ATTACHMENT E.

- USER'S MANUAL -

?

CEYON Ubiquitous RF-ID System
MANUAL

First Draft : 2005.02.01.

Contents

RF-ID Reader MANUAL

REM125

3. RFID Reader (REM125)

3.1 REM125 Specifications

(1) Product Specifications

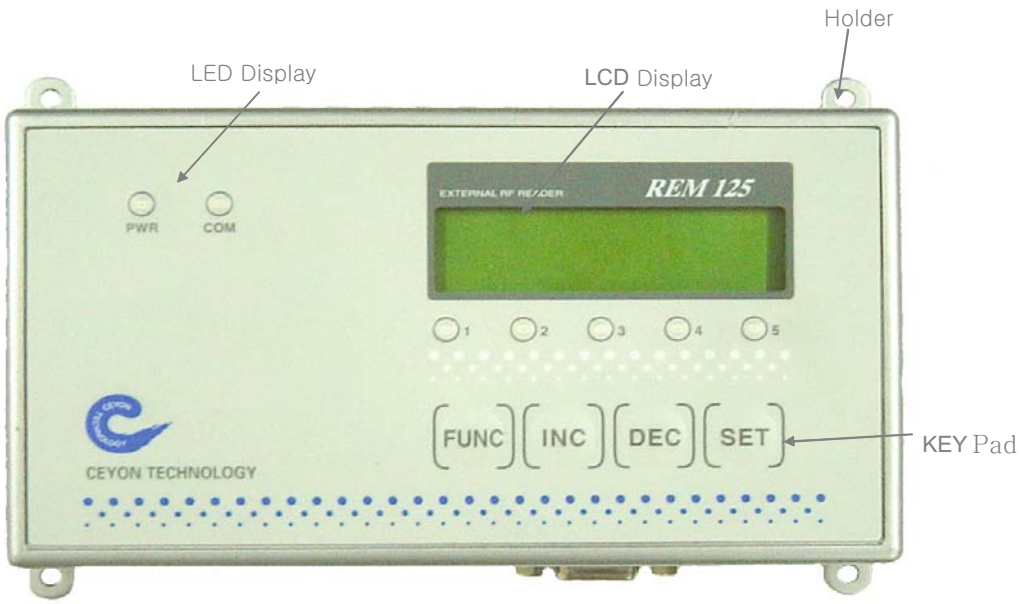
REM125	Parameter	Description
	Processor	8 bit Processor
	Frequency	125 KHz
	LCD type	16*2 line 32 character display
	Power	DC 12V / 1A
	Communication	RS232 , RS422, RS485 (Menu Setting)
	Dimensions	(W)160mm * (L)90mm * (H)35mm
	Material	ABS
	Host Interface	1ea (RS232 , RS422, RS485)
	Ant. ch	REM125 : 5ea
	LED display	POWER, COM, 1,2,3,4,5
	KEY	4 KEYS

(2) Environment Specification

Parameter	Description
Operating Temperature Range	0℃ to + 65℃
Operating Humidity Range	20% ~ 90% (No dew)
Operating Pressure Range	1 atm
Storage Temperature Range	0℃ to + 80℃
Storage Humidity Range	20% ~ 90% (No dew)

3.2 REM125 Parts

(3) REM125 Front Section



Power and Communication Lamp

PWR: It is lighted when the power is on.

1) LCD Display

This section displays the current operation mode, tag ID or other settings or messages.

2) Tag ID Recognized Channel Display

While scanning the channels, the tag ID of the channel that recognizes the tag is displayed. Only channels 1 and 2 out of 5 are valid for RM125-2 while all 5 channels are valid for REM 125-5.

3) KEY Pad

FUNC: This key is used to set the operation parameters or testing.

INC: This key is used to increment the setting type or value.

DEC: This key is used to decrement the setting type or value.

SET: This key is used to set the setting type or value.

(2) REM125-5 Lower Section

1) Antenna Connector

ANT1 ~ ANT 5: They are the 6 pin DIN connectors that are connected to the antenna. Besides the antenna signal, there is an LED lamp that shows the operating status of the channel.

2) D-sub 9 Connector

This terminal is connected to the host using either RS-232, RS-422 or RS-485.

3) DC Power Jack

The power is supplied by the certified DC12V / 1A linear adapter.

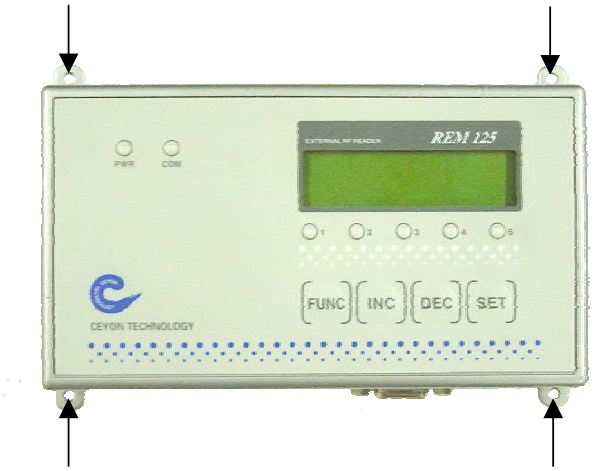
** Caution: Using the adapter other than the one supplied by us can degrade the performance.

4) Grounding Terminal

Grounding is used to ensure electrical safety or to prevent overloading.

3.3 REM125 Installation

This section describes how to install REM125.



REM125 Series can be installed on any place one can work with drills using M3.5 dish bolt on marked places(⟶) and in case of difficulty in drilling on the side of attachment, you can install it by using the special bracket on the designated area.

(1) Caution during REM125 nstallation

1) If drilling is not appropriate during installation, use the bracket to make sure that the equipment is in the proper position.
2) Install REM125 Series where it is convenient for the operator.
3) Ensure that the power supply and communication line can be easily connected.
4) Avoid the metal substance (SUS, Al, etc.) or the material that absorbs the electrical wave (magnet, ferrite, etc) for the bracket or the surface of installation. Consult with us before using such material. .
5) The antenna must be installed within the recognition range.
6) The product should not be installed near the devices that generate 125KHz or lower frequency wave.

3.4 Power Connection

Insert the included adapter to the DC power jack.

(1) When the power is supplied normally

1) The red PWR LED is lighted after power is supplied.

2) The buzzer sound is activated for 1 second.

3) The LCD displays the REM125 model name and then changes to RUN mode after certain time.

(2) When the power is not supplied

1) The LED is not lighted.

2) No buzzer sound is activated.

3) The LCD message is not displayed properly.

(4) Check the following

1) In case of abnormal operation, check the power connection cable.

2) Check if the power is DC15V

3) Confirm on polarity of power whether (Make sure that the adapter is from the manufacturer.)

3.5 Antenna Connection

The antenna terminal consists of the 6 pin mini DIN jack. The antenna cable is 2m long. In case the flat cable needs to be extended, the flat cable adapter PCB from us may be used to extend it for up to 3.5m. The cable may not arbitrarily be cut or changed. Since the tag recognition distance depends upon the size of the antenna or the tag, we have the various types of antennas in stock. Please inquire our technical staff with the use and environment.

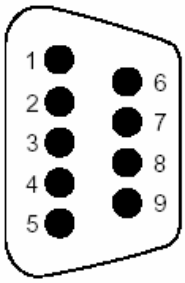
3.6 Communication Line Connection

REM125 Series is connected to the host through RS-232, RS-422 or RS-485 protocol. Check the interface standard of the host and D-SUB9 pin configuration drawing for the proper communication connection.

The interface protocol can be easily set from the LCD display.

(1) RS-232 Serial Connection

For RS-232 serial connection, only the pins 2, 3 and 5 are used. The other pins are for RS-422 or RS-486 communication. To ensure safety, do not connect the pins that are not used by REM125.



Pin number	Signal abbreviation	Signal name	Signal direction (REM 125 ↔ Host Side)
1	TX422+		
2	RD(RXD)	Reception data	←
3	SD(TXD)	Transmission data	→
4	RX422+	485+	
5	S.G	Signal ground	↔
6	TX422-		
7			
8			
9	RX422-	485-	

The DB-9P pins for the RS-232 serial connection are connected in accordance with the following diagram.

PC	
Signal Name	Pin Number
CD	1
RD(RXD)	2
SD(TXD)	3
DTR(ER)	4
SC	5
DSR(DR)	6
RS(RTS)	7
CS(CTS)	8
RI(CI)	9

REM125	
Signal Name	Pin Number
N.C	1
RD(RXD)	2
SD(TXD)	3
N.C	4
S.G	5
N.C	6
N.C	7
N.C	8
N.C	9

(2) RS-422 Serial Connection

HOST SIDE		REM125 SERIES
TX422+	→	RX422+
TX422-	→	RX422-
RX422+	←	TX422+
RX422-	←	TX422-

* In some cases, 330Ω 1/4W terminator may be needed.
(ex. Case of data loss during communication)

(3) RS-485 Serial Connection

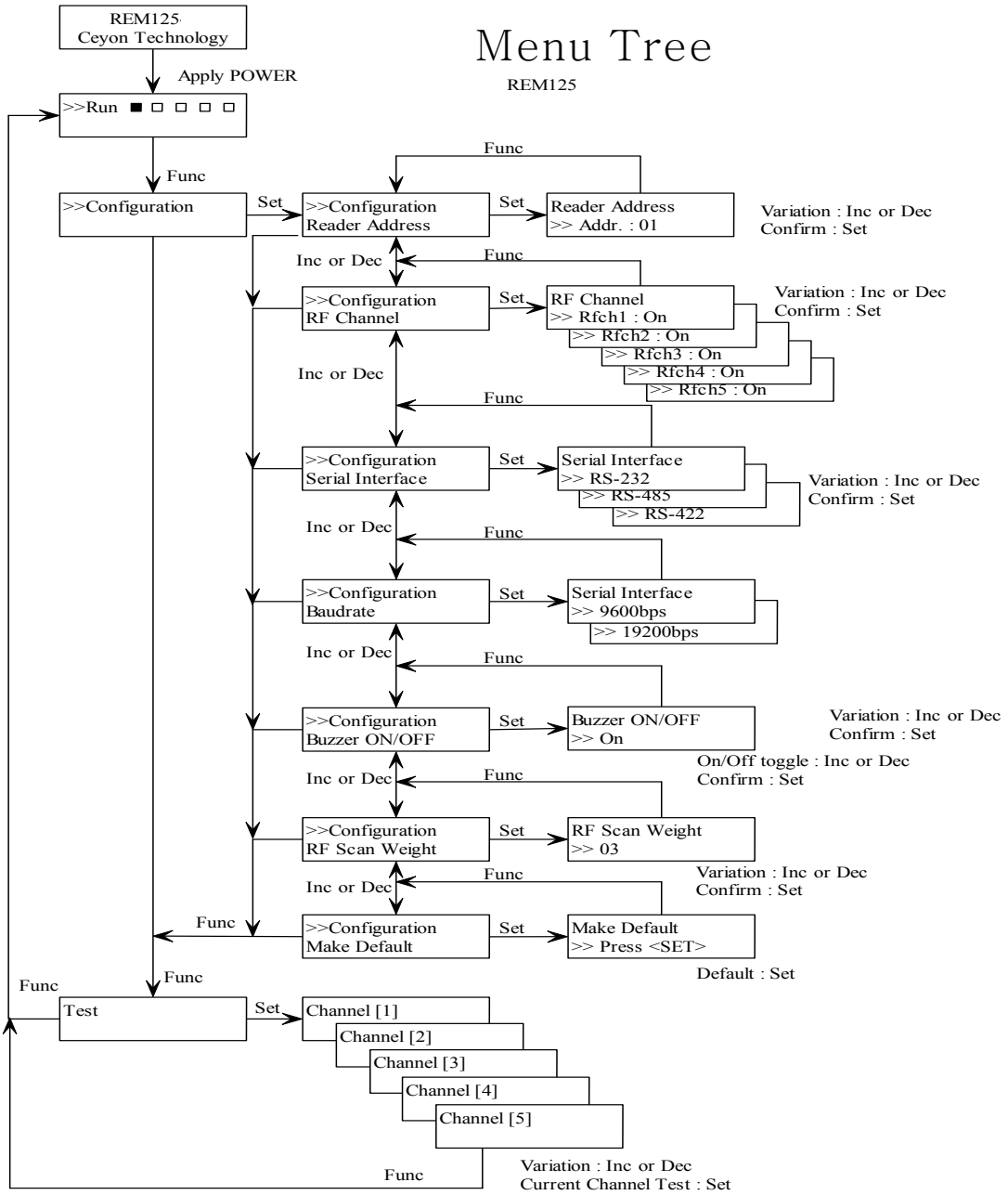
HOST SIDE		REM125 SERIES
485+	----→	485-
485-	←----	485+

* In some cases, 100Ω 1/2W terminator may be needed.
(ex. Case of data loss during communication)

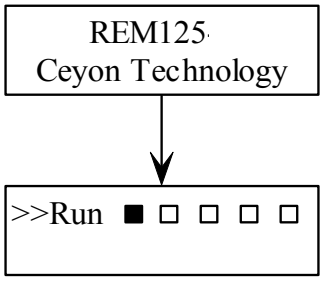
3.7 Menu

REM125 Menu Tree*

* **Lock function has been set in the Run Mode.**
For the functional setting, please push FUNC key for 2 seconds. Then locking mode will be canceled with buzzer sounds..



(1) REM125 Normal Operation



(2) REM125 Configuration

When the setting is changed, the buzzer sound is activated as follows:

3 Long Beeps: This is activated when the invalid key is pressed.

3 Short Beeps: This is activated when the setting is successfully completed.

1 Short Beep: This is activated when the setting is changed.

When the FUNC key is pressed for 3 seconds, the system is changed to Configuration mode with a long beep. The system is automatically returned back to normal mode when the key is inactive for 30 seconds.

(3) REM125 Address Setting

For the multiple communications except the point to point, the reader address must be configured.

Esq.	Key entry	LCD Message	Notes
①	FUNC	>>Configuration	The system is turned into Configuration mode after a long beep when the FUNC key is pressed for 3 seconds.
②	SET	Submenu	Configuration
③	INC, DEC control	>>Configuration Reader Address	Move the menu to the indicated direction
④	SET	Submenu	Configuration
⑤	INC, DEC control	Reader Address >> Addr. : 01	Set the REM125 address using the control key. (Not needed for point to point connection) Allowed Range:01~16 Default:01
⑥	SET	Submenu	The address is set after 3 short beeps.
⑦	FUNC	>>Configuration Reader Address	Move to the upper menu
⑧	FUNC	Test	Move to the test menu
⑨	FUNC	>>Run	Move to the normal mode

(4) RF Channel Setting

This function is provided to inactivate the channels that are not in use in order to speed up RF channel scan by skipping them.

SEQ	Key Entry	LCD Message	Notes
①	FUNC	>>Configuration	The system is turned into Configuration mode after a long beep when the FUNC key is pressed for 3 seconds.
②	SET	Submenu	Configuration
③	INC, DEC Control	>>Configuration RF Channel	Move the menu using the control key.
④	SET	Submenu	Configuration
⑤	INC, DEC Control	RF Channel >> RfCh1. : On	Set RfCh1 using the control key. Allowed Range: RfCh1~ RfCh5 Default: All channels On
⑥	SET	Submenu	The On/Off is toggled after 3 short beeps.
⑦	FUNC	>>Configuration RF Channel	Move to the upper menu.
⑧	FUNC	Test	Move to the Test menu.
⑨	FUNC	>>Run	Move to the normal mode.

(5) Serial Interface Setting

REM125 provides 3 protocols for communication with the host. The correct interface protocol must set for the proper operation.

SEQ	Key Entry	LCD Message	Notes
①	FUNC	>>Configuration	The system is turned into Configuration mode after a long beep when the FUNC key is pressed for 3 seconds.
②	SET	Submenu	Configuration
③	INC, DEC Control	>>Configuration Serial Interface	Move to the menu using the control key.
④	SET	Submenu	Configuration
⑤	INC, DEC Control	Serial Interface >> RS-232	Set the interface type using the control key.

			Default: RS-232
⑥	SET	Submenu	On/Off is toggled after 3 short beeps.
⑦	FUNC	>>Configuration Serial Interface	Move to the upper menu.
⑧	FUNC	Test	Move to the Test menu.
⑨	FUNC	>>Run	Move to the normal menu.

(6) Baudrate Setting

The interface speed must be consistent with the host and can be either 9600bps or 19200bps.

SEQ	Key Entry	LCD Message	Notes
①	FUNC	>>Configuration	The system is turned into Configuration mode after a long beep when the FUNC key is pressed for 3 seconds.
②	SET	Submenu	Configuration
③	INC, DEC CONTROL	>>Configuration Baudrate	Move to the menu using the control key.
④	SET	Submenu	Configuration
⑤	INC, DEC CONTROL	Baudrate >> 9600bps	Set the host communication speed using the control key. Default: 9600bps
⑥	SET	Submenu	The host communication speed is set after three short beeps.
⑦	FUNC	>>Configuration Baudrate	Move to the upper menu.
⑧	FUNC	Test	Move to the Test menu.
⑨	FUNC	>>Run	Move to the normal menu.

(7) Buzzer ON/OFF Setting

REM125 activates a short beep whenever a tag ID is recognized. This feature can be turned off. The key buzzer however cannot be turned off.

SEQ	Key Entry	LCD Message	Notes
①	FUNC	>>Configuration	The system is turned into Configuration mode after a long beep when the FUNC key is pressed for 3 seconds.

②	SET	Submenu	Configuration
③	INC, DEC CONTROL	>>Configuration Buzzer ON/OFF	Move to the menu using the control key.
④	SET	Submenu	Configuration
⑤	INC, DEC CONTROL	Buzzer ON/OFF >> On	The buzzer toggled On/Off using the control key. Default: On
⑥	SET	Submenu	The buzzer option is set after 3 short beeps.
⑦	FUNC	>>Configuration Buzzer ON/OFF	Move to the upper menu.
⑧	FUNC	Test	Move to the Test menu.
⑨	FUNC	>>Run	Move to the normal menu.

(8) RF Scan Weight Setting

This determines the time for each channel during scanning from 80ms to 170ms. Scan weight of 1 means 80ms and 10 means 170ms. Since RF can be influenced by the surrounding condition, adjust the channel scan weight to help better recognize the tag ID.

SEQ	Key Entry	LCD Message	Notes
①	FUNC	>>Configuration	The system is turned into Configuration mode after a long beep when the FUNC key is pressed for 3 seconds.
②	SET	Submenu	Configuration
③	INC, DEC CONTROL	>>Configuration RF Scan Weight	Move to the menu using the control key.
④	SET	Submenu	Configuration
⑤	INC, DEC CONTROL	RF Scan Weight >> On	Set the scan weight using the control key. Allowed Range: 1 ~ 10 Default: 3
⑥	SET	Submenu	The scan weight is set after three short beeps.
⑦	FUNC	>>Configuration RF Scan Weight	Move to the upper menu.
⑧	FUNC	Test	Move to the Test menu.
⑨	FUNC	>>Run	Move to the normal menu.

(9) Factory Setting

This function is used to reset the parameters to the initial manufacturer setting.

SEQ	Key Entry	LCD Message	Notes
①	FUNC	>>Configuration	
②	SET	Submenu	Configuration
③	INC, DEC CONTROL	>>Configuration Make Default	Move to the menu using the control key.
④	SET	Make Default >> Press <Set>	Reset to the initial factory setting.
⑥	FUNC	>>Configuration RF Scan Weight	Move to the upper menu.
⑦	FUNC	Test	Move to the Test menu.
⑧	FUNC	>>Run	Move to the normal menu.

(10) REM125 Test (Trial mode)

This is used to check the system before actual operation.

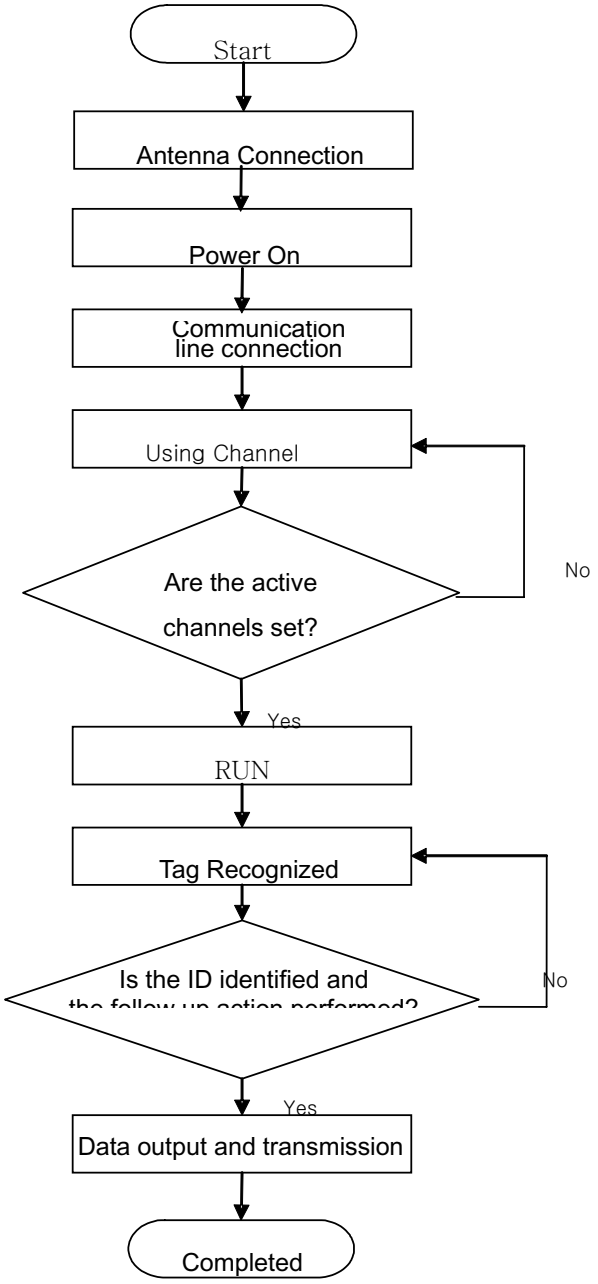
SEQ	Key Entry	LCD Message	Notes
①	FUNC	Test	Use the FUNC key.
②	SET	Submenu	Configuration
③	INC, DEC CONTROL	Channel [1]	Move to the RF channel to be tested using the control key.
④	SET	Channel [1] K60T0031	Send the read command. Normal data reception.
⑤	FUNC	>> Run	Move to the normal menu.

3. 8 Host Communication

REM125 allows transmission/reception of the ID and device setting from the host. For the type and standard of communication with the host, please refer to the attached protocol.

3.9 Recognition Test

The following diagram shows the normal process flow from power on to tag ID recognition. Make sure that the system operates according to the diagram before actual use.



For the items to be checked in addition to the above diagram, please refer to the attached check list.

3.10 Troubleshooting

(1) Operation Related

Q1 The system is not functioning normally.

A1. Check if the communication line is properly connected.

Check if the power is normally supplied.

Check if the display shows Channel[#] during the test mode of REM125.

* # means the antenna address.

Q2. The system does not function normally even after the power and communication are connected properly.

A2. Check if the proper cable is used.

Check if the address is set correctly.

Turn on the power again.

Check if the command format is correct.

Q3. The error occurs even though the tag is located within the effective recognition distance.

A3. Turn on the power again.

Check the REM125 operating mode.

If the problem is not solved after above procedure, pull off the power cable after turning off the system and call Seyeon Technology (+82-31-267-1163).

RF-ID ANTENNA MANUAL

4. ANTENNA (EA125-R)

4.1 EA125-R Specifications

(1) Product Specifications

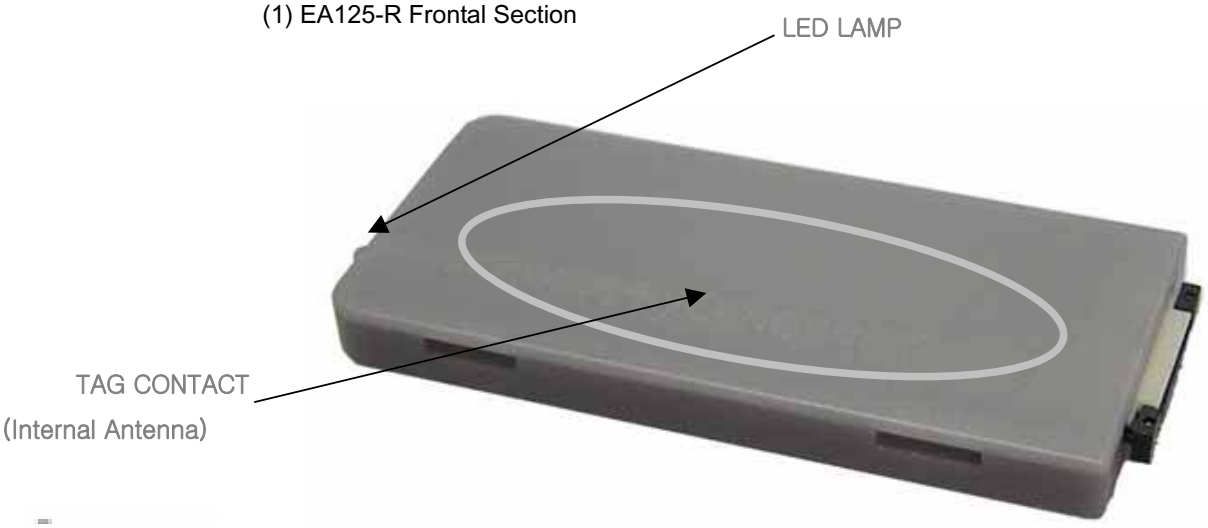
EA125-R	Parameter	Description
	Frequency	125 KHz
	Dimensions	(W)55mm *(L)25mm * (H)50mm
	Material	ABS(Flame Retardant)
	Reader contact	6 Pin FFC Connector
	Display	Green LED (Reading)

(2) Environment Specifications

Parameter	Description
Operating Temperature Range	0℃ to +65℃
Operating Humidity Range	20% ~ 90% (No dew)
Operating Pressure Range	1 atm
Storage Temperature Range	0℃ to +80℃
Storage Humidity Range	20% ~ 90% (No dew)

4.2 EA125-S Parts

(1) EA125-R Frontal Section



1) STATUS Lamp

It displays the power and operation status.

(2) EA125-R Lower Section

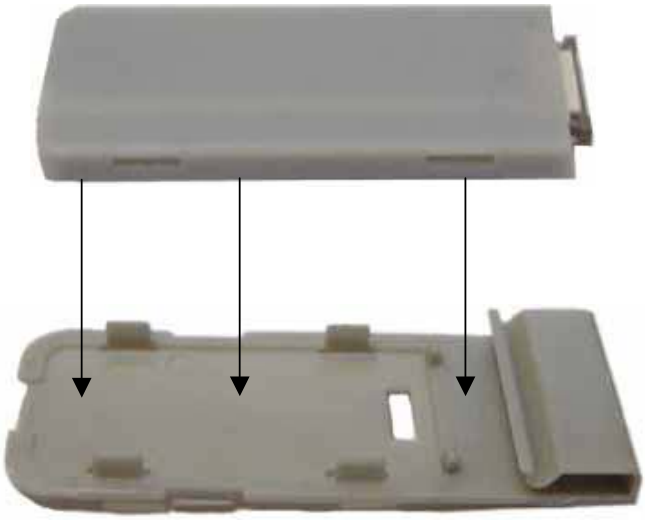
1) Reader Connector

This connector connects the EA125-S antenna to REM125 series using the dedicated cable.

*2 cable types: Mini Din 6pin + 5264 6 pin, 2.5m

FFC cable ,1m

4.3 EA125-R Installation



(1) Cautions during EA125-R Installation

1. The system must be installed on a flat surface using the adhesive.
2. If adhesive cannot be used, use a separate bracket.
3. Install EA125-R where it is convenient for the operator.
4. Ensure that the communication line can be easily connected.
5. Avoid the metal substance (SUS, Al, etc.) or the material that absorbs the electrical wave (magnet, ferrite, etc) for the bracket or the surface of installation. Consult with us before using such material. .

4.4 EA125-R Communication Line Connection

REM125-5

Communication Cable

EA125-R

Cable Swiching PCB

FFC

EA125-R is directly connected to REM125-2(5) using the cable switching PCB. The length of FCC line is 1m longer than EA125-C to be more flexible location wise.

(1) Cautions During Cable Connection

1. Check the EA125-R connector before connecting. Improper connection can bend the connector pins.
2. Check the connector jack before connecting the cable switching PCB and EA125-C FFC.
3. When connecting EA125-R with the cable switching PCB FFC, properly close the connector jack to ensure correct connection.

4.5 EA125-S Troubleshooting

This section describes the potential problems and the actions to resolve them.

Q1. The red communication lamp is not lighted.

A1. Check if the power is normally supplied to the reader.

Check if EA125-S is properly connected to FFC.

Check if WA125-S, REM125-2(5) and the cable switching PCB are properly connected.

Check if there is any damage to the connector pin or line.

Q2. Tag data cannot be read even when the tag is within the recognition distance.

A2. Check if the red light of the EA125-S communication lamp is lighted.

Check if EA125-S, REM125-2(5) and the cable switching PCB are properly connected.

Check if there is any damage to the connector pin or line.

Check if the tag data is marked correctly.

If the problem is not solved after above procedure, pull off the power cable after turning off the system and call Seyeon Technology (+82-31-267-1163).

Attachment

Attachment 1: Communication with the Host

1. Reader Operation

1.1 RF mode

(1) Verbose mode

The Reader recognizes and reads the tag by operating only one channel from those in waiting mode through the host command (CVR). The channel that is operated in Verbose mode is activated only the specific scanning duration. If the tag is read within that duration, the channel stops its operation and returns to the waiting mode. If the tag is not recognized during the scanning duration, it is also returned to the waiting mode.

(2) Continuous mode

All channels of the Reader operate for the specific duration (scan weight) set for the channel and then return to the waiting mode. The next channel is then activated and goes through the cycle. If there is only one channel, it continuously searches the tag.

1.2 Event report mode

(1) First talk mode(FT)

In this mode, the data is immediately sent to the host when the even (tag read) occurs to the reader.

(2) Listen & talk mode(LT)

The Reader stores the data in its own memory when the event occurs and sends it to the host only when requested (CTR). In this case the data is stored in the reader until the host request.

2. Frame

The communication between the reader and the host occurs through two types of frames. The type of frame is determined by the transmitting device. The data in the frame consists of ASCII code. For the numeric data, its hex value is changed to 2byte ASCII code. The frames are described in detail below.

2.1 Command Frame(Host to Reader)

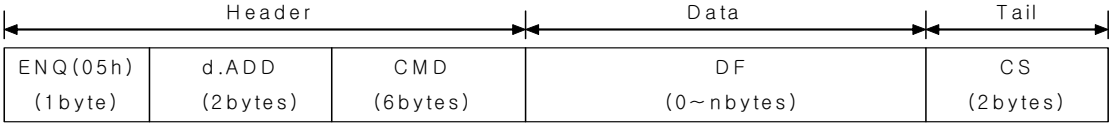


Figure 2.1

ENQ (Enquiry): It signifies the beginning of the frame and is the ASCII 05H control character.

d.ADD (Destination Address): It is the reader address to send the data and can be within 00H ~ FFH. 00H and FFH are designated for broadcasting. (Currently only 1 through 16 are used.)

CMD (Command): Please refer to Section 3.

DF (Data Field): data

CS (Checksum): The lowest 1 byte value of the sum excluding CS is changed to 2 byte ASCII code.

2.2 Response Frame(Reader to Host)

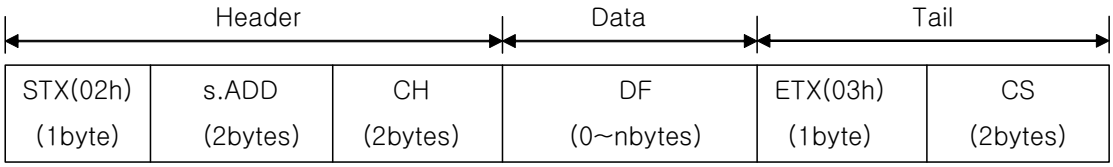


Figure 2.2

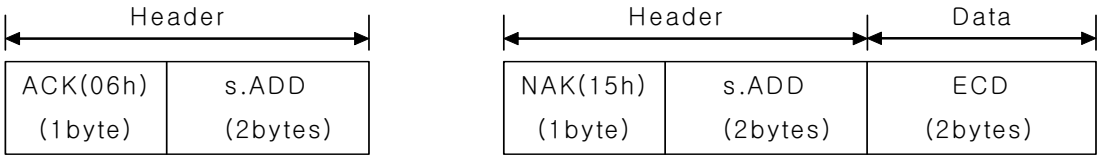


Figure 2.3

Figure 2.2 shows the response frame form the reader to the host. This frame is the response to the tag Read/Write (CTR/CTW) related command can be used to send the data or control information as the response to the various host requests. The control information must be preceded by a specific request. Therefore, there is always a set of request/response communication. If there is no data to respond or error after the request is normally received and processed, the ACK or NAK is sent as shown in Figure 2.3. The frames are described in more detail below. .

STX (Start TX): It signifies the beginning of the frame and is the 02H ASCII 02H control character.

ACK(Acknowledgement): This is sent when the request was normally processed and is 06H ASCII control character.

NAK(Negative ACK): This is sent when the request was failed to be processed and is 15H ASCII 15H control character.

s.ADD (Source Address): This is the address of the reader that sends the data.

CH (channel): This is the channel number of the reader. (Since a reader can have the multiple antennas, each antenna is designated with a channel number. If there is only one

antenna, the channel is always 1.) FFh is used to send the control information.
DF (Data Field): data
ETX (End TX): This signifies the end of data and is 02H ASCII control character.
CS (Checksum): The lowest 1 byte value of the sum excluding CS is changed to 2 byte ASCII code.
ECD: The 1 byte error code is changed to 2 byte ASCII code.

A0H: Writing failed,
A8H: Reading failed,
80H: Checksum incorrect
88H: Overflow
40H: EEPROM WRITING FAIL
20H: RF Mode error
28H:Event Mode error
10H : Unknown command
18H : Time Out

3. Command

REM125 and WIM125 models support the commands listed in the following table. Each command is named as Cxx with C standing for Command.
As shown in the table, the commands consist of 3 bytes and can include the data. One thing to note is that, as mentioned in the previous section, the one byte long hex value is changed to 2 byte ASCII code for data transmission. Therefore, the transmitted frame becomes 6 byte long..

For example:
When sending CCS (08h 03h 01h), it is expressed as '0' '8' '0' '3' '0' '1' and then changed to 30h 38h 30h 33h 30h 31h as the frame data to be sent.

The above data expression is applied to all fields except the ASCI control characters such as ENQ, STX and ETX.

Command name	Command code	Data	Description
CCS (Ch. Status)	08h 03h 01h	None	This CCE related command checks the enabled ch. The data in the response is 1 byte in the same format as CCE data byte with the bit position of the enabled ch. set. .
CRA (Read Address)	08h 17h 01h	None	It reads the 1 byte address of the reader.
CMI (Manufacturer Info.)	08h 20h 08h	None	It reads the 8 byte manufacturer information.
CPI (Protocol ver. Info.)	08h 28h 08h	None	It reads the 8 byte protocol version information.
CFI (F/W ver. Info)	08h 30h 08h	None	It reads the 8 byte firmware version information.
CVM (Verbose Mode)	10h 0Bh 01h	00h – Continuous 01h- Verbose	In the verbose mode, only the channel that was activated by the CVR command scans the tag and returns to the waiting mode after tag reading. In the continuous mode, the channels activated by CCE command take the turn to scan the tag.
CFT (First Talk)	10h 0Bh 02h	00h – Listen & talk 01h – First talk	In the LT mode, the tag information is stored into the reader memory until the host requests it through CTR command. In the FT mode the tag information is immediately sent to the host.
CRTC (Reset Tag in Continuous mode)	10h 0Bh 03h	00h – Disable 01h - Enable	This command is valid only for the continuous mode. If RTC is enabled, the same tag data is continuously sent as long as the tag remains within the recognition distance. If it is disabled, the same tag information is sent only at first.
CVTL	10h 0Bh 06h	01h – Enable	In the verbose mode, the tag is scanned

(Verbose Time Limit)		Time out	when the CVR command is received for the duration set in the CTT mode. If it is timed out without tag recognition, time out error is sent.
CBS (Buzzer Set)	10h 0Bh 07h	00h – Buzzer off 01h – Buzzer on	It activates or deactivates the buzzer operations for successful tag read or write.
CDC (Device Check)	10h 18h 03h	01h	It checks the reader condition according to ACK, NAK or no response.
CSE (Save setting to Eeprom)	10h 18h 05h	01h	The reader parameter settings are stored in EEPROM so that the values remain the same even when the power is turned off. Without this command, the parameters are reset to default values when the power is turned on.
CGB (Good Beep)	10h 19h 05h	01h	A good beep is activated.
CEB (Error Beep)	10h 19h 06h	01h	An error beep is activated.
CLB (Long Beep)	10h 19h 07h	01h	A long beep is activated.
CCE (Ch. Enable)	18h 03h 01h	01h(0000 0001) – ch1 02h(0000 0010) – ch2 04h(0000 0100) – ch3 08h(0000 1000) – ch4 10h(0001 0000) – ch5	Each channel is enabled or disabled.
CSI (Serial Interface)	18h 0Ch 01h	상위 4bits: type 0 – RS422 1 – RS485 2 – RS232 하위 4bits: BPS 6 – 9600bps	Host와 reader TO serial interface serial band rate setting. Ex) RS422, 9600bps Data – 06h

		7 – 19.2kbps 8 – 38.4kbps 9 – 56kbps	
CTT (Tag Time)	18h 1Dh 01h	00h – 0초 01h (0.5 second) ~ 0Ah(5 seconds) * Increment of 0.5 seconds.	It sets the channel scanning duration when activated by CVR command. *It is recommended that at least 3 second duration is set before timeout for data stability.
CSA (Set Address)	18h 17h 01h	The device address between 1 and 16 (01h~10h)	It sets the 1 byte device address. The change is completed after the Ack response is sent.
CVR (Verbose ch. Read)	18h 19h 01h	Channel 1 ~ 5 -00h deactivates all channels.	It sets the channel to activate for the verbose mode. The channel must have been enabled by the CCE command, and only one channel can be activated at a time. Once the reader receives this command, it responds with the Ack and then scans the tag for the scanning duration before sending the tag information to the host in response to the CTR command depending upon FT or LT mode. If the tag is not recognized within the scanning duration, the time out error response is sent to the host, and the channel is turned into the waiting mode.
CTRn (n ch Tag data Read)	2nh 47h 17h	None	The tag of the specific channel is read. This command is valid for only Listen and Talk mode. The valid range of n is 0 ~ 8. When n = 0(CTR0, 20h), all channels read the tag data. * In case of CTR0, data of all channels recognizing the tag is sent through one frame as shown in Figure 3.1
CTWn	3nh 47h 17h	Tag data	The valid range of N is 1~8.

(n ch Tag data Write)			

As shown in the table, the command that starts with 08h is used to read the specific control data from the reader. In that case no data field is used. The command that starts with 2nh is used to read the tag data. In that case the third byte is the length of the tag data and is the same as the data length of the frame. The command that starts with 10h is used to turn On/Off the reader parameters. 1 means on and 0 means off. The command that starts with 18h is used to send the specific data to the reader or tag. The last byte signifies the data length. The 3nh command is used to write the data to the tag. The tag data length is same as the third byte of the command. For the data field, the 1 byte hex value is changed to 2 byte ASCII code like other fields before transmission/reception. In other words, the data length of the actual frame is twice that of the number of bytes expressed in the last byte of 08h/18h/2n/3n commands.

Figure 3.1 shows the response frame of CTR0 command. It is used to send all valid channel tag data. The channel data format in the frame is same as 2 byte channel information data field (DF). The length of DF is same as the last byte of the CTR command.

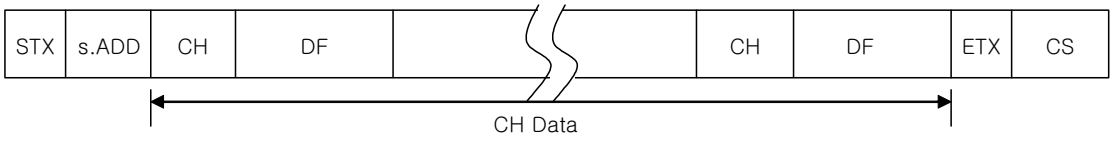


Figure 3.1

4. Frame Communication

The following shows the response of the reader for each command.

(1)READ Command Format (08h/2nh command)

Host		Reader
ENQ d.ADD CMD DF CS	----------→	
Process successful	←----------	STX s.ADD ch DF ETX CS
Tag data가 없을 때(2nh)	←----------	ACK s.ADD
Process failed	←----------	NAK s.ADD ECD

(2) WRITE Command Format (10h/18h/3nh command)

Host		Reader
ENQ d.ADD CMD DF CS	----------→	

Process successful ←---------- ACK s.ADD

Process failed ←---------- NAK s.ADD ECD

Attachment 2: Device Check list

Evaluation: OK – Pass

NOK – Fail

POK – Partially OK (Conditions are recorded in the note section)

Category	Sub-category	Detailed Category	Description	Evaluation	Notes
Reader/ Writer	Power Supply	WIM125 series REM125 series	Are all LED's lighted, buzzer sounds activated and LCD shows the product model name when the power is turned on?		
			Are all LED's except the power LED turned off and LCD show ">>Read" or ">>Run" 1 second after power on?		
		WIM125, REM125 series	Is the red LED on the external antenna of WIM125 lighted or flashed?		
	Reading	WIM125 series REM125 series	Is the correct ID displayed on LCD with the buzzer sound when the tag is placed within the recognition distance? Is the Read LED or the correct channel LED lighted for 5 seconds?		
		WIM125, REM125 series	Is the orange Led on the external antenna lighted when the ID is recognized?		
		WIM125 series REM125 series	When the same tag remains in the recognition distance, is the ID read only once? (Only when RTC mode is disabled.)		
		WIM125 series	Is the ID displayed on LCD up to 11 character long?		
			Is the reading activity performed when F1 key on the keyboard is pressed?		
Writer	Writing	WIM125 series	Is the writing activity performed when F2 key on the keyboard is pressed?		
			In the writing mode, the ID read in the reading mode is displayed and the cursor is placed at the last character?		
			Can the keyboard entry support up to 11 characters?		

			When the Enter key on the keyboard is pressed, is the entered ID written and the mode is changed to reading mode to correctly display the entered ID?		
			In the writing mode, are all previous entry erased and the cursor moved to the first character when the F3 key is pressed?		
			In the reading mode, is the previous ID erased and 0 is displayed when the F3 key is pressed?		
Reader/ Writer	Setting	WIM125 series, REM12 series	Is the mode changed to the configuration mode when the switch key is pressed for 3 seconds?		
			After the parameters are changed, are the new values remain the same after the mode is changed to the reading mode and then back to the configuration mode?		
			When the power is turned back on, are all the parameters reset to the default values? (Except when the new parameters values are stored by the CSE command from the host in which case the new values must be retained.)		
			When the address is changed, does the host recognize the new address?		
			When the checksum is turned off, is the communication enabled even when there is no or wrong checksum?		
			When the event report is set as the First talk, is the tag information sent to the host immediately after recognizing the tag?		
			When the CTR command is received during the first talk mode, is the event mode error (28h) sent to the host?		
			When the event report is set as the listen & talk mode, does the tag information stay with the reader until the CTR command is received?		
			In the listen & talk mode, is the tag information (if there is unsent information remaining) or ACK (if there is no remaining tag information) sent to the host when the CTR command is received?		
			If the RF is set in continuous mode, is that tag immediately recognized when it is within the recognition distance?		

			If the CVR command is received during the continuous mode, is the RF mode error (20h) message sent?		
			In the verbose mode, is the tag ignored even if it is within the recognition distance? (For WIM125, is the external antenna LED lighted off?)		
			In the verbose mode, is ID recognized when the CVR command is received?		
			When the CVR command is received with no tag in the recognition distance, does time out occur after the scanning duration time and the time out error (18h) message sent?		
			If the buzzer is activated, is it sounded during read or write?		
			If the buzzer is deactivated, is there no sound during read or write?		
			When the serial interface protocol or baudrate is changed, is the response sent in the old mode and the new mode becomes effective?		
	Communication	WIM125 series REM125 series	When reading, is the recognized ID corrected sent to the host?		
			Does the reader ignore the command when it is sent using the wrong device address?		
			Does the ACK or NAK response sent when the command is received?		
Writer		WIM125 series	Is the tag ID sent to the host after writing operation?		

U.S.A.

U.S.FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT INFORMATION TO THE USER

NOTE : 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 of a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for assistance.

Changes or modification not expressly approved by the party responsible for Compliance could void the user's authority to operate the equipment.
Connecting of peripherals requires the use of grounded shielded signal cables.