

# M87P4 Module Evaluation Kit User Manual V1.0

## 1. Initial setup

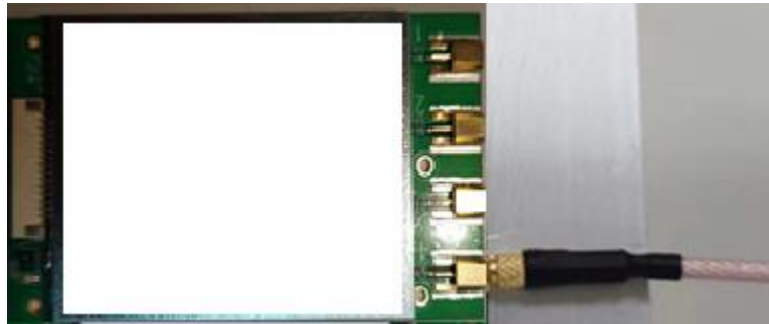
### 1.1 Powering the Reader

Plug the **power cable** in, with the **indicator light** on & reader is ready. As illustrated below:



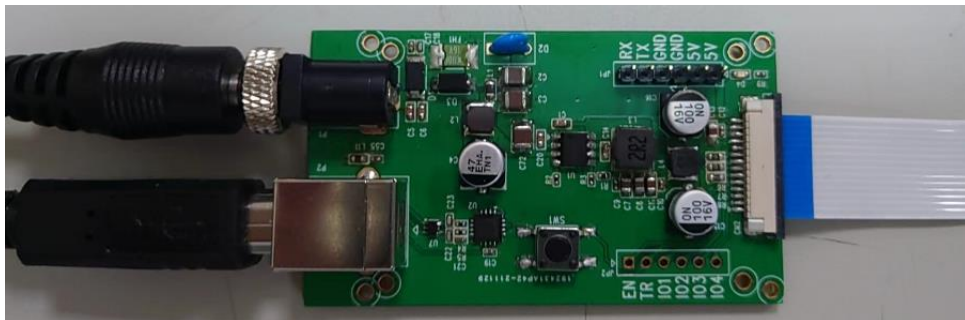
### 1.2 Connecting Antenna to Reader

Connect the antenna with the antenna MMCX port as illustrated below:



### 1.3 Connecting Data Line to Reader

You can connect the reader to your PC via B type USB, as illustrated below:

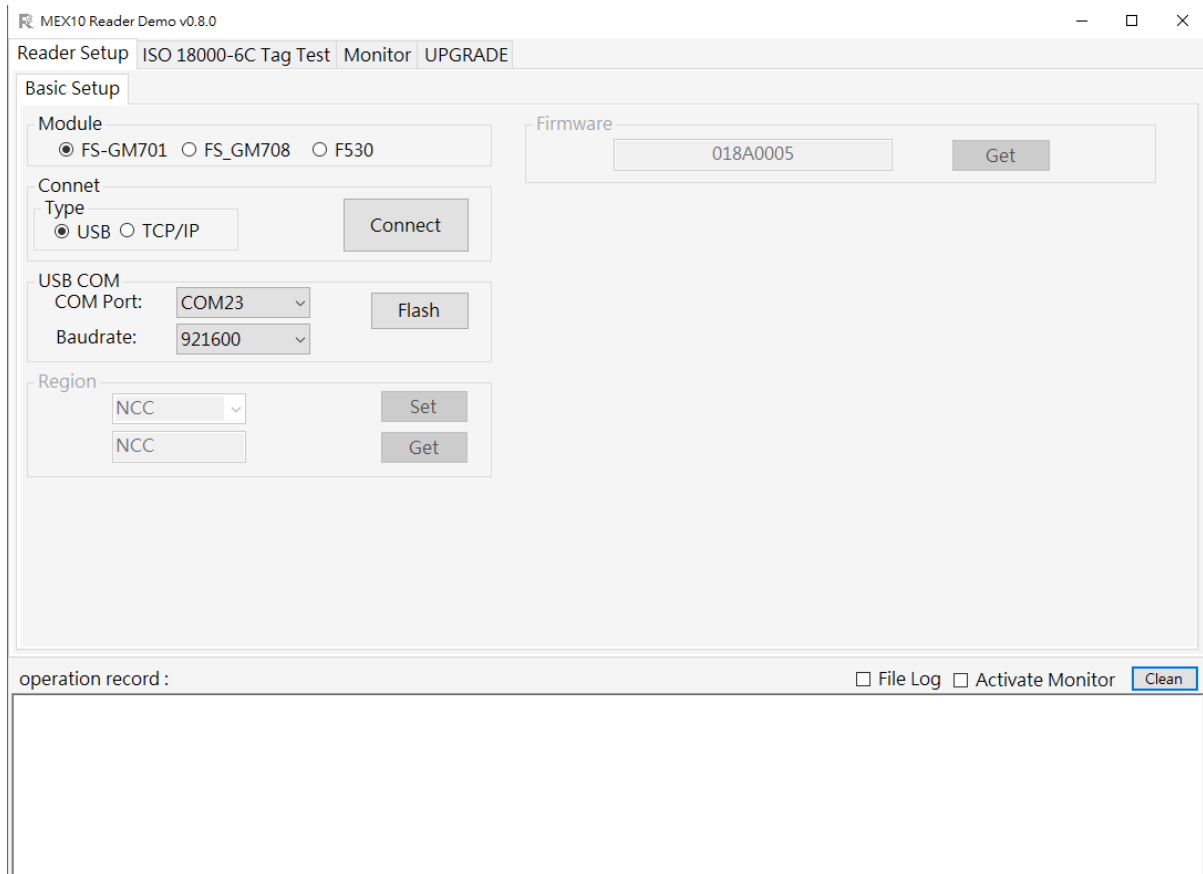


## 2. Connect DEMO SW

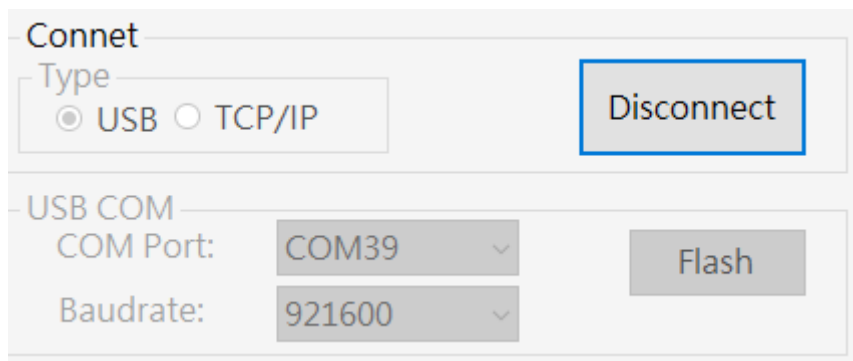
Double-click **EagleDemo.exe** to run the software.

### 2.1 Connect

2.1.1 Open the software and it will shows as below:



2.1.2. Please select **USB** as **Connection**, Choose the corresponding **Serial Port** and **Baud Rate** (default baud rate is 921600). As illustrated below:



2.1.3. Click **Connect**, if it is connected successfully, the **FW version** will display as below:

operation record :  File Log  Activate Monitor

```

2023-07-03 02:06:06.934 Connect COM39@921600
2023-07-03 02:06:06.939 GetFirmwareVersion
2023-07-03 02:06:06.971 00 01 40 00 02
    
```

2.1.4. Text communication with the reader:

Click on **Get** in Firmware Version or in Reader Region, the following screen displays:

Firmware

01400002

Read

Region

FCC

Set

Get

## 3. Run Inventory function

After connecting the reader with PC, we can start go Inventory Run function. Please select **ISO 18000-6C tag test** as illustrated below:

Reader Setup **ISO 18000-6C Tag Test** Monitor UPGRADE

Inventory

Operation

**Inventory** Abort

Inventory Type

LoopAntenna

Custom

Inventory Stop Condition

Loop Times:   continuous

Conti-Inventory Time:  ms

Warning Occur  2ndSetting

Antenna

1

power

inventory time

inventory run

Select CFG

RF mode:

RF\_Channel  RSSI  TimeStamp

ANT ID  Phase

Data

Inventory Quantity

21

Peak Speed(Tag/s) 0 Max Speed( Tag/s): 267 AVG Speed(Tag/s) 190

Command Duration(ms) 0 Total Inventory Duration 0 00:00:01.256

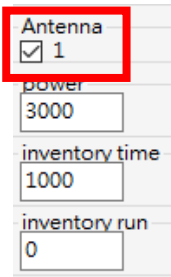
Result

Total Tag Count : **239** Min RSSI: -62.60dBm Max RSSI: -38.73dBm Refresh Save Tag

| #  | Coun | PC    | EPC                                 | Freq(khz) | Rssi(dBm) | ANT1 | Timestamp |
|----|------|-------|-------------------------------------|-----------|-----------|------|-----------|
| 1  | 8    | 30 00 | EE EE 00 00 00 00 00 00 00 00 02    | 925250    | -5301     | 8    | 620874    |
| 2  | 9    | 30 00 | EE EE 00 00 00 00 00 00 00 00 09    | 925750    | -5395     | 9    | 428920    |
| 3  | 12   | 30 00 | EE EE 00 00 00 00 00 00 00 00 0D    | 926750    | -4831     | 12   | 211546    |
| 4  | 11   | 30 00 | E2 00 00 1D 97 08 00 55 23 10 1C DF | 926750    | -5175     | 11   | 175870    |
| 5  | 12   | 30 00 | 00 00 00 00 00 00 00 00 00 00 00    | 926750    | -5001     | 12   | 219103    |
| 6  | 10   | 30 00 | E2 80 69 95 00 00 50 02 FD 98 DA 3C | 926750    | -5099     | 10   | 167488    |
| 7  | 9    | 1C 00 | 53 45 00 00 07 69                   | 926750    | -5457     | 9    | 169213    |
| 8  | 13   | 30 00 | EE EE 00 00 00 00 00 00 00 00 04    | 926750    | -5508     | 13   | 209209    |
| 9  | 10   | 30 00 | EE EE 00 00 00 00 00 00 00 00 0A    | 926750    | -4987     | 10   | 175040    |
| 10 | 6    | 30 00 | E2 00 00 1D 97 08 01 94 23 10 AB C1 | 925750    | -5724     | 6    | 426414    |

### 3.1 Setp1: Enable ANT 1

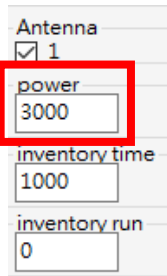
Check mark the ANT1.



Antenna  
 1  
power  
3000  
inventory time  
1000  
inventory run  
0

### 3.2 Setp2: Setting RF Output Power

RF Output Power is the strength of RF output signal from antenna port whose unit is dBm.



Antenna  
 1  
power  
3000  
inventory time  
1000  
inventory run  
0

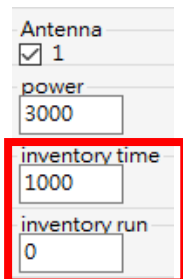
The output power range is 0 - 33dBm. Default RF output power is 30dBm .

### 3.3 Setp2: Setting Inventory time & Run

Setting Inventory time is mean the running time when start inventory command.

Setting Inventory Run is mean the running once when start inventory command.

Inventory stop if which time or run up to the setting value



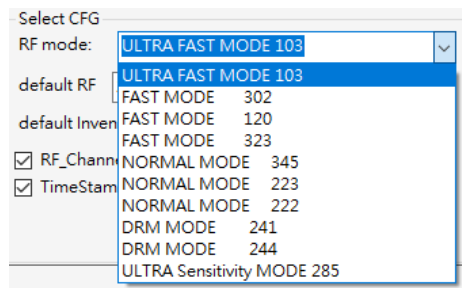
Antenna  
 1  
power  
3000  
inventory time  
1000  
inventory run  
0

The default inventory time is 1000ms.

The default inventory run is 0, which mean “don’t care”.

### 3.4 Setp3: Setting RF-link mode

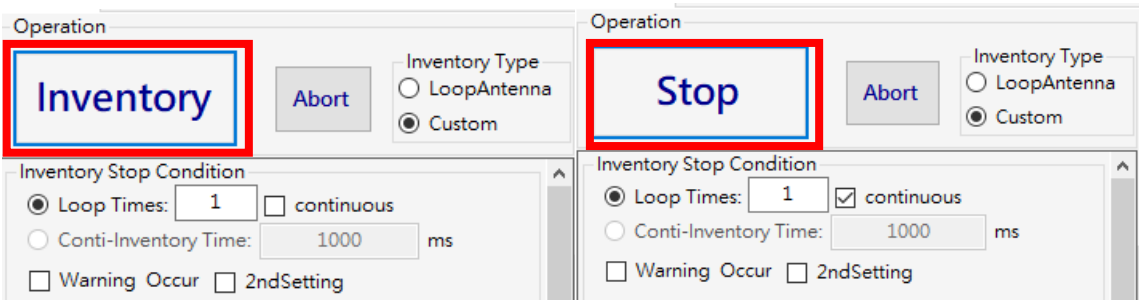
There is different read speed & sensitivity in different RF-link mode. To more detail, please check the **RF-link profile** of datasheet.



Select CFG  
RF mode: ULTRA FAST MODE 103  
default RF ULTRA FAST MODE 103  
default Inven FAST MODE 302  
FAST MODE 120  
FAST MODE 323  
 RF\_Chann NORMAL MODE 345  
 TimeStam NORMAL MODE 223  
NORMAL MODE 222  
DRM MODE 241  
DRM MODE 244  
ULTRA Sensitivity MODE 285

### 3.5 Setp4: Run/Stop Inventory

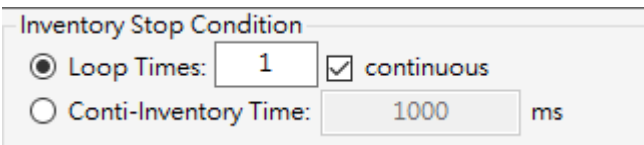
click **Inventory** button to Run Inventory function. click **Stop** button enforce to stop Inventory function.



### 3.6 Parameter of AUTO Stop Inventory

|                 |  |
|-----------------|--|
| Loop time       | Inventory stop when reach the setting of command count.    |
| Conti-Inventory | Inventory stop when reach the setting of Inventory period. |

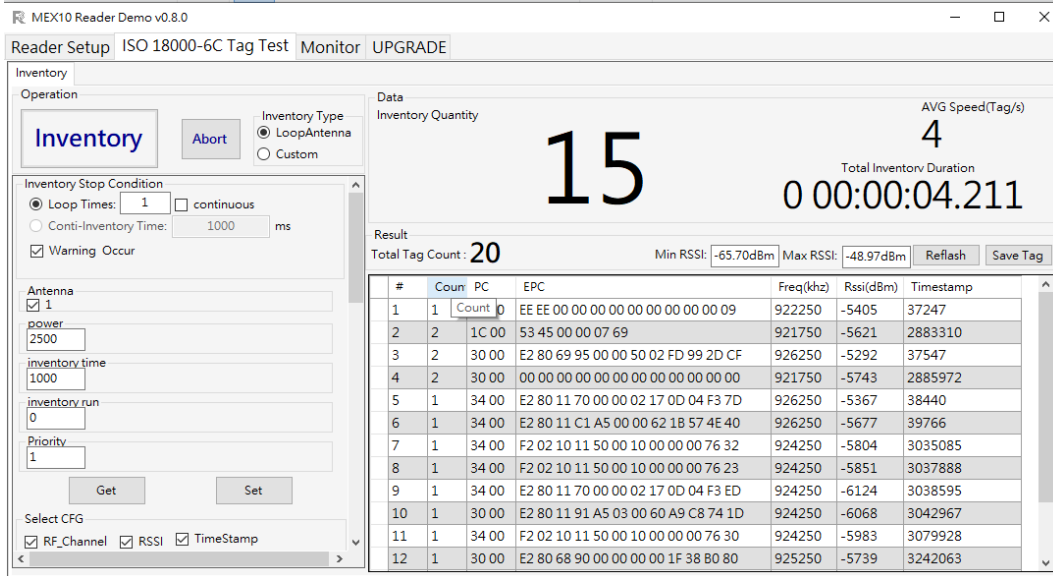
\* it will no stop if tick **continuous**



### 3.7 The parameter of Running Inventory

There are 13 parameters when run inventory as shown as following.

|                          |  |
|--------------------------|--|
| Inventoried Quantity     | Total number of inventory tags since click <b>Inventory</b> .  |
| Peak Speed               | Read Speed of Tag for last one inventory command, unit: Tag/s  |
| Max speed                | MAX Read Speed of Tag for total inventory period, unit: Tag/s  |
| AVG speed                | AVG Read Speed of Tag for total inventory period, unit: Tag/s  |
| Command Duration         | Time between Inventory Command to command, unit: ms            |
| Total Inventory Duration | Total inventory period when click <b>Inventory</b> , unit: ms. |
| Total Tag Count          | Total tags when start Inventory period.                        |
| Count                    | Tag count  |
| EPC                      | EPC data of tag.   |
| PC                       | PC data  |
| CRC                      | CRC data   |
| RSSI                     | The Tag signal strength at the last inventory command.         |
| Carrier Frequency        | Carrier Frequency of tag at the last time.                     |



## 4. Error Display

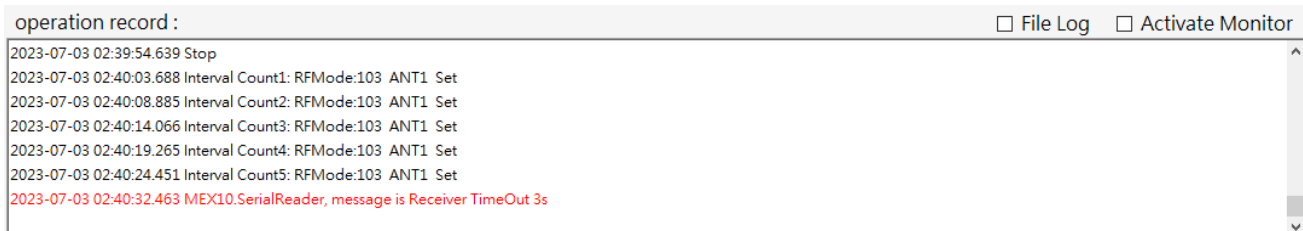
### ◆ ANT error:



#### Reason:

1. ANT is Disconnection to ANT port of module
2. VSWR is too large of ANT, it should be lower than 1.3
3. Reflection RF power too large, please check is there some Metal around ANT.

### ◆ Receiver data time out:



#### Reason:

1. Software CRASH
2. Interface CRASH

## Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

### IMPORTANT NOTE: FCC Radiation

#### Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

#### LABEL OF THE END PRODUCT:

The final end product must be labeled in a visible area with the following "Contains TX FCC ID: 2BEYTM87P1 ". The FCC part 15.19 statement below has to also be available on the label: This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference and

(2) this device must accept any interference received, including interference that may cause undesired operation.



**Validity of using the module certification:**

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization for this module in combination with the host equipment is no longer considered valid and the FCC ID of the module cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

Custom design antennas may be used, however the OEM installer must following the FCC 15.21 requirements and verify if new FCC approval will be necessary.

**Information that must be placed in the end user manual:**

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

**Co-location warning:**

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

**OEM integration instructions:**

This device is intended only for OEM integrators under the following conditions:

The antenna must be installed such that 20 cm is maintained between the antenna and users, and the transmitter module may not be co-located with any other transmitter or antenna. The module shall be only used with the external antenna(s) that has been originally tested and certified with this module.

For all products market in US, OEM has to limit the operation channels in Channel 1 to Channel 11 or 3-9 as specified above by the supplied firmware programming tool. OEM shall not supply any tool or info to the end-user regarding to Regulatory Domain change.

As long as 3 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

**Important Notes:**

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.