UniTracer

[Electronic locking device for container]

USER MANUAL

FOR UniTracer L-100(G)

This guide explains the device UniTracer L-100(G).

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1. Precautions concerning pre-service

1.1 Precautions

- The battery should be used after full charging. The device connects a 5V 2A adapter to the USB port using the included USB cable.
- The USIM card should be prepared for local use or roaming in accordance with the purpose of use.
- Once inserted, it is imperative that the insertion of caution is checked again, because it cannot be withdrawn again.
- To use an NFC card, you must register the NFC card ID in the L-100 device.
- This device can be operated in at least one Member State of EU without infringing applicable requirements on the use of radio spectrum.

1.2 Device package configuration

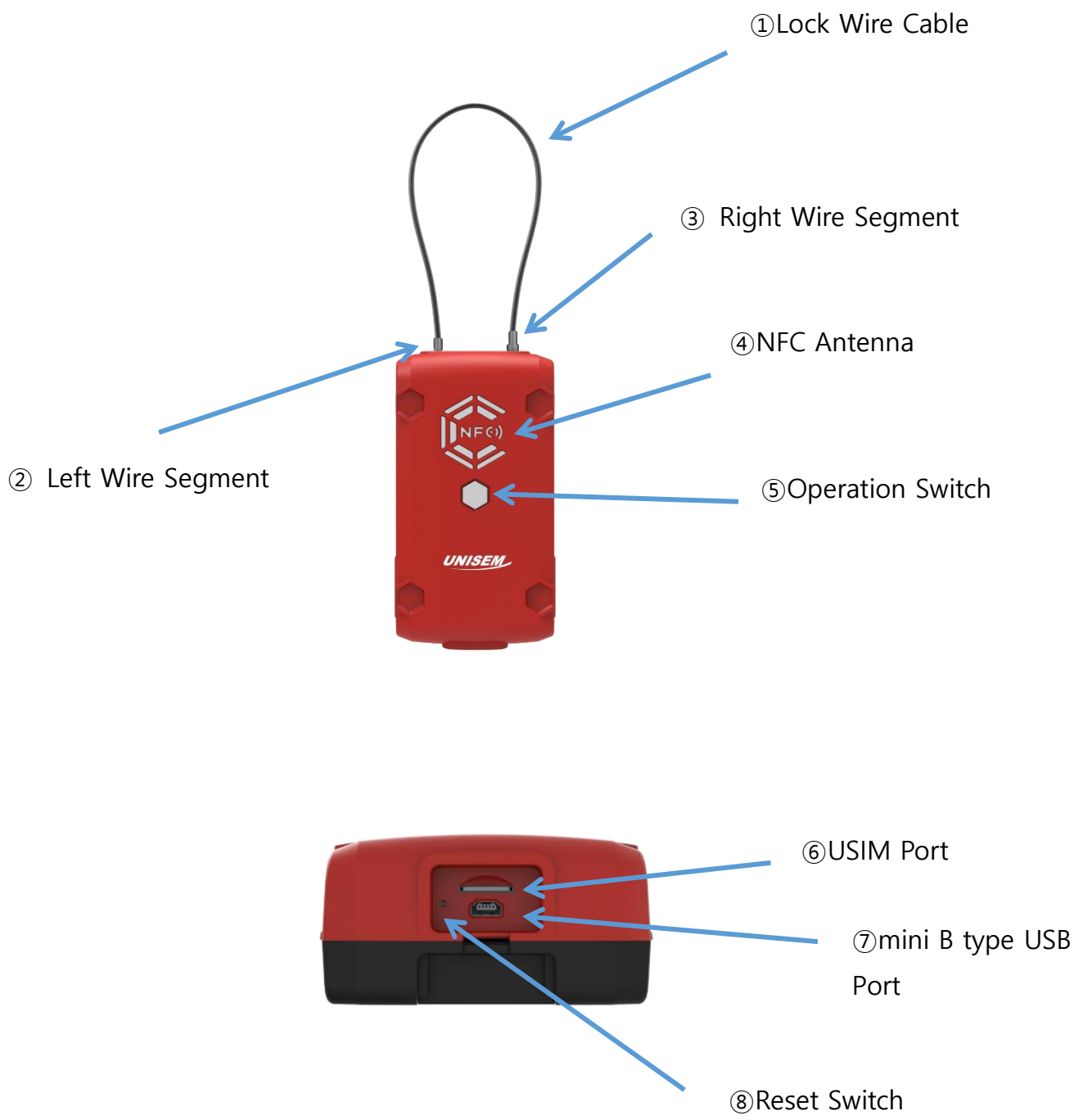
UniTracer L-100

Mini B type USB cable

- UniTracer L-100 Specification

Item	Specifications
Model	UniTracer L-100(G)
Temperature	-30~+80℃
Humidity	0~99%
Electrical Usage	3.78VDC
CPU	32Bit MPU
Data Storage	1Mbit EEPROM x 2
Data Transmission	792 Times(33 days) (24 Collections per day, every hour)
Battery Capacity	Lithium-Ion 6,000mAh(Rechargeable)
Sensor	Open/Close of door, Location, Detect cutting
GPS	GPS
-	-
Weight	1.5Kg (Inclusive 500g battery)
Size	75(W) x 140(H) x 40(D)mm
Lock Method	Sensor Wire Seal
Identification	NFC(ISO 14443 Type A)
Diagnostic Port	USB Port
DC Power Input	5V/2A
GSM UL Frequency Band	GSM 850 : 824.2 ~ 848.8 MHz GSM 1900 : 1850.2 ~ 1909.8 MHz
GSM DL Frequency Band	GSM 850 : 869.2 ~ 893.8 MHz GSM 1900 : 1930.2 ~ 1989.8 MHz
NFC transmit / receive frequency range	13.56 MHz
GPS receive frequency range	1559MHz ~ 1610MHz

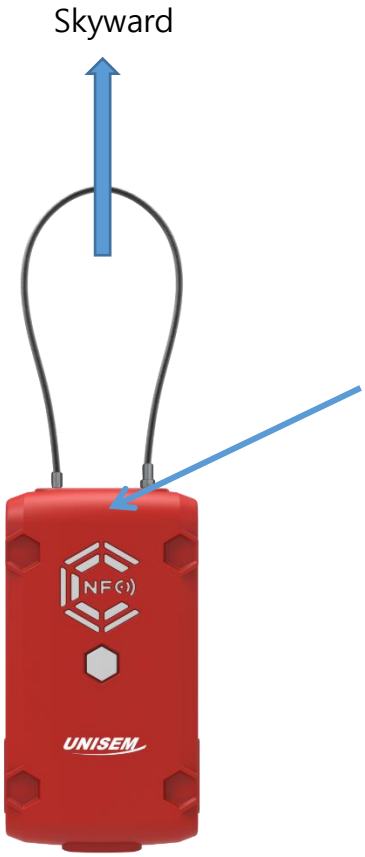
1.3 Component parts of the device



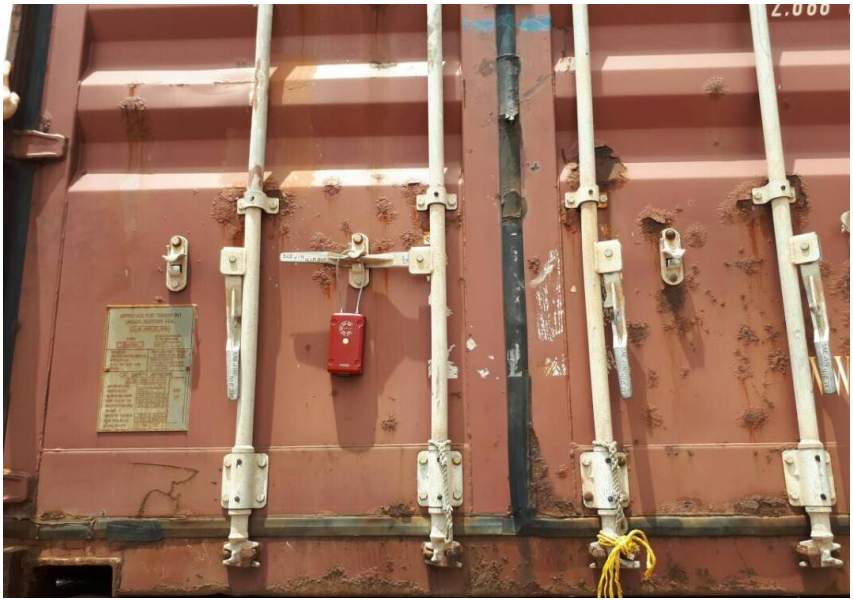
No.	Part Name	Description	Remarks
1	Lock Wire Cable	30cm, 100cm optional	
2	Left Wire Segment	The left wire segment is fixed.	
3	Right Wire Segment	You can hold and open and close the right wire segment.	
4	NFC Antenna	Where to tag the NFC card	
5	Operation Switch	- Blinking green light for GPS communication - Blinking blue light for WCDMA/GSM communication	
6	USIM Port	Port that inserts USIM card	
7	mini B type USB Port	Port that charges the device and analyzes the device log	
8	Reset Switch	Switch to reset the device	

1.4 Device installation and sealing method

- With the wire open, wire the device to the container lock and fasten the device.
- When connecting the wire to the device, be sure to push it all the way to prevent the connection failure.
- Confirm the lock by touching the NFC card registered in the NFC antenna section within 5 seconds after wire tightening.
- Attach the magnet on the back of the L-100 to the flat surface (steel material) of the container and tighten the device to the container.
- When attaching the L-100 to a container, etc., be sure to install the L-100 in the following direction to obtain optimal GPS reception.



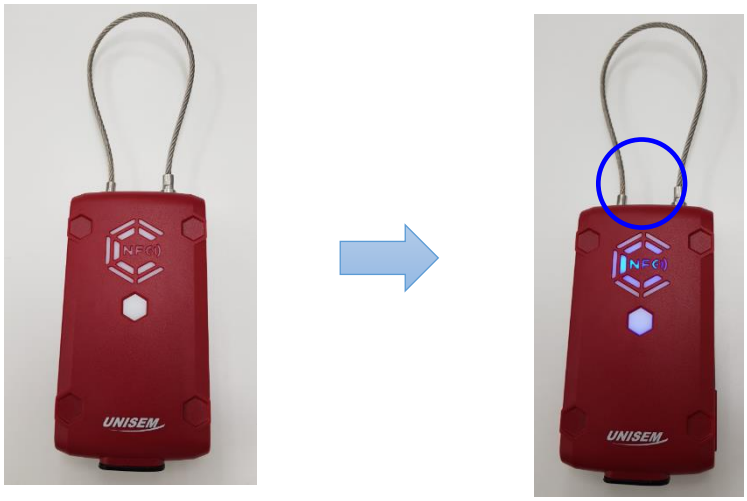
<Figure. Device installation Position>



<Figure. actual device installation example>

1.5 How to unseal and retrieve the device

1) The operation switch is not lit when the device is operating. At this time, when the operation switch is pressed, the NFC antenna lights in blue. (The light is kept in blue for 5 seconds.)



2) Attach the registered NFC card before the blue light on the NFC antenna turns off. (The blue light is on for 5 seconds.) When the touch is completed, the buzzer sounds and the NFC antenna turns off. At this time, pull the right wire segment after press it slightly inwards. When the wire is disconnected, a green light blinks to receive the GPS(to send the device's open signal). When the green light is off, a blue light will come on for the data communication. The blue light turns off when data transmission is completed.

3) Device retrieve method

- Hold the eSeal device with the magnet attached to the container with both hands firmly and remove it safely.

- Retrieve the device with opened wire device.

2. How to use the device

2.1 Device operating process

1) When the wire is tightened, the NFC card authentication is performed first.

- The LED of the NFC antenna flashes together with a beep for 5 seconds.

- The registered NFC card should be touched to the NFC tag within 5 seconds.

- If the NFC card is authenticated, the alarm is stopped and the LED flashes.

※ In order to use NFC card, NFC card ID must be registered in L-100 device.

(Refer to '3.5 APN and NFC setting method'.)

2) When the NFC card authentication is completed, GPS is received. (Takes up to 180 seconds)

- At this time, the Operation switch flashes green.

- When the GPS reception is complete, the green light turns off.

3) Once the GPS reception is complete, access the communication network. (Up to 300 seconds).

- At this time, the Operation switch flashes blue.

- When the device is connected to the network and the data transmission is finished, the blue light turns off.

4) After the Operation switch light is blinking, the device waits until the next operation.

2.2 Insertion of the USIM

Open the water-proof cover and insert it into the following directions.

(Once engaged, ensure that the correct tightening is achieved and the correct orientation is achieved.)

<Figure. Device USIM insertion direction>

< Figure. Actual device USIM insertion example>

2.3 Check battery remaining volume

Under the operation of the Operation switch, the battery power level notification (LED Color) is like

the Blue light is High level, the Green light is Middle level, the Red light is Low level.

- How to check the remaining battery level is as follows.

1) You can check the remaining battery level by viewing the debugging data of the device.

e.g.) II 2017/08/18 04:56:48 BSU(0:0:1) SM(0) BAT(4350)

In the above debugging data, the BAT(4350) is the remaining battery power.

Here, the battery means 4350 is 4.35V.

※ Refer to '4.1 Device debugging method' for details.

2) You can check the remaining battery level by viewing the log of the equipment.

e.g.) 17/08/25 06:55:40, 1, 0, A, 37 24.088240 N, 127 06.467960 E, 4236, 0xD0 0x76 0x5

- Meaning: August 25th 2017 6:55:40(Date), 1(event code), 0(open status), A(GPS reception status), 37 24.088240 N(latitude), 127 06.467960 E(longitude), 4236(battery value), D0-76-58-7E(NFC key value)

In the above log, the battery value is 4236 and the value is 4.236V.

※ Refer to '4.2 Log data analysis method' for details.

3) You can check the remaining battery level in the tracking monitoring system.

You can check the remaining battery level in 'Battery' item in 'Transport history' - 'Tracking ' by accessing the tracking monitoring system.

Here, the remaining battery level is displayed in %.

Transport Tracking History

Simulation | Save Excel

	Device no.	Collection time	Occurrence time	Event type	Latitude	Longitude	Auth. type	Auth. ID	Door	Shocking	Temperatu	Humidity	Battery
Filter				All					All				
1	20000069	09/10/2017 23:24:29	09/10/2017 23:23:48	Normal	5.59371	-0.181673	NFC	D076587E	Closed	0	0	0	87
2	20000069	09/10/2017 23:24:28	09/10/2017 23:23:44	Normal	5.59371	-0.181673	NFC	D076587E	Opened	0	0	0	87
3	20000069	09/10/2017 23:20:23	09/10/2017 23:19:39	Normal	5.593847	-0.181707	NFC	00000000	Closed	0	0	0	89
4	20000069	09/10/2017 23:19:43	09/10/2017 23:19:15	Normal	5.593812	-0.181712	NFC	D076587E	Opened	0	0	0	87
5	20000069	09/10/2017 23:19:41	09/10/2017 23:18:10	Normal	5.593812	-0.181712	NFC	00000000	None	0	0	0	85
6	20000069	09/10/2017 23:17:02	09/10/2017 23:15:50	Normal	5.593729	-0.181918	NFC	00000000	Closed	0	0	0	91
7	20000069	09/10/2017 23:17:01	09/10/2017 23:15:39	Normal	5.593729	-0.181918	NFC	B0C15C7E	Opened	0	0	0	89

3. Device maintenance

3.1 Wire replacement method

- If the wire breaks and the wire needs to be replaced, refer to the Technical Maintenance Document, which describes how to replace the wire.

3.2 USIM replacement method

Once inserted, it is imperative that the insertion of caution is checked again, because it cannot be withdrawn again.

If the USIM is incorrectly inserted or the USIM is defective, refer to the Technical Maintenance Document that describes how to replace the USIM.

3.3 How to deal with battery charging/discharging and replacement

- Battery charging can be charged by plugging the mini B USB cable underneath the device.

The charging input voltage uses 5 V 2A.

- If the battery is discharged and the wire cannot be released, connect a portable external battery to the USB port of the device and release the wire.

- The battery is cut off at 3.21V to enter sleep mode and will not operate the equipment.

- If the battery is completely discharged or the battery is defective, refer to the Technical Maintenance Document for replacement of the battery.

3.4 Device reset method

- Press the Operation switch on the device and press the Reset switch when no light flickers. (When the remaining battery power is normal)

- When upgrading the firmware of the device, press the reset switch after completing the file transfer.

※ Refer to UniTracer L-100 Firmware upgrade manual.

- Change the settings such as APN and NFC registration and press the reset switch.

Reset Switch

3.5 APN and NFC setting method

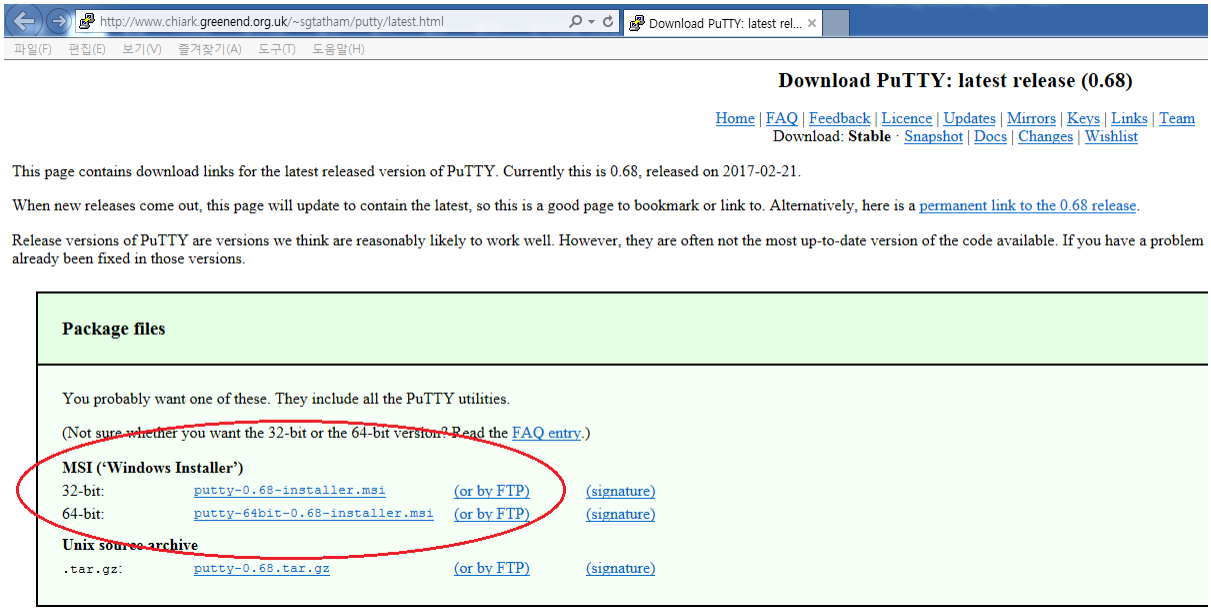
Input the commands by the PuTTY Program.

1) The device's wire is opened by NFC generally.
2) The device receives GPS signal and wait until transmitting 'Open' event.
3) After 'Open' event is sent, the device will be changed to 'setting mode'.
4) The USB cable(A to Mini-B type) connects to PC.
5) After Serial COM port is recognized, COM port connects to '115200' Speed.
   (Checking the COM port can be found in Device Manager on your PC.)
6) After the device closes, the device is working normally again.

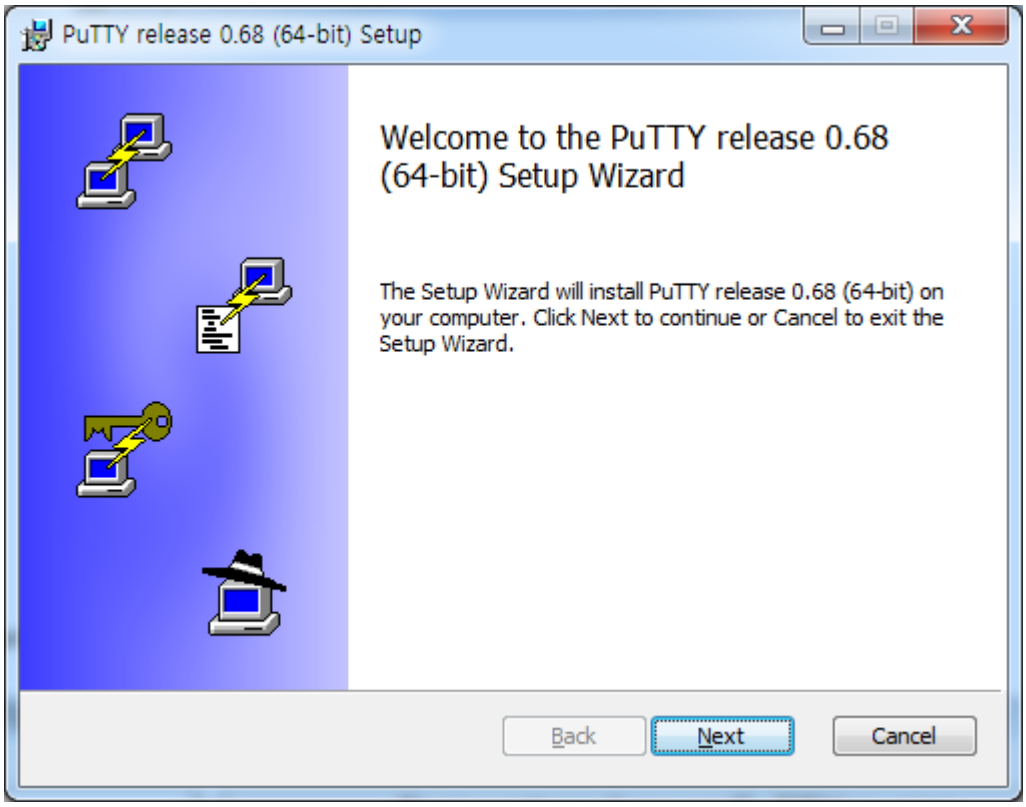
How to use the PuTTY Program

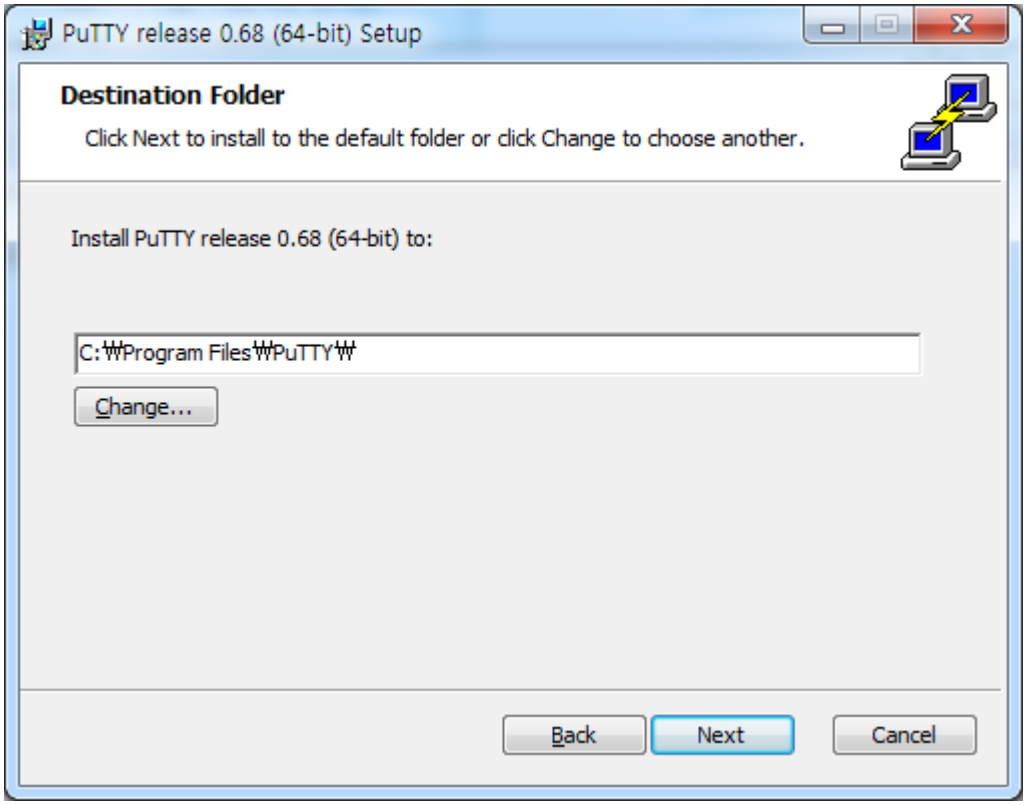
Install the PuTTY progam to use the PuTTY.

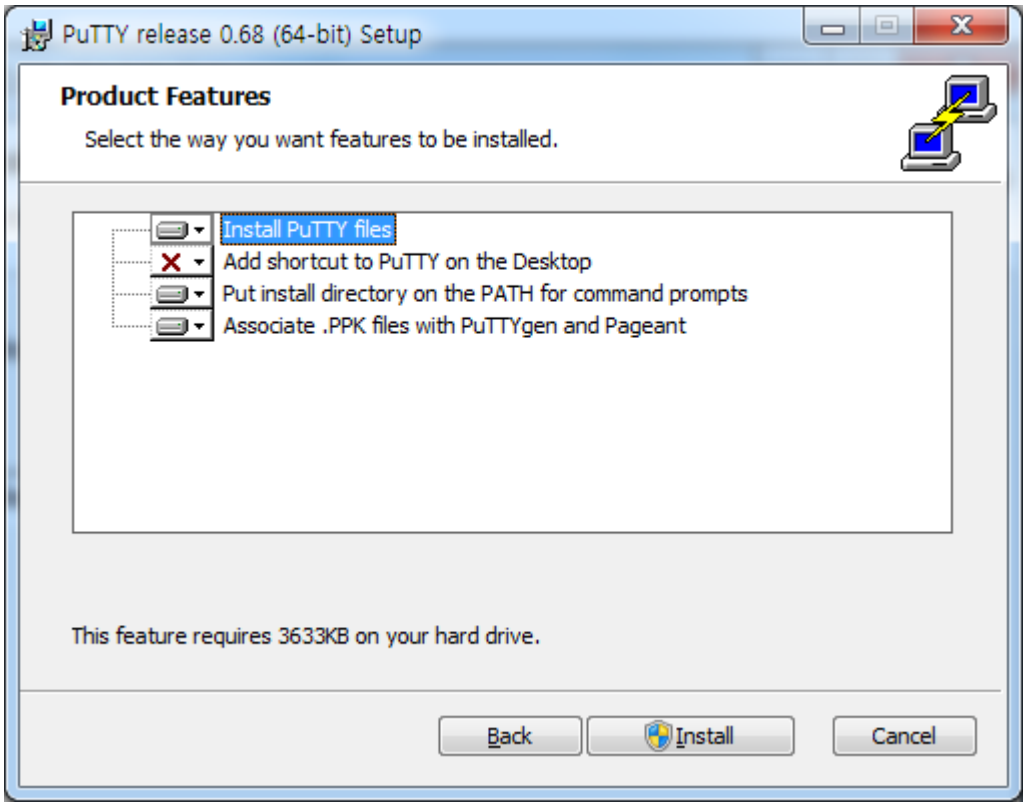
Download the program from http://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html

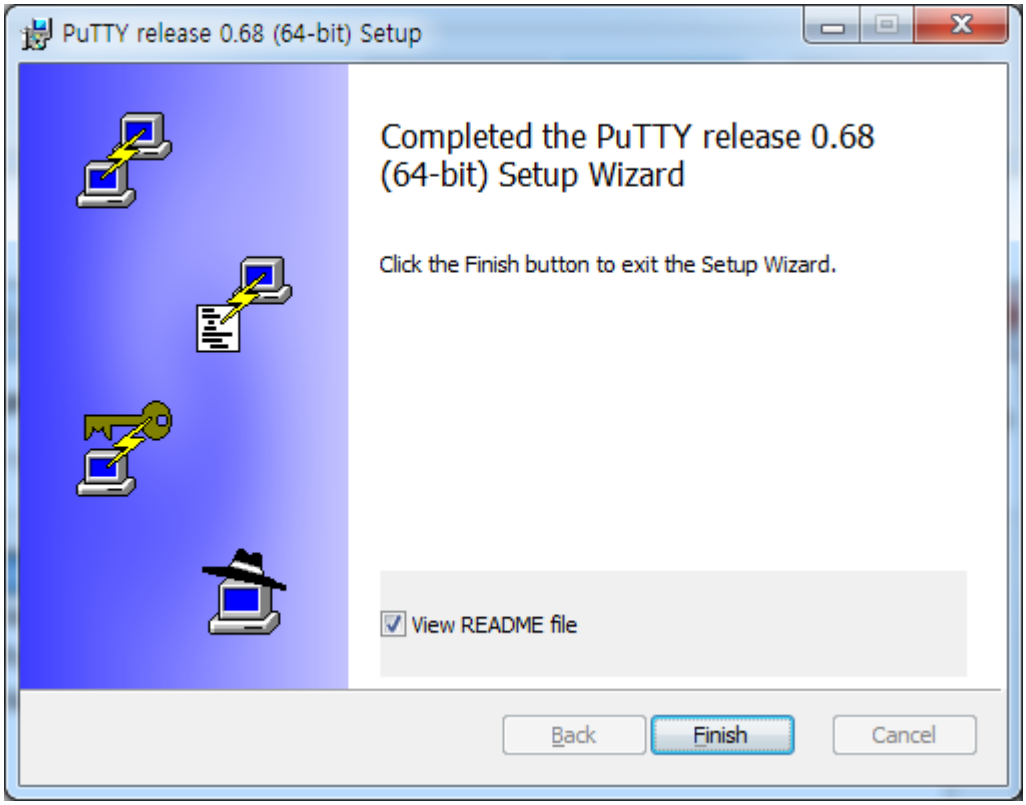


Download the MSI 64-bit file(putty-64bit-0.68-installer.msi).

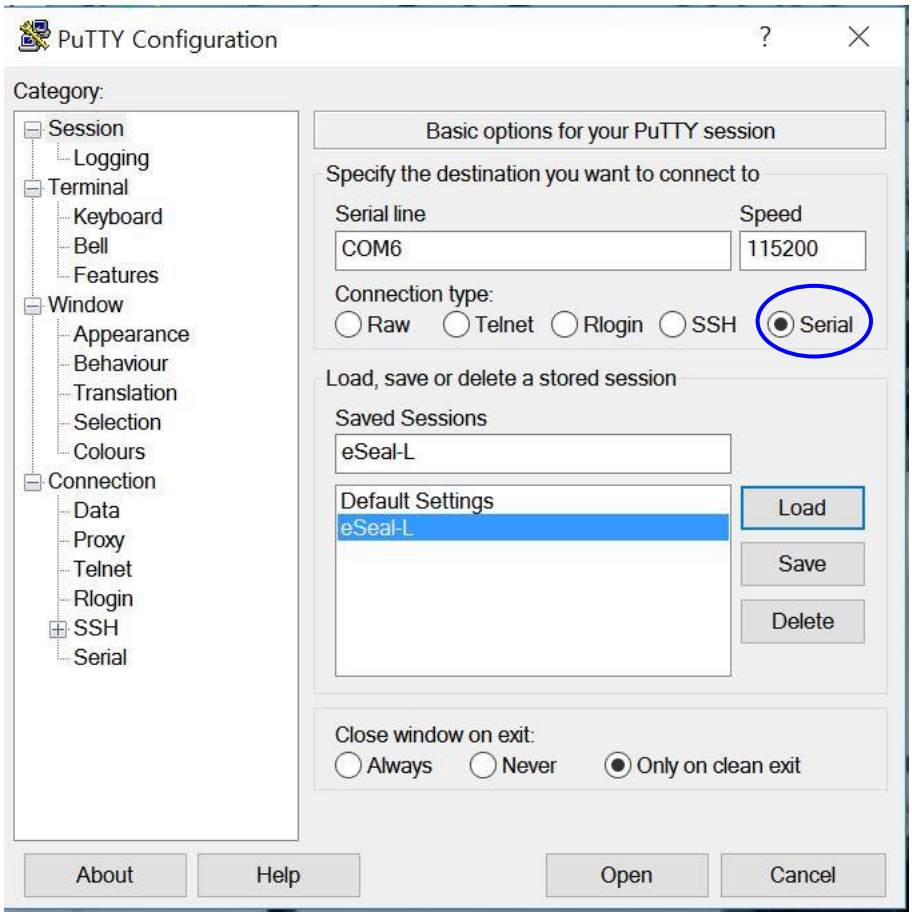

PuTTY release 0.68 (64-bit) Setup
Welcome to the PuTTY release 0.68 (64-bit) Setup Wizard
The Setup Wizard will install PuTTY release 0.68 (64-bit) on your computer. Click Next to continue or Cancel to exit the Setup Wizard.
Back
Next
Cancel


PuTTY release 0.68 (64-bit) Setup
Destination Folder
Click Next to install to the default folder or click Change to choose another.
Install PuTTY release 0.68 (64-bit) to:
C:₩Program Files₩PuTTY₩
Change...
Back
Next
Cancel


PuTTY release 0.68 (64-bit) Setup
Product Features
Select the way you want features to be installed.
Install PuTTY files
Add shortcut to PuTTY on the Desktop
Put install directory on the PATH for command prompts
Associate .PPK files with PuTTYgen and Pageant
This feature requires 3633KB on your hard drive.
Back
Install
Cancel

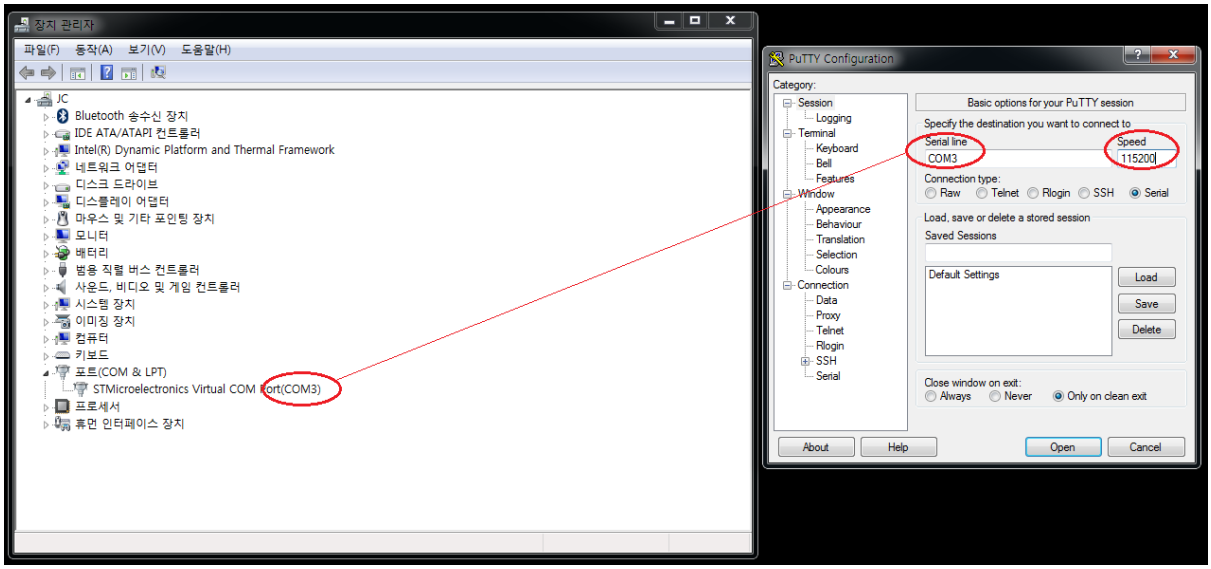

PuTTY release 0.68 (64-bit) Setup
Completed the PuTTY release 0.68 (64-bit) Setup Wizard
Click the Finish button to exit the Setup Wizard.
View README file
Back
Finish
Cancel

The screen is shown like screen after run the PuTTY program.



Select the 'Serial' (the Blue circle), set your PC COM port number in the Serial line.

You can identify the COM port number in the Device Manager in your PC.



If the Serial Port is not recognized, download the driver program by this link and then install it.

http://www.st.com/en/development-tools/stsw-stm32102.htmlhttp://www.st.com/en/development-tools/stsw-stm32102.html

Set 'Com3' (It depends on your PC com port number.) on Speed line, '115200' on Speed and press 'Open' button then connect.

1) APN setting method

- After connection, set the APN the command as below. Be sure to enter save after setting.

$ set apn [arg2]

$ save

The arg2 is the character string.

ex) $ set apn allwayson.ktfwing.co.kr

$ save

2) NFC setting method

- After connection, set the NFC command as below. Be sure to enter 'save' after setting.

$ set nfc [arg2] [arg3]

10 units of NFC can be registered per device. Each NFC ID can be registered as numerical number from 0 to 9.

The 'arg2' is the index of the registered NFC ID.

If there is input in ‘arg3’, ‘arg3’ is 32bit 16 hexadecimal value.

If there is no input in ‘arg3’, device will read the value of NFC key.

Must enter ‘save’ after registering a NFC key.

If the NFC key value is ‘0’, it recognizes as unregistered status.

If there is no NFC key registered, any NFC can be used for authentication

ex) When registering with NFC card at ‘0’ index

$ set nfc 0

After entering the command, NFC card will be touched on the NFC antenna.

$ save

ex) When registering with NFC key value ‘4f3d1122’ at ‘3’ index

$ set nfc 3 4f3d1122

$ save

ex) Delete the NFC key value at ‘3’ index

$ set nfc 3 0

$ save

4. Trouble Shooting

- If the device does not transmit normal data, trouble shooting can be done through debugging method and log analysis method below.

- When debugging the device, if gsmSeq = 7 stops, check that the USIM is installed because it is the result of missing or improperly inserted USIM.

- When debugging the device, if gsmSeq = 14 stops, the network connection cannot be made. Check with the telecommunication company to check whether the USIM is registered or not, and try again.

4.1 Device debugging method

The debugging messages are a message for easy identification of the cause when the device is performing erratic behavior. The following are the meanings of the debugging messages.

II 2017/08/18 04:56:48 BSU(0:0:1) SM(0) BAT(4350)	The line is printed every second when the device is operating.
II 2017/08/18 04:56:49 BSU(0:0:1) SM(0) BAT(4350)	Because USB is connected, it stays on without entering the sleep-state.
II 2017/08/18 04:56:50 BSU(0:0:1) SM(0) BAT(4350)	
II 2017/08/18 04:56:51 BSU(0:0:1) SM(0) BAT(4350)	BAT (4350) means a battery value of 4.35 volts.
II 2017/08/18 04:56:52 BSU(0:0:1) SM(0) BAT(4350)	
II 2017/08/18 04:56:53 BSU(0:0:1) SM(0) BAT(4350)	
PN532Begin: PN532 Begin	Ready for NFC
SAMConfig: SAMConfig	
writeCommand: [PN532] PN532 Wakeup	Power on NFC

writeCommand: [PN532] Write: readAckFrame: [PN532] Ack: readAckFrame: OK

readResponse: [PN532] Read: readResponse: length0 = 0x02, length1 = 0xFE

readResponse: OK

writeCommand: [PN532] Write: readAckFrame: [PN532] Ack: readAckFrame: OK

readResponse: [PN532] Read: readResponse: length0 = 0x06, length1 = 0xFA

readResponse: OK

main: Found chip PN5 : 838927879 Awareness of NFC chip

writeCommand: [PN532] Write: readAckFrame: [PN532] Ack: readAckFrame: OK

readResponse: [PN532] Read: readResponse: length0 = 0x0C, length1 = 0xF4

readResponse: OK

readPassiveTargetID: ATQA: 0x04

readPassiveTargetID: SAK : 0x08

main: Found an ISO14443A card Card recognition in ISO 14443

main: UID Length: 4

main: UID Value: PN532End: PN532 End ....

II 2017/08/18 04:56:54 BSU(0:0:1) SM(0) BAT(4346)

II 2017/08/18 04:56:55 BSU(0:0:1) SM(0) BAT(4347)

main: [Event] Unlock Event Unlock Occurrence

LogPrint: TIME = 17/08/18 04:56:56 LogPrint is the ease of viewing logs to be stored.

LogPrint: GPS = V, 41 14.925740 N, 069 23.448850 E

LogPrint: BAT = 4350

LogPrint: NFC = 0x6E 0xD7 0x7E 0xF1

LogPrint: EventCode = 0x01

LogPrint: DoorState = 0x00

LogPrint: rssi = 0x00

gpsBegin: Enable

II 2017/08/18 04:56:56 BSU(0:0:1) SM(1) BAT(4266)

II 2017/08/18 04:56:57 BSU(0:0:1) SM(1) BAT(4285)

II 2017/08/18 04:56:58 BSU(0:0:1) SM(1) BAT(4290)

II 2017/08/18 04:56:59 BSU(0:0:1) SM(1) BAT(4336)

main: [Event] Lock — Event Lock occurred

LogPrint: TIME = 17/08/18 04:56:59

LogPrint: GPS = V, 41 14.925740 N, 069 23.448850 E

LogPrint: BAT = 4350

LogPrint: NFC = 0x00 0x00 0x00 0x00

LogPrint: EventCode = 0x02

LogPrint: DoorState = 0x01

LogPrint: rssi = 0x00

II 2017/08/18 04:57:00 BSU(0:0:1) SM(0) BAT(4344)

II 2017/08/18 04:57:01 BSU(0:0:1) SM(0) BAT(4347)

II 2017/08/18 04:57:02 BSU(0:0:1) SM(0) BAT(4344)

II 2017/08/18 04:57:03 BSU(0:0:1) SM(0) BAT(4333)

gpsStateMachine: RTC : 17 08 18 04:57:04+00:00 — GPS is received and the time is calibrated.

gpsStateMachine: GPS : 17 08 18 04:57:03+00:00

gpsEnd: Disable — Turning off GPS

LogEnqueue: addr = 0x00004700

EepWriteForLog: d0 = 0x47, d1 = 0x00, devAddr = 0x00A0

EepWriteForLog: Success

LogEnqueue: addr = 0x00004720 — Save the log with the GPS value

EepWriteForLog: d0 = 0x47, d1 = 0x20, devAddr = 0x00A0

EepWriteForLog: Success — Log save successful.

GSM GSM_START: Start — GSM operation

GSM GSM_SendCMD: gsmSeq = 0

GSM GSM_SendCMD: SEND CMD [0] : AT SEND CMD sends commands to GSM modules.

II 2017/08/18 04:57:05 BSU(0:0:1) SM(0) BAT(4350)

GSM GSM_ProcessFin: <== GSM : AT <== The expression of GSM is verbatim output from the module.

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 1

GSM GSM_SendCMD: SEND CMD [0] : ATE0

GSM GSM_ProcessFin: <== GSM : ATE0

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 2

GSM GSM_SendCMD: SEND CMD [0] : AT+CMEE=2

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 3

GSM GSM_SendCMD: SEND CMD [0] : AT+CGMI

GSM GSM_ProcessFin: <== GSM : u-blox

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 4

GSM GSM_SendCMD: SEND CMD [0] : AT+CGMM

GSM GSM_ProcessFin: <== GSM : SARA-G350

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 5

GSM GSM_SendCMD: SEND CMD [0] : AT+CGMR

GSM GSM_ProcessFin: <== GSM : 08.90

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 6

GSM GSM_SendCMD: SEND CMD [0] : AT+CGSN

GSM GSM_ProcessFin: <== GSM : 359315071697709

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 7

GSM GSM_SendCMD: SEND CMD [0] : AT+CIMI

GSM GSM_ProcessFin: <== GSM : +CME ERROR: operation not allowed

GSM GSM_Process: ERROR 0

II 2017/08/18 04:57:06 BSU(0:0:1) SM(0) BAT(4326)

II 2017/08/18 04:57:07 BSU(0:0:1) SM(0) BAT(4327)

II 2017/08/18 04:57:08 BSU(0:0:1) SM(0) BAT(4326)

GSM GSM_Process: Retry

GSM GSM_SendCMD: gsmSeq = 7

GSM GSM_SendCMD: SEND CMD [0] : Retry(2) : AT+CIMI Get IMSI information from SIM.

GSM GSM_ProcessFin: <== GSM : 204043257078809 SIM must be inserted correctly.

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 8

GSM GSM_SendCMD: SEND CMD [0] : AT+CLCK="SC",2 Recognize SIM and set to Query state mode

GSM GSM_ProcessFin: <== GSM : +CLCK: 0

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 9

GSM GSM_SendCMD: SEND CMD [0] : AT+CPIN?

GSM GSM_ProcessFin: <== GSM : +CPIN: READY

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 10

GSM GSM_SendCMD: SEND CMD [0] : AT+UPSV?

GSM GSM_ProcessFin: <== GSM : +UPSV: 0

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 11

GSM GSM_SendCMD: SEND CMD [0] : AT+CTZU=1

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 12

GSM GSM_SendCMD: SEND CMD [0] : AT+COPS?

GSM GSM_ProcessFin: <== GSM : +COPS: 0

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 13

GSM GSM_SendCMD: SEND CMD [0] : AT+CREG=2 Attempt to register with Network

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 14

GSM GSM_SendCMD: SEND CMD [0] : AT+CREG? Requesting Network Registration

Results to Modules

GSM GSM_ProcessFin: <== GSM : +CREG: 2,0

GSM ResATCREGq: CREGq D : +CREG: 2,0 The CREG response is 2, 0, 0 not

registered for network

GSM GSM_ProcessFin: <== GSM : OK

GSM ResATCREGq: CREGq D : OK

GSM GSM_Process: ERROR 0

II 2017/08/18 04:57:09 BSU(0:0:1) SM(0) BAT(4327)

II 2017/08/18 04:57:10 BSU(0:0:1) SM(0) BAT(4326)

II 2017/08/18 04:57:11 BSU(0:0:1) SM(0) BAT(4328)

GSM GSM_Process: Retry

GSM GSM_SendCMD: gsmSeq = 14

GSM GSM_SendCMD: SEND CMD [0] : Retry(99) : AT+CREG? Attempt to Retry

GSM GSM_ProcessFin: <== GSM : +CREG: 2,0

GSM ResATCREGq: CREGq D : +CREG: 2,0

GSM GSM_ProcessFin: <== GSM : OK

GSM ResATCREGq: CREGq D : OK

GSM GSM_Process: ERROR 0

II 2017/08/18 04:57:12 BSU(0:0:1) SM(0) BAT(4327)

II 2017/08/18 04:57:13 BSU(0:0:1) SM(0) BAT(4323)

II 2017/08/18 04:57:14 BSU(0:0:1) SM(0) BAT(4326)

GSM GSM_Process: Retry

GSM GSM_SendCMD: gsmSeq = 14

GSM GSM_SendCMD: SEND CMD [0] : Retry(98) : AT+CREG? Try again with the specified number of times

GSM GSM_ProcessFin: <== GSM : +CREG: 2,0

GSM ResATCREGq: CREGq D : +CREG: 2,0

GSM GSM_ProcessFin: <== GSM : OK

GSM ResATCREGq: CREGq D : OK

GSM GSM_Process: ERROR 0

II 2017/08/18 04:57:15 BSU(0:0:1) SM(0) BAT(4327)

II 2017/08/18 04:57:16 BSU(0:0:1) SM(0) BAT(4327)

II 2017/08/18 04:57:17 BSU(0:0:1) SM(0) BAT(4327)

GSM GSM_Process: Retry

GSM GSM_SendCMD: gsmSeq = 14

GSM GSM_SendCMD: SEND CMD [0] : Retry(97) : AT+CREG?

GSM GSM_ProcessFin: <== GSM : +CREG: 2,0

GSM ResATCREGq: CREGq D : +CREG: 2,0

GSM GSM_ProcessFin: <== GSM : OK

GSM ResATCREGq: CREGq D : OK

GSM GSM_Process: ERROR 0

II 2017/08/18 04:57:18 BSU(0:0:1) SM(0) BAT(4327)

GSM GSM_ProcessFin: <== GSM : +CREG: 5,"05E3","CA05"

II 2017/08/18 04:57:19 BSU(0:0:1) SM(0) BAT(4324)

II 2017/08/18 04:57:20 BSU(0:0:1) SM(0) BAT(4327)

GSM GSM_Process: Retry

GSM GSM_SendCMD: gsmSeq = 14

GSM GSM_SendCMD: SEND CMD [0] : Retry(96) : AT+CREG?

GSM GSM_ProcessFin: <== GSM : +CREG: 2,5,"05E3","CA05" CREG 2, 5 is connected with roaming.

GSM ResATCREGq: CREGq D : +CREG: 2,5,"05E3","CA05" 1 is connected to home network

GSM GSM_ProcessFin: <== GSM : OK

GSM ResATCREGq: CREGq D : OK

GSM GSM_SendCMD: gsmSeq = 15

GSM GSM_SendCMD: SEND CMD [0] : AT+CREG=0

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 16

GSM GSM_SendCMD: SEND CMD [0] : AT+CCLK?

GSM GSM_ProcessFin: <== GSM : +CCLK: "04/01/01,00:00:15+00"

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 17

GSM GSM_SendCMD: SEND CMD [0] : AT+CSQ Receiving sensitivity

II 2017/08/18 04:57:21 BSU(0:0:1) SM(0) BAT(4350)

GSM GSM_ProcessFin: <== GSM : +CSQ: 25,99 RSSI: 25 , Quality : 99

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 18

GSM GSM_SendCMD: SEND CMD [0] : AT+UPSD=0,1,"internet.gdsp" APN Registration

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 19

GSM GSM_SendCMD: SEND CMD [0] : AT+UPSD=0,2,"ttt" ID Registration

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 20

GSM GSM_SendCMD: SEND CMD [0] : AT+UPSD=0,3,"mmm" PW Registration

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 21

GSM GSM_SendCMD: SEND CMD [0] : AT+UPSD=0,6,0

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 22

GSM GSM_SendCMD: SEND CMD [0] : AT+UPSDA=0,3

II 2017/08/18 04:57:22 BSU(0:0:1) SM(0) BAT(4326)

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 23

GSM GSM_SendCMD: SEND CMD [0] : AT+UPSND=0,8

GSM GSM_ProcessFin: <== GSM : +UPSND: 0,8,1

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 24

GSM GSM_SendCMD: SEND CMD [0] : AT+USOCR=6

GSM GSM_ProcessFin: <== GSM : +USOCR: 0

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 25

GSM GSM_SendCMD: SEND CMD [0] : AT+USOCO=0,"116.123.165.131",13000 Connect to Server

II 2017/08/18 04:57:23 BSU(0:0:1) SM(0) BAT(4327)

GSM GSM_ProcessFin: <== GSM : OK

LogPickUnsend: addr = 0x00004700

EepReadForLog: Success

main: Send Log

LogPrint: TIME = 17/08/18 04:56:56

LogPrint: GPS = A, 41 13.906110 N, 069 22.551380 E

LogPrint: BAT = 4350

LogPrint: NFC = 0x6E 0xD7 0x7E 0xF1

LogPrint: EventCode = 0x01

LogPrint: DoorState = 0x00

LogPrint: rssi = 0x00

LogDequeueUnsendNoData: head = 570, tail = 0, tailUnsend = 569

GSM GSM_SendCMD: gsmSeq = 27

GSM GSM_SendCMD: SEND CMD [0] : AT+USOWR=0,44 Send 44 bytes to server

GSM ResUSOWR_Cont: SEND Data [0] : 44

GSM GSM_ProcessFin: <== GSM : +USOWR: 0,44

GSM GSM_ProcessFin: <== GSM : OK

LogPickUnsend: addr = 0x00004720

EepReadForLog: Success

main: Send Log

LogPrint: TIME = 17/08/18 04:56:59

LogPrint: GPS = A, 41 13.906110 N, 069 22.551380 E

LogPrint: BAT = 4350

LogPrint: NFC = 0x00 0x00 0x00 0x00

LogPrint: EventCode = 0x02

LogPrint: DoorState = 0x01

LogPrint: rssi = 0x00

LogDequeueUnsendNoData: head = 570, tail = 0, tailUnsend = 570

GSM GSM_SendCMD: gsmSeq = 27

GSM GSM_SendCMD: SEND CMD [0] : AT+USOWR=0,44

II 2017/08/18 04:57:24 BSU(0:0:1) SM(0) BAT(4350)

GSM ResUSOWR_Cont: SEND Data [0] : 44

GSM GSM_ProcessFin: <== GSM : +USOWR: 0,44

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_END: END !!

GSM GSM_SendCMD: gsmSeq = 28

GSM GSM_SendCMD: SEND CMD [0] : AT+USOCL=0 Disconnecting from server

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 29

GSM GSM_SendCMD: SEND CMD [0] : AT+CPWROFF Module Power Off

II 2017/08/18 04:57:25 BSU(0:0:1) SM(0) BAT(4325)

II 2017/08/18 04:57:26 BSU(0:0:1) SM(0) BAT(4325)

GSM GSM_ProcessFin: <== GSM : OK

II 2017/08/18 04:57:27 BSU(0:0:1) SM(0) BAT(4350)

II 2017/08/18 04:57:28 BSU(0:0:1) SM(0) BAT(4350)

II 2017/08/18 04:57:29 BSU(0:0:1) SM(0) BAT(4350)

II 2017/08/18 04:57:30 BSU(0:0:1) SM(0) BAT(4350)

II 2017/08/18 05:02:57 BSU(0:0:1) SM(0) BAT(4350)

II 2017/08/18 05:02:58 BSU(0:0:1) SM(0) BAT(4350)

II 2017/08/18 05:02:59 BSU(0:0:1) SM(0) BAT(4350)

II 2017/08/18 05:03:00 BSU(0:0:1) SM(0) BAT(4350)

GPSNotiCheck: [Event] NotiGPS

GPS events happen according to the preset period

gpsBegin: Enable

LogPrint: TIME = 17/08/18 05:03:00

LogPrint: GPS = V, 41 13.906110 N, 069 22.551380 E

LogPrint: BAT = 4241

LogPrint: NFC = 0x00 0x00 0x00 0x00

LogPrint: EventCode = 0x00

LogPrint: DoorState = 0x01

LogPrint: rssi = 0x00

II 2017/08/18 05:03:01 BSU(0:0:1) SM(0) BAT(4344)

II 2017/08/18 05:03:02 BSU(0:0:1) SM(0) BAT(4335)

II 2017/08/18 05:03:03 BSU(0:0:1) SM(0) BAT(4328)

II 2017/08/18 05:03:04 BSU(0:0:1) SM(0) BAT(4340)

II 2017/08/18 05:03:05 BSU(0:0:1) SM(0) BAT(4337)

II 2017/08/18 05:03:06 BSU(0:0:1) SM(0) BAT(4343)

II 2017/08/18 05:03:07 BSU(0:0:1) SM(0) BAT(4340)

II 2017/08/18 05:03:08 BSU(0:0:1) SM(0) BAT(4335)

gpsStateMachine: RTC : 17 08 18 05:03:08+00:00

gpsStateMachine: GPS : 17 08 18 05:03:07+00:00

gpsEnd: Disable

LogEnqueue: addr = 0x00004740

EepWriteForLog: d0 = 0x47, d1 = 0x40, devAddr = 0x00A0

EepWriteForLog: Success

GSM GSM_START: Start

GSM GSM_SendCMD: gsmSeq = 0

GSM GSM_SendCMD: SEND CMD [0] : AT

GSM GSM_ProcessFin: <== GSM : AT

GSM GSM_ProcessFin: <== GSM : OK

GSM GSM_SendCMD: gsmSeq = 1

4.3 Log data analysis method

1) The device's wire is opened by NFC generally.

2) Wait until the device receives GPS signal and transmits 'Open' event.

3) After 'Open' event is sent, the device will be changed to 'setting mode'.

4) The USB cable(A to Mini-B type) connects to PC.

5) After Serial COM port is recognized, COM port connects to '115200' Speed.

Log Type

The log is expressed in a format separated by ', '.

Date, event code, open status, GPS reception status, latitude, longitude, battery value, NFC Key value

Date

Date is shown as Year/Month/Day Hour: Minute: Second

Event code

Open	1
Close	2
Cut	3
Shocking	4
Broken	5

Open status

- '0' means open.
- '1' mean close.

GPS signal status

- 'V' means that transmission is successful.
- 'A' means that transmission is fail.

Latitude & Longitude

DD mm.mmmmm type

Battery value

mV measure

NFC key value

The NFC ID is displayed as HEXA.

Date, event code, open status, GPS reception status, latitude, longitude, battery value, NFC Key

Sample

17/08/25 06:55:40, 1, 0, A, 37 24.088240 N, 127 06.467960 E, 4236, 0xD0 0x76 0x5

- Meaning: August 25th 2017 6:55:40(Date), 1(event code), 0(open status), A(GPS reception status), 37 24.088240 N(latitude), 127 06.467960 E(longitude), 4236(battery value), D0-76-58-7E(NFC key value)

5. Device FAQ

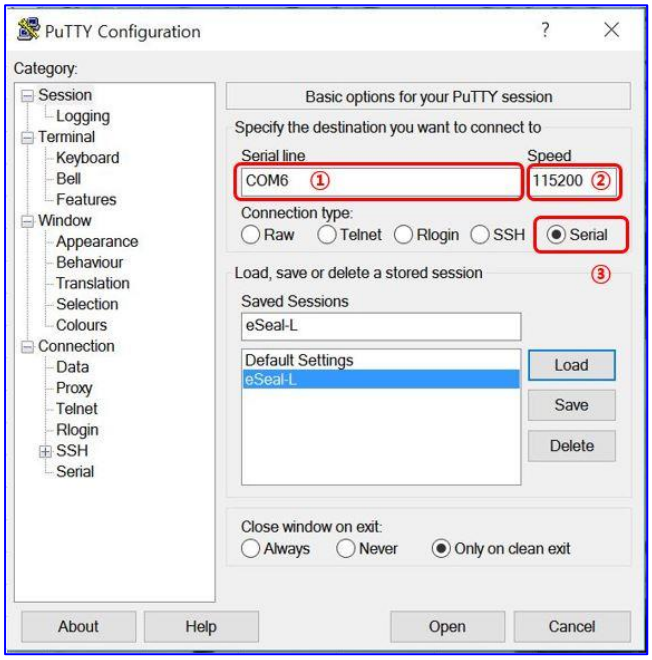
1) How to set up the NFC card for sealing?

- In the initial device setting, there is no registered NFC, so door opening/closing is possible with all NFC cards (ISO14443 Type A).
- Up to 10 NFC cards are available, and NFC card settings can be done by the procedure below.

① Connect your L-100 device to your PC using a mini B type USB cable.

② Execute Emulator SW (PuTTY.exe) and enter the device setup window.

(Emulator SW can be downloaded from the internet.)



① Enter COM number

- COM number can be checked in the PC's Device Manager.

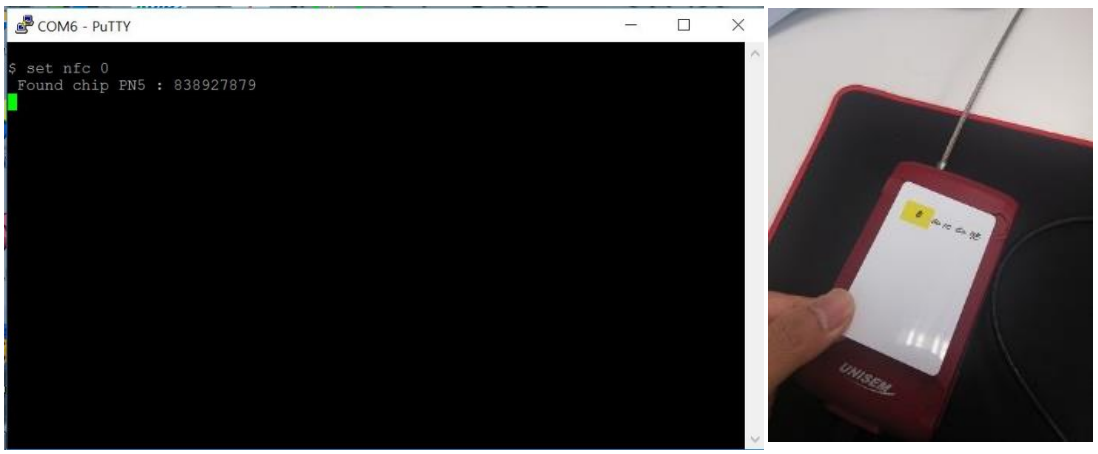
② Enter Speed 115200

③ Choose the 'Serial' among the Connection type and click 'Open' at the bottom

③ Enter the command to register the NFC card.

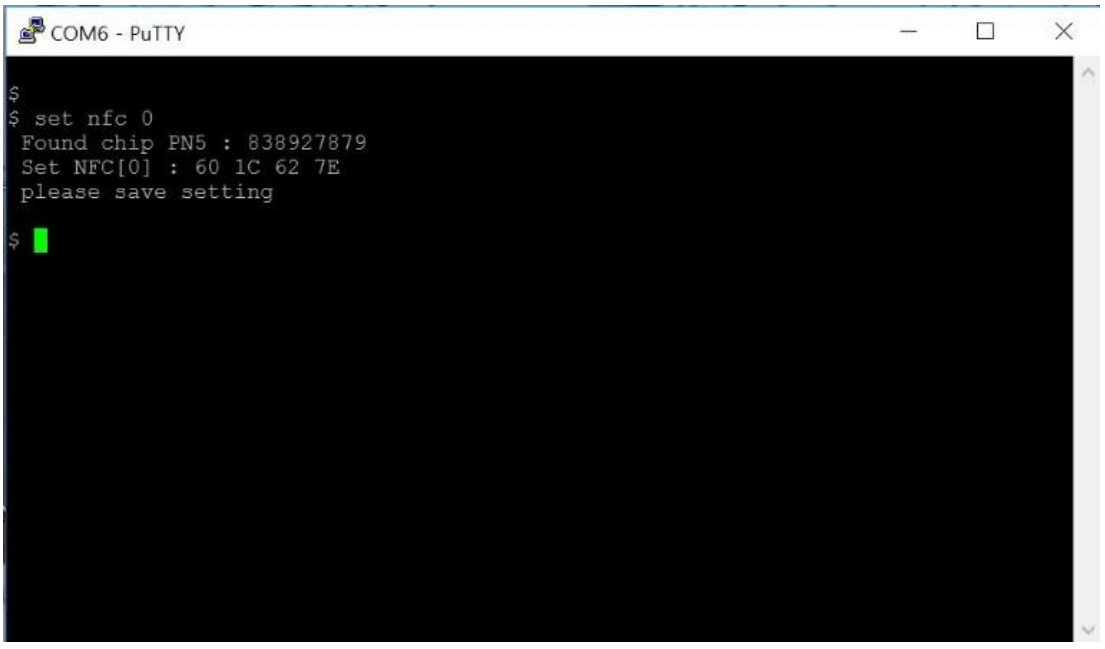
$ set nfc 0 *(Register the NFC card at position 0)*

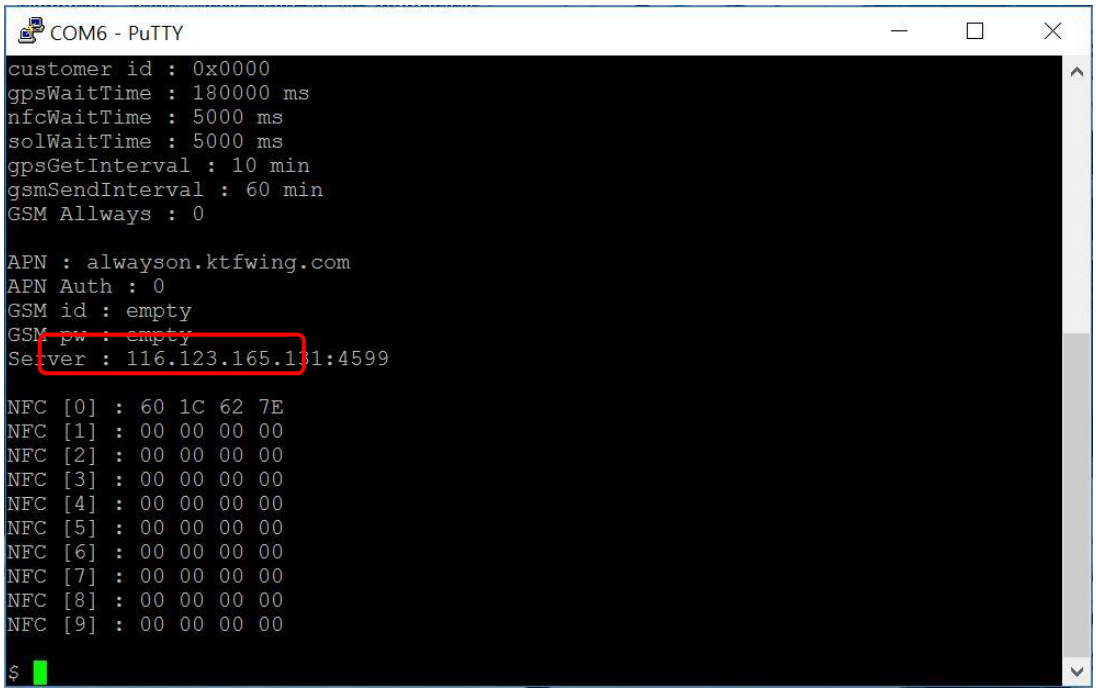
④ Press ENTER and then load the NFC card that you want to register on the NFC tag section of the device.



⑤ The card will be registered normally with a beep sound.

- To check the information of the registered card, enter 'show info' in Emulator SW and press ENTER.





⑥ Type 'save' and press Enter to save the changes and exit the setup window.

2) What should I do if I cannot seal and unseal with an NFC card?

- If you use an unregistered NFC card after registering the NFC card user in the device, the seal cannot be released. Please use the registered card to unlock the seal.

- If the battery is discharged and the power is not turned on, the seal cannot be released even by using the NFC card.

- After connecting a portable external battery (External battery for general mobile phone is also available) to the USB port of the L-100, you can unseal it with the NFC card.

3) How do I unseal eSeal if I lose the NFC card?

- If the registered NFC card is lost, the normal unsealing is not possible. If you are forced to release the eSeal, you can delete all of the information on the NFC card from the registered NFC card on the Emulator SW. And if you know the information of a lost card, you can delete the key value of the lost card and re-register another NFC card. However, if you delete all the information from the NFC card registered on the device, please note that the other NFC card you have already registered is not available on the device.

※ Refer to the user manual for how to register / release NFC card in Emulator SW.

4) How to insert and replace the eSeal's SIM card?

- By default, the SIM card cannot be replaced after insertion.

This is to prevent the device from releasing the SIM card and preventing the sending of the normal position signal during operation.

If replacement is required, please contact the manufacturer of the device.

5) How to insert and replace the eSeal's SIM card?

- When connection to the mobile communication network is not possible, follow the steps below.

① If the data of the SIM being used is exhausted and cannot be used.

② Using abnormal SIM.

③ If the telecommunication company does not normally open.

④ When using SIM that does not support roaming service when traveling between countries.

⑤ When communication enters the shadow area and communication is not made temporarily.

※ Please contact your SIM provider except for ⑤ case.

6) How to confirm that GPS signal of eSeal device is received normally?

- The green button on the front panel will blink while the GPS receiver is receiving GPS signals.

If the GPS signal is not detected properly, the green light flashes for 3 minutes and the blue light flashes. In this case, the GPS signal is not normally detected.

If the GPS signal is received normally, the green light will turn off within 3 minutes (Normally 10 ~ 60 seconds) and the blue light will flash

7) How do I view the debugging messages of the eSeal devices?

- You can check the debugging message by pressing enter after inputting 'show debug' in Emulator SW.

※ For details on how to check the Debugging Message, refer to the user manual.

8) How to check the log data of eSeal device?

- You can check the log by pressing enter after inputting 'show log' in Emulator SW.

※ For details on how to check the Log Data, refer to the user manual.

9) What is the battery capacity and usage cycle?

- The L-100 uses a Lithium-Ion battery with a capacity of 6,000 mAh.

If the device is setting like as every 10 minutes of the GPS reception cycle and every one hour of the data transmission cycle, it can be used for approximately 33 days under normal running.

10) How do I unseal if the battery is discharged?

- To unseal the battery, you can disconnect the battery by connecting a portable external battery to the USB port of the device.

11) How to check if the battery is charged up to 100%?

- When the battery is fully charged, it takes about 8 hours. And the front button light will turn blue when fully charged. (Input voltage 5V / 2A standard)

12) What should I do if I cannot open the NFC card with a red light when I put the NFC card in the device that has been shut down?

- In this case, it is impossible to unseal the battery because the battery is discharged. Please connect the portable external battery to the USB port of L-100 to unseal.

13) How to shut down your device when you're finished the transportation?

- When the transport is completed, if you open the wire of the equipment and unseal it, the device will automatically shut down after the last event signal transmission.

FCC Warning

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 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.

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

This equipment should be installed and operated with greater than 20cm between the radiator and your body.

EU Declaration of conformity

Radio equipment information

- Product name **: eSeal**
- Model name: **UniTracer L-100(G)**

Manufacturer information

- Name: **UNISEM Co., Ltd.**
- Address: 10-7, Jangjinam-gil, Dongtan-myeon, Hwaseong-si, Gyeonggi-do, Korea (18510)

We hereby declare that all essential radio test suites have been carried out and that the above named product is in conformity to all the essential requirements of RED 2014/53/EU.
This declaration of conformity is issued under the sole responsibility of the manufacturer.
The object of the declaration described above is in conformity with RE Directive(2014/53/EU)
The MiCOM LABS performed a conformity assessment of the technical documentation and issued the
EU-type examination certificate.

Essential requirements of RED 2014/53/EU	
Article	Standards
3.1(a)	EN 60950-1 : 2006 + A11 : 2009 + A1 : 2010 + A12 : 2011 + A2 : 2013 EN 62311:2008
3.1(b)	EN 301 489-1 V2.1.1 Draft EN 301 489-3 V2.1.1 Draft EN 301 489-19 V2.1.0 Draft EN 301 489-52 V1.1.0
3.2(c)	EN 301 511 V12.5.1 EN 300 330 V2.1.1 EN 303 413 V1.1.1

Description of accessories and components, Hardware version & Software version for operation

- Hardware version : **V1.0**, Software version: **V1.0**
- Accessory : N/A

Signed for and on behalf of:

Authorised Representative:

JEONG

Date of issue: 20th November 2017

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