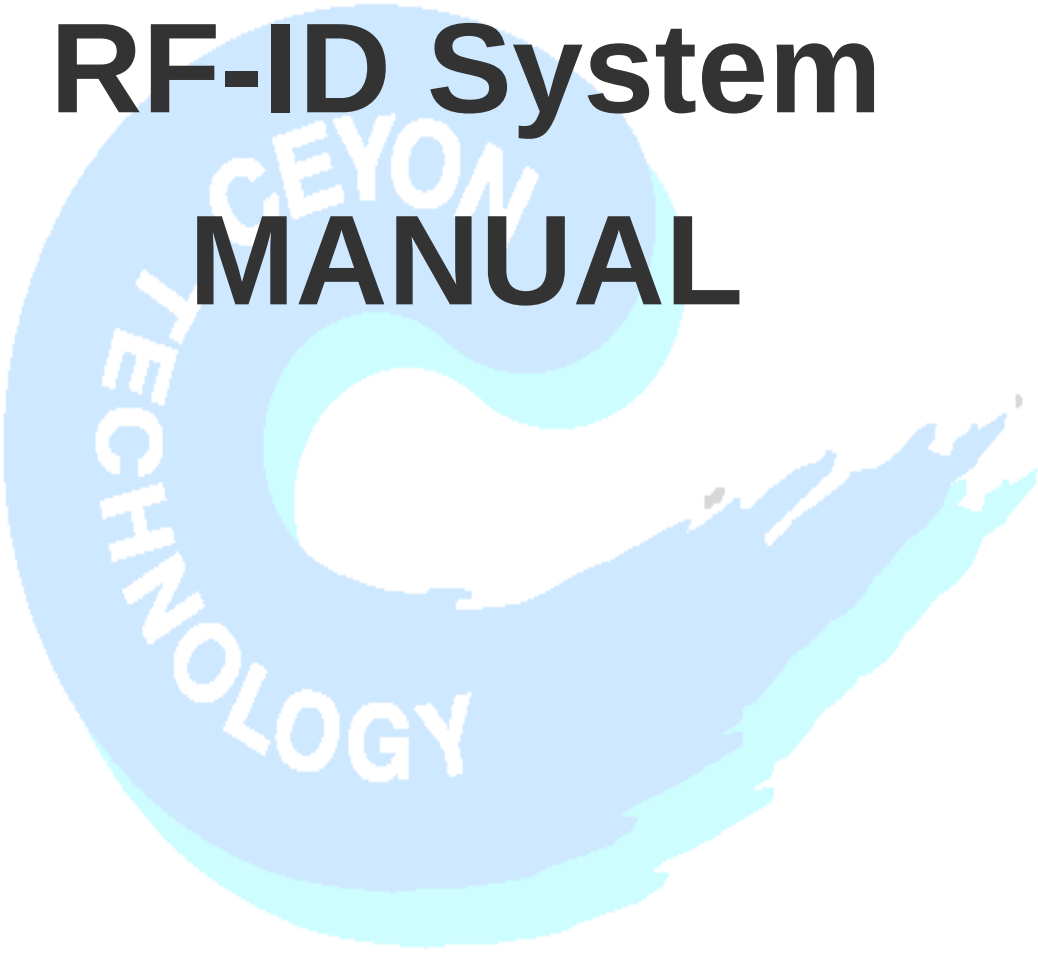
CEYON

RF-ID System

MANUAL



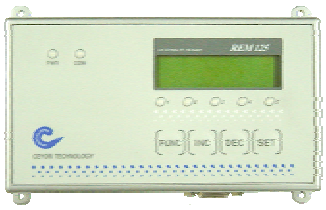
Contents

RF-ID Reader
MANUAL

1. REM125 Series

1.1. REM125 Series Specification

1.1.1. Product specification

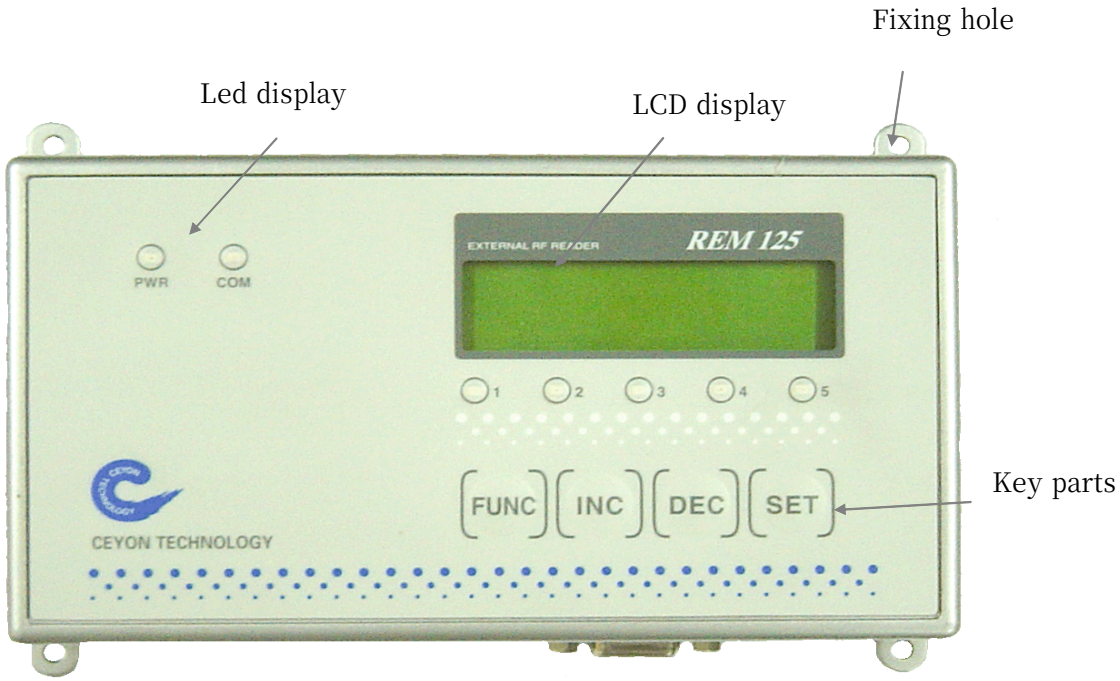
REM125	Parameter	Description
	Processor	8 bit Processor
	Frequency	125 KHz
	LCD type	16*2 line 32 character display
	Power	DC 12V / 1A
	Communication	RS232 , RS422, RS485 (Menu Setting)
	Dimensions	(W)160mm * (L)90mm * (H)35mm
	Material	ABS
	Host Interface	1ea (RS232 , RS422, RS485)
	Ant. ch	REM125-5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

1.1.2. Environment specification

Item	Specification
Range of operation temperature	0°C to +65°C
Range of operation humidity	20 % ~ 90 % (No dew forms allowed)
Range of operation steam pressure	1 steam pressure
Range of storage temperature	0°C to +80°C
Range of storage humidity	20 % ~ 90 % (No dew forms allowed)

REM125 Series Parts

1.1.3. REM125 Series Front



1.1.3.1. POWER and LED Lamp

PWR: Show power connection.

COM: Show communication condition with Host.

1.1.3.2. LCD Display

Display current operation mode or Tag ID and setting message.

Tag ID Detection CHANNEL Display

Show the detection of Tag ID from connected antenna channels among others.

REM 1256-2 has 2 operative channels from No.1 to 2 and REM 1356-5 has 5 operative channels from No.1 to 5.

1.1.3.3. KEY Parts

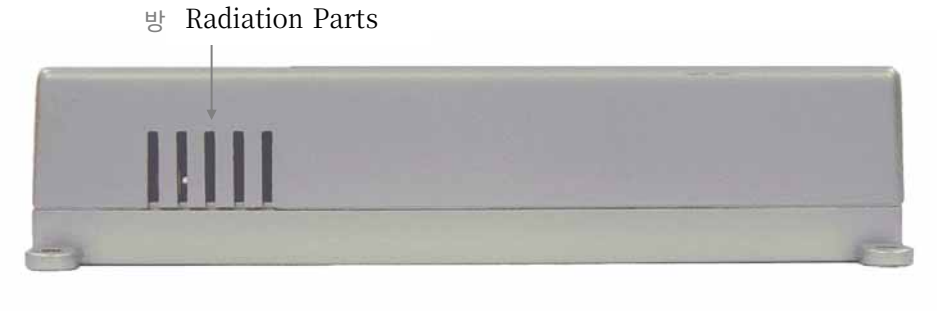
FUNC : Setting device operation or testing device

INC : Choosing setting type or increasing setting value.

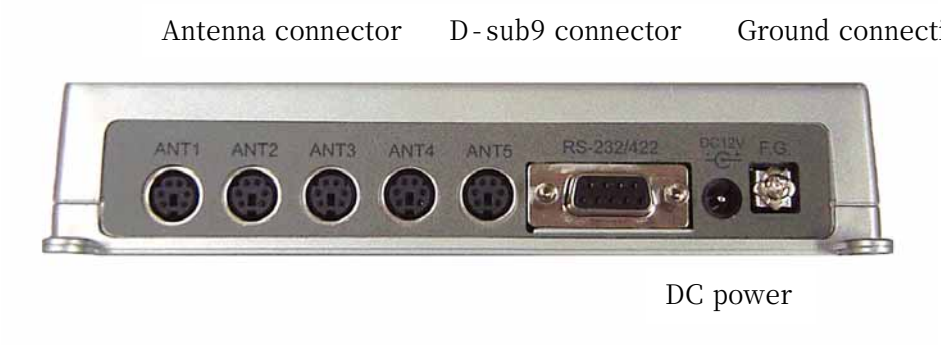
DEC : Choosing setting type or decreasing setting value.

SET : Confirm setting type or setting value.

1.1.4. REM125 Series upper section



1.1.5. REM125-5 lower section



1.1.5.1. ANTENNA Connector

ANT1 ~ ANT 5 : Antenna connector needs 6 pin DIN connector and connected with LED line to show the operation of LED Lamp

1.1.5.2. D-sub 9 Connector

Connecting to HOST and using RS-232 RS-422, RS-485 interface.

1.1.5.3. DC power connection connector

Using DC12V / 1A, proven linear type adaptor.

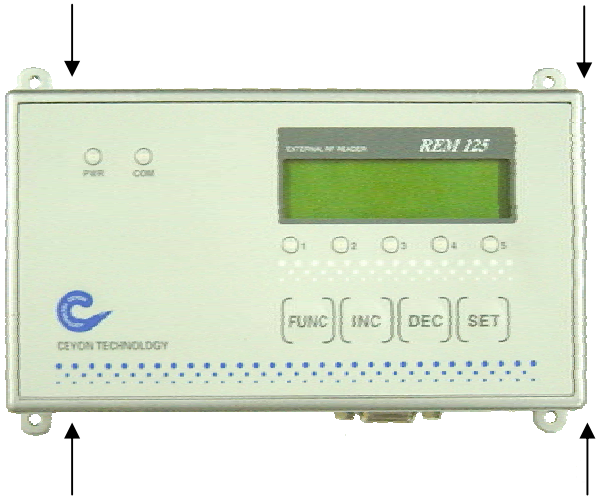
** Caution: Must use offered adaptor from CEYON TECHNOLOGY otherwise efficiency can not be guaranteed

1.1.5.4. Ground connection

Using for safety and prevent from over flow.

1.2. **REM125 Series** installation

REM125 Series installation.



REM1356-5 can be installed on any place one can work with drills using M3.5 dish bolt on marked place(⟶) and in case of difficulty in drilling on the side of attachment, you can install it by using special bracket

1.2.1. Caution during REM125 Series installation.

① In case of difficulty in drilling on the face of attachment during the installation, install it on the designated area using the special bracket.

② Install REM125 Series on the place where the operator can easily perform their work.

③ Attaching parts or bracket must not use electric wave absorption (magnet, ferrite etc) and metal material (SUS, AL etc). If you can't avoid the situation you need additional consultation.

④ Place antenna in the detection range.

⑤ Do not install near by 125KHz device or LF device.

1.3. Power connection

Insert Adaptor -from CEYON TECHNOLOGY- connector into D.C. terminal.

1.3.1. When the power is supplied normally

After power is supplied, PWR LED shows red color.

There will be 1 second buzz sound.

Operating channels are connected with each LED and once REM1356-5 turned on follows installed mode automatically.

1.3.2. When the power is not supplied normally,

LED shows nothing.

No buzz sound.

LCD displaies any message.

1.3.3. Check the followings.

Check the power adaptor when operation is not normal.

Check the power is D.C.15v when there is no load on the power.

Confirm on polarity of power. (Make sure that the adapter is from CEYON TECHNOLOGY.)

1.4. ANTENNA Connection

The antenna terminal consists of the 6 pin din jack. The antenna cable is 2M long. In case of the flat cable needs to be extended, the flat cable 1.5M from us may be used to extend it for up to 3.5M. The cable may not be cut or remodeled arbitrarily. Since the tag recognition distance depends upon the size of the antenna or the tag, we have various kinds of approved antennas in stock. Please consult with our technical staff about the use and the environment

1.5. Communication Line Connection

Open communication line connection between REM125 Series and HOST. REM1356-5 is connected to the host through RS-232, RS-422 or RS-485 interface. Check the connectable interface standard with the host and check the D-SUB 9pin drawing for connection. Also interface can be easily change by LCD setting menu for user's environment.

* RS-232 is setted in the beginning. If you want to chage to RS-422 or RS-485 go to Configuration -> Serial Interface.

1.5.1. RS-232 Serial Cable Connection Road

Use only pin No.2, No.3, No.5 during RS-232 cable connection and do notconnect the others since the others can be used for RS-422 and RS-485 connection and for safety.

The wiring diagram of serial cable RS232 is as follows

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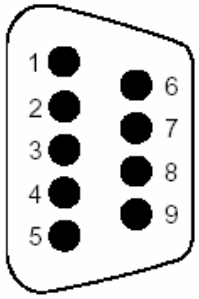


Pin number	Signal abbreviation	Signal name	Signal direction (REM 125 ↔ Host Side)
1	TX422+		
2	RD(RXD)	Reception data	←
3	SD(TXD)	Transmission data	→
4	RX422+	485+	
5	S.G	Signal ground	↔
6	TX422-		
7			
8			
9	RX422-	485-	

RS232 Cable Connection.

PC	
Signal	Pin No.
CD	1
RD(RXD)	2
SD(TXD)	3
DTR(ER)	4
SG	5
DSR(DR)	6
RS(RTS)	7
CS(CTS)	8
RI(CI)	9

REM1356-5	
Signal	Pin No.
N.C	1
RD(RXD)	2
SD(TXD)	3
N.C	4
SG	5
N.C	6
N.C	7
N.C	8
N.C	9

1.5.2. RS-422 Serial Cable Connection

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

RX422-	←	TX422-

* In case of need use 330Ω 1/4W resistence
  (Case: Communication data loose occured)

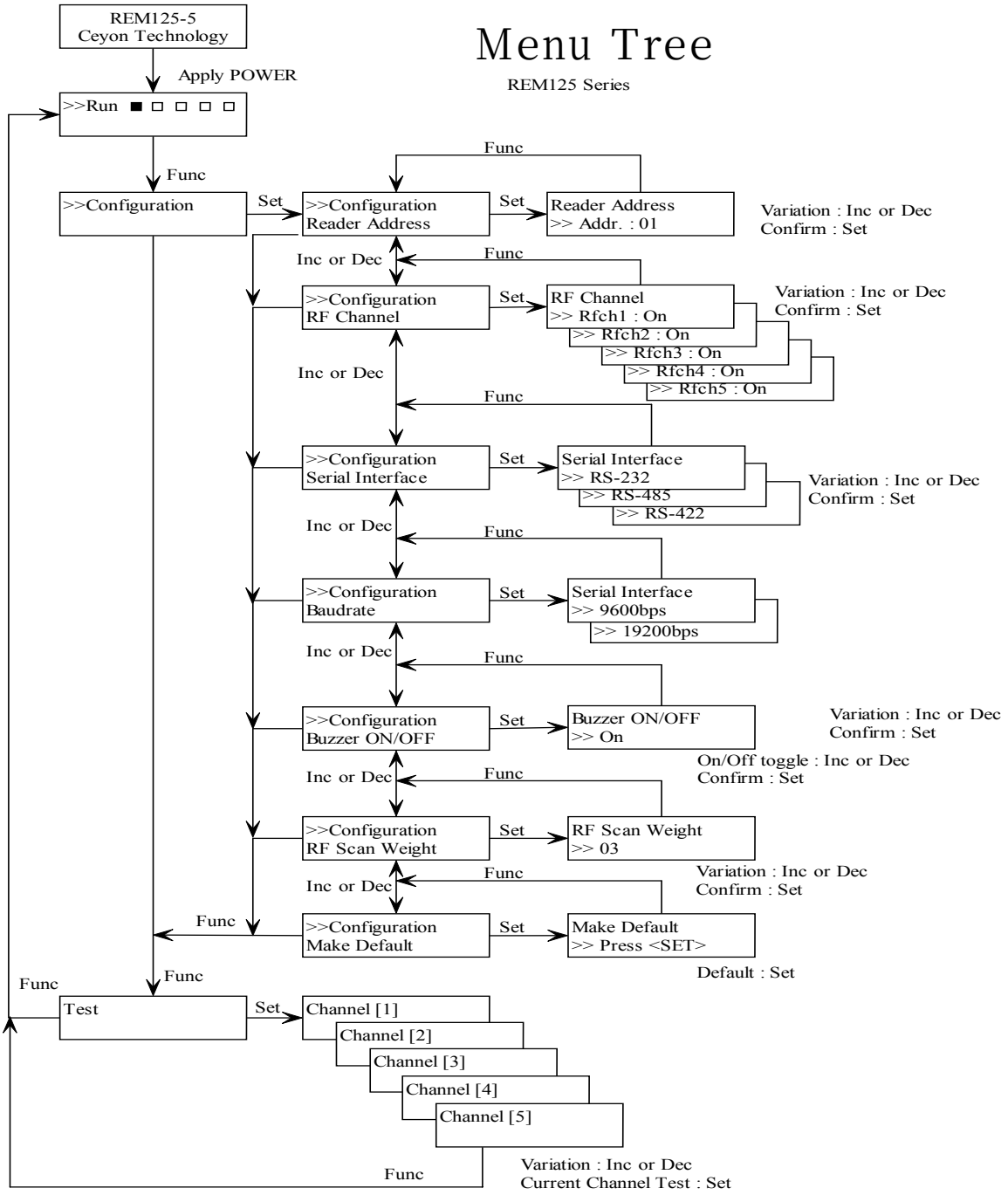
1.5.3. RS-485 Serial Cable Connection

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

* In case of need use 100Ω 1/2W resistence
  (Case: Communication data loose occured)

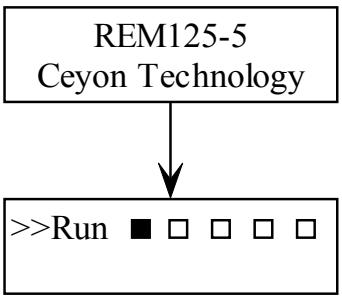
1.6. Menu

1.6.1. REM125 Series Menu Tree



LOCK is setted in the run mode. To change the lock setting push FUNC key for 3 sec after buzz sound it will be unlocked.

1.6.2. REM125 Series Normal Operation



Device always operates at RUN mode. LCD display scanning channel and deteced data. (RUN MODE)

1.6.3. REM125 Series Configuration

When you are change the setting beep sound will follow and beep sounds have meaning.

Long Beep 3 times: touched non function key.

Short Beep 3 times: setting wass confirmed. (ok)

Short Beep 1 times: setting value was changed.

FUNC KEY for 3 sec change to Configuration mode with long beep.

FUNC mode last for 30sec and back to normal mode after 30 sec.

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1.6.3.1. REM125 adress installation

Use designated reader address for multy comunication Except POINT TO POINT

order	Key input	LCD message	note
①	FUNC	>>Configuration	FUNC KEY for 3 sec change to Configuration mode
②	SET	Lower menu	setting
③	INC,DEC settlement	>>Configuration Reader Address	Move to pertinent menu by direction KEY
④	SET	Lower menu	setting
⑤	INC,DEC settlement	Reader Address >> Addr. : 01	Set REM-125's address by direction KEY(No need for 1:1 connection) Changeable range:01~16 default:01
⑥	SET	Lower menu	Reader adress designated after short 3 beep
⑦	FUNC	>>Configuration Reader Address	Move to upper menu

⑧	FUNC	Test	Move to Test mode
⑨	FUNC	>>Run	Move to Run mode

1.6.3.2. RF Channel installation

REM125-5 can have fast scan cycle when you turn off unusing channels among 5 channels by skipping to next channel.

order	Key input	LCD message	note
①	FUNC	>>Configuration	FUNC KEY for 3 sec change to Configuration mode.
②	SET	Lower menu	setting
③	INC,DEC settlement	>>Configuration RF Channel	Move to pertinent menu by direction KEY.
④	SET	Lower menu	setting
⑤	INC,DEC settlement	RF Channel >> RfCh1. : On	Set RFCh1 by direction KEY Changeable range: RfCh1~ RfCh5 Default : All channel On
⑥	SET	Lower menu	Set On, Off Toggle mode after short 3 beep
⑦	FUNC	>>Configuration RF Channel	Move to upper menu
⑧	FUNC	Test	Move to Test mode
⑨	FUNC	>>Run	Move to Run mode

1.6.3.3. Serial Interface installation

REM125 Series has 3 kinds of interface to satisfy various needs. You need to choice interface and set the interface at REM-125 menu.

order	Key input	LCD message	note
①	FUNC	>>Configuration	FUNC KEY for 3 sec change to Configuration mode.
②	SET	Lower menu	setting
③	INC, DEC settlement	>>Configuration Serial Interface	Move to pertinent menu by direction KEY
④	SET	Lower menu	setting
⑤	INC, DEC	Serial Interface	Choice interface by direction KEY

	settlement	>> RS-232	Default: RS-232
⑥	SET	Lower menu	Set On, Off Toggle mode after short 3 beep
⑦	FUNC	>>Configuration Serial Interface	Move to upper menu
⑧	FUNC	Test	Move to test menu
⑨	FUNC	>>Run	Move to run mode

1.6.3.4. Baudrate installation

The host makes a choice interface speed and support 9600bps or 19200bps.

order	Key input	LCD message	note
①	FUNC	>>Configuration	FUNC KEY for 3 sec change to Configuration mode.
②	SET	Lower menu	setting
③	INC, DEC settlement	>>Configuration Baudrate	Move to pertinent menu by direction KEY
④	SET	Lower menu	setting
⑤	INC, DEC settlement	Baudrate >> 9600bps	Choice interface speed by direction KEY default: 9600bps
⑥	SET	Lower menu	Set Host speed after short 3 beep
⑦	FUNC	>>Configuration Baudrate	Move to upper menu
⑧	FUNC	Test	Move to Test menu
⑨	FUNC	>>Run	Move to run menu

1.6.3.5. Buzzer ON/OFF installation

REM125 Tag ID detection makes 1 beep sound and you can you can turn the sound on/off but can not handle control key beep sound.

order	Key input	LCD message	note
①	FUNC	>>Configuration	FUNC KEY for 3 sec change to

			Configuration mode.
②	SET	Lower menu	setting
③	INC, DEC settlement	>>Configuration Buzzer ON/OFF	Move to pertinent menu by direction KEY
④	SET	Lower menu	setting
⑤	INC, DEC settlement	Buzzer ON/OFF >> On	Set on/off with direction KEY default: On
⑥	SET	Lower menu	Set Host speed with 3 short beep sound
⑦	FUNC	>>Configuration Buzzer ON/OFF	Move to upper menu
⑧	FUNC	Test	Move to Test menu
⑨	FUNC	>>Run	Move to run mode

1.6.3.6. RF Scan Weight installation

Scan weight can adjust channel time posrssesion from 80ms to 170ms. There are 1 to 10 (80ms~170ms). RF can be disturbed by envurement so scan weight function make quick detection of Tag Id

order	Key input	LCD message	note
①	FUNC	>>Configuration	FUNC KEY for 3 sec change to Configuration mode.
②	SET	Lower menu	setting
③	INC, DEC settlement	>>Configuration RF Scan Weight	Move to pertinent menu by direction KEY
④	SET	Lower menu	setting
⑤	INC, DEC settlement	RF Scan Weight >> On	Set scan weight by direction KEY Changeable range: 1 ~ 10 default: 3
⑥	SET	Lower menu	Set scan weight with 3 short beep sound
⑦	FUNC	>>Configuration RF Scan Weight	Move to upper menu
⑧	FUNC	Test	Move test menu
⑨	FUNC	>>Run	Move to run mode

1.6.3.7. Factory installation

Back to default value.

order	Key input	LCD message	note
①	FUNC	>>Configuration	
②	SET	Lower menu	setting
③	INC,DEC settlement	>>Configuration Make Default	Move to pertinent menu by direction KEY
④	SET	Make Default >> Press <Set>	Back to default mode
⑥	FUNC	>>Configuration RF Scan Weight	Move to upper menu
⑦	FUNC	Test	Move to Test menu
⑧	FUNC	>>Run	Move to run mode

1.6.4. REM125 Series Test (Trial mode)

Checking operation condition before actual operation

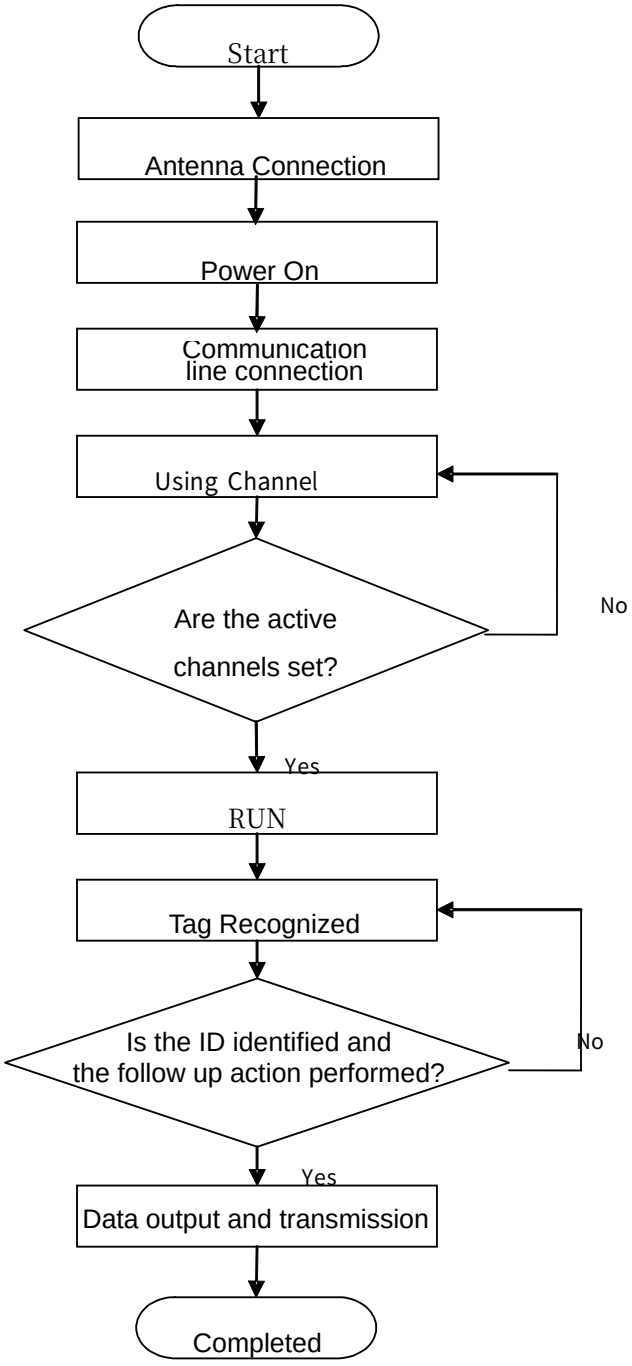
order	Key input	LCD message	note
①	FUNC	Test	Move to FUNC key
②	SET	Lower menu	setting
③	INC,DEC settlement	Channel [1]	Move to pertinent menu by direction KEY Move to Testing RF CHANNEL
④	SET	Channel [1] K60T0031	Send reading order Receive data normally
⑤	FUNC	>> Run	Move to run mode

1.7. Host Communication

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

1.8. 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.



Confirm a supplement of the check list for more description about operation except above test

1.9. Problems and solutions

Introduce diversity problems and solutions that could happen..

1.9.1. Power-related problems

Q1. After connecting the power connector, LED isn't on

A1. When this problem occurs, check the followings.

Check the equipment of the power supply. (DC12V / 1A)

Remove the cable from power input port and after 10 seconds reconnect it and restart REM125.

1.9.2. Problems on the connection between the networks

Q1. When the connection between the host and REM125 cannot be made.

A1. When this problem occurs, checks the followings.

Check again the connection status of all kinds of cables connecting the host and REM125.

Also check if using the private cable or not.

Check the operational status of the host and REM125.

.

Q2. The connection between ANTENNA and REM1356-5 cannot be made.

A2. When this problem occurs, checks the followings.

Check again the connection status of all kinds of cables connecting the REM1356-5and ANTENNA.

Also check if using the private cable or not.

Check the operational status of REM134and ANTENNA.

1.9.3. Operation Related problems

Q1 The system is not functioning normally .

A1. Check the communication line is properly connected.

Check if the power is normally supplied.

Check LCD display Channel[!] at test mode

* [!]means atenna adress

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 the address is setted corrected.

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 SEYON Technology (+82-31-267-1163).

APPROVED ANTENNA for RFID System (REM125-5).

Product Name / model name	Approved Antenna Model name
REM125-5	EA125-C
	EA125-S

About the antenna specification, please see the antenna manual.

Caution

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

FCC Compliance Information

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.

Information to User

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.

RF-ID ANTENNA MANUAL

2. EA125C

2.1. EA125C Specifications

2.1.1. Product Specifications

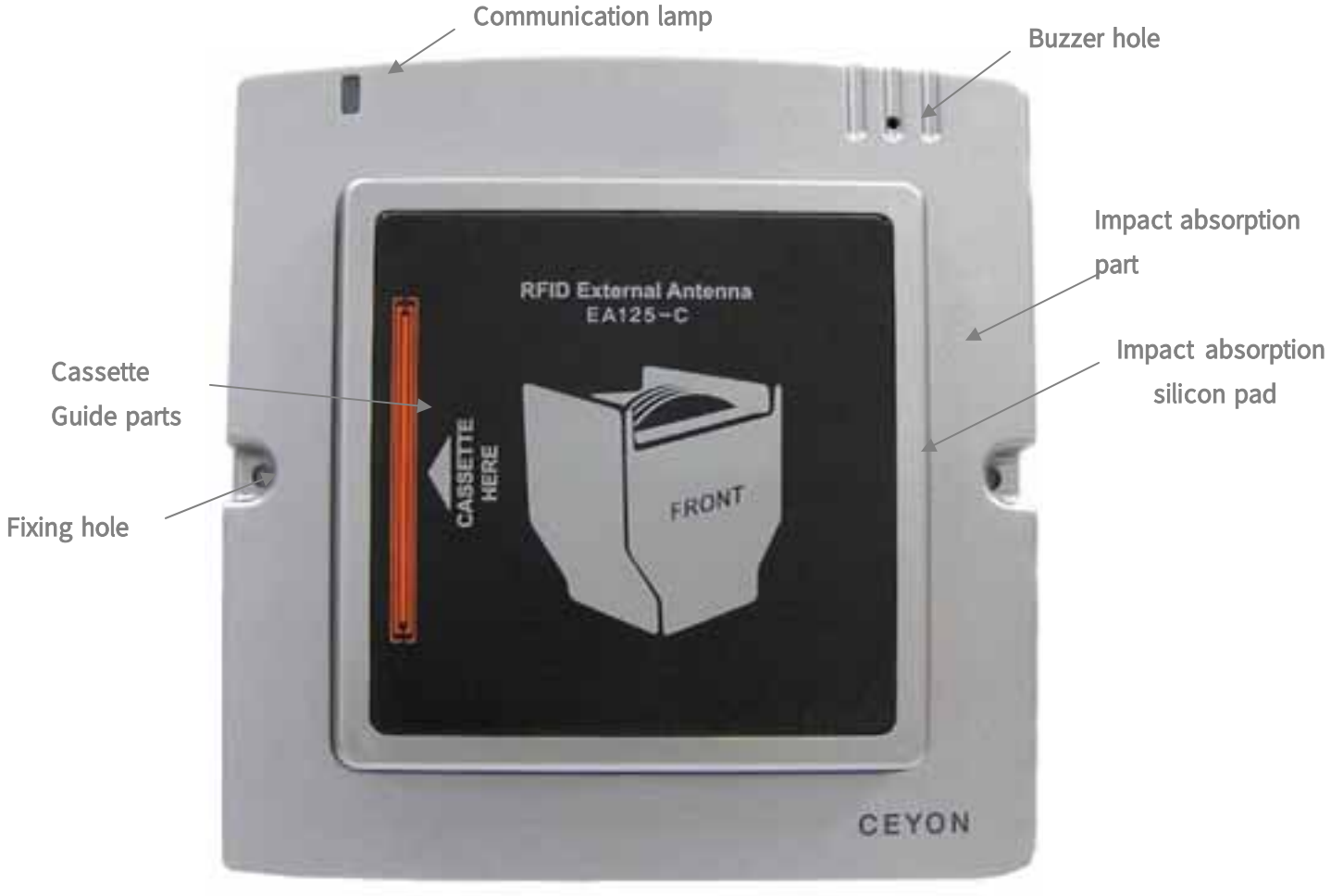
EA125C	Parameter	Description
	Processor	8 bit Processor
	Frequency	125 KHz
	Dimensions	(W)165mm * (L)168mm * (H)45mm
	Material	ABS
	Reader contact	6 Pin 5268 Connector
	Display	Dual LED (RUN,Status)
		Buzzer

2.1.2. Environment Specifications

Item	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)

2.2. EA125C Parts

2.2.1. EA125C Front Section



2.2.1.1. LED Part

Show power connection and operation condition.

2.2.1.2. Buzzer display part

2 buzzer sound with detection of tag ID

2.2.1.3. Impact absorption part

Impact absorption is designed to protect atenna from damage between EA125c and Cassette.

Used silicon pad for the first impact and made cassette guide line for correct direction.

2.2.2. EA125C lower parts

2.2.2.1. Reader connection

Connect EA125C Antenna and REM125 series by cable(Mini Din 6pin +5264 6 pin, 2.5m).

2.3. EA125C Installation

EA125C can be installed on any place one can work with drills using M3.5 dish bolt on marked place(⟶) and in case of difficulty in drilling on the side of attachment, you can install it by using special bracket

2.3.1. Caution during E A125C Series installation

① In case of difficulty in drilling on the face of attachment during the installation, install it on the designated area using the special bracket

② Install EA125C Series on the place where the operator can easily perform their work.

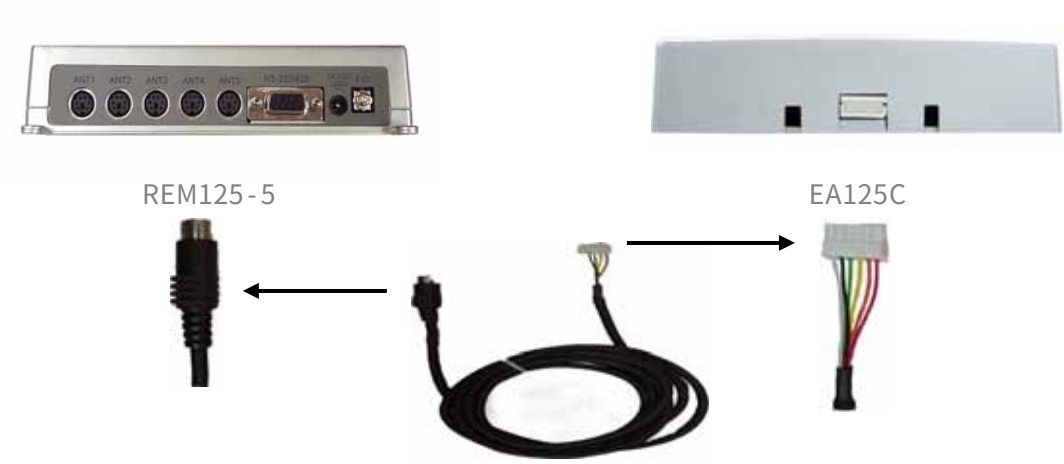
③ Chase worker's moving line before installation and place Tag in the detection

range.

④ Install communication line for comfortable place.

⑤ Attaching parts or bracket must not use electric wave absorption (magnet, ferrite etc) and metal material (SUS, AL etc). If you can't avoid the situation you need additional consultation.

2.4. EA125C Communication Line Connection



Connect Flat cable with EA1356R and EA1356CV with Pin connector using antenna cable.

2.4.1. Caution during cable connection.

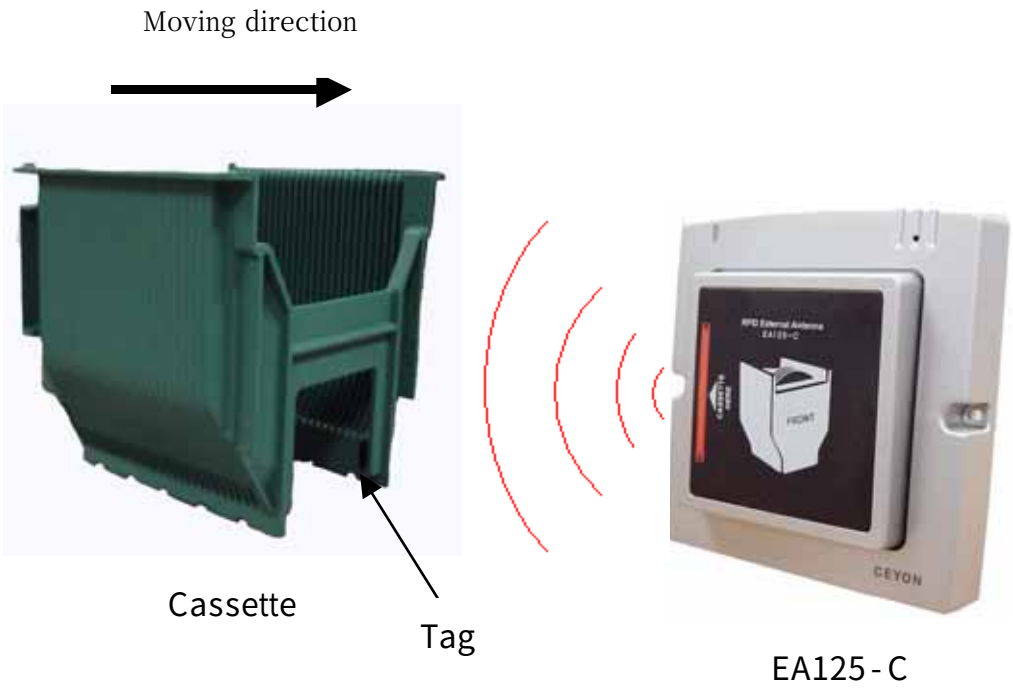
Connect cables after checking connection part and pin before connect to EA125C.

Wrong connection can damage pins.

Hold connector part when you pull out or insert communication cable to protect cable.

Keep away from foreign substance and should not be stock in each connector.

2.5. EA125C operation



Upper picture is about magnetic field radiation. Move Cassette to the center of EA125c and cassette's tag will be detected at the middle of EA125-C.

2.6. EA125C Problems and solutions

Introduce diversity problems and solutions that could happen.

Q1. Communication lamp doesn't work or no buzzer sound after reading Tag.

A1. Check power is supplied normally to REM125-(2)5.
Check cable connection condition between EA1356R and Reader.
Check connector pin and line condition.

Q2. Can't detect Tag within possible range.

A2. Check EA1356R, CV's communication lamp has red light.
Check EA125C's cable connection condition.
Check connector pin and line condition.
Check data input is correct for CassetteTag

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

3. EA125S

3.1. EA125S Specifications

3.1.1. Product Specifications

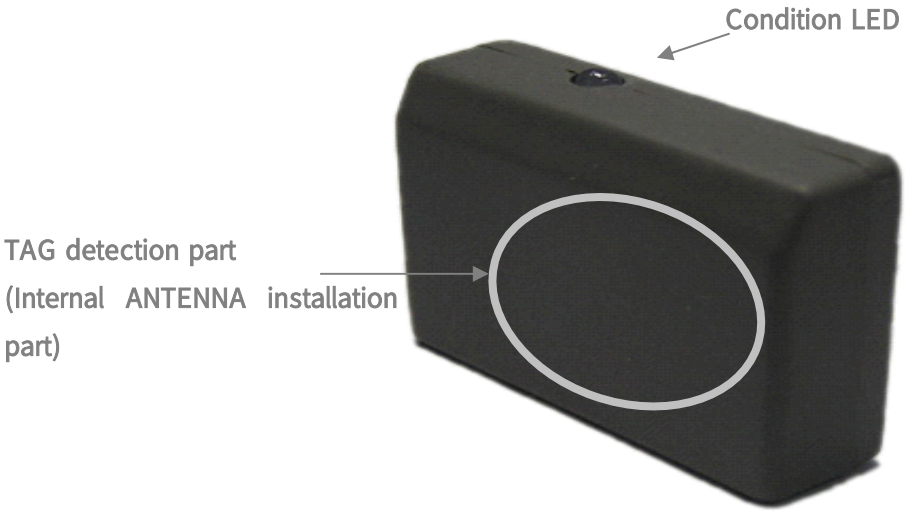
EA125S	Parameter	Description
	Frequency	125 KHz
	Dimensions	(W)35mm * (L)25mm * (H)10mm
	Material	ABS
	Reader contact	6 Pin FFC Connector 접속
	Display	Dual LED (RUN,Status)

3.1.2. Environment Specifications

Item	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. EA125S Parts

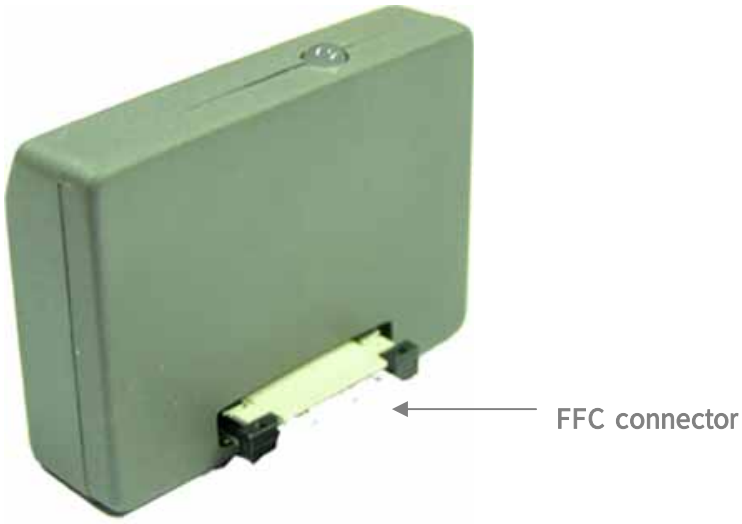
3.2.1. EA125S Front Section



3.2.1.1. LED Part

Show power connection and operation condition

3.2.2. EA125S lower part



3.2.2.1. Reader connector

EA125S 안테나와 REM125 series를 전용 Cable을 사용하여 접속하기 위한 커넥터입니다.

Connector for connection between EA125s and REM125series

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

FFC cable ,1m

3.3. EA125S Installation

REM1356-5 can be installed on any place one can work with drills using M3.5 dish bolt on marked ~~place~~( ) and in case of difficulty in drilling on the side of attachment, you can install it by using special bracket

3.3.1. Caution during EA125S installation

① In case of difficulty in drilling on the face of attachment during the installation, install it on the designated area using the special bracket

② Install EA125s Series on the place where the operator can easily perform their work.

③ Attaching part must be flat and use special adhesive.

④ Install communication line for comfortable place.

⑤ Attaching parts or bracket must not use electric wave absorption (magnet, ferrite etc) and metal material (SUS, AL etc). If you can't avoid the situation you need additional consultation.

3.4. EA125S communication Cable Connection

REM125-5

EA125-S

Communication cable

Cable transeform PCB

FFC

EA125s is connected to REM125-2(5) with cable through transform PCB. Compare to EA125c FCCline is 1m added that installation will be easy.

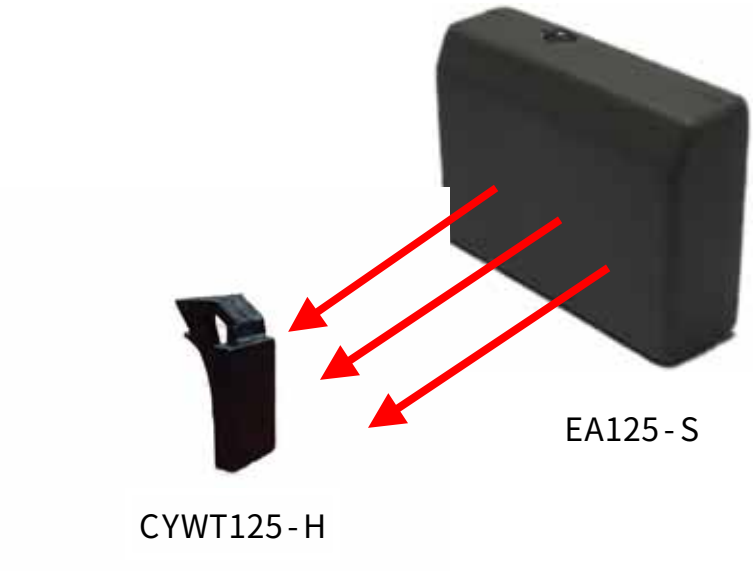
3.4.1. Caution during cable connection

① Check connecting part of EA125C and connector and wrong connection can damage pins.

② Check transform PCB and EA125S connector before connect to connector

③ Make sure connector jack's connection not to loose connection.

3.5. EA125S operation



Upper picture is about magnetic field radiation. Tag shows best efficiency at the center of EA134, especially best detection range can be guaranteed when Tag's the center is located at antenna's the middle.

3.6. EA125S Problems and solutions

Introduce diversity problems and solutions that could happen.

Q1. Communication lamp doesn't work or no buzzer sound after reading Tag.

A1. Check power is supplied normally to Reader.

Check connection condition between EA125S and FFC.

Check connector pin and line condition.

Check EA125S, REM125-2(5) and cable transform PCB's connection.

Q2. Can't detect Tag within possible range.

A2. Check EA125S communication lamp has red light.

Check EA125S, REM125-2(5) and cable transform PCB's connection

Check connector pin and line condition

Check data input is correct for Tag

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

Supplement

Supplement 1: Communication with the Host

4. Reader Operation

4.1. RF mode

1.1.1. 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.

1.1.2. 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.

4.2. Event report mode

1.2.1 First talk mode(FT)

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

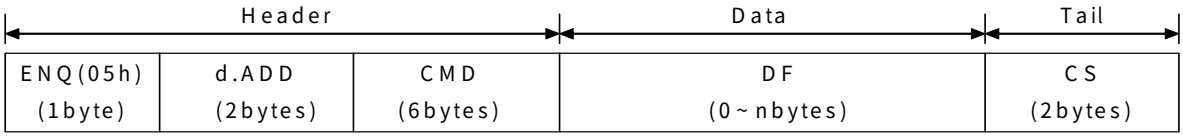
1.2.2 Listen & talk mode(LT)

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.

5. 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.

5.1. Command Frame(Host to Reader)



2.1

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

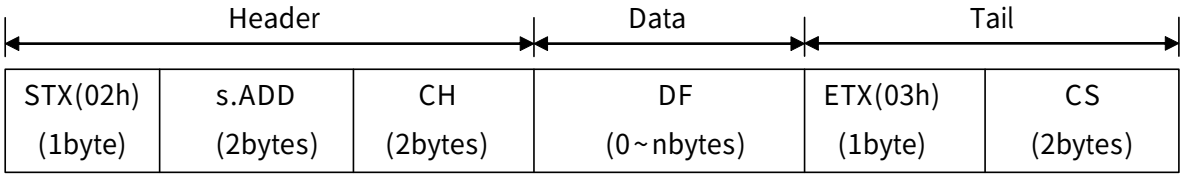
d.ADD (Destination Address) :): It is the reader's address to send the data or to accepting data and can be within 00H ~ FFH, set as default (01).

CMD (Command) : Decide reader's operation and send directly to the host. But the writing and abnormal response will send back to reader

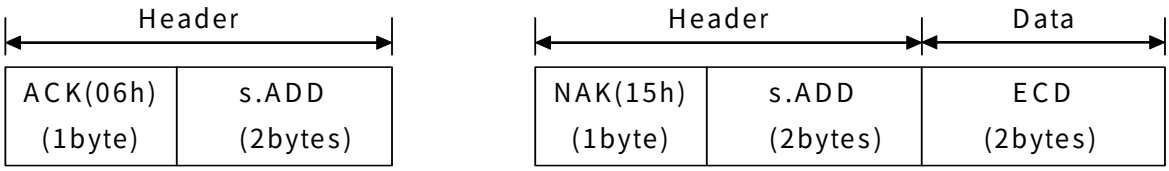
DF (Data Field) : data

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

5.2. Response Frame(Reader to Host)



2.2



2.3

Resposnse frame using for sending control information, reader to host is shown 2.2. This frame is about Tag's reade/write(CTR/CTW) and command respond when sending data or various respond from host request. Control information can be sand following request that request/response co-work. If there is no response data or error sending ACK or NAK in 2.3

STX (Start TX) : Means Frame start and ASCII 02h' control character.

ACK(Acknowledgement) : Proper request handle and ASCII 06H's control character

NAK(Negative ACK) : Fail from request and ASCII 15H's control character

s.ADD (Source Address) : Reader's address sending data

CH (channel) : Reader's channel nember(One reader has several channels and each antenna called channel. Single antenna always has 1ch. FFH for sending control information
DF (Data Field) : data
ETX (End TX) : Means end of data and ASCII 03H's control character
CS (Checksum) : The lowest 1 byte value of the sum excluding CS is changed to 2 byte ASCII code.
ECD : Signifies ERROR CODE 1 byte and changed to 2 byte ASCII code.

A0H : WRITING FAIL,
A8H : READING FAIL,
80H : CHECKSUM FAIL
88H : Overflow
40H : EEPROM WRITING FAIL
20H: RF Mode error
28H:Event Mode error
10H : Unknown command
18H : Time Out

6. Command

REM125 and WIM125 suport below commands. Each command display as Cxx and here c means Command. As shown in the table CDM has 3byte and each command cowork with data.
One important thing is that data's 1byte Hex transforms 2byte ASCII that 6bytes long in the frame.
Ex)CCS (08h 03h 01h)will be '0''8''0''3''0''1' and become 30h 38h 30h 33h 30h 31h in the freame.

Such data transforming is applied to all field as ENQ, STX and ETX except control character exgisting in ASKII.

Command name	Command code	Data	Description
CCS (Ch. Status)	08h 03h 01h	None	Related with CCE command identification of enabled Ch. Response's data is 1 byte and enabled Ch's bit position is setted same as CCE's data byte
CRA (Read Address)	08h 17h 01h	None	Read READER's address 1byte
CMI (Manufacturer Info.)	08h 20h 08h	None	Read 8bytes production info.
CPI (Protocol ver. Info.)	08h 28h 08h	None	Read 8bytes protocol version info.
CFI (F/W ver. Info)	08h 30h 08h	None	Read 8bytes Firm ware version info.
CVM (Verbose Mode)	10h 0Bh 01h	00h – Continuous 01h- Verbose	Verbose mode is that antenna can scan (on mode) Tag only by CVR command and back to off mode after reading tag Continuous mode Enabled Ch by CCE has specification cycle and read tag 1time.
CFT (First Talk)	10h 0Bh 02h	00h – Listen & talk 01h – First talk	LT mode is that not sending Tag info to host immediately but sending by CTR command. FT mode is that sending tag data immediately to host.
CRTC (Reset Tag in Continuous mode)	10h 0Bh 03h	00h – Disable 01h - Enalbe	This command only works in continuous mode. RTC enable mode is that keep sending same tag data if the tag located in antenna range. Enalbe mode is that sending same tag info only 1 time at first reading and not sending anymore.

CVTL (Verbose Time Limit)	10h 0Bh 06h	01h – Enable Time out	Reader scan tag for setted time in CTT mode when Verbose mode receiving CVR command. If there is no tag sending time out errormessage.
CBS (Buzzer Set)	10h 0Bh 07h	00h – Buzzer off 01h – Buzzer on	Decide buzzer operation when read tag or write ok.
CDC (Device Check)	10h 18h 03h	01h	Check reader condition after receiving ACK, NAK or none answer.
CSE (Save setting to Eeprom)	10h 18h 05h	01h	Memorise reader's setting mode at EEPEROM when power is not supply. Without this order reader will be default mode after power off.
CGB (Good Beep)	10h 19h 05h	01h	Good beep sound
CEB (Error Beep)	10h 19h 06h	01h	Error beep sound
CLB (Long Beep)	10h 19h 07h	01h	Long beep sound.
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	Enable or disable each Ch.
CSI (Serial Interface)	18h 0Ch 01h	upper4bits: type 0 – RS422 1 – RS485 2 – RS232 low4bits: BPS 6 – 9600bps	Set serial interface and transfortation speed between host and reader. Changed info can be written after sending Ack response. Ex) RS422, 9600bps Data – 06h

		7 – 19.2kbps 8 – 38.4kbps 9 – 56kbps	
CTT (Tag Time)	18h 1Dh 01h	00h – 0sec 01h (0.5sec) ~ 0Ah(5sec) *1increase means 0.5sec increase	Ch's canning duration operated by CVR *Set 3sec time out for safe data reading
CSA (Set Address)	18h 17h 01h	1 ~ 16(01h~10h) device address	Set1 byte device address. Changed info memorized after sending Ack response.
CVR (Verbose ch. Read)	18h 19h 01h	ch 1 ~ 5 -00h off all Ch.	Choice antenna to turn on at Verbose mode. At this point setting channel need to be enabled and operate only 1 Ch at specific time. Reader will send Ack immediately and scanning tag for scanning duration time. It will be send by FT/LT or CTR command to host if there is a tag data. If antenna can't read Tag time out error response will be send and conver to waiting mode.
CTRn (n ch Tag data Read)	2nh 47h 17h	None	Read specification ch's Tag. This order operates only within Listen&talk mode. n's range within 0~8ch and support 8ch. N=0(OCTR0,20h) is mode that can read tag data at any channel. *CTR0 sends all channel's data to 1 frame and shown as 3.1.
CTWn (n ch Tag data Write)	3nh 47h 17h	Tag data	N's range is within 1~8

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.

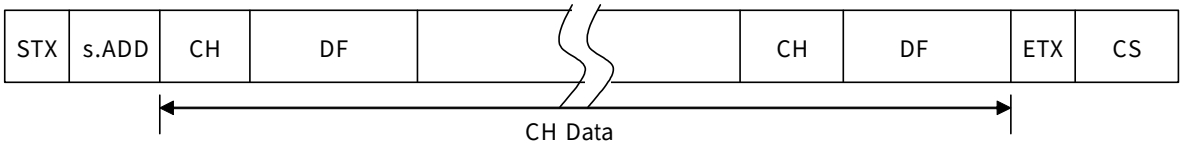


Figure 3.1

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

Supplement 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	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?		
		REM125 series	Is the red LED on the external antenna of WIM125 lighted or flashed?		
	Reading	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?		
		REM125 series	Is the orange Led on the external antenna lighted when the ID is recognized?		
		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?		
Reader/ Writer	Setting	REM125 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	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?		