User Manual

Revision v1.0   July 2009

P234

Hardware

System
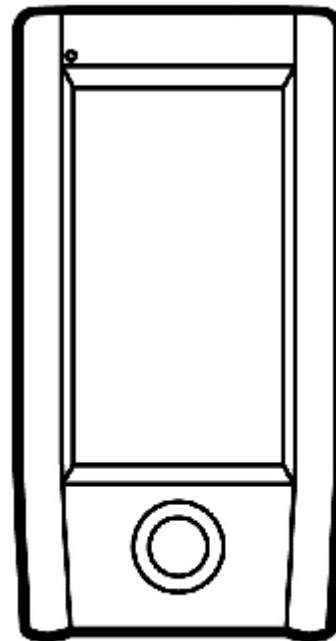
Flytech Technology co., Ltd.

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Revision History

Changes to the original user manual are listed below:

Version	Date	Description
1.0	2009/07	Initial release

Safety

Regulatory Information:

Caution: Only use approved and UL Listed accessories, battery packs and battery chargers. Do NOT attempt to charge damp/wet mobile computers or batteries. All components must be dry before connecting to an external power source.

Power Supply

Use only the approved power supply 50-14000-148 output rated 5 Vdc and minimum 2 A. The power supply is certified to EN60950-1 with SELV outputs. Use of alternative power supply will invalidate any approval given to this device and may be dangerous.

Warning for Use of Wireless Devices

Please observe all warning notices with regard to the usage of wireless devices.

Potentially Hazardous Atmospheres

You are reminded of the need to observe restrictions on the use of radio devices in fuel depots, chemical plants etc. and areas where the air contains chemicals or particles (such as grain, dust, or metal powders)
and any other area where you would normally be advised to turn off your vehicle engine.

Safety in Aircraft

Switch off your wireless device whenever you are instructed to do so by airport or airline staff.

Pacemakers

Pacemaker manufacturers recommended that a minimum of 15cm (6 inches) be maintained between a handheld wireless device and a pacemaker to avoid potential interference with the pacemaker. These recommendations are consistent with independent research and recommendations by Wireless Technology Research.

Persons with Pacemakers:

Persons with Pacemakers should ALWAYS keep the device more than 15cm (6 inches) from their pacemaker when turned ON and hence they should not carry the device in a breast pocket .

Should use the ear furthest from the pacemaker to minimize the potential for interference.

If you have any reason to suspect that interference is taking place, turn OFF your device.

Hearing Aids

The wireless device may interfere with some hearing aids. In the event of interference you may want to consult your hearing aid supplier to discuss solutions.

Other Medical Devices

Please consult your physician or the manufacturer of the medical device, to determine if the operation of your wireless product may interfere with the medical device.

FCC / EU RF Exposure Guidelines

Safety Information

This device complies with internationally recognized standards covering Specific Absorption Rate (SAR) related to human exposure to electromagnetic fields from radio devices.

Reducing RF Influence - Use Properly

It is advisable to use the device only in the normal operating position.

Handheld Devices

This device was tested for typical body-worn operation. Use only tested and approved belt-holsters, hand strip and similar accessories to ensure FCC Compliance. The use of third-party

belt-clips, holsters, and similar accessories may not comply with FCC RF exposure compliance requirements, and should be avoided.

To comply with FCC RF exposure requirements, this device must be operated in the hand with a minimum separation distance of 2.5 cm or more from a person's body. Other operating configurations should be avoided.

Radio Frequency Interference Requirements - FCC

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.

CE Marking and European Economic Area (EEA)

The use of 2.4GHz RLAN's, for use through the EEA, have the following restrictions:

l Maximum radiated transmit power of 100 mW EIRP in the frequency range 2.400 -2.4835 GHz

l France, outside usage is restricted to 2.4 - 2.454 GHz.

l Italy requires a user license for outside usage.

Bluetooth® Wireless Technology for use through the EEA has the following restrictions:

l Maximum radiated transmit power of 100mW EIRP in the frequency range 2.400 -2.4835 GHz

l France, outside usage is restricted to 10mW EIRP

l Italy requires a user license for outside usage.

Battery Information

Our rechargeable battery packs are designed and constructed to the highest standards within the industry.

However, there are limitations to how long a battery can operate or be stored before needing replacement.

Many factors affect the actual life cycle of a battery pack, such as heat, cold, harsh environmental conditions and severe drops.

When batteries are stored over six (6) months, some irreversible deterioration in overall battery quality may occur. Store batteries discharged in a dry, cool place, removed from the equipment to prevent loss of capacity, rusting of metallic parts and electrolyte leakage. When storing batteries for one year or longer, they should be charged and discharged at least once a year. If an electrolyte leakage is observed, avoid any contact with affected area and properly dispose of the battery. Batteries must be charged within the 32° to 95° F (0° to +35° C) ambient temperature range.

Replace the battery when a significant loss of run time is detected.

⚠ Battery Caution

Risk of explosion if battery is replaced by an incorrectly type. Dispose of used battery according to the local disposal instructions.

Waste Electrical and Electronic Equipment (WEEE)

English: For EU Customers: All products at the end of their life must be returned to the reseller for recycling.

Notational Conventions

The following conventions are used in this document:

ㄩ   Italics are used to highlight specific items in the general text, and to identify chapters and sections in this and related documents.

ㄩ   bullets (•) indicate:

- action items
- lists of alternatives
- lists of required steps that are not necessarily sequential
- Sequential lists (e.g., those that describe step-by-step procedures) appear as numbered lists.

NOTE This symbol indicates something of special interest or importance to the reader. Failure to read the note will not result in physical harm to the reader, equipment or data.

CAUTION This symbol indicates that if this information is ignored, the possibility of data or material damage may occur.

WARNING! This symbol indicates that if this information is ignored the possibility that serious personal injury may occur.

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1 Introduction

This chapter lists the parts, accessories, hardware

1-1 System Overview

System Overview table -1

	Location	Description
1	LED Indicator	Show the Status of Wi-Fi connection and battery.
2	Power & 4 Programmable Keys	Hold 5 seconds to power on/off the system.
3	Speaker	At rear side
4	Hand Strap Screw Hole	Mounted for hand strap
5	Reset Hole	For system reset to the default setting
6	Battery locker	Secure the Main Battery door
7	Strap Holes	Mount for neck strap and wrist strap.
8	Charging Slot	Charger Slot for recharging the battery.

1-2 Standard Components

	Items
1	Mobile System
2	Travel Charger (**Note**: Only for power charge use, not for data transfer use)
3	Main Battery
4	Holster
5	Power Adapter (AC-USB connector)
6	Hand Strap
7	Wrist Strap
8	Neck Strap

1-3   Optional Accessory

	Items
1	Standard Battery Charger
2	Power Brick of Standard Battery Charger
3	Power Cord of Standard Battery Charger Note: Power cord are various according to the shipping country.
4	MSR Module
5	2-in-1 MSR & Scanner Module
6	USB Cable for synchronization & programming

1-4 Hardware Description

Item	Features		Descriptions
1	Main Processor	l	Marvell PXA270 416MHz (Xscale Core)
2	System Memory	l	128Mbytes SDRAM
		l	Around 115MB use for system operation, otherwise for storing system loader and system data
3	System Storage	l	1Gbytes Flash (ROM file system)
		l	More than 300MB for storing WindowCE image and OEM application programs
		l	Around 600MB leaved for system and user storage, emulated as folders in all system directories
		l	Around 100MB leaved for storing OEM data and configurations This device provides a specific mechanism to let system integrator easily to integrate the OEM applications and device configurations into device as factory default mode without merging OEM applications into WindowCE image It can help system integrator doesn't have to maintain the device after end user crashed the device by reset device to factory default mode or on-line updated the OS image from internet
4	Display	l	PXA270 Display controller
		l	Share System Memory as Video Frame Buffer
		l	Resolution : 272x480 pixels, 16 bit color
		l	4 way rotator for direction detection
5	LCD	l	43 inches TFT LCD – WQVGA (480x272 pixels resolution)
		l	Transmissive display mode
		l	Digital RGB 8bit color depth , 10 LEDs backlight

Item	Features		Descriptions
6	Touch Panel	l	LCD panel with touch panel design
		l	Resistor 80% Transparency (Film to Glass type)
7	Audio	l	Stereo audio system with mono speaker design
		l	05W speaker amplifier
		l	Headphone stereo output (Optional)
8	Secure Digital Socket	l	SD memory card (Support up to: 2Gbytes)
9	WiFi IEEE 80211b/g	l	Auto fallback mode : 6M~54M(80211g), 1M~11M(80211b)
		l	Complying with Wireless Ethernet Compatibility Alliance
		l	Support hardware signaling BT WiFi co-existence
		l	Link LED indicator
		l	Output Power : 802.11b: +18 dBm (peak) / 16 dBm (e.i.r.p.) 802.11g: +21 dBm (peak) / 16 dBm (e.i.r.p.)
10	Bluetooth	l	Compliant with Bluetooth Specification V2.0+EDR
		l	Output Power : -1dBm (peak) / 1dBm (e.i.r.p.) (Class 2)
		l	Receive Sensitivity : Typical -78dBm
11	USB Client	l	USB Specification - 11 compliant
		l	Full-Speed operation on half-duplex at 12Mbps baud rate
12	USB Host	l	Compliant with USB Specification 11 and OHCI Spec
		l	Support both low-speed and full-speed USB devices
		l	Expansion slot for optional device (either one of the MSR reader, IC card reader, Barcode scanner, and so on)
13	FFUART port	l	Expansion slot for optional device (either one of the MSR reader, IC card reader, Barcode scanner, and so on)
		l	Maximum baud rate 921600bps
		l	Full function UART

14	Buttons	I	Keypad – 4 programmable buttons

Item	Features		Descriptions
15	Power / Reset buttons	l	Power Button : Suspend/ Resume Device and "Enter" Key
		l	Reset Button : Warm Reset
		l	Press Power and Reset buttons simultaneously: Cold Reset
16	LED indicators	l	Green: ON – device power on , OFF – device off / suspend
		l	Blue: Link Status of WiFi manager
		l	Red: Flash – Battery low, ON –Charging battery
17	Vibrator	l	Vibrational indicator
18	Smart Battery	l	37V Li-Ion battery pack : 2200mA/h
		l	Charging time : maximum 35 ~ 4Hours
		l	Thermal / Over Charging Protections
		l	Auto mode of Low / High speed charging mechanism
19	Travel Charger	l	Mini-USB type connector
20	Adapter	l	AC110V ~ 240V / DC5V (10W) 50~60Hz

1-5 System Feature Description

Item	Features	Descriptions
1	Application	l File Explorer l Internet Explorer 6.0 for Windows CE l Windows Media Player l Windows CE standard shell (Windows XP-like skin)
2	File System	l ROM File system with hive registry
3	Graphic / Display	l 480x272x16 (Landscape mode) as panel default mode 272x480x16 (Portrait mode) as system default mode l Compliant with Graphics, Windowing and Event Subsystems of Window CE embedded. l Still Image Codec Support l DirectShow l Support screen rotation feature
4	User Input Interface	l Stylus input rather than mouse input capability l USB Keyboard / Mouse (optional) – USB Host Interface l Buttons: 4 programmable keys (without system wakeup feature)
5	Audio	l Audio playback feature only l Support waveform audio Input/Output device APIs l Configurable sound enable/disable feature of system event, message notification, screen taps. l MP3 Codec l MPEG-1 Layer 1 and 2 audio codec l Waveform audio renderer l WMA Codec

Item	Features		Descriptions
6	Storage	l	Removable storage : SD memory (up to 2GB) : USB storage (optional)
		l	Persistent storage: NAND flash memory (On Board)
7	Data Communication WLAN	l	Support seamless roaming in IEEE802.11b/g WLAN authentication infrastructure
		l	Support single SSID
		l	Support fast Wi-Fi roaming
		l	Support always on Wi-Fi
		l	WPA and 802.11i security standard (AES/CCMP and WEP with TKIP security mechanism)
		l	Support Window Wireless Zero Configuration service
8	Data Communication Bluetooth	l	Compliant Bluetooth software specification
		l	Window CE Bluetooth communication software stack
		l	"SPP" "FTP" "Activesync" profile supports
		l	Support Winsock Bluetooth programming interface
9	Data Synchronization	l	Bluetooth Window CE Active-sync
		l	USB SD card reader
10	Vibration Notification	l	Support Programming API of Window CE device manager
11	System Power State	l	Support Remote Application Interface (RAPI) for retrieves the power state of system : Battery Status / AC status
12	Backlight	l	Support Programming API of Window CE device manager
		l	Support 10 backlight scales

Item	Features		Descriptions
13	Network Features	l	NDIS network driver architecture
		l	TCP/IP
		l	Windows Networking API /Redirector [SMB]
		l	WinSock Support
14	Security	l	Authentication Services (SSPI)
		l	Credential Manager
		l	CrytoAPI 1.0
15	Applications and Service Development	l	.NET compact framework 2.0
		l	Active Template Library (ATL)
		l	C Libraries and Runtimes
		l	COM and DCOM
		l	Microsoft Foundation Classes (MFC)
		l	Object Exahange Protocol
		l	Standard SDK for Windows CE
		l	MSXML 3.0
16	Fonts	l	Courier New (Subset 1_30)
		l	Tahoma (Subset 1_07)
		l	Wingding
17	Multilingual	l	English (English software Input Panel)
		l	Traditional Chinese
		l	(Bopomofo/ Chan Jei software Input Panel, Handwriting)
		l	Simplified Chinese (Shuang Pin software Input Panel)
18	OEM	l	Factory Device Manager
		l	User mode / Admin mode operation modes

2 Getting Started

2-1 Installing the Main Battery

Battery Door   Battery Bay   Main Battery

1. Rotate the lock screw counter-clockwise with a flat-head screw driver or a coin to release the lock.

2. Slide the battery door outwards as direction of the arrow and open the battery door.
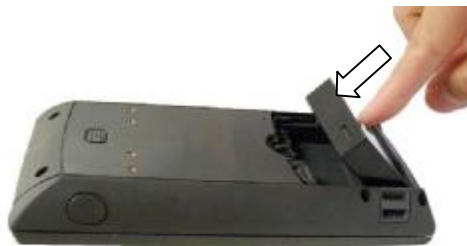
3. Push down the main battery into the battery bay until you hear a clip sound.

4. Put back the battery door and fasten the lock screw in clockwise way.

2-2   Removing the Main Battery

1. Open the battery door described in Chapter 2-1 first.

2. Please use your finger nail to pull the fillister on the battery latch (the circle marked) toward the front as the direction of the arrow shows.

3. Flip up and remove the battery to replace another.

2-3 Installing / Uninstalling SD Card

SD Card Slot locates in the inner side of the battery bay which is a push-push type.

2-3-1 Installing the SD Card

1. To open the battery door and remove the main battery first as described in Chapter 2-1 and 2-2.

2. To push the SD card into the Slot until it clicks.

3. To remove the SD Card, please push again the SD card and slide outwards.

2-3-2 Uninstalling the SD Card

1. To remove the SD Card, please push again the SD card and slide outwards.

2-4   Neck Strap Installation

To installing the Neck Strap, please unthread the Neck Strap first then follow the below steps.

1. Start threading the Neck Strap through the Strap Hole as arrow direction.

2. Thread through the plastic ring to make it secured with the Neck strap.

3. Repeat a and b at the other side.

4. Finished.

2-5   Wrist Strap Installation

1. Start threading the Wrist Strap through the Strap Ring.

2. Thread through as the arrow direction point.

3. Finished.

2-6 Hand Strap Installation

Hand strap screw holes

1. Start threading the Hand Strap through the strap hole at the either side of the system.

2. Thread through as the arrows direction show.

3. Finish the Hand Strap threading through the strap hole at the side of the system.

4. Fasten the Hand Strap Plastic Ring with the screws (2) to the screw holes at rear side of the system.

5. Thread the Hand Strap through the plastic ring as the direction of the arrows show.

6. Finished.

2-7   Charging the Main Battery

1. Connect the Mobile System, Travel Charger and USB-AC power Adaptor as above arrow instruction.

2. Plug the USB-AC Adapter to the electrical outlet.

3. The LED light turns Orange while recharging.

4. When recharging is complete, the LED light turns Green.

> Ø   **Note:** Please make sure to align the juts (2) of the Travel Charger into the holes at the bottom of the Mobile system when connecting the 2 units.

2-8 Backup Battery

The internal Backup Battery can last for 5 minutes. The screen will be powered on with the last status when you replaced the Main Battery within 5 minutes.

When the Main Battery is out of system over 5 minutes, the boot-up screen will pop up as above figure shows after pressing the Power Button for **1** second.

> Ø **Note:** Normal procedure of system power-on is holding down the Power Button for 5 seconds.

2-9 Power on/off the System

Power Button

Turn on the System

Press and hold the Power Button (as the arrow marked) for 5 seconds to turn on the system.

Turn off the System

To press the Power Button for 5 seconds or press "Start Menu" > "Suspend" to turn off the system.

3   Using the System

3-1   Wi-Fi Connection Settings

3-1-1   Connecting to an Existing Network

Enable Wireless Connection
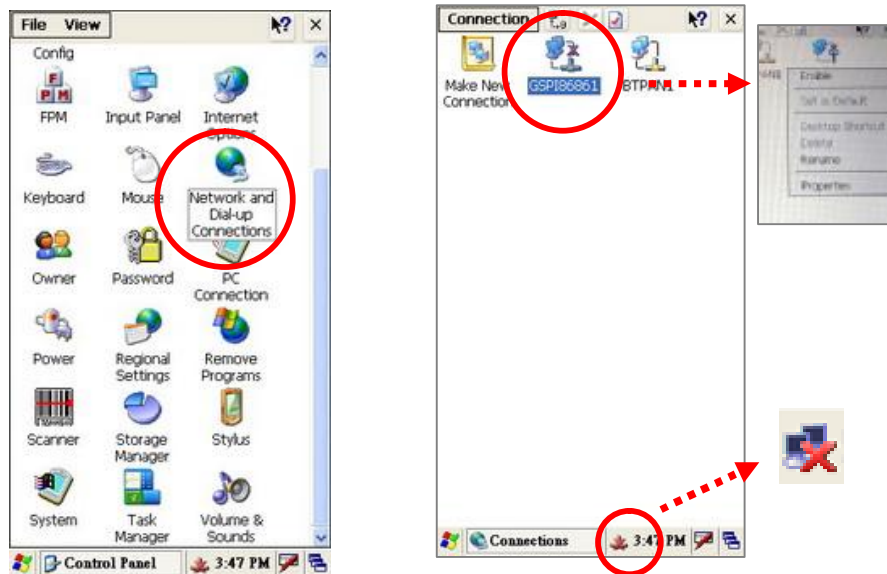
1. Enable the Wireless Connection by choosing as steps of "Start" > "Settings" > "Control Panel" > "Network and Dial-up Connections".

2. Right click on the "GPS186861" and tap the "Enable" icon in the drop down menu to access the wireless connection.

3. After enable the "GPSI86861", you will see the icon appears in the system tray.

Select a Network and get connection
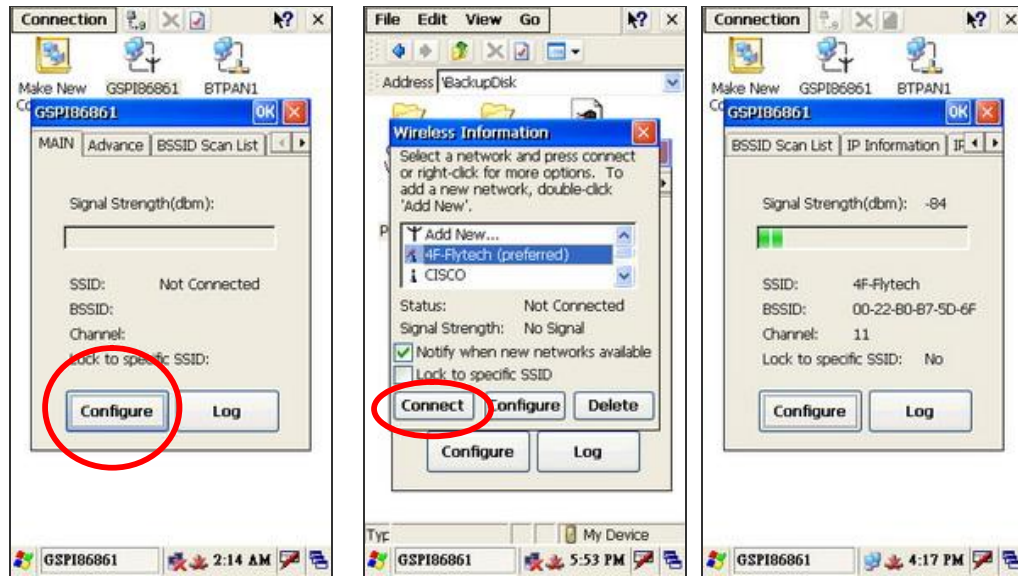
4. You will see the "GPSI86861" window pop up after you double click on the icon

5. Press "Main" tab and "Configure" button.

6. Select the network you want and put the key (password) if needed, then press "Connect" button to get connection.

> Ø **NOTE:** You can create a new network by selecting "Add New…" (please see Chapter 3-1-2)

7. After WiFi is successfully connected, the screen will pop up a message showing the status of the connecting condition and the icon in he system tray will turn to icon .

3-1-2 Adding a New Network

To add a new network connection, please enable the wireless connection first by following the steps in Chapter 3-1-1.
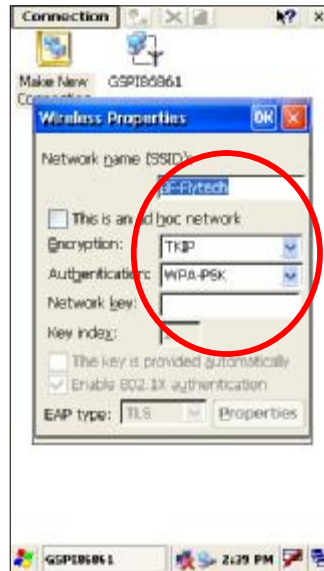
1. The "Wireless Properties" dialog box pop up after pressing "Add New…".

2. To put a network name you want in "Network name (SSID)" text box, select "Encryption" and "Authentication" and enter password in the "Network key" to access a new network point existing in you place.

3. Wireless successfully connected when Status showing "Connected to xxx".

3-1-3 Enhancing the WiFi Connection

If the status of WiFi Connection stays low, please follow the below steps:
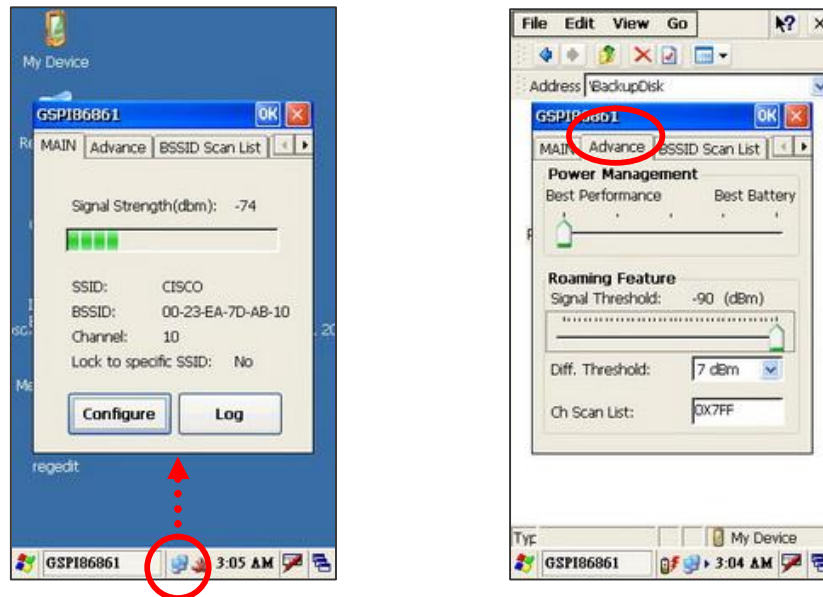
1. Please double-click on the icon 🌐 in the system tray. The "GSP186861" dialog will appear.

2. Please select "Advance" tab and move the "Power Management" to the "Best Performance level" and the "Roaming Feature" to the far right.

3. Press "OK" to save the settings.

3-1-4 SSID Lock Function
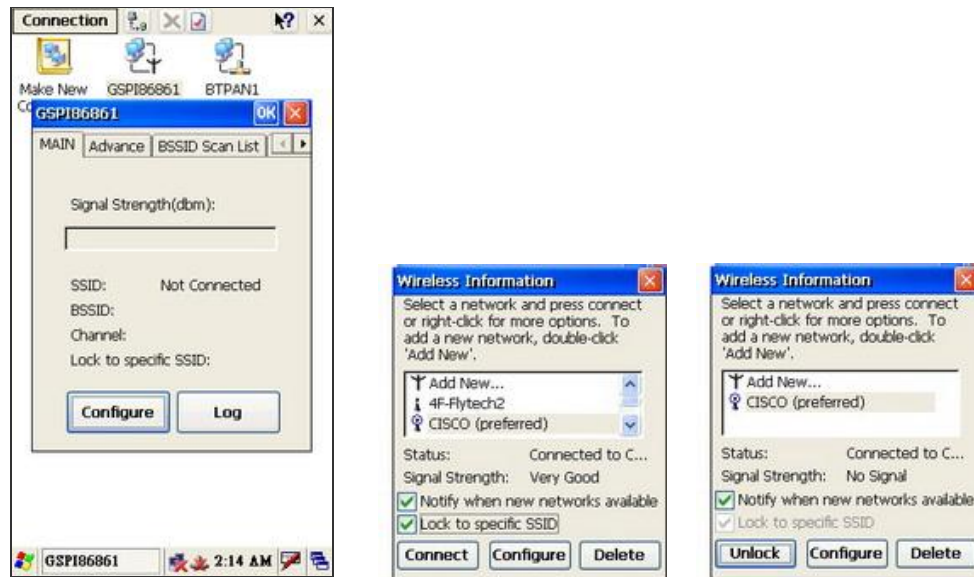
1. Enable Wireless Connection by following the steps in Chapter 3-1-1.

2. After enable the Wireless Connection, the icon ![icon] will appear in the system tray. Double click the icon ![icon] and press "configure" button on the "GPSI86861" window. "Windows Information" window will appear.

3. Select a network you want and click the "Lock to specific SSID" check box. Click "Connect" button to lock the SSID.

4. SSID is locked successfully by showing "Status" as" Connected to…." on the "Wireless Information" window.

3-2 Connecting to a Bluetooth Device

3-2-1 Turning on the Bluetooth Connection
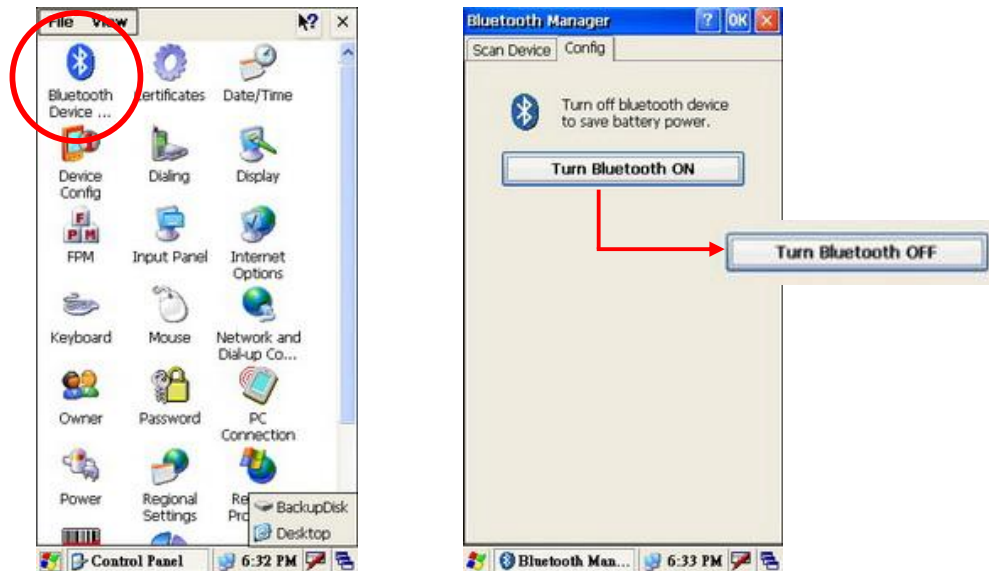
1. Enable the Bluetooth Connection by following the steps "Start" > "Settings" > "Control Panel" > "Bluetooth Device".

2. Select "Config" tab In the "Bluetooth Manager " dialog box.

3. Press "Turn Bluetooth ON" button to "Turn Bluetooth Off" to enable the Bluetooth connection.

3-2-2 Scanning Bluetooth Devices

We can scan the devices in a area and active their services in a "Bluetooth Manger" dialog by selecting "Start" > "Settings" > "Control Panel" > "Bluetooth Device".

1. To turn on the Bluetooth Connection. (Chapter 3-2-1)

2. Select "**Scan Device**" tab in the "Bluetooth Manager dialog box".

3. Press "**Scan Device**" button to scan the surrounding Bluetooth devices.

4. Select a Bluetooth device you want listing in the "Device menu" and press "Add Device" button.

> Ø **Note:** Please refer to the Chapter 4-1-10 for Programming Interface of Bluetooth.

3-2-3 Connecting to a Bluetooth Printer

Please perform the steps in the Chapter 3-2-1 to turn the Bluetooth on and the Chapter 3-2-2 to scan the surrounding Bluetooth device first.

Paring a Bluetooth Printer Device

In Bluetooth, you have the option to "pair" two devices. When you pair with a Bluetooth device, this device will be "remembered" that means you need not search for the device again when you want to use the device next time.
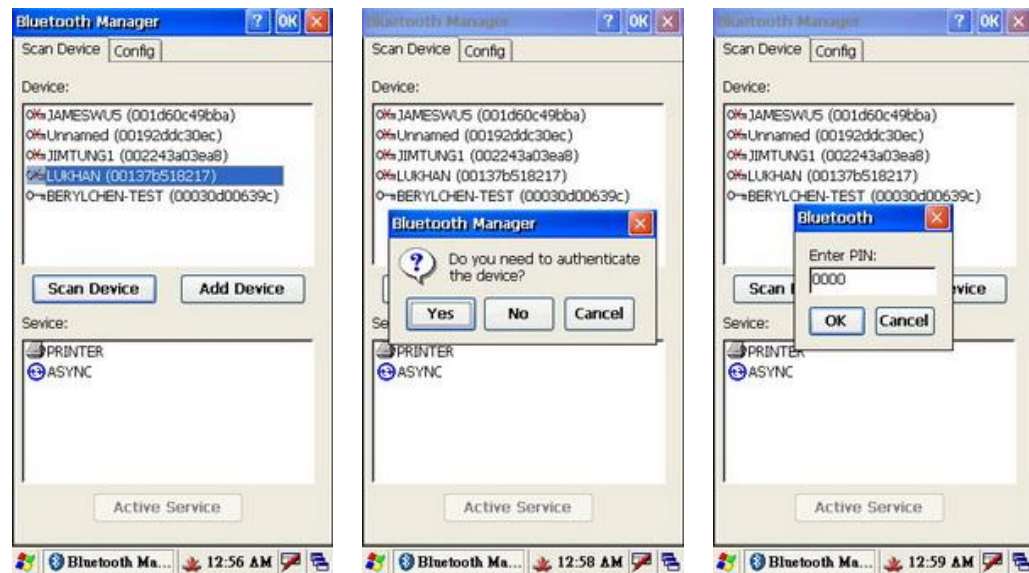
1. Select a Bluetooth printer device you want on the Device list after tapping on the "Scan Devices" button.

2. Press "Add Device" button. A "Bluetooth Manager" dialog box will pop up.

3. Press "Yes" button to authenticate (pair) the mobile system and the printer device.

4. A PIN code is request when paring to a printer device.

5. Enter the pin code to complete the authentication.

Active Printer Service
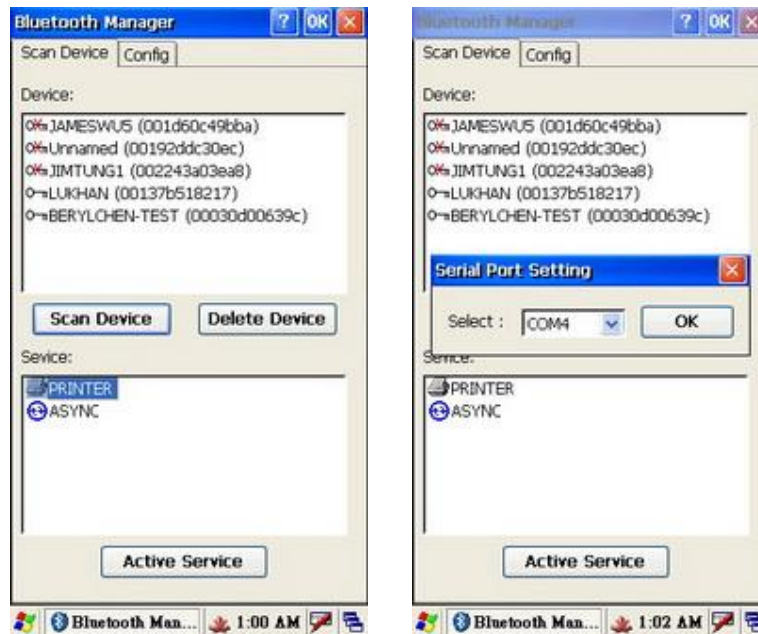
1. Tapping on the Bluetooth Printer device you want and choose a service on the "Service" menu. The current example is selecting "Printer" service.

2. Press "Active Service" button to active the Printer service. A "Serial Port Setting" dialog box will appear.

3. Choose the COM port options in the drop down list you want.

4. Press "OK".

3-2-4 To Synchronize with a PC via Bluetooth

Before Synchronize the Mobile System with a PC, please turn on the Bluetooth connection as described in the Chapter 3-2-1 and pair the PC and the Mobile System first as detailed in the below.

Pairing a Bluetooth enabled PC

When you pair with a Bluetooth device, this device will be "remembered" that means you need not search for the device again when you want to use the device next time.
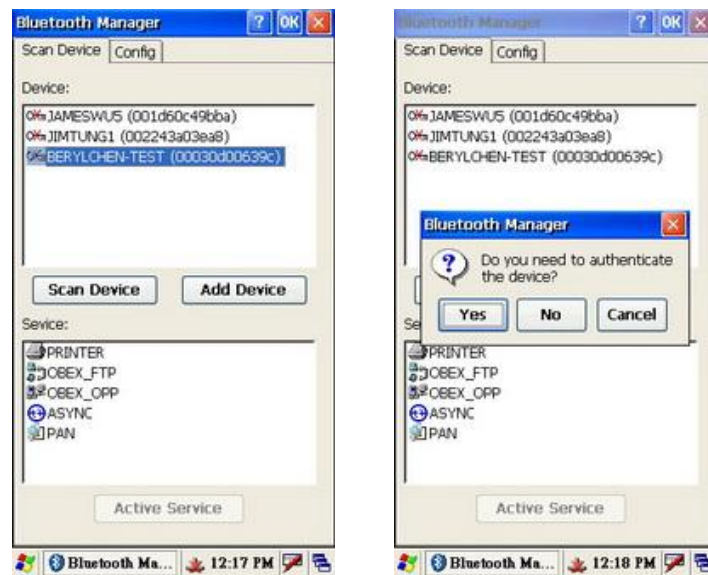
1. To turn on the Bluetooth Connection first, see Chapter 3-2-1.

2. Select a Bluetooth enabled PC device you want in the "Device" list.

3. Press "Add Device" button. A "Bluetooth Manager" dialog box will pop up.

4. Press "Yes" button to authenticate the Mobile System and the PC.
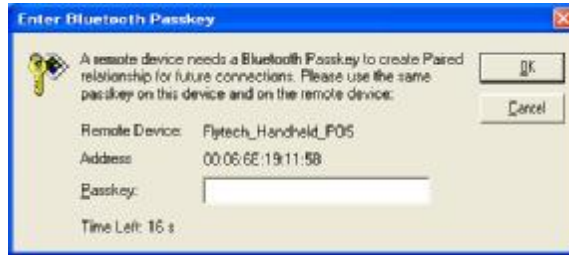
5. A PIN Entry request will pop up on the 2 Bluetooth connecting devices for paring.

> Ø **Note:** Here is an example screen captured from the IVT Bluetooth dongle and the pertaining AP installed on the PC.

6. Enter the same pin code on both sides.

7. Select service at "Service" menu you want. Here we choose "ASYNC" service.

8. Press "Active Service" button.

Installing the Microsoft ActiveSync

To synchronize the Mobile System with a PC, we need to install the Microsoft ActiveSync Program on the PC. Please refer the detail installation procedures to the Microsoft official website.

Check the Assigned Bluetooth Serial Com Port

Check to see what the Bluetooth serial port is assigned. The COM port is assigned according to the Bluetooth Device you use. It is only checked for the first time.

The following Bluetooth Settings window is captured by IVT Bluetooth dongle and the pertaining AP. The screen various according to the AP you install.

1. Open the Bluetooth AP and check the COM Port that is assigned.

2. Select the "View" > "Service" menu on the toolbar of IVT AP. We will see the assigned Serial Port. In this case, it is mapped to COM7 or COM8. We will need the assigned COM Port to set up for the Microsoft ActiveSync Program. The setting only happens in the first time.

Setup COM Port in the ActiveSync Program

The COM port is only setup for the first time.
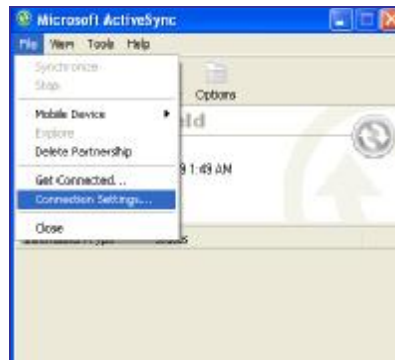
1. Open the Microsoft ActiveSync Program on your PC.

2. Choose "File" > "Connection Settings" menu on the toolbar. A "Connections Settings" dialog box will appear.

3. Enable the "Allow connections to one of the following" check box and select the COM Port options. In this case we choose COM 7.

4. Press "OK" button to save the connection settings.

Connecting the Mobile System to the Bluetooth enabled PC

1. Click "Start" > "Run" to run "repllog" in the text box.

2. Press "OK" button. A "Bluetooth Status" dialog box will pop up. Press

"Hide" to hide the message.

3. After running the "repllog", the Mobile System connects to the PC automatically and a "New Partnership" is requested to set up for the first time.

4. Press "Next" button.

5. A "Select Synchronization Settings" window will appear.

6. Press "Setting" for your own setting inquiry.

7. Press "Next" button to the "Setup Complete Window".

8. To press "Finish" button to complete the setup procedure.

Disconnecting the PC

1. Go to "Start" > "Settings" > "Control Panel" > "Bluetooth Device" on the Mobile System.

2. Press "Deactive Service" button to disable the service and disconnect the PC.

3-2-5 Bluetooth File Transfer (FTP)

To transfer files from a PC to the Mobile System, please turn on the Bluetooth connection and scanning the Bluetooth enabled PC
In this case, we use IVT Bluetooth Dongle and the pertaining AP as an example. The screen various according to the AP you install.
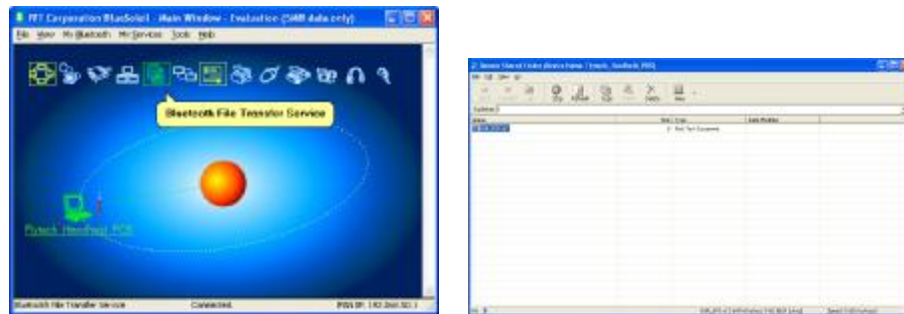
1. Enabling the Bluetooth connection, see the Chapter 3-2-1.

2. Scanning the destination PC, see the Chapter 3-2-2.

3. Press "Bluetooth File Transfer Service" on the IVT Bluetooth AP. A "Remote Shared Folder" window will appear.

4. Put files on it by performing copy-and-past.
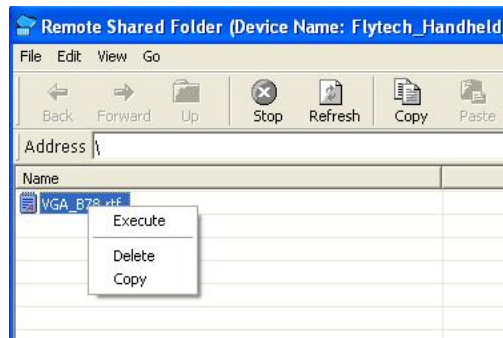
5. Right Click on the file and press "Execute" to transfer the file to your system.

Access the files on the Mobile System
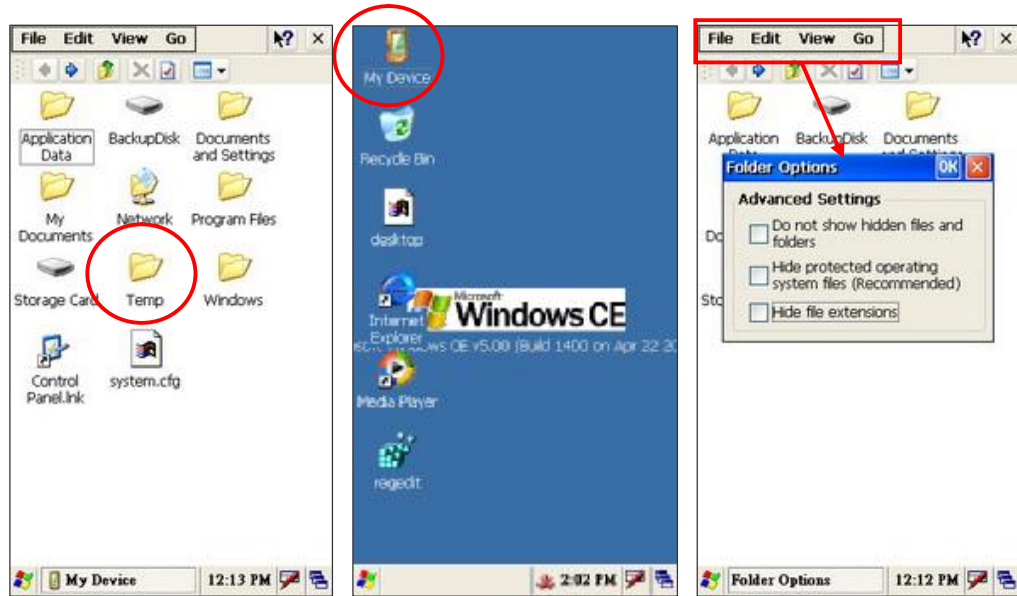
1. To Select "My Device" icon on Today Screen.

2. Click "View" > "Options" on the toolbar.

3. To disable the 3 check boxes on the "Folder Options" dialog box.

4. You will see the "Temp" folder appears on the "My Device" Window.
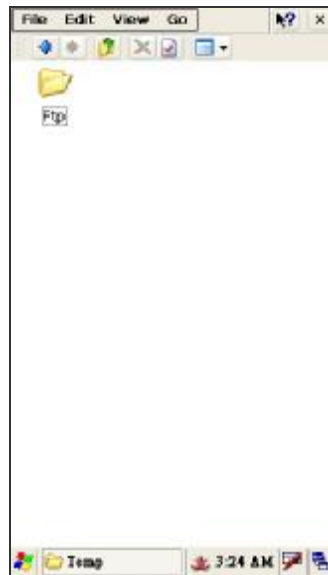
5. If the files transferring is successful. It will create a "FTP" folder in the Temp Folder automatically. All the transferring files are put in the folder.

3-3 Backup and Restoring the System

Go to "**Start**" > "**Control Panel**" > "**Device Config**".

3-3-1 Backup the System

To restore the system, please follow Chapter 3-3 then the below steps.
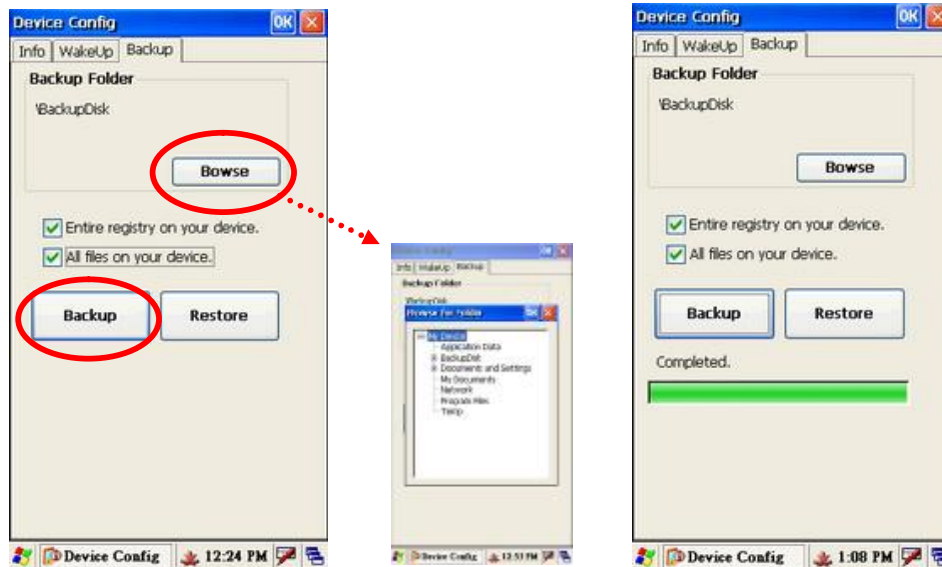
1. Select "Backup" tab then enable the "Entire the registry on your device" and the "All your files on your device" check boxes.

2. Press "Browse" button if you want to specify the location Backup Files to be saved to.

3. Press "Backup" button to start backup the system.

3-3-2 Restoring the System

To restore the system, please follow Chapter 3-3 then the below steps.
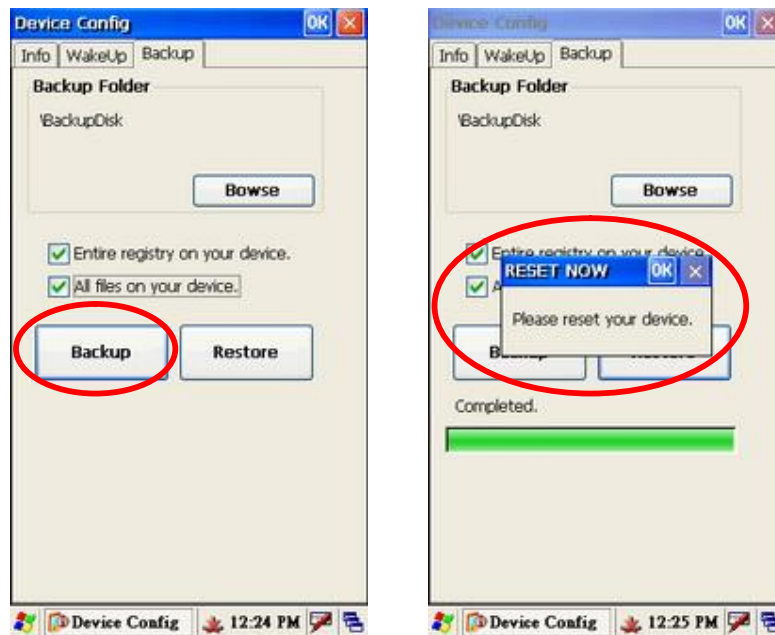
1. Press "Restore".

2. Press "OK" of "RESET NOW" dialog to finish the Restore.

> Ø **Note:** System Restore means to restore the system to the latest "Backup" version.

3-4 Switching the Admin / User mode
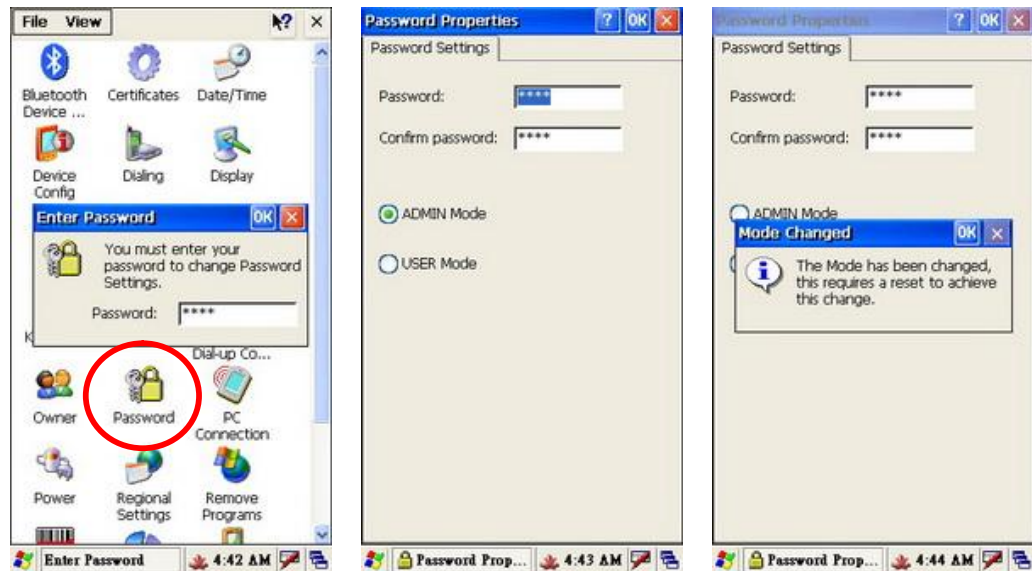
1. Please follow below steps to access the Mode Change screen. "Start Menu" > "Settings" > "Control Panel" > "Password" > Enter Password (default is 1111)

2. The "Password Properties" dialog will popup after entering the password (default), select the Mode you want. Press "OK" to save the setting.

3. If the mode being switched, the "Mode Changed" dialog will popup. Press "OK" to restart the system.

3-5 Power Management Settings

3-5-1 CPU Power Mode Settings
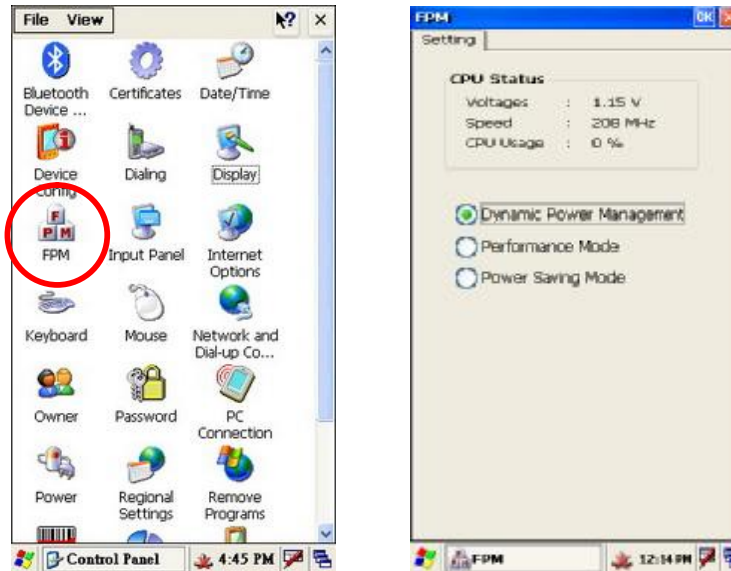
1. Select "Start" > " Control Panel" > " FPM" button

2. Select the mode you want on the "FPM" window.

> Ø **Note:** The CPU Power Consumption is ranked as:
> " Performance Mode" **>** " Dynamic Power Management" **>** "
> Power Saving Mode".

3-5-2 System Configuring Power Mode Settings
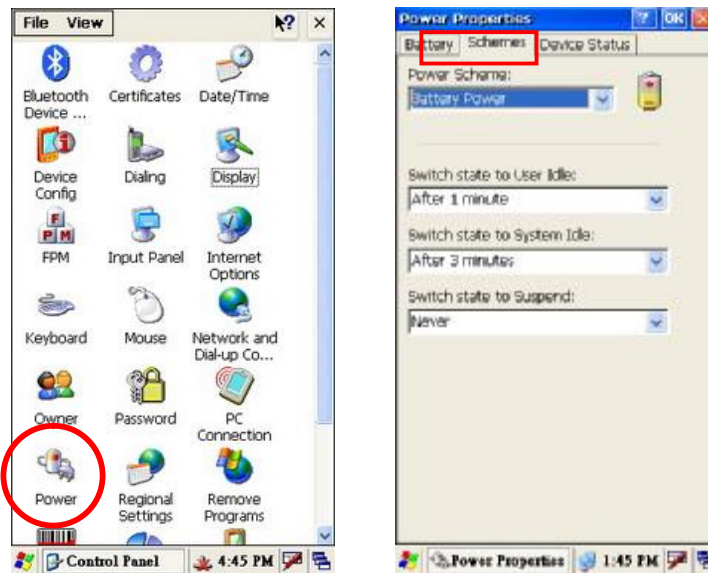
1. Click "Start" > " Control Panel" > " Power" button

2. Select "Schemes" tab.

3. Set up the power mode as "Battery Power" or "AC Power" in the "Power Scheme" drop down menu.

4. To set up the times you want on each option for turning the Mobile System off or going to standby mode after a period of inactivity.
   a. Switch state to User Idle.
   b. Switch state to System Idle.
   c. Switch state to suspend.

5. Press "OK" to save the settings.

3-5-3 Display Backlight Settings
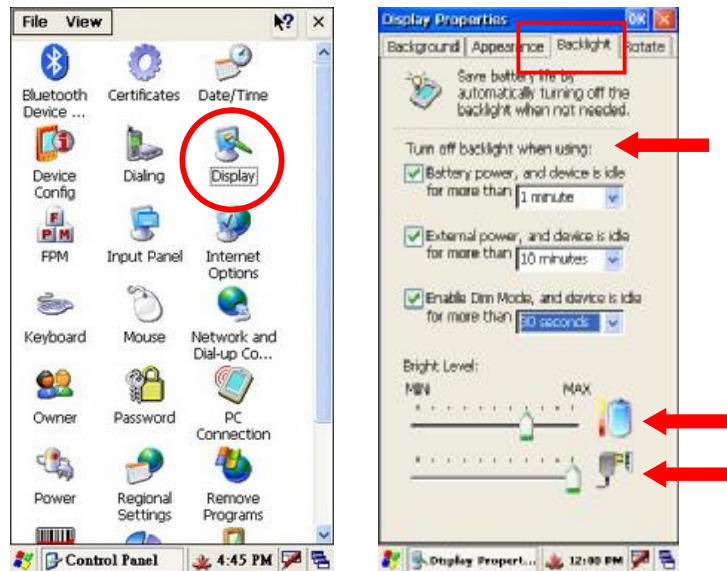
1. Go to "Start" > "Control Panel".

2. Double click on the "Display" icon.

3. In the "Display Properties" window, select "Backlight" tab.

4. You can enable the backlight savings by checking and setting turn-off time in the checkboxes of "Battery power…", "External power…" and "Enable Dim Mode…"

5. To drag the "Bright Level" slider on "MIN – MAX" scale for "Battery Power" and "External (AC) power".

6. Press "OK" button to save the settings.

> Ø **Note:** If you enable the "Dim Mode", the system runs "Dim Mode" prior to "Battery power" and "External power".

3-5-4 WiFi Power Mode Settings
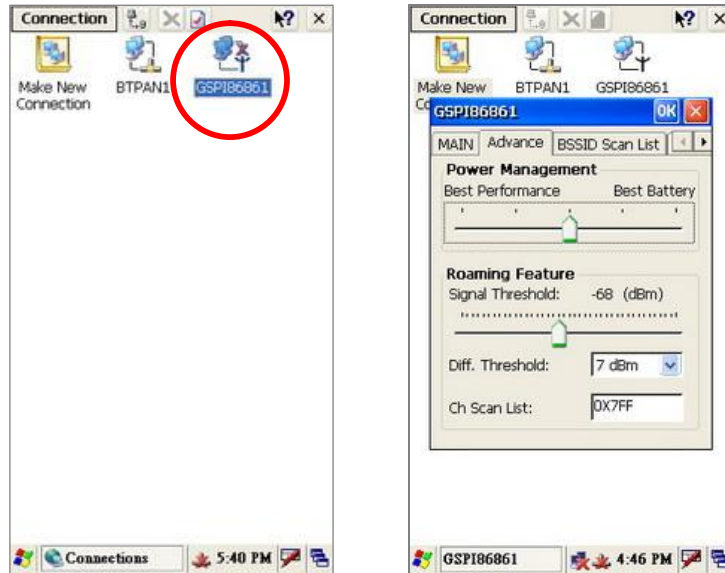
1. To tap "Start" > "Control Panel" > "Network and Dial-up Connections" button.

2. Hold to press "GSPI86861" button until the drop down menu appears.

3. Press "Enable" in the drop down menu to active the WiFi Connection.

4. After step "c", the "GSPI86861" setup window as above right figure will pop up.

5. To tap the "Advance" tab.

6. To set up the "Power Management" by dragging the slider on the "Best Performance – Best Battery" scale.

> Ø **Note:** To conserve more battery power, drag the slider toward the "Best Battery" which also reduces the WiFi signal performance.
> To improve signal performance, drag the slider toward the "Best Performance" which also consumes more power and shorten the battery life.

3-6 LED Indicator Description

The LED indicator is located in the front of the Mobile System which indicates the status of Power on/off, the Main Battery and WiFi Link. The Description as follows:

Green color LED:

Battery power charging state(S/W)

LED ON: Battery power charging finished (100%)

Orange color LED:

Battery power charging state(S/W)

LED ON: Battery power charging

Blue color LED:

Link status of WiFi manager (H/W)

LED ON: WiFi link active

Red color LED:

Battery power state(S/W)

LED Flash: Battery low
LED ON: Critical battery low

3-7 Resetting the Mobile System

The mobile system provides functions of "Reset to the factory default settings" and "cold boot". The detail procedures as bellows:

3-7-1 Reset to the Factory Default Settings

1. Use a tool to gently press the "Reset Hole" on the rear of the Mobile System while keep holding down the "Power Button" throughout until the system vibration occurs.

2. Release the "Reset Hole" and press the "Power Button" the second time after the system vibration occurs.

3. The calibration instruction window will pop up to lead you to the "Reset to the factory default settings".
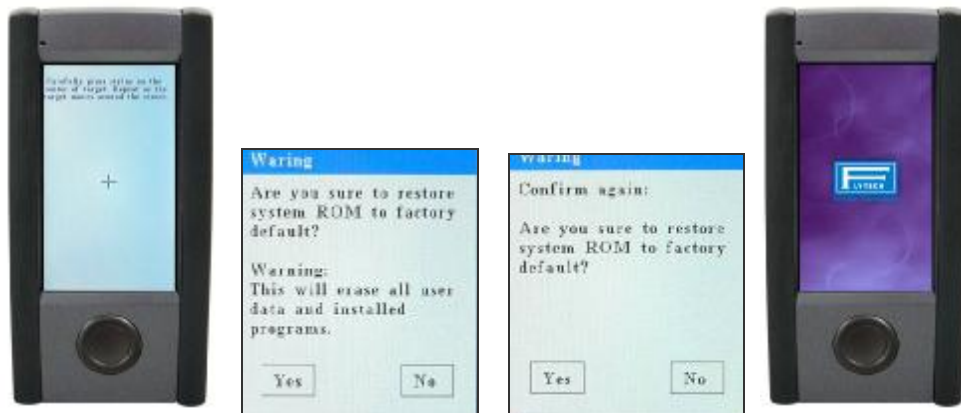
4. Completing the "Calibration window" instructions.

5. Press "Yes" to accept the "reset".

6. Click "Yes" to confirm again.

7. System rest window appears as above far right picture.

3-7-2 Cold Boot

1. Use a tool to gently press the "Reset Hole" on the rear of the Mobile System while keep holding the "Power Button" throughout.

2. Release the press of "Reset Hole" and the "Power Button" at the same time after system vibration occurs.

3. System reboot to Today Screen as above picture shows.

> Ø **Note:** Today Screen slightly varies according to the OS version installed.

4   Application Programming Interface

4-1   Windows Embedded CE 5.0 Standard

Interface Introduction

Most of software programming interfaces of each device are following
WindowCE standard architecture to be designed.

- **Core OS Service**

  (Uhttp://msdn.microsoft.com/en-us/library/aa450512.aspxU)

- **Kernel**

  (HUhttp://msdn.microsoft.com/en-us/library/aa450998.aspxUH)

Programming interface of RAM file system

- **File system and storage management**

  (HUhttp://msdn.microsoft.com/en-us/library/ms892386.aspxUH)

Programming interface of Persistent storage

- **Folder name: "Backup"**
- **Block Drivers**

  (http://msdn.microsoft.com/en-us/library/ms923712.aspx)

- **File system and storage management**

  (http://msdn.microsoft.com/en-us/library/ms892386.aspx)

Programming interface of Secure Digital Card

- **Folder name: "Storage Card"**
- **Secure Digital Card Drivers**

  (http://msdn.microsoft.com/en-us/library/ms923739.aspx)

- **Block Drivers**

  (http://msdn.microsoft.com/en-us/library/ms923712.aspx)

- **File system and storage management**

  (http://msdn.microsoft.com/en-us/library/ms892386.aspx)

Programming interface of Audio

- **Audio**

  (http://msdn.microsoft.com/en-us/library/ms890653.aspx **)**
- **Audio Drivers**

  (http://msdn.microsoft.com/en-us/library/aa910103.aspx **)**

Programming interface of Display(LCD)

- **Shell and User Interface**

  (http://msdn.microsoft.com/en-us/library/aa453940.aspx **)**
- **Graphic**

  (http://msdn.microsoft.com/en-us/library/ms923392.aspx **)**
- **Display Drivers**

  (http://msdn.microsoft.com/en-us/library/aa447505.aspx **)**

Programming interface of USB Host

- **USB Host Drivers**

  (http://msdn.microsoft.com/en-us/library/ms923751.aspx **)**
- **Shell, GWES, and User Interface**

  (http://msdn.microsoft.com/en-us/library/aa932172.aspx **)**

Programming interface of MSR Reader

Programming interface of USB Slave

- **USB Function Drivers**

  (http://msdn.microsoft.com/en-us/library/aa931533.aspx **)**
- **USB Serial Host Driver   (Activesync)**

  (http://msdn.microsoft.com/en-us/library/aa932783.aspx **)**
- **File system and storage management (Card Reader)**

  (http://msdn.microsoft.com/en-us/library/aa914412.aspx **)**

Programming interface of Bluetooth

- **Bluetooth HCI Transport Driver**

  (http://msdn.microsoft.com/en-us/library/aa924569.aspx **)**
- **Networking - Core**

(http://msdn.microsoft.com/en-us/library/aa917156.aspx **)**

- **Networking - Remote**

    (http://msdn.microsoft.com/en-us/library/aa920180.aspx **)**
- **Networking – Wireless (Bluetooth)**

    (http://msdn.microsoft.com/en-us/library/aa917877.aspx **)**

Programming interface of Wireless

- **Network Driver**

    (http://msdn.microsoft.com/en-us/library/aa919639.aspx **)**
- **Networking - Core**

    (http://msdn.microsoft.com/en-us/library/aa917156.aspx **)**
- **Networking - Remote**

    (http://msdn.microsoft.com/en-us/library/aa920180.aspx **)**
- **Networking – Wireless (Wi-Fi)**

    (http://msdn.microsoft.com/en-us/library/aa916578.aspx **)**

Programming interface of Touch

- **Touch Screen Drivers**

    (http://msdn.microsoft.com/en-us/library/aa925927.aspx **)**
- **Shell, GWES, and User Interface**

    (http://msdn.microsoft.com/en-us/library/aa932172.aspx **)**

Programming interface of Button

- **Keyboard Drivers**

    (http://msdn.microsoft.com/en-us/library/aa932012.aspx **)**
- **Shell, GWES, and User Interface**

    (http://msdn.microsoft.com/en-us/library/aa932172.aspx **)**

Programming interface of Vibrator

- **Notification LED Drivers**

    (http://msdn.microsoft.com/en-us/library/aa925927.aspx **)**
- **Shell, GWES, and User Interface**

    (http://msdn.microsoft.com/en-us/library/aa932172.aspx **)**

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Programming interface of System Power

- **Battery Drivers (Battery)**
  (http://msdn.microsoft.com/en-us/library/aa932396.aspx **)**
- **Power Management (Power status – battery/DC)**
  (HUhttp://msdn.microsoft.com/en-us/library/aa923906.aspxUH)

Programming interface of Power Management

- **Power Management**
  (http://msdn.microsoft.com/en-us/library/aa923906.aspx **)**

4-2 Non WindowsCE Standard

4-2-1 Admin/User Mode Application

Architecture Introduction:

System provides three pair of directories to map the working folder of each operating mode.

Working folders name of Admin mode

/Windows/Desktop

File folder for saving the shortcut of application program in the Desktop.

/Windows/Programs

File folder for saving the shortcut of application program in the Programs tab at start menu.

/Windows/StartUp

File folder for saving the shortcut of application program in the StartUp folder where to be used to auto-run the programs during OS booting phase .

Working folders name of User mode

/Windows/Desktop_

File folder for saving the shortcut of application program in the Desktop.

/Windows/Programs_

File folder for saving the shortcut of application program in the Programs tab at start menu.

/Windows/StartUp_

File folder for saving the shortcut of application program in the StartUp folder where to be used to auto-run the programs during OS booting phase.
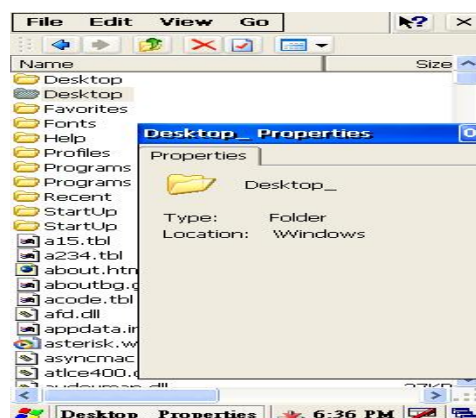
Switching between Admin mode and User mode

There is a control box in control panel applet, named - "Password", The Manufacturer redefine the password policy of WindowCE standard. The password control box should input the password in advance to enter the page for finding the selection items of changing the operating mode and/or reset the default password. The default password is "1111".

Step:

1. Find Password control box from control panel applet.
2. Enter password: "1111" (Default)
3. Select User mode or Admin mode.
4. Type the "OK" button of password properties control box.
5. Type the "OK" button of "Mode Chang" dialog for double confirmation.
6. System would reboot automatically to the selected mode.

How to use this feature?

System Integrator only has to copy the desired files to the working folders of each mode.

It is impossible to change the operation mode by reset system to factory default.

In case user forgets the password. The only way to achieve the password is to run the Manufacturer maintenance application by copying the application to SD card and cold reset the device.

Step:

1. Copy the desired files to the working folder of the operation mode
2. Follow Section "Switch the operation mode between Admin mode and User mode" to switch operation mode.

4-2-2 Overwrite Factory Default

Architecture Introduction:

The Manufacturer provides a mechanism to merge the OEM application and OEM specific settings into WindowCE operating system during booting phase. This feature can make OEM stuffs as system default components. There are many benefits for device maintenance.

It is a valuable feature for OEM doesn't have to reinstall OEM programs after end user reset the device to factory default mode. This benefit also helps to reduce the RMA cost from OEM vender.

Because of this system architecture, WindowCE operating system and OEM application programs are not merged together. So both parts can be upgraded separately.

Architecture of the OEM Device Manager

System Integrator should base on the directory structure of WindowCE to prepare the OEM installation files in SD card. All files in "GHARST" file directory would be copy into WindowCE file system during cold booting phase. By the way, the config files in "configfiles" directory are for system registry maintenance.

GHARST

Configfiles	**Oem.cfg**
	System.cfg
Windows	
Program Files	
My Documents	
Documents and Settings	
Temp	
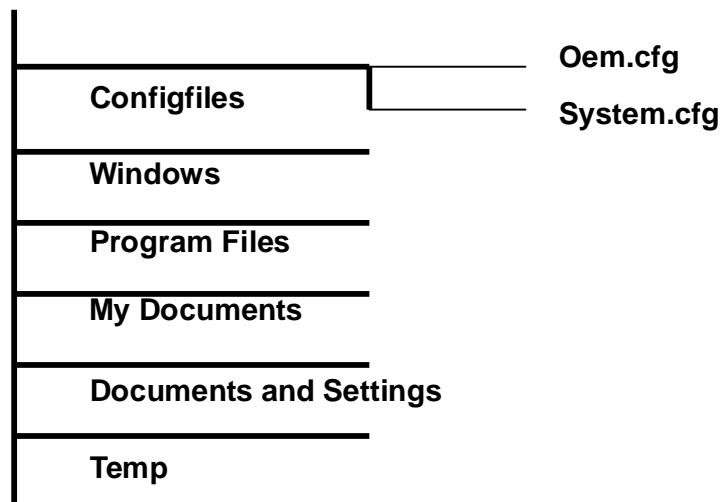
Merge an application program into default operating system by using the OEM Device Manager

u   **Example:**

- **For Auto-running the OEM application at booting phase of user mode when after reset to factory default.**

1. Create a file directory "GHARST" in root folder of SD card.
2. Change into "GHART" folder to create directory "Windows".
3. Change into "Windows" folder to create directory "StartUp_".
4. Copy the OEM application file into "Windows->StartUp_" folder.
   [Second way is: copy OEM application file into "Windows" folder, creates a lnk file of OEM application and copy it into "Windows->StartUp_" folder.
5. Put SD card into the SD socket on B21 device.
6. Use OEM Device Manager to merge all files in "GHARST" folder in SD card into device. After the file integration process, all OEM specify files will be the system default components of B21 device.

- **Place the OEM application at "Programs" folder in Windows Start menu - System running in user mode.**

1. Create a file directory "GHARST" in root folder of SD card.
2. Change into "GHART" folder to create directory "Windows".
3. Change into "Windows" folder to create directory "Programs_".
4. Copy the OEM application file into "Windows->Programs_" folder.
   [Second way is: copy OEM application file into "Windows" folder, creates a lnk file of OEM application and copy it into "Windows->Programs_" folder]
5. Put SD card into the SD socket on B21 device.
6. Use OEM Device Manager to merge all files in "GHARST" folder in SD card into device. After the file integration process, all OEM specify files will be the system default components of B21 device.

How to overwrite the factory default settings by using the OEM Device Manager

Two config files are used to modify the registry settings of factory default mode. System Integrator is easy to add and/or modify the registry key without upgraded the image of WindowsCE operating system. The way to remove the registry key is to put empty to the key value in the config file.
System.cfg – Using for early registry initialization stage at booting phase.

Oem.cfg – Using for system registry initialization stage at booting phase.

u **Example:**
- **Overwrite the factory default backlight level setting.**
1. Create a file directory "GHARST" in root folder of SD card.
2. Change into "GHART" folder to create directory "configfiles".
3. Prepare the oem.cfg config file by text editor.
   Input following setting:

   [HKEY_CURRENT_USER\ControlPanel\BackLight]
   "BatteryBacklightLevel"=dword:7
   "ACBacklightLevel"=dword:A

4. Copy oem.cfg file into "configfiles" folder.
5. Put SD card into the SD socket on B21 device.
6. Use OEM Device Manager to merge all files in "GHARST" folder in SD card into device. After the integration process, all OEM desired settings will be the system default settings of B21 device.

- **Overwrite the default WiFi state to power on mode. (Default is power down)**
1. Create a file directory "GHARST" in root folder of SD card.
2. Change into "GHART" folder to create directory "configfiles".
3. Prepare the system.cfg config file by text editor.
   Input following setting:
   [HKEY_LOCAL_MACHINE\Comm\NdisPower]
   "GSPI86861"=dword:0   ;0(D0), 1(D1), 2(D2), 3(D3), 4(D4)-Default
4. Copy system.cfg file into "configfiles" folder.
5. Put SD card into the SD socket on B21 device.
6. Use OEM Device Manager to merge all files in "GHARST" folder in SD card into device. After the integration process, all OEM desired settings will be the system default settings of B21 device.

- **Remove a registry key from the registry in factory default settings**
Only have to put the key equal to empty. factory manager will remove the specify key from default system registry setting.
Example:
   [HKEY_LOCAL_MACHINE**RegistryKey**]
       "ValueName"=

Overwrite Factory Default Registry Settings for OEM Customization (oem.cfg)

<1> Bluetooth operating mode

[HKEY_LOCAL_MACHINE\System\State\Hardware\Bluetooth]

"BluetoothOn"=dword:1   ; 1-> BT on, 0->BT off

"BluetoothWakeUpEnable"=dword:0   ;1-> Enable, 0-> Disable

<2> WiFi operating mode

[HKEY_LOCAL_MACHINE\Comm\NdisPower]

"GSPI86861"=dword:4   ; 0-> WiFi on, 4->WiFi off

[HKEY_LOCAL_MACHINE\Comm\GSPI86861\Parms]

"PowerMode" = dword:1   ; 0: Performance mode, 1: PS mode

"MultipleDTim"=dowrd:2   ; PS mode (0,1,2,3,4 –most power saving)

<3> Screen rotation feature

[HKEY_LOCAL_MACHINE\System\GDI\Rotation]

"Angle"=dword:1 ;(Decimal 0->0 degree, 90->90 degree, 180->180 degree, 270->270 degree)   // Manual rotate mode

"AutoRotate"=dword:F   // Auto Rotate control

; bit 15   = 0 (Manual rotate)   = 1 (Auto Rotate)

; bit 0   = 0 (180 degree ignored)   = 1 (180 degree accepted)

; bit 1   = 0 (90 degree ignored)   = 1 (90 degree accepted)

; bit 2   = 0 (0 degree ignored)   = 1 (0 degree accepted)

; bit 3   = 0 (270 degree ignored)   = 1 (270 degree accepted)

<4> Backlight control

[HKEY_CURRENT_USER\ControlPanel\BackLight]

"BatteryBacklightLevel"=dword:7   // Backlight level of battery only

"ACBacklightLevel"=dword:A   // Backlight level of AC IN mode

"BatteryTimeout"=dword:3c   // Backlight timeout value of battery only mode

"ACTimeout"=dword:258   // Backlight timeout value of AC IN mode

"DimTimeOut"=dword:1E   // Backlight DIM mode timeout

"UseBattery"=dword:0   // Battery only mode timeout Enable/Disable

"UseExt"=dword:0   // AC IN mode timeout Enable/Disable

"UseDim"=dword:0   // Backlight DIM mode

Enable/Disable

<5> Keypad control
 [HKEY_LOCAL_MACHINE\Drivers\BuiltIn\KEYPAD]
    "KeyPadSet0"=dword:27280000
    "KeyPadSet1"=dword:25260000

<6> CPU operating frequency control
 Option1: Dynamic Mode
 [HKEY_LOCAL_MACHINE\Drivers\BuiltIn\IPM]
     "ProfileType"=dword:0

Option2: Performance Mode
 [HKEY_LOCAL_MACHINE\Drivers\BuiltIn\IPM]
     "ProfileType"=dword:1
"Speed"=dword:0

Option3: Power Saving Mode
 [HKEY_LOCAL_MACHINE\Drivers\BuiltIn\IPM]
     "ProfileType"=dword:1
"Speed"=dword:4

Application program of the OEM Device Manager

Snapshoot of OEM Device Manager

System Layer   : "system.cfg" file update
OEM Layer   : "oem.cfg" file update

Press "OK" button to merge the GHARST directory and specified layer config files into OS image

Overwrite display backlight settings

Once the backlight is enabled, you can set separately both battery backlight setting and backlight setting of AC power. System Integrator can use Control Panel to change the setting values or modify the following registry keys to change settings. Note that the units for the timeout values are in seconds

Registry Key:
[HKEY_CURRENT_USER\ControlPanel\Backlight]

Modify display backlight settings for AC power
Values:
- UseExt : 1 (Enable/default) / 0 (Disable)
- ACTimeout : 15/30/60/120/300/600(default)/900/1800
- ACBacklightLevel : 0/1/2/3/4/5/6/7/8/9/10(default)

Modify display backlight settings for battery power
Values:
- UseBattery : 1 (Enable/default) / 0 (Disable)
- BatteryTimeout : 15/30/60(default)/120/300
- BatteryBacklightLevel : 0/1/2/3/4/5/6/7(default)/8/9/10

Modify display backlight settings for DIM mode
Values:
- UseDim : 1 (Enable/default) / 0 (Disable)
- DimTimeout : 15/30(default)/60/120/300

Example Code (Update backlight level)
```
void UpdateRegistry(DWORD dwVal)
{
    TCHAR szRegClass[] = TEXT("DWORD");
    HKEY hRegBacklight;
    DWORD dwDisposition;
    if(ERROR_SUCCESS == RegCreateKeyEx(HKEY_CURRENT_USER,
L"ControlPanel\\Backlight", 0, szRegClass, REG_OPTION_NON_VOLATILE,
0, NULL, &hRegBacklight, &dwDisposition))
    {
        LONG      lResult;
        DWORD    dwType = REG_DWORD;
        DWORD    dwLen = sizeof(DWORD);
```

```
        // Battery Level
        lResult = RegSetValueEx(hRegBacklight, L"BatteryBacklightLevel",
0, dwType, (LPBYTE)&dwVal, dwLen);


        // AC Level
        lResult = RegSetValueEx(hRegBacklight, L"AcBacklightLevel", 0,
dwType, (LPBYTE)&dwVal, dwLen);
    }
    RegCloseKey(hRegBacklight);
}
```

4-2-3 Programmable button feature

Five buttons designed on front bottom of B21 device. Keypad driver will report the Windows virtual key code what described in a registry key to system when button to be pressed. System Integrator can modify the registry key value of each button separately. The modification will work on next button pressed instantly.

- One key with combination function: combined Power button and "Enter" button functions into one button.
  This button is a fix function button, no available API for function modification.

- 4 programmable buttons: defined to be 4 way navigation keys by system default mode. All buttons can be re-programmed to one of the number of Windows keyboard virtual key code to redefine the button function by registry modification.

Registry key definition

Registry Key:

[HKEY_LOCAL_MACHINE\Drivers\BuildIn\KEYPAD]

Value Name	DWORD (HEX)			
KeyPadSet0	27 (Right)	28(Down)	00	00
KeyPadSet1	25 (Left)	26 (Up)	00	00

Windows virtual key code

Virtual key codes

Symbolic constant	Hexadecimal value	Mouse or keyboard equivalent
VK_LBUTTON	01H	Left mouse button
VK_RBUTTON	02H	Right mouse button
VK_CANCEL	03H	Control-break processing
VK_MBUTTON	04H	Middle mouse button on a three-button mouse
	05H-07H	Undefined

VK_BACK	08H	BACKSPACE key
VK_TAB	09H	TAB key
	0AH-0BH	Undefined
VK_CLEAR	0CH	CLEAR key
VK_RETURN	0DH	ENTER key
	0EH-0FH	Undefined
VK_SHIFT	10H	SHIFT key
VK_CONTROL	11H	CTRL key
VK_MENU	12H	ALT key
VK_PAUSE	13H	PAUSE key
VK_CAPITAL	14H	CAPS LOCK key
	15H-19H	Reserved for Kanji systems
	1AH	Undefined
VK_ESCAPE	1BH	ESC key
	1CH-1FH	Reserved for Kanji systems
VK_SPACE	20H	SPACEBAR
VK_PRIOR	21H	PAGE UP key
VK_NEXT	22H	PAGE DOWN key
VK_END	23H	END key
VK_HOME	24H	HOME key
VK_LEFT	25H	LEFT ARROW key
VK_UP	26H	UP ARROW key
VK_RIGHT	27H	RIGHT ARROW key
VK_DOWN	28H	DOWN ARROW key

VK_SELECT	29H	SELECT key
	2AH	Specific to original equipment manufacturer
VK_EXECUTE	2BH	EXECUTE key
VK_SNAPSHOT	2CH	PRINT SCREEN key
VK_INSERT	2DH	INS key
VK_DELETE	2EH	DEL key
VK_HELP	2FH	HELP key
	3AH-40H	Undefined
VK_LWIN	5BH	Left Windows key on a Microsoft Natural Keyboard
VK_RWIN	5CH	Right Windows key on a Microsoft Natural Keyboard
VK_APPS	5DH	Applications key on a Microsoft Natural Keyboard
	5EH-5FH	Undefined
VK_NUMPAD0	60H	Numeric keypad 0 key
VK_NUMPAD1	61H	Numeric keypad 1 key
VK_NUMPAD2	62H	Numeric keypad 2 key
VK_NUMPAD3	63H	Numeric keypad 3 key
VK_NUMPAD4	64H	Numeric keypad 4 key
VK_NUMPAD5	65H	Numeric keypad 5 key
VK_NUMPAD6	66H	Numeric keypad 6 key
VK_NUMPAD7	67H	Numeric keypad 7 key
VK_NUMPAD8	68H	Numeric keypad 8 key
VK_NUMPAD9	69H	Numeric keypad 9 key

VK_MULTIPLY	6AH	Multiply key
VK_ADD	6BH	Add key
VK_SEPARATOR	6CH	Separator key
VK_SUBTRACT	6DH	Subtract key
VK_DECIMAL	6EH	Decimal key
VK_DIVIDE	6FH	Divide key
VK_F1	70H	F1 key
VK_F2	71H	F2 key
VK_F3	72H	F3 key
VK_F4	73H	F4 key
VK_F5	74H	F5 key
VK_F6	75H	F6 key
VK_F7	76H	F7 key
VK_F8	77H	F8 key
VK_F9	78H	F9 key
VK_F10	79H	F10 key
VK_F11	7AH	F11 key
VK_F12	7BH	F12 key
VK_F13	7CH	F13 key
VK_F14	7DH	F14 key
VK_F15	7EH	F15 key
VK_F16	7FH	F16 key
VK_F17	80H	F17 key
VK_F18	81H	F18 key

VK_F19	82H	F19 key
VK_F20	83H	F20 key
VK_F21	84H	F21 key
VK_F22	85H	F22 key (PPC only) Key used to lock device.
VK_F23	86H	F23 key
VK_F24	87H	F24 key
	88H-8FH	Unassigned
VK_NUMLOCK	90H	NUM LOCK key
VK_SCROLL	91H	SCROLL LOCK key
VK_LSHIFT	A0H	Left SHIFT
VK_RSHIFT	A1H	Right SHIFT
VK_LCONTROL	A2H	Left CTRL
VK_RCONTROL	A3H	Right CTRL
VK_LMENU	A4H	Left ALT
VK_RMENU	A5H	Right ALT
	BA-C0	Specific to original equipment manufacturer; reserved. See following tables.
	C1-DA	Unassigned
	DB-E2	Specific to original equipment manufacturer; reserved. See following tables.
	E3 – E4	Specific to original equipment manufacturer
	E5	Unassigned
	E6	Specific to original equipment

		manufacturer
VK_PACKET	E7	Used to pass Unicode characters as if they were keystrokes. If VK_PACKET is used with SendInput, then the Unicode character to be delivered should be placed into the lower 16 bits of the scan code. If a keyboard message is removed from the message queue and the virtual key is VK_PACKET, then the Unicode character will be the upper 16 bits of the lparam.
	E8	Unassigned
	E9-F5	Specific to original equipment manufacturer
VK_ATTN	F6	ATTN key
VK_CRSEL	F7	CRSEL key
VK_EXSEL	F8	EXSEL key
VK_EREOF	F9	Erase EOF key
VK_PLAY	FA	PLAY key
VK_ZOOM	FB	ZOOM key
VK_NONAME	FC	Reserved for future use
VK_PA1	FD	PA1 key
VK_OEM_CLEAR	FE	CLEAR key
VK_KEYLOCK	F22	Key used to lock device

Example code

```
void ModifyKeyCode(DWORD data)
{      //modify the virtual key code of up button
HKEY     hKeyPad = NULL;
TCHAR    RegStr[14],
   if (ERROR_SUCCESS == RegOpenKeyEx(HKEY_LOCAL_MACHINE,
L"Drivers\\BuiltIn\\KEYPAD", 0, 0, &hKeyPad))
   {
wsprintf(RegStr,L"KeyPadSet0");      //assign value name of up button
dwSize = sizeof(DWORD);
if (ERROR_SUCCESS == RegQueryValueEx(hKeyPad, RegStr, NULL,
&dwType, (LPBYTE)& SaveReg, &dwSize))
{

data = (data << 24) & 0xff000000;
SaveReg = (SaveReg &0x00ffffff) | data;      // modify the virtual key code of
up button
RegSetValueEx(hKeyPad, RegStr, NULL, dwType, (LPBYTE)&SaveReg,
dwSize);
}
   }
   RegCloseKey(hKeyPad);
}
```

4-2-4 Vibration notification feature

A vibrator is designed into this device for notification usage. The vibrator driver is following the notification LED driver architecture of WindowCE to be developed. This architecture is easy for System Integrator using WindowCE NLED standard API for application development, and also provides the advantage of backward compatibility.

Data Structure introduction

```
struct NLED_SETTINGS_INFO
    {
    UINT      LedNum;
    INT       OffOnBlink;
    LONG      TotalCycleTime;
    LONG      OnTime;
    LONG      OffTime;
    INT       MetaCycleOn;
    INT       MetaCycleOff;
    };
```

LedNum

LED number. Virbrator is zero (0).

OffOnBlink

Current setting. The following table shows the defined values.

Value	Description
0	Off
1	On
2	Blink

TotalCycleTime

Total cycle time of a blink, in microseconds. (Not support – default 0)

OnTime

On time of the cycle, in microseconds. (Not support – default 0)

OffTime

Off time of the cycle, in microseconds. (Not support – default 0)

MetaCycleOn

Number of on blink cycles. (Not support – default 0)

MetaCycleOff
    Number of off blink cycles. (Not support – default 0)

Example code

```
#include "stdafx.h"

NLED_SETTINGS_INFO ledSettingsInfo     = { 0 };

void SetVibratorOn(void)
{
    ledSettingsInfo.LedNum = 0;
    ledSettingsInfo.OffOnBlink = 0;
    if(!NLedSetDevice(NLED_SETTINGS_INFO_ID,&ledSettingsInfo))
            MessageBox(L"NLED ghNLED = NULL!!",L"Error",MB_OK);
    }
```

5 Optional Accessory Installation

5-1 USB Cable

There is only USB port with WindowsCE® ActiveSync® function to be exposed to software developer to develop and debug their software application.

A specific application program located in "Application" Folder and named as "USB.EXE" to provide manual USB Activesync connection.

A specific USB cable would be required.

USB Cable Snapshot

To PC

To Mobile

Optional USB Cable is for functioning Synchronization with PC and Software uploading or Debug.

5-1-1 Synchronization via USB Cable

To synchronize the Mobile System with PC, please install the "Microsoft Active Sync" program on each PC first.

The set-up of a "Partnership" will be requested once after connecting the USB Cable to the Mobile System and PC.

The Synchronization will be running automatically after "Microsoft Active Sync" and "Partnership Set-up" being installed successfully and the USB Cable is connected.

Please refer the detail installation procedure of ActiveSync program to the Microsoft official website.

5-1-2   Installing the USB Cable

To Mobile

To PC

1.   Unscrew the screws (2) on the back cover of the Mobile System to access the Connector Slot.

2.   Connect the white connector to the Mobile System.

PC

3.   Connect the USB Connector to the PC device to communicate the Mobile System and the PC.
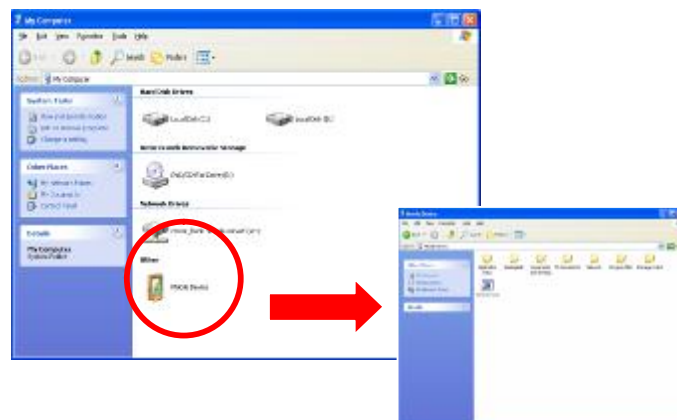
5-1-3 Start the Synchronization

After installing the "Microsoft® ActiveSync®" program at your PC, please enable it. You will see the "Connecting" is running automatically after USB Cable is connected the Mobile System and PC.

> Ø **NOTE:** If the "Connecting" is not running automatically, please go to the Chapter 5.3.3 to connect manually

1. The "Microsoft ActiveSync" window will show "Connected" after USB Cable is successfully connected.

> Ø **Note**: To choose "Options" tab to set up the customized Synchronization items on your own.
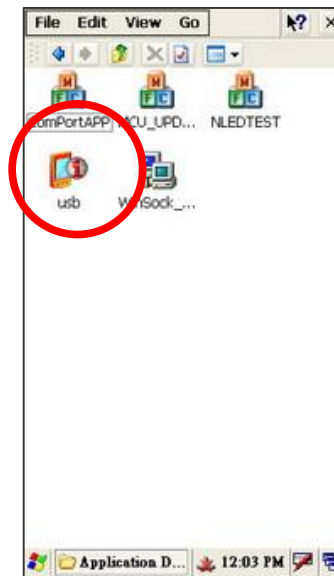

2. Double click the "Mobile Device" icon by opening "My Computer" to access the documents or files saved in the Mobile System.
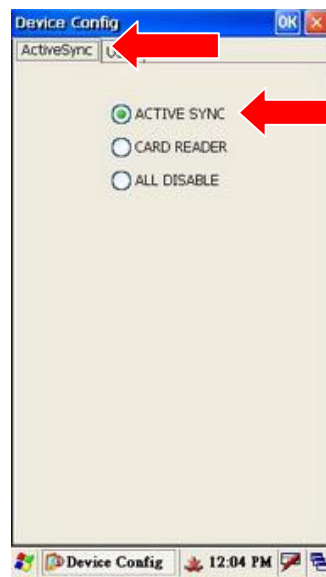
5-1-4 Enable the Synchronization Manually

If the synchronization is not running automatically after connecting the USB Cable to your PC and the Mobile System, please follow below steps.

1. Double-click on the "My Device" icon on Today screen.

2. Double-click on the "Application Data" folder.

3. Double-click on the "usb" icon.

4. Select "USB" tab

5. Press "Connect" button.

6. Select "ActiveSync" tab.

7. Select "ACTIVE SYNC" button.

8. Press "OK" button.

5-2 MSR Module Installation

1. Unscrew the screws (2) on the rear side of the Mobile System.

2. Slide upward to open the Connector Cover to access the connector slot.

3. Connect MSR cable to the respective connector on the connector slot of the Mobile System.

4. To make sure the metal juts are entered to the right position of the system.

5. Use the attached screws (2) to fix the MSR module to the Mobile system as above photo shows.

6.   Finished.

      Front view of the MSR module and the Mobile system.

5-3　2-in-1 MSR and Scanner Module Installation

MSR Cable

Scanner Cable

1. To open the connector cover on the Mobile System first by following the steps in Chapter 5.2.1

2. Connect cables (2) to the respective connectors on the connector slot of the Mobile System.

3. To make sure the metal juts are entered into the right position of the Mobile System.

4. To use the attached screws (2) to fix the 2-in-1 MSR module to the Mobile System.

5. Finished.
The front view of the 2-in-1 MSR and Scanner Module with the Mobile System.