



# F24+ Series Radio Remote Control User Manual



# **WARRANTY**

## **LIMITED WARRANTY**

TELECRANE guarantees that this product meets its published specifications at the time of shipment from the factory. Under proper installation it should work as expected. However, TELECRANE cannot guarantee that operation in TELECRANE system is absolutely error-free, or without interruption.

### **Warranty period**

This equipment is warranted against defects in material and manufacturing for a period of one year from the date of shipment. During the warranty period, TELECRANE is responsible for necessary repairs as long as the product can be proven to be defective.

For warranty service or repair this product must be returned to the service facility designated by TELECRANE. Buyer will pay shipping charges to TELECRANE while TELECRANE will bear return shipping charges.

### **Excluded Items**

This warranty does not include consumable parts such as batteries, fuses, buttons, and relays. Also this warranty does not cover failure or damage resulting from misuse, accident, unauthorized modification, unsuitable operating environment, natural disasters, improper software setting or improper maintenance.

### **Limitation of liability and remedy**

If your TELECRANE product fails to work as warranted above, TELECRANE maximum liability under this limited warranty is expressly limited to the lesser of the price you have paid for the product. TELECRANE disclaims any liability as a result of any direct/indirect, special, incidental or consequential damages.

### **Remarks**

No other warranty is expressed or implied, except for the above mentioned. Any use of this remote control product would be regarded the same as agreed to all clauses within this user manual.

# **ATTENTION**

- Please carefully read the manual before installing and operating this device.
- Due to the complex nature of this equipment, it is necessary to read the entire manual before installation.
- The equipment has been stringently tested for quality assurance before delivery from factory. However, it must not be used in extremely dangerous situations, or where damage may result.
- After operation, shut off crane main power, receiver power, and remove transmitter key.
- After operation, by pressing "STOP" pushbutton switches off receiver unit then keeping the transmitter in a safe place when not in use to avoid any unintentionally operation.
- The crane should be equipped with main power relay, limit switch and other safety devices.
- Do not use this device during electrical storm or where there are conditions of high electrical interference.

- Make sure that the batteries are in good condition and power for receiver is correctly supplied.
- The installation and maintenance service is allowed only when the receiver power is disconnected to avoid electrical shock.
- The contents of this manual may be amended by the manufacturer without notice.
- The specification and function of remote is subjected to change without notice by manufacturer.

## **PRECAUTIONS**

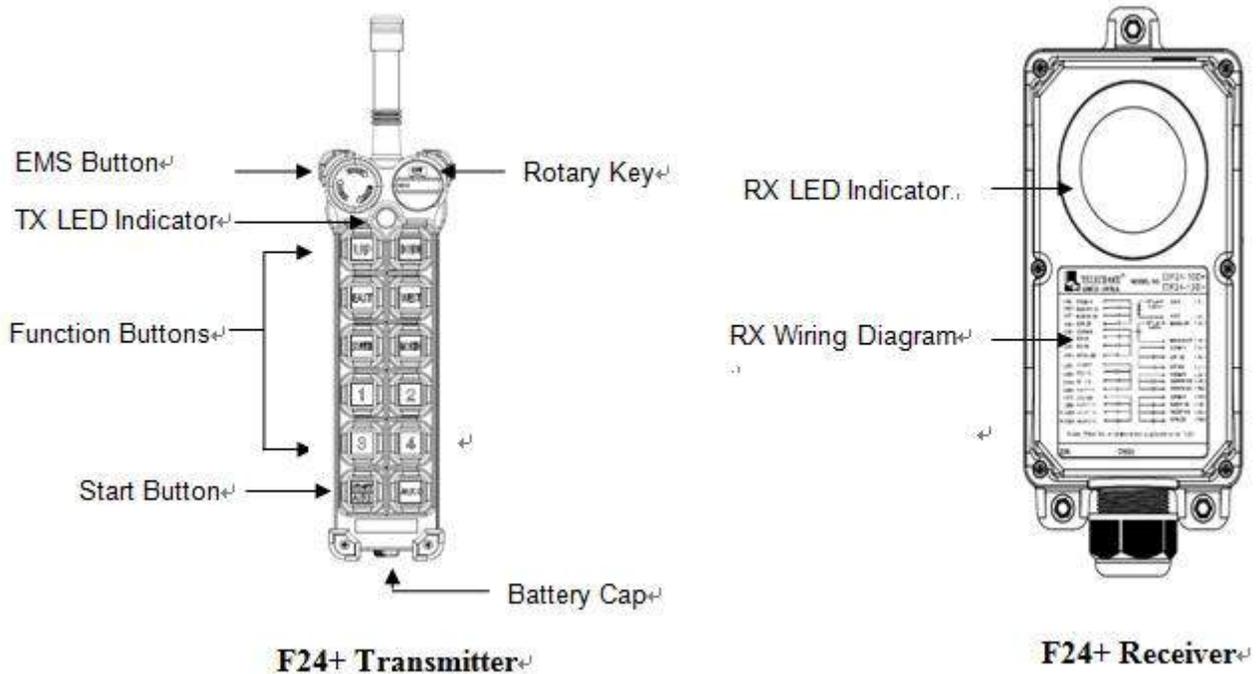
- Operating in an industrial facility is relatively dangerous; therefore, operator must have taken the adequate trainings in using F24+ system.
- Besides obtaining qualification certificate for operating this remote control product, users must also be both physically and mentally in well conditions, and has sufficient knowledge with safety precaution.
- Although F24+ transmitters are solid made for certain level of impact and weathering resistance, but any malicious destruction or improper use might still cause high possibility of potential damage.
- When transmitter battery power is low (Red LED), a STOP signal will be sent to receiver automatically to turn off receiver. The batteries must be replaced immediately.
- If the severe interference occurred, the operation must be stopped immediately.
- Please remove the batteries when the equipment will not be used for a long time.
- Be sure to know the "Procedures of Emergency" as follows.

## **PROCEDURES OF EMERGENCY**

In case of an Emergency, please follow the procedure below and contact authorized distributor for service immediately.

- Press "EMS" button
- Turn the key to "OFF" position and remove it.
- Switch off crane main power.
- Contact authorized distributor for inspection.

# Chapter 1 F24+ TRANSMITTER & RECEIVER OVERVIEW



## How to Start

### Pre-inspection

1. There is e-card on both transmitter and receiver. Make sure the e-card is correctly installed.
2. Place 4 AA batteries with correct direction. And lock the battery cover.  
**Note: Before placing the batteries, make sure the Rotary KEY is on the OFF position**
3. Turn on the transmitter. (Turn the EMS button clockwise and switch rotary key to ON position then press START button)
4. Press function button for operation.
5. To switch off the transmitter/receiver, please follow the procedure below
  - a) Press EMS button.
  - b) Switch rotary key to off position and remove the KEY from transmitter.
  - c) Remove the batteries when the equipment will not be used for a long period of time.



e-Card on Transmitter



e-Card on Receiver

### Transmitter LED indicator

Three stages power indicator

1. Green color (Full power): Operate as usual.
2. Yellow color (Mid Power): Stop operation until new batteries are replaced.
3. Red (Low Power): A Stop signal will be sent to receiver automatically to turn off receiver. To avoid the interruption during operation, check battery power frequently.

## Inspection & Troubleshooting

### Inspection

The daily inspection is highly recommended for safety reason. The inspection includes EMS Button, Rotary Key and all other relevant functions. Stop the operation immediately when any error occurs and resume to work until the error is being removed.

### Transmitter LED Indicator

- Transmitter red LED indicator blinking (Fast)
  - Pushbutton Jammed
  - Power-On without releasing EMS button
  - Not correct Power-On procedure
- Transmitter red LED indicator blinking (Slow)
  - Low battery power, replace new batteries immediately
- Transmitter red LED indicator remain ON
  - Check transmitter e-Card if is correctly installed

### Receiver LED Indicator

The receiver LED indicator provide the messages to the operator as below

Status	LED Indicator ( ● ON, — OFF, — Permanent On)
Stand-by	● — ● — ● — ●
Power-On	—
Function Relay Active	● — ● — ● — ● — ● — ● — ● — ● — ● — ●
Error	● — ● — ● — ● — ● — ● — ● — ● — ● — ● — ● — ● — ● — ●

- Receiver relay module LED3 blinking
  - Check receiver e-Card if is correctly installed

# Specification

## General Specification

- Frequency : 430.00 ~ 438.00 MHz
- ID Code : 4.3 Billions sets
- Channel Space : 50KHz
- Hamming Distance : >20
- Structure : Fiberglass reinforced plastic materials
- Operating Temp. : -30°C ~ +85°C
- Operating Distance : Up to 100 Meters

## Transmitter

- Power : AA Battery x 4
- Emission Power : < 10mW
- Pushbutton : Single/Double Steps
- Dimension : 245x61x51 mm
- Weight : Approx. 255g (without battery)

## Receiver

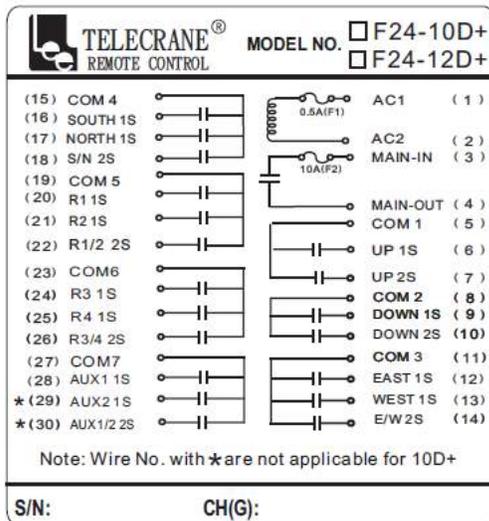
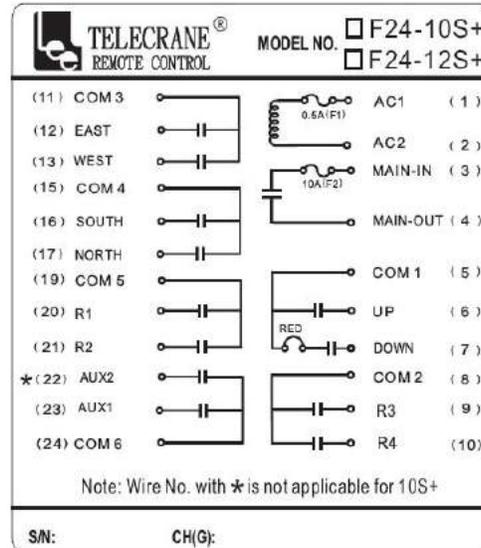
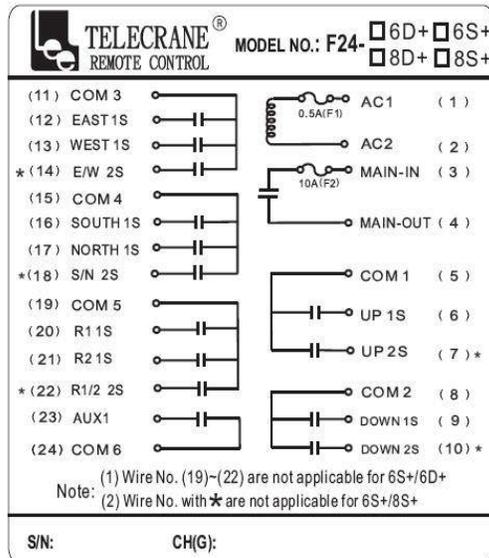
- Power : (1) 24/36/42/48/110/220/230/380 VAC (50/60Hz), tolerance  $\pm 20\%$  (2) 12~24VDC
- Sensitivity : -110dbm
- Relay : 5A/250VAC
- Dimension : Approx. 234x116x130 mm
- Weight : Approx. 1240g (without cable)

# CHAPTER 2 INSTALLATION & SETTING

## Installation Precaution

- Switch off receiver and keep power disconnected during installation to avoid electrical shock.
- Keep away from spark (such as electrical motor, relay contactor, power line or any high voltage devices) during receiver installation.
- Receiver should be properly installed to prevent from loosing or dropping on the ground.
- Check the power setting and relay configuration before installing the receiver. °
- Installing the receiver unit inside the control box is prohibited. It is appropriate to install the receiver outside the control box.
- F24+ provides 4.3 billion sets of ID codes. Each unit has a unique ID code address. For safety reason, please check the ID code again during installation if any other remote control device nearby.

## Wiring Diagram

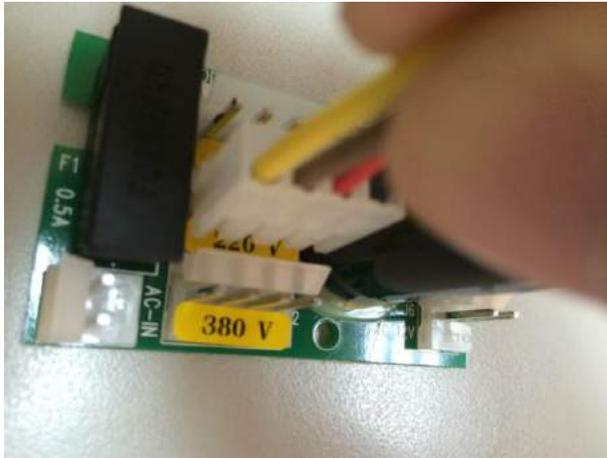


## Receiver power voltage selection

F24+ receiver provides transformer with 3 stages (i.e. 48VAC/220VAC/380VAC) that allows user to change input power on site. The designated voltage had been preset by the factory.

### Changing input power

1. Disconnect receiver power.
2. Unplug the connector (Fig. A)
3. Re-plug the connector into the new power position (Fig. B)
4. Completed



(Fig. A)



(Fig. B)

### Function Setting

F24+ remote control system can be set according to the working condition and operator's need for the following purposes: Specific pushbutton function, EMS neglected function, Auto-off time, Interference neglected time...etc.

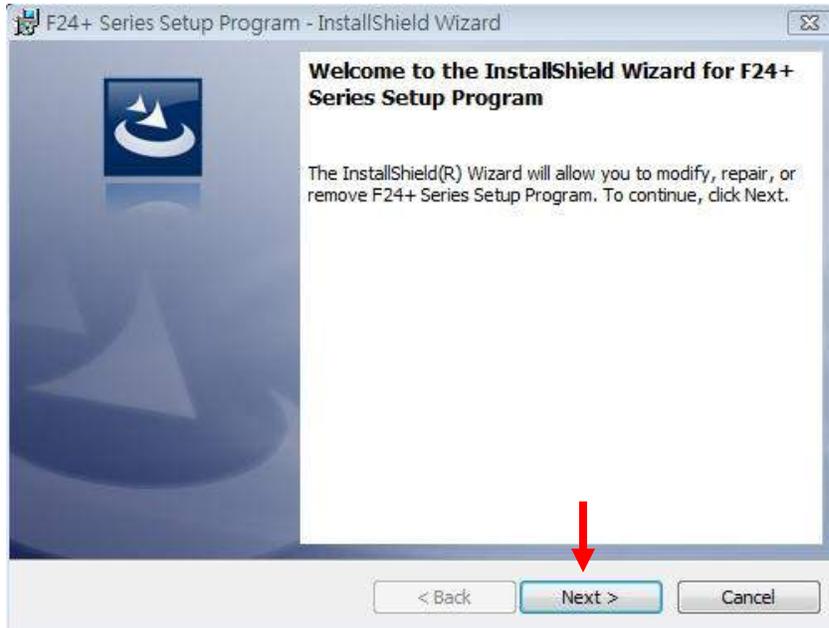
This enables the remote controller to perform the most effective operation and to provide the safest operation. Please refer to the Software Function Setting in Chapter 3, next chapter.

**Note:** In addition to the PC software, the transmitter provides e-Card copy function which makes easy, quick copying features without using software.

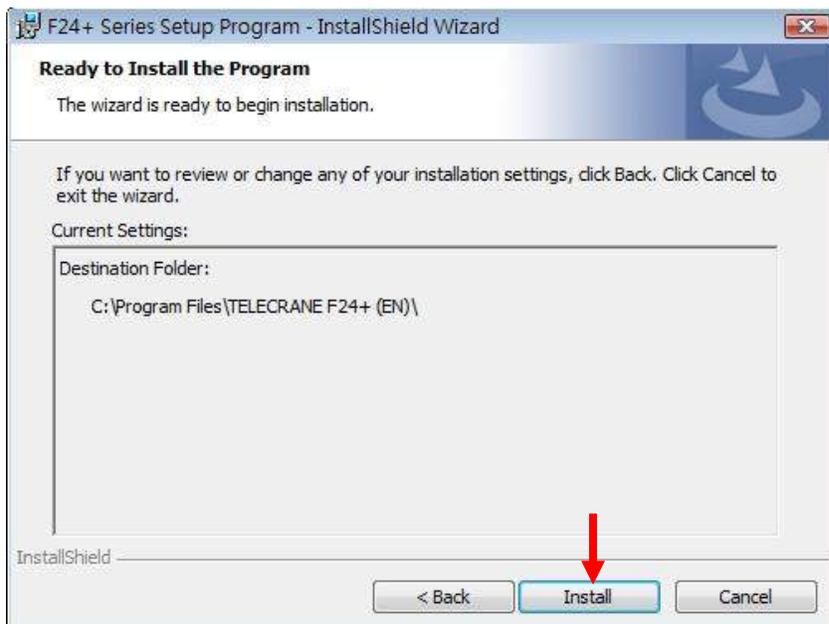
# Chapter 3 SOFTWARE & COPY FUNTIONS

## F24+ series PC Software Installation

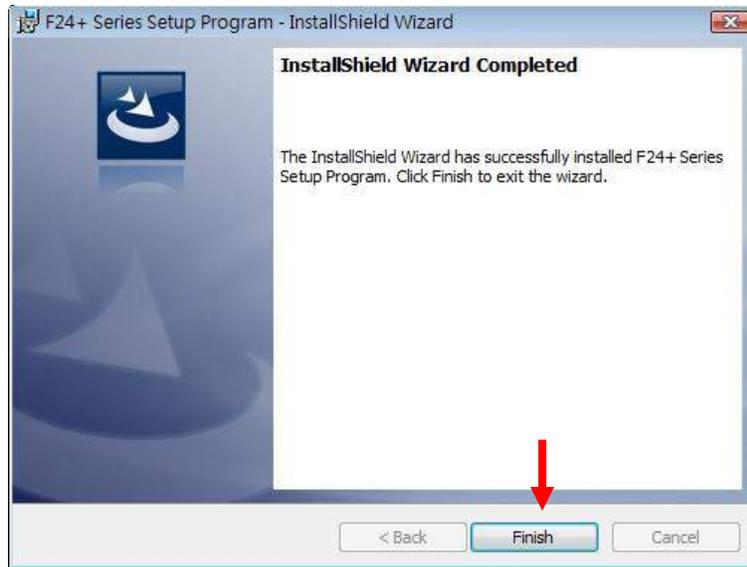
1. Insert F24+ CD into CD-ROM Drive, the “auto-run” program will be pop up automatically.
2. Click “Next “for continue installation.



3. Click “Install”



4. Click "FINISH" for complete the installation.



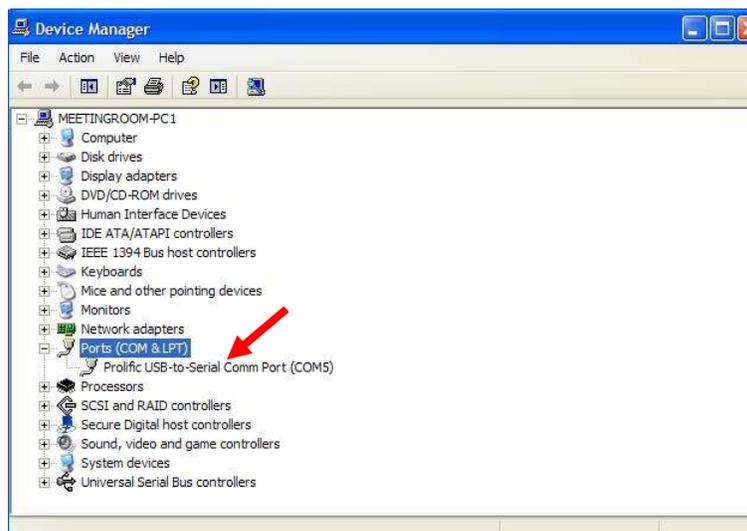
## USB Driver Installation

1. Go back to the F24+ series PC program file, install "PL2303\_Prolific\_DriverInstaller\_V.1.8.0".
2. Double click PL2303 installer icon then the USB Driver program will be installed automatically.

## How to use F24+ series PC program

### ■ Reading / Writing the e-Card

1. Before using F24+ software, check the COM port number which is being occupied by the USB cable. You may find the COM port number from Control Panel/System/Hardware/Device Manager.



- Pick up the e-Card from transmitter or receiver, and insert into the slot at the side of USB cable.



- 
 COM Port Selection: Select a COM port which USB cable is connected

- 
 Read e-Card Setting:



- 
 Writing to e-Card:

Make sure the e-Card has been inserting into the slot of USB interface cable.

- Click “Write Setting”
- Click “Finish” completing the writing

**Note** : Do not remove or disconnect the USB cable during reading or writing.

■ Changing pushbutton function

Read data setting from e-Card.

1. From main (Function-Setting) page, click any function blocks you would like to program. The pushbutton function table will drop down immediately.
2. Select any function block from the list.
3. To change the other pushbutton function setting, please repeat steps 2 and 3.

**Note:** For further information about the function definition, please refer to the ANNEX for more detail explanation.



■ Saving the file:

To complete function setting and customer information of the remote, please make a copy on your computer for after service and future data management.

1. Click "SAVE file" button
2. Select the saving folder and file name.
3. Then save the file.

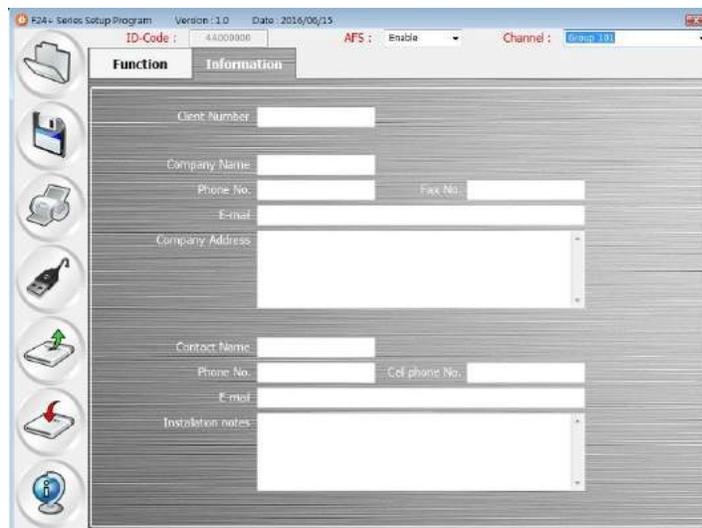


■ Load the file data:

1. Click "LOAD" button.
2. Select the file name then press "OPEN".

■ Filing user information:

Click "User-Information", you may store user information such as company name, purchasing date, address, and phone etc.



-  Printing: To print a file, click "PRINT" button.
-  Version Information: Click "Version Information" for software information
-  Exit F24+ series PC Program: Click "EXIT" button to exit the program.

### e-Card Duplicate Procedure

In addition to F24+ series PC Software procedure to copy the e-Card, the transmitter also provides easy, quick copying feature without using software.

- Check out the transmitter status
  - Make sure the batteries are installed. Confirm transmitter is working correctly and with sufficient battery power.
- Upload e-Card data
  1. Press EMS button and turn the rotary key to "OFF" position.
  2. Insert the e-Card which is destined to copy into the transmitter.
  3. Press "**UP**" pushbuttons and hold still.
  4. Turn the rotary KEY to "ON" position. Then LED power indicator would be flashing :
    - LED flashing in GREEN: The transmitter has completed the e-Card reading procedure.
    - LED blinking in RED: Reading procedure is failed, please repeat the procedure from step1 ~ 4.
  5. Turn the rotary key to "**OFF**" position. Waiting for LED blackout, take off the destined e-Card.
- Download e-Card data
 

Press EMS button and turn the rotary key to "OFF" position first.

  1. Insert the e-Card which is destined to copy from the transmitter.
  2. Press "**DOWN**" pushbutton and hold still.
  3. Turn the rotary KEY to "ON" position. Then LED power indicator would be flashing :
    - LED flashing in GREEN: The transmitter has completed the e-Card writing procedure.
    - LED blinking in RED: Writing procedure is failed, please repeat the procedure from step1 ~ 4.
  4. Turn the rotary key to "**OFF**" position. Waiting for LED blackout, take off the destined e-Card.
  5. Complete.

**Note 1:** To duplicate multiple e-Card, please repeat the writing procedure in step 1~4.

**Note 2:** The uploaded data will be erased automatically from transmitter memory once the transmitter power turns on again.

## ANNEX: DEFINITION OF FUNCTION SETTING TERMS

**Note :** Make sure the e-Card setting matching the remote control hardware setting. i.e. Dual Motor only available to the remote control with double step button models.

Function Setting	Definition
Normal	The relative relay is “ON” when the pushbutton is pressed and held; and relay is “off” when the pushbutton is released.
Toggle	Maintained function: the relay is operated by pressing and releasing. Press the pushbutton and release once for “on”; press and release again to turn off the relay.
ON/OFF	Both pushbuttons are used to operate the same relay. Press the ON pushbutton to activate the relay and press the OFF pushbutton to de-activate the relay.
Magnetic ON/OFF	Both pushbuttons are used to operate the same relay. Press the “Magnetic ON” pushbutton to activate the relay. If the operator wants to de-activate the relay, he must keep pressing the “Magnetic ON” pushbutton and then press the “Magnetic OFF” pushbutton in the meantime. The purpose is to prevent the operator from accidentally pressing the “Magnetic OFF” pushbutton and dropping the load held by the magnetic sucking disc.
ON/OFF/ON	Two relative pushbuttons are set to control two relay outputs. As these two pushbuttons work individual, they are acting as” Toggle”. However, if these two pushbuttons associating together, as the first relay turns on, if you need to change into the second relay turns on, then this setting will be forced to shut down the first one, then the operator must press the button again to turn the second relay on. This function can prevent an instant reverse motor operation; it is helpful to prevent accidental damage.
Hydraulic Pump	<ol style="list-style-type: none"> <li>1. This function allows a pushbutton having an auxiliary relay output, mainly used on hydraulic motors and hydraulic valves.</li> <li>2. Pump On Time &amp; Pump Off Time: According to the application, the relay starting time could be set from 0.1s~15 min as ADVANCE, DELAY, or SIMUTANEUOSLY.</li> <li>3. Hydraulic Control : Select the button group (#1~15) with hydraulic pump.</li> </ol>

Function Setting	Definition
Dual Motor	<p>For 2 steps button model, only one relay active at a time i.e. press UP 1<sup>st</sup> step button, the UP1S relay turns on. And press to 2<sup>nd</sup> step, the UP2S relay turns on while UP1S relay turns off. There are 2 modes for Dual Motor as below</p> <p><b>Dual Motors (1):</b> The 1<sup>st</sup> step relay is not active (bypass) when pushbutton is released from 2<sup>nd</sup> step to neutral position.</p> <p><b>Dual Motors (2):</b> When pushbutton is released from 2<sup>nd</sup> step to neutral position. The 1<sup>st</sup> step relay will turns on for very short time till the pushbutton is totally released.</p>
Acc. Delay	<p>This function uses to set the time interval between acceleration relay (i.e. conduction-delayed time of acceleration relay). It is suitable for accelerative operation only in order to prevent the cranes directly runs to highest speed to damage the motor.</p>
EMS Control	<p><b>Bypass EMS :</b> The relay will not be controlled by EMS button</p> <p><b>Control by EMS:</b> The relay is controlled by EMS button.</p> <p>*Only available in Toggle, ON/OFF, ON/OFF/ON and Magnet mode.</p>
Group Toogle	<p>Relay motion acts as same as Toggle. The difference is when you press the same button <b>twice</b>; the relay still remains ON until another Group Toggle button is pressed. This Feature also can be programmed for different application to setup a group of buttons to execute Toggle function.</p> <p><b>Note: "Group Toggle "</b>is available from group # 1~8</p>
Interlock	<p>The two pushbuttons are interlocked; it's not possible to operate two opposite functions at same time.</p>
Normal Interlock A	<p>The 2 opposite directional pushbuttons are interlocked. The two buttons could not be turned on simultaneously.</p>
Normal Interlock B	<p>The two buttons could not be turned on simultaneously. In addition, the first button turns ON will not be switch OFF if the relative button is being press. i.e. UP and DOWN button preset in Normal Interlock(B),When UP relay turns ON, press DOWN button then the UP relay remains ON without interruption.</p>
Toggle Interlock	<p>The two relays which set in Toggle Interlock mode could not be turn on simultaneously. i.e. UP and DOWN relays are preset in toggle interlock. When UP relay is ON, press DOWN button then the UP relay turns OFF while DOWN relay turns ON.</p>
Non-Interlock	<p>The two pushbuttons can be operated at the same time: When the application allows operating at the same time two functions which are usually opposite to one another.</p>

Function Setting	Definition
Interlock Delay Time	<p>“Interlock Delay Time” is delay time between 2 opposite pushbuttons are being press one after another. i.e.: while crane is moving one direction (forward), moving opposite direction (backward) immediately would be dangerous specially when crane is hooking up the heavy object. The object may sway if crane does not completely stop before moving into opposite direction. Therefore the interlocked delay time could potentially prevent it. Normally, the interlocked delay time should be larger than the duration of crane stop.</p>
AFS	<p>First all, each channel group preset with 5 different channels.</p> <p><b>“AFS (STD)”</b>—Auto Freq. Selection (Standard)  The remote control will select the most pure channel automatically from each Channel Group during operation.  If freq. interference occurs during operation, the remote control will select the next most pure channel automatically. This feature makes operating free from radio interference.</p> <p><b>“AFS (ECO)”</b> -- Auto Freq. Selection (Power-Saving)  The AFS (ECO) is a semi-auto frequency selecting system.  If freq. interference occurs during operation, TX has to be rebooting in order to select a new pure channel.  AFS (ECO) is the factory default mode, has been proved to meet the needs of most users and with the battery efficiency advantages comparing to AFS (STD).</p> <p><b>“Single CH”</b>—specified channel (freq.) for work  The remote control will work in the specified channel only.</p>
Channel	<p>There are total 32 groups with 160channels. Select the group from No. 1~32 when using AFS or manually select single channel when AFS disable.</p>
Power-On Mode	<p>Any pushbutton/Start-Pushbutton/Password:  <b>Any pushbutton:</b> Pressing any button to power on the receiver.  <b>Start-Pushbutton:</b> Pressing “START” button to power on the receiver.  <b>Password:</b> The selection menu of key1, key2, key3, key4, Key5, and Key6 are popped up when Password is chosen. Allow the operator to select any combination of these 6 keys. Operator has to enter password before turning on the transmitter. The purpose is to prevent the unauthorized person from operating the remote controller or machine.</p>
Take & Release	<p>The receiver is available to be controlled by multiple users with maximum 15 transmitters, but only one transmitter allows for controlling at a time (First-come, first-served). Free from other users radio interference after one taking control of the receiver. Press EMS button for releasing the control to others.</p> <p>(1) Select Take &amp; Release “Enable”  (2) Select the transmitter from No. 1~15 or receiver for writing data.</p> <p>Note: Do not interchange the e-Card between transmitter and receiver when using “Take &amp; Release”</p>

Function Setting	Definition
Inching 1 &2	<p>The relative relay will be conducted within a certain time, in order to operate with short and precision movement. There are 2 ways to perform this function:</p> <p><b>Inching 1:</b> Once “START” pushbutton is pressed, just presses the relative motion pushbutton then can perform inching motion. To release this function, just press “START” pushbutton again.</p> <p><b>Inching 2:</b> Press and hold “START” pushbutton and press the relative motion pushbutton to perform inching motion.</p>
Inching Time	<p>“Inching time” can be set from 0. 1~3.0 seconds. This function is used to operate crane with short and precise movement (e.g. accurate position). “Inching Time” is the same as the working time for the relative relay that is controlled by executing “Inching” control function.</p>
Transmission Mode	<p><b>Non-continuous transmitting mode:</b> After “Power-On”, the transmitter will transmit the signal only when the pushbutton is pressed. This mode can save the power of transmitter.</p> <p><b>Continuous transmitting mode:</b> Transmitter will continuously transmit signal once transmitter is being Power-On.</p>
Auto Off (TX)	<p>This function refers to turn off the Transmitter after a given idle time while transmitting the STOP signal to switch off the receiver.</p> <p>*Only available under “continuous transmitting” mode.</p>
e-Card Copy	<p>Enable/Disable: Select “Enable” to unlock the e-Card Read/write protected for being duplicated by copier. Or “Disable” to lock the e-Card Read/write protected for being duplicated by copier.</p>
LED OFF-Time	<p>This setting allows you to select the LED intermittent time to save transmitter power. i.e.: If 1 second is being selected, the LED will be lighted 0.6 second and off 1 second as cycle.</p>
TX Power	<p>The emission power of the transmitter is adjustable according to the user’s requirement. This option is providing 5 stages for controlling distance. The higher emission power, it consumes more battery power.</p>
Start-Alarm	<p>This function allows the user to activate R0 relay for controlling external alarm device during Power-On and Power-Off the receiver. The duration is available from 2~6 seconds.</p>
Passive EMS	<p>This setting allows user to select the radio interfering duration can be bypassed. If the radio interfering duration not exceeds the “<b>Passive EMS</b>” setting time, then the receiver is still in operation. If the interfering duration exceeds the setting time, then the receiver will stop working. This stop action is called “<b>Passive EMS</b>”.</p>

Function Setting	Definition
Passive Act	<p>If receiver doesn't receive the correct signal over a particular time, then the receiver will go into "<b>Relay-Off</b>" or "<b>Power-Off</b>" mode.</p> <ol style="list-style-type: none"> <li>1. <b>Relay-Off</b> (Stop motion): Only the motion relays go to OFF status. The Main relay remains ON. As long as the correct signal received again, the remote function can be operated without rebooting.</li> <li>2. <b>Power-Off</b> (Shutdown): It means that the Main relay will be OFF. User need to reboot the remote control system to continue operating.</li> </ol>
AUTO OFF (RX)	<p>User can set the receiver standby time; exceeds the setting time then the receiver MAIN Relay will be turned off automatically.</p>