



Flex EX2

Radio Remote Control Equipment Instruction Manual



MAGNETEK

Part Number: 191-50000-M100 R00

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PRODUCT SAFETY INFORMATION

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

The recommendations in this manual do not take precedence over any of the following requirements relating to cranes, hoists and lifting devices:

- 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 Magnetek Products are being used,
- Applicable local, state/provincial or federal codes (e.g., OSHA), ordinances, standards, and requirements, or
- Safety standards and practices for the overhead material handling industry.
- National and international directives and regulations must be observed for erection, commissioning, operation, and periodic tests, in particular the Machinery Directive 2006/42/EC, the directive for the use of work equipment 89/655/EEC, safety regulations and relevant national safety regulations.

This manual does not include or address the specific instructions and safety warnings of the equipment manufacturers or any of the other requirements listed above. It is the responsibility of the owners, users, and operators of the Magnetek Products to know, understand and follow all of these requirements. It is the responsibility of the owner of the Magnetek Products 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 Magnetek Products prior to becoming familiar with and being trained in these requirements.**

WARRANTY INFORMATION

FOR INFORMATION ON MAGNETEK'S PRODUCT WARRANTIES BY PRODUCT TYPE, PLEASE VISIT WWW.COLUMBUSMCKINNON.COM/MAGNETEK.

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1 Introduction

The **Flex EX2** 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 other material handling equipment where wireless control is preferred.

Each **Flex EX2** system consists of two transmitter handsets paired with one or more receiver unit(s). Other standard-equipped accessories include transmitter waist belt, spare transmitter power key, vinyl pouch, “AA” alkaline batteries, pushbutton labels, LED labels, output cable, and instruction manuals / CD.

List of notable features includes:

- **Advanced Controls** – the system utilizes dual advanced microprocessor controls with 32-bit CRC and Hamming Code, providing ultra-fast, safe, precise, and error-free encoding and decoding.
- **Frequency Agile RF Transceiver** – the system automatically searches and locks 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 as well as receiver-to-receiver with system status and relay output feedbacks.
- **Zero-G Sensor Embedded** – 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 Pushbuttons** – the pushbuttons have gold-plated contacts and are rated for more than 2 million press cycles. The defined snap-action steps provide positive tactile feedback even through gloves.
- **Low Power Consumption** – requires only two “AA” alkaline batteries for more than 100 hours of uninterrupted operation between replacements.
- **Durable Nylon and Fiberglass Composite Enclosures** – highly resistant to breakage and deformation even in the most abusive environments. The receiver enclosures and output cables are IEC60332-1-2 specified. The transmitter and receiver enclosures are IP66 rated.
- **Full Compliance** – all systems fully comply with the FCC Part: 15 Rules, IC-RSS-210 and European Safety Standards (CE mark). For a full list of compliance please contact the manufacturer for details.
- **Optional Accessories** – Transmitter belt clip, transmitter lanyard, transmitter rubber guard, buzzer, charging station, multiple receivers function, and many others.

2 Radio Controlled Safety

WARNINGS and CAUTIONS

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



WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTE: A NOTE statement is used to notify people of installation, operation, programming, or maintenance information that is important, but not hazard-related.

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



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 can operate at high speeds. The equipment is often 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, prevent 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 that may cause them to lose control of the equipment, 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



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 Magnetek 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 perform, at 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.

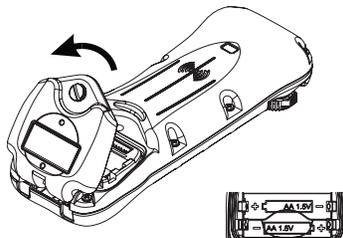
2.7 Batteries



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.

2.7.1 Changing Batteries

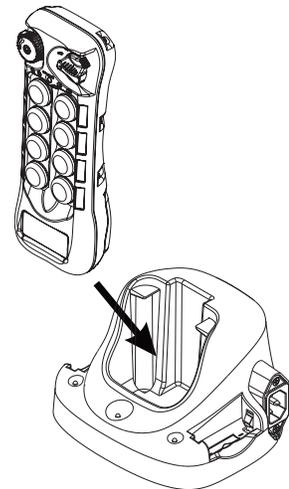
Change transmitter batteries (“AA” alkaline battery x 2) by unscrewing the battery cover located on the backside of the transmitter. During battery installation make sure the batteries are installed correctly, with “+” to “+” charge and “-” to “-” charge. Also make sure the screw is tightened after battery installation to avoid water, moisture, dirt, grease, and other liquid penetration.



2.7.2 Battery Charging

The transmitter is designed to accept any off-the-shelf NiMH 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 3 hours from completely drained to fully charged. Solid red on the LED represents charging in progress, solid green represents batteries fully charged, and LED off represents no batteries detected.

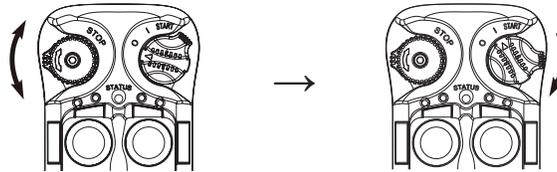
NOTE: Do not use any rechargeable lithium ion batteries as they will damage both the transmitter and the charging station.



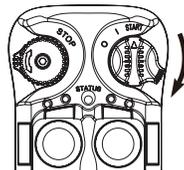
3 General System Information

3.1 General Operation

1. Reset the STOP button located on the top left hand corner of the transmitter by rotating it clockwise or counterclockwise; the button will pop up. Turn on the transmitter power by inserting the power switch key and rotating to the ON (I) position.



2. After turning on the transmitter power, check the Status LED on the transmitter for any sign of system irregularities (**see Section 6.1 Transmitter Status Indications on page 80**). If the transmitter is in good working order the Status LED will display solid green for up to 2 seconds at power on (no faults detected).
3. Rotate the power switch key further to the START position and hold it there for up to 2 seconds (Status LED solid green). When the receiver MAIN relays are activated the Status LED will change from solid green to solid orange (system on). The power switch key will retract back to the ON (I) position when released. The same START position becomes an auxiliary function thereafter (**see Section 4.2.2.3 START + AUX Function on page 56**). Once the MAIN relays are closed by a successful start, the system is active for operation. Press any pushbutton on the transmitter to begin operation. Pressing any pushbutton before executing the START command at system startup will result in no signals transmitted (Status LED blinks orange).



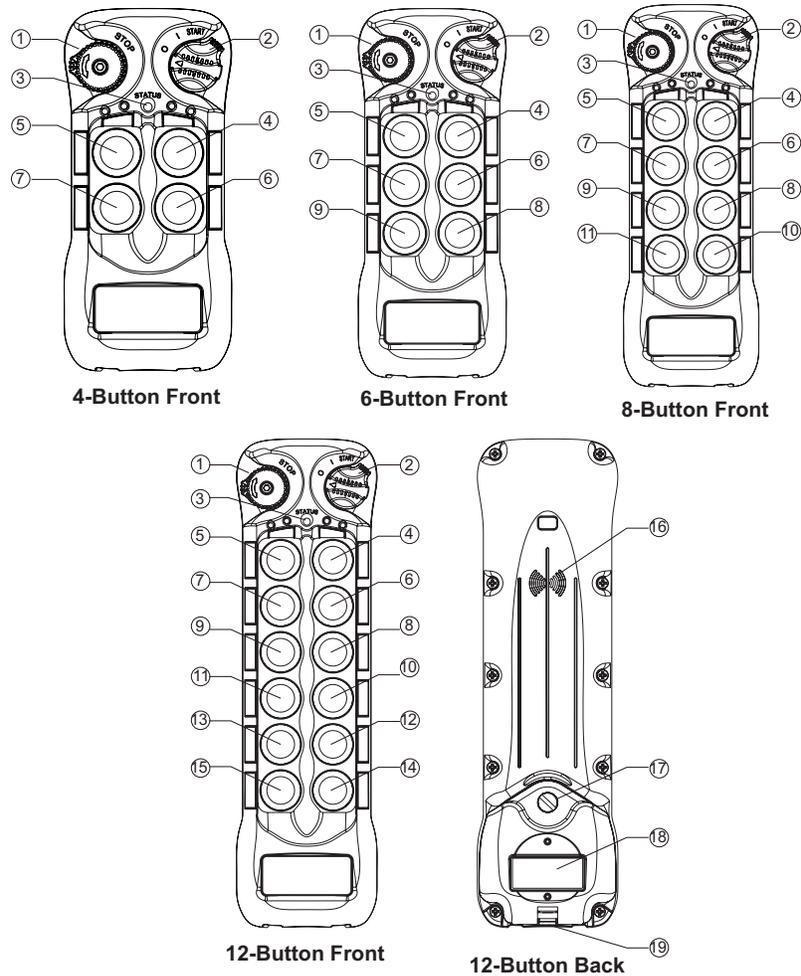
4. Press any pushbutton on the transmitter to begin operation. During transmitter inactivity (pushbuttons not pressed), the transmitter will automatically switch to standby mode, with an orange blink on the Status LED at 4-second intervals. Always turn off the transmitter power by turning the key switch to the OFF position, when not in use to save battery power.
5. In case of an emergency, press down the STOP button to disconnect the receiver MAIN relays and the transmitter power. To resume operation, rotate the STOP button clockwise or counterclockwise; the button will pop up. Then rotate the power key to the START position to reconnect the receiver MAIN relays. For safety, executing the START command is required every time the transmitter is turned on or after every STOP button reset.

NOTE: Pushing the STOP button does not turn off the transmitter power and it will continue to draw battery power. The only way to turn the transmitter off and stop battery draw is to turn the key switch to the OFF position.

6. After 5 minutes of inactivity (pushbutton not pressed) the receiver MAIN relays are temporarily disconnected (**see Section 4.1.7 Transmitter Inactivity Timer Settings on page 33**). Press any pushbutton or execute the START command to resume operation (**see Section 4.1.9 Transmitter Start Function Settings on page 34**). The receiver MAIN relays are also temporarily disconnected when the system encounters strong radio interference, dead spots, low battery condition, and system out of operating range.
7. Turn off the transmitter power by rotating the power switch key counterclockwise to the OFF (0) position; it will disconnect the transmitter power and the receiver MAIN relays altogether. Turn it further counterclockwise to release the key.

3.2 Transmitter

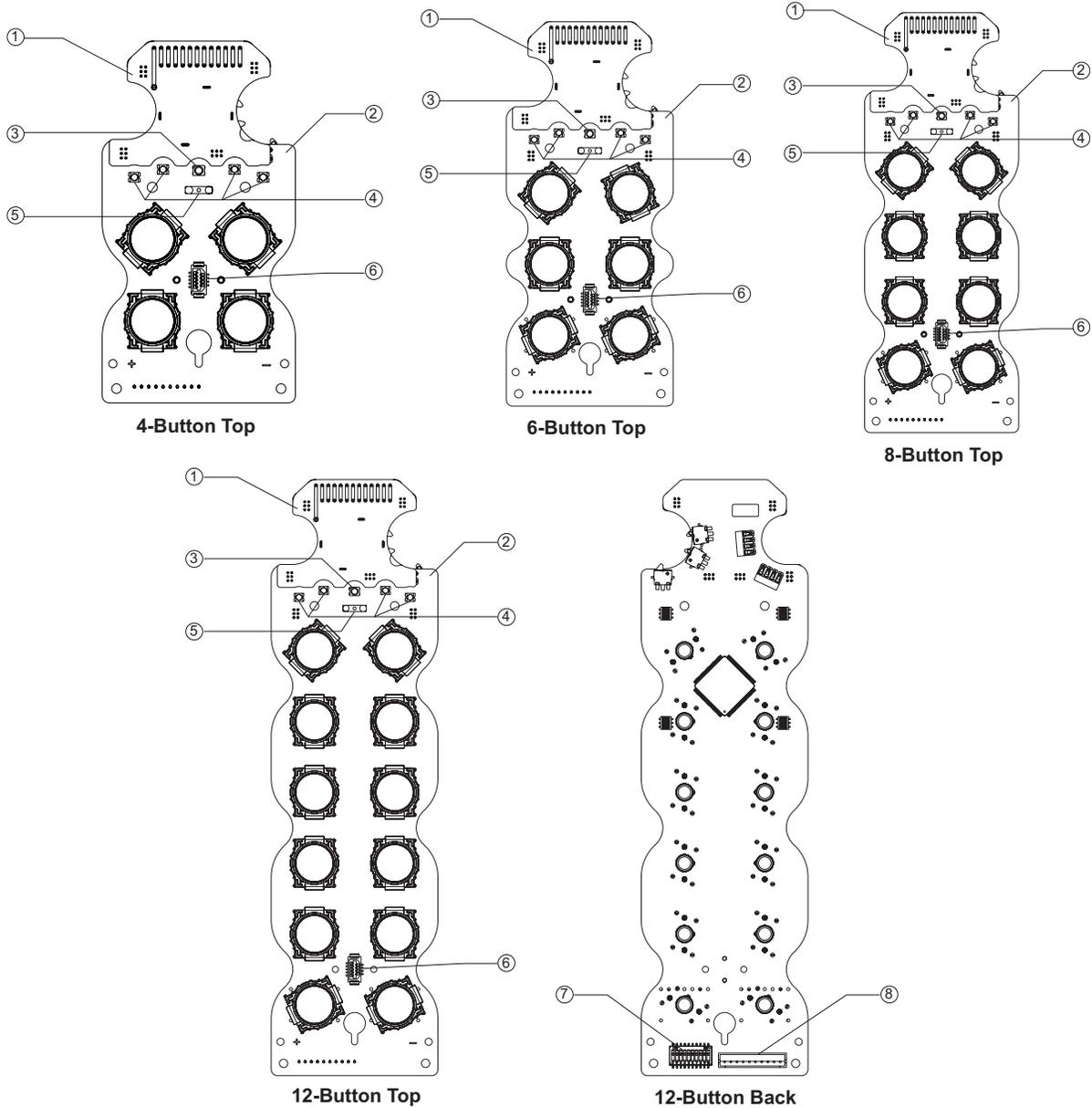
3.2.1 External Illustrations



- | | | | |
|-----|----------------------|-----|---|
| 1. | STOP Button | 11. | Pushbutton 8 (PB8) |
| 2. | Power Key Switch | 12. | Pushbutton 9 (PB9) |
| 3. | Status LED Indicator | 13. | Pushbutton 10 (PB10) |
| 4. | Pushbutton 1 (PB1) | 14. | Pushbutton 11 (PB11) |
| 5. | Pushbutton 2 (PB2) | 15. | Pushbutton 12 (PB12) |
| 6. | Pushbutton 3 (PB3) | 16. | TAC* and Inductive Charging Slot (Future Feature) |
| 7. | Pushbutton 4 (PB4) | 17. | Battery Cover Screw |
| 8. | Pushbutton 5 (PB5) | 18. | System Information |
| 9. | Pushbutton 6 (PB6) | 19. | Lanyard and Waist Belt Attachment Slot |
| 10. | Pushbutton 7 (PB7) | | |

NOTE: Flex 8EX2-AB, 8EX2-T, Flex 12EX2-AB, and 12EX2-T models have the A/B/A+B rotary switch on PB8 (8EX2) or PB12 (12EX2) slot.

3.2.2 Internal Illustrations



- | | | | |
|----|------------------------|----|--------------------|
| 1. | RF Transceiver Board | 5. | Infrared Sensors |
| 2. | Encoder Board | 6. | I-Chip Slot |
| 3. | Status LED Indicator | 7. | Function Dipswitch |
| 4. | A/B/C/D LED Indicators | 8. | Programming Port* |

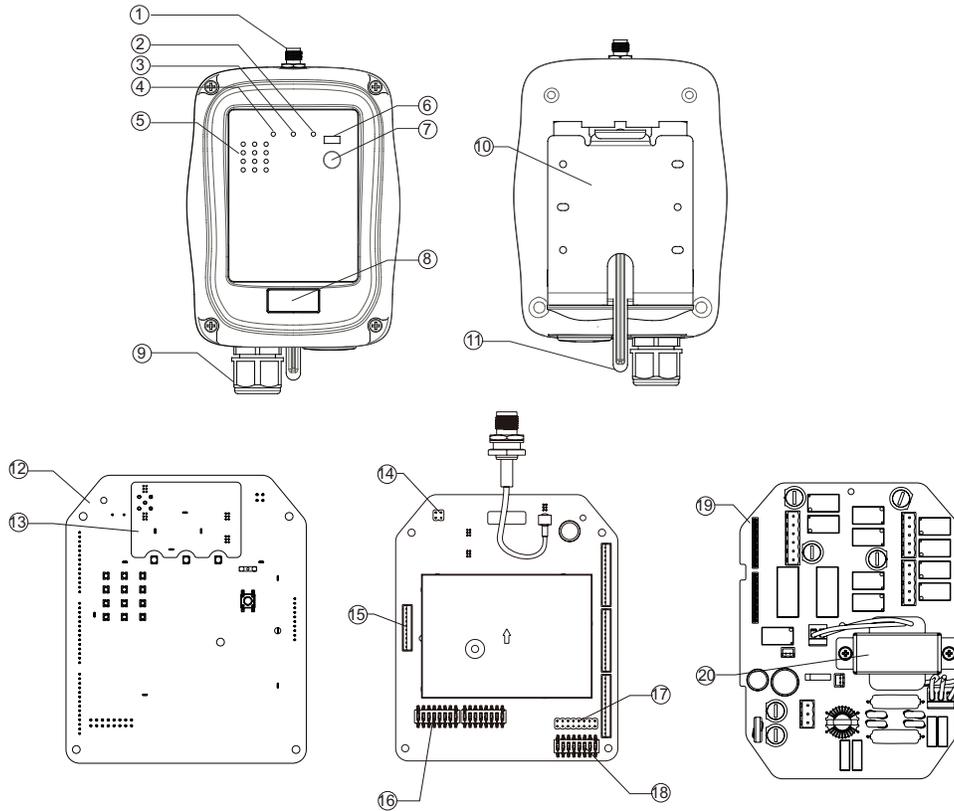
* The programming port is only used for updating the transmitter firmware. It is not used with the infrared (IR) programmer. For more information, contact Magnetek field service.

NOTE: Flex 8EX2-AB and, 8EX2-TT, Flex 12EX2-AB and 12EX2-T models have the A/B/A+B rotary switch on PBB PB8 (8EX2) or PB12 (12EX2) slot.

3.3 Receiver

3.3.1 4EX2 Receiver

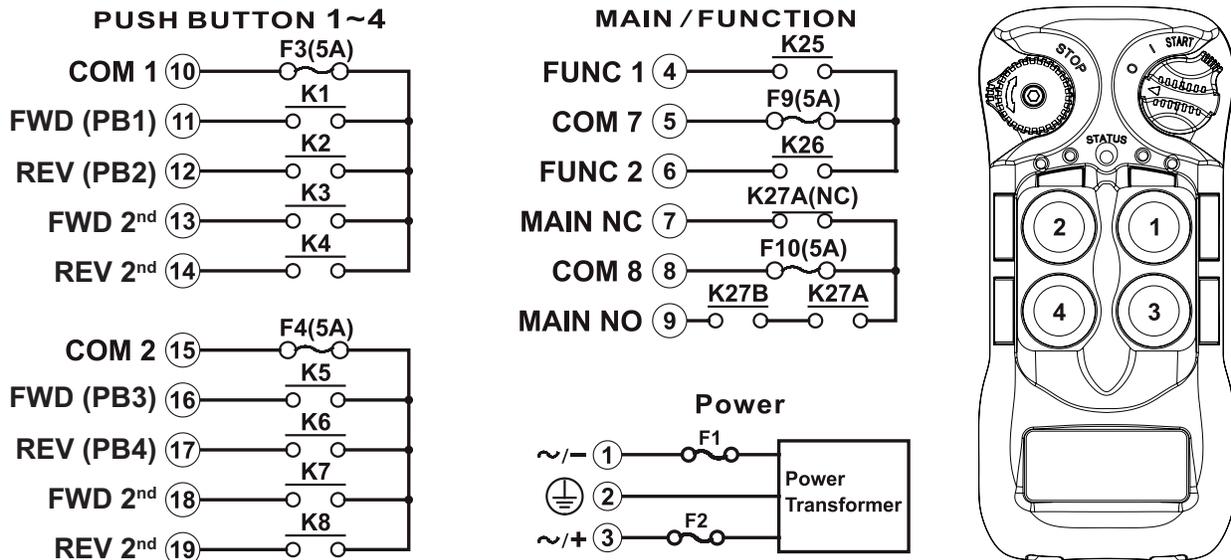
3.3.1.1 External and Internal Illustrations



- | | | | |
|-----|---|-----|----------------------------|
| 1. | External RP-TNC Antenna Port ^a | 11. | Mounting Bracket Release |
| 2. | COM LED Indicator | 12. | Decoder Board |
| 3. | Status LED Indicator | 13. | RF Transceiver Board |
| 4. | Power LED Indicator | 14. | INT/EXT Antenna Jumpers |
| 5. | Output Relay LED Indicators | 15. | Programming Port |
| 6. | Infrared Sensors | 16. | Function Dipswitches |
| 7. | Remote Pairing Button | 17. | Function Jumpers |
| 8. | System Information | 18. | Channel Dipswitch |
| 9. | Cord Grip | 19. | AC Line Filter/Relay Board |
| 10. | Mounting Bracket | 20. | Power Transformer |

^a **NOTE:** The GEN1 Flex EX receiver used a TNC antenna connection, whereas the GEN2 Flex EX2 receiver uses an RP-TNC antenna connection. Make sure the antenna you are using has the correct connection to avoid damaging the antenna connection.

3.3.1.2 Output Relay Contact Diagram



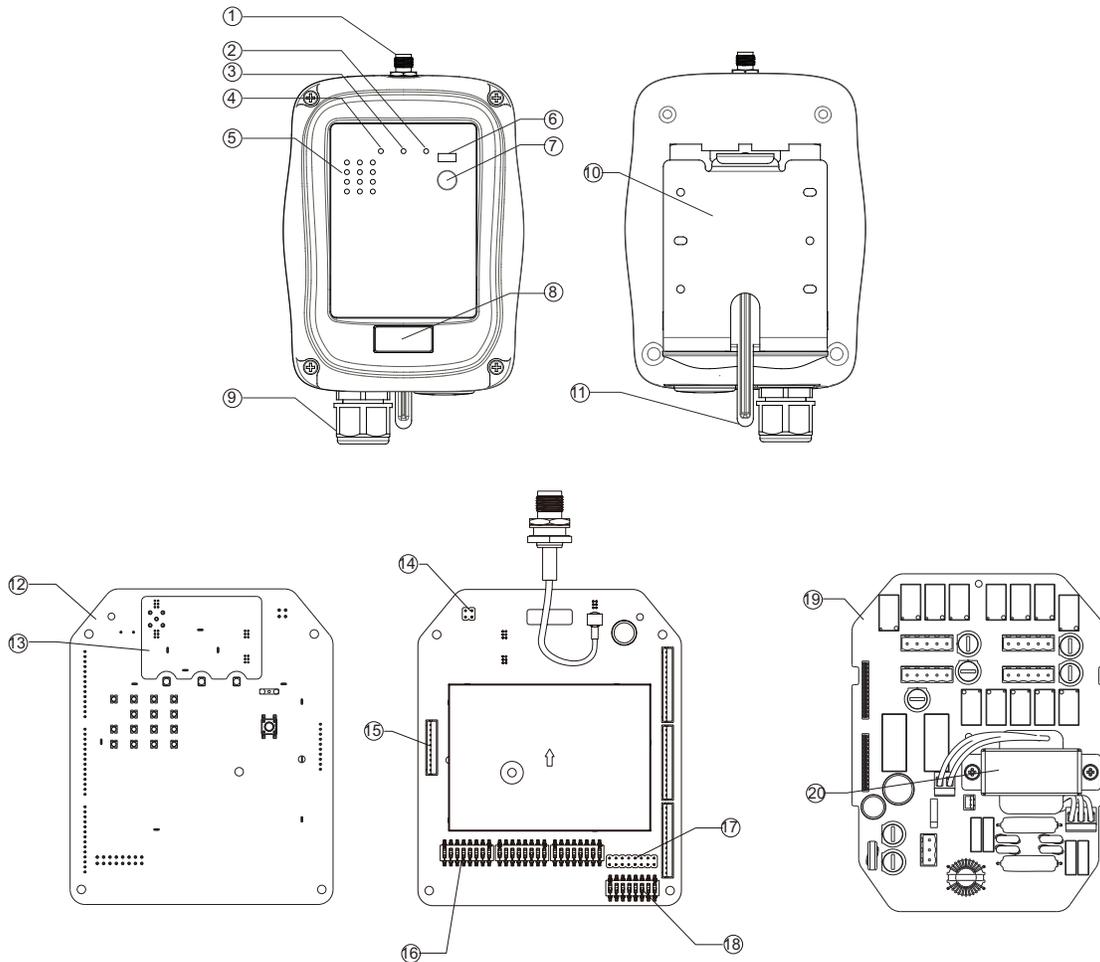
* For 9-36VDC power supply, wire #1 corresponds to the negative charge (-) and wire #3 corresponds to the positive charge (+). Wire #2 is for GROUND.

* If PB3 (or PB4) is set to A/B pushbutton select function, connect output A to K5 (or K6) and output B to K7 (or K8). See Section 4.1.12.5 on page 39 on how to set to this function.

* Due to the possibility of voltage spikes on the contactors, suppressors are recommended on contactors being driven by Flex relays.

3.3.2 6EX2 Receiver

3.3.2.1 External and Internal Illustrations

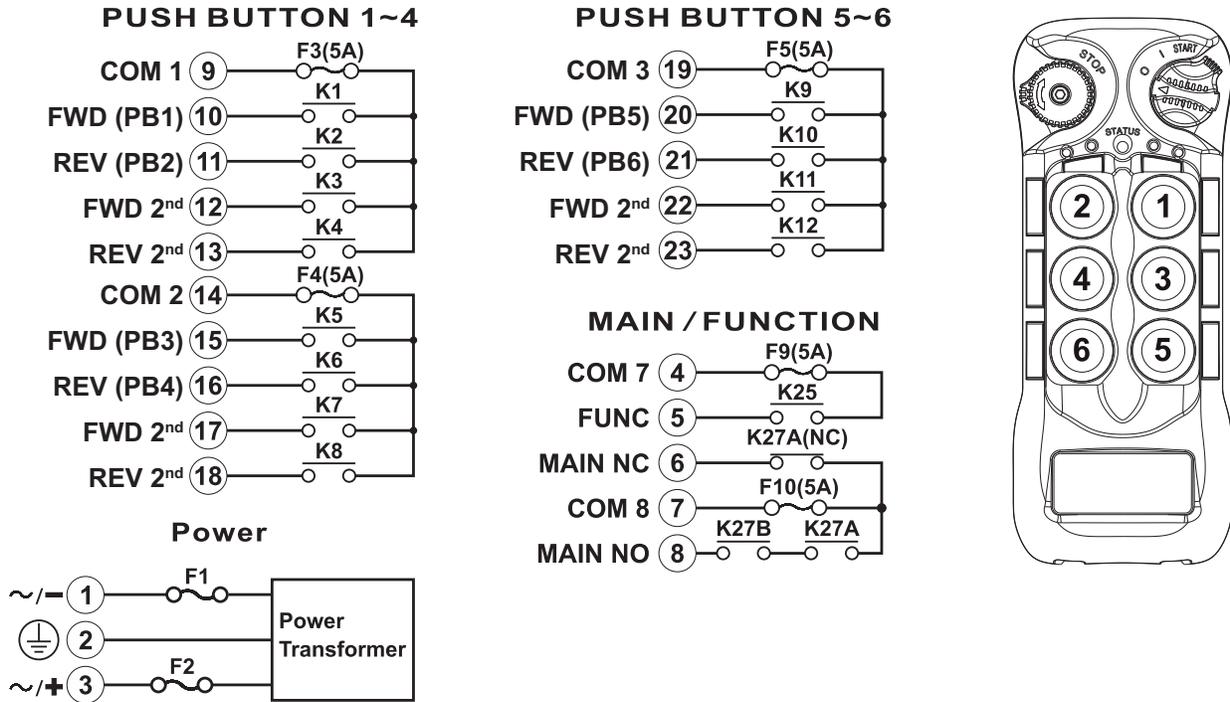


- | | | | |
|-----|---|-----|----------------------------|
| 1. | External RP-TNC Antenna Port ^a | 11. | Mounting Bracket Release |
| 2. | COM LED Indicator | 12. | Decoder Board |
| 3. | Status LED Indicator | 13. | RF Transceiver Board |
| 4. | Power LED Indicator | 14. | INT/EXT Antenna Jumpers |
| 5. | Output Relay LED Indicators | 15. | Programming Port |
| 6. | Infrared Sensors | 16. | Function Dipswitches |
| 7. | Remote Pairing Button | 17. | Function Jumpers |
| 8. | System Information | 18. | Channel Dipswitch |
| 9. | Cord Grip | 19. | AC Line Filter/Relay Board |
| 10. | Mounting Bracket | 20. | Power Transformer |

^a **NOTE:** The GEN1 Flex EX receiver used a TNC antenna connection, whereas the GEN2 Flex EX2 receiver uses an RP-TNC antenna connection. Make sure the antenna you are using has the correct connection to avoid damaging the antenna port.

3.3.2.2 Output Relay Contact Diagram

Flex 6EX2

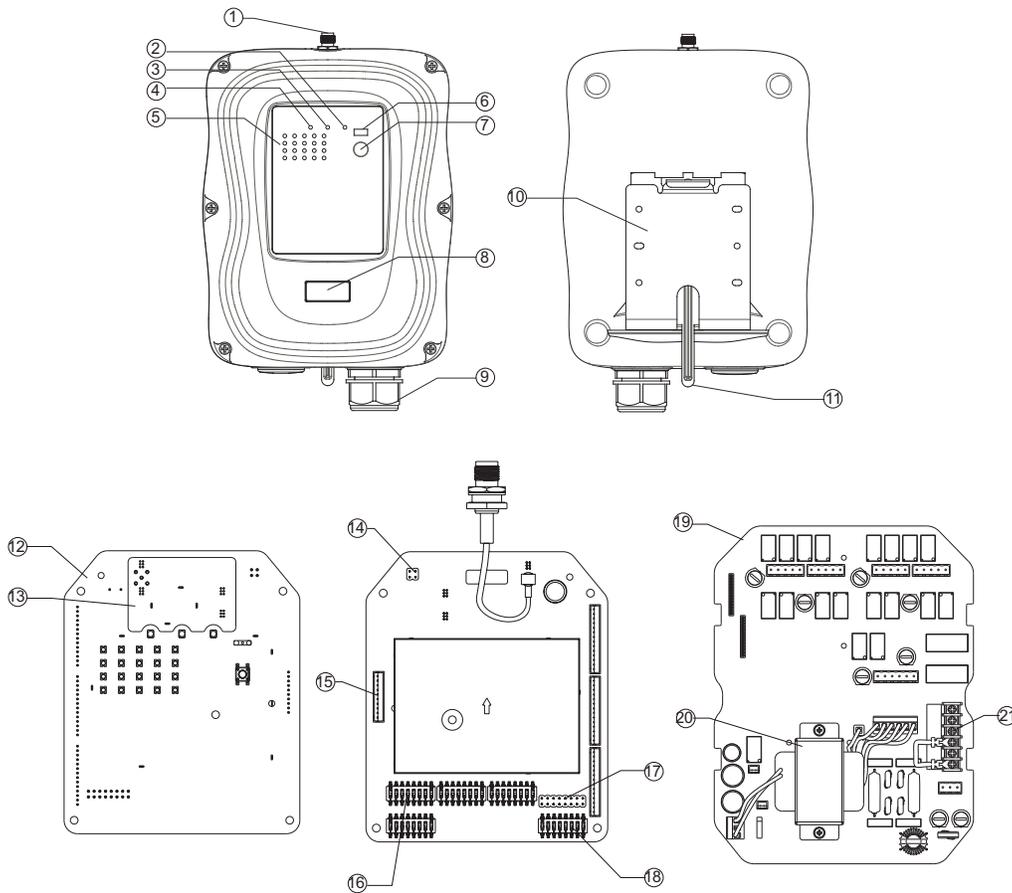


* For 9 - 36VDC power supply, wire #1 corresponds to the negative charge (-), wire #3 corresponds to the positive charge (+), and wire #2 is for GROUND.

* Due to the possibility of voltage spikes on the contactors, suppressors are recommended on contactors being driven by Flex relays.

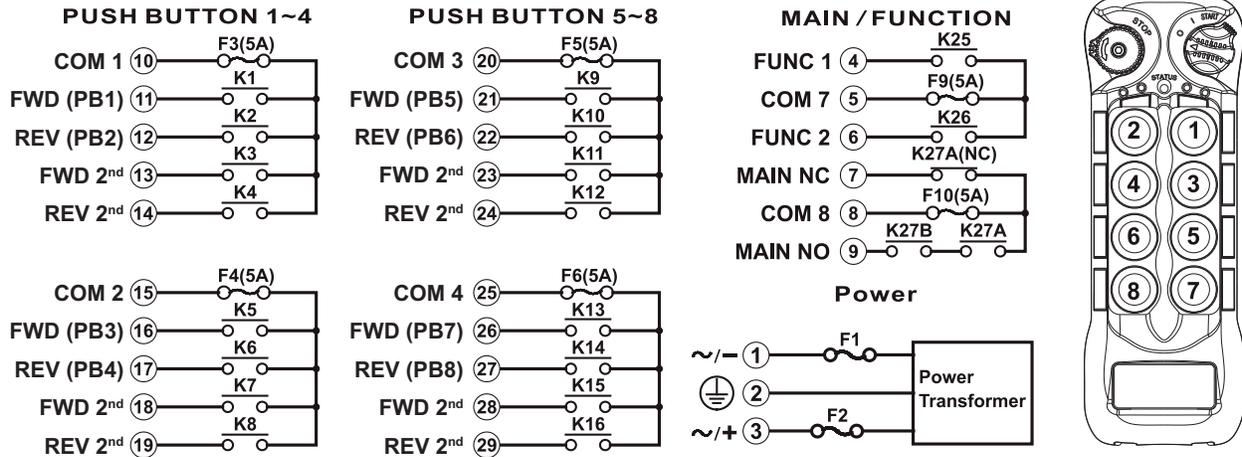
3.3.3 8EX2 Receiver

3.3.3.1 External and Internal Illustrations



- | | | | |
|-----|-----------------------------|-----|----------------------------|
| 1. | External TNC Antenna Port | 12. | Decoder Board |
| 2. | COM LED Indicator | 13. | RF Transceiver Board |
| 3. | Status LED Indicator | 14. | INT/EXT Antenna Jumpers |
| 4. | Power LED Indicator | 15. | Programming Port |
| 5. | Output Relay LED Indicators | 16. | Function Dipswitches |
| 6. | Infrared Sensors | 17. | Function Jumpers |
| 7. | Remote Pairing Button | 18. | Channel Dipswitch |
| 8. | System Information | 19. | AC Line Filter/Relay Board |
| 9. | Cord Grip | 20. | Power Transformer |
| 10. | Mounting Bracket | 21. | Voltage Selector |
| 11. | Mounting Bracket Release | | |

3.3.3.2 Output Relay Contact Diagram



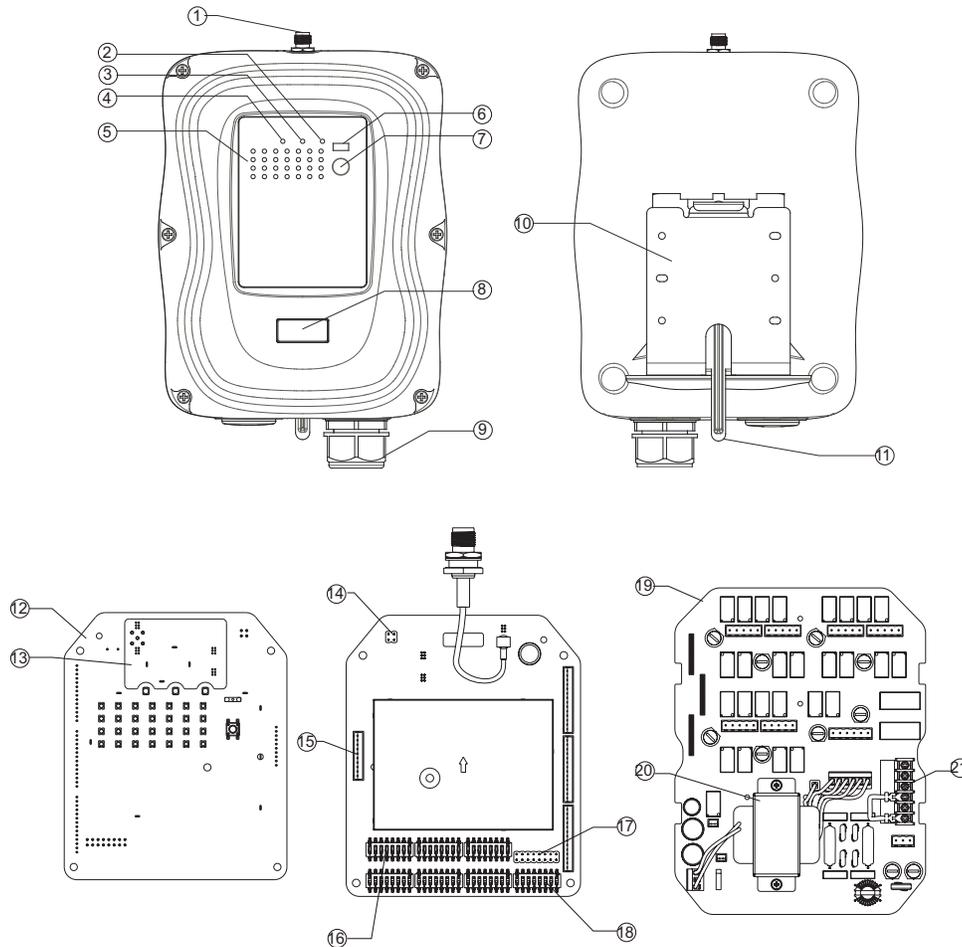
* For 9 - 36VDC power supply, wire #1 corresponds to the negative charge (-), wire #3 corresponds to the positive charge (+), and wire #2 is for GROUND.

* If PB7 (or PB8) is set to A/B pushbutton select, connect output A to K13 relay (or K14) and output B to K15 relay (or K16). See **Section 4.1.12.14 on page 49** on how to set to this function.

* Due to the possibility of voltage spikes on the contactors, suppressors are recommended on contactors being driven by Flex relays.

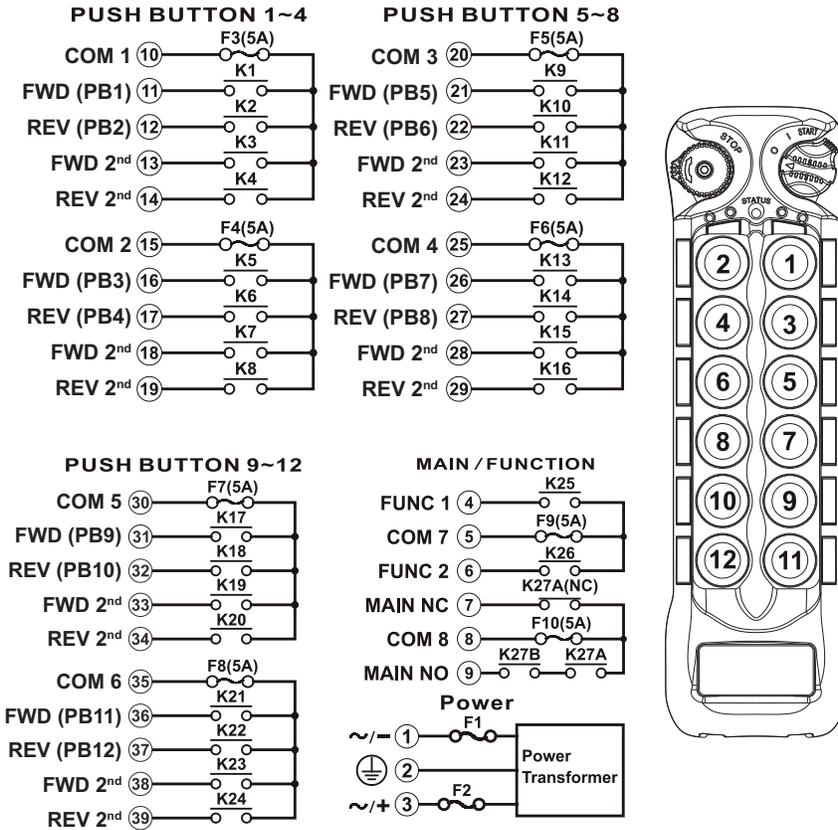
3.3.4 12EX2 Receiver

3.3.4.1 External and Internal Illustrations



- | | | | |
|-----|-----------------------------|-----|----------------------------|
| 1. | External TNC Antenna Port | 12. | Decoder Board |
| 2. | COM LED Indicator | 13. | RF Transceiver Board |
| 3. | Status LED Indicator | 14. | INT/EXT Antenna Jumpers |
| 4. | Power LED Indicator | 15. | Programming Port |
| 5. | Output Relay LED Indicators | 16. | Function Dipswitches |
| 6. | Infrared Sensors | 17. | Function Jumpers |
| 7. | Remote Pairing Button | 18. | Channel Dipswitch |
| 8. | System Information | 19. | AC Line Filter/Relay Board |
| 9. | Cord Grip | 20. | Power Transformer |
| 10. | Mounting Bracket | 21. | Voltage Selector |
| 11. | Mounting Bracket Release | | |

3.3.4.2 Output Relay Contact Diagram

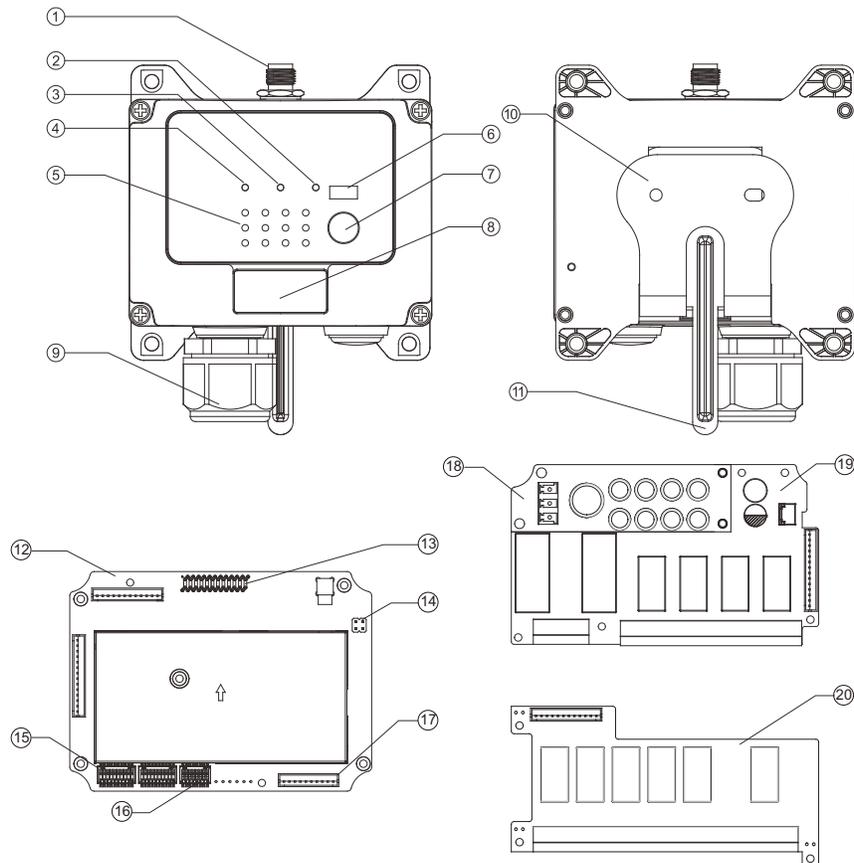


- * For 9 - 36VDC power supply, wire #1 corresponds to the negative charge (-), wire #3 corresponds to the positive charge (+), and wire #2 is for GROUND.
- * If PB11 (or PB12) is set to A/B pushbutton select, connect output A to K21 relay (or K22) and output B to K23 relay (or K24). See **Section 4.1.12.15 on page 51** on how to set to this function.
- * Due to the possibility of voltage spikes on the contactors, suppressors are recommended on contactors being driven by Flex relays.

3.3.5 4EX2-MRX and 6EX2-MRX

NOTE: MRX receiver is not available with the EX2 transmitter in the U.S., Mexico, and Canada.

3.3.5.1 External Illustration

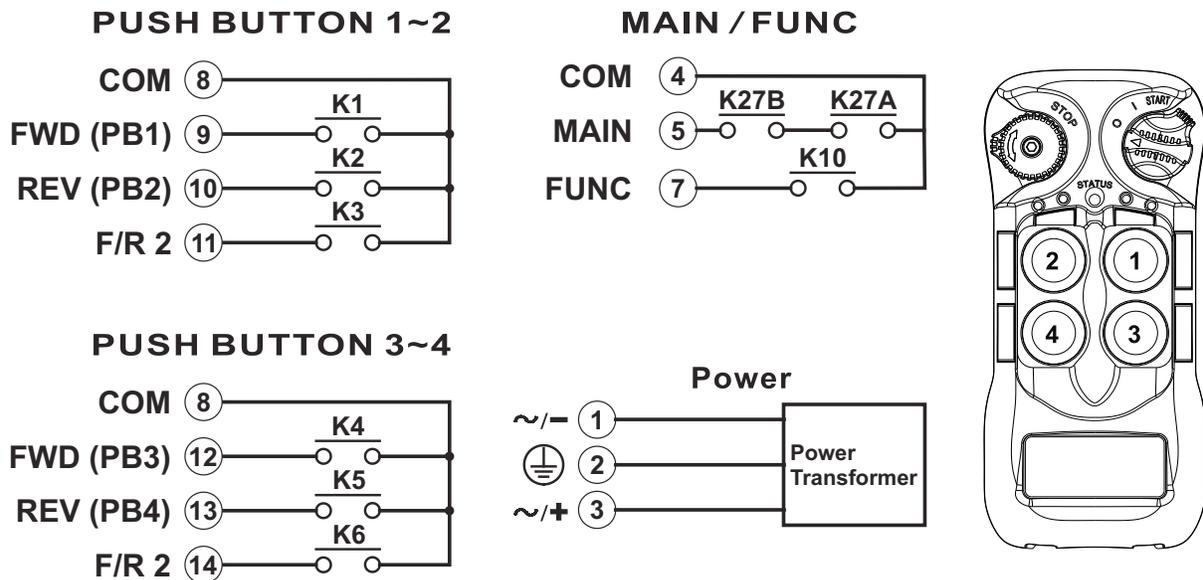


- | | | | |
|-----|-----------------------------|-----|--------------------------|
| 1. | External TNC Antenna Port | 11. | Mounting Bracket Release |
| 2. | COM LED Indicator | 12. | RF/Decoder Board |
| 3. | Status LED Indicator | 13. | Internal Antenna |
| 4. | Power LED Indicator | 14. | INT/EXT Antenna Jumpers |
| 5. | Output Relay LED Indicators | 15. | Function Dipswitches |
| 6. | Infrared Sensors | 16. | Channel Dipswitch |
| 7. | Remote Pairing Button | 17. | Programming Port |
| 8. | System Information | 18. | Power Transformer |
| 9. | Cord Grip | 19. | Lower Relay Board |
| 10. | Mounting Bracket (optional) | 20. | Upper Relay Board |

3.3.5.2 Output Relay Contact Diagram (4EX2-MRX)

NOTE: MRX receiver paired with an EX2 transmitter is not available in the U.S., Mexico, and Canada.

Flex 4EX2



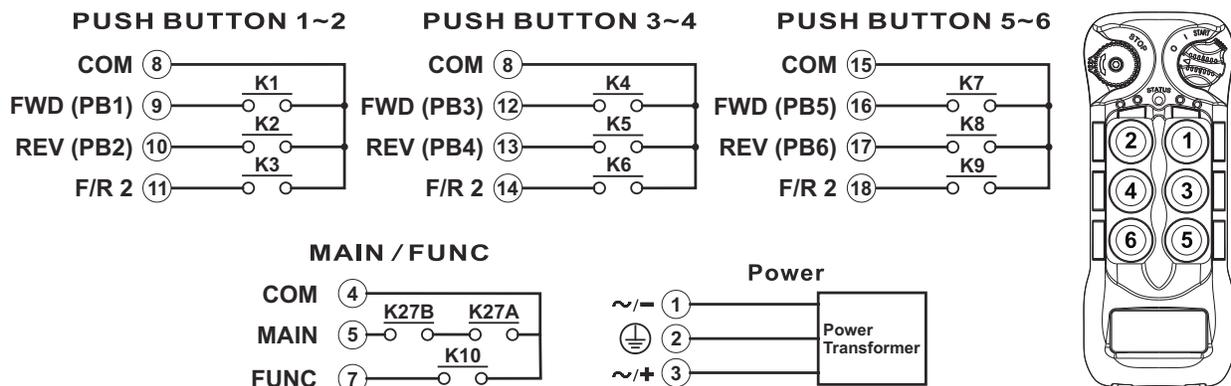
* For 9-36VDC power supply, wire #1 corresponds to the negative charge (-) and wire #3 corresponds to the positive charge (+). Wire #2 is for GROUND.

* Due to the possibility of voltage spikes on the contactors, suppressors are recommended on contactors being driven by Flex relays.

3.3.5.3 Output Relay Contact Diagram (6EX2-MRX)

NOTE: MRX receiver paired with an EX2 transmitter is not available in the U.S., Mexico, and Canada.

Flex 6EX2



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

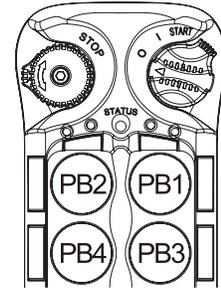
* Due to the possibility of voltage spikes on the contactors, suppressors are recommended on contactors being driven by Flex relays.

4 Function Settings

4.1 Transmitter

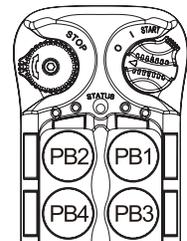
4.1.1 Transmitter Firmware Version

1. Rotate the power switch key to the OFF (0) position.
2. With the STOP button elevated, press and hold PB1 and PB3 at the same time.
3. Rotate the power switch key to the ON (1) position.
4. Release PB1 and PB3 at the same time. The Status LED displays firmware version with red, green, and orange blinks.
5. Exit Firmware Version mode by rotating the power switch key to the OFF (0) position.



4.1.2 Display Frequency Band

1. Rotate the power switch key to the OFF (0) position.
2. With the STOP button elevated, press and hold PB2 and PB4 at the same time.
3. Rotate the power switch key to the ON (1) position.
4. Release PB2 and PB4 at the same time. The system will enter Frequency Band Display mode.
5. The Status LED displays the preset 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 ones (+001). For a complete list of frequencies and their corresponding blink sequences, refer to **Section 4.2.10 on page 72**. See the chart below for an example of how the blink sequence works.



Frequency Band	Hundreds (+100)	Tens (+010)	Ones (+001)
433 MHz	4 orange blinks	3 green blinks	3 red blinks
863 MHz	8 orange blinks	6 green blinks	3 red blinks
921 MHz	9 orange blinks	2 green blinks	1 red blink

6. Exit Frequency Band Display mode by rotating the power switch key to the OFF (0) position.

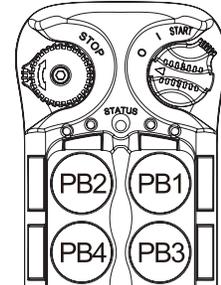
4.1.3 Transmitter Channel Settings

A. Unassigned Channel Scheme (no preset system channel) – Default Setting

When both transmitter and receiver are set to unassigned channel scheme (no preset channel), the system automatically searches and locks onto a free and uninterrupted channel at every transmitter startup.

NOTE: Pitch and catch and multi-receiver configurations **MUST NOT** be set to the unassigned channel scheme.

1. Rotate the power switch key to the OFF (0) position.
2. With the STOP button elevated, press and hold PB1 and PB2 at the same time.
3. Rotate the power switch key to the ON (1) position.
4. Release PB1 and PB2 at the same time. The system will enter Channel Setting mode. The Status LED displays current channel setting with red and green blinks. A green blink represents the tens (+10) and a red blink represents the units (+1). For example, 1 green blink followed by 5 red blinks is channel 15. Channel unassigned is represented by solid orange on the Status LED. If the transmitter has been configured for the “unassigned channel” the Status LED will be solid orange.
5. Change transmitter channel to “channel unassigned” by pressing PB4 one time (Status LED displays solid orange).
6. Transfer “channel unassigned” setting to the receiver by rotating and holding the power switch key at the START position until the Status LED turns to solid green (transfer complete). Turn off the transmitter power if solid green is not shown on the Status LED after more than 10 seconds (transfer incomplete); the transmitter will revert back to its previous channel setting. Make sure the receiver power is turned on and the receiver is within the operating distance during the entire process. When transmitter is set to “channel unassigned” the receiver must also set to “channel unassigned” in order for the entire system to work.
7. Exit Channel Setting mode by rotating the power switch key to the OFF (0) position.

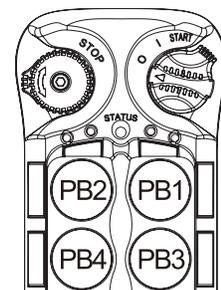


B. Assigned Channel Scheme (preset system channel)

Both transmitter and receiver are assigned with a matching preset channel (channel 01 - 62). When programming the radio control for dedicated channels, the scanning function should be turned on to help maintain first-come-first-served functionality (**see Section 4.2.2.10 on page 58**).

NOTE: Pitch and catch and multi-receiver **MUST** be set to the assigned channel scheme.

1. Rotate the power switch key to the OFF (0) position.
2. With the STOP button elevated, press and hold PB1 and PB2 at the same time.
3. Rotate the power switch key to the ON (1) position.
4. Release PB1 and PB2 at the same time. The system will enter Channel Setting mode. The Status LED displays current channel setting with red and green blinks. A green blink represents the tens (+10) and a red blink represents the units (+1). For example, 1 green blink followed by 5 red blinks is channel 15. Channel unassigned is represented by solid orange on the Status LED.



- Change transmitter channel by pressing PB1 to increment the units (+1) and PB2 to increment the tens (+10). For example, press PB2 two times and then PB1 four times for channel 24 (Status LED blinks 2 greens and 4 reds). Make sure the newly selected channel appears on the Status LED before proceeding to the next step.

Example:

Function Name	Display Type	Location		
256 Button → Color	2 Orange +5 Greens +6 Reds Status Display	+(200)	+(050)	+(006)
PB1 =	Red			6 times
PB2 =	Green		5 times	
PB3 =	Orange	2 times		

Transfer the newly selected channel to the receiver by rotating and holding the power switch key at the START position until the Status LED turns to solid green (transfer complete). Turn off the transmitter power if solid green is not shown on the Status LED after more than 10 seconds (transfer incomplete); the transmitter will revert back to its previous channel setting. Make sure the receiver power is turned on and the receiver is within the operating distance during the entire process. Skip step 6 if changing receiver channel is not required.

- Exit Channel Setting mode by rotating the power switch key to the OFF (0) position.

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

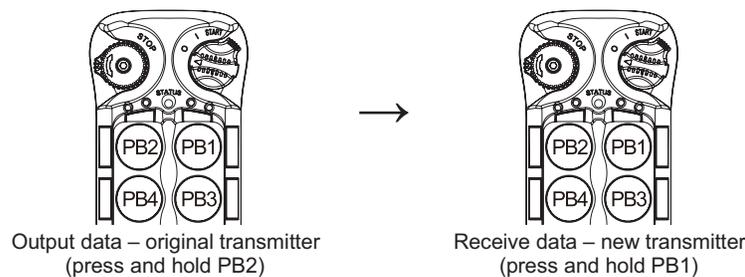
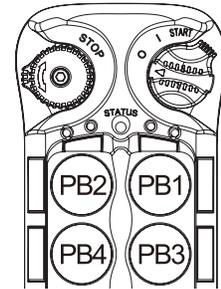
Important Note:

Step 6 illustrated above is strictly required if you are intending to change the entire system channel (both transmitter and receiver). The entire system will no longer work 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 steps 1-4 and step 6 to transfer the newly selected transmitter channel to the receiver.

4.1.4 Remote Pairing

A. Transmitter-to-Transmitter Pairing:

1. Rotate the power switch key on transmitter(s) to the OFF (0) position.
2. With the STOP button elevated, press and hold PB1 and PB3 at the same time.
3. Rotate the power switch key to the ON (1) position.
4. Release PB1 and PB3 at the same time. The system will enter Remote Pairing mode. The Status LED displays firmware version with red, green and orange blinks.
5. Output data (original transmitter) by pressing and holding PB2 (Status LED off).
6. Receive data (new transmitter) by pressing and holding PB1 (Status LED blinks green).
7. When the Status LED (receiving data end) turns to solid green while both pushbuttons are still pressed down, the pairing is completed.
8. Exit Remote Pairing mode by rotating the power switch key to the OFF (0) position.



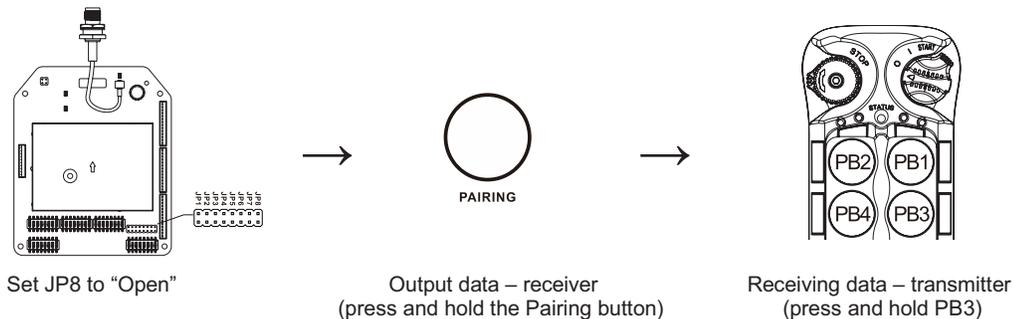
NOTE: During remote pairing make sure the distance between the two transmitters is no more than 1 meter.

B. Receiver-to-Transmitter Pairing (4/6/8/12EX2):

1. Rotate the power switch key to the OFF (0) position.
2. With the STOP button elevated, press and hold PB1 and PB3 at the same time.
3. Rotate the power switch key to the ON (1) position.
4. Release PB1 and PB3 at the same time. The Status LED will now display the firmware version with red, green, and orange blinks. The transmitter is now in Remote Pairing Mode. During remote pairing make sure the distance between the two transmitters is no more than 1 meter.
5. Press the Pairing Button on the receiver and PB3 on the transmitter until the Status LED on the Transmitter goes solid green.

NOTE: If you have done the above procedure and it does not work, cycle power on the receiver and try the above procedure again.

JP8 Open Method: After the transmitter enters the Remote Pairing mode, output receiver data by pressing and holding the PAIRING button located on the receiver cover and receive data by pressing and holding PB3 on the transmitter, both at the same time. When the transmitter Status LED turns to solid green while both pushbuttons are still pressed down, the pairing is completed.



JP8 Short Method (press Pairing button not required): After the transmitter enters the Remote Pairing mode, press and hold PB3 on the transmitter until the Status LED turns to solid green, indicating the pairing is complete. Make sure the transmitter and receiver are within 10 meters from one another and that no other active receivers are nearby during the pairing process. During pairing process, the receiver MAIN relays must be deactivated (relay open).



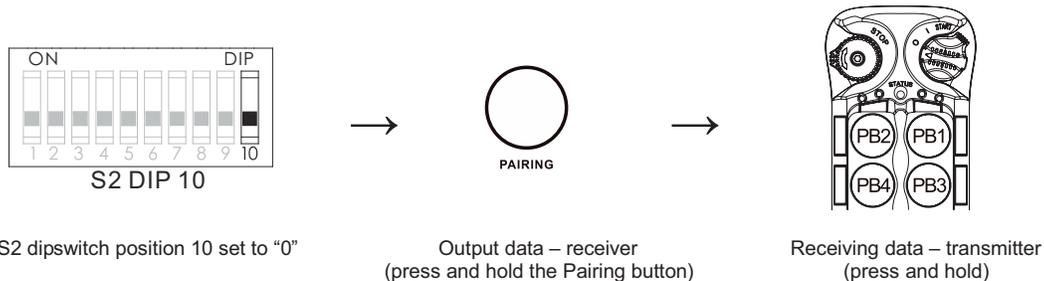
CAUTION

When JP8 is installed that means the receiver is always ready for pairing and can result in unexpected results if multiple receivers are in the area where a transmitter is attempting to pair with receivers. JP8 should be removed when not pairing.

c. Receiver-to-Transmitter Pairing (4/6EX2 MRX):

NOTE: MRX receiver paired with an EX2 transmitter is not available in the U.S., Mexico, and Canada.

S2 dipswitch position 10 set to “0” (down): After the transmitter enters the Remote Pairing mode, output receiver data by pressing and holding the PAIRING button located on the receiver cover and receive data by pressing and holding PB3 on the transmitter, both at the same time. When the transmitter Status LED turns to solid green while both pushbuttons are still pressed down, the pairing is completed.



S2 dipswitch position 10 set to “1” (up): After the transmitter enters the Remote Pairing mode, press and hold PB3 on the transmitter until the Status LED turns to solid green, indicating the pairing is complete. Make sure the transmitter and receiver are within 10 meters from one another and that no other active receivers are nearby during the pairing process. During pairing process, the receiver MAIN relays must be deactivated (relay open).

d. Transmitter-to-Receiver Pairing (4/6EX2 MRX only):



CAUTION

This function should only be used if the receiver is being replaced. The old receiver should be removed from service and discarded.

NOTE: MRX receiver paired with an EX2 transmitter is not available in the U.S., Mexico, and Canada.

S2 dipswitch position 10 set to “0” (down): After the transmitter enters the Remote Pairing mode, output transmitter data by pressing and holding PB4 on the transmitter and receive data by pressing and holding the PAIRING button on the receiver cover, both at the same time. When the transmitter Status LED turns to solid green while both pushbuttons are still pressed down, the pairing is completed.

4.1.5 I-Chip

A 433-439 MHz Flex EX2 transmitter will enter a legacy mode and become backwards compatible with GEN1 Flex EX receivers once an I-Chip is inserted. The serial number and channel are transferred through the I-Chip.

The dipswitch is NOT used to change the channel. If the channel needs to be changed, refer to the Channel Change via Push Buttons procedure in a GEN 1 Flex EX manual.

The first 8 positions on the EX2 transmitter dipswitch will operate the same as the function dipswitch on the GEN 1 Flex EX transmitter. Refer to the appropriate GEN 1 Flex EX CE manual for function dipswitch settings. Position 9 on the dipswitch will set the Continuous Transmitting Time (0 = 1 minute, 1 = time set in I-Chip). Position 10 on the dipswitch is not used.

NOTE: 863-869 MHz and 921-927 MHz (Australia only) Flex EX2 CE transmitters are not compatible with GEN1 Flex EX receivers even if an I-Chip is inserted into the transmitter.

NOTE: All settings in this manual are no longer applicable once an I-Chip is inserted into a Flex EX2 transmitter. Refer to the appropriate GEN 1 Flex EX CE manual instead.

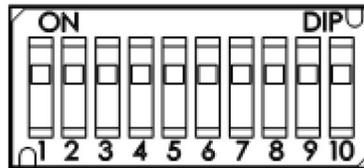
NOTE: A Flex EX transmitter will **NOT** work with a Flex EX2 receiver.

I-Chip Settings:

Serial number = match receiver/s

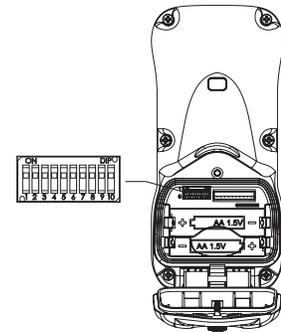
Channel = match receiver/s

Type = 00



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. Default is 1mW (FCC version), 2mW (CE version). If a different output power is required please contact the factory.



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

4.1.7 Transmitter Inactivity Timer Settings

Set how long the system waits to enter the sleep mode when the transmitter is not in use (pushbutton not pressed). When transmitter goes into sleep mode the receiver MAIN relays are deactivated. Default is 5 minutes.

NOTE: If an A/B pushbutton function is set, then the transmitter may not go idle and, therefore, will not timeout.

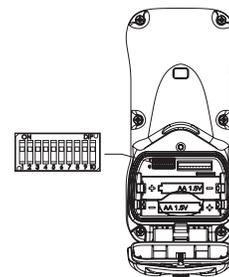
	Dipswitch Settings	Time		Dipswitch Settings	Time
1	xxx000xxxx	1 minute	5	xxx100xxxx	10 minutes
2	xxx001xxxx	20 seconds	6	xxx101xxxx	30 minutes
3	xxx010xxxx	3 minutes	7	xxx110xxxx	60 minutes
4	xxx011xxxx	5 minutes	8	xxx111xxxx	Constant On (sleep mode disabled)

4.1.8 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 the transmitter is thrown, dropped or experiences a Zero-G instance. By default, the sensor is disabled. When the sensor is enabled and a Zero-G instance is detected, the receiver MAIN relays will be deactivated. When triggered, the receiver MAIN relays are deactivated with the exception of the horn output that can be assigned to the K25 Function output relay (for 4/6EX2) or any Function output relay: K25, K26 or K30 (for 8/12EX2) or K10 (for 4/6EX2 MRX). This horn output setting requires the infrared IR programmer unit. Please contact Magnetek field service for more details.

NOTE: MRX receiver paired with an EX2 transmitter is not available in the U.S., Mexico, and Canada.

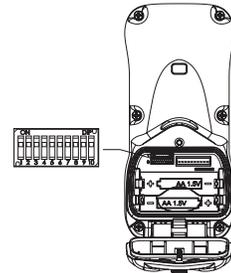
	Dipswitch Settings	Function
1	xxxxxxxx0x	Sensor Disabled
2	xxxxxxxx1x	Sensor Enabled



4.1.9 Transmitter Start Function Settings

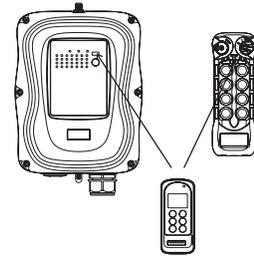
When the transmitter goes into sleep mode the system is temporarily deactivated (MAIN relays opened). Execute the START command (default) or press any pushbutton to wake up the system (MAIN relays closed).

	Dipswitch Settings	Function
1	xxxxxxxx0	START Reactivation
2	xxxxxxxx1	Any Button Reactivation



4.1.10 Infrared Programming

Other custom functions and settings not listed in this manual can be programmed via the infrared IR programmer unit, such as the system serial number, frequency range, relay output status feedback, new and updated functions, and many others. Please refer to the IR programmer manual or contact Magnetek field service for more details.



4.1.11 Output Feedback Settings

Up to 4 assignable relay outputs can be programmed into the system and feedback to the transmitter LED indicators during operation. These settings require using the infrared IR programmer unit. See IR programmer manual or contact Magnetek field service for more details.

4.1.12 Pushbutton Function Settings



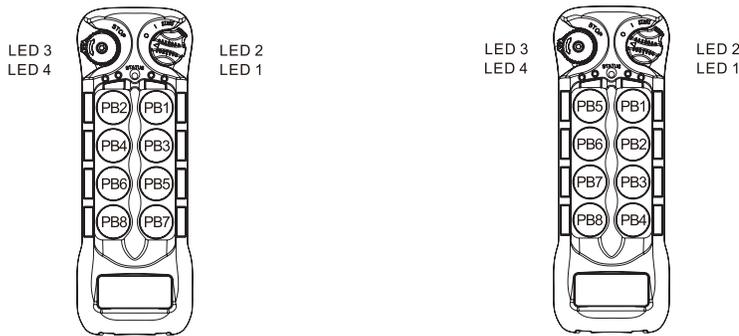
CAUTION

Activation of the toggle and AB functions should be evaluated for compliance with safety standards. Please note some programming features may not comply with the machinery directive, if used in a safety critical function.

Only one function value can be active at a time. The following steps show the function value and the corresponding result from the transmitter's operation.

1. Rotate the power switch key to the OFF (0) position.
2. With the STOP button elevated, press and hold PB3 and PB4 at the same time.
3. Rotate the power switch key to the ON (1) position.
4. Release PB3 and PB4 at the same time. The system will enter Pushbutton Function mode.

- The Status LED displays current pushbutton function setting with orange, green and red blinks. An orange blink represents the hundreds (+100), a green blink represents the tens (+010), a red blink represents the units (+001), and solid orange represents no function (000). For example, 1 orange blink followed by 2 green blinks and 5 red blinks is pushbutton function no. 125. Pushbutton 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.
- Set pushbutton function number by pressing PB3 to increment the hundreds (+100), PB2 to increment the tens (+010), PB1 to increment the units (+001), and PB4 to reset (000 - solid orange). For example, press PB3 one time, PB2 four times, and PB1 six times for pushbutton function no. 146 (Status LED blinks 1 orange, 4 greens and 6 reds).
- Exit Pushbutton Function mode by rotating the power switch key to the OFF (0) position.

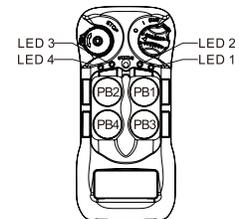


Standard Right/Left Configuration Inline Top/Bottom Configuration

4.1.12.1 Toggled Pushbutton with LED Indication – Standard Right/Left Pushbutton Configuration – 4EX2 and 4EX2-MRX

NOTE: MRX receiver paired with an EX2 transmitter is not available in the U.S., Mexico, and Canada.

Set pushbutton toggled function (latching output relay) with LED indications. LED 1 - 4 shown inside the shaded box illustrates which LED on the transmitter lights up when the designated pushbutton is pressed.



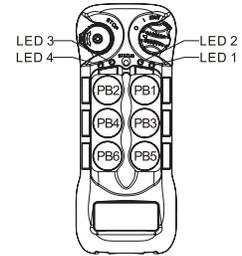
Function Number	Display Type	PB1	PB2	PB3	PB4
1	1 Red	Normal	Normal	Normal	LED 4
2	2 Reds	Normal	Normal	LED 3	LED 4
3	3 Reds	Normal	LED 2	LED 3	LED 4
4	4 Reds	LED 1	LED 2	LED 3	LED 4

- * PB1...PB4 → Pushbutton number.
- * Normal → Normal momentary contact.
- * LED 1 - LED 4 → Pushbutton toggled function with designated LED indication.

4.1.12.2 Toggled Pushbutton with LED Indication – Standard Right/Left Pushbutton Configuration – 6EX2 and 6EX2-MRX

NOTE: MRX receiver paired with an EX2 transmitter is not available in the U.S., Mexico, and Canada.

Set pushbutton toggled function (latching output relay) with LED indications. LED 1 - 4 shown inside the shaded box illustrates which LED on the transmitter lights up when the designated pushbutton is pressed.



Function Number	Display Type	PB1	PB2	PB3	PB4	PB5	PB6
1	1 Red	Normal	Normal	Normal	LED 4	Normal	Normal
2	2 Reds	Normal	Normal	LED 3	LED 4	Normal	Normal
3	3 Reds	Normal	LED 2	LED 3	LED 4	Normal	Normal
4	4 Reds	LED 1	LED 2	LED 3	LED 4	Normal	Normal
7	7 Reds	Normal	Normal	Normal	Normal	Normal	LED 2
8	8 Reds	Normal	Normal	Normal	Normal	LED 1	LED 2

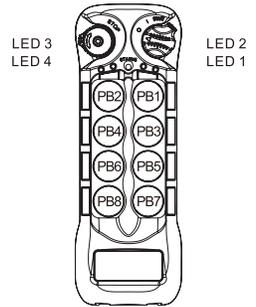
* PB1...PB6 → Pushbutton number.

* Normal → Normal momentary contact.

* LED 1 - LED 4 → Pushbutton toggled function with designated LED indication.

4.1.12.3 Toggled Pushbutton with LED Indication – Standard Right/Left Pushbutton Configuration – 8EX2

Set pushbutton toggled function (latching output relay) with LED indications. LED 1 - 4 shown inside the shaded box illustrates which LED on the transmitter lights up when the designated pushbutton is pressed.



Function Number	Display Type	PB1	PB2	PB3	PB4
1	1 Red	Normal	Normal	Normal	LED 4
2	2 Reds	Normal	Normal	LED 3	LED 4
3	3 Reds	Normal	LED 2	LED 3	LED 4
4	4 Reds	LED 1	LED 2	LED 3	LED 4

Function Number	Display Type	PB5	PB6	PB7	PB8
5	5 Reds	Normal	Normal	Normal	LED 4
6	6 Reds	Normal	Normal	LED 3	LED 4
7	7 Reds	Normal	LED 2	LED 3	LED 4
8	8 Reds	LED 1	LED 2	LED 3	LED 4

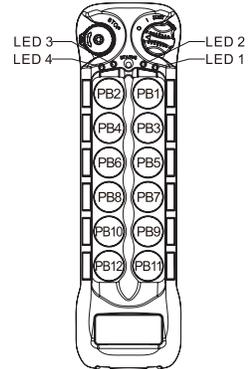
* PB1...PB8 → Pushbutton number.

* Normal → Normal momentary contact.

* LED 1 - LED 4 → Pushbutton toggled function with designated LED indication.

4.1.12.4 Toggled Pushbutton with LED Indication – Standard Right/Left Pushbutton Configuration – 12EX2

Set pushbutton toggled function (latching output relay) with LED indications. LED 1 - 4 shown inside the shaded box illustrate which LED on the transmitter lights up when the designated pushbutton is pressed.



Function Number	Display Type	PB1	PB2	PB3	PB4
1	1 Red	Normal	Normal	Normal	LED 4
2	2 Reds	Normal	Normal	LED 3	LED 4
3	3 Reds	Normal	LED 2	LED 3	LED 4
4	4 Reds	LED 1	LED 2	LED 3	LED 4

Function Number	Display Type	PB5	PB6	PB7	PB8
5	5 Reds	Normal	Normal	Normal	LED 4
6	6 Reds	Normal	Normal	LED 3	LED 4
7	7 Reds	Normal	LED 2	LED 3	LED 4
8	8 Reds	LED 1	LED 2	LED 3	LED 4

Function Number	Display Type	PB9	PB10	PB11	PB12
13	1 Green + 3 Reds	Normal	Normal	Normal	LED 4
14	1 Green + 4 Reds	Normal	Normal	LED 3	LED 4
15	1 Green + 5 Reds	Normal	LED 2	LED 3	LED 4
16	1 Green + 6 Reds	LED 1	LED 2	LED 3	LED 4

* PB1...PB12 → Pushbutton number.

* Normal → Normal momentary contact.

* LED 1 - LED 4 → Pushbutton toggled function with designated LED indication.

4.1.12.5 A/B Pushbutton Select with LED Indication – Standard Right/Left Pushbutton Configuration – 4EX2

There are 5 different types of A/B selector sequence available. Choose one that is most suitable for your application. See Section 3.3.1.2 on page 17 for output relay contact diagrams.

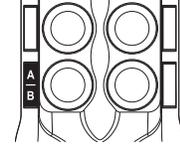
Type-A selector sequence: A → B

Type-B selector sequence: Off → A

Type-C selector sequence: A → B → A+B

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

Type-E selector sequence: A+B → A → B



Function Number	Display Type	PB1	PB2	PB3	PB4
29	2 Greens + 9 Reds	Normal	Normal	A/1&2	Normal
30	3 Greens	Normal	Normal	B/1&2	Normal
31	3 Greens + 1 Red	Normal	Normal	C/1&2	Normal
32	3 Greens + 2 Reds	Normal	Normal	D/1&2	Normal
33	3 Greens + 3 Reds	Normal	Normal	Normal	A/3&4
34	3 Greens + 4 Reds	Normal	Normal	Normal	B/3&4
35	3 Greens + 5 Reds	Normal	Normal	Normal	C/3&4
36	3 Greens + 6 Reds	Normal	Normal	Normal	D/3&4
37	3 Greens + 7 Reds	Normal	Normal	A/1&2	A/3&4
38	3 Greens + 8 Reds	Normal	Normal	A/1&2	B/3&4
39	3 Greens + 9 Reds	Normal	Normal	A/1&2	C/3&4
40	4 Greens	Normal	Normal	A/1&2	D/3&4
41	4 Greens + 1 Red	Normal	Normal	B/1&2	B/3&4
42	4 Greens + 2 Reds	Normal	Normal	B/1&2	C/3&4
43	4 Greens + 3 Reds	Normal	Normal	B/1&2	D/3&4
44	4 Greens + 4 Reds	Normal	Normal	C/1&2	C/3&4
45	4 Greens + 5 Reds	Normal	Normal	C/1&2	D/3&4
46	4 Greens + 6 Reds	Normal	Normal	D/1&2	D/3&4
256	2 Orange + 5 Greens + 6 Reds	Normal	Normal	E/1&2	Normal
257	2 Orange + 5 Greens + 7 Reds	Normal	Normal	Normal	E/3&4
258	2 Orange + 5 Greens + 8 Reds	Normal	Normal	E/1&2	E/3&4
259	2 Orange + 5 Greens + 9 Reds	Normal	Normal	E/1&2	B/3&4

Function Number	Display Type	PB1	PB2	PB3	PB4
260	2 Orange + 6 Greens	Normal	Normal	E/1&2	C/3&4
261	2 Orange + 6 Greens + 1 Red	Normal	Normal	E/1&2	D/3&4

* PB1...PB4 → Pushbutton number.

* Normal → Normal momentary contact.

* A/1&2 - E/3&4 → A/B pushbutton select function with designated LED indication.

4.1.12.6 A/B Pushbutton Select with LED Indication – Standard Right/Left Pushbutton Configuration – 6EX2

There are 5 different types of A/B selector sequence available. Choose one that is most suitable for your application. See Section 3.3.2.2 on page 19 for output relay contact diagrams.

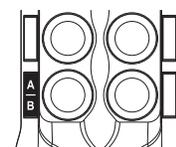
Type-A selector sequence: A → B

Type-B selector sequence: Off → A

Type-C selector sequence: A → B → A+B

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

Type-E selector sequence: A+B → A → B



Function Number	Display Type	PB1	PB2	PB3	PB4	PB5	PB6
101	1 Orange + 1 Red	Normal	Normal	Normal	Normal	A/1&2	Normal
102	1 Orange + 2 Reds	Normal	Normal	Normal	Normal	B/1&2	Normal
103	1 Orange + 3 Reds	Normal	Normal	Normal	Normal	C/1&2	Normal
104	1 Orange + 4 Reds	Normal	Normal	Normal	Normal	D/1&2	Normal
115	1 Orange + 1 Green + 5 Reds	Normal	Normal	Normal	Normal	Normal	A/1&2
116	1 Orange + 1 Green + 6 Reds	Normal	Normal	Normal	Normal	Normal	B/1&2
117	1 Orange + 1 Green + 7 Reds	Normal	Normal	Normal	Normal	Normal	C/1&2
118	1 Orange + 1 Green + 8 Reds	Normal	Normal	Normal	Normal	Normal	D/1&2
285	2 Orange + 8 Green + 5 Reds	Normal	Normal	Normal	Normal	Normal	E/1&2

* PB1...PB6 → Pushbutton number.

* Normal → Normal momentary contact.

* A/1&2 - D/1&2 → A/B pushbutton select function with designated LED indication.

4.1.12.7 A/B Pushbutton Select with LED Indication – Standard Right/Left Pushbutton Configuration – 8EX2

There are 5 different types of A/B selector sequence available. Choose one that is most suitable for your application. See Section 3.3.3.2 on page 21 for output relay contact diagrams.

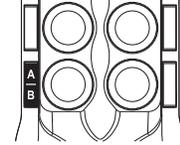
Type-A selector sequence: A → B

Type-B selector sequence: Off → A → B

Type-C selector sequence: A → B → A+B

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

Type-E selector sequence: A+B → A → B



Function Number	Display Type	PB5	PB6	PB7	PB8
47	4 Greens + 7 Reds	Normal	Normal	A/1&2	Normal
48	4 Greens + 8 Reds	Normal	Normal	B/1&2	Normal
49	4 Greens + 9 Reds	Normal	Normal	C/1&2	Normal
50	5 Greens	Normal	Normal	D/1&2	Normal
51	5 Greens + 1 Red	Normal	Normal	Normal	A/3&4
52	5 Greens + 2 Reds	Normal	Normal	Normal	B/3&4
53	5 Greens + 3 Reds	Normal	Normal	Normal	C/3&4
54	5 Greens + 4 Reds	Normal	Normal	Normal	D/3&4
55	5 Greens + 5 Reds	Normal	Normal	A/1&2	A/3&4
56	5 Greens + 6 Reds	Normal	Normal	A/1&2	B/3&4
57	5 Greens + 7 Reds	Normal	Normal	A/1&2	C/3&4
58	5 Greens + 8 Reds	Normal	Normal	A/1&2	D/3&4
59	5 Greens + 9 Reds	Normal	Normal	B/1&2	B/3&4
60	6 Greens	Normal	Normal	B/1&2	C/3&4
61	6 Greens + 1 Red	Normal	Normal	B/1&2	D/3&4
62	6 Greens + 2 Reds	Normal	Normal	C/1&2	C/3&4
63	6 Greens + 3 Reds	Normal	Normal	C/1&2	D/3&4
64	6 Greens + 4 Reds	Normal	Normal	D/1&2	D/3&4
262	2 Orange + 6 Greens + 2 Reds	Normal	Normal	E/1&2	Normal
263	2 Orange + 6 Greens + 3 Reds	Normal	Normal	Normal	E/3&4
264	2 Orange + 6 Greens + 4 Reds	Normal	Normal	E/1&2	E/3&4
265	2 Orange + 6 Greens + 5 Reds	Normal	Normal	E/1&2	B/3&4

Function Number	Display Type	PB5	PB6	PB7	PB8
266	2 Orange + 6 Greens + 6 Reds	Normal	Normal	E/1&2	C/3&4
267	2 Orange + 6 Greens + 7 Reds	Normal	Normal	E/1&2	D/3&4

* PB5...PB8 → Pushbutton number.

* Normal → Normal momentary contact.

* A/1&2 - E/3&4 → A/B pushbutton select function with designated LED indication.

4.1.12.8 A/B Pushbutton Select with LED Indication – Standard Right/Left Pushbutton Configuration – 12EX2

There are 5 different types of A/B selector sequence available. Choose one that is most suitable for your application. See Section 3.3.4.2 on page 23 for output relay contact diagrams.

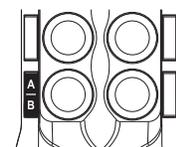
Type-A selector sequence: A → B

Type-B selector sequence: Off → A → B

Type-C selector sequence: A → B → A+B

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

Type-E selector sequence: A+B → A → B



Function Number	Display Type	PB9	PB10	PB11	PB12
65	6 Greens + 5 Reds	A/1&2	Normal	Normal	Normal
66	6 Greens + 6 Reds	B/1&2	Normal	Normal	Normal
67	6 Greens + 7 Reds	C/1&2	Normal	Normal	Normal
68	6 Greens + 8 Reds	D/1&2	Normal	Normal	Normal
69	6 Greens + 9 Reds	Normal	A/3&4	Normal	Normal
70	7 Greens	Normal	B/3&4	Normal	Normal
71	7 Greens + 1 Red	Normal	C/3&4	Normal	Normal
72	7 Greens + 2 Reds	Normal	D/3&4	Normal	Normal
73	7 Greens + 3 Reds	A/1&2	A/3&4	Normal	Normal
74	7 Greens + 4 Reds	A/1&2	B/3&4	Normal	Normal
75	7 Greens + 5 Reds	A/1&2	C/3&4	Normal	Normal
76	7 Greens + 6 Reds	A/1&2	D/3&4	Normal	Normal
77	7 Greens + 7 Reds	B/1&2	B/3&4	Normal	Normal
78	7 Greens + 8 Reds	B/1&2	C/3&4	Normal	Normal
79	7 Greens + 9 Reds	B/1&2	D/3&4	Normal	Normal
80	8 Greens	C/1&2	C/3&4	Normal	Normal

Function Number	Display Type	PB9	PB10	PB11	PB12
81	8 Greens + 1 Red	C/1&2	D/3&4	Normal	Normal
82	8 Greens + 2 Reds	D/1&2	D/3&4	Normal	Normal
83	8 Greens + 3 Reds	Normal	Normal	A/1&2	Normal
84	8 Greens + 4 Reds	Normal	Normal	B/1&2	Normal
85	8 Greens + 5 Reds	Normal	Normal	C/1&2	Normal
86	8 Greens + 6 Reds	Normal	Normal	D/1&2	Normal
87	8 Greens + 7 Reds	Normal	Normal	Normal	A/3&4
88	8 Greens + 8 Reds	Normal	Normal	Normal	B/3&4
89	8 Greens + 9 Reds	Normal	Normal	Normal	C/3&4
90	9 Greens	Normal	Normal	Normal	D/3&4
91	9 Greens + 1 Red	Normal	Normal	A/1&2	A/3&4
92	9 Greens + 2 Reds	Normal	Normal	A/1&2	B/3&4
93	9 Greens + 3 Reds	Normal	Normal	A/1&2	C/3&4
94	9 Greens + 4 Reds	Normal	Normal	A/1&2	D/3&4
95	9 Greens + 5 Reds	Normal	Normal	B/1&2	B/3&4
96	9 Greens + 6 Reds	Normal	Normal	B/1&2	C/3&4
97	9 Greens + 7 Reds	Normal	Normal	B/1&2	D/3&4
98	9 Greens + 8 Reds	Normal	Normal	C/1&2	C/3&4
99	9 Greens + 9 Reds	Normal	Normal	C/1&2	D/3&4
100	1 Orange	Normal	Normal	D/1&2	D/3&4
268	2 Orange+ 6 Greens + 8 Reds	E/1&2	Normal	Normal	Normal
269	2 Orange+ 6 Greens + 9 Reds	Normal	E/3&4	Normal	Normal
270	2 Orange+ 7 Greens	E/1&2	E/3&4	Normal	Normal
271	2 Orange+ 7 Greens + 1 Red	E/1&2	B/3&4	Normal	Normal
272	2 Orange+ 7 Greens + 2 Reds	E/1&2	C/3&4	Normal	Normal
273	2 Orange+ 7 Greens + 3 Reds	E/1&2	D/3&4	Normal	Normal
274	2 Orange+ 7 Greens + 4 Reds	Normal	Normal	E/1&2	Normal
275	2 Orange+ 7 Greens + 5 Reds	Normal	Normal	Normal	E/3&4
276	2 Orange+ 7 Greens + 6 Reds	Normal	Normal	E/1&2	E/3&4
277	2 Orange+ 7 Greens + 7 Reds	Normal	Normal	E/1&2	B/3&4

Function Number	Display Type	PB9	PB10	PB11	PB12
278	2 Orange+ 7 Greens + 8 Reds	Normal	Normal	E/1&2	C/3&4
279	2 Orange+ 7 Greens + 9 Reds	Normal	Normal	E/1&2	D/3&4

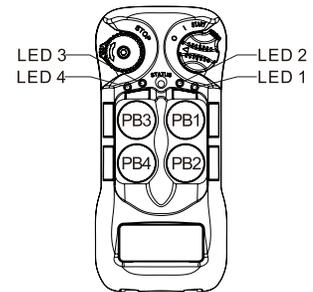
* PB9...PB12 → Pushbutton number.

* Normal → Normal momentary contact.

* A/1&2 - E/3&4 → A/B pushbutton select function with designated LED indication.

4.1.12.9 Toggled Pushbutton with LED Indication – Inline Top/Bottom Pushbutton Configuration – 4EX2

Set pushbutton toggled function (latching output relay) with LED indications. LED 1-4 shown inside the shaded box illustrates which LED on the transmitter lights up when the designated pushbutton is pressed. **See Section 4.2.4 on page 66.**



Function Number	Display Type	PB1	PB2	PB3	PB4
1	1 Red	Normal	Normal	Normal	LED 4
17	1 Green + 7 Reds	Normal	Normal	LED 3	LED 4
18	1 Green + 8 Reds	Normal	LED 2	LED 3	LED 4
19	1 Green + 9 Reds	LED 1	LED 2	LED 3	LED 4

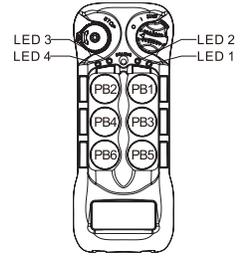
* PB1...PB4 → Pushbutton number.

* Normal → Normal momentary contact.

* LED 1 - LED 4 → A/B pushbutton select function with designated LED indication.

4.1.12.10 Toggled Pushbutton with LED Indication – Inline Top/Bottom Pushbutton Configuration – 6EX2

Set pushbutton toggled function (latching output relay) with LED indications. LED 1 - 4 shown inside the shaded box illustrates which LED on the transmitter lights up when the designated pushbutton is pressed. **See Section 4.2.4 on page 66.**



Function Number	Display Type	PB1	PB2	PB3	PB4	PB5	PB6
1	1 Red	Normal	Normal	Normal	LED 4	Normal	Normal
2	2 Reds	Normal	Normal	LED 3	LED 4	Normal	Normal
3	3 Reds	Normal	LED 2	LED 3	LED 4	Normal	Normal
4	4 Reds	LED 1	LED 2	LED 3	LED 4	Normal	Normal
7	7 Reds	Normal	Normal	Normal	Normal	Normal	LED 2
8	8 Reds	Normal	Normal	Normal	Normal	LED 1	LED 2

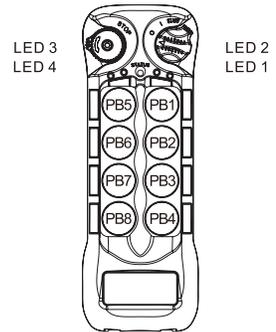
* PB1...PB6 → Pushbutton number.

* Normal → Normal momentary contact.

* LED 1 - LED 4 → Pushbutton toggled function with designated LED indication.

4.1.12.11 Toggled Pushbutton with LED Indication – Inline Top/Bottom Pushbutton Configuration – 8EX2

Set pushbutton toggled function (latching output relay) with LED indications. LED 1 - 4 shown inside the shaded box illustrates which LED on the transmitter lights up when the designated pushbutton is pressed. **See Section 4.2.4 on page 66** for jumper settings.



Function Number	Display Type	PB1	PB2	PB3	PB4
1	1 Red	Normal	Normal	Normal	LED 4
17	1 Green + 7 Reds	Normal	Normal	LED 3	LED 4
18	1 Green + 8 Reds	Normal	LED 2	LED 3	LED 4
19	1 Green + 9 Reds	LED 1	LED 2	LED 3	LED 4

Function Number	Display Type	PB5	PB6	PB7	PB8
5	5 Reds	Normal	Normal	Normal	LED 4
20	2 Greens	Normal	Normal	LED 3	LED 4
21	2 Greens + 1 Red	Normal	LED 2	LED 3	LED 4
22	2 Greens + 2 Reds	LED 1	LED 2	LED 3	LED 4

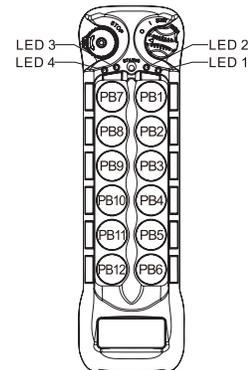
* PB1...PB8 → Pushbutton number.

* Normal → Normal momentary contact.

* LED 1 - LED 4 → Pushbutton toggled function with designated LED indication.

4.1.12.12 Toggled Pushbutton with LED Indication – Inline Top/Bottom Pushbutton Configuration – 12EX2

Set pushbutton toggled function (latching output relay) with LED indications. LED 1 - 4 shown inside the shaded box illustrate which LED on the transmitter lights up when the designated pushbutton is pressed. **See Section 4.2.4 on page 66** for jumper settings.



Function Number	Display Type	PB1	PB2	PB3	PB4
1	1 Red	Normal	Normal	Normal	LED 4
17	1 Green + 7 Reds	Normal	Normal	LED 3	LED 4
18	1 Green + 8 Reds	Normal	LED 2	LED 3	LED 4
19	1 Green + 9 Reds	LED 1	LED 2	LED 3	LED 4

Function Number	Display Type	PB5	PB6	PB7	PB8
5	5 Reds	Normal	Normal	Normal	LED 4
20	2 Greens	Normal	Normal	LED 3	LED 4
21	2 Greens + 1 Red	Normal	LED 2	LED 3	LED 4
22	2 Greens + 2 Reds	LED 1	LED 2	LED 3	LED 4

Function Number	Display Type	PB9	PB10	PB11	PB12
13	1 Green + 3 Reds	Normal	Normal	Normal	LED 4
26	2 Greens + 6 Reds	Normal	Normal	LED 3	LED 4
27	2 Greens + 7 Reds	Normal	LED 2	LED 3	LED 4
28	2 Greens + 8 Reds	LED 1	LED 2	LED 3	LED 4

* PB1...PB12 → Pushbutton number.

* Normal → Normal momentary contact.

* LED 1 - LED 4 → Pushbutton toggled function with designated LED indication.

4.1.12.13 A/B Pushbutton Select with LED Indication - Inline Top/Bottom Pushbutton Configuration – 4EX2

There are 5 different types of A/B selector sequence available. Choose one that is most suitable for your application. See Section 3.3.1.2 on page 17 for output relay contact diagrams.

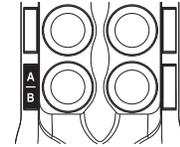
Type-A selector sequence: A → B

Type-B selector sequence: Off → A

Type-C selector sequence: A → B → A+B

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

Type-E selector sequence: A+B → A → B



Function Number	Display Type	PB1	PB2	PB3	PB4
101	1 Orange + 1 Red	Normal	Normal	A/1&2	Normal
102	1 Orange + 2 Reds	Normal	Normal	B/1&2	Normal
103	1 Orange + 3 Reds	Normal	Normal	C/1&2	Normal
104	1 Orange + 4 Reds	Normal	Normal	D/1&2	Normal
33	3 Greens + 3 Reds	Normal	Normal	Normal	A/3&4
34	3 Greens + 4 Reds	Normal	Normal	Normal	B/3&4
35	3 Greens + 5 Reds	Normal	Normal	Normal	C/3&4
36	3 Greens + 6 Reds	Normal	Normal	Normal	D/3&4
105	1 Orange + 5 Reds	Normal	Normal	A/1&2	A/3&4
106	1 Orange + 6 Reds	Normal	Normal	A/1&2	B/3&4
107	1 Orange + 7 Reds	Normal	Normal	A/1&2	C/3&4
108	1 Orange + 8 Reds	Normal	Normal	A/1&2	D/3&4
109	1 Orange + 9 Reds	Normal	Normal	B/1&2	B/3&4
110	1 Orange + 1 Green	Normal	Normal	B/1&2	C/3&4
111	1 Orange + 1 Green + 1 Red	Normal	Normal	B/1&2	D/3&4
112	1 Orange + 1 Green + 2 Reds	Normal	Normal	C/1&2	C/3&4
113	1 Orange + 1 Green + 3 Reds	Normal	Normal	C/1&2	D/3&4
114	1 Orange + 1 Green + 4 Reds	Normal	Normal	D/1&2	D/3&4
280	2 Orange + 8 Greens	Normal	Normal	E/1&2	Normal
257	2 Orange + 5 Greens + 7 Reds	Normal	Normal	Normal	E/3&4
281	2 Orange + 8 Greens + 7 Reds	Normal	Normal	E/1&2	E/3&4
282	2 Orange + 8 Greens + 2 Reds	Normal	Normal	E/1&2	B/3&4

Function Number	Display Type	PB1	PB2	PB3	PB4
283	2 Orange + 8 Greens + 3 Reds	Normal	Normal	E/1&2	C/3&4
284	2 Orange + 8 Greens + 4 Red	Normal	Normal	E/1&2	D/3&4

* PB1...PB4 → Pushbutton number.

* Normal → Normal momentary contact.

* A/1&2 - E/3&4 → A/B pushbutton select function with designated LED indication.

4.1.12.14 A/B Pushbutton Select with LED Indication – Inline Top/Bottom Pushbutton Configuration – 8EX2

There are 5 different types of A/B selector sequence available. Choose one that is most suitable for your application. See **Section 4.2.4 on page 66** for jumper settings and **Section 3.3.3.2 on page 21** for output relay contact diagrams.

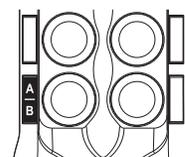
Type-A selector sequence: A → B

Type-B selector sequence: Off → A → B

Type-C selector sequence: A → B → A+B

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

Type-E selector sequence: A+B → A → B



Function Number	Display Type	PB5	PB6	PB7	PB8
115	1 Orange + 1 Green + 5 Reds	Normal	Normal	A/1&2	Normal
116	1 Orange + 1 Green + 6 Reds	Normal	Normal	B/1&2	Normal
117	1 Orange + 1 Green + 7 Reds	Normal	Normal	C/1&2	Normal
118	1 Orange + 1 Green + 8 Reds	Normal	Normal	D/1&2	Normal
51	5 Greens + 1 Red	Normal	Normal	Normal	A/3&4
52	5 Greens + 2 Reds	Normal	Normal	Normal	B/3&4
53	5 Greens + 3 Reds	Normal	Normal	Normal	C/3&4
54	5 Greens + 4 Reds	Normal	Normal	Normal	D/3&4
119	1 Orange + 1 Green + 9 Reds	Normal	Normal	A/1&2	A/3&4
120	1 Orange + 2 Greens	Normal	Normal	A/1&2	B/3&4
121	1 Orange + 2 Greens + 1 Red	Normal	Normal	A/1&2	C/3&4

Function Number	Display Type	PB5	PB6	PB7	PB8
122	1 Orange + 2 Greens + 2 Reds	Normal	Normal	A/1&2	D/3&4
123	1 Orange + 2 Greens + 3 Reds	Normal	Normal	B/1&2	B/3&4
124	1 Orange + 2 Greens + 4 Reds	Normal	Normal	B/1&2	C/3&4
125	1 Orange + 2 Greens + 5 Reds	Normal	Normal	B/1&2	D/3&4
126	1 Orange + 2 Greens + 6 Reds	Normal	Normal	C/1&2	C/3&4
127	1 Orange + 2 Greens + 7 Reds	Normal	Normal	C/1&2	D/3&4
128	1 Orange + 2 Greens + 8 Reds	Normal	Normal	D/1&2	D/3&4
285	2 Orange + 8 Greens + 5 Reds	Normal	Normal	E/1&2	Normal
263	2 Orange + 6 Greens + 3 Reds	Normal	Normal	Normal	E/3&4
286	2 Orange + 8 Greens + 6 Reds	Normal	Normal	E/1&2	E/3&4
287	2 Orange + 8 Greens + 7 Reds	Normal	Normal	E/1&2	B/3&4
288	2 Orange + 8 Greens + 8 Reds	Normal	Normal	E/1&2	C/3&4
289	2 Orange + 8 Greens + 9 Reds	Normal	Normal	E/1&2	D/3&4

* PB5...PB8 → Pushbutton number.

* Normal → Normal momentary contact.

* A/1&2 - E/3&4 → A/B pushbutton select function with designated LED indication.

4.1.12.15 A/B Pushbutton Select with LED Indication – Inline Top/Bottom Pushbutton Configuration – 12EX2

There are 5 different types of A/B selector sequence available. Choose one that is most suitable for your application. See **Section 4.2.4 on page 66** for jumper settings and **Section 3.3.4.2 on page 23** for output relay contact diagrams.

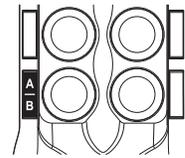
Type-A selector sequence: A → B

Type-B selector sequence: Off → A → B

Type-C selector sequence: A → B → A+B

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

Type-E selector sequence: A+B → A → B



Function Number	Display Type	PB9	PB10	PB11	PB12
115	1 Orange + 1 Green + 5 Reds	A/1&2	Normal	Normal	Normal
116	1 Orange + 1 Green + 6 Reds	B/1&2	Normal	Normal	Normal
117	1 Orange + 1 Green + 7 Reds	C/1&2	Normal	Normal	Normal
118	1 Orange + 1 Green + 8 Reds	D/1&2	Normal	Normal	Normal
51	5 Greens + 1 Red	Normal	A/3&4	Normal	Normal
52	5 Greens + 2 Reds	Normal	B/3&4	Normal	Normal
53	5 Greens + 3 Reds	Normal	C/3&4	Normal	Normal
54	5 Greens + 4 Reds	Normal	D/3&4	Normal	Normal
119	1 Orange + 1 Green + 9 Reds	A/1&2	A/3&4	Normal	Normal
120	1 Orange + 2 Greens	A/1&2	B/3&4	Normal	Normal
121	1 Orange + 2 Greens + 1 Red	A/1&2	C/3&4	Normal	Normal
122	1 Orange + 2 Greens + 2 Reds	A/1&2	D/3&4	Normal	Normal
123	1 Orange + 2 Greens + 3 Reds	B/1&2	B/3&4	Normal	Normal
124	1 Orange + 2 Greens + 4 Reds	B/1&2	C/3&4	Normal	Normal
125	1 Orange + 2 Greens + 5 Reds	B/1&2	D/3&4	Normal	Normal
126	1 Orange + 2 Greens + 6 Reds	C/1&2	C/3&4	Normal	Normal
127	1 Orange + 2 Greens + 7 Reds	C/1&2	D/3&4	Normal	Normal
128	1 Orange + 2 Greens + 8 Reds	D/1&2	D/3&4	Normal	Normal
143	1 Orange + 4 Greens + 3 Reds	Normal	Normal	A/1&2	Normal
144	1 Orange + 4 Greens + 4 Reds	Normal	Normal	B/1&2	Normal
145	1 Orange + 4 Greens + 5 Reds	Normal	Normal	C/1&2	Normal
146	1 Orange + 4 Greens + 6 Reds	Normal	Normal	D/1&2	Normal
87	8 Greens + 7 Reds	Normal	Normal	Normal	A/3&4
88	8 Greens + 8 Reds	Normal	Normal	Normal	B/3&4

Function Number	Display Type	PB9	PB10	PB11	PB12
89	8 Greens + 9 Reds	Normal	Normal	Normal	C/3&4
90	9 Greens	Normal	Normal	Normal	D/3&4
147	1 Orange + 4 Greens + 7 Reds	Normal	Normal	A/1&2	A/3&4
148	1 Orange + 4 Greens + 8 Reds	Normal	Normal	A/1&2	B/3&4
149	1 Orange + 4 Greens + 9 Reds	Normal	Normal	A/1&2	C/3&4
150	1 Orange + 5 Greens	Normal	Normal	A/1&2	D/3&4
151	1 Orange + 5 Greens + 1 Red	Normal	Normal	B/1&2	B/3&4
152	1 Orange + 5 Greens + 2 Reds	Normal	Normal	B/1&2	C/3&4
153	1 Orange + 5 Greens + 3 Reds	Normal	Normal	B/1&2	D/3&4
154	1 Orange + 5 Greens + 4 Reds	Normal	Normal	C/1&2	C/3&4
155	1 Orange + 5 Greens + 5 Reds	Normal	Normal	C/1&2	D/3&4
156	1 Orange + 5 Greens + 6 Reds	Normal	Normal	D/1&2	D/3&4
285	2 Orange + 8 Greens + 5 Reds	E/1&2	Normal	Normal	Normal
263	2 Orange + 6 Greens + 3 Reds	Normal	E/3&4	Normal	Normal
286	2 Orange + 8 Greens + 6 Reds	E/1&2	E/3&4	Normal	Normal
287	2 Orange + 8 Greens + 7 Reds	E/1&2	B/3&4	Normal	Normal
288	2 Orange + 8 Greens + 8 Reds	E/1&2	C/3&4	Normal	Normal
289	2 Orange + 8 Greens + 9 Reds	E/1&2	D/3&4	Normal	Normal
290	2 Orange + 9 Greens	Normal	E/1&2	Normal	Normal
269	2 Orange + 6 Greens + 9 Reds	Normal	Normal	E/3&4	Normal
291	2 Orange + 9 Greens + 1 Red	Normal	E/1&2	E/3&4	Normal
292	2 Orange + 9 Greens + 2 Reds	Normal	E/1&2	B/3&4	Normal
293	2 Orange + 9 Greens + 3 Reds	Normal	E/1&2	C/3&4	Normal
294	2 Orange + 9 Greens + 4 Reds	Normal	E/1&2	D/3&4	Normal
295	2 Orange + 9 Greens + 5 Reds	Normal	Normal	E/1&2	Normal
275	2 Orange + 7 Greens + 5 Reds	Normal	Normal	Normal	E/3&4
296	2 Orange + 9 Greens + 6 Reds	Normal	Normal	E/1&2	E/3&4
297	2 Orange + 9 Greens + 7 Reds	Normal	Normal	E/1&2	B/3&4
298	2 Orange + 9 Greens + 8 Reds	Normal	Normal	E/1&2	C/3&4
299	2 Orange + 9 Greens + 9 Reds	Normal	Normal	E/1&2	D/3&4

* PB9...PB12 → Pushbutton number.

* Normal → Normal momentary contact.

* A/1&2 - D/3&4 → A/B pushbutton select function with designated LED indication.

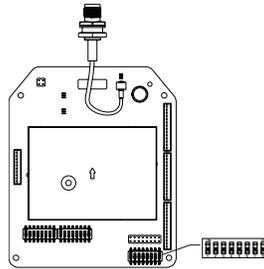
4.2 Receiver

4.2.1 Receiver Channel Settings

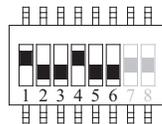
For the 4/6/8/12EX2, set the receiver channel by configuring the channel dipswitch located on the decoder board, which is mounted to the inside of the front half of the enclosure. For the 4EX2-MRX and 6EX2-MRX, set the receiver channel by configuring the S3 channel dipswitch located on the RF/decoder board. Only the first 6 dip positions are used for channel programming. The system channels table in **Section 4.2.10 on page 72** illustrates which dipswitch setting corresponds to which channel. Once the receiver channel is altered, make sure to change the transmitter channel as well. The channel on both transmitter and receiver must be identical in order for the system to work (**see Section 4.1.3 on page 27**, part B). When set to all zeros (000000), the receiver becomes unassigned channel scheme (**see Section 4.1.3 on page 27**, part A).

NOTE: MRX receiver with the EX2 transmitter is not available in the U.S., Mexico, and Canada.

4/6/8/12EX2 Decoder Board:



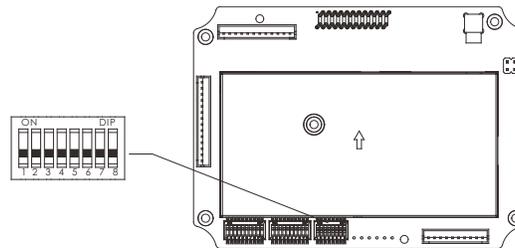
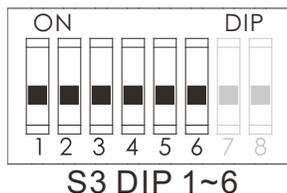
Example:



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

The above dipswitch setting "1 0 0 1 0 0" corresponds to "channel 36" in the system channels table in **Section 4.2.10 on page 72**.

4EX2-MRX and 6EX2-MRX RF/Decoder Board:

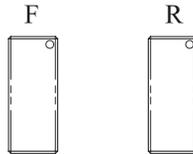


4.2.2 Output Relay Configurations

4.2.2.1 Output Relay Types

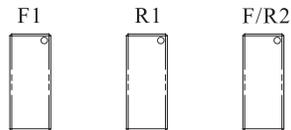
1. 2 output relays per motion – single speed only

Output relays with Forward (F) and Reverse (R) 1st speed only.



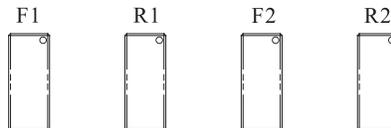
2. 3 output relays per motion – shared 2nd speed output relay

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



**3. 4 output relays per motion – separate 1st and 2nd speed output relays
(4/6/8/12EX2 only)**

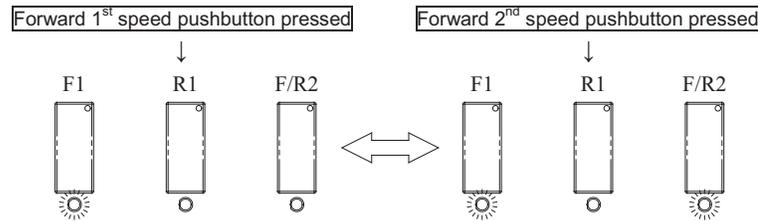
Output relays with Forward 1st speed (F1), Reverse 1st speed (R1), Forward 2nd speed (F2) and Reverse 2nd speed (R2). Forward and Reverse 2nd speed are separate output relays.



4.2.2.2 Output Relay Actions at 2nd Speed

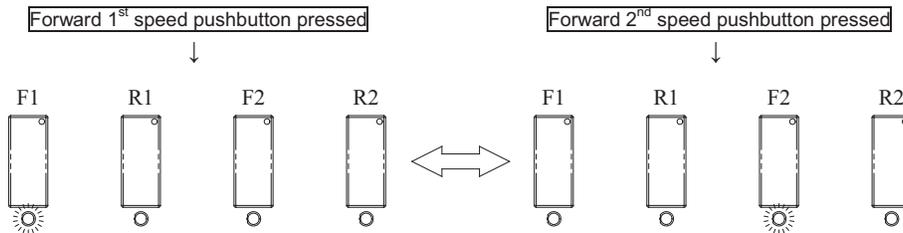
1. 3 output relays configuration with Closed/Closed contact at 2nd speed

F1 (or R1) output relay closed at 1st speed and F1 + F/R2 (or R1 + F/R2) output relays closed at 2nd speed. See [Section 4.2.3.1 on page 59](#) and [Section 4.2.3.2 on page 61](#) on how to set to this function.



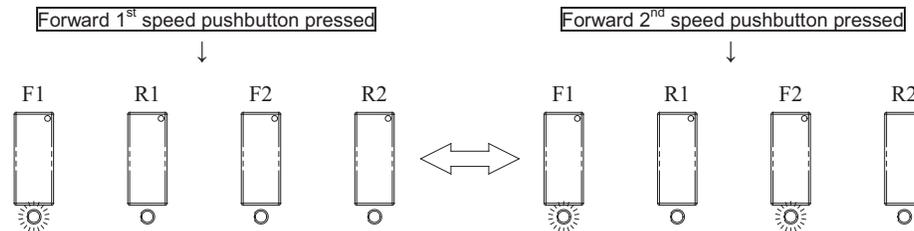
2. 4 output relays configuration with Opened/Closed contact at 2nd speed (4/6/8/12EX2 only)

F1 (or R1) output relay closed at 1st speed and F2 (or R2) output relay closed at 2nd speed. See [Section 4.2.3.1 on page 59](#) on how to set to this function.



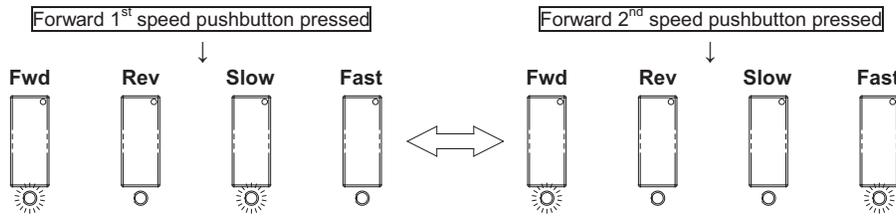
3. 4 output relays configuration with Closed/Closed contact at 2nd speed (4/6/8/12EX2 only)

F1 (or R1) output relay closed at 1st speed and F1 + F2 (or R1 + R2) output relays closed at 2nd speed. See [Section 4.2.3.1 on page 59](#) on how to set to this function.



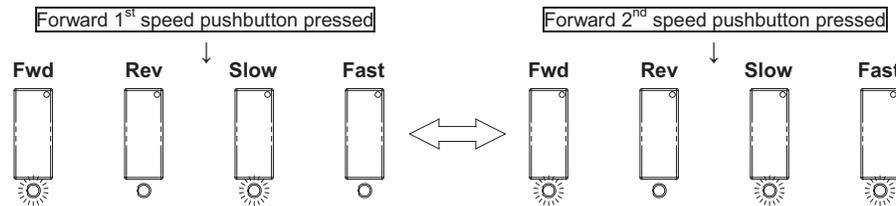
**4. 4 output relays configuration with Slow and Fast output relays (Type A)
(4/6/8/12EX2 only)**

Fwd (or Rev) + Slow output relays closed at 1st speed and Fwd (or Rev) + Fast output relays closed at 2nd speed. **See Section 4.2.3.1 on page 59** on how to set to this function.



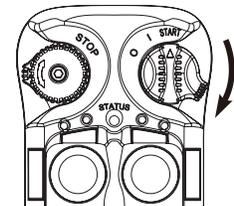
**5. 4 output relays configuration with Slow and Fast output relays (Type B)
(4/6/8/12EX2 only)**

Fwd + Slow (or Rev + Slow) output relays closed at 1st speed and Fwd + Slow + Fast (or Rev + Slow + Fast) output relays closed at 2nd speed. **See Section 4.2.3.1 on page 59** on how to set to this function.



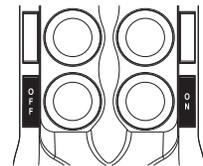
4.2.2.3 START + AUX Function

After executing the START command at transmitter startup the same START position becomes an auxiliary function with momentary contact connected through the K25 Function output relay (manufacturer preset). There are other types of auxiliary functions made available for the K25 Function output relays (**see Section 4.2.9 on page 71**). Contact Magnetek field service if your application requires other types of auxiliary functions.



4.2.2.4 ON/OFF Pushbutton Function

The user can set any of the two adjacent pushbuttons on the transmitter to behave like a mechanical ON and OFF rocker or toggle switch. The ON output relay closes when the ON pushbutton is pressed (the OFF output relay opens) and the OFF output relay closes when the OFF pushbutton is pressed (the ON output relay opens). **See Section 4.2.3.1 on page 59** and **Section 4.2.3.2 on page 61** on how to set to this function.



4.2.2.5 Brake Function

When the transmitter pushbutton is released from 2nd speed up to 1st speed, both 1st and 2nd speed output relays will open for up to 1 second and then with 1st speed output relay closed thereafter. **See Section 4.2.3.1 on page 59** and **Section 4.2.3.2 on page 61** on how to set to this function.

4.2.2.6 External Warning Function

The user can install an external warning device (rotating lights, horn, etc.) to the Function output relay on the receiver. The user can choose which pushbutton pair (or pairs) triggers the external warning device when pressed. **See Section 4.2.3.1 on page 59** and **Section 4.2.3.2 on page 61** on how to set to this function.

4.2.2.7 Momentary Contact

When the pushbutton is released the corresponding output relay will open or deactivate. This type of relay action usually applies to external applications such as the horn and buzzer. **See Section 4.2.3.3 on page 62** and **Section 4.2.3.4 on page 64** on how to set to this function.

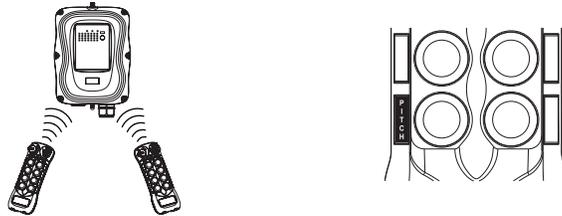
4.2.2.8 Toggled Contact

When the pushbutton is released the corresponding output relay will maintain contact or closure until the user presses the same pushbutton again which will open the relay's contact. This type of relay action usually applies to external applications such as a warning light. **See Section 4.2.3.3 on page 62** and **Section 4.2.3.4 on page 64** on how to set to this function.

4.2.2.9 Pitch & Catch Function – 4/6/8/12EX2 only

This function allows one transmitter to retain control of a receiver, even if it is powered off, until the “Pitch” command is sent from the transmitter to the receiver and is locked onto and received by the receiver.

Whichever transmitter gains control of the receiver, the receiver locks on to that transmitter's channel. This lock remains in place, even if the transmitter is turned off or goes out of range. This will prevent the other transmitter from being able to start the receiver. This lock remains in place until the correct transmitter sends the Pitch command allowing the receiver to go back into channel scanning.

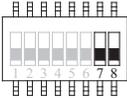
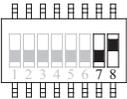
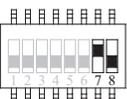
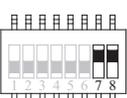


When set to “Pitch & Catch” make sure the 2nd transmitter is set to one channel higher (channel X + 1) than the 1st transmitter (channel X). The receiver must be set to the same channel as the 1st transmitter (channel X) and be set to two-channel scanning per **Section 4.2.2.10 on page 58**. The Pitch & Catch function will not work if the unassigned channel scheme is used.

Example: *If the system is set to channel 01 then the newly added 2nd transmitter must be set to channel 02 with identical serial number. Furthermore, the Channel dipswitch position #7 and #8 on the decoder board must set to “10” for 2-channel scanning (scans channel 01 and 02). See Section 4.2.2.10 on page 58, Section 4.2.3.3 on page 62 and Section 4.2.3.4 on page 64 on how to set to this function.*

4.2.2.10 Receiver Channel Scanning Function

Receiver channel scanning function is applicable only when a preset channel is assigned to the system (*see Section 4.1.3 on page 27*, part B). When programming the radio control for dedicated channels, the scanning function should be turned on to help maintain first-come-first-served functionality. The receiver should be set for a base channel. One transmitter should be set a base channel and subsequent transmitters should be incremented by one channel each.

- (1)  → "00" manufacturer preset (channel X)*
- (2)  → "01" scans 2 channels (channel X and channel X+1)
- (3)  → "10" scans 3 channels (channel X... channel X+2)
- (4)  → "11" scans 4 channels (channel X... channel X+3)**

* Channel X → channel set on the Channel dipswitch.

** Contact Magnetek field service if your application requires scanning more than 4 channels.

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

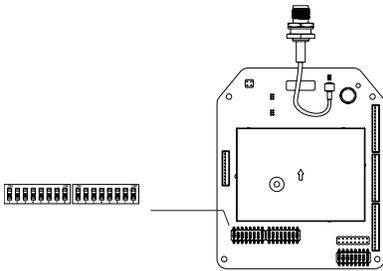
4.2.3 Dipswitch Settings

4.2.3.1 Interlocked Pushbutton Pair – 4/6/8/12EX2

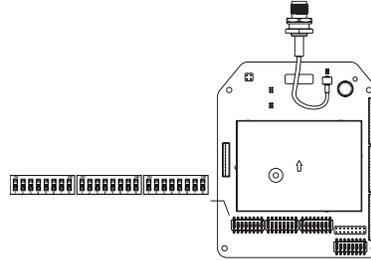
Interlocked means any pushbutton pair cannot be pressed simultaneously as each press will cancel the other out. Interlocked setting usually applies to electric motor's forward and reverse motion and ON and OFF switches. Each dipswitch on the decoder board corresponds to a pushbutton pair.

- Dipswitch S1 is for pushbuttons 1 and 2
- Dipswitch S2 is for pushbuttons 3 and 4
- Dipswitch S3 is for pushbuttons 5 and 6
- Dipswitch S4 is for pushbuttons 7 and 8
- Dipswitch S5 is for pushbuttons 9 and 10
- Dipswitch S6 is for pushbuttons 11 and 12

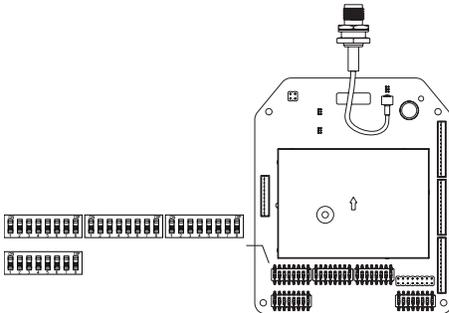
4EX2:



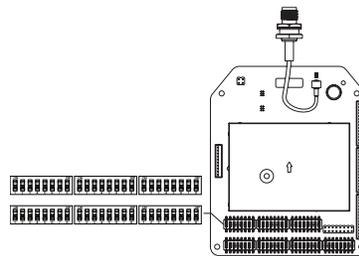
6EX2:



8EX2:



12EX2:



■ Default

Dip Settings	Function Descriptions	# of Relays Used
00000000	Single speed only	2
00000010	4 output relays Closed/Closed relay action at 2nd speed (separate 2nd speed output relays)	4
00000100	3 output relays Closed/Closed relay action at 2nd speed (shared 2nd speed output relay)	3
00000110	4 output relays Opened/Closed relay action at 2nd speed (separate 2nd speed output relays)	4

Default

Dip Settings	Function Descriptions	# of Relays Used
00001000	Forward (or Reverse) + Fast output relays engaged at 2nd speed	4
00001010	Forward (or Reverse) + Slow + Fast output relays engaged at 2nd speed	4
00001100	On (right button) & Off (left button)	2
00010010	On + Start/Off + Start - For added safety, you must first rotate and hold the power switch key at START position and then press the ON or OFF pushbutton to activate the output relay.	2
00010100	FWD/REV toggled (latching)	2
00100000	Single speed + External warning*	2
00100010	4 output relays Closed/Closed relay action + External warning*	4
00100100	3 output relays Closed/Closed relay action + External warning*	3
00100110	4 output relays Opened/Closed relay action + External warning*	4
01000010	4 output relays Closed/Closed relay action + Brake	4
01000100	3 output relays Closed/Closed relay action + Brake	3
01000110	4 output relays Opened/Closed relay action + Brake	4
01100010	4 output relays Closed/Closed relay action + Brake + External warning*	4
01100100	3 output relays Closed/Closed relay action + Brake + External warning*	3
01100110	4 output relays Opened/Closed relay action + Brake + External warning*	4

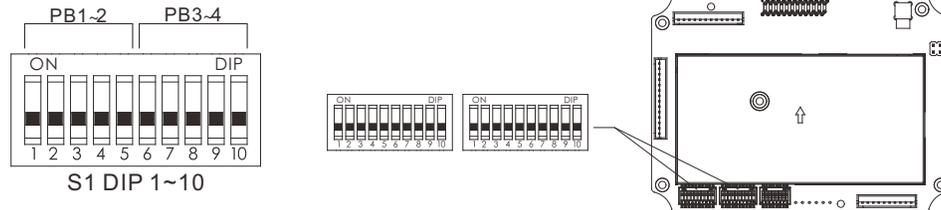
* External warning function requires installing an external warning device such as horn or lights to the K25 Function output relay.

4.2.3.2 Interlocked Pushbutton Pair – 4/6EX2 MRX

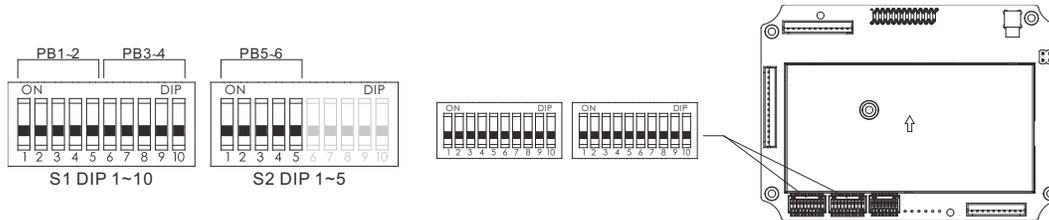
NOTE: MRX receiver paired with an EX2 transmitter is not available in the U.S., Mexico, and Canada.

Interlocked means any pushbutton pair cannot be pressed simultaneously as each press will cancel the other out. Interlocked setting usually applies to electric motor's forward and reverse motion and ON and OFF switches. Each dipswitch on the decoder board corresponds to a pushbutton pair.

4EX2-MRX:



6EX2-MRX:



Default

Dip Settings	Function Descriptions
00000	Single speed only
00001	3 output relays Closed/Closed relay action at 2nd speed (shared 2nd speed output relay)
00010	On (right button) & Off (left button) (NOTE: See CAUTION below.)
00100	On (right button) & Off (left button) (EMS → all relays deactivate when STOP button is pressed)
00101	On + Start/Off + Start - For added safety, you must first press and hold the START button and then press the ON or OFF pushbutton to activate the output relay.
00110	FWD/REV toggled (NOTE: See CAUTION below.)
00111	FWD/REV toggled (EMS → all relays deactivate when STOP button is pressed)
01000	Single speed + External warning*
01001	3 output relays Closed/Closed relay action + External warning*
01010	3 output relays Closed/Closed relay action + Brake
01011	3 output relays Closed/Closed relay action + Brake + External warning*

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

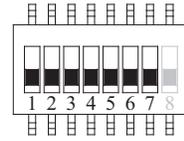


CAUTION

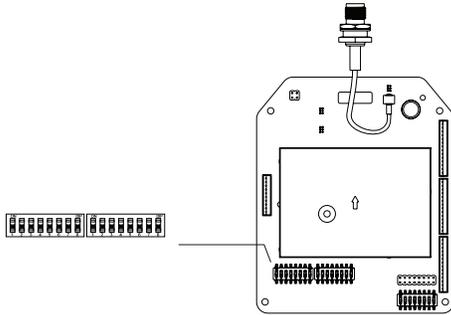
The toggle function in this configuration will stay active after an E-stop. If the function is safety critical, this function is not compliant with the machinery directive.

4.2.3.3 Non-Interlocked Pushbutton Pair – 4/6/8/12EX2

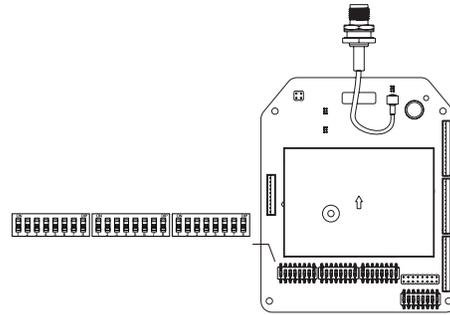
The non-interlocked setting allows the receiver to activate relays when a pushbutton pair are pressed simultaneously. It usually applies to equipment's auxiliary functions such as lights, horn, or buzzer. Each dipswitch on the decoder board corresponds to a pushbutton pair. Only the first 7 dipswitch positions are used (counting from left to right). The 8th dipswitch position (far right) is not used.



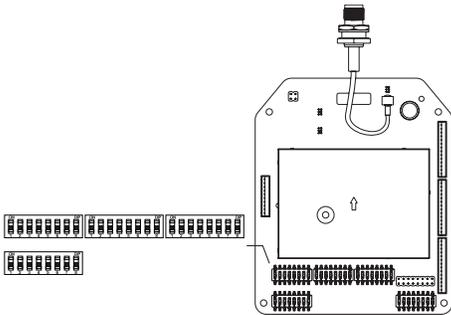
4EX2:



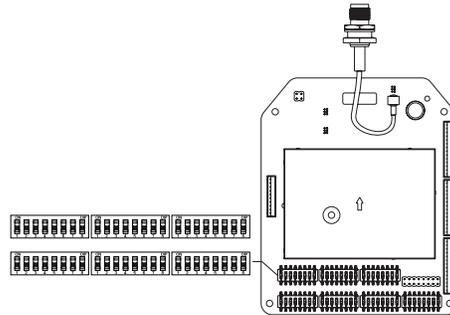
6EX2:



8EX2:



12EX2:



Function Code	Dip Position #1	Dip Position #2 - #4 (left button) and #5 - #7 (right button)	Function Description
A	1	000	Normal momentary contact
B	1	001	Toggled/latching contact (type A) <i>(NOTE: See CAUTION below.)</i>
C	1	011	Toggled/latching contact (type B) <i>Output relay disconnects when STOP button is pressed or transmitter power is off</i>
D	1	100	Normal + Start function <i>For added safety, first rotate and hold the power switch key at the START position and then press the intended pushbutton to activate the output relay</i>
E	1	110	Pitch & Catch (type A)
F	1	101	Pitch & Catch (type B) <i>Receiver MAIN relays maintain closure during switchovers.</i>
G	1	111	2 steps with Closed/Closed relay action

Example #1: Left button (set to function code A) / right button (set to function code B) → **1 000 001**

Example #2: Left button (set to function code C) / right button (set to function code D) → **1 011 100**



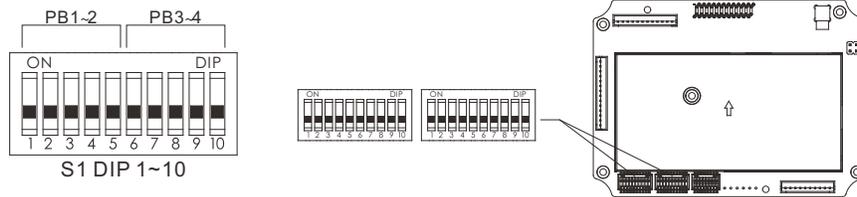
The toggle function in this configuration will stay active after an E-stop. If the function is safety critical, this function is not compliant with the machinery directive.

4.2.3.4 Non-Interlocked Pushbutton Pair – 4/6EX2 MRX

Non-interlocked setting allows the pushbutton pair to be pressed simultaneously. It usually applies to equipment's auxiliary functions such as lights, horn, or buzzer. Five dip positions correspond to a pushbutton pair.

NOTE: MRX receiver paired with an EX2 transmitter is not available in the U.S., Mexico, and Canada.

4EX2-MRX:



6EX2-MRX:



Dip Settings	Left Pushbutton	Right Pushbutton
10000	Normal	Normal
10001	Normal	Toggle (<i>NOTE: See CAUTION below.</i>)
10010	Normal	Toggle (EMS)
10011	Normal	Normal + Start
10100	Toggle (<i>NOTE: See CAUTION below.</i>)	Normal
10101	Toggle (<i>NOTE: See CAUTION below.</i>)	Toggle (<i>NOTE: See CAUTION below.</i>)
10110	Toggle (<i>NOTE: See CAUTION below.</i>)	Toggle (EMS)
10111	Toggle (<i>NOTE: See CAUTION below.</i>)	Normal + Start
11000	Toggle (EMS)	Normal
11001	Toggle (EMS)	Toggle (<i>NOTE: See CAUTION below.</i>)
11010	Toggle (EMS)	Toggle (EMS)
11011	Toggle (EMS)	Normal + Start
11100	Normal + Start	Normal
11101	Normal + Start	Toggle (<i>NOTE: See CAUTION below.</i>)
11110	Normal + Start	Toggle (EMS)
11111	Normal + Start	Normal + Start

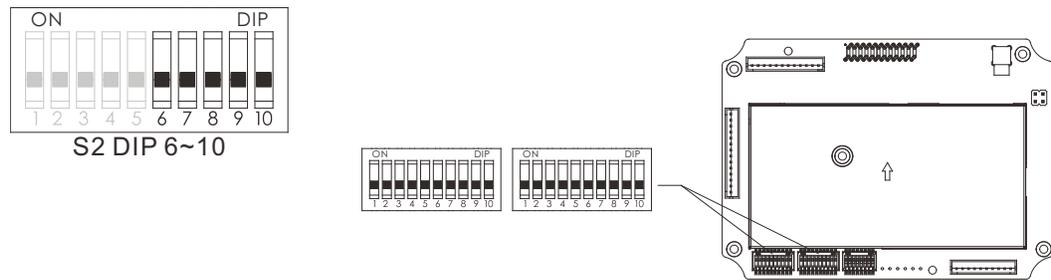
* EMS → all relays deactivate when STOP button is pressed.



The toggle function in this configuration will stay active after an E-stop. If the function is safety critical, this function is not compliant with the safety directive.

4.2.3.5 Other Dipswitch Settings – 4/6EX2 MRX only

NOTE: MRX receiver paired with an EX2 transmitter is not available in the U.S., Mexico, and Canada.

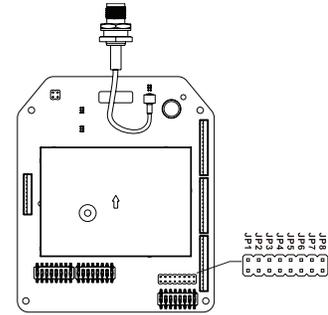


S2 Dip Position 8	Function
Dip set to "0" or down	Normal
Dip set to "1" or up	Display system firmware version
S2 Dip Position 9	Function
Dip set to "0" or down	Normal
Dip set to "1" or up	System testing (receiver MAIN relays disabled)
S2 Dip Position 10	Function
Dip set to "0" or down	Receiver-to-transmitter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

4.2.4 Jumper Settings

4.2.4.1 4EX2

The jumper settings apply to functions such as the standard or reversed logic A/B selector sequence, receiver A/B/C settings, transmitter inline pushbutton configurations, firmware version, system testing and remote pairing methods.

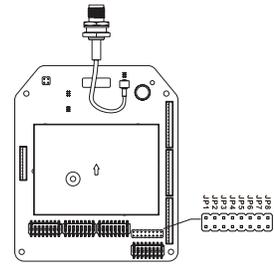


Jumper Settings		Function
JP3 (Opened)		Standard A/B selector sequence – Output relay A activated at A position, output relay B activated at B position, both relays activated at A+B position
JP3 (Inserted)		Reversed logic A/B selector sequence – Output relay B activated at A position, output relay A activated at B position, both relays deactivated at A+B position
JP4 (Opened)	JP5 (Opened)	Receiver A setting for PB1 through PB4 (receiver select configuration) ^a
JP4 (Inserted)	JP5 (Opened)	Receiver B setting for PB5 through PB8 (receiver select configuration) [*]
JP4 (Opened)	JP5 (Inserted)	Receiver C setting for PB9 through PB12 (receiver select configuration) [*]
JP4 (Inserted)	JP5 (Inserted)	Inline top/bottom pushbutton configuration for PB1 to PB4
JP6 (Inserted)		Display system firmware version
JP7 (Inserted)		For system testing only (receiver MAIN relays disabled)
JP8 (Opened)		Receiver-to-transmitter remote pairing (pressing the Pairing button required)
JP8 (Inserted)		Receiver-to-transmitter remote pairing (pressing the Pairing button not required)

^a Appendix B outlines full functionality

4.2.4.2 6EX2

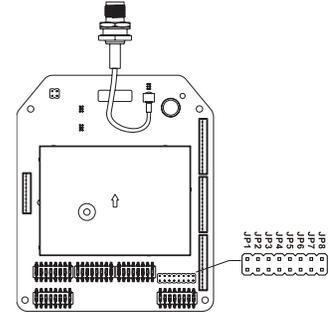
Jumper setting applies to functions such as the standard or reversed logic A/B selector sequence, firmware version, system testing and remote pairing methods.



Jumper Settings	Function
JP3 (Opened)	Standard A/B selector sequence – Output relay A activated at A position, output relay B activated at B position, both relays activated at A+B position
JP3 (Inserted)	Reversed logic A/B selector sequence – Output relay B activated at A position, output relay A activated at B position, both relays deactivated at A+B position
JP6 (Inserted)	Display system firmware version
JP7 (Inserted)	For system testing only (receiver MAIN relays disabled)
JP8 (Opened)	Receiver-to-transmitter remote pairing (pressing the Pairing button required)
JP8 (Inserted)	Receiver-to-transmitter remote pairing (pressing the Pairing button not required)

4.2.4.3 8EX2 and 12EX2

Jumper setting applies to functions such as the standard or reversed logic A/B selector sequence, transmitter inline pushbutton configurations, firmware version, system testing and remote pairing methods.



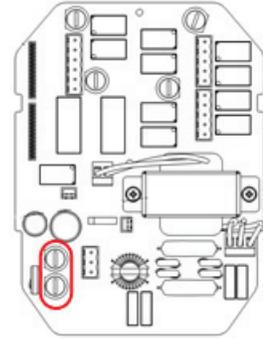
Jumper Settings		Function
JP3 (Opened)		Standard A/B selector sequence – Output relay A activated at A position, output relay B activated at B position, both relays activated at A+B position
JP3 (Inserted)		Reversed logic A/B selector sequence – Output relay B activated at A position, output relay A activated at B position, both relays deactivated at A+B position
JP4 (Opened)	JP5 (Opened)	Standard right/left pushbutton configuration
JP4 (Inserted)	JP5 (Opened)	Inline top/bottom pushbutton configuration for PB1 to PB8 ^a
JP4 (Opened)	JP5 (Inserted)	Inline top/bottom pushbutton configuration for PB1 to PB12 [*]
JP4 (Inserted)	JP5 (Inserted)	Inline top/bottom pushbutton configuration for PB1 to PB4 [*]
JP6 (Inserted)		System firmware version
JP7 (Inserted)		For system testing only (receiver MAIN relays disabled)
JP8 (Opened)		Receiver-to-transmitter remote pairing (pressing the Pairing button required)
JP8 (Inserted)		Receiver-to-transmitter remote pairing (pressing the Pairing button not required)

^a Appendix B outlines full functionality

4.2.5 Fuse Ratings – 4/6EX2 only

In each receiver are black, vertically mounted fuse holders. Fuses F1 & F2 (circled in red) are for the control voltage to power the receiver.

All other fuses are for the control voltage feeds to the output relays.



FUSE #	110 - 120VAC	220 - 240VAC	380 - 400VAC	410 - 460VAC	24VAC	42 & 48VAC	9 - 36VDC
F3 - F10	5.0A	5.0A	5.0A	5.0A	5.0A	5.0A	5.0A
F1 - F2	0.5A	0.5A	0.5A	0.5A	1.0A	1.0A	3.0A

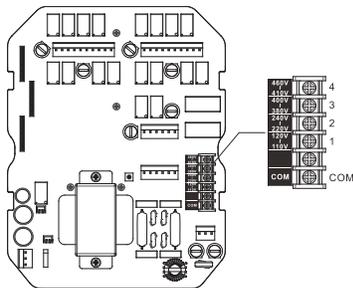
NOTE: 4EX2 and 6EX2 receivers have power supplies that are specific to their control voltage.

NOTE: The 4EX2-MRX and 6EX2-MRX receivers have three different control voltage configurations: 24-48VAC, 48-240VAC, or 9-36VDC. They do not have field-swappable fuses for the power transformer or the relay outputs.

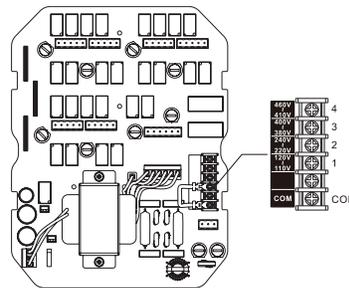
4.2.6 Voltage Settings – 8/12EX2 only

Prior to installation always check to make sure the voltage setting is correct for your application. In each receiver are black, vertically mounted fuse holders. Fuses F1 & F2 are for the control voltage to power the receiver and all other fuses are for the control voltage feeds to the output relays.

8EX2:



12EX2:



Position 1 → 110 - 120VAC

Position 2 → 220 - 240VAC or 24VAC**

Position 3 → 380 - 400VAC or 42VAC**

Position 4 → 410 - 460VAC or 48VAC** or 9 - 36VDC***

** For system equipped with 24/42/48VAC power supply

*** For system equipped with 9 - 36VDC power supply

FUSE #	110 - 120VAC	220 - 240VAC	380 - 400VAC	410 - 460VAC	24VAC	42 & 48VAC	9 - 36VDC
F3 - F10	5.0A	5.0A	5.0A	5.0A	5.0A	5.0A	5.0A
F1 - F2	1.0A	1.0A	1.0A	0.5A	3.0A	2.0A	3.0A

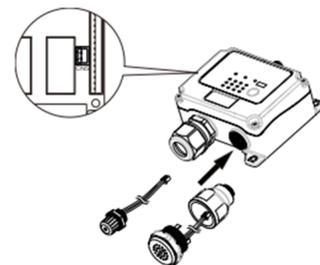
4.2.7 Horn Installation

A horn can be easily fitted onto the receiver enclosure. When installed at the factory, the horn is wired into the K25 or K10 (**4/6EX2 MRX**) (FUNC 1) output relay and will function as described in **Section 4.2.9 on page 71**. Please contact Magnetek field service if you would like the horn to work differently.



4.2.8 Indicator Light and Buzzer Installation on the MRX

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

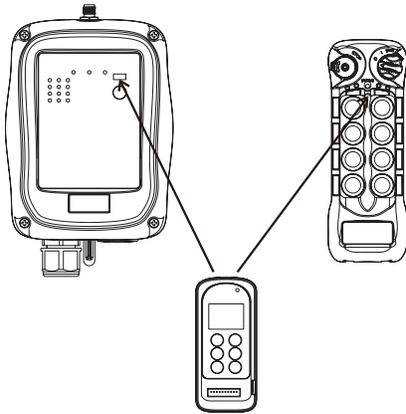


4.2.9 Other Function Output Relays Settings

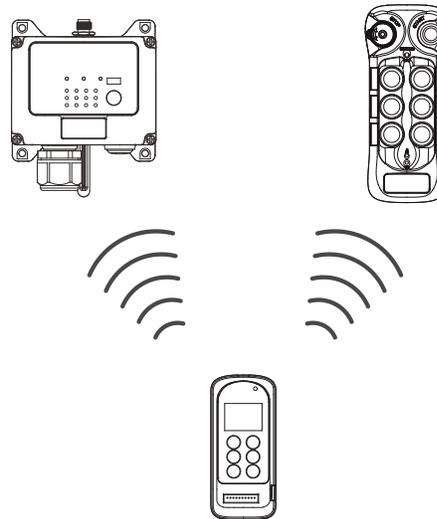
Listed below are other types of functions that can be outputted through K25, K26 and K30 (**4EX2, 8EX2 and 12EX2**), K25 and K30 (**6EX2**), and K10 (**4/6EX2 MRX**) Function output relays via the infrared IR programmer unit. Contact Sales for more information.

NOTE: MRX receiver paired with an EX2 transmitter is not available in the U.S., Mexico, and Canada.

4/6/8/12EX2:



4/6EX2 MRX:



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.

TOGGLE → START function + AUX with toggled/latching output.

TOG&E → START function + AUX with toggled/latching output. The relay opens when STOP button is pressed down and transmitter power is off.

S/P → Function relay closes when START command is executed and opens only when transmitter power is turned off.

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 rotated to A or B positions (tandem monitoring output).

HORN → Function relay closes for up to 3 seconds when START command is executed 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.

4.2.10 System Channels Table

The Flex EX2 system makes use of 124 channels. The first set of 62 channels comprises the lower-end channels that can be selected through dipswitch configuration in the receiver and pushbutton configuration in the transmitter.

There is a second set of 62 channels that comprises the upper-end channels that cannot be selected through dipswitch or pushbutton configurations. They are only used when the lower-end channel experiences interference. In this case, the system will automatically switch to its accompanying upper-end channel. If both the lower- and upper-end channel experience interference, then it is recommended that the transmitter be power-cycled to reestablish a clean channel again. The upper-end channels are listed below for the purpose of frequency management only.

433 MHz Channel Set

Ch.	Dipswitch Setting	Channel Frequency (MHz)	Ch.	Dipswitch Setting	Channel Frequency (MHz)	Upper-End Channel Frequency (MHz)	
01	000001	433.050	32	100000	434.600	436.550	438.100
02	000010	433.100	33	100001	434.650	436.600	438.150
03	000011	433.150	34	100010	434.700	436.650	438.200
04	000100	433.200	35	100011	434.750	436.700	438.250
05	000101	433.250	36	100100	434.800	436.750	438.300
06	000110	433.300	37	100101	434.850	436.800	438.350
07	000111	433.350	38	100110	434.900	436.850	438.400
08	001000	433.400	39	100111	434.950	436.900	438.450
09	001001	433.450	40	101000	435.000	436.950	438.500
10	001010	433.500	41	101001	435.050	437.000	438.550
11	001011	433.550	42	101010	435.100	437.050	438.600
12	001100	433.600	43	101011	435.150	437.100	438.650
13	001101	433.650	44	101100	435.200	437.150	438.700
14	001110	433.700	45	101101	435.250	437.200	438.750
15	001111	433.750	46	101110	435.300	437.250	438.800
16	010000	433.800	47	101111	435.350	437.300	438.850
17	010001	433.850	48	110000	435.400	437.350	438.900
18	010010	433.900	49	110001	435.450	437.400	438.950
19	010011	433.950	50	110010	435.500	437.450	439.000
20	010100	434.000	51	110011	435.550	437.500	439.050
21	010101	434.050	52	110100	435.600	437.550	439.100
22	010110	434.100	53	110101	435.650	437.600	439.150
23	010111	434.150	54	110110	435.700	437.650	439.200
24	011000	434.200	55	110111	435.750	437.700	439.250
25	011001	434.250	56	111000	435.800	437.750	439.300

433 MHz Channel Set (Continued)

Ch.	Dipswitch Setting	Channel Frequency (MHz)	Ch.	Dipswitch Setting	Channel Frequency (MHz)	Upper-End Channel Frequency (MHz)	
26	011010	434.300	57	111001	435.850	437.800	439.350
27	011011	434.350	58	111010	435.900	437.850	439.400
28	011100	434.400	59	111011	435.950	437.900	439.450
29	011101	434.450	60	111100	436.000	437.950	439.500
30	011110	434.500	61	111101	436.050	438.000	439.550
31	011111	434.550	62	111110	436.100	438.050	439.600

863 MHz Channel Set

Ch.	Dipswitch Setting	Primary Channel Frequency (MHz)	Secondary Channel Frequency (MHz)	Ch.	Dipswitch Setting	Primary Channel Frequency (MHz)	Secondary Channel Frequency (MHz)
01	000001	863.050	866.550	32	100000	864.600	868.100
02	000010	863.100	866.600	33	100001	864.650	868.150
03	000011	863.150	866.650	34	100010	864.700	868.200
04	000100	863.200	866.700	35	100011	864.750	868.250
05	000101	863.250	866.750	36	100100	864.800	868.300
06	000110	863.300	866.800	37	100101	864.850	868.350
07	000111	863.350	866.850	38	100110	864.900	868.400
08	001000	863.400	866.900	39	100111	864.950	868.450
09	001001	863.450	866.950	40	101000	865.000	868.500
10	001010	863.500	867.000	41	101001	865.050	868.550
11	001011	863.550	867.050	42	101010	865.100	868.600
12	001100	863.600	867.100	43	101011	865.150	868.650
13	001101	863.650	867.150	44	101100	865.200	868.700
14	001110	863.700	867.200	45	101101	865.250	868.750
15	001111	863.750	867.250	46	101110	865.300	868.800
16	010000	863.800	867.300	47	101111	865.350	868.850
17	010001	863.850	867.350	48	110000	865.400	868.900
18	010010	863.900	867.400	49	110001	865.450	868.950

863 MHz Channel Set (Continued)

19	010011	863.950	867.450	50	110010	865.500	869.000
20	010100	864.000	867.500	51	110011	865.550	869.050
21	010101	864.050	867.550	52	110100	865.600	869.100
22	010110	864.100	867.600	53	110101	865.650	869.150
23	010111	864.150	867.650	54	110110	865.700	869.200
24	011000	864.200	867.700	55	110111	865.750	869.250
25	011001	864.250	867.750	56	111000	865.800	869.300
26	011010	864.300	867.800	57	111001	865.850	869.350
27	011011	864.350	867.850	58	111010	865.900	869.400
28	011100	864.400	867.900	59	111011	865.950	869.450
29	011101	864.450	867.950	60	111100	866.000	869.500
30	011110	864.500	868.000	61	111101	866.050	869.550
31	011111	864.550	868.050	62	111110	866.100	869.600

921 MHz Channel Set

01	000001	921.000	924.500	32	100000	922.550	926.050
02	000010	921.050	924.550	33	100001	922.600	926.100
03	000011	921.100	924.600	34	100010	922.650	926.150
04	000100	921.150	924.650	35	100011	922.700	926.200
05	000101	921.200	924.700	36	100100	922.750	926.250
06	000110	921.250	924.750	37	100101	922.800	926.300
07	000111	921.300	924.800	38	100110	922.850	926.350
08	001000	921.350	924.850	39	100111	922.900	926.400
09	001001	921.400	924.900	40	101000	922.950	926.450
10	001010	921.450	924.950	41	101001	923.000	926.500
11	001011	921.500	925.000	42	101010	923.050	926.550
12	001100	921.550	925.050	43	101011	923.100	926.600
13	001101	921.600	925.100	44	101100	923.150	926.650
14	001110	921.650	925.150	45	101101	923.200	926.700
15	001111	921.700	925.200	46	101110	923.250	926.750
16	010000	921.750	925.250	47	101111	923.300	926.800

921 MHz Channel Set (Continued)

17	010001	921.800	925.300	48	110000	923.350	926.850
18	010010	921.850	925.350	49	110001	923.400	926.900
19	010011	921.900	925.400	50	110010	923.450	926.950
20	010100	921.950	925.450	51	110011	923.500	927.000
21	010101	922.000	925.500	52	110100	923.550	927.050
22	010110	922.050	925.550	53	110101	923.600	927.100
23	010111	922.100	925.600	54	110110	923.650	927.150
24	011000	922.150	925.650	55	110111	923.700	927.200
25	011001	922.200	925.700	56	111000	923.750	927.250
26	011010	922.250	925.750	57	111001	923.800	927.300
27	011011	922.300	925.800	58	111010	923.850	927.350
28	011100	922.350	925.850	59	111011	923.900	927.400
29	011101	922.400	925.900	60	111100	923.950	927.450
30	011110	922.450	925.950	61	111101	924.000	927.500
31	011111	922.500	926.000	62	111110	924.050	927.550

The above dipswitch settings only apply to setting the channel in the receiver when using the assigned channel scheme (**see Section 4.2.1 on page 53**). For information on setting the transmitter channel when assigned channel is used, **see Section 4.1.3 on page 27**, part B.

NOTE: Channel unassigned is represented by "000000" dipswitch setting. **See Section 4.1.3 on page 27**, part A, unassigned channel scheme.

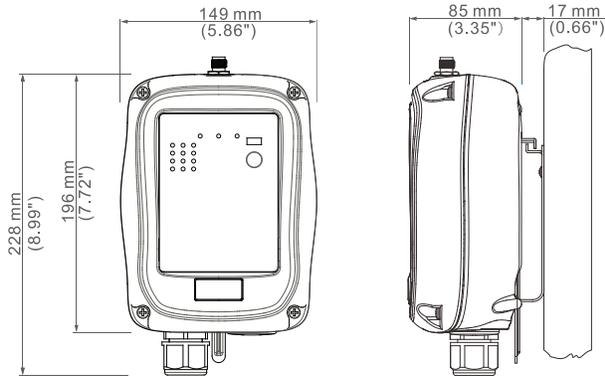
5 Receiver Installation

5.1 Pre-installation Precautions

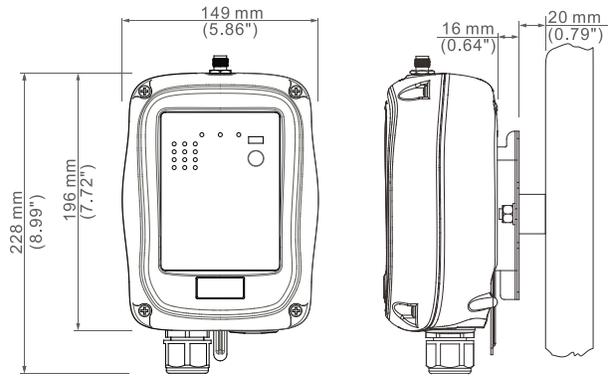
1. Make sure the transmitter and receiver have the same serial numbers and are set to the same channel. If you paired the transmitter and the receiver, the serial number and channel will be the same between the transmitter and receiver.
2. Make sure the receiver is not set to the same channel as any other systems in use in the surrounding area. It is acceptable to have multiple receivers set for the unassigned frequency setting.
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.

5.2 Step-by-Step Installation

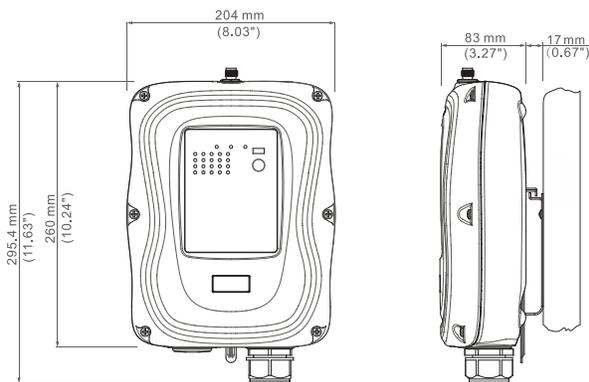
Mounting Bracket Type 1



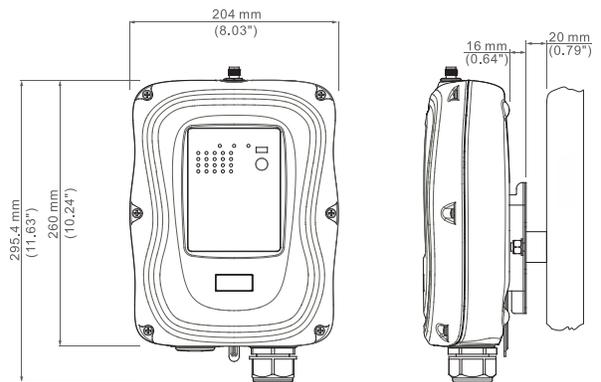
Mounting Bracket Type 2



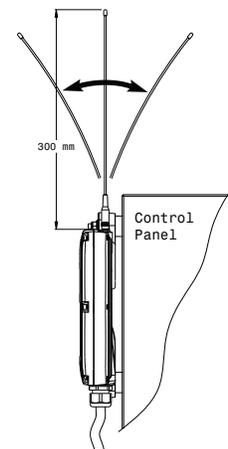
Mounting Bracket Type 1



Mounting Bracket Type 2

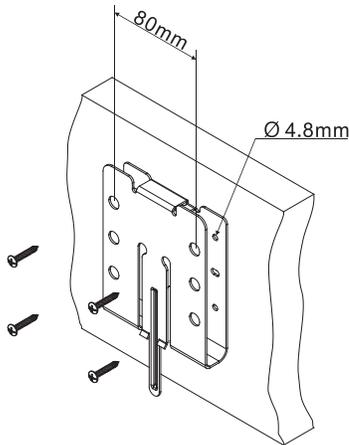


1. For best reception the location of the receiver should be visible to the operator at all times.
2. The location selected should not be exposed to high levels of electric noise. Mounting the receiver next to an unshielded variable frequency drive may cause radio interference. Always locate the receiver as far away from variable frequency drives and electric motors 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 obstructions.
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. See number 14 in **Section 3.3.1.1 on page 16**, **Section 3.3.2.1 on page 18**, **Section 3.3.3.1 on page 20** and **Section 3.3.4.1 on page 22**.

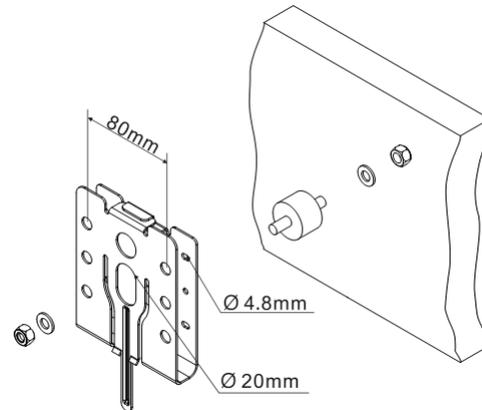


5. For better reception, make sure the receiver is in an upright position.
6. Drill four holes for mounting bracket type 1 option 1, one hole for bracket type 1 option 2 on the control panel, wall, or location where the receiver is to be installed.
7. Make sure the screws, bolts or shock absorbers are tightened after installation.
8. It is recommended to install suppressors on all contactors being driven by Flex relays. This is due to the possibility of voltage spikes on the contactors.

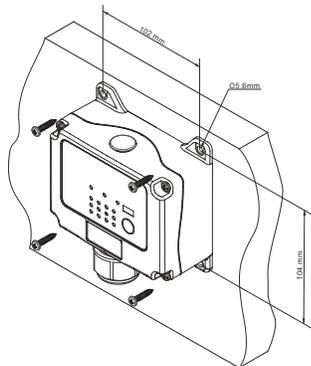
Mounting Bracket Type 1 (Option 1)



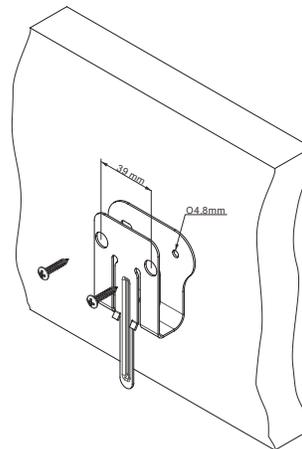
Mounting Bracket Type 1 (Option 2)



MRX Mounting (Option 1)



MRX with Mounting Bracket

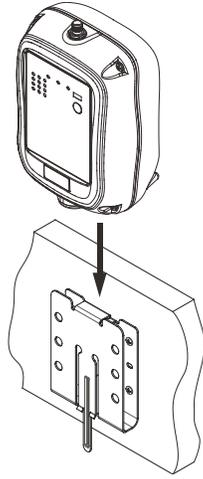


NOTE: If wiring the harness into the enclosure is done after the receiver has been slid onto the bracket, be sure to leave enough slack in the harness to allow for the receiver to slide back up off the bracket.

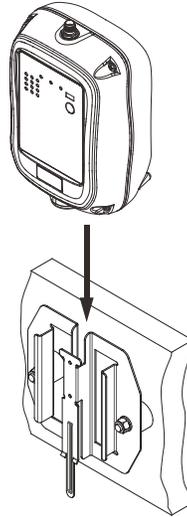
9. Slide down the receiver along the guided track to secure the receiver to the mounting bracket.
10. Remove the receiver by pressing down the bracket release and pulling the receiver upward until it clears the guided track.

Install

Mounting Bracket Type 1

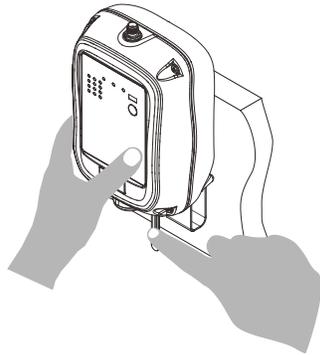


Mounting Bracket Type 2

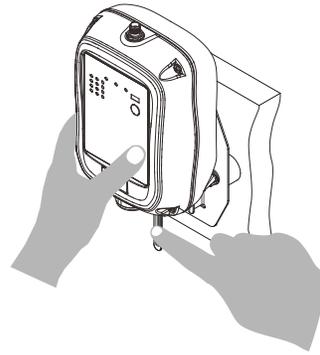


Remove

Mounting Bracket Type 1



Mounting Bracket Type 2



6 System Status Light Indications

6.1 Transmitter Status Indications

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

6.2 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	Solid red	Receiver low voltage
8	No light displayed	Decoding processors defective
9	3 slow red blinks followed by slow green blinks	STOP button pressed down

6.3 Receiver Power Indications

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

6.4 Receiver COM Indications

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

7 General Specifications

Frequency Range:	433.050 MHz - 439.600 MHz 863.050 MHz - 869.600 MHz 921.000 MHz - 927.550 MHz (Australia only)
Number of Channels:	124 channels
Channel Spacing:	50 KHz
Modulation:	Digital Frequency Modulation based on Manchester Code, 20-bit address, 32-bit 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:	-116 dBm
Spurious Emission:	-50 dB
Antenna Impedance:	50 ohms
Responding Time:	40 mS (average)
Transmitting Power:	4/6/8/12EX2: 1.0 mW CE: 2.0 mW
Enclosure Type:	NEMA4
Enclosure Rating:	IP66
Output Contact Rating:	4/6/8/12EX2: 250V @ 8 Amps; 4/6EX2 MRX: 250V @ 6 Amps
Transmitter Operating Voltage:	3.0VDC
Receiver Power Consumption:	4/6EX2: 8VA (max); 8/12EX2: 22VA (max); 4/6EX2 MRX: 7VA (max)
Available Receiver Voltages:	9 - 36VDC 24VAC, 42VAC, 48VAC 48 - 240VAC (4/6EX2 MRX only) 110 - 120VAC (4/6/8/12EX2 only) 220 - 240VAC (4/6/8/12EX2 only) 380 - 400VAC (4/6/8/12EX2 only) 410 - 460VAC (4/6/8/12EX2 only)
Operating Temperature:	-25°C - 75°C / -13°F - 167°F
Transmitter Dimension:	4EX2: 152 mm (L) x 70 mm (W) x 44 mm (H) 6EX2: 175 mm (L) x 70 mm (W) x 44 mm (H) 8EX2: 198 mm (L) x 70 mm (W) x 44 mm (H) 12EX2: 244 mm (L) x 70 mm (W) x 44 mm (H)
Receiver Dimension:	4/6EX2: 196 mm (L) x 149 mm (W) x 85 mm (H) 8/12EX2: 260 mm (L) x 204 mm (W) x 83 mm (H) 4/6EX2 MRX: 120 mm (L) x 90 mm (W) x 55 mm (H)
Transmitter Weight:	4EX2: 249 g / 8.8 oz (including batteries) 6EX2: 270 g / 9.5 oz (including batteries) 8EX2: 292 g / 10.3 oz (including batteries) 12EX2: 341 g / 12.0 oz (including batteries)
Receiver Weight:	4/6EX2: 1.76 kg / 3.8 lb (including output cable) 8EX2: 2.75 kg / 6.1 lb (including output cable) 12EX2: 3.15 kg / 6.9 lb (including output cable) 4/6EX2 MRX: 900 g / 2.0 lb (including output cable)

EU Declaration of Conformity Certificate

For the following equipment:

Product : Flex Series Radio Remote Control System
Multiple Listee Model No. : Flex Duo, Flex Base, Flex EX2, Flex Wave
Manufacturer's Name : Magnetek, Inc.
Manufacturer's Address : N49W13650 Campbell Drive
Menomonee Falls, WI 53051

The undersigned hereby declares on behalf of Magnetek, that the above-referenced product, to which this declaration relates, is in conformity with the provisions of the following directives:

- CE Mark Directive (93/68/EEC)
- Machinery Safety Directive (2006/42/EC)
- Radio Equipment Directive (2014/53/EU)
- EMC Directive (2014/30/EU)
- ROHS2 Directive (2011/65/EU)
- General Product Safety (2001/95/EC)

The standards relevant for the evaluation of the product referenced above conformity to the directive requirements are as follows:

EN 301 489-1 V2.2.1	EN ISO 13849-1:2015 (PLd)
EN 301 489-3 V2.2.1	EN 13557:2003+A2:2008
EN 300 220-1 V2.4.1	EN 60529 (IP66)
EN 300 220-2 V2.4.1	EN 62479
EN 60950:2006+A1+A11+A12	EN 55032
EN 60204-32:2008	EN 55024

The Technical Construction File is maintained at:

Columbus McKinnon Corporation
13830 Ballantyne Corporate Place
Suite 300
Charlotte, NC 28277 USA

The European contact for technical documentation is:

Ian Knight
STAHL CraneSystems, Ltd.
Unit 2 Forge Mills Park
Station Road
Coleshill
Warwickshire B46 1JH
United Kingdom

Per Annex II.B of the Machinery Directive (2006/42/EC):

The machinery, product, assembly or sub-assembly covered by this Declaration of Conformity must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the applicable Directive(s). This statement is only necessary where the product is to be incorporated into a machine or system (e.g. a safety component).

Signature of Authorized Person:



Benjamin J. Stoller
Global Product Manager - Controls
Columbus McKinnon Corporation
Date of Issuance: 10 August 2020

Appendix A Tandem Systems

NOTE: This is a supplemental section specifically for the Tandem operation. All other sections of the manual still apply to the tandem systems.



The tandem system is not compliant with the CE standards EN 7121 and EN 15011.

Apx A1. Tandem System Operation

In addition to the features and functions listed in this manual, Flex EX2 Tandem systems provide an operator control of two cranes at the same time. The Flex EX2 Tandem systems allow for simultaneous control of two bridge cranes either by separate transmitters, each controlling a crane independently or from one transmitter controlling both cranes.

Tandem systems come with two types of transmitters: tandem and dedicated. Tandem transmitters have a 3-position rotary selector in the lower left that is used for crane select. Dedicated transmitters do not have a 3-position rotary and that button location is blocked off. Dedicated transmitters are only capable of controlling one bridge without the ability to select cranes.

General operation will have each receiver accept commands from the first transmitter that selects it. During continued operation the receiver will only respond to that transmitter. For a different transmitter to take control of the receiver, the first transmitter must first release control of the receiver by turning the key switch to the OFF position.

When controlling two bridge cranes from a tandem transmitter, the operator will need to be able to have control of both receivers. This requires that no other transmitter is currently linked with a receiver. From the tandem transmitter with the selector switch in the A+B position, the operator will take control of the receivers by holding the key switch in the START position until both receivers link with the transmitter.

When both receivers are linked with one tandem transmitter, the operator can switch control from controlling Crane A or Crane B by changing the rotary selector switch to the desired selection. As long as the transmitter is not turned off, the tandem transmitter will retain control over both receivers, even when only one crane is selected to move into position. Once both cranes are in place, the operator can select BOTH cranes to complete a tandem lift with both cranes from a tandem transmitter.

After the tandem lift is completed and the operator no longer needs to control both cranes, the tandem transmitter is turned off to release control of each receiver. At this time the receivers are now available for another transmitter to link with them.

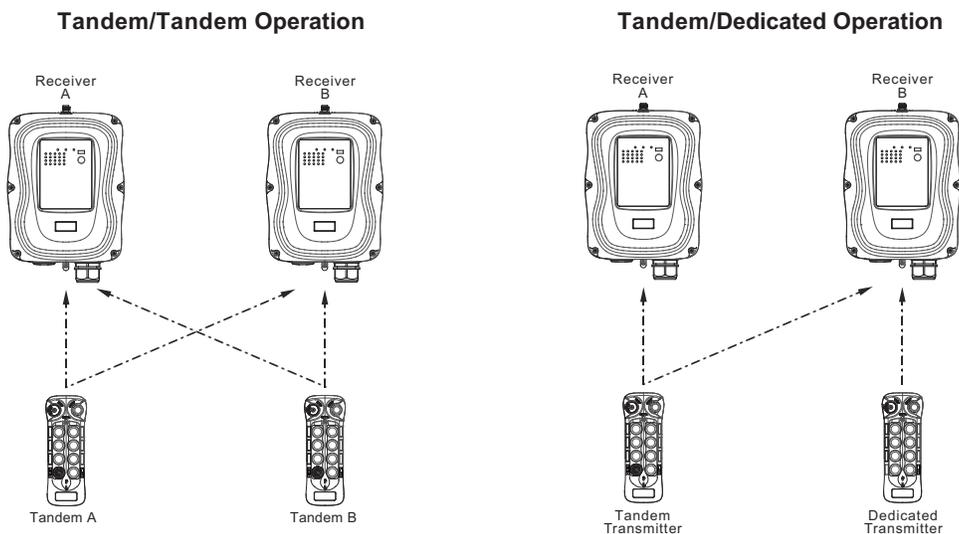
Apx A2. Tandem System Operation

- Before initial start-up, rotate the selector switch on one of the master transmitters to either the A, B, or A+B position. Then, execute the START command to activate the MAIN relays in receiver A, receiver B, or both receivers (depending on the selector switch position).
- Once the MAIN relays are active in both receivers, rotate the selector switch to either the A, B, or A+B position for independent or simultaneous operation. The A/B output relays will also activate based on the selector switch position.
 - Selector switch is on A: The A relay will be active on receiver A.
 - Selector switch is on B: The B relay will be active on receiver B.
 - Selector switch is on A+B: The A relay will be active on receiver A and the B relay (K16) will be active on receiver B.
 - The relay outputs for the specific receiver selection are shown in the table below.

Active Transmitter	Flex 8EX2 Receiver	Flex 12EX2 Receiver
Dedicated A transmitter	K14	K22
Dedicated B transmitter	K16	K24
Tandem transmitter Rotary Position A	K14	K22
Tandem transmitter Rotary Position B	K16	K24
Tandem transmitter Rotary Position A+B	K14 + K16	K22 + K24

NOTE: These relays are only used to indicate receiver selection. These relays could be wired to crane indicator lights (not provided).

- Additional FUNC relay functions are available through the infrared programmer. Refer to the infrared programmer manual for a complete listing of functions and how to configure their operation.
- For safety, always check if the selector switch is correctly positioned for the intended receiver or receivers prior to turning on the transmitter power. After the MAIN relays are active in both receivers, turning the master transmitter off or pushing the STOP button will disconnect the MAIN relays in both receivers (regardless of the selector switch position).



Apx A3. Tandem System Configurations

A complete Flex EX2 Tandem system provides two receivers, two dedicated transmitters and two tandem transmitters. These components are set up to work together out of the box with the following configurations:

- Receiver A
- Receiver B
- Dedicated transmitter for Receiver A
- Dedicated transmitter for Receiver B
- TWO Tandem transmitters

The default configurations that are present with a new system are as follows:

Component	Channel Scheme	Channel	Receiver Channel Scanning	Type
Receiver A	Assigned	X	3 channel	1
Receiver B	Assigned	X +1	3 channel	2
Dedicated Transmitter A	Assigned	X	-	1
Tandem Transmitter 1	Assigned	X +1	-	1
Tandem Transmitter 2	Assigned	X +2	-	2
Dedicated Transmitter B	Assigned	X +3	-	2

Table Notes:

- Channel Scheme - **see Section 4.1.3 on page 27** and **Section 4.2.1 on page 53**
- Channel - "X" is used to represent the lowest channel used in a configured Tandem system
- Receiver Channel Scanning - **see Section 4.2.2.10 on page 58**
- Type - Is an additional layer for addressing components that is configurable through the IR Programmer

Appendix B Receiver Select Radio Systems (RS)

Receiver Select (RS) systems are designed for cranes for interlocking cranes or cranes with independent controls without festooning between the bridge and carrier controls. Multiple receivers are used in this configuration and are mounted on every bridge and carrier. The receivers can be selected through the button sequences below and are indicated on the lights on transmitter when available per configuration.

NOTE: Flex EX2 RS systems allow for one operator at a time regardless of how many receivers are in the configuration. If a second operator is needed for operations, a Flex EX2 tandem system can be considered which will allow for two operators at the same time.

General Operation

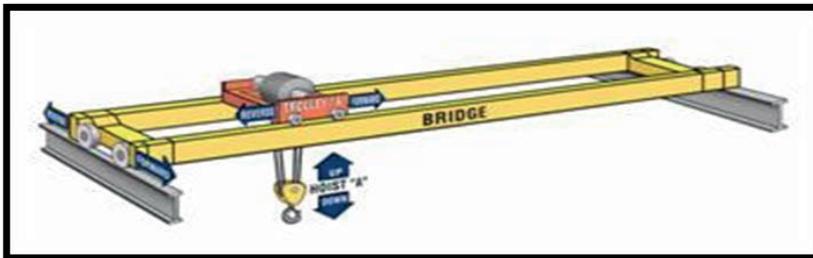
Apx B1. RS System Types



CAUTION

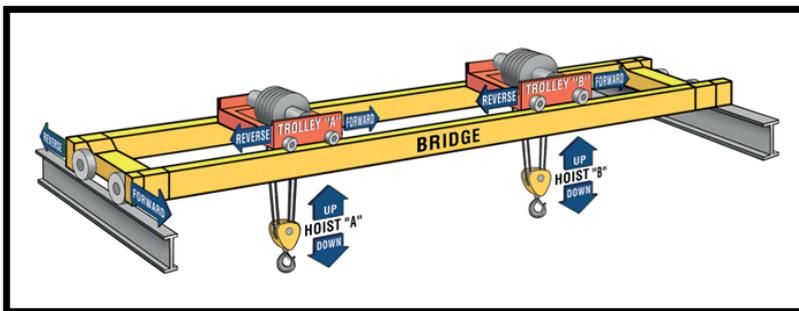
The Receiver Select system is not compliant with the CE standards EN 7121 and EN 15011.

FLEX-8EX2-2RS-3M

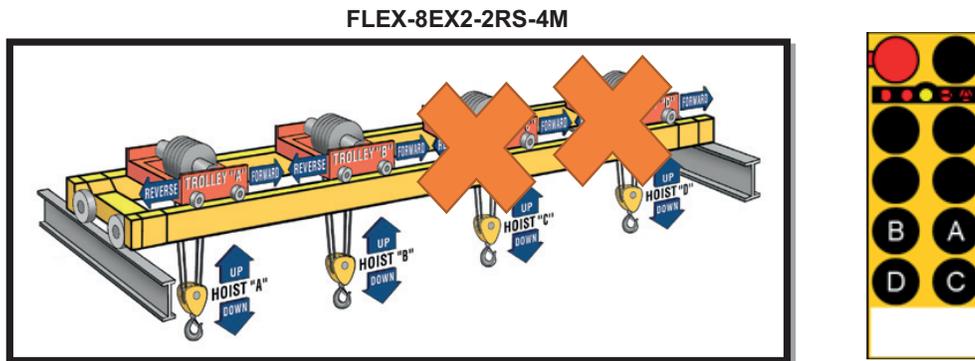


FLEX-EX2-2RS-3M is designed for (1) Bridge and (1) Carrier with independent Controls. This system comes with (1) Bridge receiver and (1) Carrier Receiver. Carriers are controlled by buttons A & B. System uses a Type B transmitter.

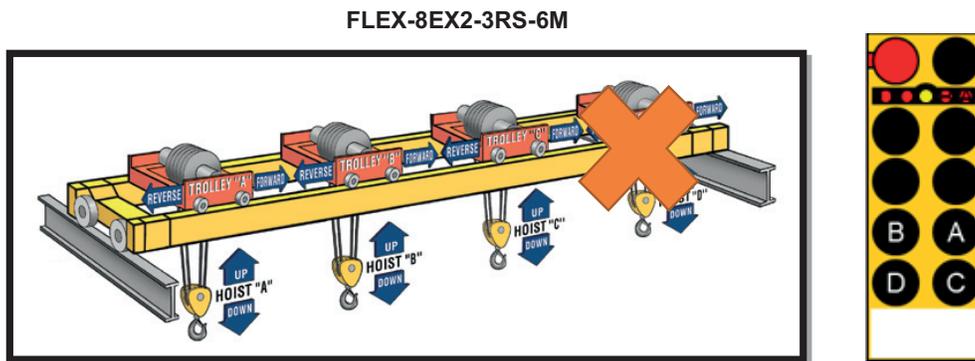
FLEX-8EX2-3RS-5M



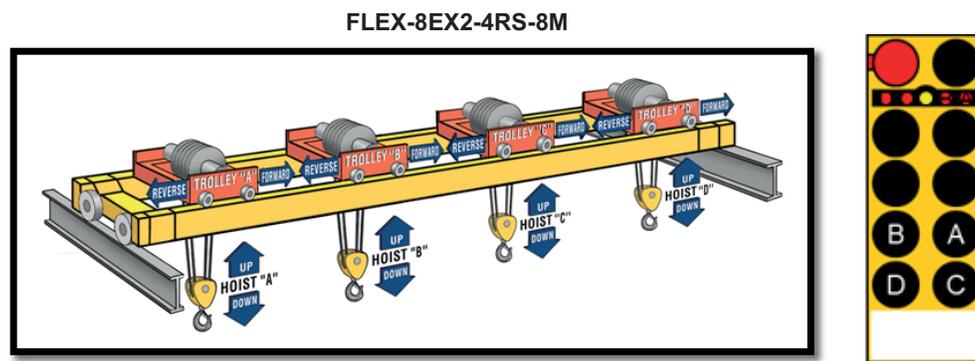
FLEX-EX2-3RS-5M is designed for (1) Bridge and (2) Carriers with independent Controls. This system comes with (1) Bridge receiver and (2) Carrier Receivers. Carriers are controlled by buttons A & B. System uses a Type B transmitter.



FLEX-EX2-2RS-4M is designed for (2) Carriers with independent Controls. This system comes with (2) Carrier Receivers. Carriers are controlled by buttons A & B. System uses a Type C transmitter.

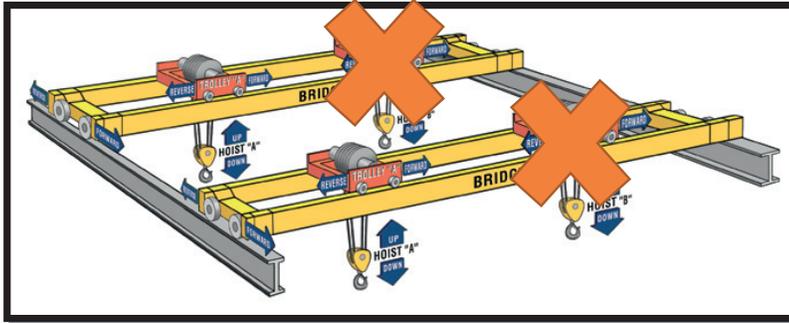


FLEX-EX2-3RS-6M is designed for (3) Carriers with independent Controls. This system comes with (1) Bridge receiver and (3) Carrier Receivers. Carriers are controlled by buttons A, B, & C. System uses a Type C transmitter.



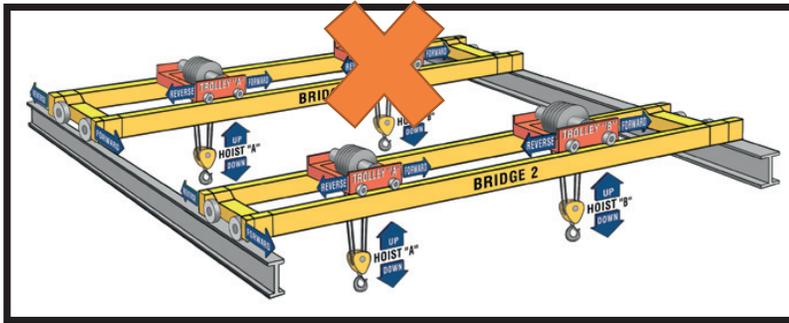
FLEX-8EX2-4RS-8M is designed for (4) Carriers with independent controls. This system comes with (4) Carrier Receivers. System uses a Type C transmitter.

FLEX-12EX2-4RS-6M



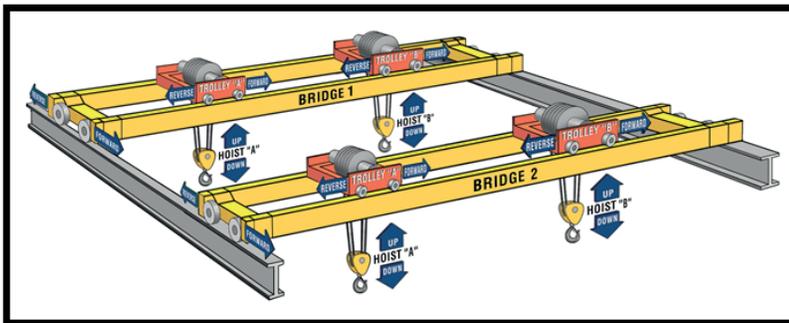
FLEX-12EX2-4RS-6M is designed for (2) Bridges and (2) Carriers with independent Controls. This system comes with (2) Bridge receivers and (2) Carrier Receivers. Bridge selection is controlled by buttons 1 & 2. Carriers are controlled by buttons A & B. System uses a Type F transmitter.

FLEX-12EX2-5RS-8M



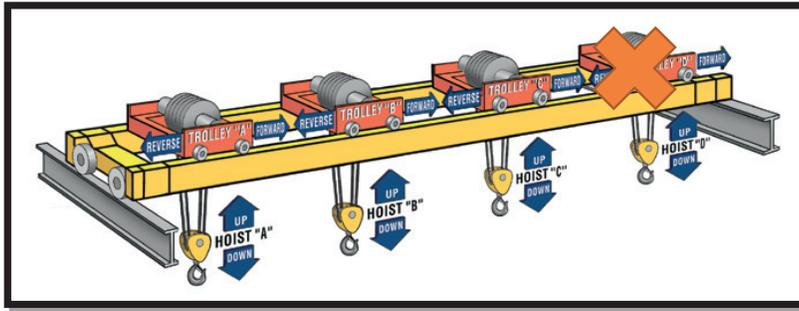
FLEX-12EX2-5RS-8M is designed for (2) Bridges and (3) Carriers with independent Controls. This system comes with (2) Bridge receivers and (4) Carrier Receivers. Bridge selection is controlled by buttons 1 & 2. Carriers are controlled by buttons A, B, C, & D. System uses a Type F transmitter.

FLEX-12EX2-6RS-10M



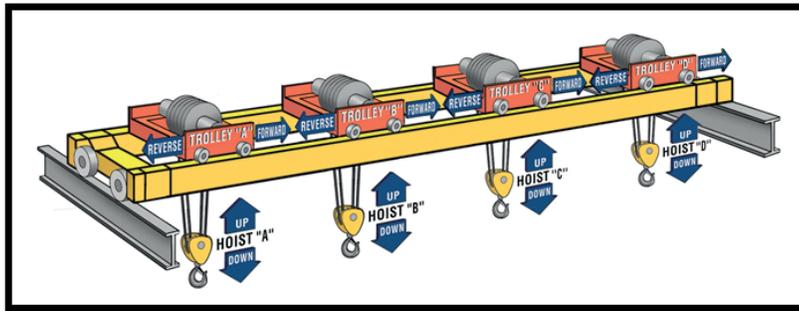
FLEX-12EX2-6RS-10M is designed for (2) Bridges and (4) Carriers with independent Controls. This system comes with (2) Bridge receivers and (4) Carrier Receivers. Bridge selection is controlled by buttons 1 & 2. Carriers are controlled by buttons A, B, C, & D. System uses a Type F transmitter.

FLEX-12EX2-4RS-7M



FLEX-12EX2-4RS-7M is designed for (1) Bridge and (3) Carriers with independent Controls. This system comes with (1) Bridge receiver and (3) Carrier Receivers. Carriers are controlled by buttons A, B & C. System uses a Type E transmitter.

FLEX-12EX2-5RS-9M



FLEX-12EX2-5RS-9M is designed for (1) Bridge and (4) Carriers with independent Controls. This system comes with (1) Bridge receiver and (4) Carrier Receivers. Carriers are controlled by buttons A, B, C, & D. System uses a Type E transmitter.

Apx B2. I-Chip Settings

A 433-439 MHz Flex EX2 CE transmitter will enter a legacy mode and become backwards compatible with GEN1 Flex EX receivers once an I-Chip is inserted. The serial number and channel are transferred through the I-Chip. The dipswitch is NOT used to change the channel. If the channel needs to be changed, refer to the Channel Change via Push Buttons procedure in a GEN 1 Flex EX manual. The first 8 positions on the EX2 transmitter dipswitch will operate the same as the function dipswitch on the GEN 1 Flex EX transmitter. Refer to the appropriate GEN 1 Flex EX CE manual for function dipswitch settings. Position 9 on the dipswitch will set the Continuous Transmitting Time (0 = 1 minute, 1 = time set in I-Chip). Position 10 on the dipswitch is not used.

NOTE: 863-869 MHz and 921-927 MHz (Australia only) Flex EX2 CE transmitters are not compatible with GEN1 Flex EX receivers even if an I-Chip is inserted into the transmitter.

NOTE: All settings in this manual are no longer applicable once an I-Chip is inserted into a Flex EX2 transmitter. Refer to the appropriate GEN 1 Flex EX CE manual instead.

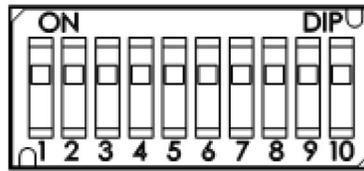
NOTE: A Flex EX transmitter will NOT work with a Flex EX2 receiver.

I-Chip Settings:

Serial number = match receiver/s

Channel = match receiver/s

Type = 00



Transmitter Dipswitch Settings											
Transmitter Type		1	2	3	4	5	6	7	8	9	10
B	Non-Interlocked	Off	On	Off	Off	Off	Off	Off	Off	X	X
	Interlocked	Off	On	Off	Off	Off	Off	On	Off	X	X
C	Non-Interlocked	Off	Off	On	Off	Off	Off	Off	Off	X	X
	Interlocked	Off	Off	On	Off	Off	Off	On	Off	X	X
E	Non-Interlocked	Off	Off	Off	Off	On	Off	Off	Off	X	X
	Interlocked	Off	Off	Off	Off	On	Off	On	Off	X	X
F	Non-Interlocked	Off	Off	Off	Off	Off	On	Off	Off	X	X
	Interlocked	Off	Off	Off	Off	Off	On	On	Off	X	X

X = Not used

Apx B3. Transmitter Types

There are six transmitter types. Type A through type F.

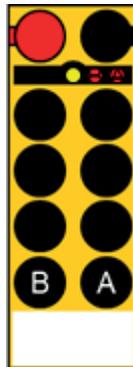
Type A is a standard transmitter with 8 or 12 function buttons (not pictured)

Type B is to select between 2 carriers (A, B) with 6 function buttons

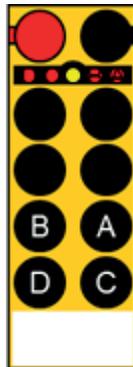
Type C is to select between 4 carriers (A, B, C, D) with 4 function buttons

Type E is to select between 4 carriers (A, B, C, D) with 8 function buttons

Type F is to select between 2 bridges (1, 2) and 4 carriers (A, B, C, D) with 6 function buttons



Type B



Type C



Type E



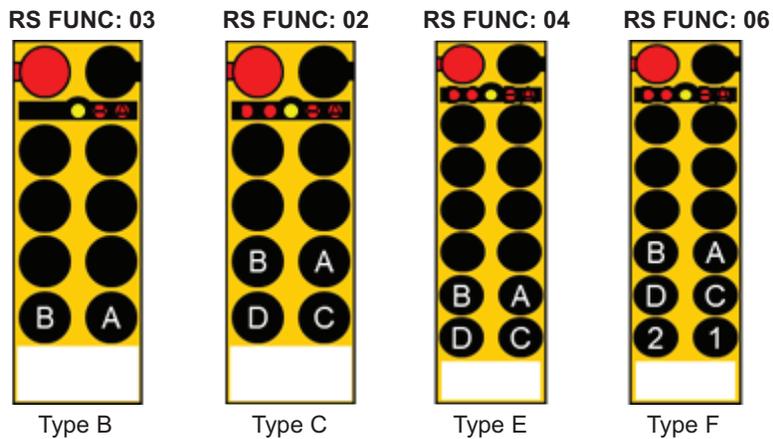
Type F

Apx B4. RS Transmitter Settings

a. Infrared Transmitter Settings

The IR programmer unit can be used to set the system serial number, channel, type setting, RS function setting, and many others. Please refer to the Flex IR programmer manual or contact Magnetek field service for more details.

- All transmitters in a system are set to the same serial number and assigned channel.
- All RS transmitters (regardless of their configuration) come preset to Type 00.
- The RS Function settings for each transmitter configuration come preset as follows:



Please note that the Transmitters must be ordered from the Factory with the receiver select Firmware. Standard EX2 transmitters cannot be reprogrammed for RS functionality.

Apx B5. RS Receiver Settings

a. Infrared Receiver Settings

The IR programmer unit can be used to set the system serial number, channel, type setting, function relay settings, and many others. Refer to the Flex IR programmer manual or contact Magnetek field service for more details.

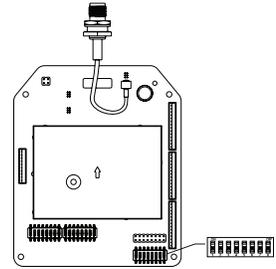
Presets:

- All receivers in a system are set to the same serial number and assigned channel
- Receiver A - Type 01
- Receiver B - Type 02
- Receiver C - Type 04
- Receiver D - Type 08
- Bridge receiver (non-selectable) - Type 00
- Bridge receiver 1 - Type 16
- Bridge receiver 2 - Type 32
- FUNC RLY1 - Normal
- FUNC RLY2 - RS



b. EX2 Receiver Select Systems

Jumper setting applies to functions such as the receiver settings, firmware version, system testing and remote pairing methods.

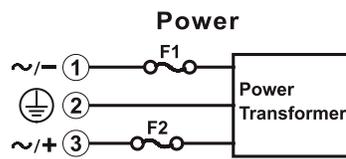
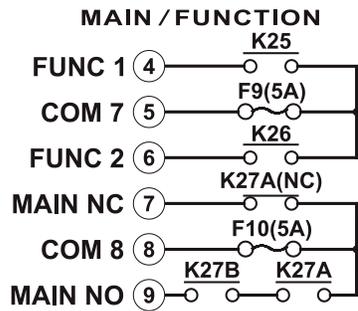
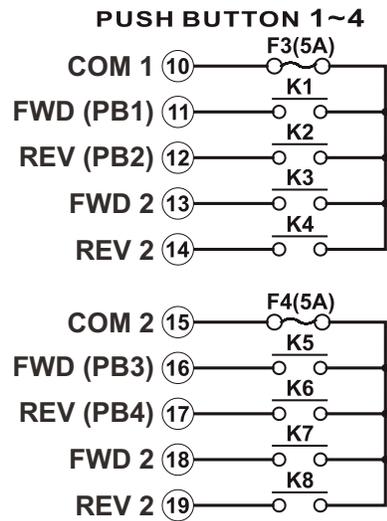


■ Default

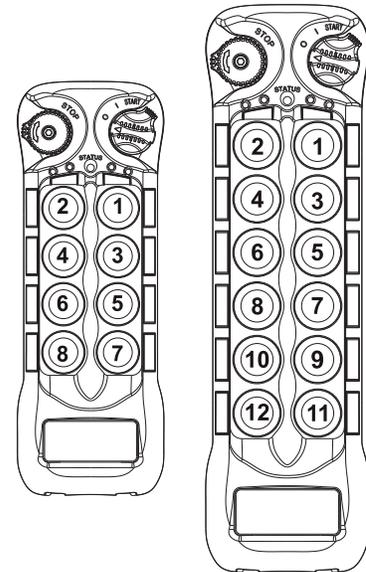
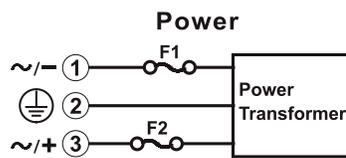
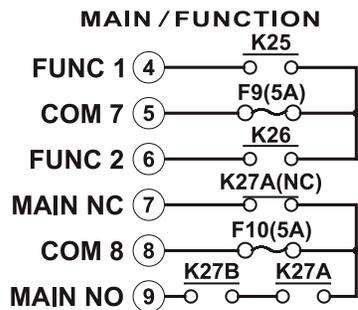
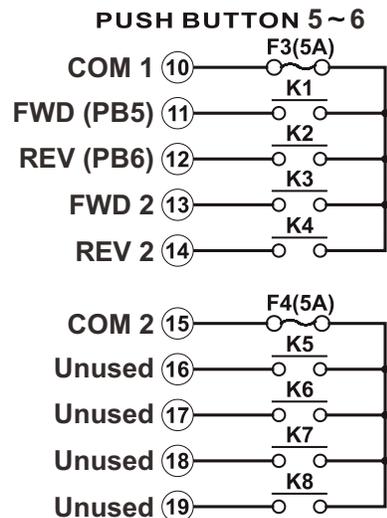
Jumper Settings		Function
JP4 (Inserted)	JP5 (Open)	Setting for Bridge Receivers (selectable and non-selectable)
JP4 (Open)	JP5 (Open)	Setting for Trolley/Hoist Receivers (all letters)
JP6 (Inserted)		Display system firmware version
JP7 (Inserted)		For system testing only (receiver MAIN relays disabled)
JP8 (Opened)		Receiver-to-transmitter remote pairing (pressing the Pairing button required)
JP8 (Inserted)		Receiver-to-transmitter remote pairing (pressing the Pairing button not required)

Apx B6. Flex EX2 RS Wiring Diagram

Carrier Receiver Wiring



Bridge Receiver Wiring



- For 9-36VDC power supply, wire #1 corresponds to the negative charge (-) and wire #3 corresponds to the positive charge (+). Wire #2 is for GROUND.
- Due to the possibility of voltage spikes on the contactors, suppressors are required on contactors being driven by Flex relays.
- FUNC1 (K25) is set to Normal by default. It will become a normal momentary output after the initial START command.
- FUNC 2 (K26) is set to RS by default. It will become a latched output on any and all receivers that are selected by the transmitter.



MAGNETEK

Flex EX2
Radio Remote Control Equipment Instruction Manual
March 2021