

mBFT17, multi-path Blue Force Tracker

Operator Manual



April 2017

Hyundai J·Comm

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1. Over view

Hyundai J.Comm’s mBFT17, multi-path Blue Force Tracker (hereafter “mBFT17) is an advanced hand held blue force tracking terminal for users to enables them sharing situational awareness in near real time by position reporting & C2 messaging.

With integral GPS receiver and electronic map, users can identify its accurate position and share various tactical messages with geographic location information to other subscribers through integral iridium and optional communication modems (analog radio modem, WCDMA modem).

Use of mBFT17 and or external WCDMA modem is available after proper subscription procedure with local representative of Iridium satellite service provider and mobile telecommunication service provider respectively.

mBFT17 has BLE Bluetooth module to support local area sensor (e.g. heart rate meter, temperature-humidity sensor). Also it has designed to utilize location based service such as beacon sensors.



Figure 1-1 operational diagram of mBFT17

2. Descriptions of mBFT 17

mBFT17 assembly support data communication with Iridium satellite network via integral data communication modem and it support data communication with WCDMA communication network and tactical radio network via optional external WCDMA modem and analog radio modem respectively.



Figure 2-1 mBFT17 Assembly

3. Descriptions of Battery pack assembly

Battery pack assembly is rechargeable Lithium-ion Polymer battery with Max 3.7V 5800mAh capacity and supply power to mBFT17 as installed inside of mBFT17.

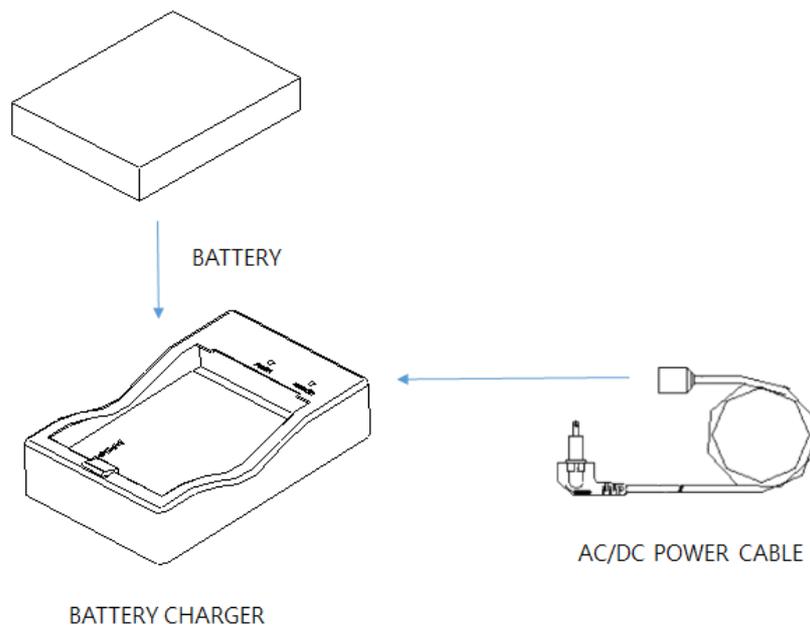


Figure 3-1 Battery pack assembly

4. Operational Instructions

4.1 Power ON/OFF

Pressing power button right upper placed over 2 seconds powering mBFT17.

Pressing power button right upper placed over 2 seconds then turn off mBFT17 by click terminate icon on the LCD

4.2 Volume control

Press volume UP/DOWN button left upper placed to control volume.

4.3 Shortcut button

User can use Menu/home/Cancel button in accordance with its Intended use.

4.4 LED indicator

The status LED lights up green as mBFT17 powered on.

The status LED lights up red while mBFT17 is charging.

The status LED lights up green when the recharging is completed.

4.5 Satellite LED indicator

Satellite LED indicator lights up green as Iridium satellite communication is available.

Satellite LED indicator lights out as Iridium satellite communication is unavailable.

4.6 Power port

mBFT17 can be powered by AC power supply for long time in door use or lack of battery. Connect cable of AC power supply assembly to power port placed bottom of mBFT17. Once it connected normally, status bar placed top of LCD display charging icon. In case of charging failure, please re-connect charging cable. Please replace AC/DC adaptor for permanent charging failure.

4.7 USB Port

mBFT17 has USB port to connect it to usb port at computer to download user data and or map data.

Once the cable connected normally, user can identify it display of the computer. USB drive supplied with mBFT17 should be installed on the computer.

4.8 GPS Antenna

mBFT17 has integral GPS receiver to acquire GPS signal. If mBFT 17 fail to acquire GPS signal after 2minutes later powering on then powering off then re-install GPS antenna. Please replace GPS antenna for permanent failure.

External GPS antenna installation recommended for In door or vehicle operation.



4.9 Iridium satellite antenna

mBFT17 has integral Iridium satellite antenna to communicate through Iridium satellite network.

If mBFT 17 fail to receive Iridium satellite signal after 2minutes later powering on then powering off then re-install Iridium satellite antenna. Please replace Iridium satellite antenna for permanent failure. External Iridium satellite antenna installation recommended for In door or vehicle operation.

4.10 Charger assembly

Rechargeable battery pack assembly of mBFT17 can be charged by charger assembly with high speed.

Install rechargeable battery pack assembly into charger assembly then connect to AC power supply cable.

The status LED lights up red as connect AC power supply cable while charging.

The status LED lights up green when the recharging is completed.

External Iridium satellite antenna installation recommended for In door or vehicle operation.

4.11 Protective case

Protective housing is used exclusively for carrying equipment.

5. Operation procedure

5.1 Login

1. Input password (eight digit)
2. Then Press "OK" ICON

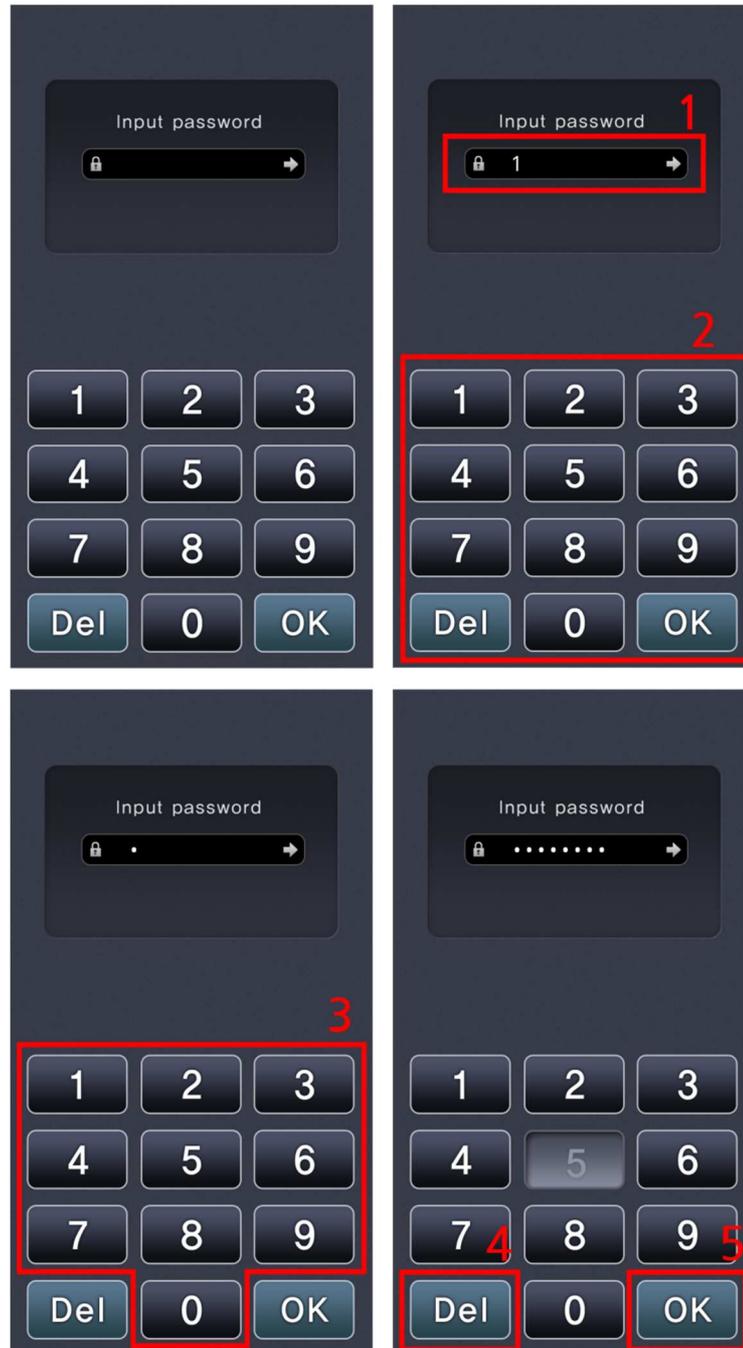


Figure 5-1Login screen

5.2 Main Menu

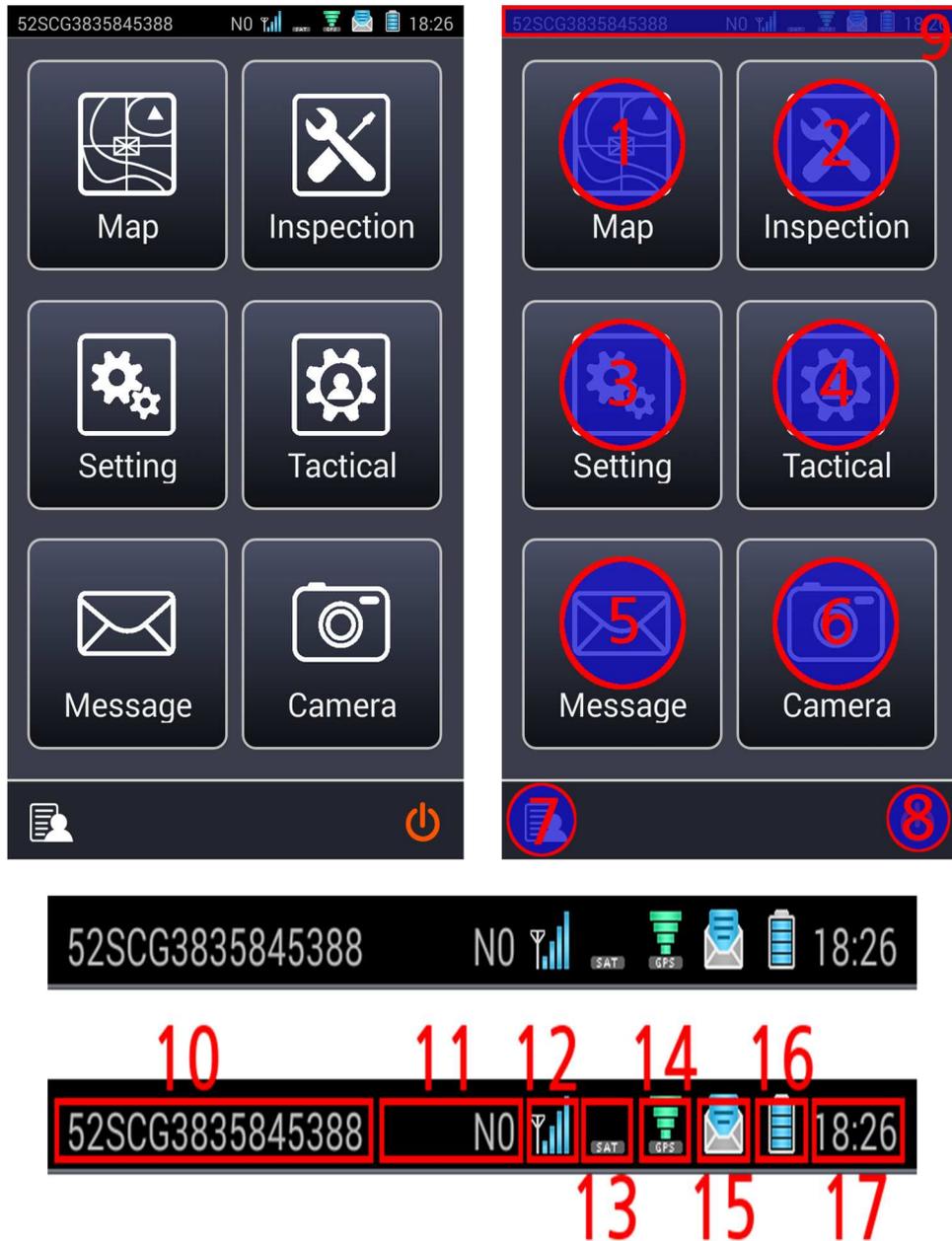


Figure 5-2 main menu & status bar of screen

- ① Map ICON
- ② Inspection ICON
- ③ Setting ICON
- ④ Tactical ICON
- ⑤ Message ICON
- ⑥ Camera ICON
- ⑦ User Information Management

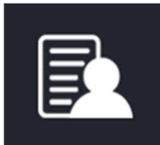
- ⑧ End
- ⑨ Status Bar
- ⑩ Position
- ⑪ Communication Status Bar
- ⑫ 3G Antenna Bar
- ⑬ Satellite Antenna Bar
- ⑭ GPS Antenna Bar
- ⑮ New Message Status Bar
- ⑯ Battery Status Bar
- ⑰ Time

5.3 Initial user registration

Initial user of mBFT17 should input required information into mBFT before use.



- A. Basic setting for communication should be done for C2 message exchange. These items are controlled as list and user should set these information in Tactical ④



- B. To send C2 messages or position reporting, “permanent station” should be set.



- C. Then automatic position reporting, SOS emergency message should be set. (Refer to automatic position reporting, SOS emergency message in setting.)

5.4 Tactical Information

User can manage tactical information in the “Tactical Information” menu as follows.

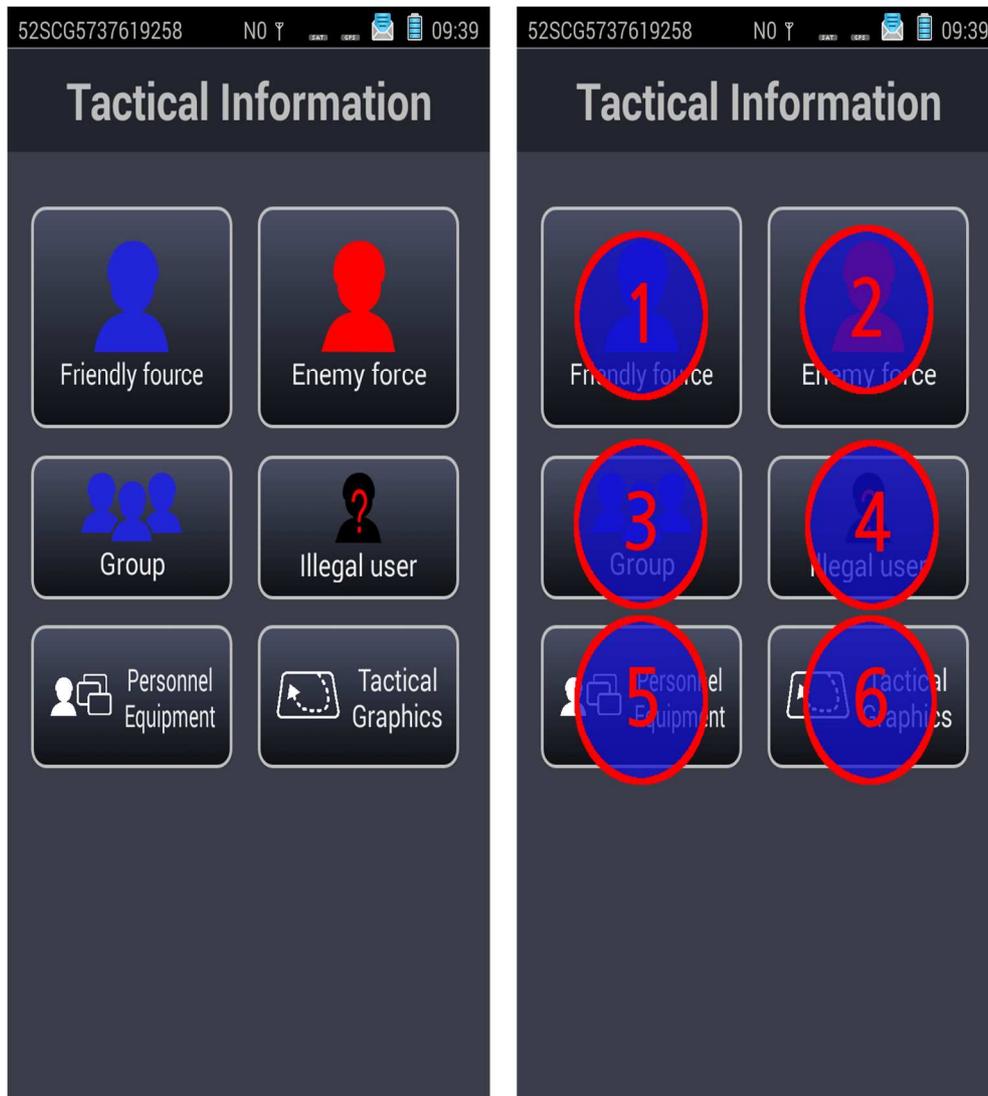


Figure 5-3Tactical information management screen

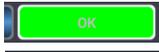
- ① Friendly Force Management ICON
- ② Enemy Force Management ICON
- ③ Group Management ICON
- ④ Illegal User Management ICON
- ⑤ Personnel Equipment Management ICON
- ⑥ Tactical Graphic Management ICON

5.5. Diagnostics

Inspection menu of mBFT17 provides built in test function.

User can verify functionality of SDCard, Battery Gauge, Ethernet Device, GPS module, Iridium module, FPGA, LED Lamp, Display, Sound, Vibrator, Touch panel and Keypad.

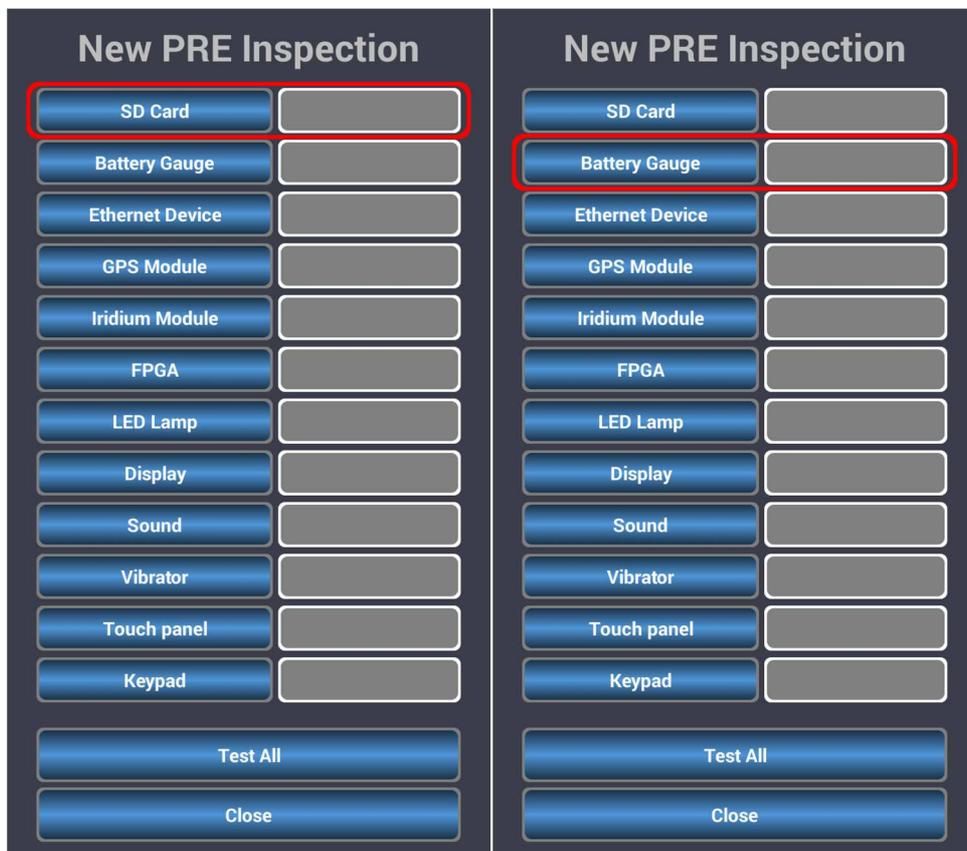
User can verify individual functionality by click left button respectively or verify all at a time by click "Test all" at bottom.

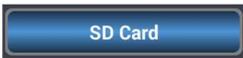
In normal status each item's grey window () turn to green ()

In abnormal status each item's grey window () turn to red ()

A. SD card

SC memory Card is main storage of mBFT which has electronic map and C2 messages.



Click  button check up SD card.

B. Battery

Click  button check up battery then display capacity of the battery on result window.

C. Ethernet Device

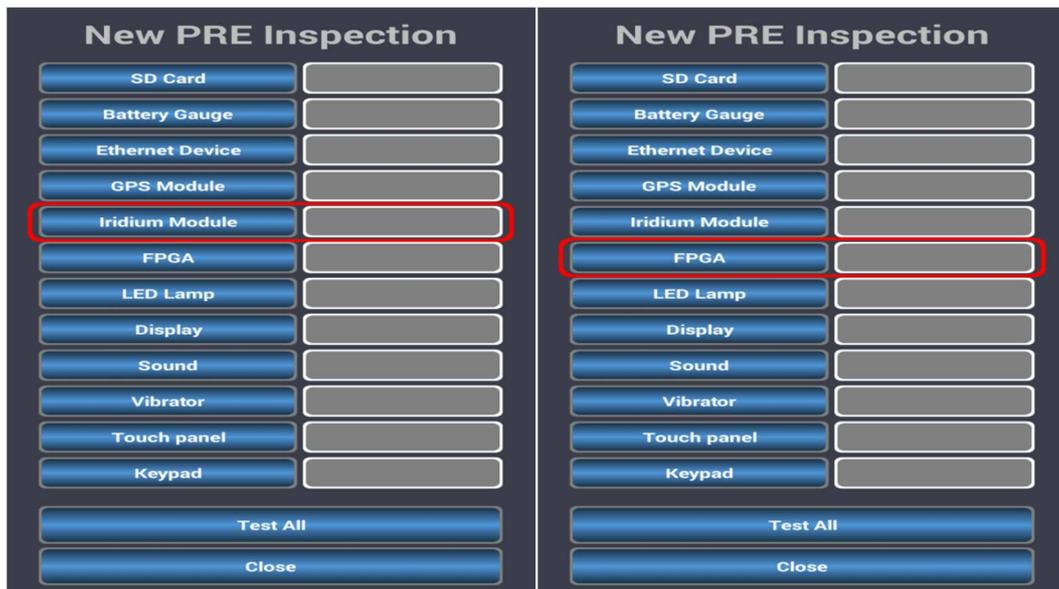
Click  button check up Ethernet device.



D. GPS receiver

Click  button check up GPS receiver.

E. Iridium Communication Module



Click  button check up Iridium Communication Module

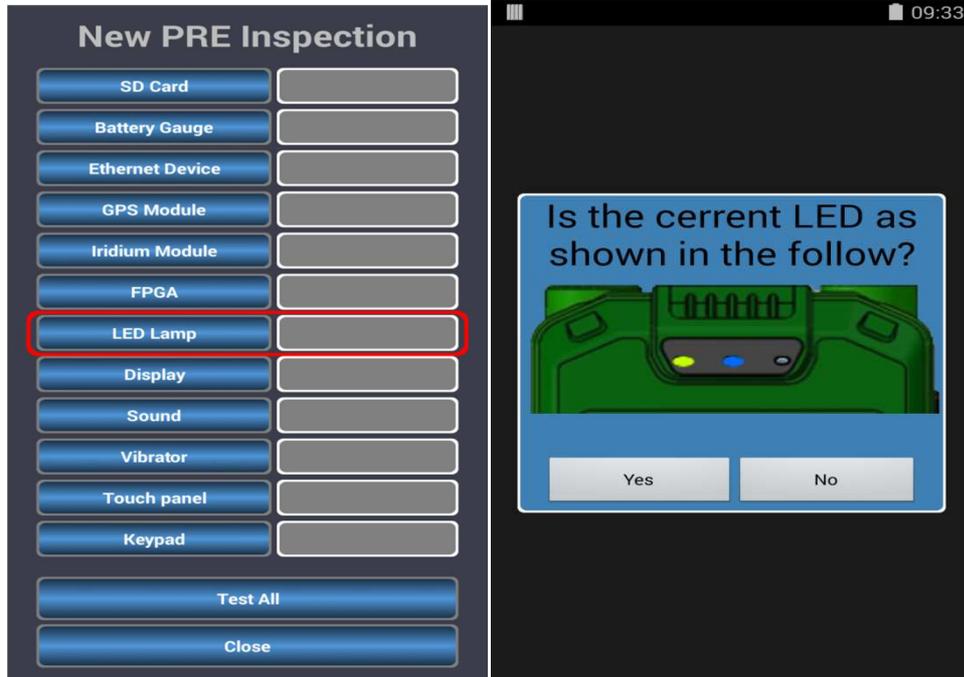
F. FPGA

Click  button check up FPGA

G. LED Indicators

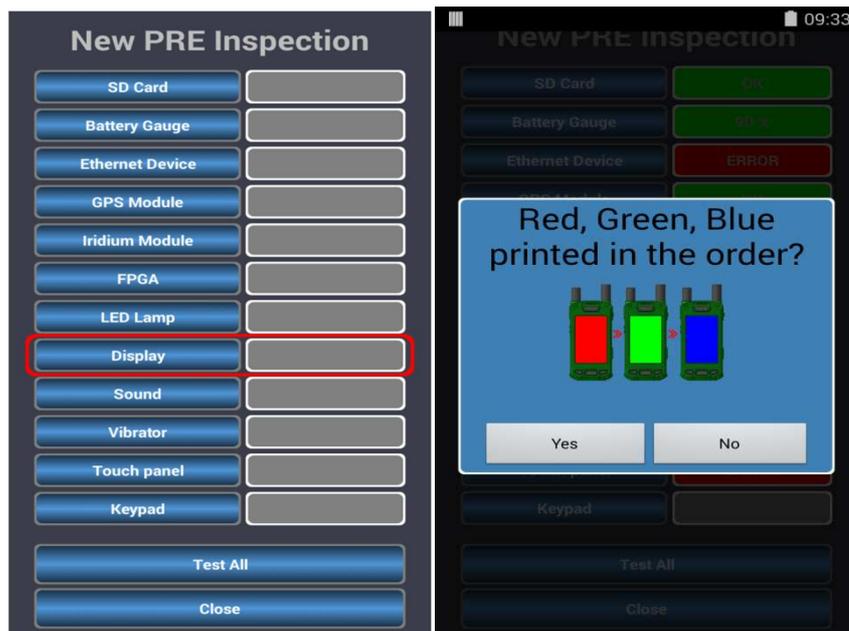
Click  button check up LED indicators

Cross check between actual LED indicator of mBFT and LED indicators displayed picture in LCD.

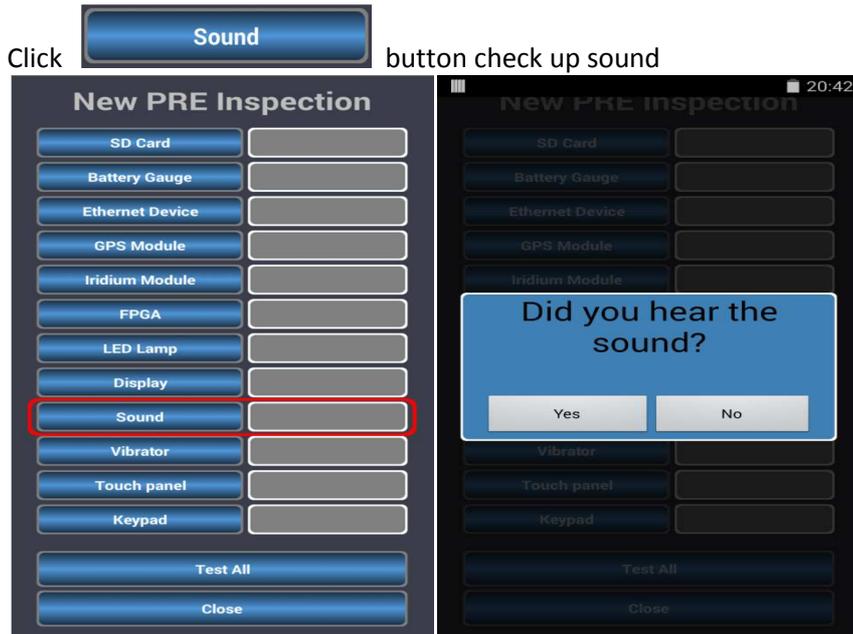


H. Display

Click  button check up LCD.
Display color changed sequentially from green to red to blue in 1 second.



I. Sound



J. Vibration motor

Click  button check up vibration motor



K. Touch panel

Click  button check up touch panel

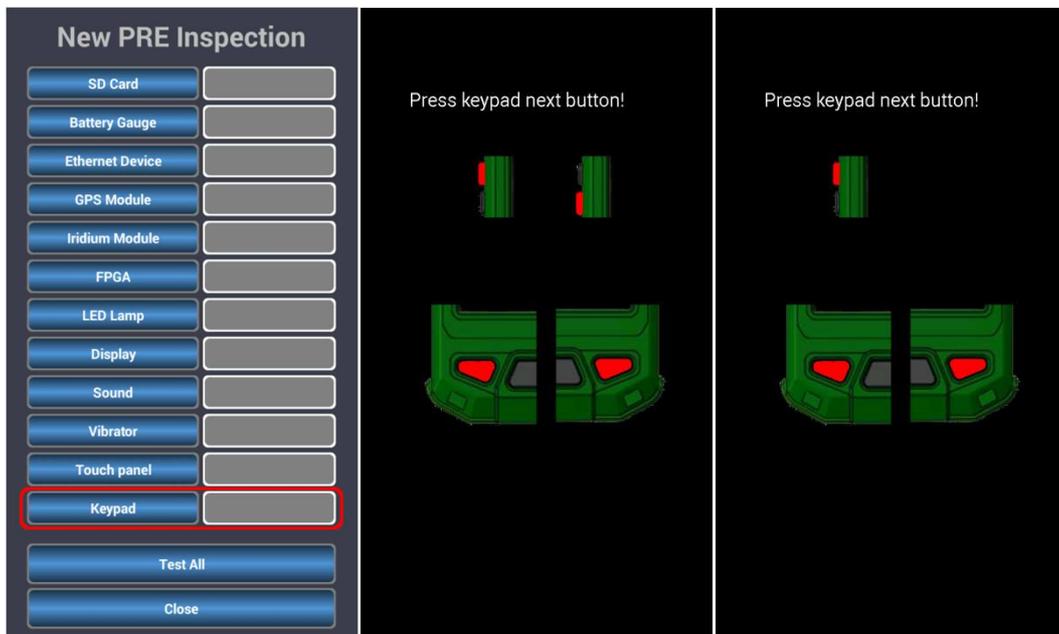
Display change as below picture of 1 then check up if each red colored X disappeared by click.



L. Keypad

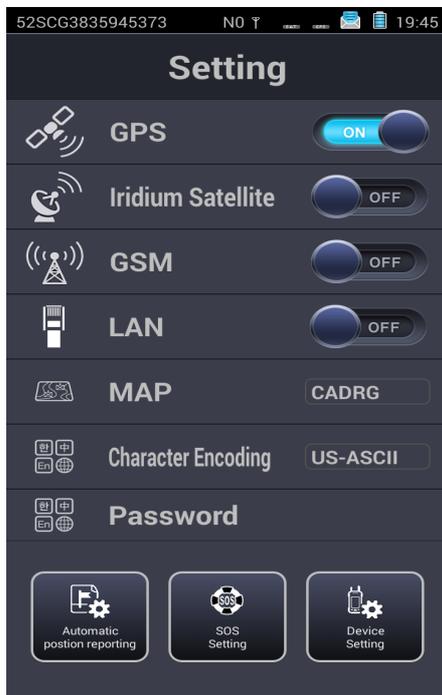
Click  check up key pad.

Keypad check up displays each key on LCD then disappeared by pressing each key..



5.6 Setting

This menu set GPS, Iridium communication, WCDMA communication, Ethernet communication.



This is slide-to activation switch of GPS. It is activated by slide it to right then de-activates by slide it to left. Above picture show activated GPS.



If user touches GPS line except slide switch, hidden button as above displayed and it is for checking GPS status.

GPS Sky view displayed when it enter into GPS status menu (refer to Figure XX GPS status view).

It displays available and acquired GPS. (Green dot is GPS and blue dot is GLONASS.)

Figure 5-4 Setting screen

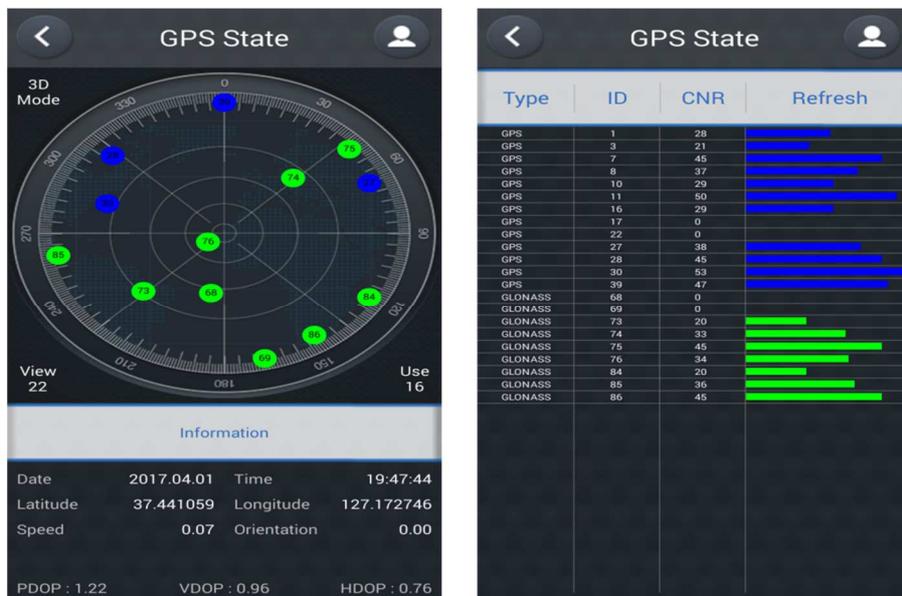


Figure 5-5 GPS status screen

Display shift to CNR view as right above by touching  button. The above table displays signal strengths of receive GPS signal as CNR value.



It is slide-to activation switch of integral Iridium satellite communication module. It is activated by slide it to right then de-activates by slide it to left. Above picture show de-activated.



It is slide-to activation switch of external WCDMA communication module. It is activated by slide it to right then de-activates by slide it to left. Above picture show de-activated.

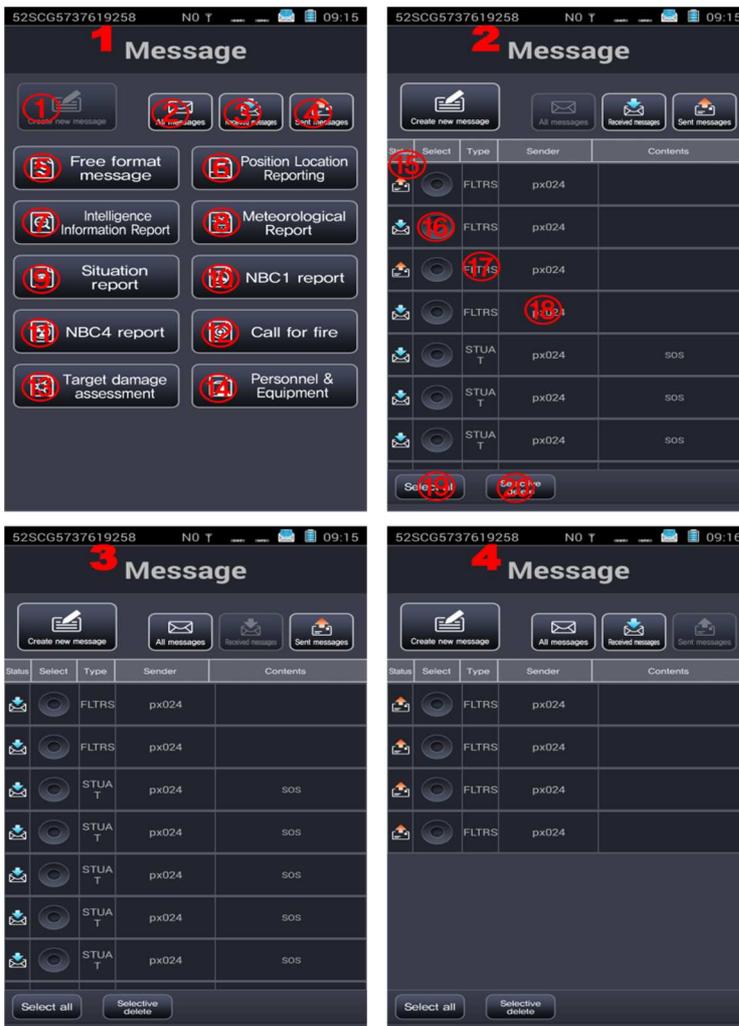


It is slide-to activation switch of integral Ethernet communication module. It is activated by slide it to right then de-activates by slide it to left. Above picture show de-activated.

If user touches LAN line except slide switch, it enters into Ethernet setting mode to set IP, MASK, GATEWAY and BCCP.

5.7 C2 Messages

In C2 message menu of mBFT 17, user can create, edit and manage messages sent or received.



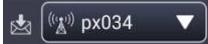
- ① Create new message
- ② List of messages (sent/received)
- ③ Received messages
- ④ Sent messages
- ⑤ Button to create free format message
- ⑥ Button to create position location reporting
- ⑦ Button to create intelligence information report
- ⑧ Button to create meteorological report
- ⑨ Button to create situation report
- ⑩ Button to create NBC1 report
- ⑪ Button to create NBC4 report (NBC RECON)
- ⑫ Button to create Call for fire message
- ⑬ Button to create Target damage Assessment report
- ⑭ Button to create Person & Equipment report
- ⑮ Button to check status of message
- ⑯ Message select toggle button
- ⑰ Show types of message
- ⑱ Select all button
- ⑳ Delete selected message button

Figure 5-6 C2 message screen

A. Free format message

Click free format message button on the first menu to write free format message.

Scroll menu  is fixed permanent station that user belong to.

User can choose recipient of the message by scrolling of  button.

Recipient list show registered friendly force and group of Tactical information.

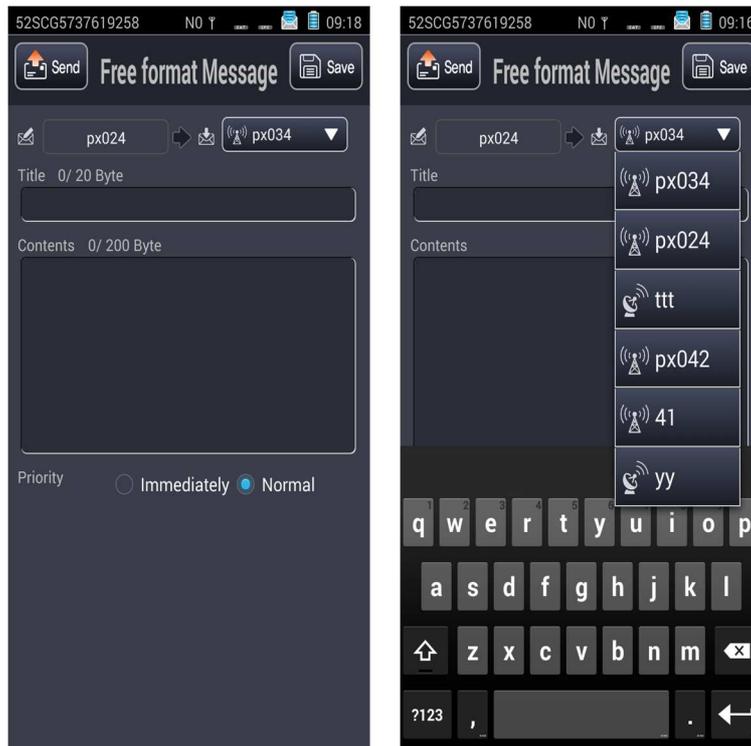


Figure 5-7 Free format message screen

Available transmission path will be scrolled ahead recipient, relevant transmission path should be set before use.

Free format message consist with title and contents. Once click send button, transmission initiated then shift to new message write window.

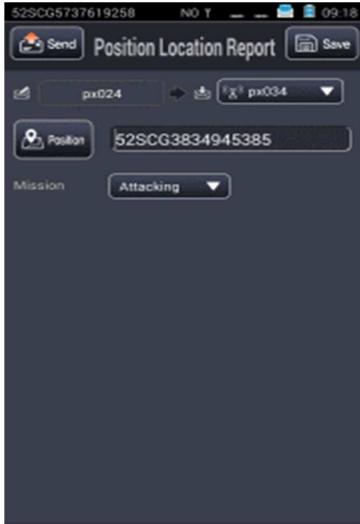
If click save button, mBFT17 store message but not send then shift to new message write window.



User can prioritize the message between normal and immediate.

B. Position Location report

User can report its position location report to designated recipient and group



GPS acquired coordination is default.

User can input MGRS coordinate manually or choose position on the map by click position button in case of GPS failure or user wants to change its position manually.

Scroll menu  is fixed permanent station that user belong to.

User can choose recipient of the message

By scrolling of  button.

Available transmission path will scrolled ahead recipient, relevant transmission path should be set before use.



By scrolling of  user can set current status of operation.

Once click send button, transmission initiated then shift to new message write window.

If click save button, mBFT17 store message but not send then shift to new message write window.

Figure 5-8 Position Location Report screen

5.8 Camera

mBFT17 has 500M pixel Camera upper back and support dedicated picture viewer application.

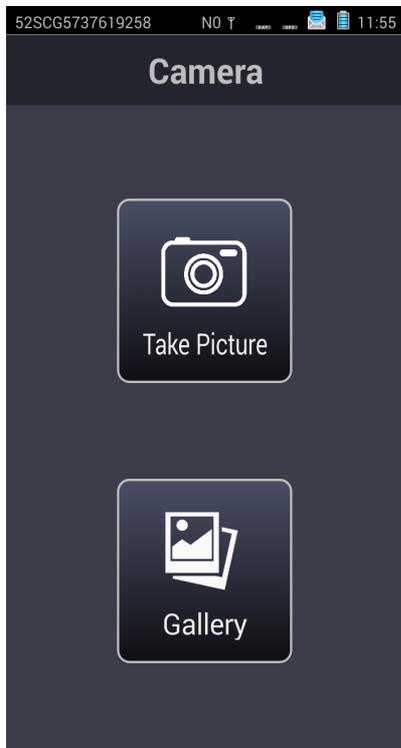


Figure 5-9 Camera screen

User can access camera by click “Take Picture” button

Once select photo in photo viewer menu then display shift to menu to send photo to designated recipient and group.

Scroll menu  is fixed permanent station that user belong to.

User can choose recipient of the photo By scrolling of

 button.

Available transmission path will scrolled ahead recipient, relevant transmission path should be set before use.

User can back to main menu by press back key bottom right on the mBFT when it display photo viewer menu or send file menu.

In send file menu, click save button just save message then back to main menu. Transmission of photo take long time so it operated as background and status bar placed top of menu show its status of transmission or receiving.

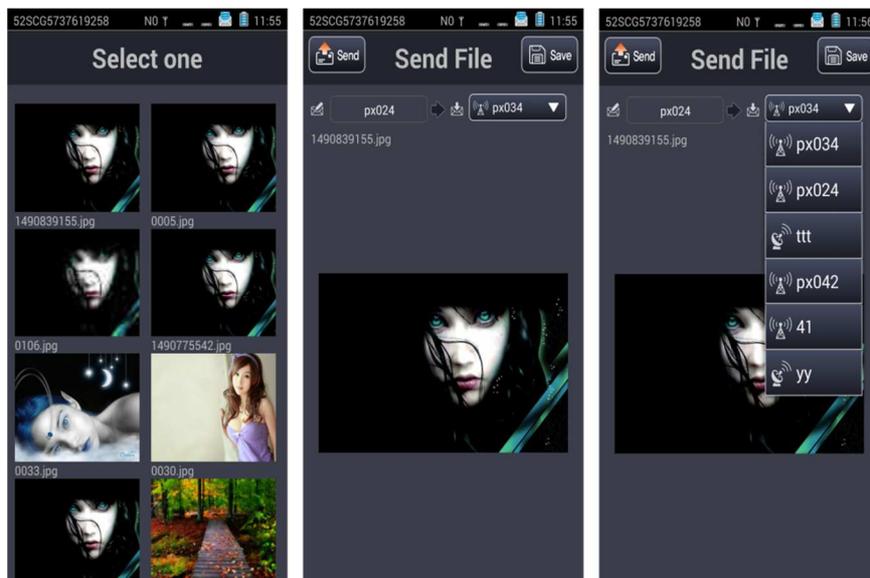


Figure 5-10 Photo viewer screen

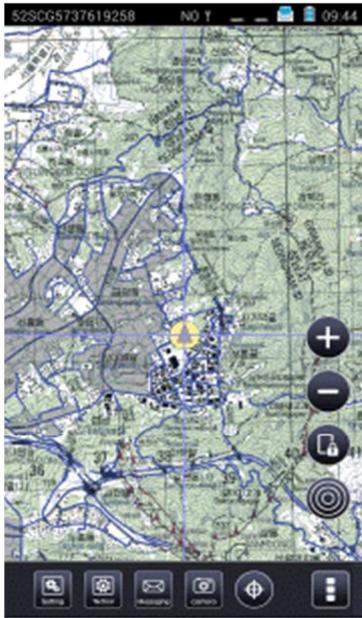
5.9 Electronic Map

When it enters to map menu, map is displayed as below pictures.

On the map menu, user can move area of map by touch or drag on the LCD.

Vertical control menu consist with “+” and “-” to magnify or reduce map and toggle key to fix display or rotate it per moving direction and return key to users current position from up to down.

Bottom menu provide access to message, setting camera and tactical information by click.



A. Vertical Control button in 1, 2 and 3 in red colored squares

- Button 1 toggled its display on the map by button 2.
- “+”. “-” key in 1 enable magnitude/reduce displayed map level
- Third from top Lock button in 1 is toggle key between map rotation per moving direction or rotation of arrow symbol in 4. When lock displayed, map doesn’t rotate but symbol in 4 rotate.
- Concentric circle symbol in 1 displays distance from arrow symbol.



Figure 5-11 menu bar on the Map

B. Shortcut menu of map screen

Touch then press one point on map screen around 1 second displays shortcut menu (refer to left picture below)



Figure 5-12 Distance measuring between two points on the map

C. Distance measuring between two points in map

Click Measure Distance button displays distance between selected two points on the map. Distance measuring performed as shown picture above. If type MGRS coordinate into column of “from” and “to” it displays distance and direction as shown in right picture above. At the moment, user can set the points on the map by pressing one point around 1 second.

D. Location calculation with direction and distance

Touch then press one point on map screen around 1 second displays shortcut menu (refer to left picture below)

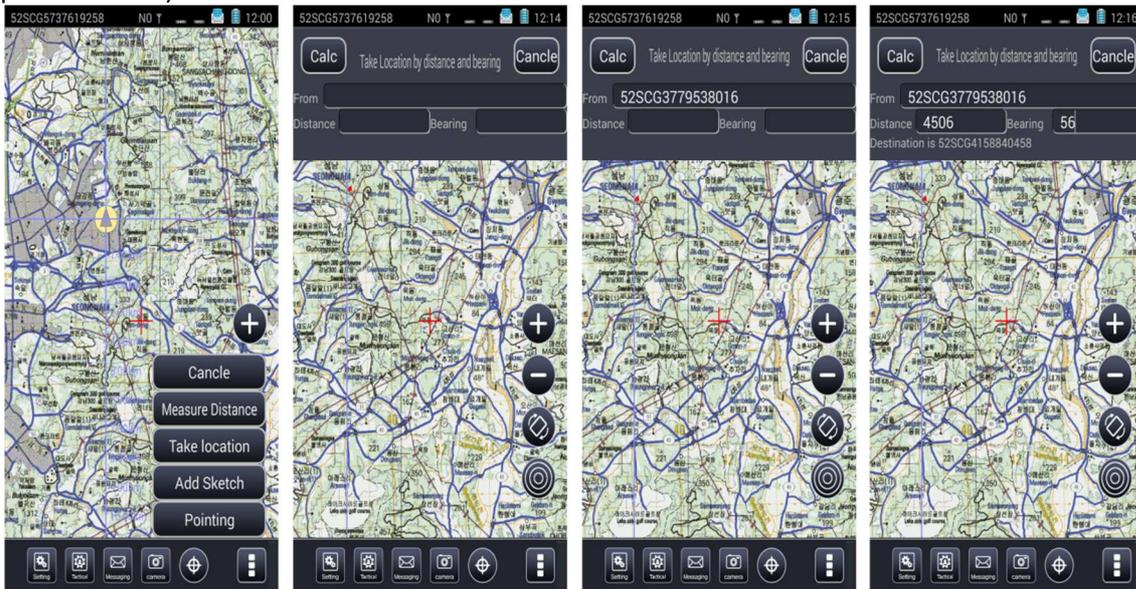


Figure 5-13 Location calculation with direction and distance

At the moment, click “Take location” button enables user to acquire coordinate with direction and

distance.

Once entered into this menu, point on the map pressed then hold 1 second become entered as a reference point. (Refer to third picture from left to right in above picture).

Once reference point entered, type distance and bearing then click "Calc" button to display location with acquired coordinate.

E. Reference point

Touch then press specific point on map screen around 1 second displays shortcut menu (refer to left picture below)

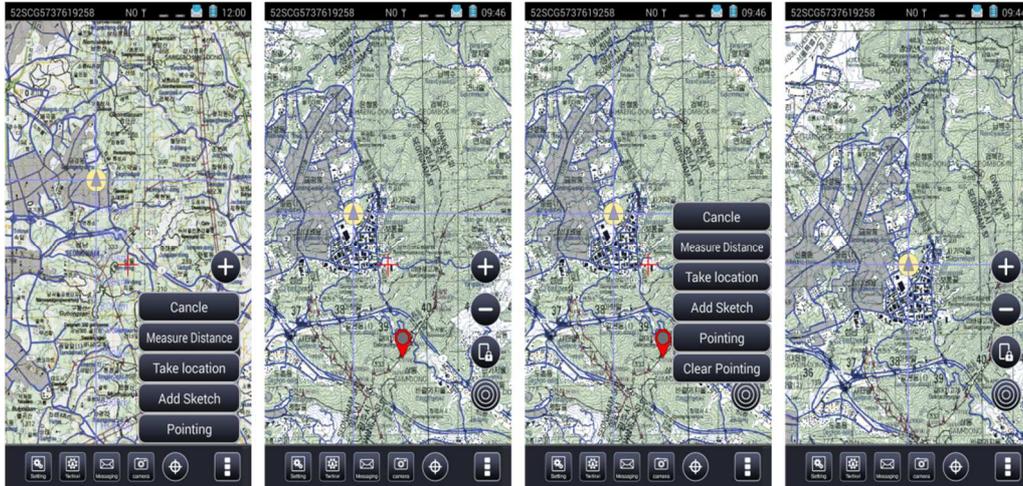


Figure 5-14 Set reference point

Choose point as above then click "Pointing" button creates reference point on the map and store it. These created reference point and my position displayed on the map by click target shaped button in 3 of main menu by turns.

F. Hand sketch mode

mBFT17 provide hand sketch mode on the map and entered into this menu by pressing one point on the map then hold 1 second then choose "add sketch" among popup menu.



Figure 5-15 Hand sketch 1

Figure 5-15 Hand sketch1 shows how to add path on the map.

Click "add sketch" popup menu to use type of sketch in ① of Figure 5-15 Hand sketch 1.

Click “Path” in ② clears popup menu and bottom menu bar as well then “Cancel” and “end” menu is on the map as ③. Then User can set a point on the map by touch. ⑤ of Figure 5-15 Hand sketch 1 will be displayed after complete input then press “end”. At this screen once click “save” will return to normal map screen.

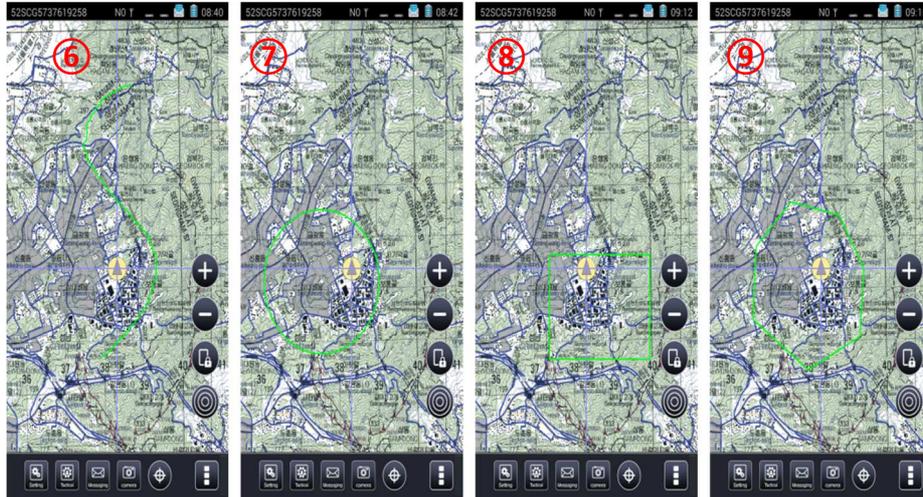


Figure 5-16 Hand sketch 2

Hand sketch support drawing of free line, circle, box, polygon in addition to “Path”. ⑥, ⑦, ⑧, ⑨ in Figure 5-16 Hand sketch 2 shows example of drawing of free line, circle, box and polygon respectively.

Drawing procedure is similar with Hand sketch 1.

Free line draw as shown in ⑥, it maintain line as long as keep touch on the screen.

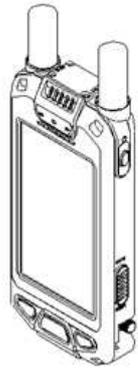
Circle draw as shown in ⑦, it forms circle as first touched point become central point then next clicked point become radius.

In the box drawing as shown in ⑧, it forms quadrangle as first touched point become first point then dragged point become diagonal point.

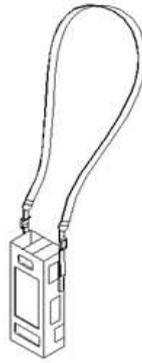
6. Components

mBFT17 has basic issue items and optional items. Basic issue item includes mBFT17 assembly, battery pack assembly, charger assembly, AC power supply assembly, protective case assembly, carrying case assembly and stylus pen assembly.

Descriptions	Q'ty	Drawing No	Remarks
mBFT17	1		
EXTERNAL 3G MODEM	1		DETACHABLE
BATTERY PACK	2		
BATTERY CHARGER	1		
AC/DC ADAPTER	1		
PROTECTIVE CASE	1		
EXTERNAL SATELLITE ANTENNA	1		
EXTERNAL GPS ANTENNA	1		
ETHERNET CABLE	1		
DOWNLOAD CABLE	1		
BAG	1		
STYLUS PEN	1		
SOFTWARE CD	1		OPTION



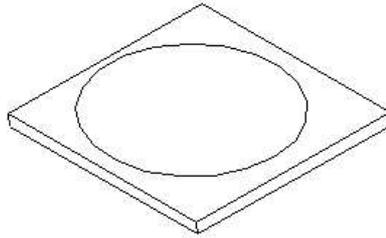
mBFT17



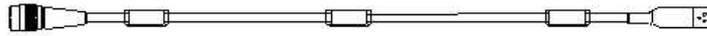
CASE



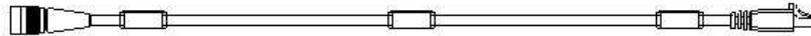
STYLUS PEN



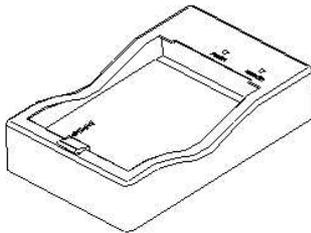
SOFTWARE CD



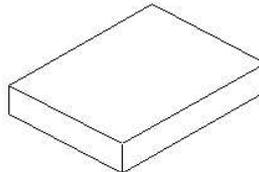
DOWNLOAD CABLE



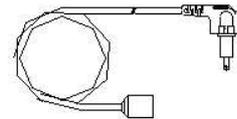
ETHERNET CABLE



BATTERY CHARGER



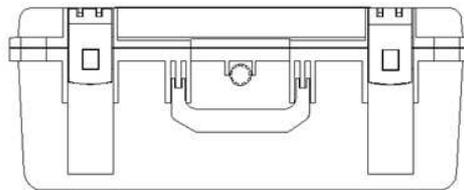
BATTERY



AC/DC ADAPTER



EXTERNER 3G MODEM



BAG

Figure 6-1 components of mBFT17

7. Specifications

CATEGORY	STANDARD	Remarks
SIZE	88 (W) X 190 (H) X34 (D) mm	Except (exclude Antennas and protrusions)
WEIGHT	700g	
CPU	1.9GHz/1.3GHz Octa Core	DDR3 2GB
OS	Android 4.4 (KitKat)	
INT. FLASH MEMORY	4GB	OS & USER DATA
MICRO SD CARD	128GB	MAP
CHARGEING	CHARGER / SELF CHARGING	DC +5.0V INPUT
BATTERY	5800 mAh	NOMINAL 3.7V
OPERATING TIME	10 HOURS	
LCD	5.0 INCH / 1280 x 720	AMOLED / C-TOUCH
CAMERA	1300M PIXEL	
SENSOR	GYRO'/ACCEL'/COMP'	9-AXIS
EXT. PORT	USB	Data Download
CERTIFICATION	MIL-STD-810G/461F/FCC	

8. Certification

FCC Part 15 Statement

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 can cause undesired operation.

FCC Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital

device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the radio or television receiving antenna.
- Increase the separation between the computer equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the radio or television receiver is connected.
- Consult the dealer or an experienced radio television technician for help.

FCC RF Exposure Warning

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

SAR Information

mBFT17 is a radio transmitter and receiver. It is designed and manufactured not to exceed the limits for exposure to radio frequency (RF) recommended by FCC . These limits are part of comprehensive guidelines and establish permitted levels of RF energy for the general population. The guidelines include a substantial safety margin designed to assure the safety of all persons, regardless of age and health.

The exposure guidelines for mobile devices employ a unit of measurement known as the Specific Absorption Rate or SAR.

The SAR limit is 4.0 watts/kilogram (W/kg) averaged over 10g of tissue. Tests for SAR are conducted using standard operating positions with the device transmitting at its highest certified power level in all tested frequency bands.

Use of device accessories and enhancements may result in different SAR values. SAR values may vary depending on national reporting and testing requirements and the network band.

When using protective case, mBFT17 operates in standby mode or rx only mode under Conditions of use close to body.