter remote pairing<br>(pressing the Pairing button not required)                                                                                   |

## 4.2.5 Function Relay Outputs

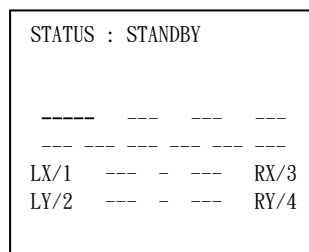
Listed below are other types of functions that can be outputted through the three Function output relays (K25, K26 and K30). Refer to section 4.2.6.6 ~ 4.2.6.8 function relay programming.

|          |   |                                                                                                                                                          |
|----------|---|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| LV       | : | Function relay closes when receiver voltage is low.                                                                                                      |
| ID       | : | Function relay works simultaneously with all motion commands.                                                                                            |
| NORMAL   | : | START function + AUX with normal momentary output. Works the 2 <sup>nd</sup> time the START button is pressed.                                           |
| NORMAL2  | : | START function + AUX with normal momentary output. Works the 1 <sup>st</sup> time the START button is pressed.                                           |
| TOGGLE   | : | START function + AUX with toggled output.                                                                                                                |
| TOG&E    | : | START function + AUX with toggled output. The relay opens when STOP button is pressed down.                                                              |
| EXT      | : | Function relay works simultaneously with the receiver MAIN relays.                                                                                       |
| TDM A+B  | : | Function relay closes when selector switch is rotated to the A+B position and opens when rotate to A or B positions (tandem monitoring output).          |
| HORN     | : | Function relay closes for up to 3 seconds when START button is pressed at transmitter power on and then becomes a normal momentary output thereafter.    |
| G SENSOR | : | Function relay closes when Zero-G sensor is triggered (receiver MAIN relays deactivated) and opens when receiver MAIN relays are reactivated.            |
| RESET    | : | Function relay closes when the START button is pressed and opens when let go. Works during initial transmitter startup and inactivity timer START reset. |
| SW1 ABC  | : | Function relay closes at C position (for button or toggle switch programmed to Select A/B/C function).                                                   |
| SW2 ABC  | : | Function relay closes at C position (for button or toggle switch programmed to Select A/B/C function).                                                   |
| SW3 ABC  | : | Function relay closes at C position (for button or toggle switch programmed to Select A/B/C function).                                                   |
| SW4 ABC  | : | Function relay closes at C position (for button or toggle switch programmed to Select A/B/C function).                                                   |
| SW7 ABC  | : | Function relay closes at C position (for button or toggle switch programmed to Select A/B/C function).                                                   |

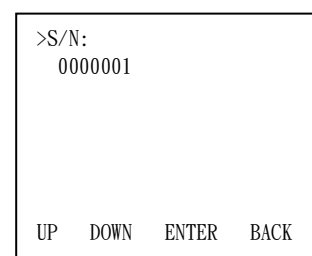
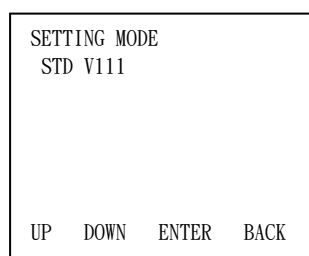
## 4.2.6 Programming



- 1) Turn on the receiver power (receiver in standby mode).



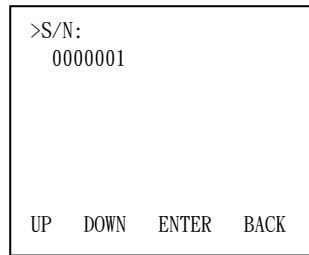
- 2) Press and hold both PB2 and PB3 for up to 3 seconds to enter system programming. The LCD screen will exit system programming after 5 minutes of inactivity.



- 3) Press the UP/DOWN buttons to scroll through all available settings.

#### 4.2.6.1 System Serial Number

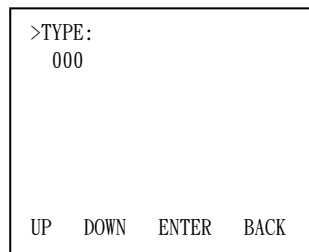
For safety measure, system serial number can only be changed via the IR programmer unit. Please contact ARC representative for more details. Press the UP/DOWN buttons to scroll through other system settings



The screenshot shows a monochrome display with the text ">S/N:" at the top, followed by the value "0000001". At the bottom of the display, there are four buttons labeled "UP", "DOWN", "ENTER", and "BACK".

#### 4.2.6.2 System Type Programming

System type number is associated with functions such as the dual-crane tandem operation, multiple-receiver operation, and random-access operation. Please contact ARC representative for more details.

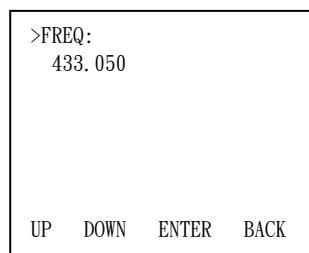


The screenshot shows a monochrome display with the text ">TYPE:" at the top, followed by the value "000". At the bottom of the display, there are four buttons labeled "UP", "DOWN", "ENTER", and "BACK".

- 1) Press the ENTER button to enter system type setting (cursor shown next to the 3-digit type value).
- 2) Press the UP/DOWN buttons to scroll and select type value as a whole (000~512).
- 3) Or press the ENTER button again to change the 3-digit type value individually (cursor shown under the first digit to the far left). Press the UP/DOWN buttons to scroll and select, and then the ENTER button to go to the next digit to the right. Press the ENTER button repeatedly to cycle through the 3-digit type value. Press the UP/DOWN buttons to change value.
- 4) Press the BACK button to return to step #1 above. Press it again to go back to System TYPE Programming (cursor shown next to TYPE).
- 5) Press the UP/DOWN buttons to scroll through other system settings.

#### 4.2.6.3 System Frequency Programming

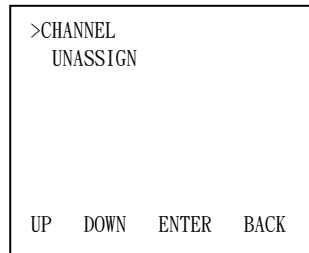
For safety measure, system frequency range can only be changed via the IR programmer unit. Please contact ARC representative for more details. Press the UP/DOWN buttons to scroll through other system settings



The screenshot shows a monochrome display with the text ">FREQ:" at the top, followed by the value "433.050". At the bottom of the display, there are four buttons labeled "UP", "DOWN", "ENTER", and "BACK".

#### 4.2.6.4 System Channel Programming

Tandems, random access, pitch & catch, t-type, and multi-receiver configurations “cannot” set to unassigned channel.



>CHANNEL  
UNASSIGN

UP DOWN ENTER BACK

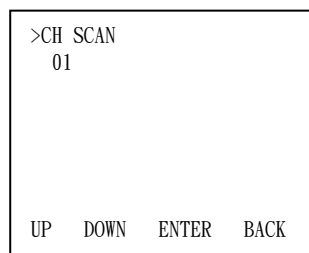
- 1) Press the ENTER button to enter system channel setting (cursor shown next to UNASSIGN\* or the 2-digit channel value\*\*).
- 2) Press the UP/DOWN buttons to scroll and select UNASSIGN or channel value as a whole (channel 1~62).
- 3) Or press the ENTER button again to change the 2-digit channel value individually (cursor shown under the first digit to the left). Press the UP/DOWN buttons to scroll and select, and then the ENTER button to go to the next digit to the right. Press the ENTER button repeatedly to cycle through the 2-digit channel value. Press the UP/DOWN buttons to change value.
- 4) Press the BACK button to return to step #1 above. Press it again to go back to System Channel Programming (cursor shown next to CHANNEL).
- 5) Press the UP/DOWN buttons to scroll through other system settings.

*\* Make sure the transmitter is also set to Unassigned Channel Scheme.*

*\*\* Make sure the transmitter channel is identical to the receiver channel.*

#### 4.2.6.5 Auto-Scanning Programming

Auto-scanning function is required for pitch & catch, tandems, and random-access operations.



>CH SCAN  
01

UP DOWN ENTER BACK

- 1) Press the ENTER button to enter channel scanning setting (cursor shown next to the 2-digit channel scanning value).
- 2) Press the UP/DOWN buttons to scroll and select the number of channels to be scanned when the receiver is in standby mode (maximum 12 channels).
- 3) Press the BACK button to go back to Auto-Scanning Programming (cursor shown next to CH SCAN).
- 4) Press the UP/DOWN buttons to scroll through other system settings.

*\* When set to 2-channel scanning, the receiver will scan the channel set in the receiver (channel X) and the next channel up (channel X+1). When set to 3-channel scanning, the receiver will scan the channel set in the receiver (channel X) and the next 2 channels up (channel X+1 and X+2 ).*

#### 4.2.6.6 Function Relay-1 Programming

Please refer to section 4.2.5 for various types of function relay outputs available.

|            |      |       |      |
|------------|------|-------|------|
| >FUNC RLY1 |      |       |      |
| NORMAL     |      |       |      |
|            |      |       |      |
| UP         | DOWN | ENTER | BACK |

- 1) Press the ENTER button to enter function relay-1 setting (cursor shown next to NORMAL or other setting previously programmed).
- 2) Press the UP/DOWN buttons to scroll and select.
- 3) Press the BACK button to go back to Function Relay-1 Programming (cursor shown next to FUNC RLY1).
- 4) Press the UP/DOWN buttons to scroll through other system settings.

#### 4.2.6.7 Function Relay-2 Programming

Please refer to section 4.2.5 for various types of function relay outputs available.

|            |      |       |      |
|------------|------|-------|------|
| >FUNC RLY2 |      |       |      |
| ---        |      |       |      |
|            |      |       |      |
| UP         | DOWN | ENTER | BACK |

- 1) Press the ENTER button to enter function relay-2 setting (cursor shown next to --- or other setting previously programmed).
- 2) Press the UP/DOWN buttons to scroll and select.
- 3) Press the BACK button to go back to Function Relay-2 Programming (cursor shown next to FUNC RLY2).
- 4) Press the UP/DOWN buttons to scroll through other system settings.

#### 4.2.6.8 Function Relay-3 Programming

Please refer to section 4.2.5 for various types of function relay outputs available.

|            |      |       |      |
|------------|------|-------|------|
| >FUNC RLY3 |      |       |      |
| EXT        |      |       |      |
|            |      |       |      |
| UP         | DOWN | ENTER | BACK |

- 1) Press the ENTER button to enter function relay-3 setting (cursor shown next to EXT or other setting previously programmed).
- 2) Press the UP/DOWN buttons to scroll and select.
- 3) Press the BACK button to go back to Function Relay-3 Programming (cursor shown next to FUNC RLY3).
- 4) Press the UP/DOWN buttons to scroll through other system settings.

#### 4.2.6.9 Joystick LX Axis or Lever L1 Relay Output Programming

Please refer to section 4.2.3.1 for various types of relay output configurations.

|           |      |       |      |
|-----------|------|-------|------|
| >LX or L1 |      |       |      |
| 00000000  |      | RELAY |      |
|           |      |       |      |
| UP        | DOWN | ENTER | BACK |

- 1) Press the ENTER button to enter relay output type setting (cursor shown next to the 8-digit relay output type value).
- 2) Press the UP/DOWN buttons to scroll and select relay output type as a whole.
- 3) Or press the ENTER button again to change the 8-digit relay output type individually (cursor shown under the first digit to the far left). Press the UP/DOWN buttons to scroll and select between 0 and 1, and then the ENTER button to go to the next digit to the right. Press the ENTER button repeatedly to cycle through the 8-digit relay output type. Press the UP/DOWN buttons to change value.
- 4) Press the BACK button to return to step #1 above. Press it again to go back to LX or L1 Relay Output Programming (cursor shown next to LX or L1).
- 5) Press the UP/DOWN buttons to scroll through other system settings.

#### 4.2.6.10 Joystick LY Axis or Lever L2 Relay Output Programming

Please refer to section 4.2.3.1 for various types of relay output configurations.

|           |      |       |      |
|-----------|------|-------|------|
| >LY or L2 |      |       |      |
| 00000000  |      | RELAY |      |
|           |      |       |      |
| UP        | DOWN | ENTER | BACK |

- 1) Press the ENTER button to enter relay output type setting (cursor shown next to the 8-digit relay output type value).
- 2) Press the UP/DOWN buttons to scroll and select relay output type as a whole.
- 3) Or press the ENTER button again to change the 8-digit relay output type individually (cursor shown under the first digit to the far left). Press the UP/DOWN buttons to scroll and select between 0 and 1, and then the ENTER button to go to the next digit to the right. Press the ENTER button repeatedly to cycle through the 8-digit relay output type. Press the UP/DOWN buttons to change value.
- 4) Press the BACK button to return to step #1 above. Press it again to go back to LY or L2 Relay Output Programming (cursor shown next to LY or L2).
- 5) Press the UP/DOWN buttons to scroll through other system settings.

#### 4.2.6.11 Joystick RX Axis or Lever L3 Relay Output Programming

Please refer to section 4.2.3.1 for various types of relay output configurations.

|           |      |       |      |
|-----------|------|-------|------|
| >RX or L3 |      |       |      |
| 00000000  |      | RELAY |      |
|           |      |       |      |
| UP        | DOWN | ENTER | BACK |

- 1) Press the ENTER button to enter relay output type setting (cursor shown next to the 8-digit relay output type value).
- 2) Press the UP/DOWN buttons to scroll and select relay output type as a whole.
- 3) Or press the ENTER button again to change the 8-digit relay output type individually (cursor shown under the first digit to the far left). Press the UP/DOWN buttons to scroll and select between 0 and 1, and then the ENTER button to go to the next digit to the right. Press the ENTER button repeatedly to cycle through the 8-digit relay output type. Press the UP/DOWN buttons to change value.
- 4) Press the BACK button to return to step #1 above. Press it again to go back to RX or L3 Relay Output Programming (cursor shown next to RX or L3).
- 5) Press the UP/DOWN buttons to scroll through other system settings.

#### 4.2.6.12 Joystick RY Axis or Lever L4 Relay Output Programming

Please refer to section 4.2.3.1 for various types of relay output configurations.

|           |      |       |      |
|-----------|------|-------|------|
| >RY or L4 |      |       |      |
| 00000000  |      | RELAY |      |
|           |      |       |      |
| UP        | DOWN | ENTER | BACK |

- 1) Press the ENTER button to enter relay output type setting (cursor shown next to the 8-digit relay output type value).
- 2) Press the UP/DOWN buttons to scroll and select relay output type as a whole.
- 3) Or press the ENTER button again to change the 8-digit relay output type individually (cursor shown under the first digit to the far left). Press the UP/DOWN buttons to scroll and select between 0 and 1, and then the ENTER button to go to the next digit to the right. Press the ENTER button repeatedly to cycle through the 8-digit relay output type. Press the UP/DOWN buttons to change value.
- 4) Press the BACK button to return to step #1 above. Press it again to go back to RY or L4 Relay Output Programming (cursor shown next to RY or L4).
- 5) Press the UP/DOWN buttons to scroll through other system settings.

#### 4.2.6.13 PB1&2 Relay Output Programming

Please refer to section 4.2.2.1 and 4.2.2.2 for various types of interlocking and non-interlocking relay output configurations.

|          |      |       |      |
|----------|------|-------|------|
| >SW1&2   |      |       |      |
| 00000000 |      | RELAY |      |
|          |      |       |      |
| UP       | DOWN | ENTER | BACK |

- 1) Press the ENTER button to enter relay output type setting (cursor shown next to the 8-digit relay output type value).
- 2) Press the UP/DOWN buttons to scroll and select relay output type as a whole.
- 3) Or press the ENTER button again to change the 8-digit relay output type individually (cursor shown under the first digit to the far left). Press the UP/DOWN buttons to scroll and select between 0 and 1, and then the ENTER button to go to the next digit to the right. Press the ENTER button repeatedly to cycle through the 8-digit relay output type. Press the UP/DOWN buttons to change value.
- 4) Press the BACK button to return to step #1 above. Press it again to go back to SW1&2 Relay Output Programming (cursor shown next to SW1&2).
- 5) Press the UP/DOWN buttons to scroll through other system settings.

#### 4.2.6.14 PB3&4 Relay Output Programming

Please refer to section 4.2.2.1 and 4.2.2.2 for various types of interlocking and non-interlocking relay output configurations.

|          |      |       |      |
|----------|------|-------|------|
| >SW3&4   |      |       |      |
| 00000000 |      | RELAY |      |
|          |      |       |      |
| UP       | DOWN | ENTER | BACK |

- 1) Press the ENTER button to enter relay output type setting (cursor shown next to the 8-digit relay output type value).
- 2) Press the UP/DOWN buttons to scroll and select relay output type as a whole.
- 3) Or press the ENTER button again to change the 8-digit relay output type individually (cursor shown under the first digit to the far left). Press the UP/DOWN buttons to scroll and select between 0 and 1, and then the ENTER button to go to the next digit to the right. Press the ENTER button repeatedly to cycle through the 8-digit relay output type. Press the UP/DOWN buttons to change value.
- 4) Press the BACK button to return to step #1 above. Press it again to go back to SW3&4 Relay Output Programming (cursor shown next to SW3&4).
- 5) Press the UP/DOWN buttons to scroll through other system settings.

#### 4.2.6.15 PB5&6 Relay Output Programming

Please refer to section 4.2.2.1 and 4.2.2.2 for various types of interlocking and non-interlocking relay output configurations.

|          |      |       |      |
|----------|------|-------|------|
| >SW5&6   |      |       |      |
| 00000000 |      | RELAY |      |
|          |      |       |      |
| UP       | DOWN | ENTER | BACK |

- 1) Press the ENTER button to enter relay output type setting (cursor shown next to the 8-digit relay output type value).
- 2) Press the UP/DOWN buttons to scroll and select relay output type as a whole.
- 3) Or press the ENTER button again to change the 8-digit relay output type individually (cursor shown under the first digit to the far left). Press the UP/DOWN buttons to scroll and select between 0 and 1, and then the ENTER button to go to the next digit to the right. Press the ENTER button repeatedly to cycle through the 8-digit relay output type. Press the UP/DOWN buttons to change value.
- 4) Press the BACK button to return to step #1 above. Press it again to go back to SW5&6 Relay Output Programming (cursor shown next to SW5&6).
- 5) Press the UP/DOWN buttons to scroll through other system settings.

#### 4.2.6.16 PB7 Relay Output Programming

Please refer to section 4.2.2.3 for various types of relay output configurations.

|          |      |       |      |
|----------|------|-------|------|
| >SW7     |      |       |      |
| 00000000 |      | RELAY |      |
|          |      |       |      |
| UP       | DOWN | ENTER | BACK |

- 1) Press the ENTER button to enter relay output type setting (cursor shown next to the 8-digit relay output type value).
- 2) Press the UP/DOWN buttons to scroll and select relay output type as a whole.
- 3) Or press the ENTER button again to change the 8-digit relay output type individually (cursor shown under the first digit to the far left). Press the UP/DOWN buttons to scroll and select between 0 and 1, and then the ENTER button to go to the next digit to the right. Press the ENTER button repeatedly to cycle through the 8-digit relay output type. Press the UP/DOWN buttons to change value.
- 4) Press the BACK button to return to step #1 above. Press it again to go back to SW7 Relay Output Programming (cursor shown next to SW7).
- 5) Press the UP/DOWN buttons to scroll through other system settings.

#### 4.2.6.16 Joystick LX Axis and Lever L1 Analog Output Programming

Please refer to section 4.2.3.2 for various types of analog output configurations.

|           |                 |
|-----------|-----------------|
| >LX or L1 |                 |
| >VOLTAGE  | ANALOG          |
| MAX 10.0V |                 |
| NEU 00.0V |                 |
| MIN 10.0V |                 |
| UP        | DOWN ENTER BACK |

|           |                 |
|-----------|-----------------|
| >LX or L1 |                 |
| >CURRENT  | ANALOG          |
| MAX 20mA  |                 |
| NEU 00mA  |                 |
| MIN 20mA  |                 |
| UP        | DOWN ENTER BACK |

|           |                 |
|-----------|-----------------|
| >LX or L1 |                 |
| >OFF      | ANALOG          |
|           |                 |
|           |                 |
| UP        | DOWN ENTER BACK |

- 1) Press the ENTER button to enter analog output type setting (cursor shown next to VOLTAGE, CURRENT or OFF).
- 2) Press the UP/DOWN buttons and then the ENTER button to scroll and select between Voltage Outputs, Current Outputs or Off (analog outputs disabled).

##### Voltage Outputs:

- 3) Press the UP/DOWN buttons and then the ENTER button to scroll and select between Minimum, Neutral and Maximum voltage outputs (cursor shown under the first digit to the far left). Press the UP/DOWN buttons to scroll and select voltage value, and then the ENTER button to go to the next digit to the right. Press the ENTER button repeatedly to cycle through the 3-digit voltage value. Press the UP/DOWN buttons to change value.
- 4) Press the BACK button to return to step #3 above. Press it again to go back to step #1. Press it again to go back to LX or L1 Analog Output Programming (cursor shown next to LX or L1).
- 5) Press the UP/DOWN buttons to scroll through other system settings.

*\* Make sure the selector switch on analog module is set to "V" position for voltage outputs.*



##### Current Outputs:

- 6) Press the UP/DOWN buttons and then the ENTER button to scroll and select between Minimum, Neutral and Maximum current outputs (cursor shown next to the 2-digit current value). Press the UP/DOWN buttons to scroll and select current output value.
- 7) Press the BACK button to return to step #6 above. Press it again to go back to step #1. Press it again to go back to LX or L1 Analog Output Programming (cursor shown next to LX or L1).
- 8) Press the UP/DOWN buttons to scroll through other system settings.

*\* Make sure the selector switch on analog module is set to "A" position for current (amperage) outputs.*



#### 4.2.6.17 Joystick LY Axis and Lever L2 Analog Output Programming

Please refer to section 4.2.3.2 for various types of analog output configurations.

|           |                 |
|-----------|-----------------|
| >LY or L2 |                 |
| >VOLTAGE  | ANALOG          |
| MAX 10.0V |                 |
| NEU 00.0V |                 |
| MIN 10.0V |                 |
| UP        | DOWN ENTER BACK |

|           |                 |
|-----------|-----------------|
| >LY or L2 |                 |
| >CURRENT  | ANALOG          |
| MAX 20mA  |                 |
| NEU 00mA  |                 |
| MIN 20mA  |                 |
| UP        | DOWN ENTER BACK |

|           |                 |
|-----------|-----------------|
| >LY or L2 |                 |
| >OFF      | ANALOG          |
|           |                 |
|           |                 |
| UP        | DOWN ENTER BACK |

- 1) Press the ENTER button to enter analog output type setting (cursor shown next to VOLTAGE, CURRENT or OFF).
- 2) Press the UP/DOWN buttons and then the ENTER button to scroll and select between Voltage Outputs, Current Outputs or Off (analog outputs disabled).

#### Voltage Outputs:

- 3) Press the UP/DOWN buttons and then the ENTER button to scroll and select between Minimum, Neutral and Maximum voltage outputs (cursor shown under the first digit to the far left). Press the UP/DOWN buttons to scroll and select voltage value, and then the ENTER button to go to the next digit to the right. Press the ENTER button repeatedly to cycle through the 3-digit voltage value. Press the UP/DOWN buttons to change value.
- 4) Press the BACK button to return to step #3 above. Press it again to go back to step #1. Press it again to go back to LY or L2 Analog Output Programming (cursor shown next to LY or L2).
- 5) Press the UP/DOWN buttons to scroll through other system settings.

*\* Make sure the selector switch on analog module is set to "V" position for voltage outputs.*



#### Current Outputs:

- 6) Press the UP/DOWN buttons and then the ENTER button to scroll and select between Minimum, Neutral and Maximum current outputs (cursor shown next to the 2-digit current value). Press the UP/DOWN buttons to scroll and select current output value.
- 7) Press the BACK button to return to step #6 above. Press it again to go back to step #1. Press it again to go back to LY or L2 Analog Output Programming (cursor shown next to LY or L2).
- 8) Press the UP/DOWN buttons to scroll through other system settings.

*\* Make sure the selector switch on analog module is set to "A" position for current (amperage) outputs.*



#### 4.2.6.18 Joystick RX Axis and Lever L3 Analog Output Programming

Please refer to section 4.2.3.2 for various types of analog output configurations.

|           |                 |
|-----------|-----------------|
| >RX or L3 |                 |
| >VOLTAGE  | ANALOG          |
| MAX 10.0V |                 |
| NEU 00.0V |                 |
| MIN 10.0V |                 |
| UP        | DOWN ENTER BACK |

|           |                 |
|-----------|-----------------|
| >RX or L3 |                 |
| >CURRENT  | ANALOG          |
| MAX 20mA  |                 |
| NEU 00mA  |                 |
| MIN 20mA  |                 |
| UP        | DOWN ENTER BACK |

|           |                 |
|-----------|-----------------|
| >RX or L3 |                 |
| >OFF      | ANALOG          |
|           |                 |
|           |                 |
| UP        | DOWN ENTER BACK |

- 1) Press the ENTER button to enter analog output type setting (cursor shown next to VOLTAGE, CURRENT or OFF).
- 2) Press the UP/DOWN buttons and then the ENTER button to scroll and select between Voltage Outputs, Current Outputs or Off (analog outputs disabled).

##### Voltage Outputs:

- 3) Press the UP/DOWN buttons and then the ENTER button to scroll and select between Minimum, Neutral and Maximum voltage outputs (cursor shown under the first digit to the far left). Press the UP/DOWN buttons to scroll and select voltage value, and then the ENTER button to go to the next digit to the right. Press the ENTER button repeatedly to cycle through the 3-digit voltage value. Press the UP/DOWN buttons to change value.
- 4) Press the BACK button to return to step #3 above. Press it again to go back to step #1. Press it again to go back to RX or L3 Analog Output Programming (cursor shown next to RX or L3).
- 5) Press the UP/DOWN buttons to scroll through other system settings.

*\* Make sure the selector switch on analog module is set to "V" position for voltage outputs.*



##### Current Outputs:

- 6) Press the UP/DOWN buttons and then the ENTER button to scroll and select between Minimum, Neutral and Maximum current outputs (cursor shown next to the 2-digit current value). Press the UP/DOWN buttons to scroll and select current output value.
- 7) Press the BACK button to return to step #6 above. Press it again to go back to step #1. Press it again to go back to RX or L3 Analog Output Programming (cursor shown next to RX or L3).
- 8) Press the UP/DOWN buttons to scroll through other system settings.

*\* Make sure the selector switch on analog module is set to "A" position for current (amperage) outputs.*



#### 4.2.6.19 Joystick RY Axis and Lever L4 Analog Output Programming

Please refer to section 4.2.3.2 for various types of analog output configurations.

|           |      |        |      |
|-----------|------|--------|------|
| >RY or L4 |      |        |      |
| >VOLTAGE  |      | ANALOG |      |
| MAX 10.0V |      |        |      |
| NEU 00.0V |      |        |      |
| MIN 10.0V |      |        |      |
| UP        | DOWN | ENTER  | BACK |

|           |      |        |      |
|-----------|------|--------|------|
| >RY or L4 |      |        |      |
| >CURRENT  |      | ANALOG |      |
| MAX 20mA  |      |        |      |
| NEU 00mA  |      |        |      |
| MIN 20mA  |      |        |      |
| UP        | DOWN | ENTER  | BACK |

|           |      |        |      |
|-----------|------|--------|------|
| >RY or L4 |      |        |      |
| >OFF      |      | ANALOG |      |
|           |      |        |      |
| UP        | DOWN | ENTER  | BACK |

- 1) Press the ENTER button to enter analog output type setting (cursor shown next to VOLTAGE, CURRENT or OFF).
- 2) Press the UP/DOWN buttons and then the ENTER button to scroll and select between Voltage Outputs, Current Outputs or Off (analog outputs disabled).

##### Voltage Outputs:

- 3) Press the UP/DOWN buttons and then the ENTER button to scroll and select between Minimum, Neutral and Maximum voltage outputs (cursor shown under the first digit to the far left). Press the UP/DOWN buttons to scroll and select voltage value, and then the ENTER button to go to the next digit to the right. Press the ENTER button repeatedly to cycle through the 3-digit voltage value. Press the UP/DOWN buttons to change value.
- 4) Press the BACK button to return to step #3 above. Press it again to go back to step #1. Press it again to go back to RY or L4 Analog Output Programming (cursor shown next to RY or L4).
- 5) Press the UP/DOWN buttons to scroll through other system settings.

*\* Make sure the selector switch on analog module is set to "V" position for voltage outputs.*



##### Current Outputs:

- 6) Press the UP/DOWN buttons and then the ENTER button to scroll and select between Minimum, Neutral and Maximum current outputs (cursor shown next to the 2-digit current value). Press the UP/DOWN buttons to scroll and select current output value.
- 7) Press the BACK button to return to step #6 above. Press it again to go back to step #1. Press it again to go back to RY or L4 Analog Output Programming (cursor shown next to RY or L4).
- 8) Press the UP/DOWN buttons to scroll through other system settings.

*\* Make sure the selector switch on analog module is set to "A" position for current (amperage) outputs.*



#### 4.2.6.20 Jumper Function Programming

Please refer to section 4.2.4 for various types of jumper settings available.

|                          |  |          |  |
|--------------------------|--|----------|--|
| >JUMPER                  |  |          |  |
| JP1-OPEN                 |  | JP5-OPEN |  |
| JP2-OPEN                 |  | JP6-OPEN |  |
| JP3-OPEN                 |  | JP7-OPEN |  |
| JP4-OPEN                 |  | JP8-OPEN |  |
| UP   DOWN   ENTER   BACK |  |          |  |

- 1) Press the ENTER button to enter jumper setting (cursor shown next to JP1-OPEN or other setting previously programmed).
- 2) Press the UP/DOWN buttons and then the ENTER button to scroll and select which Jumper to program (cursor shown next to OPEN or SHORT)
- 3) Press the UP/DOWN buttons to select OPEN or SHORT.
- 4) Press the BACK button to go back to step #1. Press it again to go back to Jumper Function Programming (cursor shown next to JUMPER)
- 5) Press the UP/DOWN buttons to scroll through other system settings.

#### 4.2.6.21 SAVE Programming

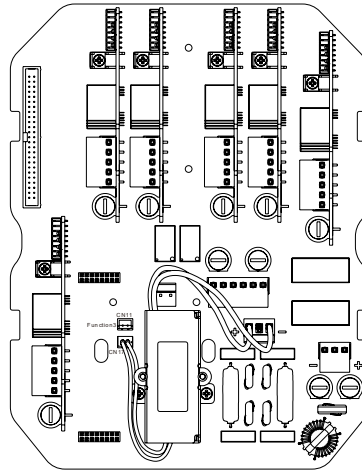
|                          |  |  |  |
|--------------------------|--|--|--|
| >SAVE?                   |  |  |  |
| YES                      |  |  |  |
| NO                       |  |  |  |
| UP   DOWN   ENTER   BACK |  |  |  |

- 1) Press the ENTER button to enter save programming (cursor shown next to YES).
- 2) Press the UP/DOWN buttons to select Yes or No.
- 3) Press the ENTER button to execute.
- 4) Programming completed with LCD returned to the main screen.

|                   |     |   |      |
|-------------------|-----|---|------|
| STATUS : DECODING |     |   |      |
| -----             |     |   |      |
| -----             |     |   |      |
| LX/1              | --- | - | RX/3 |
| LY/2              | --- | - | RY/4 |

## 4.2.7 Voltage Settings

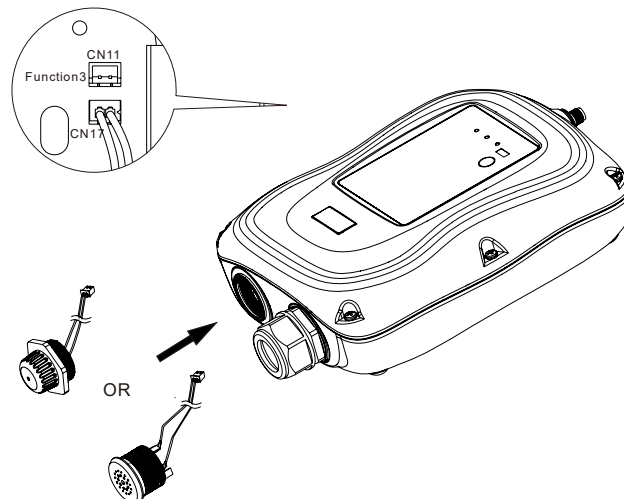
Always check the voltage setting is correct for your application prior to installation.



| FUSE #         | 9~36VDC | 24~48VAC | 110~240VAC | 380~460VAC |
|----------------|---------|----------|------------|------------|
| F3, F9 and F10 | 5.0A    | 5.0A     | 5.0A       | 5.0A       |
| F1 and F2      | 3.0A    | 3.0A     | 2.0A       | 2.0A       |

## 4.2.8 Indicator Light and Buzzer Installation

The miniature indicator light and buzzer can be easily fitted onto the receiver enclosure. The indicator light or the buzzer works simultaneously with the receiver MAIN relays (manufacture preset). When receiver MAIN relays are activated the indicator light or the buzzer is also activated, or vice versa. Make sure the indicator light or the buzzer is connected to the K30 Function output relay CN11 port located on the line filter/digital/analog mother board inside the receiver. Please contact ARC representative if you would like the indicator light or the buzzer work differently than described above. Refer to section 4.2.5 and section 4.2.6.6 ~ 4.2.6.8 Function relay descriptions and programming



## 4.2.9 System Channels Table (433~439MHz)

| Channel | Primary/Secondary Frequency | Channel | Primary/Secondary Frequency |
|---------|-----------------------------|---------|-----------------------------|
| 01      | 433.050/436.550             | 32      | 434.600/438.100             |
| 02      | 433.100/436.600             | 33      | 434.650/438.150             |
| 03      | 433.150/436.650             | 34      | 434.700/438.200             |
| 04      | 433.200/436.700             | 35      | 434.750/438.250             |
| 05      | 433.250/436.750             | 36      | 434.800/438.300             |
| 06      | 433.300/436.800             | 37      | 434.850/438.350             |
| 07      | 433.350/436.850             | 38      | 434.900/438.400             |
| 08      | 433.400/436.900             | 39      | 434.950/438.450             |
| 09      | 433.450/436.950             | 40      | 435.000/438.500             |
| 10      | 433.500/437.000             | 41      | 435.050/438.550             |
| 11      | 433.550/437.050             | 42      | 435.100/438.600             |
| 12      | 433.600/437.100             | 43      | 435.150/438.650             |
| 13      | 433.650/437.150             | 44      | 435.200/438.700             |
| 14      | 433.700/437.200             | 45      | 435.250/438.750             |
| 15      | 433.750/437.250             | 46      | 435.300/438.800             |
| 16      | 433.800/437.300             | 47      | 435.350/438.850             |
| 17      | 433.850/437.350             | 48      | 435.400/438.900             |
| 18      | 433.900/437.400             | 49      | 435.450/438.950             |
| 19      | 433.950/437.450             | 50      | 435.500/439.000             |
| 20      | 434.000/437.500             | 51      | 435.550/439.050             |
| 21      | 434.050/437.550             | 52      | 435.600/439.100             |
| 22      | 434.100/437.600             | 53      | 435.650/439.150             |
| 23      | 434.150/437.650             | 54      | 435.700/439.200             |
| 24      | 434.200/437.700             | 55      | 435.750/439.250             |
| 25      | 434.250/437.750             | 56      | 435.800/439.300             |
| 26      | 434.300/437.800             | 57      | 435.850/439.350             |
| 27      | 434.350/437.850             | 58      | 435.900/439.400             |
| 28      | 434.400/437.900             | 59      | 435.950/439.450             |
| 29      | 434.450/437.950             | 60      | 436.000/439.500             |
| 30      | 434.500/438.000             | 61      | 436.050/439.550             |
| 31      | 434.550/438.050             | 62      | 436.100/439.600             |

## 4.2.10 System Channels Table (863~869MHz)

| Channel | Primary/Secondary Frequency | Channel | Primary/Secondary Frequency |
|---------|-----------------------------|---------|-----------------------------|
| 01      | 863.050/866.550             | 32      | 864.600/868.100             |
| 02      | 863.100/866.600             | 33      | 864.650/868.150             |
| 03      | 863.150/866.650             | 34      | 864.700/868.200             |
| 04      | 863.200/866.700             | 35      | 864.750/868.250             |
| 05      | 863.250/866.750             | 36      | 864.800/868.300             |
| 06      | 863.300/866.800             | 37      | 864.850/868.350             |
| 07      | 863.350/866.850             | 38      | 864.900/868.400             |
| 08      | 863.400/866.900             | 39      | 864.950/868.450             |
| 09      | 863.450/866.950             | 40      | 865.000/868.500             |
| 10      | 863.500/867.000             | 41      | 865.050/868.550             |
| 11      | 863.550/867.050             | 42      | 865.100/868.600             |
| 12      | 863.600/867.100             | 43      | 865.150/868.650             |
| 13      | 863.650/867.150             | 44      | 865.200/868.700             |
| 14      | 863.700/867.200             | 45      | 865.250/868.750             |
| 15      | 863.750/867.250             | 46      | 865.300/868.800             |
| 16      | 863.800/867.300             | 47      | 865.350/868.850             |
| 17      | 863.850/867.350             | 48      | 865.400/868.900             |
| 18      | 863.900/867.400             | 49      | 865.450/868.950             |
| 19      | 863.950/867.450             | 50      | 865.500/869.000             |
| 20      | 864.000/867.500             | 51      | 865.550/869.050             |
| 21      | 864.050/867.550             | 52      | 865.600/869.100             |
| 22      | 864.100/867.600             | 53      | 865.650/869.150             |
| 23      | 864.150/867.650             | 54      | 865.700/869.200             |
| 24      | 864.200/867.700             | 55      | 865.750/869.250             |
| 25      | 864.250/867.750             | 56      | 865.800/869.300             |
| 26      | 864.300/867.800             | 57      | 865.850/869.350             |
| 27      | 864.350/867.850             | 58      | 865.900/869.400             |
| 28      | 864.400/867.900             | 59      | 865.950/869.450             |
| 29      | 864.450/867.950             | 60      | 866.000/869.500             |
| 30      | 864.500/868.000             | 61      | 866.050/869.550             |
| 31      | 864.550/868.050             | 62      | 866.100/869.600             |

#### 4.2.11 System Channels Table (921~927MHz)

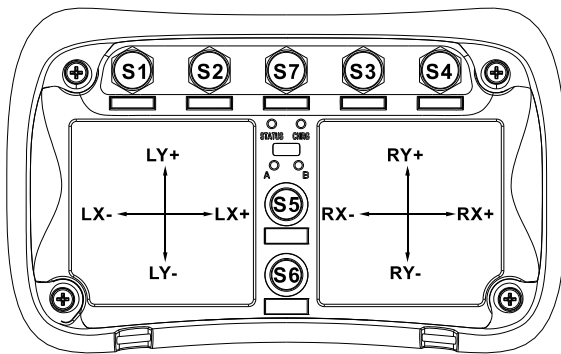
| Channel | Primary/Secondary Frequency | Channel | Primary/Secondary Frequency |
|---------|-----------------------------|---------|-----------------------------|
| 01      | 921.000/924.500             | 32      | 922.550/926.050             |
| 02      | 921.050/924.550             | 33      | 922.600/926.100             |
| 03      | 921.100/924.600             | 34      | 922.650/926.150             |
| 04      | 921.150/924.650             | 35      | 922.700/926.200             |
| 05      | 921.200/924.700             | 36      | 922.750/926.250             |
| 06      | 921.250/924.750             | 37      | 922.800/926.300             |
| 07      | 921.300/924.800             | 38      | 922.850/926.350             |
| 08      | 921.350/924.850             | 39      | 922.900/926.400             |
| 09      | 921.400/924.900             | 40      | 922.950/926.450             |
| 10      | 921.450/924.950             | 41      | 923.000/926.500             |
| 11      | 921.500/925.000             | 42      | 923.050/926.550             |
| 12      | 921.550/925.050             | 43      | 923.100/926.600             |
| 13      | 921.600/925.100             | 44      | 923.150/926.650             |
| 14      | 921.650/925.150             | 45      | 923.200/926.700             |
| 15      | 921.700/925.200             | 46      | 923.250/926.750             |
| 16      | 921.750/925.250             | 47      | 923.300/926.800             |
| 17      | 921.800/925.300             | 48      | 923.350/926.850             |
| 18      | 921.850/925.350             | 49      | 923.400/926.900             |
| 19      | 921.900/925.400             | 50      | 923.450/926.950             |
| 20      | 921.950/925.450             | 51      | 923.500/927.000             |
| 21      | 922.000/925.500             | 52      | 923.550/927.050             |
| 22      | 922.050/925.550             | 53      | 923.600/927.100             |
| 23      | 922.100/925.600             | 54      | 923.650/927.150             |
| 24      | 922.150/925.650             | 55      | 923.700/927.200             |
| 25      | 922.200/925.700             | 56      | 923.750/927.250             |
| 26      | 922.250/925.750             | 57      | 923.800/927.300             |
| 27      | 922.300/925.800             | 58      | 923.850/927.350             |
| 28      | 922.350/925.850             | 59      | 923.900/927.400             |
| 29      | 922.400/925.900             | 60      | 923.950/927.450             |
| 30      | 922.450/925.950             | 61      | 924.000/927.500             |
| 31      | 922.500/926.000             | 62      | 924.050/927.550             |

# 5. Receiver Installation

## 5.1 Wiring Instructions

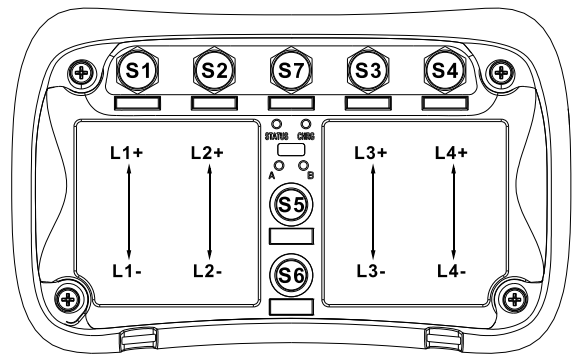
### 5.1.1 Receiver Output Module Layouts

Joystick Configuration

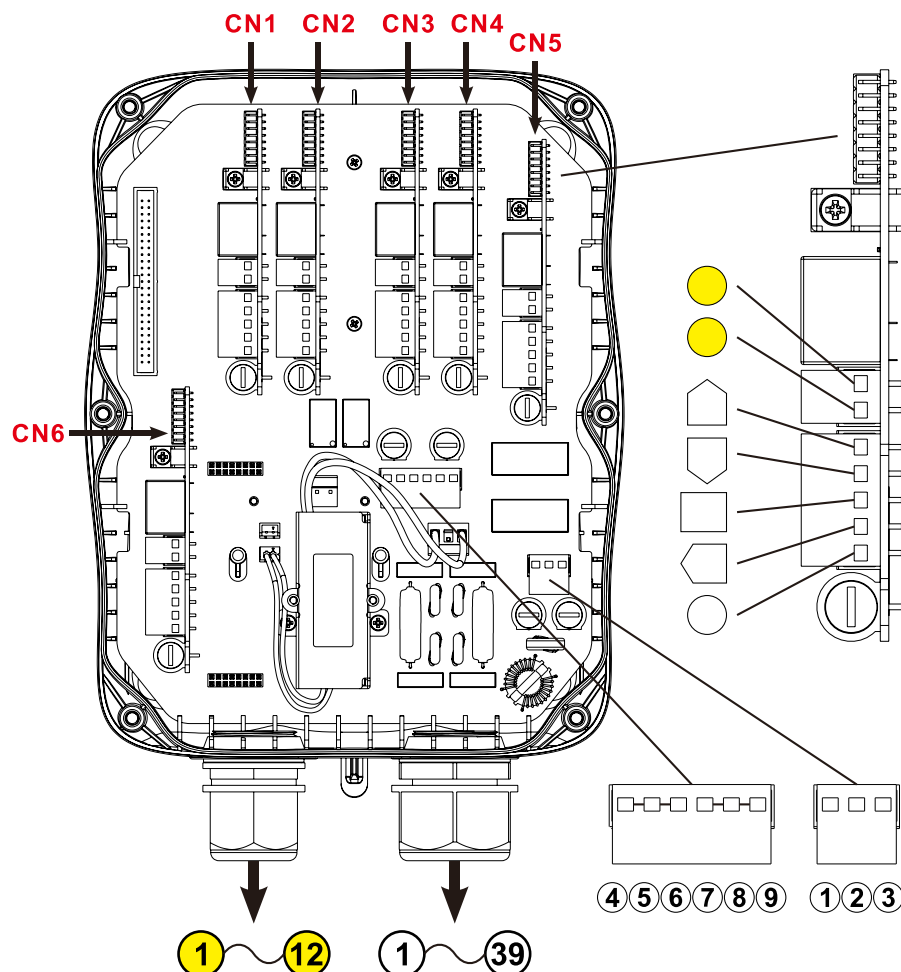


LX → CN1    LY → CN2    RX → CN3  
 RY → CN4    S1/S2/S5/S6 → CN5  
 S3/S4/S7 → CN6

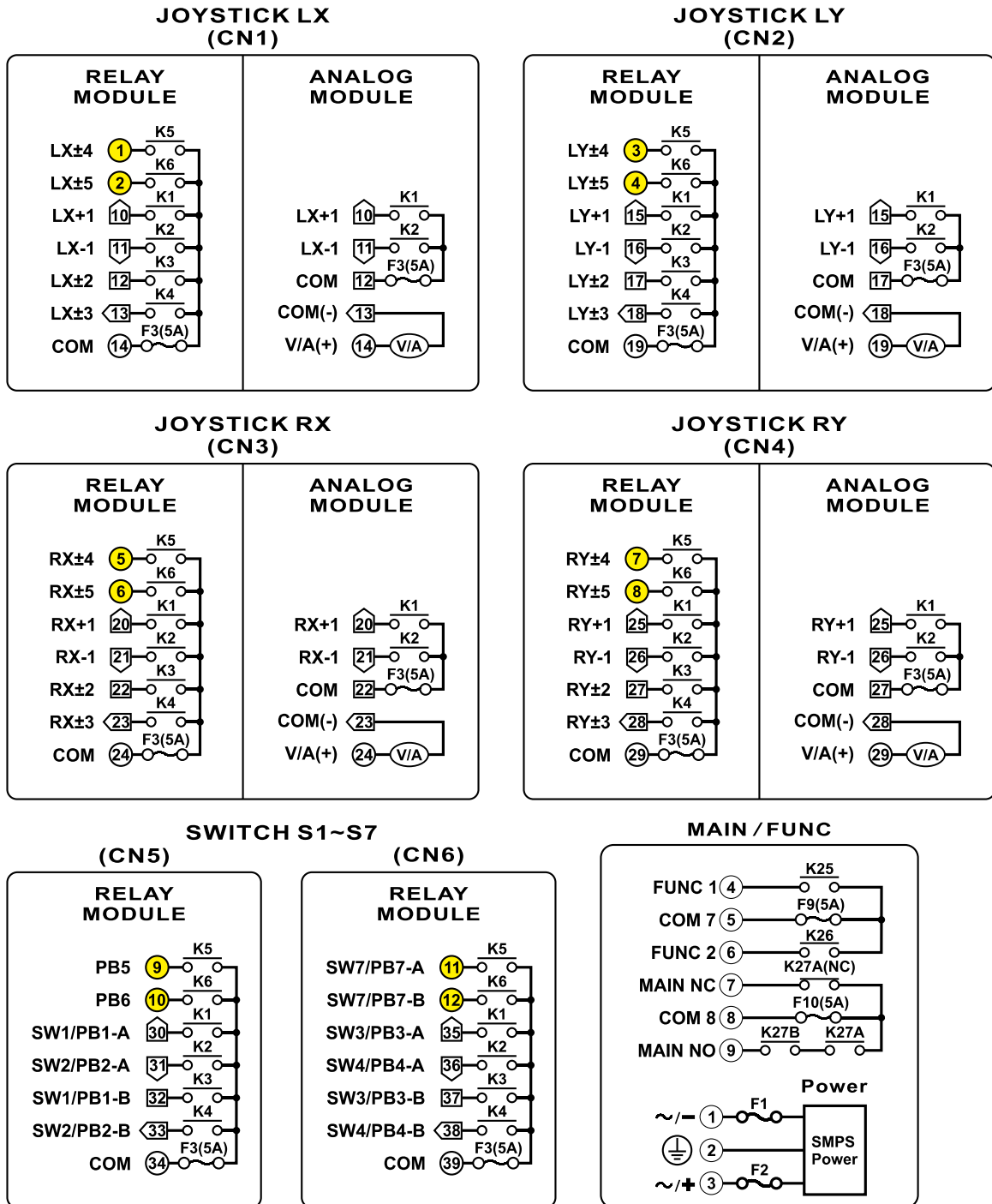
Lever Configuration



L1 → CN1    L2 → CN2    L3 → CN3  
 L4 → CN4    S1/S2/S5/S6 → CN5  
 S3/S4/S7 → CN6



## 5.1.2 Joystick Wiring Diagrams

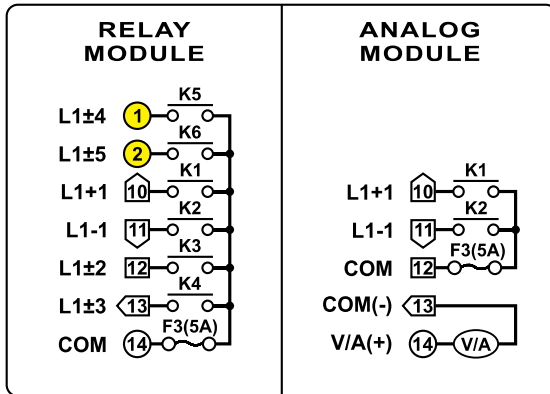


\* Refer to Section 4.2.3.1 Joystick and Lever Stepped Relay Outputs if your relay output arrangements are different than the above manufacture preset (Type-A).

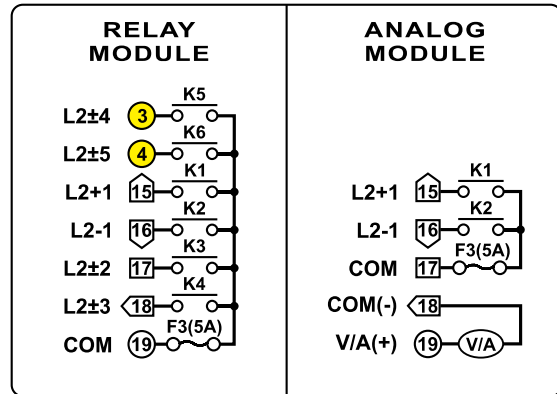
\* For 9~36VDC power supply, wire #1 corresponds to the negative charge (-) and wire #3 corresponds to the positive charge (+). Wire #2 or the green/yellow wire connects to AC ground.

## 5.1.3 Lever Wiring Diagrams

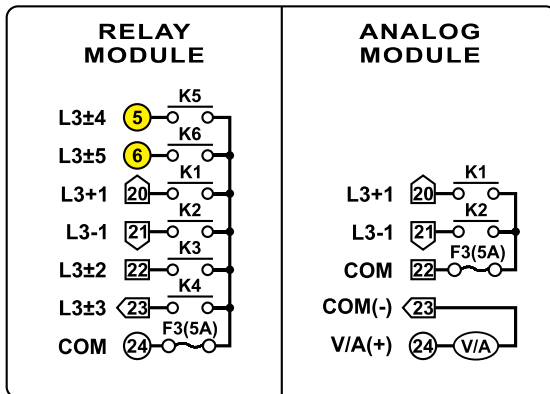
**LEVER L1  
(CN1)**



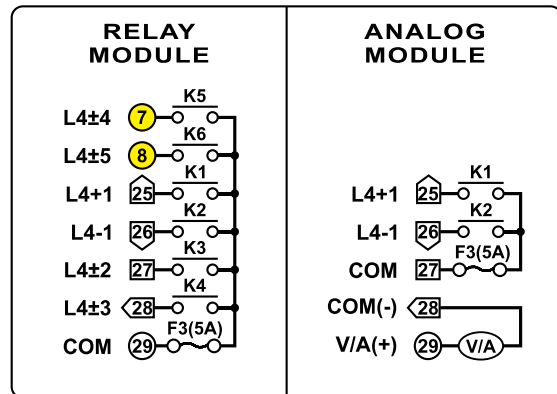
**LEVER L2  
(CN2)**



**LEVER L3  
(CN3)**

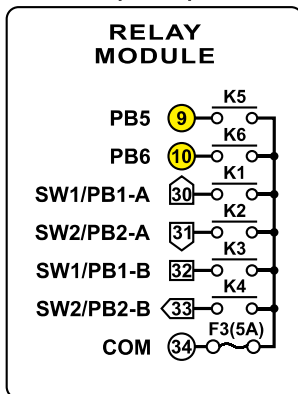


**LEVER L4  
(CN4)**

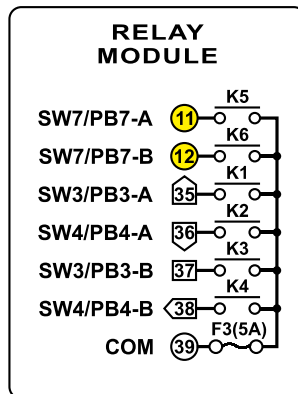


**SWITCH S1~S7**

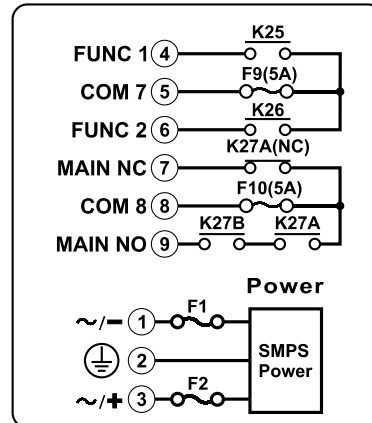
**(CN5)**



**(CN6)**



**MAIN / FUNC**



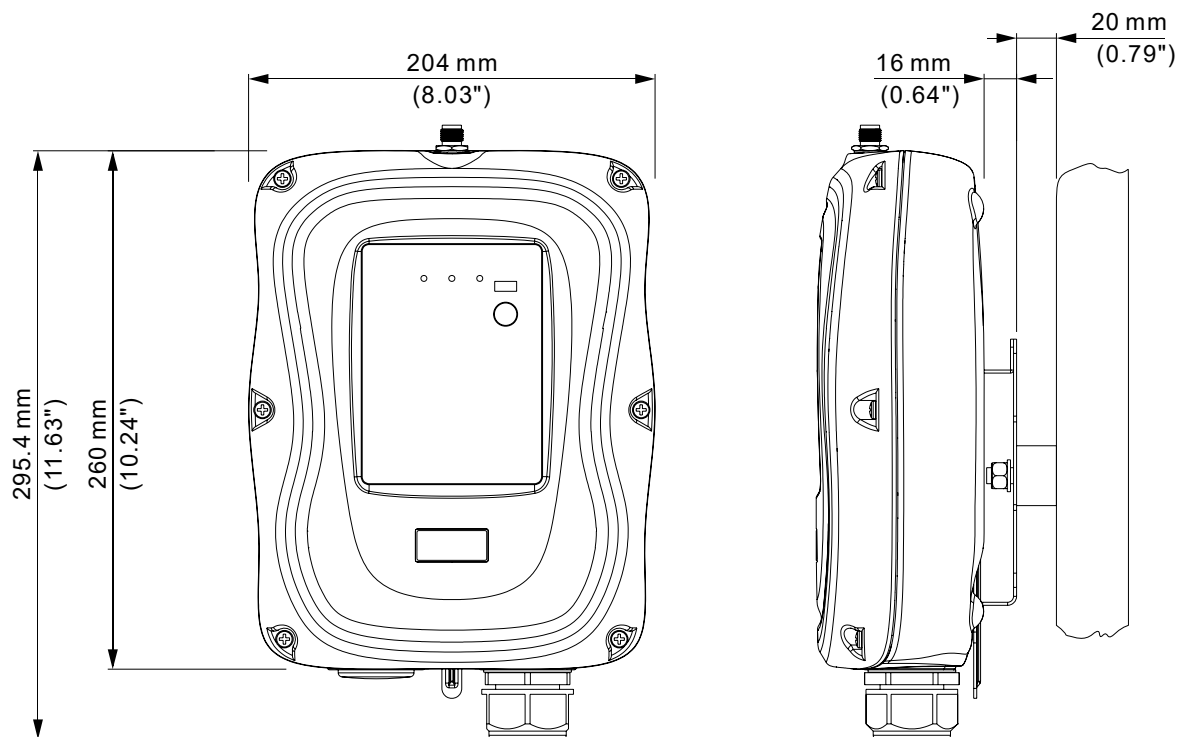
\* Refer to Section 4.2.3.1 Joystick and Lever Stepped Relay Outputs if your relay output arrangements are different than the above manufacture preset (Type-A).

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

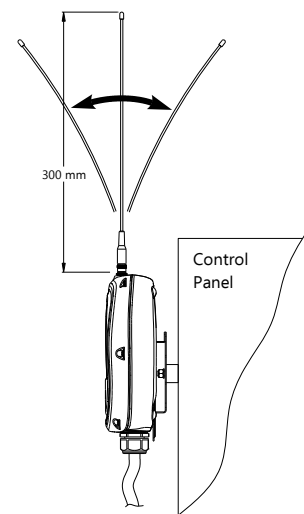
## 5.2 Pre-installation Precautions

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 crane 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 crane or equipment prior to installation.

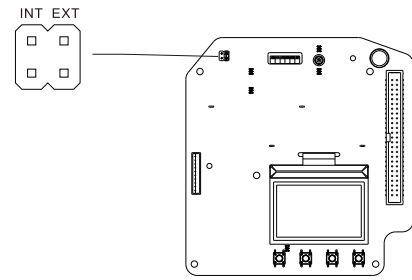
## 5.3 Step-By-Step Installation



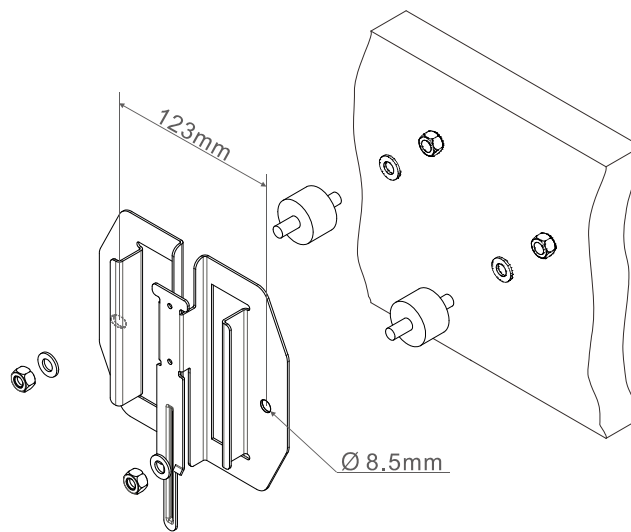
1. For best reception the location of the receiver should be visible to the operator at all time.
2. The location selected should not be exposed to high levels of electric noise. Mounting the receiver next to an unshielded variable frequency drive may cause radio interference. Always locate the receiver 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 decoder board inside the receiver is connected and jumper set to “EXT” position.

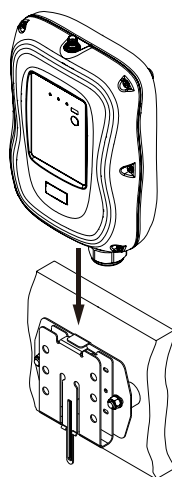


5. For better reception, make sure the receiver is in an upright position.
6. Drill two holes on the control panel, wall or location where the receiver is to be installed.
7. Make sure the mounting bracket is fully secured after installation.

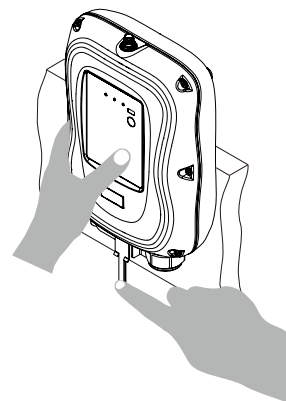


8. Slide down the receiver along the guided track to secure the receiver to the mounting bracket.
9. Remove the receiver by pressing down the bracket release and pull the receiver upward until it clears the guided track.

Install



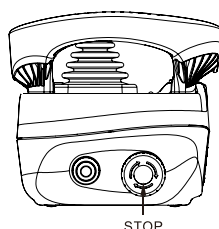
Remove



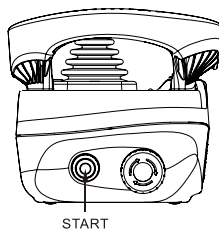
# 6. Operating Procedures

## 6.1 General Operation

- a. Reset the STOP button located on the right side of the transmitter by pulling it outward or rotating it clockwise, the button will pop up. Transmitter power is turned on when the STOP button is elevated.



- b. After transmitter power on, check the Status LED on the transmitter for any sign of system irregularities (refer to section 6.10.1 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 the START button located on the right side of the transmitter for up to 2.0 seconds (transmitter Status LED constant green) to activate the receiver MAIN relays. The transmitter Status LED will change from constant green to constant orange when receiver MAIN relays are activated (system on). The same START button becomes an auxiliary function thereafter (refer to section 4.2.1.1 START + AUX Function). Executing any transmitter command prior to pressing the START button at system startup will result in no signals transmitted (Status LED blinks orange).

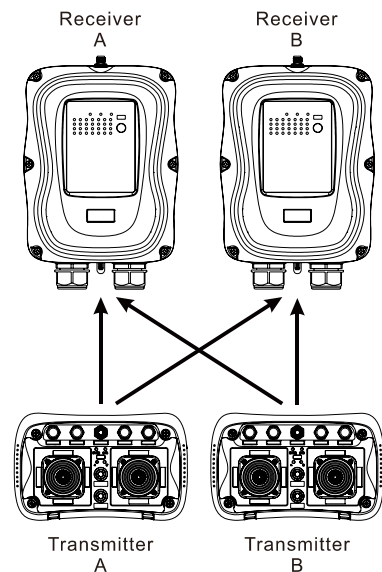


- d. Now initiate any command on the transmitter to begin operation. During transmitter inactivity (no command initiated), the transmitter will automatically switch to standby mode, with an orange blink on the Status LED every 4-second interval. Always turn off the transmitter power when not in use to save battery power.
- e. 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 pull it outward, the button will pop up. Then press and hold the START button for up to 2 seconds to reconnect the receiver MAIN relays. For safety, executing the START command is strictly required every time when the transmitter is turned on or after every STOP button reset.

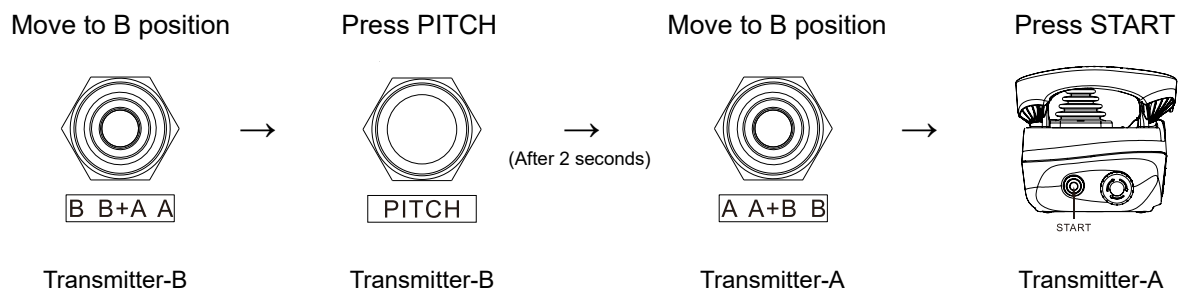
- f. After 5 minutes of transmitter inactivity, the receiver MAIN relays are temporarily disconnected (refer to section 4.1.5 Inactivity Timer Settings). The Status LED blinks 3 reds and then shuts off. Press the START button to reactivate the receiver MAIN relays and resume operation (refer to section 4.1.4 Start Function Settings).
- g. Turn off the transmitter power by pressing down the STOP button; it will disconnect the transmitter power and the receiver MAIN relays altogether.

## 6.2 Master/Master Tandem Operation (Tandem models)

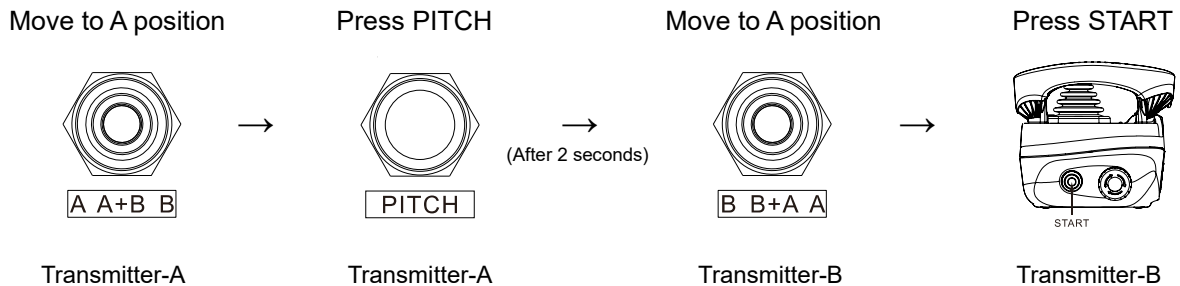
- a. To gain control of one or both receivers, first move the 3-position rocker switch to either A, B or A+B position and then press the START button to activate the receiver MAIN relays inside receiver A, receiver B, or both receivers (depending on the rocker switch position). In order to gain control of a receiver, the PITCH button on the other transmitter must be pressed prior to your takeover. For example, in order for transmitter-A to gain control of receiver-B, transmitter-B must first release its control of receiver-B by first move the rocker switch to B position and then press the PITCH button for up to 2.0 seconds. This action releases transmitter-B control of receiver-B. Transmitter-A is then able to take control of receiver-B by first move the rocker switch to B position and then press the START button. Make sure the START command is executed 2.0 seconds after transmitter-B presses the PITCH button (refer to diagram below).



### Master Transmitter-A Takeover Procedure



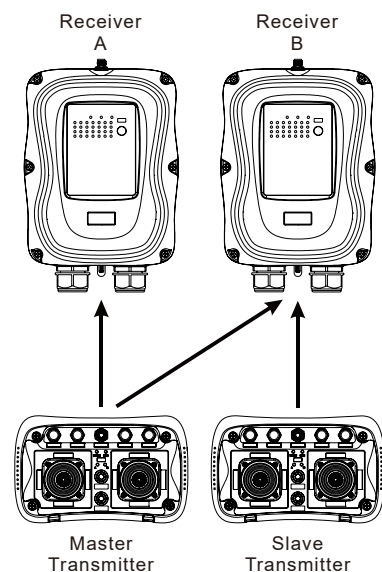
## Master Transmitter-B Takeover Procedure



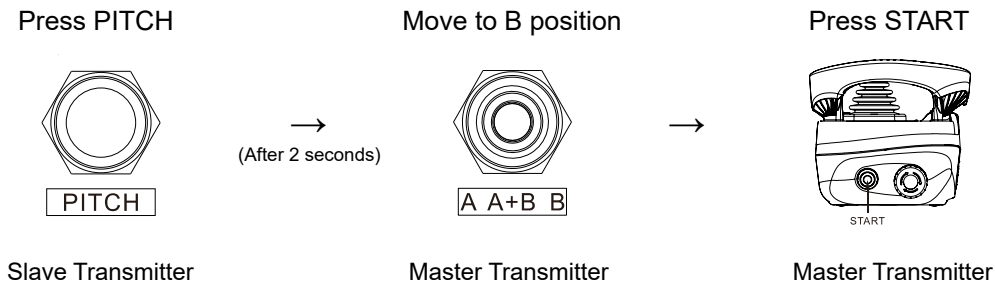
- Once the transmitter is locked on to both receivers, move the rocker switch to either A, B, or A+B position for independent or simultaneous operation.
- At beginning of each shift prior to turning on the transmitter power, always check if the rocker switch is correctly positioned for the intended receiver or receivers.
- For safety, there is a 2-second grace period followed after executing the PITCH command. What this means is that after PITCH button is pressed, executing the START command on the other transmitter within this 2-second grace period is ineffective. In order to gain control of the other receiver you must first wait for up to 2 seconds after the other transmitter presses the PITCH button and then for you to execute the START command thereafter.

## 6.3 Master/Slave Tandem Operation (Tandem models)

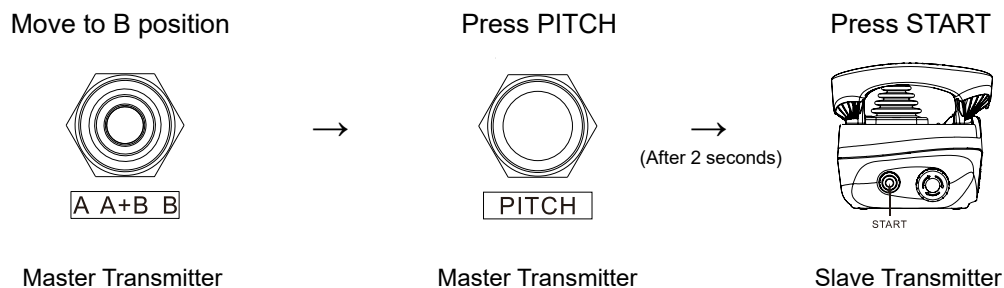
- To gain control of one or both receivers, first move the selector switch to either A, B or A+B position and then press the START button to activate the receiver MAIN relays inside receiver A, receiver B, or both receivers (depending on the rocker switch position). In order to gain control of a receiver, the PITCH button on the other transmitter must be pressed prior to your takeover. For example, in order for Master transmitter to gain control of the Slave receiver (receiver-B), Slave transmitter must first release control of its receiver (receiver-B) by pressing the PITCH button for up to 2.0 seconds. This action releases Slave transmitter control of its receiver (receiver-B). Master transmitter is then able to take control of the Slave receiver (receiver-B) by first move the rocker switch to B position and then execute the START command. Make sure the START command is executed 2.0 seconds after Slave transmitter presses the PITCH button (refer to diagram below).



## Master Transmitter Takeover Procedure



## Slave Transmitter Takeover Procedure



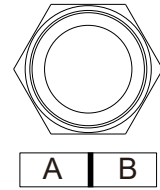
- b. Once the transmitter is locked on to both receivers, move the rocker switch to either A, B, or A+B position for independent or simultaneous operation.
- c. At beginning of each shift prior to turning on the transmitter power, always check if the rocker switch is correctly positioned for the intended receiver or receivers.
- d. For safety, there is a 2-second grace period followed after executing the PITCH command. What this means is that when PITCH button is pressed, executing the START command on the other transmitter within this 2-second grace period is ineffective. In order to gain control of the other receiver you must first wait for up to 2 seconds after the other transmitter presses the PITCH button and then for you to execute the START command thereafter.

## 6.4 A/B Button Select Operation

Press the “A/B” button repeatedly toggles between output relay A, B and A+B respectively. There are 5 different types of Select A/B sequence available (refer to section 4.1.8.2).

**Standard** – Output relay A activated at A position, output relay B activated at B position, both output relays activated at A+B position.

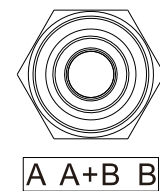
**Reversed logic** - Output relay A activated at B position, output relay B activated at A position, both output relays deactivated at A+B position. Refer to section 4.2.4 JP3 jumper settings.



## 6.5 A/B Toggle Switch Select Operation

**Standard** - Move to A position activates output relay A, move to B position activates output relay B, move to A+B position activates both output relays.

**Reversed logic** - Move to A position activates output relay B, move to B position activates output relay A, move to A+B position deactivates both output relays. Refer to section 4.2.4 JP3 jumper setting.



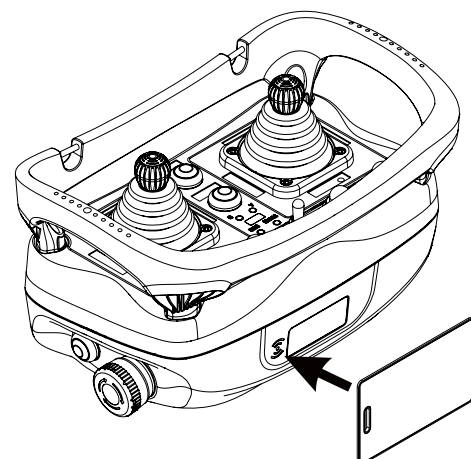
## 6.6 Pitch & Catch Operation

Press the “PITCH” button for up to 2 seconds to release control of the receiver. After 2-second grace period, press the START button for up to 2 seconds to gain control of the receiver. The 2<sup>nd</sup> operator is unable to take control of the receiver unless the 1<sup>st</sup> operator presses the “PITCH” button. Refer to section 4.2.1.7 on how to set to this function.



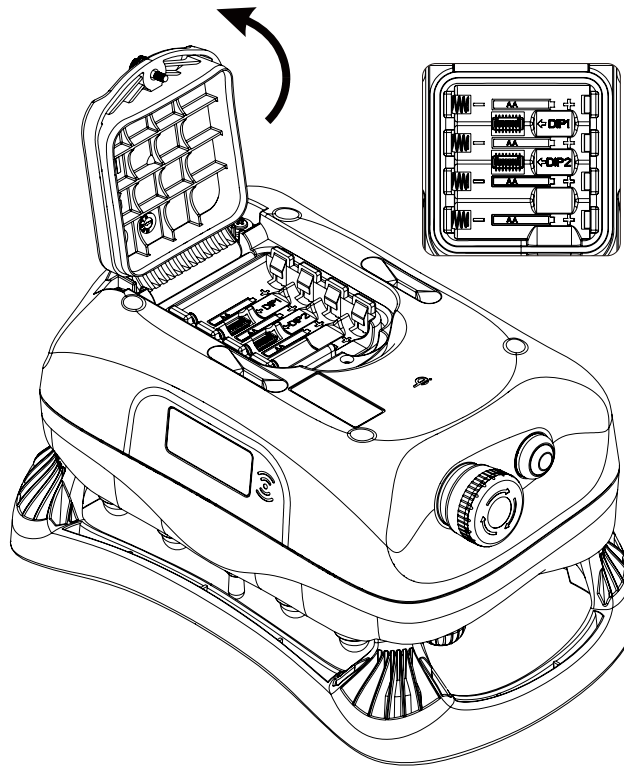
## 6.7 Transmitter Access Card (TAC) Operation

After turning on the transmitter power, place the TAC directly over the RFID marking located on the frontside of the transmitter. A 2-second green on the Status LED represents access card accepted. Status LED with red blinks represents invalid access card. Then press the START button for up to 2 seconds to begin operation. TAC is not required after every transmitter inactivity restart, only during initial transmitter power on.



## 6.8 Changing Batteries

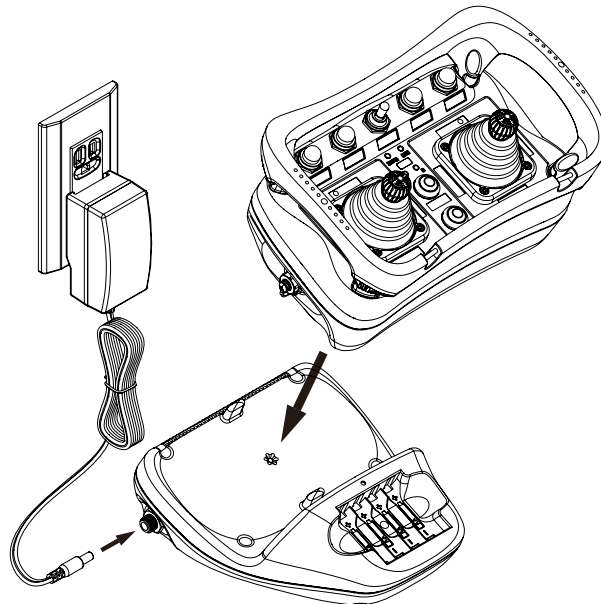
Changing transmitter batteries (“AA” alkaline battery x 4) by unscrewing the battery cover located on the backside of the transmitter. During battery installation, make sure the batteries are installed correctly, with “+” to “+” charge and “-” to “-” charge. Also make sure the screw is tightened after battery installation to avoid water, moisture, dirt, grease, and other liquid penetration. Do not use lithium-ion batteries.



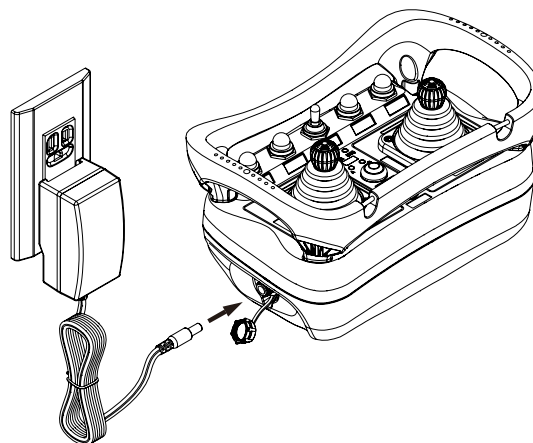
## 6.9 Battery Charging

The transmitter is designed to accept any off-the-shelf Ni-MH rechargeable batteries. When charging both transmitter and individual batteries at the same time the priority always goes to the transmitter charging. The individual battery charging begins only after the transmitter charging is completed. Depending on the battery capacity the average charging time is approximately 2 hours from completely drained to fully charged. Constant red on transmitter battery charging LED (when charging the transmitter) and charging station LED (when charging individual batteries) represents charging in progress, constant green represents batteries fully charged, and LED off represents no batteries detected. Please do not use any rechargeable lithium-ion batteries as it will damage both the transmitter and the charging station.

### Wireless Charging



### Plugin Charging



## 6.10 System Status Light Indications

### 6.10.1 Transmitter Status Indications

| Type | Display Type                                                                 | Indication                                                                                                                                                                                                                                                                                                                                                           |
|------|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Constant red                                                                 | Voltage below 3.8V at initial power on<br>(change batteries suggested)                                                                                                                                                                                                                                                                                               |
| 2    | Slow red blinks                                                              | Voltage below 3.7V during operation<br>(change batteries suggested)                                                                                                                                                                                                                                                                                                  |
| 3    | Constant red                                                                 | Voltage below 3.6V during operation<br>(change batteries suggested)                                                                                                                                                                                                                                                                                                  |
| 4    | Constant red → off                                                           | Voltage below 3.5V during operation<br>(receiver MAIN relays shut off)                                                                                                                                                                                                                                                                                               |
| 5A   | 2 red blinks                                                                 | Defective button, switch, joystick or lever<br>internal contact detected at initial<br>transmitter power on.                                                                                                                                                                                                                                                         |
| 5B   | No light displayed                                                           | When defective internal contact condition<br>occurs per type 5A above, find out which<br>internal contact is defective by initiating all<br>buttons, switches, joysticks and levers one<br>at a time. The Status LED shuts off if the<br>internal contact is in good working order.<br>The Status LED maintain 2 red blinks if<br>the internal contact is defective. |
| 6    | 3 red blinks                                                                 | Zero-G sensor triggered, receiver MAIN<br>relay deactivated.                                                                                                                                                                                                                                                                                                         |
| 7    | 4 red blinks                                                                 | Transmitter is unable to lock onto the<br>assigned channel                                                                                                                                                                                                                                                                                                           |
| 8    | Constant green for up to<br>2 seconds                                        | Transmitter power on with no faults detected                                                                                                                                                                                                                                                                                                                         |
| 9    | Blinking green                                                               | Transmission in progress                                                                                                                                                                                                                                                                                                                                             |
| 10   | Blinking orange                                                              | Initiating any transmitter command prior to<br>pressing the START button at power on                                                                                                                                                                                                                                                                                 |
| 11   | 3 slow red blinks → off                                                      | STOP button pressed down                                                                                                                                                                                                                                                                                                                                             |
| 12   | 4 orange blinks                                                              | Transmitter on standby                                                                                                                                                                                                                                                                                                                                               |
| 13   | 2 orange blinks                                                              | Receiver MAIN relays jammed or defective                                                                                                                                                                                                                                                                                                                             |
| 14   | 3 orange blinks                                                              | Decoding processors defective                                                                                                                                                                                                                                                                                                                                        |
| 15   | Constant orange when START<br>button is pressed at initial<br>system startup | Receiver MAIN relays activated                                                                                                                                                                                                                                                                                                                                       |

## 6.10.2 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 board 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                 |

## 6.10.3 Receiver Power Indications

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

## 6.10.4 Receiver COM Indications

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

## 6.10.5 Receiver Status LCD Indications

STATUS:DECODING

-----

-----

LX/1 --- - --- RX/3

LY/2 --- - --- RY/4

Decoding  
in progress

STATUS:STANDBY

-----

-----

LX/1 --- - --- RX/3

LY/2 --- - --- RY/4

Decoding  
on standby

Transmitter  
timeout

Stop button  
pressed down

STATUS:MAIN OFF

-----

-----

LX/1 --- - --- RX/3

LY/2 --- - --- RY/4

Stop button  
pressed down

Transmitter  
timeout

STATUS:LOW VOLTAGE

-----

-----

LX/1 --- - --- RX/3

LY/2 --- - --- RY/4

Receiver  
low voltage

STATUS:DECODER DEFECT

-----

-----

LX/1 --- - --- RX/3

LY/2 --- - --- RY/4

Decoder board  
defective

STATUS:MAIN DEFECT

-----

-----

LX/1 --- - --- RX/3

LY/2 --- - --- RY/4

MAIN relay  
defective

STATUS:INCORRECT S/N

-----

-----

LX/1 --- - --- RX/3

LY/2 --- - --- RY/4

Incorrect TX  
serial number

STATUS:RF DEFECT

-----

-----

LX/1 --- - --- RX/3

LY/2 --- - --- RY/4

RF board  
defective

## 7. General Specifications

|                               |   |                                                                                                   |
|-------------------------------|---|---------------------------------------------------------------------------------------------------|
| Frequency Range               | : | 433.050MHz ~ 439.600MHz<br>863.050MHz ~ 869.600MHz<br>921.000MHz ~ 927.550MHz                     |
| Number of Channels            | : | 62 channels                                                                                       |
| Channel Spacing               | : | 50 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            | : | 6.0mW                                                                                             |
| Enclosure Type                | : | NEMA4                                                                                             |
| Enclosure Rating              | : | IP66                                                                                              |
| Output Contact Rating         | : | 250V @ 8 Amps                                                                                     |
| Transmitter Operating Voltage | : | 6.0VDC                                                                                            |
| Receiver Power Consumption    | : | 22VA (max)                                                                                        |
| Available Receiver Voltages   | : | 9~36VDC<br>24~48VAC<br>100~240VAC<br>380~460VAC                                                   |
| Operating Temperature         | : | -25°C ~ 75°C / -13°F ~ 167°F                                                                      |
| Transmitter Dimension         | : | 229mm (L) x 141.5mm (W) x 129.2mm (H)                                                             |
| Receiver Dimension            | : | 260mm (L) x 204mm (W) x 83mm (H)                                                                  |
| Transmitter Weight            | : | 1,0kg / 2.2lb (include batteries)                                                                 |
| Receiver Weight               | : | 2.64kg / 5.8lb (include output cable)                                                             |

# CE EU Declaration of Conformity CE

## (RED, LVD & Machinery)

### For the following equipment:

|                           |   |                                                                                             |
|---------------------------|---|---------------------------------------------------------------------------------------------|
| Product                   | : | <u>Flex 2JB Series Radio Remote Control System</u>                                          |
| Multiple Listee Model No. | : | <u>Flex 2JB-ERX, 2JB-VRX and 2JB-HRX</u>                                                    |
| Manufacturer's Name       | : | <u>Advanced Radiotech Corporation</u>                                                       |
| Manufacturer's Address    | : | <u>No.3, South 1<sup>st</sup> Road, Cianjhen District</u><br><u>Kaohsiung 80681, Taiwan</u> |

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) | : | <u>EN301 489-1 V2.2.3:2019-11</u><br><u>EN 301 489-3 V2.1.1:2019-03</u>            |
| RED (RF)  | : | <u>EN 300 220-1 V3.1.1 + EN 300 220-2 V3.2.1</u>                                   |
| LVD       | : | <u>EN 61010-1:2010+A1:2019</u>                                                     |
| MACHINERY | : | <u>EN 60204-32:2008, EN ISO 13849-1:2015 (PLd)</u><br><u>EN 13557:2003+A2:2008</u> |
| OTHERS    | : | <u>EN 60529 (IP66), EN 62479, EN 55032 + EN 55035</u>                              |

### Test reports issued by:

|           |   |            |
|-----------|---|------------|
| RED (EMC) | : | <u>SGS</u> |
| RED (RF)  | : | <u>SGS</u> |
| LVD       | : | <u>SGS</u> |
| MACHINERY | : | <u>SGS</u> |
| OTHERS    | : | <u>SGS</u> |

### Person responsible for making this declaration:



Tom Jou / President

Name and signature of authorized person