

FS-GM708 Module Evaluation Kit

User Manual V1.0

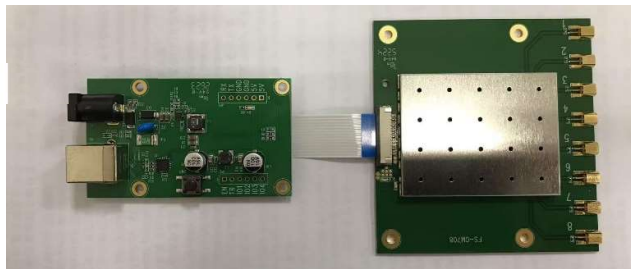
1. Initial setup

1.1 Powering the Reader

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

DC IN: 9~24V

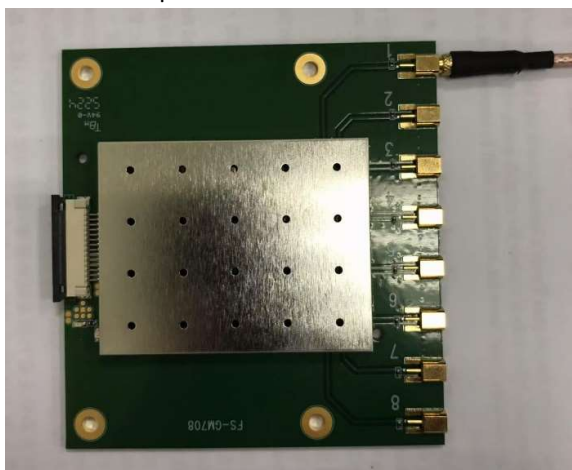
B TYPE USB



MMCX RF
connector

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:

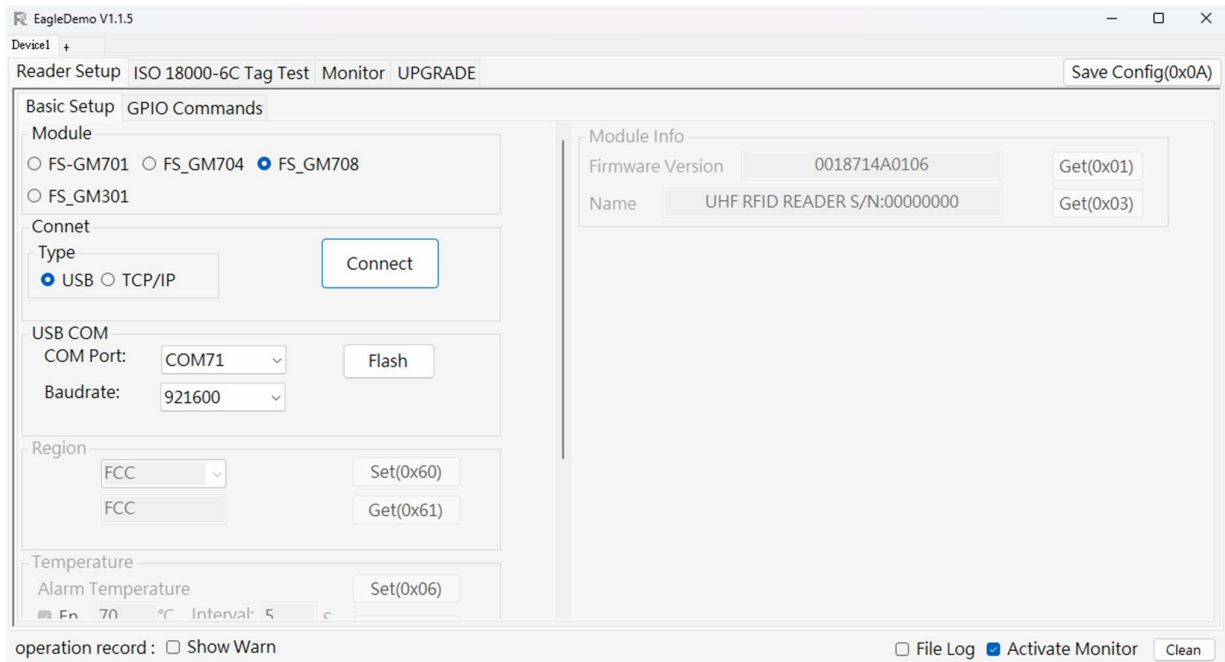


2. Connect DEMO SW

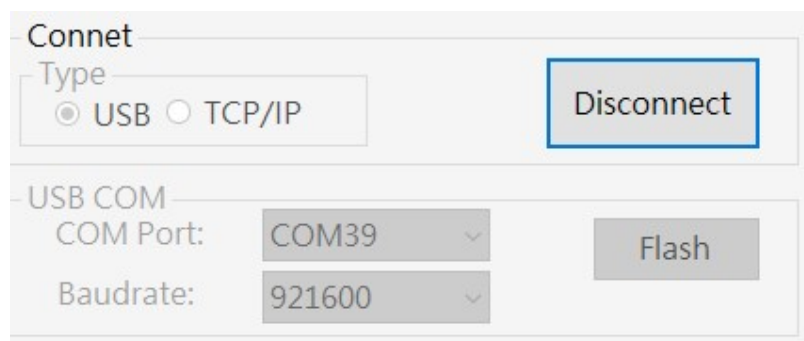
Double-click **EagleDemo.exe** to run the software.

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:

EagleDemo V1.1.5

Device1 +

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

Save Config(0x0A)

Inventory Tag Operate

Inventory

Abort

Inventory Type

☐ LoopAntenna(0x6E)
☒ 0x6D Custom Application

Inventory Stop Condition

☒ Loop Times: 1 ☒ continuous
☐ Conti-Inventory Time: 1000 ms
☐ Warning Occur ☐ 2ndSetting Rest T: 0 ms

Inventory Custom Application

RF Mode: ULTRA FAST MODE 103

☒ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8

Power

2800 2800 2800 2800 2800 2800 2800 2800

Inventory Time

1000 1000 1000 1000 1000 1000 1000 1000

Inventory Run

50 50 50 50 50 50 50 50

Inventory parameter (0x64) (0x65)

☒ dynamic Q ☐ Static Q

Inventory Quantity

14

Peak Speed(Tag/s)

150

Max Speed(Tag/s):

462

AVG Speed(Tag/s)

132

Command Duration(ms)

696

Total Inventory Duration

0 00:00:05.786

Result

Total Tag Count : 769

Min RSSI: -66.6dbm Max RSSI: -34.5dbm

Reflash Save Tag

☒ RF_Channel ☒ RSSI ☒ TimeStamp ☒ ANT ID ☐ Phase

SetFormat(0x6A) Get Format(0x6B)

#	Date	TCount	PC	EPC	Freq(khz)	Rssi(dBm)	ANT1
1	:22:28:618	288	30 00	31 10 AF EC 2B 0B EB C2 01 00 00 01	911750	-5419	288
2	:22:27:932	44	30 00	E0 00 20 11 06 12 00 00 00 06 65	921750	-5377	44
3	:22:27:854	35	30 00	E0 00 20 11 06 12 00 00 00 06 5B	909250	-6209	35
4	:22:27:827	33	30 00	00 00 00 00 36 13 20 19 01 23 03 87	909250	-5551	33
5	:22:27:826	41	30 00	E2 00 20 47 38 13 01 67 16 20 6C E6	909250	-5739	41
6	:22:28:030	50	34 00	30 08 33 B2 DD D9 01 40 20 18 07 27	921750	-4813	50
7	:22:28:450	65	34 00	20 18 10 16 08 72 5A 01 11 10 00 FE	905750	-6594	65
8	:22:27:826	31	30 00	E2 00 00 18 73 12 00 98 20 20 44 71	909250	-6077	31
9	:22:28:104	54	30 00	22 22 22 22 22 22 22 22 22 22 22	921750	-6110	54

operation record : ☐ Show Warn

☐ File Log
 ☒ Activate Monitor

Clean

4

V1.00

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

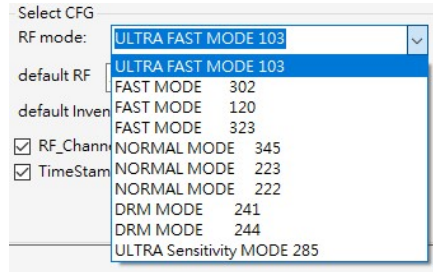
Antenna
☒ 1
power
3000
inventory time
1000
inventory run
0

The default inventory time is 1000ms.

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

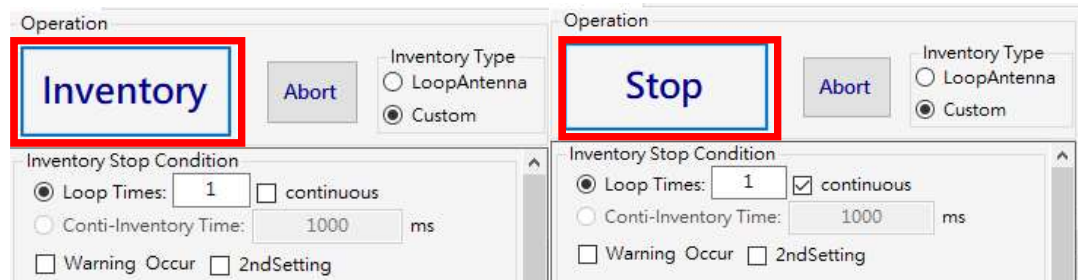
3.4 Setp3: Setting RF-link mode

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



3.5 Setp4: Run/Stop Inventory

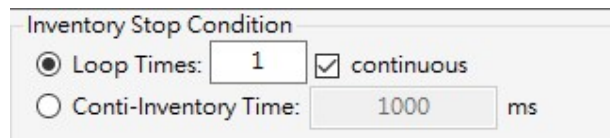
click **Inventory** button to Run Inventory function. click **Stop** button enforce to stop Inventory function.



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 Inventory .
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 Inventory , 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.

The screenshot shows the EagleDemo V1.1.5 software interface. The 'ISO 18000-6C Tag Test' tab is selected. The 'Inventory' button is highlighted. The 'Inventory Stop Condition' section shows 'Loop Times' set to 1 and 'continuous' selected. The 'Inventory Custom Application' section shows 'RF Mode' set to 'ULTRA FAST MODE 103'. The 'Inventory parameter (0x64) (0x65)' section shows 'Q Type' set to 'dynamic Q'. The 'Inventory Quantity' section shows a large '14'. The 'Peak Speed(Tag/s)' is 150, 'Max Speed(Tag/s)' is 462, and 'AVG Speed(Tag/s)' is 132. The 'Command Duration(ms)' is 696 and 'Total Inventory Duration' is 0 00:00:05.786. The 'Result' section shows 'Total Tag Count: 769'. The 'Min RSSI' is -66.6dbm and 'Max RSSI' is -34.5dbm. The 'RF_Channel', 'RSSI', 'TimeStamp', and 'ANT ID' checkboxes are checked. The 'SetFormat(0x6A)' and 'Get Format(0x6B)' buttons are visible. The 'operation record' section at the bottom shows a list of events, including '2023-09-08 01:37:28.134 CMD 0x6D Status Error:62 01 ERR_OP_STATUS'.

4. Error Display

◆ ANT error:

The screenshot shows the 'operation record' window. The 'File Log' checkbox is checked. The 'Clean' button is visible. The log shows the following events:

```

2023-09-08 01:37:17.751 Interval Count1: RFMode:103 ANT1 Set
2023-09-08 01:37:18.456 Stop
2023-09-08 01:37:24.966 Interval Count1: RFMode:103 ANT1 Set
2023-09-08 01:37:25.461 Stop
2023-09-08 01:37:28.121 Interval Count1: RFMode:103 ANT1 Set
2023-09-08 01:37:28.134 CMD 0x6D Status Error:62 01 ERR_OP_STATUS
2023-09-08 01:37:28.135 Stop
  
```

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:

- 15.105 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 or more 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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.

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.

End product labeling:

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: “Contains FCC ID: ZDD-FS-GM701-00”.

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.