

# Radio Controls Protean Series



# Conductix Incorporated

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## **Disclaimer/General Warranty**

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# 1.0 Radio Warranty

## 1.1 Warranty

Conductix-Wampfler guarantees that this equipment meets its published specifications at the time of shipment from the factory. This equipment will perform as described if installed properly. However, Conductix-Wampfler cannot guarantee that operation of remote control system is absolutely error-free, or without interruption.

## 1.2 Warranty Period

This equipment is warranted against defects in materials and workmanship for a period of one (1) year from the date of shipment. During the warranty period, Conductix-Wampfler is responsible for necessary repairs/ replacement as long as the product can be proven defective.

## 1.3 Warranty Service

For warranty service or repair, this equipment must be returned to Conductix-Wampfler. Customer is responsible for shipping charges to Conductix-Wampfler. Conductix-Wampfler's warranty covers only parts and factory labor. No on site in and out charges are covered under this warranty.

## 1.4 Excluded Parts

This warranty does not include consumable parts such as joysticks, batteries, fuses, buttons, and relays. Also, this warranty does not cover defects caused by improper installation, improper/insufficient maintenance, unauthorized modification, improper operation, ignorance of environmental specifications, and/or improper software/interfaces.

## 1.5 Remarks

No other warranty is expressed or implied, except for the above mentioned. The remedies provided herein are the buyers' sole and exclusive remedies. Conductix-Wampfler shall not be liable for any direct/indirect, special, incidental, or consequential damage. Consult Conductix-Wampfler general warranty for further information.

# 2.0 Safety Considerations

## 2.1 Symbols

### 2.1.1 Safety Considerations:

Check input voltage **BEFORE** wiring this Protean Unit. Insufficient or overvoltage **WILL** damage unit and **VOID** Warranty.

The default value for AC units is 110v + 10% (99 to 121 VAC). For DC units, the voltage should be 12-24 Volts.

This product and related documentation must be reviewed for familiarization with safety markings and instructions before operation. This product requires strict adherence to instructions in order to ensure operational safety.

### 2.1.2 Safety Symbols

The following symbols may be found on the remote control or throughout the remote control documentation. Their purpose is to alert you to potentially dangerous situations.



#### Refer To Manual

When the product is marked with this symbol refer to the instruction manual for additional information.



#### High Voltage

Indicates presence of hazardous voltage. Unsafe practice could result in severe personal injury.



#### Protective Earth Ground

Indicates protective earth terminal

## 2.0 Safety Considerations

### 2.1 Symbols continued



#### Warning

Denotes hazard. Included text will give proper instructions. Failure to follow instructions could result in severe personal injury and/or property damage.



#### Caution

Denotes hazard. Included text will give proper instructions. Failure to follow instructions could result in minor personal injury and/or property damage.

### 2.2 Warnings



1. Read this manual carefully before operating and installing this product.

2. Due to the complex nature of equipment, it is necessary to read the entire manual before installation.

3. Only authorized personnel should service this equipment. Unauthorized work on this unit will void the warranty.



4. This manual is for reference only; please call your distributor or Conductix-Wampfler if further assistance is required.

5. The equipment has been tested for correct operation before delivery from the factory. However, it must not be used in critical or hazardous operation where incorrect operation may cause personal injury or equipment damage.

6. After daily operation, please shut off main power in crane and the power to the receiver.

7. Transmitter should be placed in a safe place when not in use to avoid accidental pressing of buttons.



8. The crane should be equipped with mainline contactor, limit switches, and other required safety devices as dictated by CMAA, OSHA, or all other applicable governing regulations.

9. The GND (ground) of receiver must be connected to ground of machine, or electrical shock can occur.



10. Do not use this device during electrical storms or under conditions of electrical interference.

11. Ensure transmitter batteries are in good condition and power for receiver is correct.

12. Installation and maintenance should be done only while the machine's main power and receiver's power are off and locked out to prevent electrical shock.

13. Contents of the manual may be amended by the manufacturer without notice.

## 3.0 Standard Components

A standard full set of Protean Radio Control consists of:

700PRO4, 700PRO6, 700PRO8, 700PRO6HT and 700PROL8B Kits include a single (1) transmitter 700PRO4D, 700PRO6D, 700PRO8D, 700PRO6DHT and 700PROL8BD Kits include two (2) transmitters.

**NOTE:** Upon receipt of the radio kit, please identify and verify the correct number of transmitters have been included.

### 3.1 Receiver



| Model No.    | Receiver Part No. |
|--------------|-------------------|
| 700PRO4      | 701P0040          |
| 700PRO4-DC   | 701P0040-DC       |
| 700PRO6      | 701P0060          |
| 700PRO6-DC   | 701P0060-DC       |
| 700PRO6HT    | 701PROL6B-RX      |
| 700PRO6HT-DC | 701PROL6BDC-RX    |
| 700PRO8      | 701P0080          |
| 700PRO8-DC   | 701P0080-DC       |
| 700PROL8B    | 701P0080          |
| 700PROL8B-DC | 701P0080-DC       |

### 3.2 Transmitter



Style A




Style B

| Style | Model        | Transmitter Part No. |
|-------|--------------|----------------------|
| A     | 4 Button     | 701P0004             |
| B     | 4 Button HT  | 701PROL6B-TX         |
| A     | 6 Button     | 701P0006             |
| B     | 6 Button L8B | 701L8001             |
| A     | 8 Button     | 701P0008             |

# 4.0 Installation Procedures

## 4.1 General Precautions

- 
1. Observe all safety precautions when climbing or working on the machine.
  2. Turn off the main power source of cranes before installation to avoid electric shock. Lockout/Tagout the main power source.
  3. Receiver must be installed as to not touch any part of the machine or structure during the operation, except for mounting provisions.
  4. The receiver must be fastened securely via shock-proof mount provided.
  5. Before installation, inspect the crane's safety devices and make sure everything is in proper working condition.
  6. To avoid any interference, the receiver must be located away from motors, frequency drives, and power cables (shown on page 7).
  7. **Coil suppressors must be installed on all contactor coils and relay coils where an inductive load may damage the radios relay contacts. Conductix-Wampfler recommends RC type suppressors Conductix-Wampfler Parts 103KV FCC1 with wire leads or 103KV FCC2 with bare metal leads.**

## 4.2 Receiver Preparation

### 4.2.1 Power Supply

There are two types (DC and AC) available for the Protean:

**DC Type:** Input Voltage: 12~24VDC Relay contact: 10A-36VDC

**AC Type:** (4 different transformers: 24/48V, 48/110V, 110/220V, 220/380V): The voltage selection jumper is:

| Transformer | LO   | HI   |
|-------------|------|------|
| AC 24/48V   | 24V  | 48V  |
| AC 48/110V  | 48V  | 110V |
| AC 110/220V | 110V | 220V |
| AC 220/380V | 220V | 380V |

### 4.2.1 Power Supply Continued

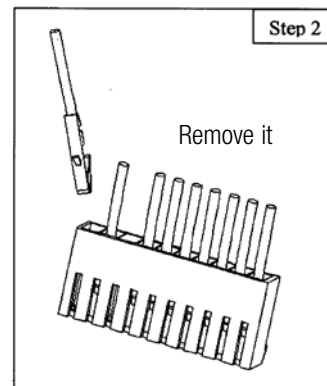
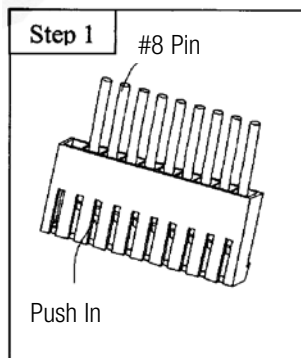
1. Locate the Hi/Low jumper to the lower left of the transformer.
2. Place the jumper connecting the two pins to enable the correct transformer setting as shown in the chart above.

NOTE: The Default transformer is the 48/110V version. Please contact your distributor for other options and lead-times.

### 4.2.2 R0 Open/Closed Setup

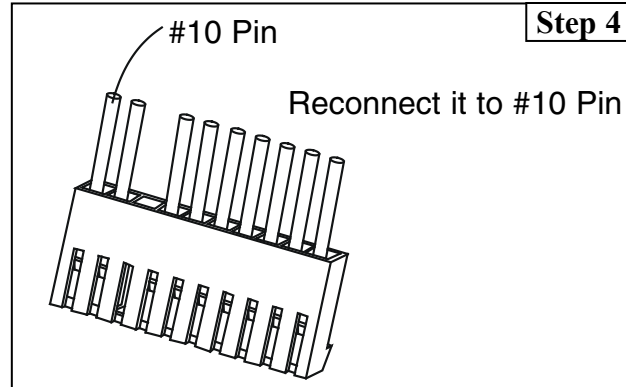
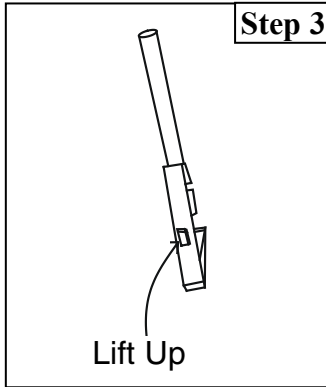
The Protean series provides two different outputs: **NO and NC**. The NO is the default setting. If an NC output is necessary, please remove the No. 8 wire (R0/Start) from the connector and insert it into No. 10.

#### Procedure:



## 4.0 Installation Procedures

### Procedure Continued



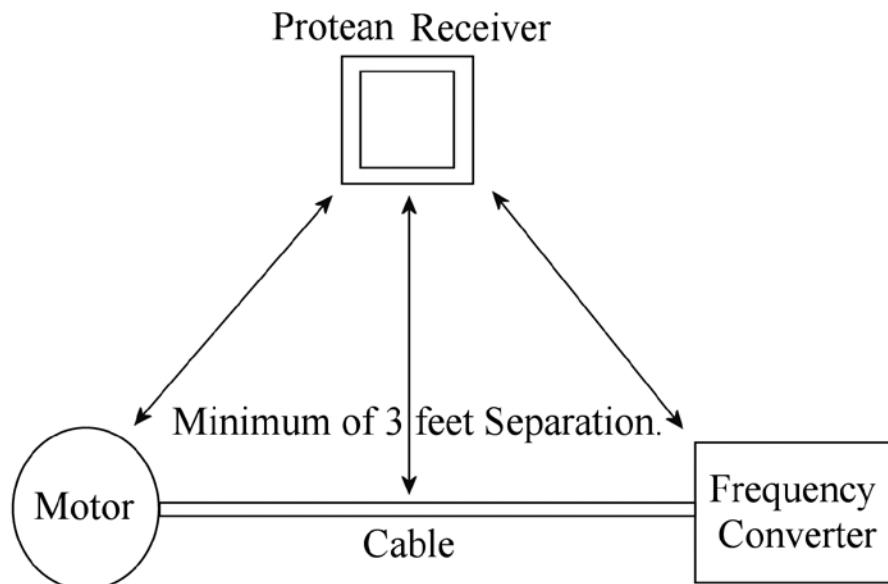
### 4.3 Receiver Installation



1. Turn off main power to the machine.
2. Locate a proper place for the receiver. (See diagram below.)
  - a. Select a stable place free from electrical noise, vibration, excessive heat, etc.
  - b. Select a location that is visible from the operation location.
  - c. Select a location at least 3 feet away from motors, relays power cables, and frequency converters.
  - d. Keep away from high voltage wiring and devices.
  - e. The receiver box must be at least 1.5" (4cm) away from other obstacles.
3. Drill four (4) 6mm holes for the receiver mounting the unit with the included hardware.
4. Connect wire to the control circuit of the machine according to the wiring diagram of the receiver (shown in Section 4.3.1).
5. Secure the cable between the receiver and the machine so that the cable sheath will not wear due to vibration.



6. Complete Section 4.5 and test every function of the radio control making sure all motions are correct.
7. Secure the cover making sure not to pinch any wires between the case and the lid.
8. This completes the receiver installation.

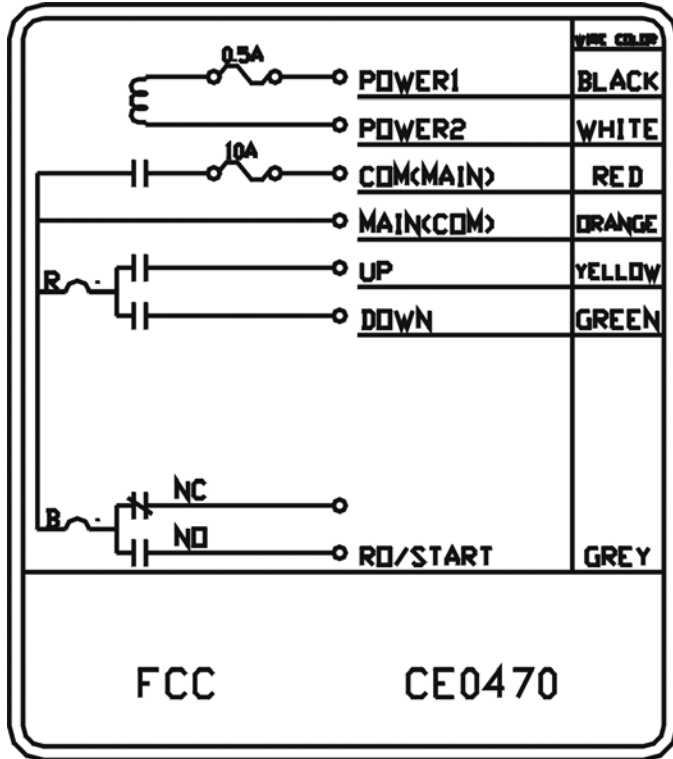




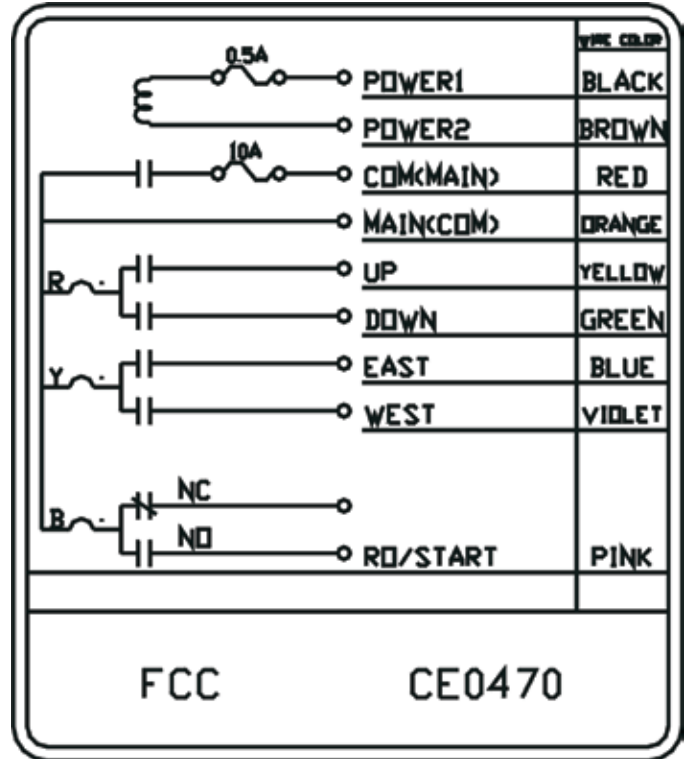
## 4.0 Installation Procedures

### 4.3.1 Radio Schematics

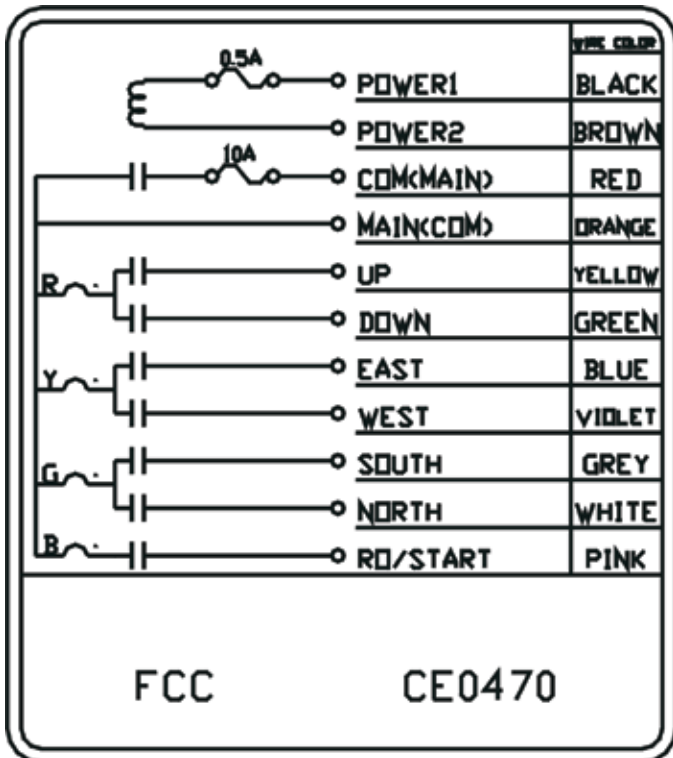
#### AC Models



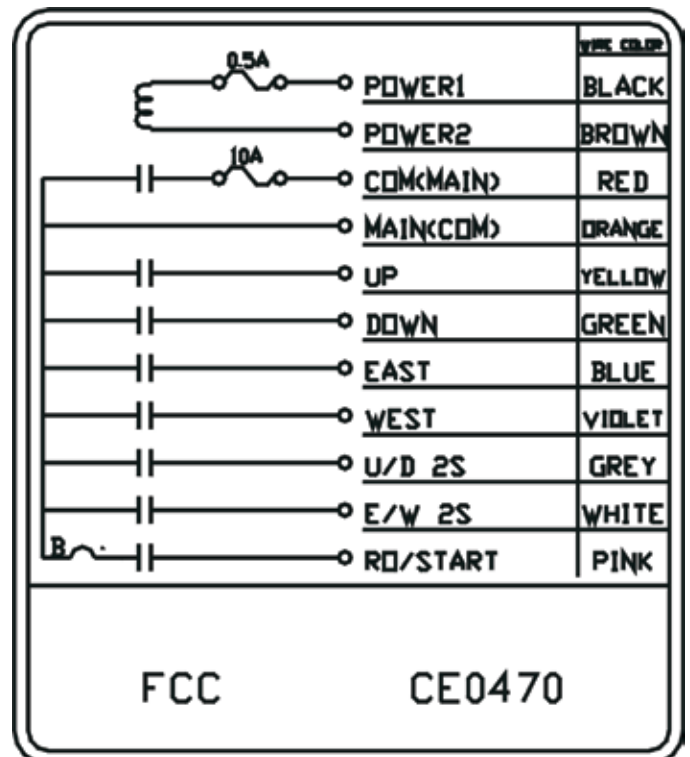
4 Button Protean



6 Button Protean



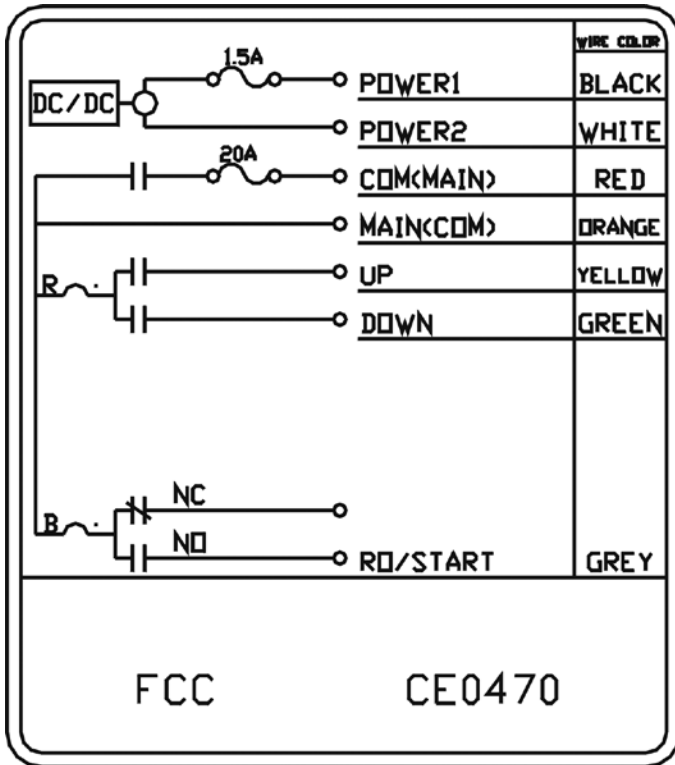
8 Button Protean &  
6 Button L8B



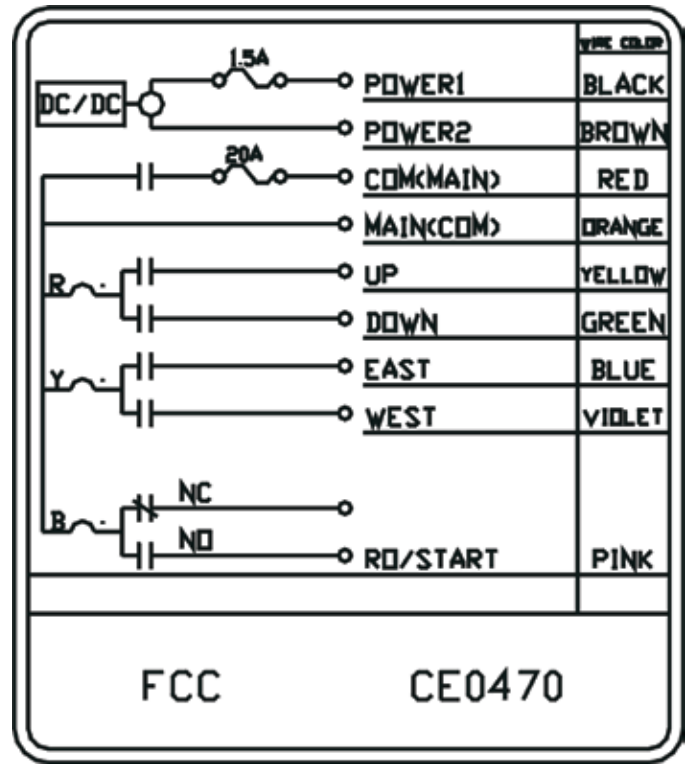
4 Button Protean HT

## 4.0 Installation Procedures

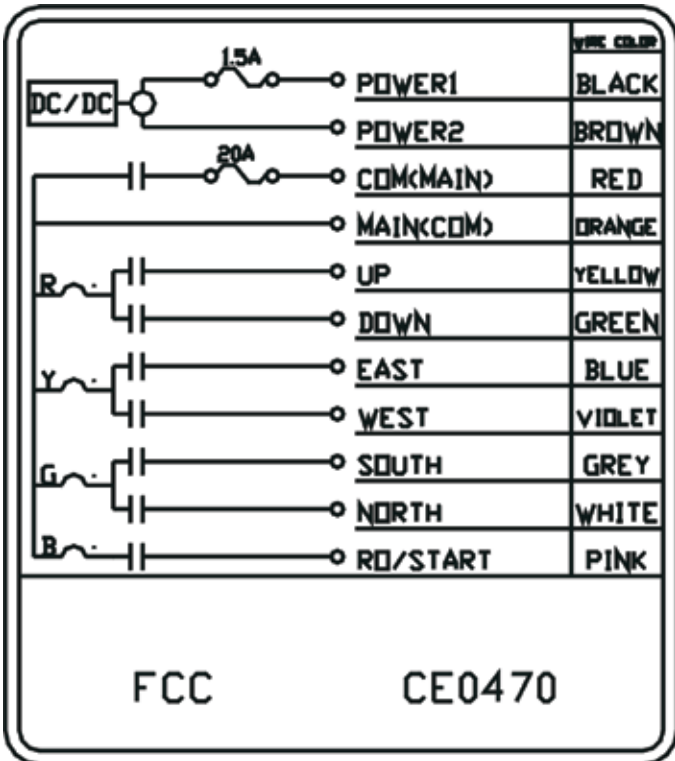
### DC Models



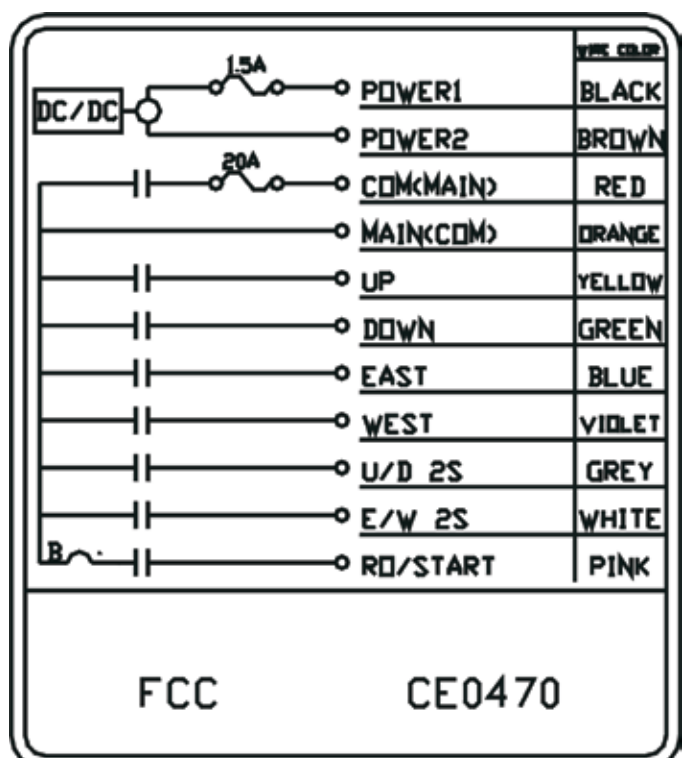
4 Button Protean



6 Button Protean



8 Button Protean &  
6 Button L8B



4 Button Protean HT

## 4.0 Installation Procedures

### 4.4 Remote Setting

Remote setting allows you to pair the new TX and RX if either of them becomes damaged. In order for the radios to work the TX & RX must have the same ID codes and frequency. Using remote setting will set both the TX and RX to have the same ID codes.

#### 4.4.1. Please ensure the following conditions are met before attempting the remote setting procedure.

- (a) Both TX and RX are of the SAME **model** and **frequency**.
- (b) Place the transmitter **as close as possible** to the receiver to avoid any interference.
- (c) **Turn off the RX power for at least 10 seconds** and then turn it on again.
- (d) Complete the "Remote Setting" **within 4 minutes** after turning on the RX. The RX will **NOT** accept the remote setting signal after 4 minutes time has elapsed.

#### 4.4.2. Remote Setting Instructions:

1. Depress the transmitter **STOP or EMS** pushbutton.
2. Press **DOWN** pushbutton and hold it.
3. Press **UP** pushbutton (**4**) times and release "**STOP or EMS & DOWN**" pushbuttons when the red light flashes.
4. Start the system per General Operation (Section 5.0).



1. Press and hold the STOP/EMS pushbutton

2. Press and hold the DOWN pushbutton

3. Press the UP pushbutton 4 times



\* **NOTE:** On HT Model (2 speed only depress to first indent for steps 2 & 3)

#### **ATTENTION:**

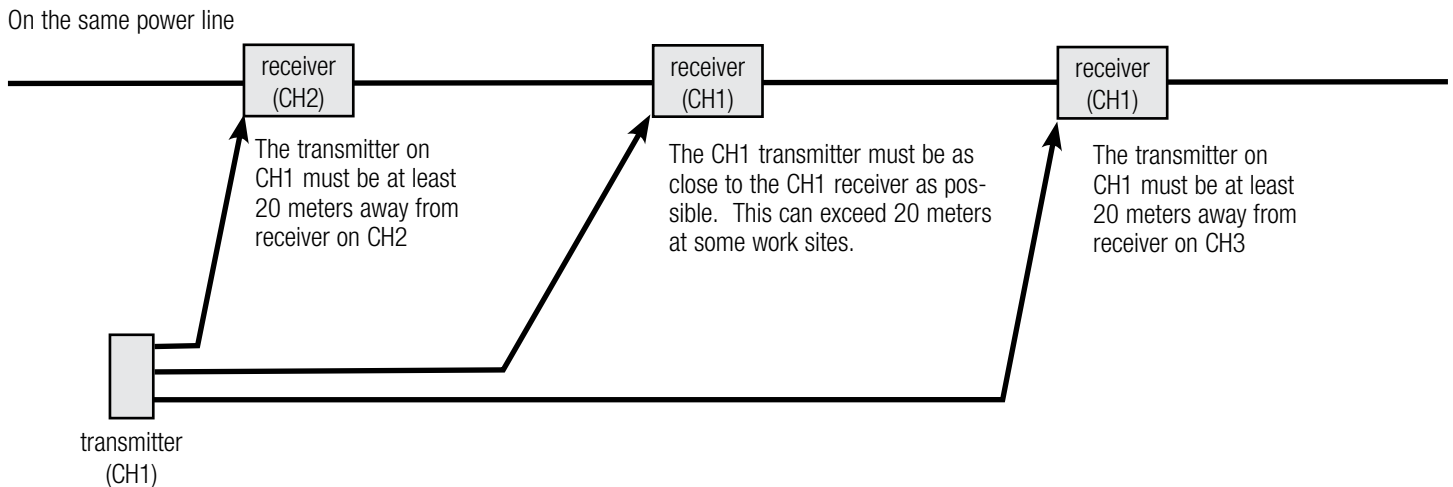
- In case the remote setting procedure fails, repeat the instructions above within 4 minutes.
- The remote setting procedure will update the ID code only. It will not change function settings.
- All same model systems on the same frequency will be paired with the transmitters ID code within the operating distance.

## 4.0 Installation Procedures

### 4.4.3 Remote setting precautions.

If a receiver on CH1 and other receivers, for example, on CH2 and CH3 are on the same power line controlled by a switch, such as different hoists on the same crane or rail, special care must be taken. When on CH1 receiver is turned off for the required 10 seconds and then turned on the ID registration, the CH2 and CH3 receivers would be switched on simultaneously and might receive the ID registration signal from the CH1 transmitter. To avoid this, please observe the following:

- a) The CH2 and CH3 receivers must be at least 20 meters away from the CH1 transmitter it is being used to pair with the CH1 receiver; otherwise the CH2 and CH3 receivers may pair with the CH1 transmitter. In case this happens, switch off the receiver which incorrectly paired for at least 10 seconds, then turn it on again, and use the correct transmitter to pair with it within 4 minutes. Or, switch off the receiver and directly pair the two using the copier to read the data from the correct transmitter and then write to the receiver. Please refer to the "Copier User's Manual".



- b) Because receivers do not accept an ID registration past 4 minutes after application of power to the receiver, or after the MAIN relay is energized, the best way to avoid incorrect programming of other receivers is to press "START" on the CH2 and CH3 transmitters to energize the MAIN relay in the CH2 and CH3 receivers, then use the CH1 transmitter to complete ID code registration within 4 minutes of switching on the receiver.

## 4.5 Transmitter Setup

Two (2) AA sized alkaline batteries are required for the TX. The LED will flash GREEN when the battery power is sufficient. The LED will flash RED when the battery power is low.

### NOTES:

1. The operating distance will shorten when the batteries are low.
2. Replace with new batteries when battery power is low.
3. Re-chargeable batteries are **NOT** recommended, use only Alkaline batteries.

## 5.0 General Operation

### 5.1 Standard Operation

1. Turn on the main power switch of the equipment.
2. Install two (2) AA sized alkaline batteries in the transmitter.
3. Press the **START/RO** pushbutton or turn the key clockwise to the start position to turn on the main relay inside receiver.
4. Operate normally according to the function settings.
5. Please perform the following procedure when done operating:
  - a. Press **STOP** or **EMS** pushbutton.
  - b. Place the transmitter in safe storage location.
6. Turn off the main power switch to the equipment.

### 5.2 Emergency Operation

In case of any emergency please:

1. Press **STOP** pushbutton or EMS Button on the HT & L8B Models.
2. Switch off the main power of crane. If the problem persists contact your local distributor for service.

## 6.0 LED Malfunction Alert

### 6.0 LED MALFUNCTION ALERT

#### 6.1 General Precautions

Daily inspection is important and will ensure safe operation. Inspection should include testing the emergency stop and other safety devices and functions. If there is any doubt, operation must be stopped immediately and problems must be corrected before operation is resumed.

#### 6.2 General Error Codes and Resolutions

##### 1. Red LED flashing quickly (every 0.2 sec) when any pushbutton is pressed.

Possible Problems:

- (a) One of the pushbuttons is jammed.
- (b) The system is not properly powered according to the instructions.

***\*If a problem is found, please contact your local distributor for repair.***

##### 2. TX LED flashes slowly (every 0.5 sec).

The TX memory is defective. Contact the distributor for repair.

##### 3. RX Error LED flashes slowly (every 0.5 sec).

The RX memory is defective. Contact the distributor for repair.

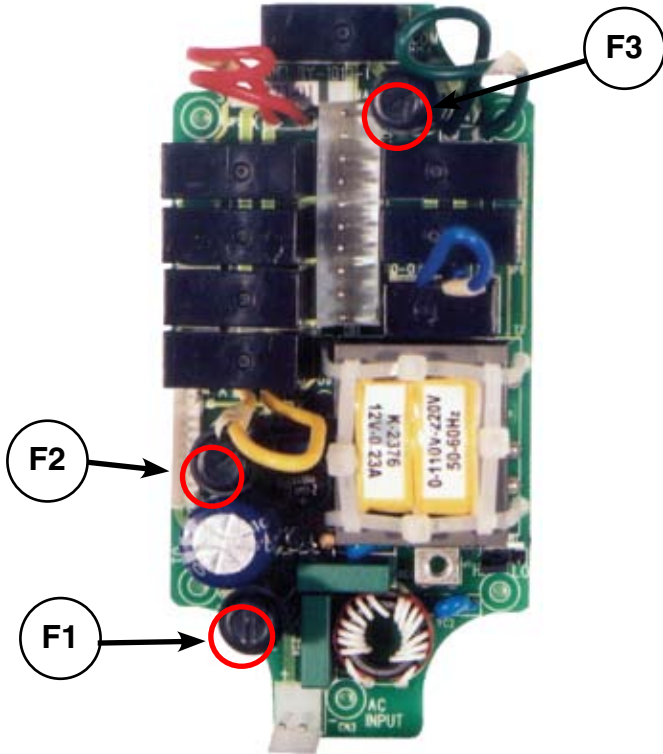
**NOTE:** The receiver error LED is located on the inside of the receiver, observe the appropriate precautions when opening the unit.

# 6.0 LED Malfunction Alert

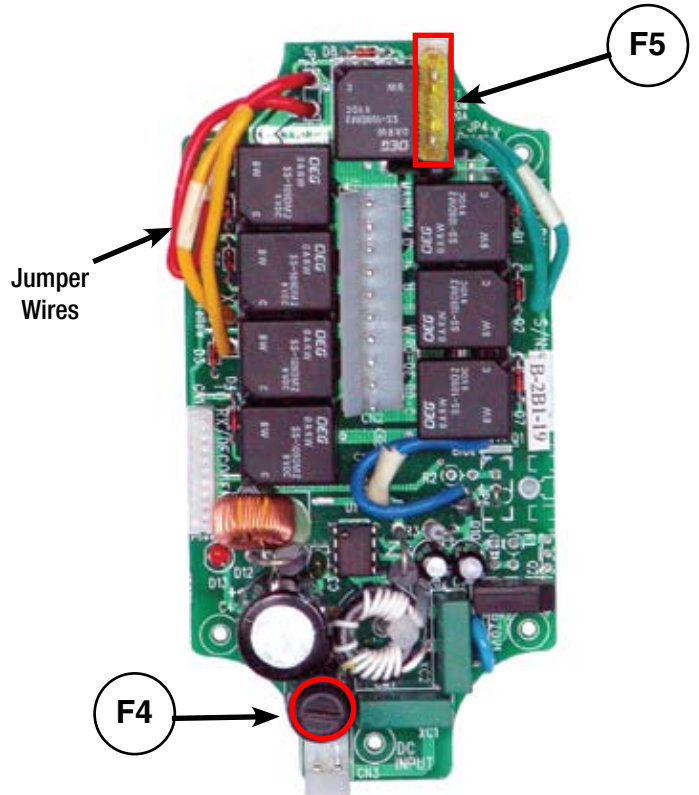
## 6.3 Change of Fuse (F1 thru F4)

Depress the fuse cover and turn counter-clockwise with a flat screwdriver to open up the fuse cover. Remove the old fuse and insert a new fuse into the cover first. Place this fuse along with cover into the fuse holder base. Depress the fuse cover and turn clockwise with flat screwdriver.

Legend: F= Fuse



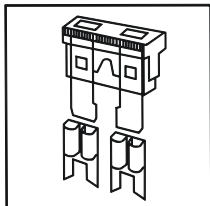
(AC Type) Relay Board Reference: Relay board shown above is for 700PR08



(DC Type) Relay Board Reference: Relay board shown above is for 700PR08-DC

### 6.3.1 Change of fuse DC Type.

Unplug the yellow fuse "F5" (20A) and replace with a new one.



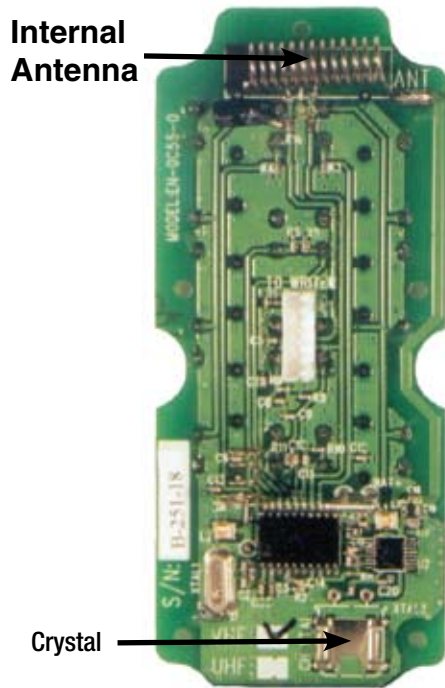
| Ref Fuse # | Size | Part Number |
|------------|------|-------------|
| F1         | .5A  | 701C0045    |
| F2         | .5A  | 701C0045    |
| F3         | 10A  | 701D0032    |
| F4         | 1.5A | 701D0038    |
| F5         | 20A  | 701P0211    |



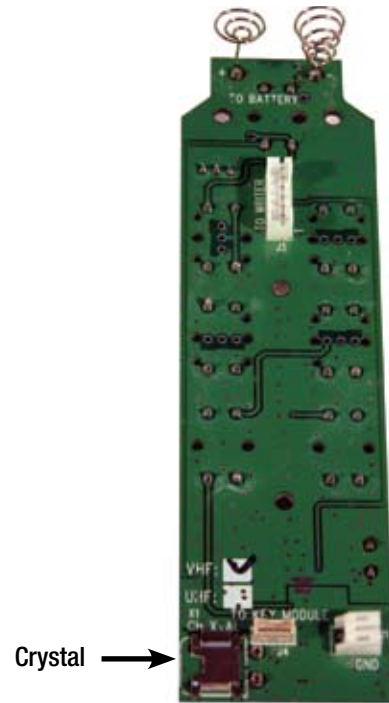
## 6.0 LED Malfunction Alert

### 6.4 Change of Frequency/Crystal

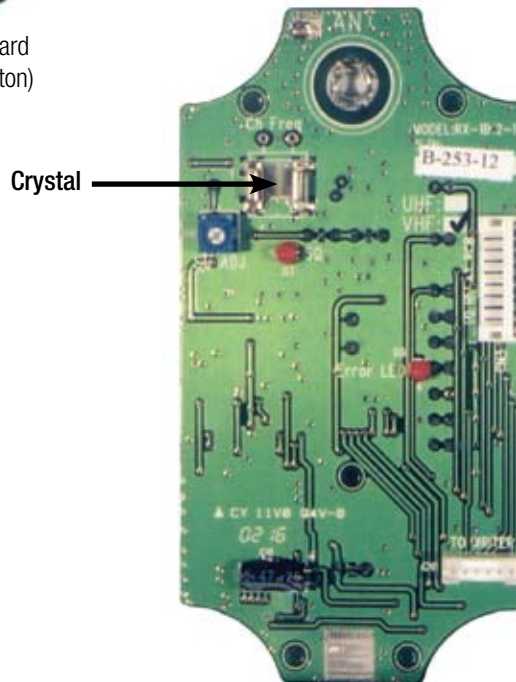
The frequency of Protean system can be simply changed by replacing the correspondent crystal frequency in both the TX and RX. Please consult factory for further details.



Transmitter Circuit Board  
(Protean 4, 6, & 8 Button)



Transmitter Circuit Board  
(Protean HT & L8 Models)



Receiver Circuit Board  
(All Models)

## 7.0 Function Settings

The Protean series offers the following function settings in the transmitter: Normal, ON-OFF, Toggle, and interlocked. By default they are set in an interlocked mode. Protean series radios can be custom programmed at the factory based on requirements and specific applications, please contact your distributor for more information.

## 8.0 Specifications

### 8.1 General

- |   |   |
|---|---|
| 1. Enclosure: IP65                                      | 5. ID Code: 32bit (Greater than 4 Billion unique codes) |
| 2. Structure: Glass Fiber/ABS                           | 6. Hamming distance $\geq$                              |
| 3. Operating Temperature: -45 ~ +80°C<br>-50 ~ +175°F   | 7. Static > 15KV  |
| 4. Relay: 10A/250VAC (AC Power)<br>15A/12VDC (DC Power) | 8. Remote ID code setting                               |
|   | 9. Operating range: Up to 328 ft (100 meters)           |

### 8.2 Transmitter (4, 6 & 8 Button Model)

- |  |                                       |
|--|---------------------------------------|
| 1. L x W x H: 4.72 x 2.17 x 1.00 in.<br>(120 x 55 x 25 mm) | 6. Shock resistant                    |
| 2. Weight: 5.47 oz. (155g) (with batteries)                | 7. Output power $\leq$ 4 mW           |
| 3. Uses 2 AA alkaline batteries                            | 8. Normal power consumption: 10 mA    |
| 4. Low power indicator (LED flash red)                     | 9. Sleep mode consumption: $\leq$ 1uA |
| 5. Pushbutton jammed detector                              | 10. Modulation: FM                    |

### 8.2 Transmitter for (4 Button HT & 6 Button L8B)

- |  |                                    |
|--|------------------------------------|
| 1. L x W x H: 6.42 x 1.93 x 1.77 in.<br>(163 x 49 x 45 mm) | 6. Shock resistant                 |
| 2. Weight: 8.82 oz. (250g) (with batteries)                | 7. Output power < 4 mW             |
| 3. Uses 2 AA alkaline batteries                            | 8. Normal power consumption: 10 mA |
| 4. Low power indicator (LED flash red)                     | 9. Sleep mode consumption: < 1uA   |
| 5. Pushbutton jammed detector                              | 10. Modulation: FM                 |

### 8.3 Receiver

- |   |   |
|---|---|
| 1. L x W x H: 6.34 x 2.91 x 2.05 in.<br>(161 x 74 x 52 mm)      | 6.1 (4) independent common lines<br>(U/D, E/W, S/N, R/O) for 8 Button & L8B Models. |
| 2. Weight: 2.43 lbs. (1.1kg) (w/out cable)                      | 6.2 (3) Independent common lines<br>(U/D, E/W, R/O) for 6 Button Model.             |
| 3. AC type: 48/110, 110/220, 220/380VAC<br>DC type: 12V - 24VDC | 6.3 (2) independent common lines<br>(U/D, R/O) for 4 Button Model.                  |
| 4. Sensitivity: approx. - 105dBm                                | 6.4 (2) independent common lines<br>(U/D, E/W) for HT Models.                       |
| 5. Shock resistant design                                       |   |



# Notes

## Notes

# Notes

[www.conductix.com](http://www.conductix.com)

**Conductix-Wampfler**

10102 F Street  
Omaha, NE 68127  
USA

Customer Support  
Phone: 800 521 4888  
Fax: 800 780 8329

Phone: 402 339 9300  
Fax: 402 339 9627

[info.us@conductix.com](mailto:info.us@conductix.com)  
[www.conductix.com](http://www.conductix.com)

