



FCC ID: XBV-MKUH-300

ATTACHMENT E.

- User Manual -

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MKUH-300

UHF RFID Reader Module

For FCC

User Manual



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The pictures and screens shots on this document may be different to actual. .
Please thoroughly read the caution section before installing the reader.
Reasonable measures have been taken to ensure that the information included in this manual is complete and accurate.
However, Minerva reserves the right to change any specification at any time without prior notice.

CAUTIONS

- ✓ Stop the reader in case there is smoke, strange smell and overheated.
 - A. It can cause an electric shock and fire.
 - B. Remove the power cable.
 - C. Do not open the reader.
- ✓ Do not open/ modify the reader in order to repair. It can cause an electric shock and fire.
- ✓ Use the accurate power cable for the reader. If not, it can cause an electric shock and fire.
- ✓ Do not use other power adaptor or battery.
- ✓ Apply the power plug properly. If not, it can cause an electric shock and fire.

Please follow the instruction below to operate the power adaptor or battery.

 - A. Make sure that there is no dust inside.
 - B. Ensure that the power plug is firmly in place.
 - C. Disconnect the reader from the power if the reader is not in use for a long period of time.
 - D. Do not remove the power cable with wet hands.
- ✓ Turn off the power before connecting any communication cables or peripheral devices. If not, it can cause electric shock.
- ✓ Do not place any heavy objects on the reader.
- ✓ Do not install the reader under the circumstance of high humidity or heavy dust.
- ✓ Do not install the reader in an unstable environment.
- ✓ Use the Null-Modem cable according to the specification of DB-9Pin cable.
- ✓ Check the antenna port if the reader cannot read the tags.
- ✓ This product may interfere with other electronic devices due to the transmission of ultra high radio frequency.
- ✓ risk of explosion if battery is replaced by an incorrect type, dispose of used batteries according to the instructions

※ **Some of commands and specifications may be different depending on the software version.**

Some pictures may differ according to the software version.

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1. Specification

1.1. Description

MKUH-300 is consisted of an UHF RFID reader Module and an internal UHF Antenna. The Module can support ISO 18000-6B, and 6C air protocols. This Module is able to connect to Tag printer, PDA, PC via RS232 interface.

1.1.1. Function

- ① **Support UART communicztion.**
- ② **Support ISO 18000-6C , EPC class1 GEN II Air Interface protocol.**
- ③ **Support Power down mode with Module Enable Pin.**

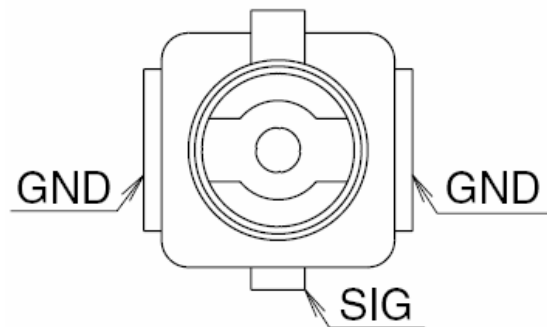
1.1.2. General Specification

Item	Specification	Remark
Operating Power	4.2Vdc / 1.5A	1cell Li-Ion BAT
Host Communication	UART	
Frequency range	US(FCC) 902.75~927.25MHz	
RF Power output	Max 30dBm	
Connector Type	10pin, 1.25mm Pitch	Yeonho, 12505RW-10
Antenna port	1Port	Hirose, U.FL-R-SMT
Air Interface Protocol	ISO 18000-6C, EPC class1 GEN II	18000-6B Not support
Operating Temp.	-10℃ ~ 50℃	
Size /weight	95 x 95 x 48mm / 100g	±0.5mm / ±1g

1.2. Connectors specifications

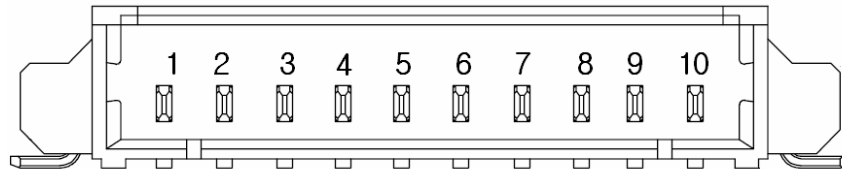
1.2.1. Antenna Port

- Connect to Antenna
- U.FL (HIROSE)



1.2.2. Power & Communication Interface

- Supply power to Module and connect to HOST device.
- 1.25mm(.049") Pitch Wire-to-Board Right angle header, 10 Circuits



Pin No.	Pin Name	Description (specification)
1	Operating Power +	Power Supply 4.2Vdc / 1.5A
2	Operating Power +	Power Supply 4.2Vdc / 1.5A
3	Host TXD In	0 ~ 3.3V
4	Host RXD Out	0 ~ 3.3V
5	USB N	0~5.0V (USB spec)
6	USB P	0~5.0V (USB spec)
7	Operating Power GND	Power Supply Ground
8	Operating Power GND	Power Supply Ground
9	Module Enable	0 ~ 3.3V
10	NC	NC

1.3. RF Specifications

Item	Specification	Remark
Frequency Range	902.75~927.25MHz	
RF Power	1W	
Modulation	ASK, PR-ASK	
Air Protocol	ISO18000-6B, EPC Class1 GEN II	
RF Port	Common	1 포트
Type	FHSS	송/수신 겸용
Read Range	< 5m (dependent on reader placement and Tag type)	
Antenna Gain	< 2.5dBi Below	
Channel Number	50 Channel	
Channel Band Width	500KHz@1FA	

Table 1] RF Specification

1.4. Operating condition

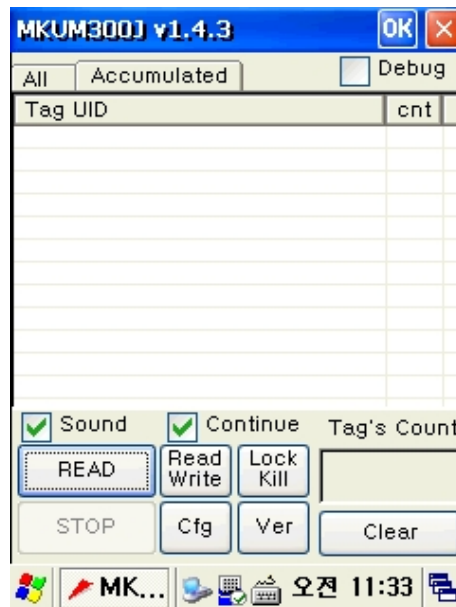
Item	Specification	Remark
Operating Temp.	-10℃ ~ 50℃	
Humidity	90% (Relative humidity)	

Table 2] Operation condition

2. Operating manual

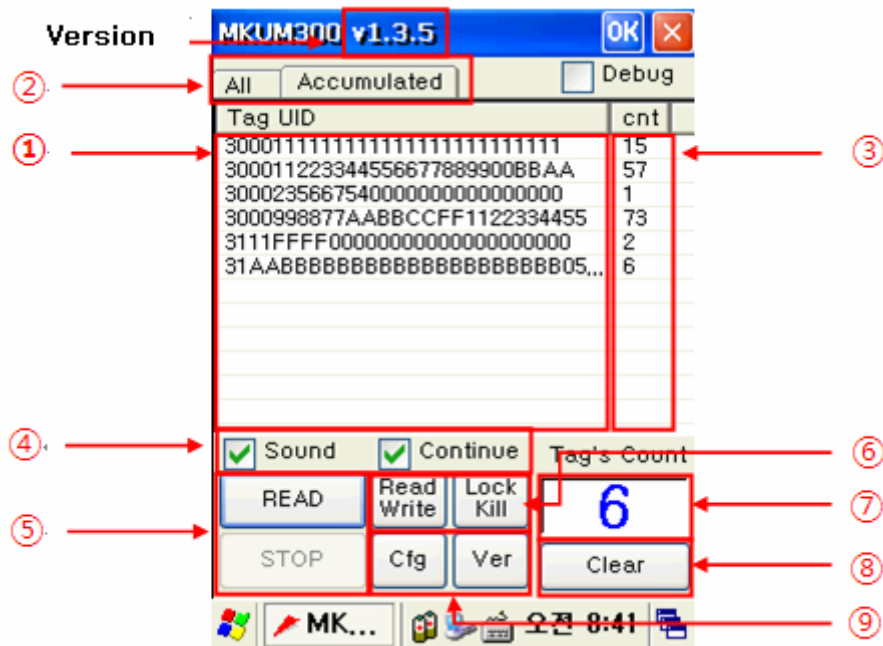
2.1. Introduction

After executing UHF Reader Application program, The Below window and the reader configuration window are appeared. The reader configuration window is referred to the next section. This Program can control and manage the MKUH-300 reader. This program displays Tag IDs and writes the wanted ID to a Tag. More detailed information is shown in next article.



2.2. The Description of the main display window.

- The below Picture describes the status of each parts in main window.



< Main window >

- ① The list-box windows displays Tag's UID(PC + EPC Data).
- ② These Taps select display mode in the list box. The kinds of the display mode are all mode and Accumulated mode.

All Mode: tags are displayed by time in the list box. The first tag is displayed on the first line. Max 128 tags can be shown in this window.

Accumulated Mode: The displayed tag is listed by UID value. The Lowest Value UID is shown on the top line in the list box. And the read count of the tag is shown on the same line in cnt column ③.

- ④ If SOUND check box is checked, Sound is ON. CONTINUE check Box function use when Accumulated Mode is enabled. When CONTINUE Check Box is NOT checked,

Sound is ON whenever a new tag is read.

⑤ READ Button is pushed then Reader starts to read tags. If STOP Button is pushed, The Reader does NOT work.

⑥ Tag memory read/write, Lock/Kill function starts on these buttons are pushed.

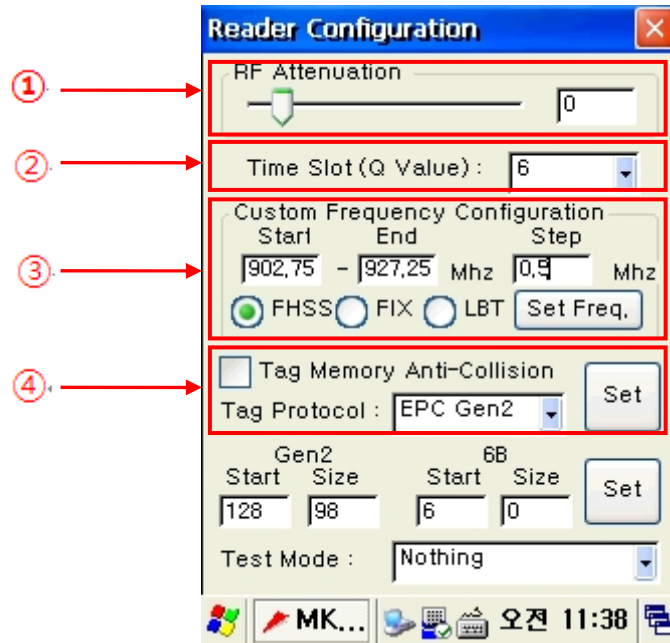
⑦ the number of tag is appeared in the text box.

⑧ This button is used for clearing tag list and number.

⑨ After [Cfg] button is pushed, A Configuration dialog Box is appeared. The more detailed version information is displayed.

2.3. Reader Configuration window

- RF Power, frequency, Q value and Test modes are setting using this window.



< Configuration Windows >

- ① RF Power is changed by the position of slide bar. That the Value in the text box is 0 means the RF power is Max. if The Value is increased, The Power is decreased. The Unit is dB.
- ② Q Value is an important parameter of anti collision function. So Do NOT Change this value during normal operating.
- ③ Select and change the RFID operation frequency and operation mode.
There are three operation mode, which are FHSS (Frequency Hopping Spread Spectrum) Fixed frequency and LBT (Listen Before Talking)
- ④ Select RFID Air Protocol. This reader supports two air protocols which are ISO 18000-6B, and 6C.

This equipment has been tested and found to comply with the limits for a Class A 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.

Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this equipment.

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.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum 20 cm between the radiator and your body. This transmitter must not be collocated or operating in conjunction with any other antenna or transmitter unless authorized to do so by the FCC.

IC Warning

Operation of this device is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.