# TELECRANE F21-E2B series

# Industrial Radio Remote Controller

# Technician's Manual

# CHAPTER 1.

# Installation and Function Setting

## 1-1 PRECAUTIONS DURING INSTALLATION

1. To avoid electric shock, please power off the main power source of cranes before installation.

2. When installing the receiver, choose the right location that is free of spark contacts, such as away from motors. Relays and, cables must avoid going near high-voltage wiring or facilities. Also need to consider the crane movement is free from any corner of the buildings.

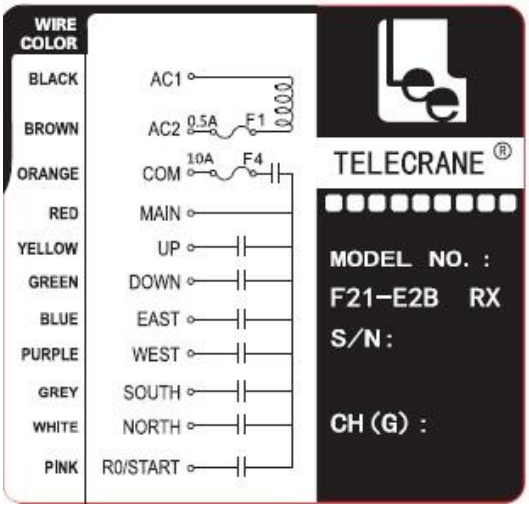
3. Receiver must be fastened securely. Or it may run into the crane, causing the receiver loose and fall.

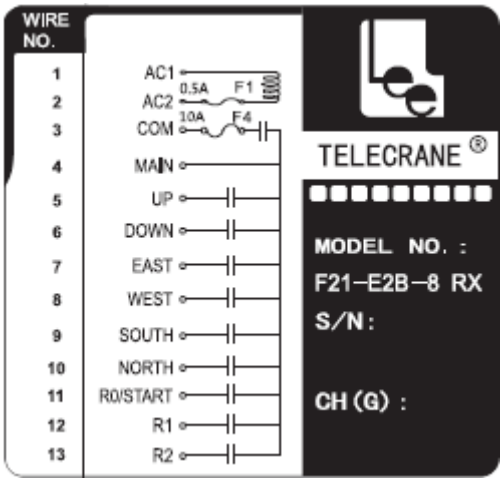
4. Make sure you are fully understanding the crane circuits and power distribution as well as the function setting of remote controller (with relay output), to avoid incorrect wiring.

5. Receiver cannot be installed in the electrical control box, the correct way is to install the receiver on the appropriate location (For example: the top side (or external) of control box), then have the receiver output cables into the electrical control box to make the appropriate connections.

6. F21-E2B series contain over 4.3 billion unique available ID code. However, to avoid interference problem, please make sure if there's any same ID code products in your working site while installing.

### 1-1-1 Receiver wiring diagram






## 1-2 Receiver power transformer voltage selection

F21-E2B series receiver provides with 6 kinds of Transformer (24 VAC、36VAC、48 VAC、110 VAC、220VAC、380VAC) that allows user to choose based on the power input on site and the designated voltage will be set when the receiver is made in factory.

## 1-3 Function Setting

This 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.

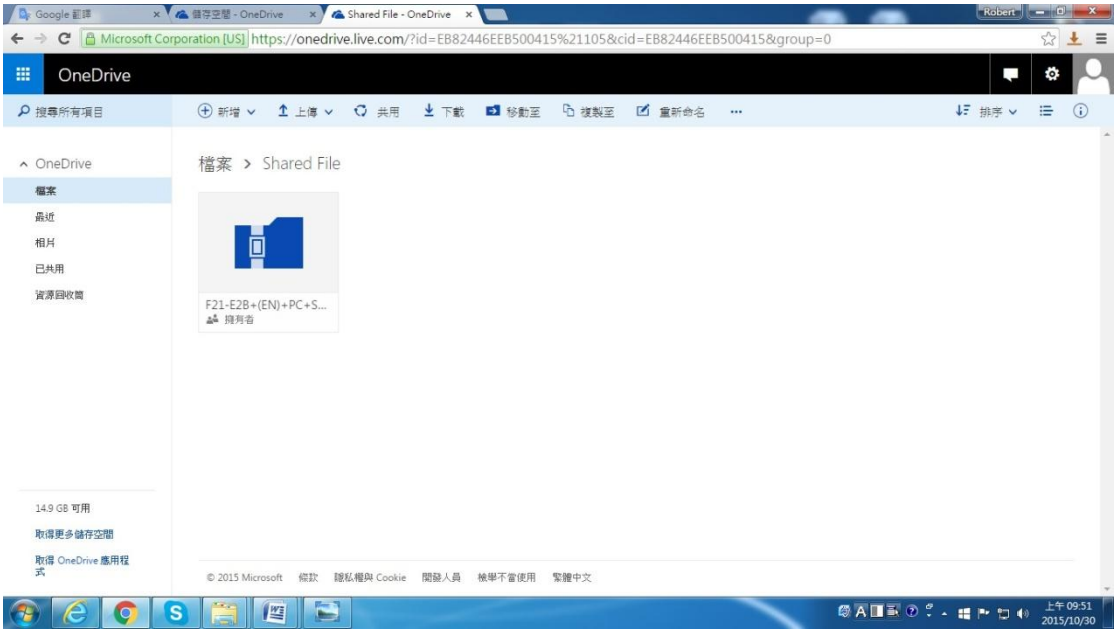
**Note**: Although F21-E2B series PC software provides an easy way to read and write e-Card, F21-E2B series transmitter would also provide an easy, quick copy function without software as well (Please read Chapter 3).

# CHAPTER 2.

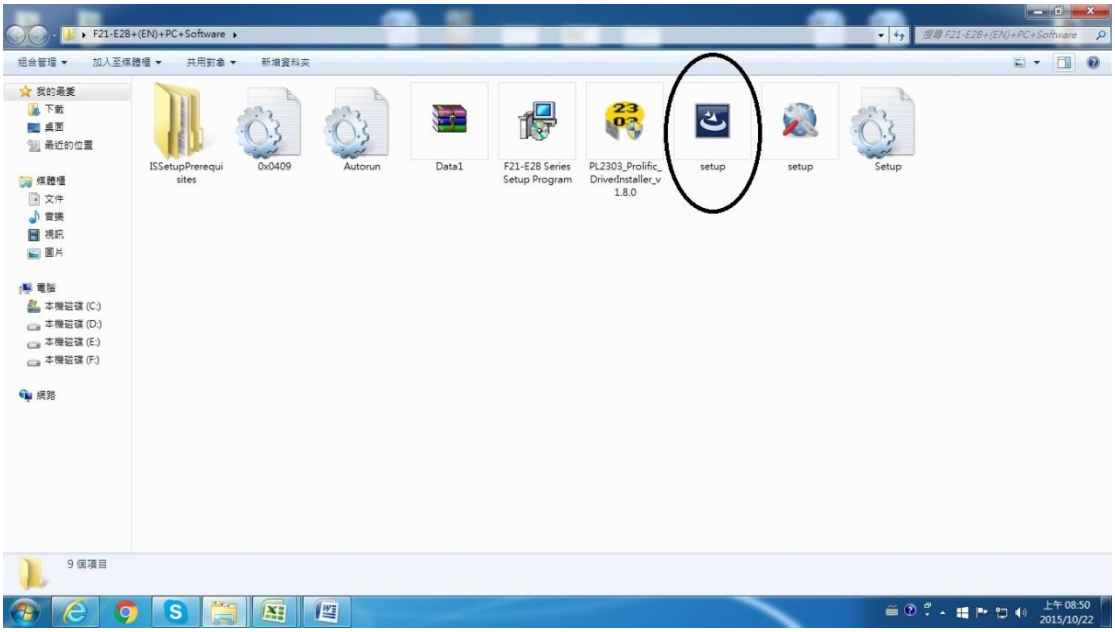
# SOFTWARE & COPY FUNTIONS

## 2-1 F21-E2B series PC Software Installation

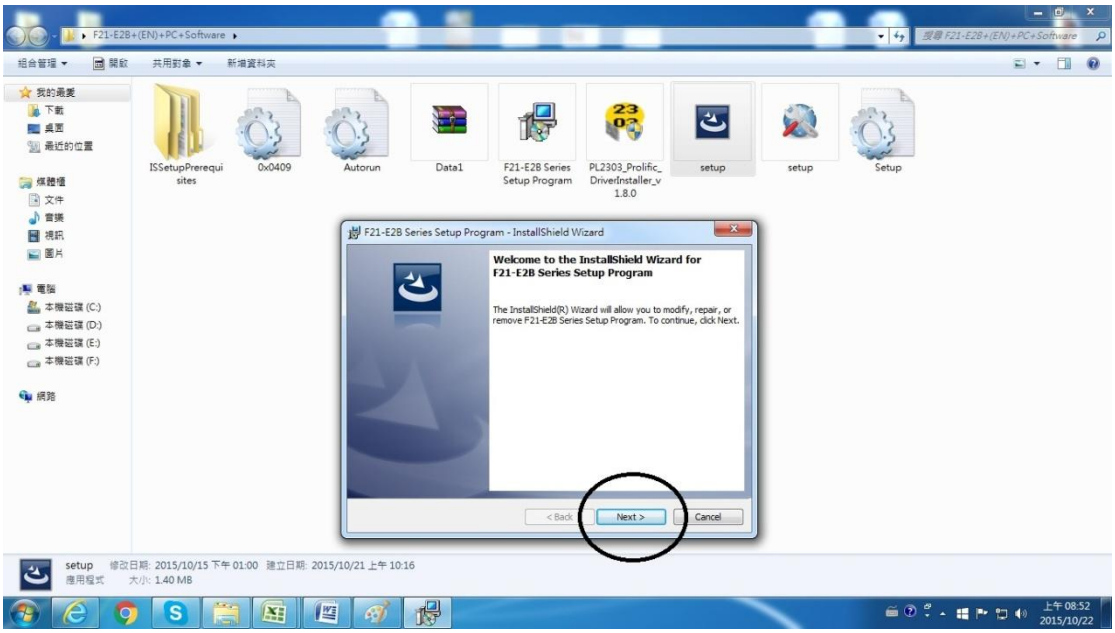
1. Go to the specified cloud disk (Microsoft OneDrive) and open the shared file.
2. The cloud disk Destination URL will be provided by Array Electronic Co., Ltd.



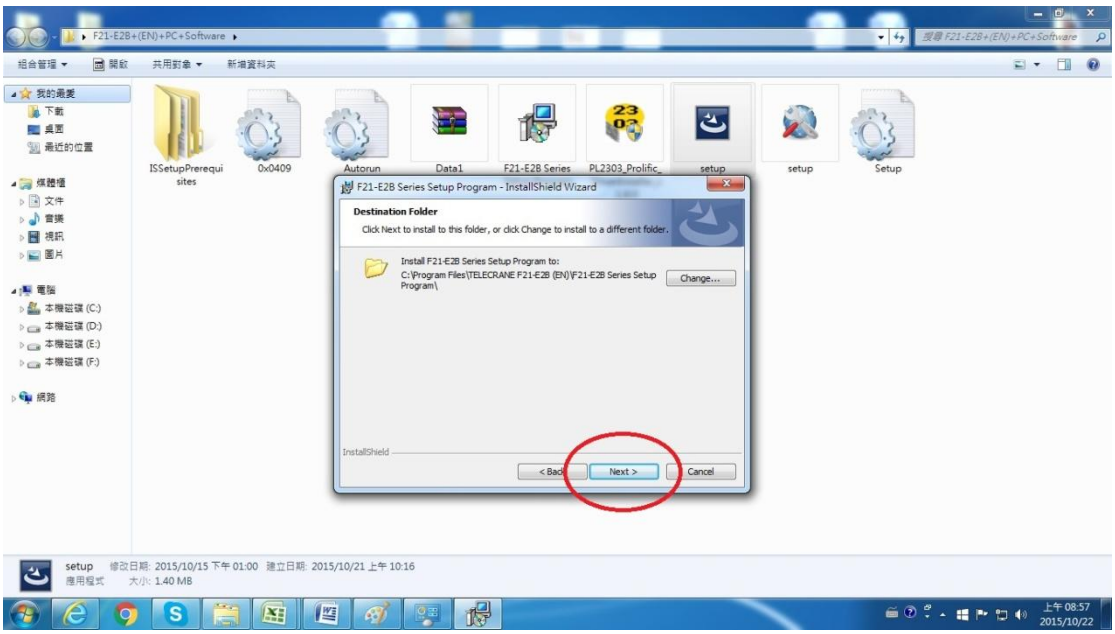

1. Open program file, double click “SET UP” icon and continue the installation.



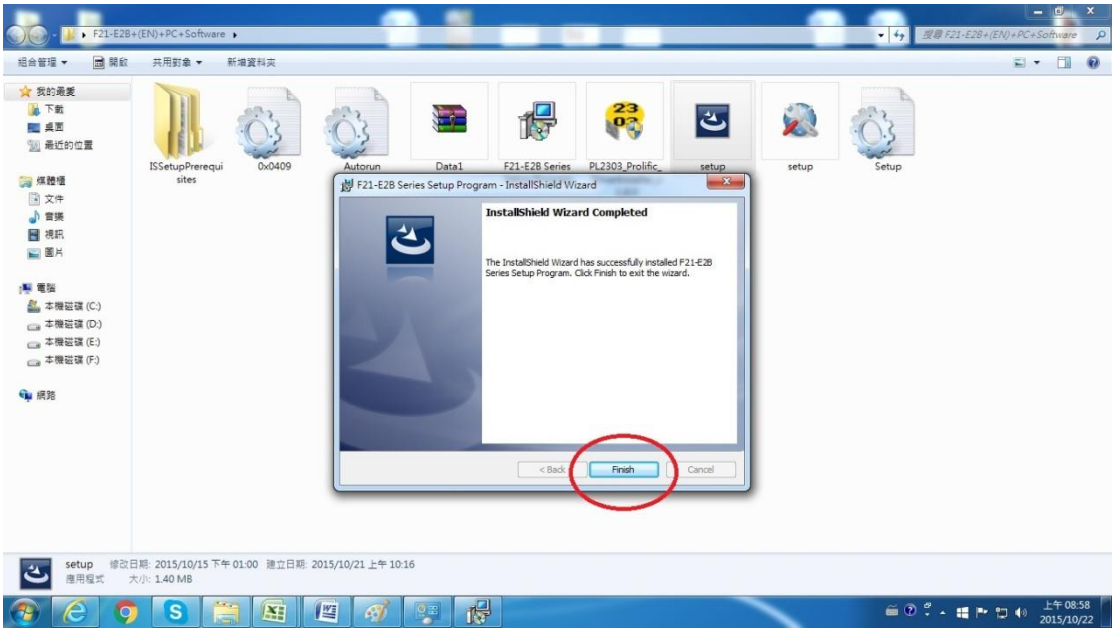
2. Press “NEXT” button.




3. Press “NEXT” button.

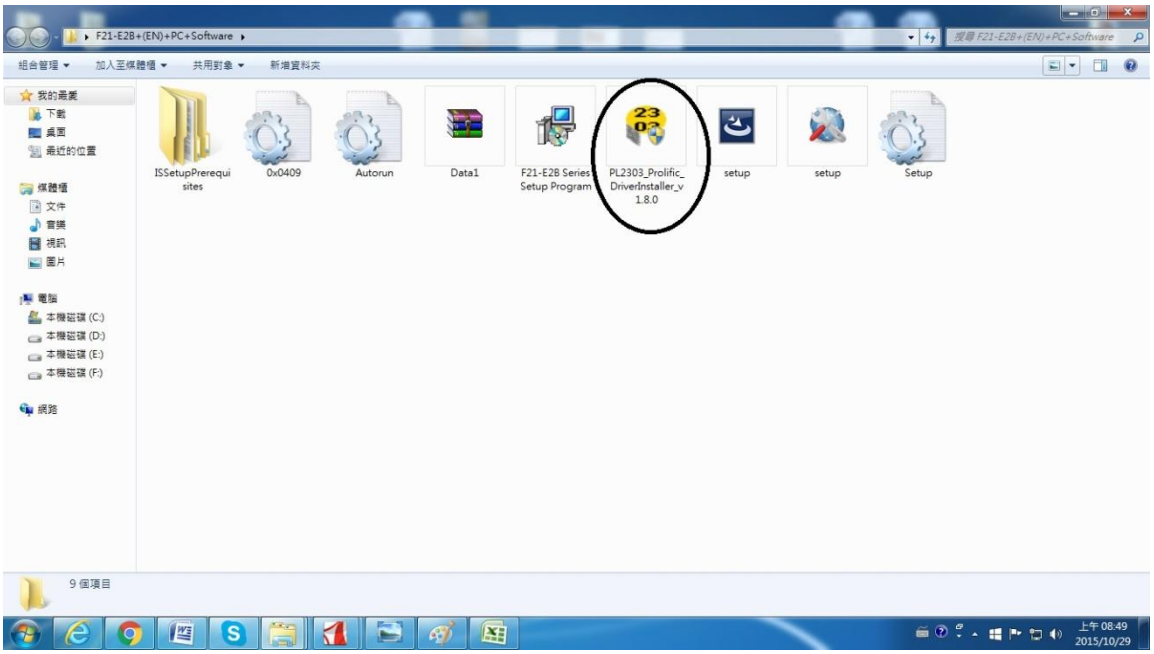


4. Press "FINISH" button, the installation procedure is completed.




## 2-2 USB Driver Installation

1. Go back to the F21-E2B 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.



# 2-3 How to use F21-E2B series PC program

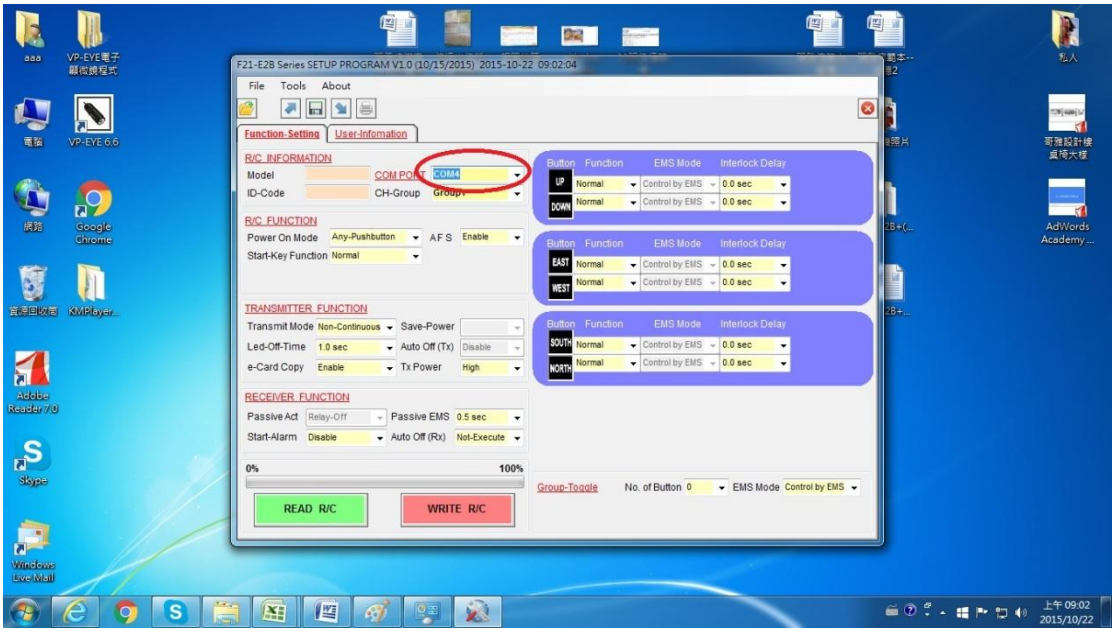
## 2-3-1 Connect USB interface cable to computer

User can connect USB interface cable to PC any USB port which is available.

## 2-3-2 F21-E2B series PC program execution

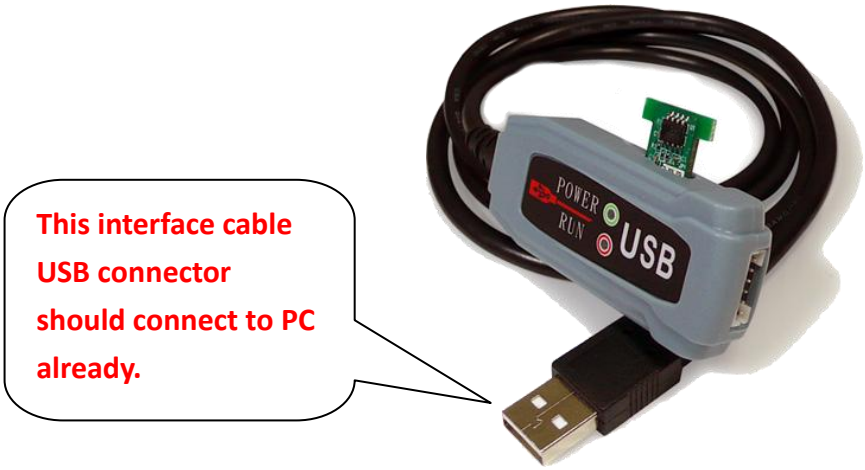
Double click the “F21-E2B series setup program” icon on desktop


F21-E2B series PC program will automatically select the correct COM port



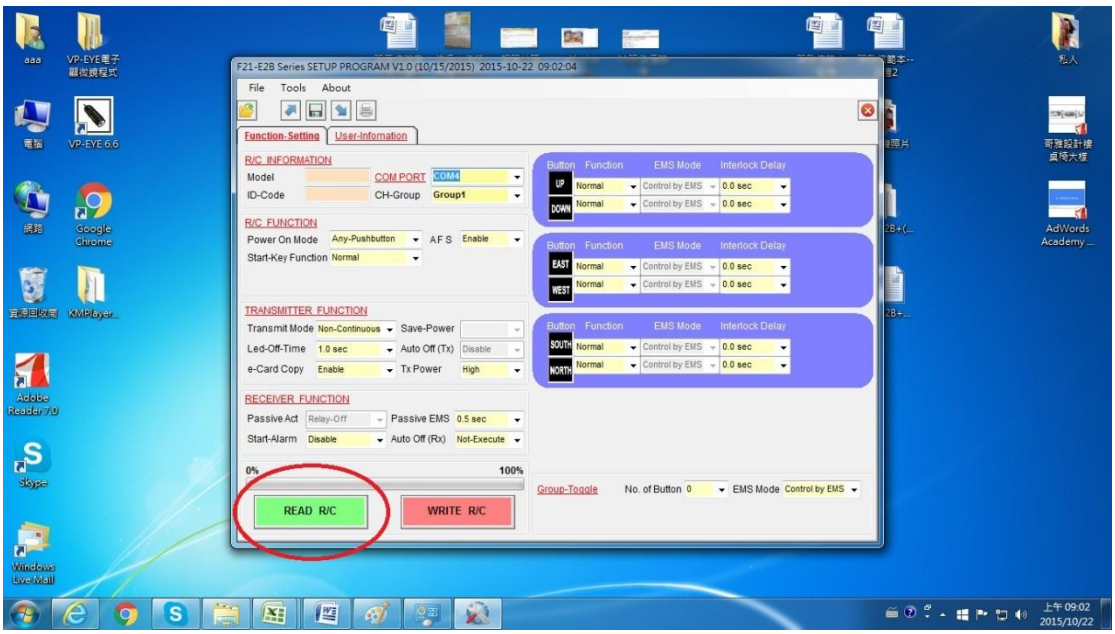
## 2-3-3 Connect e-Card with USB interface cable

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




## 2-3-4 Read the function setting from e-Card.

1. Make sure the e-Card has been put into the slot of USB interface cable.
2. Press " READ R/C" for reading e-Card function setting.
3. After achievement, press the "OK" button.



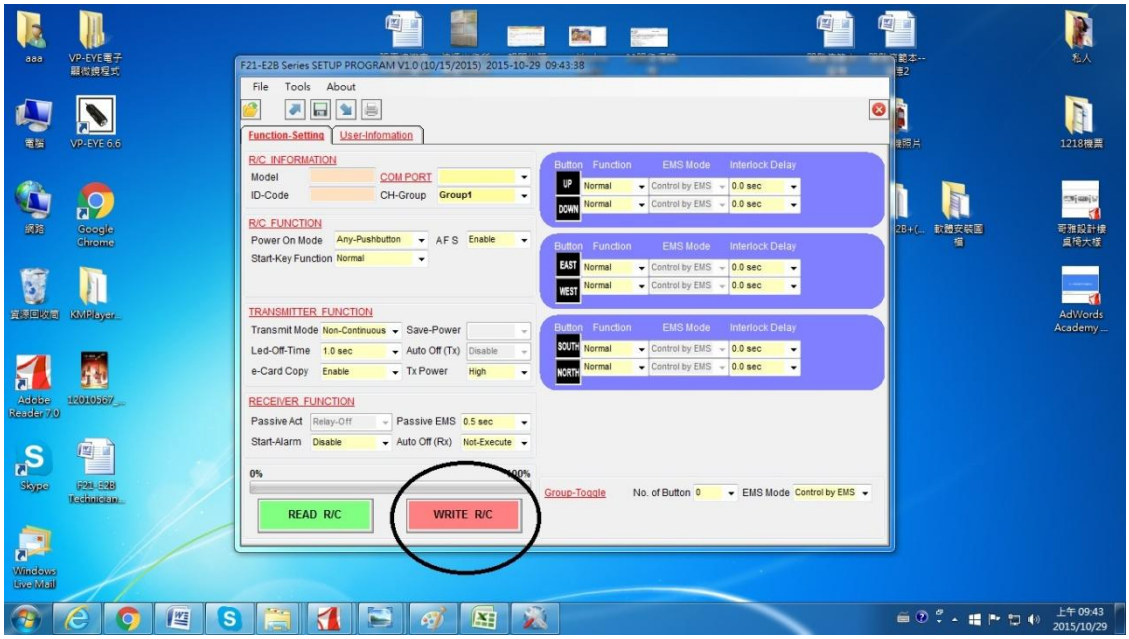

**Note:**

**Use the F21-E2B series PC software to read / write e-Card, please be patient to waiting the whole procedure completed.**

**To avoid unexpected data corruption, do not pull out the e-Card or USB cable when perform read / write procedure.**

## 2-3-5 Write the new settings to e-Card

1. Make sure the e-Card has been put into the slot of USB interface cable.
2. Press "WRITE R/C".
3. After achievement, press the "OK" button.




**Note:**

**Use the F21-E2B series PC software to read / write e-Card, please be patient to waiting the whole procedure completed.**

**To avoid unexpected data corruption, do not pull out the e-Card or USB cable when perform read / write procedure.**

## 2-3-6 Change pushbutton function setting

1. Read data setting from e-Card.
2. From main (Function-Setting) page, click any function blocks you would like to program. The pushbutton function table will drop down immediately.
3. Select any function block from the list.
4. 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.
- Press "EXIT" to close function table without change.

## 2-3-7 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. Press “SAVE” button
2. Select the saving folder and file name.
3. Then save the file.

## 2-3-8 Load the file

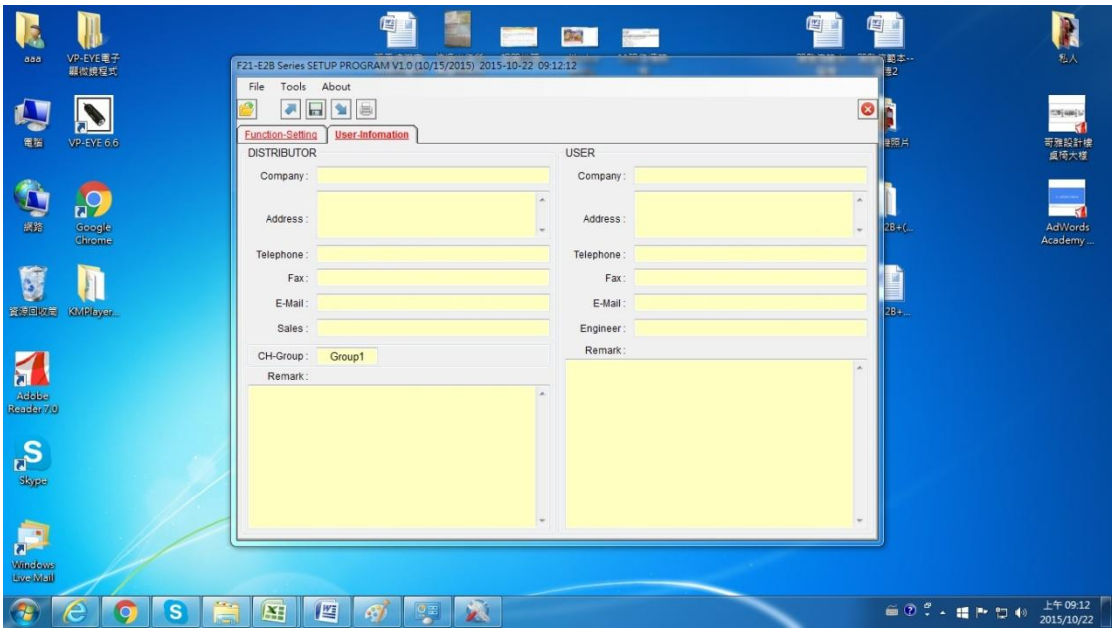
To load file (data):

1. Press “LOAD” button.
2. Select the file name then press “OPEN”.

## 2-3-9 Filing user information

You may store user information such as company name, purchasing date, address, and phone etc.

1. Click "User-Information".
2. Input the customer information.



## 2-3-10 Print 

To print a file, press “PRINT” button.

**Note:** Printing operation can only print the last page when printing. To print another page, please select the screen to another page and then press the print button.

## 2-3-11 Exit F21-E2B series PC Program

Press the “EXIT” button to close the program.

# CHAPTER 3. e-Card Duplicate Procedure

Except in Chapter2 listed F21- E2B series PC Software procedure to copy e-Card, F21-E2B/E2M/E2S/E2B-8/E2M-8 transmitters can also provides easy, quick copy feature without using software.

**Note:** F21- E2B series contain 5 different transmitters; the copy procedure is also different. For E2B/E2B-8 and E2S, please read 3-1. For E2M/E2M-8, please read 3-2.

## 3-1 For E2B / E2B-8 / E2S Transmitter

### 3-1-1 Check out the transmitter status

Make sure the batteries are installed. Confirm transmitter is working correctly and with sufficient battery power.

### 3-1-2 Read e-Card data (Upload)

1. For E2B/E2B-8, remove the magnetic KEY. For E2S, turn the rotary key to "OFF" position.
2. Insert the e-Card which is destined to copy into the transmitter.
3. Press "**STOP**" and "**UP**" two pushbuttons simultaneously, and hold still.
4. For E2B, return the magnetic KEY. For E2S, turn the rotary KEY to “ON” position. Than 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) to 3).
5. For E2B/E2B-8, remove the magnetic KEY. For E2S, turn the rotary key to "**OFF**" position. Waiting for LED blackout, take off the destined e-Card.
6. Complete.

### 3-1-3 Write e-Card data (Download)

1. For E2B/E2B-8, remove the magnetic KEY. For E2S, turn the rotary key to "**OFF**" position.
2. Insert the e-Card which is destined to copy into the transmitter.
3. Press "**STOP**" and "**DOWN**" two pushbuttons simultaneously, and hold still.
4. For E2B/E2B-8, return the magnetic KEY. For E2S, turn the rotary KEY to “**ON**” position. Than LED power indicator should 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) to 3).
5. For E2B/E2B-8, remove the magnetic KEY. For E2S, turn the rotary key to "**OFF**" position. Waiting for LED blackout, take off the destined e-Card.
6. Complete

**Note**: To duplicate multiple e-Card, please repeat the writing procedure in 3-1-3.

**Note:**

1. **After e-Card reading procedure, the upload data will be erased from Transmitter memory once the transmitter power is turn on .**
   **For E2B/E2B-8 : return the magnetic KEY**
   **For E2S : rotate the KEY to "ON" position**
   **For E2M/E2M-8 : lock the battery cap**
2. **E2B/E2M/E2S use the same mode e-Card and E2B-8/E2M-8 use another mode e-CARD, This 2 different modes e-CARD can't use interchangeably. Therefore, the E2B/E2M/E2S e-Card function setting can't copy to E2B-8/E2M-8 e-CARD.**

## 3-2 For E2M / E2M-8 Transmitter

### 3-2-1 Check procedure is the same as the step above. (3-1-1)

### 3-2-2 Read e-Card data (Upload)

1. Press the EMS button. Take off the battery cap.
2. Insert the e-Card which is destined to copy into the transmitter.
3. Press "**UP**" pushbutton, and hold still. (EMS button is still pressed.)
4. By using another hand to lock the battery cap. (Power on the transmitter.) Than LED power indicator would be flashing:
   - LED flashing in green: The transmitter has completed the e-Card reading procedure.
   - LED blinking in red: Writing procedure is failed, please repeat the procedure from step1) to 3).
5. Remove the battery cap. (Power off the transmitter.) Waiting for LED blackout, take off the destined e-Card.
6. Complete.

### 3-2-3 Write e-Card data (Download)

1. Press the EMS button, unplug the battery cap (Power off the transmitter.)
2. Insert a spare e-Card that its data can be overwritten.
3. Press "**DOWN**" pushbutton, and hold still (At the moment, EMS butt3.on is still pressed.)
4. By using another hand to lock the battery cap. (Power on the transmitter.) Than LED power indicator should 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) to 3).
5. Remove the battery cap (Power off the transmitter.) Waiting for LED blackout, take off the destined e-Card.
6. Complete.

**Note**: To duplicate multiple e-Card, please repeat the writing procedure in 3-1-3.

**Note:**

3. **After e-Card reading procedure, the upload data will be erased from Transmitter memory once the transmitter power is turn on .**
   **For E2B/E2B-8 : return the magnetic KEY**
   **For E2S : rotate the KEY to "ON" position**
   **For E2M/E2M-8 : lock the battery cap**
4. **E2B/E2M/E2S use the same mode e-Card and E2B-8/E2M-8 use another mode e-CARD, This 2 different modes e-CARD can't use interchangeably. Therefore, the E2B/E2M/E2S e-Card function setting can't copy to E2B-8/E2M-8 e-CARD.**

# Annex: Glossary of Function Setting

| Function Setting | Setting content | Function Description |
|---|---|---|
| **R/C INFORMATION** | **CH-Group** | **"CH-Group"** (channel group) setting: there are 16 channel groups can be select by user (each channel group contains 5 different communication freq.).<br>User is allowed to select any channel group which the communication efficiency is the best. |
| **R/C FUNCTION** | **Power- On Mode** | **Note**:<br>**1.** Transmitter (TX) are powered by batteries, so turn the TX power on is necessary before activate the receiver go into" Power On" mode. turn the TX power on:<br>For E2B/E2B-8 TX: put on the magnetic key.<br>For E2S TX: Turn the Rotary Key into ON position.<br>For E2M/E2M-8 TX: Release the EMS button clockwise.<br>**2.** " Power On" mode means: Receiver Main Relay was activated by Transmitter and then standby for receiving the next radio control commands.<br>**Start-Pushbutton**: Press the Start-Pushbutton to activate the Receiver Main Relay.<br>**Any-Pushbutton**: The Receiver Main Relay & Motion Relay will be activated once any pushbutton on transmitter is pressed.<br>**Password**: User can set 1 up to 4 pushbuttons (key1, key 2, key 3, key 4) as the password to activate the Receiver Main Relay. User has to press the setting pushbuttons in sequence first and press start-pushbutton then the Receiver Main Relay will be activated. This feature can prevent unauthorized operation.<br>For example: you can set key1=Up, key 2=Down, key 3=East, key 4=West; then the power-on password is" Up, Down, East, West" |
| | **CH-Group & AFS** | **"CH-Group"** (channel group) setting: there are 16 channel groups can be select by user (each channel group contains 5 different communication freq.).<br>User is allowed to select any channel group which the communication efficiency is the best.<br><br>First all, each channel group preset with 5 different channels.<br>**"AFS (STD)"**—Auto Freq. Selection (Standard)<br>The remote control will select the most pure channel automatically from each Channel Group during operation.<br>If freq. interference occurs during operation, the remote control will |

| Function Setting | Setting content | Function Description |
|---|---|---|
| | | select the next most pure channel automatically. This feature makes operating free from radio interference.<br><br>**"AFS (ECO)"** -- Auto Freq. Selection (Power-Saving)<br>The AFS (ECO) is a semi-auto frequency selecting system.<br>If freq. interference occurs during operation, TX has to be rebooting in order to select a new pure channel.<br>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).<br><br>**"Single CH"**—specified channel (freq.) for work<br>The remote control will work in the specified channel only. |
| **R/C FUNCTION** | **Start-Key FUNCTION** | 1. **Normal:** The relative relay is "ON" when the pushbutton is pressed and held, and relay is "OFF" when the pushbutton is released.<br>2. **Toggle:** 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.(for example: lighting control)<br>3. **Normal Inching**: Press "START" pushbutton and hold it, then press any motion pushbutton to perform inching motion. (When "Normal Inching" is chosen.)<br>4. **Toggle Inching**: In **"Power- On"** mode, press "START" pushbutton and released, then press any motion pushbutton to perform inching motion. If you want to release Toggle Inching function, just to press "START" pushbutton and released again. (When "Toggle Inching" is chosen.)<br><br>The timing of **inching** mode use is:<br>The specified motion relays need to be conducted within a very short time, in order to remote control precision movement. |
| **Transmitter FUNCTION** | **Transmit Mode** | **Non-continuous Transmitting Mode**: After "Power-On", the transmitter will transmit the signal only when the pushbutton is pressed. This mode can save the power of transmitter.<br><br>**Continuous Transmitting Mode**: Transmitter will continuously transmit CH-Group RF carriers in tern once transmitter is being Power-On. |
| | **Save Power** | This function is used to turn off the Transmitter automatically after idle time (idle time period can be set 30 sec ~ 10 min). |

| Function Setting | Setting content | Function Description |
|---|---|---|
| | | *Only available under “Continuous transmitting” mode. |
| | **Auto-OFF(TX)** | Beyond the Transmitter setting idle time (Auto-Off Time), transmitter will transmit stop signal to switch off the receiver main relay and then turn the TX power off.<br>*Only available under “Continuous transmitting " mode. |
| | **LED- OFF-Time** | This setting allows you to select the transmitter LED On Off Cycle to save transmitter power.<br>For example: If “**LED- OFF-Time” set** “4.0 sec” , then the LED On Off Cycle is 4 seconds. The transmitter LED lighting duration 0.6 sec is fixed. |
| **Transmitter FUNCTION** | **e-card copy** | 1. “Enable” means setting e-card can be copied not only by F-21 E2B series PC program but also by transmitter.<br>2. “Disable” means setting e-card can’t be copied not only by F-21 E2B series PC program but also by transmitter. |

| Function Setting | Setting content | Function Description |
|---|---|---|
| **RECEIVER FUNCTION** | **Passive EMS** | This setting allows user to select the radio interfering duration can be bypassed. If the radio interfering duration not exceeds the "**Passive EMS**" setting time, then the receiver is still in operation.<br>If the interfering duration exceeds the setting time, then the receiver will "**Power Off**" (Main Relay Off) automatically.<br>For example: If user presses anyone motion pushbutton on transmitter and hold on , then remove the transmitter batteries beyond the "**Passive EMS**" setting time, the receiver will "**Power Off**" automatically .<br><br>This safety protect action is called "**Passive EMS**" |
| | **Passive Act** | TX in "**Continuous Transmitting**" mode, if receiver doesn't receive the correct signal over a particular time, then the receiver will go into "**Relay-Off**" or "**Power-Off**" mode.<br>1. **Relay-Off** (RX Stop motion): Only the motion relay OFF, the Mai n Relay is still ON. As long as the correct signal received again, the remote function can be operated.<br>2. **Power-Off** (RX Shutdown): It means that the Main relay will be OFF, and the remote function can't be operated.<br>This function will be activated only if the range exceeds the maximum remote control distance.<br><br>TX in "**Noncontiguous Transmitting**" mode ("**Passive Act**" can't be set), if receiver doesn't receive the correct signal over a particular time, then the receiver will go into "**Relay-Off**" mode only. |
| | **AUTO OFF (RX)** | User can set the receiver idle time; exceeds the setting idle time then the receiver will be" **Power-Off**" automatically.<br><br>This function is cooperated with "**Noncontiguous Transmitting**" mode. |
| | **Start-Alarm** | If Relay Ro connect to crane buzzer, user can set "**Start-Alarm**" time from2 to 6 sec. |

| Function Setting | Setting content | Function Description |
|---|---|---|
| **Button function** | **Normal** | The relative relay is "ON" when the pushbutton is pressed and held, and relay is “OFF” when the pushbutton is released. |
| | **Toggle** | 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.<br>For example: lighting control |
| | **ON/OFF** | Both opposite directional 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.<br><br>For example: water pump control |
| | **Magnetic ON/OFF** | Both opposite directional 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.<br><br>The purpose is to prevent the operator from accidentally pressing the "Magnetic OFF" pushbutton and dropping the heavy load held by the magnetic sucking disc |
| | **ON/OFF/ON** | This function will set up a pair of opposite directional pushbuttons to control 2 relays output: When the 1st relay turns on, if you push the 2nd pushbutton, then this setting will shut down the 1st relay only,<br>then user must press the 2nd button again to turn the 2nd relay on.<br><br>This function can prevent rapid motor reversal condition occurs and protect the motor equipment safety. |

| Function Setting | Setting content | Function Description |
|---|---|---|
| **Button Interlock Delay** | **Interlock** | The 2 opposite directional pushbuttons are interlocked; it's not possible to operate two opposite functions at same time. |
| | **Non-Interlock** | These 2 opposite directional pushbuttons can be operated at the same time.<br>This application allows 2 opposite motions operating at the same time. |
| | **Interlock Delay Time** | "Interlock Delay Time" is the delay time between 2 opposite directional pushbuttons are being press one after another. i.e.: while crane is moving one direction (forward), moving opposite direction (backward) immediately would be dangerous especially when crane is hooking up the heavy load. The load may be kept swinging if crane does not completely stop before moving into the opposite direction. Therefore the interlocked delay time could prevent the occurrence of such a situation. Normally, the interlocked delay time should be larger than the crane stop time. |
| **Button Inching Time** | **Inching time** | "Inching time" can be set from **0.1~1.0** seconds. This function is used to operate crane with short and precise movement. "Inching Time" is the same as the working time for the relative relay which is controlled by executing "Inching" control function.<br>"**Inching**" function is activated by"**Start-Key FUNCTION"** was set as**" Normal Inching"** or **"Toggle Inching" .** |
| **Group-Toggle** | **Group Toggle** | Relays action is same as Toggle. The difference is when you press one of the **Group Toggle** button twice; the relay still remains ON until another **Group Toggle** button has been pressed.<br>**Note**: "**Group Toggle** "Can be set as"4" or"6" up to "8" pushbuttons. |