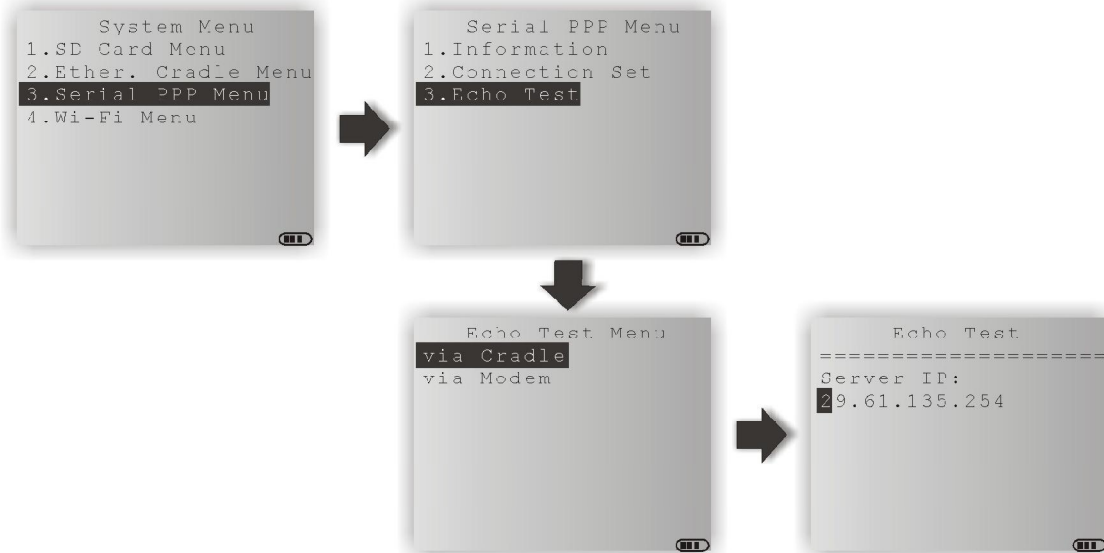## 3.10.3 ECHO TEST

This echo test is used for verifying connectivity via Point-to-Point Protocol.

▸ Select "via Cradle" if the mobile computer is seated in the Modem Cradle.

For the Modem Cradle, its physical connectivity can be verified via **System Menu | Tests | Echo Test | MODEM**.

▸ Select "via Modem" if you are connecting a generic modem to the mobile computer.

Note: Enter the IP address of a server with which a PPP connection is desired. Then, it will try to connect to the server. After the PPP connection is established properly, run the utility "EchoTest.exe" on your computer (TCP/IP – Server), and then, start this test on your mobile computer.

3.11 WI-FI MENU

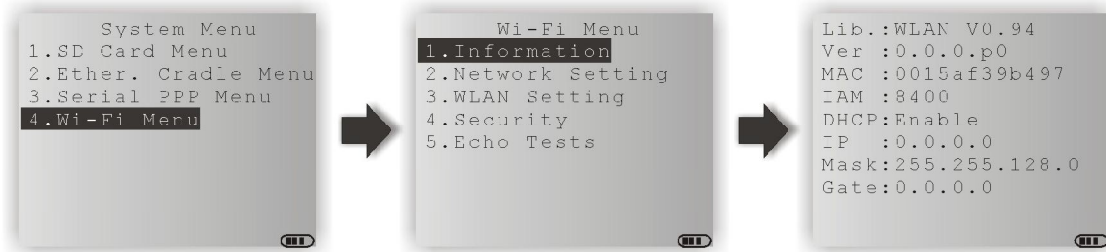This submenu is for 802.11b/g wireless networking. You must configure these parameters correctly.
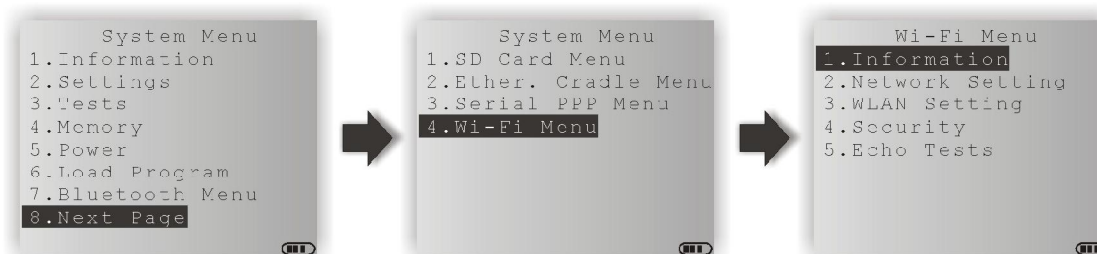
Note: The menu is available only when (1) the Wi-Fi module is present, and (2) the external library 84WLAN.lib is included in your program (.SHX).

Wi-Fi Settings	Default Value	Ad-hoc	Infrastructure
Network Setting		**Items Need to Be Checked**	
DHCP	Enable	---	v
SubNet Mask	255.255.128.0	v	v
Local IP Address	0.0.0.0	v	v
Default Gateway	0.0.0.0	---	v
DNS Server	0.0.0.0	---	v
Domain Name	---	---	v
WLAN Setting			
Local Name	Model no. + Serial no.	v	v
SS ID	---	---	v
System Scale	Medium	---	v
Power Saving	Enable	---	v
Preamble	Long	---	v
Ad-Hoc	Disable	v	---
Security			
Authentication	Open System	---	v
WEP Menu	Disable	---	v
EAP Menu	Disable	---	v
WPA Menu	Disable	---	v

3.11.1 INFORMATION
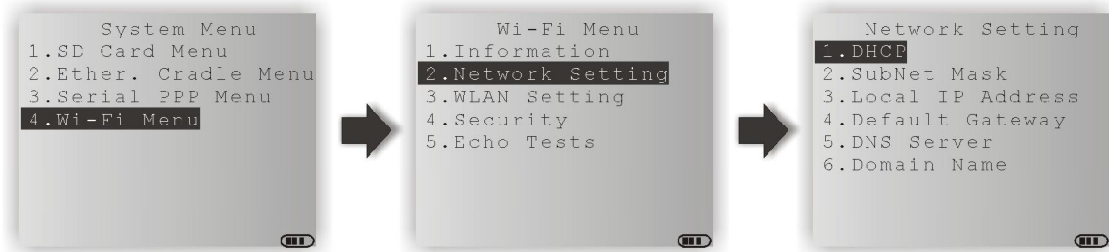
Information of network configuration can be viewed here.

```
      System Menu              Wi-Fi Menu          Lib.:WLAN V0.94
1.SD Card Menu          1.Information             Ver :0.0.0.p0
2.Ether. Cradle Menu    2.Network Setting         MAC :0015af39b497
3.Serial PPP Menu       3.WLAN Setting            IAM :8400
4.Wi-Fi Menu            4.Security                DHCP:Enable
                        5.Echo Tests              IP  :0.0.0.0
                                                  Mask:255.255.128.0
                                                  Gate:0.0.0.0
```

Wi-Fi Menu | 1. Information

Lib	Wi-Fi library version
Ver	Firmware version of the Wi-Fi module
MAC	MAC address of the Wi-Fi module
IAM	A name given to the mobile computer for identification.
	▶ By default, it is made up of model number and the serial number. (Identical to 3. WLAN Setting | 1. Local Name)
DHCP	DHCP server in use or not
IP	IP address of the mobile computer
Mask	Subnet Mask
Gate	Default Gateway

3.11.2 NETWORK SETTING

Set parameters for IP networking.

```
     System Menu              Wi-Fi Menu            Network Setting
1.SD Card Menu          1.Information           1.DHCP
2.Ether. Cradle Menu    2.Network Setting       2.SubNet Mask
3.Serial PPP Menu       3.WLAN Setting          3.Local IP Address
4.Wi-Fi Menu            4.Security              4.Default Gateway
                        5.Echo Tests            5.DNS Server
                                                6.Domain Name
```

DHCP

Options — Enable or Disable

Subnet Mask

Enter a new Mask IP, if necessary.

Local IP Address

Enter a new address for the mobile computer, if necessary.

Default Gateway

Enter a new address for the default Gateway, if necessary.

DNS Server

Enter a new address for the DNS server, if necessary.

Domain Name

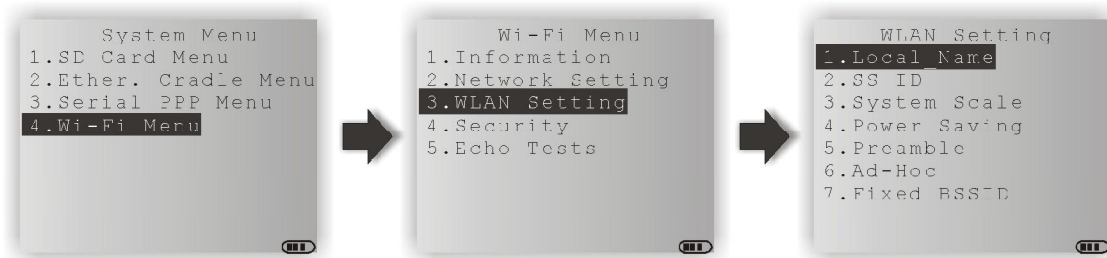**The domain name of the host is displayed when DHCP server is enabled.**

Note: Normally, DHCP is enabled and all of the settings can be obtained form the DHCP server.

3.11.3 WLAN SETTING

Wireless networking can operate in two modes – (1) Ad-hoc mode: peer-to-peer, and (2) Infrastructure mode: point to multi-point through access points.

Set the following parameters.

Local Name

Enter a name for identifying the mobile computer.

▶ By default, it is made up of model number and the serial number.

SS ID

This refers to Service Set Identifier or AP name, which is used for remote device association.

▶ The mobile computer can ONLY communicate with access points that have the same SS ID.

System Scale

This refers to Access Point Density.

Options — [1] Low [2] Medium [3] High [4] Customized

▶ The value you set must match that set for the access point.

▶ "Low / Medium / High" means the mobile computer will search for other APs only when data transmission rate drops below "1 / 2 / 5" Mbps individually.

▶ "Customized" lets you set data rate for the mobile computer to search for other APs when data transmission rate drops below the specified value —

  802.11b: 1, 2, 5.5, 11 Mbps

  802.11g: 1, 2, 5.5, 11 Mbps & 6, 9, 12, 18, 24, 36, 48, 54 Mbps

Power Saving

This refers to the low power consumption mode.

Options — Enable or Disable

▶ The value you set must match that set for the access point.

Preamble

Options — [1] Long [2] Short [3] Both

▶ The value you set must match that set for the access point.

Ad-Hoc

This refers to peer-to-peer mode, without going through access points.
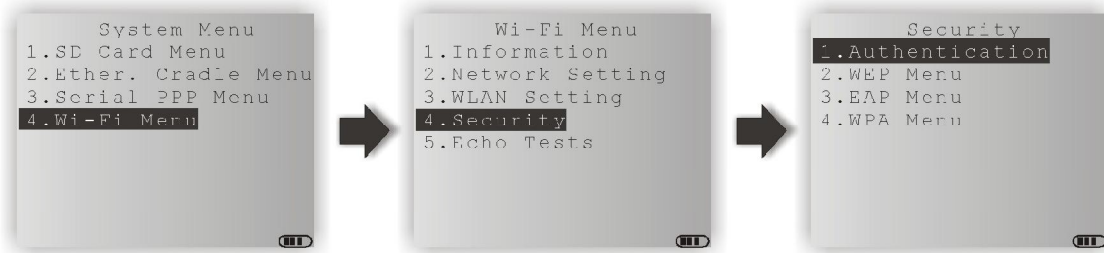
Options — Enable or Disable

Fixed BSSID

This refers to the use of a specific AP's MAC address as the fixed Basic Service Set Identifier.

▸ The mobile computer can ONLY communicate with this one and only access point.

3.11.4 SECURITY

Set or modify security parameters.

▸ **WEP:**   Wired Equivalent Privacy
▸ **EAP:**   Extensible Authentication Protocol
▸ **WPA:**   Wi-Fi Protected Access

Authentication

[1] Open System	▸ Default authentication type
[0] Share Key	▸ This requires implementing WEP key.

WEP Menu

|	
WEP Setting	▸ Enable (For Share Key, it must be enabled!)
	▸ Disable (default)
WEP Key Length	▸ 64 bits
	▸ 128 bits (default)
Default Key	WEP KEY1
WEP Key	Enter WEP Keys 1 ~ 4 in one of the following input data type:
	▸ ASCII (up to 13 characters)
	▸ Hexadecimal (up to 26 characters)

EAP Menu (for associating to Cisco access points)

EAP Setting	▸ Enable
	▸ Disable (default)
EAP ID	Enter a user name (up to 32 characters)
EAP Password	Enter a password (up to 32 characters)

WPA Menu (WPA-PSK)

WPA Setting	▸ Enable
	▸ Disable (default)
WPA2 Setting	▸ Enable
	▸ Disable (default)
WPA Passphrase	Enter a phrase as your password (8 ~ 63 characters)

3.11.5 ECHO TESTS

This function is used to measure the coverage of the range, estimate the number of APs and mobile computers needed, and determine the topology of deploying APs.
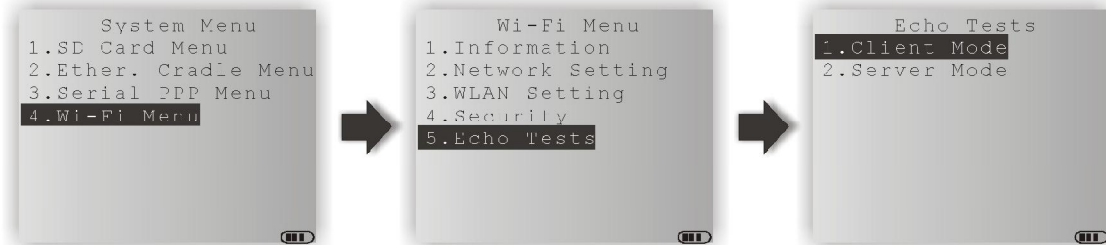
Client Mode

Set the mobile computer as a client. Enter the IP address of a server with which a connection is desired. Then, it will try to connect to an AP.

1. Run the utility "EchoTest.exe" on your computer. Associated settings include

    - Select "TCP/IP – Server" for interface.

    - Set Action Mode to "Passive".

2. Start the echo test on both ends.

3. Enter the server IP and port number on the mobile computer.

Server Mode

Set the mobile computer as a server. The mobile computer will try to connect to an AP.

1. Run the utility "EchoTest.exe" on your computer. Associated settings include

    - Select "TCP/IP – Client" for interface.

    - Set Action Mode to "Passive".

2. Start the echo test on both ends.

While running echo tests, if WPA setting is enabled for security, the SSID and Passphrase will be processed to generate a pre-share key.

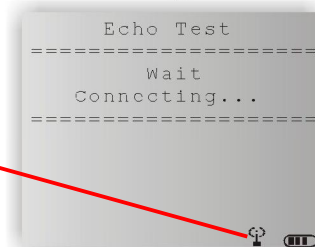Note: If you change the SSID or Passphrase, it will have to re-generate a pre-share key.

1) For initial association with an access point, you will see an antenna icon developing on the screen to indicate that the mobile computer is processing a pre-share key.

2) After having generated the pre-share key, the mobile computer proceeds to establish a connection with an access point, and you will see the whole antenna is flashing.

3) When the mobile computer has been connected to the access point successfully, you will see the whole antenna and the indication of wireless signal strength.

The changing icon ▬ ⚚ ⚚ ⚚indicates
8400 is processing a pre-share key.

Wait for a few seconds.

```
      System Menu
1.SD Card Menu
2.Ether. Cradle Menu
3.Serial PPP Menu
4.Wi-Fi Menu
```

```
      Wi-Fi Menu
1.Information
2.Network Setting
3.WLAN Setting
4.Security
5.Echo Tests
```

```
      Echo Tests
1.Client Mode
2.Server Mode
```

The antenna icon will become ready and
flashes to indicate 8400 is connecting
to an access point under the same SSID.

```
      Echo Test
====================
      Wait
   Connecting...
====================
```

```
Sending  412
Recv OK  411



Q:0084   T:36M
S:0154   N:0008
```

Once connected, the antenna icon will
stop flashing. Next to the icon, the
more bars, the stronger the signal.
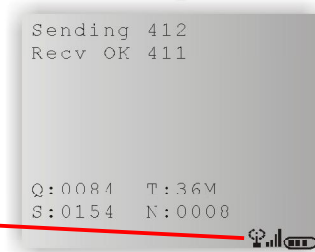
Note: If you are programming in C or BASIC, be aware that these icons will appear on
the device screen after NetInit() or START TCPIP() is called. (WPA must be
enabled first!)

Once the connection of echo test is established, the details will be displayed as illustrated below. Link Quality ("Q") will be the most important element while the others are for your reference.

```
Sending 412
Recv OK 411




Q:0084  T:36M
S:0154  N:0008
        (signal/battery icons)
```
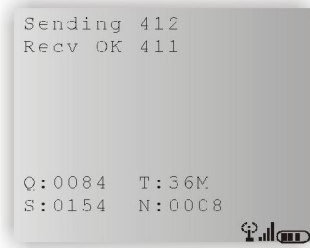
Q (Link Quality)		T (Transmit Speed)		S (Signal Level)		N (Noise Level)	
0 ~ 10	Very Poor	1	Mbps	0 ~ 10	Weak	1	Weak
10 ~ 15	Poor	2	Mbps	30 ~ 60	Moderate	2 ~ 3	Moderate
15 ~ 30	Good	5.5	Mbps	Over 60	Strong	4 ~ 5	Strong
50 ~ 80	Very Good	11	Mbps				
		6	Mbps				
		9	Mbps				
		12	Mbps				
		18	Mbps				
		24	Mbps				
		36	Mbps				
		48	Mbps				
		54	Mbps				

PROGRAM MANAGER & KERNEL

This chapter explains **Program Manager** and **Kernel** that manage multiple programs and firmware upgrade.

IN THIS CHAPTER

4.1 PROGRAM MANAGER

The mobile computer supports multiple applications and languages. In the menu of **Program Manager**, it allows storing up to eight programs and has one activated for the current use.

If there is no application program exists, the **Program Manager** will be displayed after you turn on the mobile computer.

Warning!   The Program Manager menu is provided for managing programs in an administrative level.

How to access the Program Manager menu?

1) Turn off the mobile computer.

2) Press [8] + [Power].

4.1.1 DOWNLOAD

Here provides a full list of programs that are currently stored on the mobile computer with size information. Multiple application programs can be downloaded through a variety of interfaces. Upon completion of downloading, you are allowed to input a name for the program. If there is no need to rename the program, simply press [ENTER] to leave as it is.

The length of program name can be up to 12 characters. Program size is in kilobytes.

A suffix letter after the memory sector (1 ~ 7) indicates the file type of program.

▶ "b" for BASIC program   (.SYN)
▶ "c" for C program   (.SHX)
▶ "f" for font file   (.SHX)

Note: In addition to the system font, there can be only one font file downloaded to the mobile computer. The custom font file needs to be downloaded through the System Menu or Kernel Menu.

SPARE MEMORY SECTORS (1 ~ 7)

Additional program files can be directly downloaded to these sectors.

Download a program file to an empty sector:

1. Press the arrow keys ▲ (Up) ▼ (Down) to select an empty sector, and then press [ENTER].

2. Select a desired interface for downloading.

3. Connect the interface cable if required, and wait for a few seconds to establish a connection…

4. To abort the action, press [ESC]. Then press [ESC] again to return to the menu.

Download a program file to an occupied sector:

If no available sectors, you'll have to replace one program with the new one.

1. Press the arrow keys ▲ (Up) ▼ (Down) to select a program that you want to delete, and then press [ENTER].

2. The program information is displayed on the screen.

   Press the blue modifier key (▢ or ⬤) to enter the Alpha mode:
   ▶ Press the capital letter [C] and follow the steps below to download a program file.
   ▶ Press the capital letter [D] if you simply want to delete the program.

3. Select a desired interface for downloading.

4. Connect the interface cable if required, and wait for a few seconds to establish a connection…

5. To abort the action, press [ESC]. Then press [ESC] again to return to the menu.

   From the menu, you'll see the program has been deleted but no new program is present (because you have canceled the download action).

Note: [C], [D] are case-sensitive.

ACTIVE MEMORY SECTOR ("ACT")

Only the application program, which needs to be activated immediately, can be downloaded to the active memory sector.

Download to Memory Sector "ACT":

1. Press the arrow key ▼ to select the memory sector "ACT" (may be unoccupied), and then press [ENTER].

2. Select a desired interface for downloading.

3. Connect the interface cable if required, and wait for a few seconds to establish a connection…

   If the active memory sector has already been occupied by an application program, the newly downloaded program will replace the currently active program and come into effect immediately.

4.1.2 ACTIVATE

The list shows the entire spare programs stored on the mobile computer. From the list, you can select from 1 to 7 and activate one of them. The selected program will be copied to the active memory sector and replace the current one.
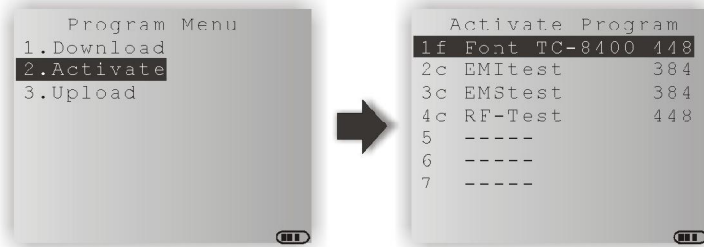
Note: A font file cannot be activated.

TO CLEAR FILE SYSTEM

When `<New Program Start>` screen appears, "Press [ESC] to clear file" means the file system in the SRAM will be cleared out by pressing [ESC]. Then there will be no data (transactions, settings, etc.) stored on the mobile computer when the new program comes into effect.

TO KEEP FILE SYSTEM

To keep the data, simply press any other key.

4.1.3 UPLOAD

You may duplicate one or all of the programs from the mobile computer to a host computer or another mobile computer. This can be used to clone software on mobile computers.

Note: To clone all of the programs, the target mobile computer cannot have any other program downloaded except the active one; that is, Memory Sectors 1 ~ 7 must be empty!

The procedures are similar to that for downloading programs, except that "USB Virtual COM" and "SD Card" options are unavailable.

This screen is not available if you select "2.All Programs" from the previous screen.
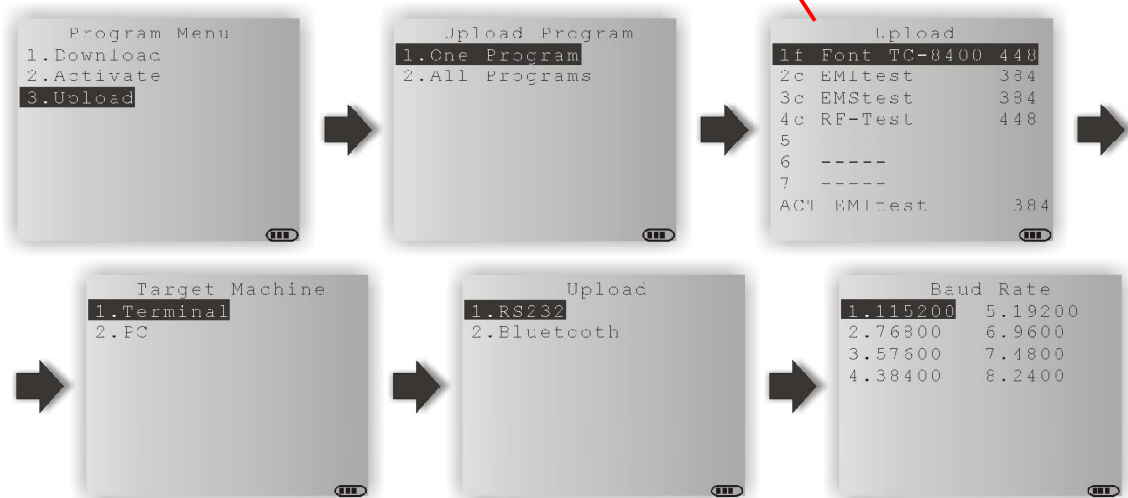
4.2 KERNEL

The kernel resides in the innermost core of the system. It has the highest security and is always protected by the system. When the application program is corrupted and the **System Menu** fails, the **Kernel Menu** provides an access to fix the system.

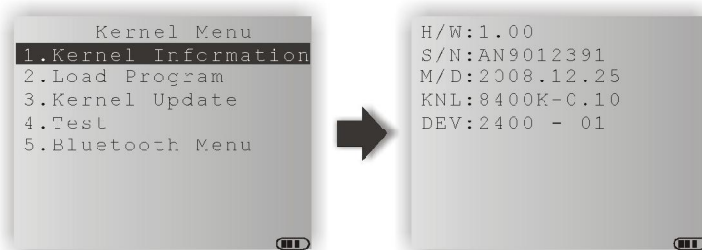Warning!   The Kernel Menu is NOT for the use of any end users.

How to access the Kernel Menu?

1) When the last session is in the **System Menu** or **Program Manager,** simply turn off the mobile computer. Otherwise, you must reload the battery pack.

2) Press [1] + [7] + [Power].

4.2.1 KERNEL INFORMATION

Here provides important system information to help diagnose the system.

| Kernel Menu | 1. Information	
H/W	Hardware version (PCB)
S/N	Serial number of the mobile computer
M/D	Manufacturing date
KNL	Kernel version
DEV	6-digit code for optional hardware configurations
	Refer to <u>Understanding Device Code</u>.

4.2.2 LOAD PROGRAM

You can download one program file to the active memory sector, as well as one font file to the memory address assigned by the system. After downloading, restart the mobile computer to activate the new program.

▶ New application program or program update

▶ And/or one font file, i.e. multi-language font

If you are using a custom font file rather the system font and you want to download another font file, it is necessary to delete the current font file from the program list displayed by the Program Manager first. Otherwise, downloading new font file is not allowed.
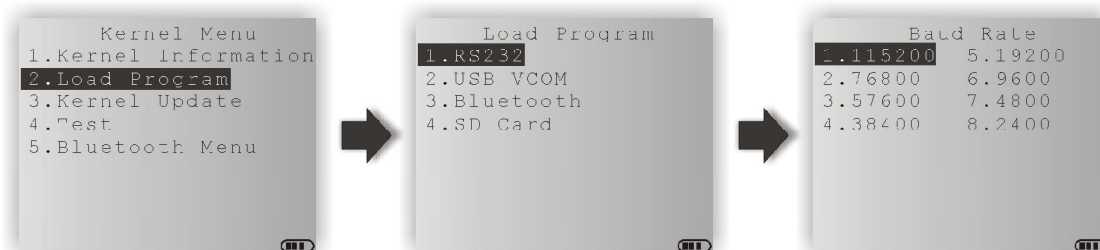
.SHX Program	Download one of the following C program files and/or one font file:	
Program File	▶ AG Runtime	(U*.shx)
	▶ CipherNet Runtime	(84xx-5250.shx, 84xx-VT.shx)
	▶ BASIC Runtime*	(BC*.shx)
	▶ User program	
Font File	Refer to the Font Files folder on CD-ROM.	

If you have downloaded a BASIC Runtime program, the next time you access the Load Program service through the **System Menu**, you will be able to select whether to download a C program (.SHX) or BASIC program (.SYN).

Note: Go to **System Menu | 6. Load Program | 2. Load Basic**, and download a BASIC program (*SYN).

SETTINGS

Interface

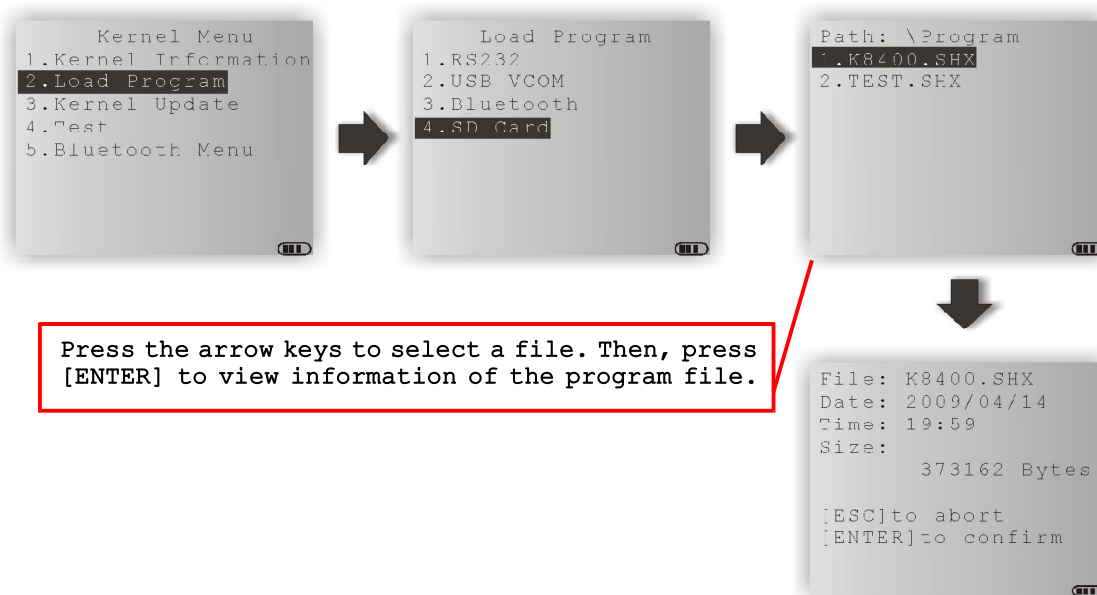| Options	Description
RS232	Proceed to configure baud rate settings on your computer and the mobile computer.
USB VCOM	Connect the USB cable between your computer and the mobile computer.
Bluetooth	Approach the target Bluetooth enabled device.
SD Card	This option is available only when the memory card is present.

Baud Rate

Options	Supported by CipherLab software, including download utilities	
115200 (bps)	Yes	
76800 (bps)		No
57600 (bps)	Yes	
38400 (bps)	Yes	
19200 (bps)	Yes	
9600 (bps)	Yes	
4800 (bps)		No
2400 (bps)		No

LOAD PROGRAM VIA BLUETOOTH

1) Go to **System Menu | 7. Bluetooth Menu | 3. Security**, and configure the following Bluetooth settings first.

   ‣ Authentication

   ‣ PIN code

2) Go to **System Menu | 6. Load Program** and select Bluetooth.

3) Start the pairing procedure from your computer, for example, click [Pair Device] and/or [Connect Bluetooth Serial Port].

4) Run the download utility: ProgLoad.exe

   - Select interface RS-232 for using Bluetooth SPP.

   - Select COM port properties that match with the serial port settings used on your computer.

LOAD PROGRAM VIA SD CARD

```
      Kernel Menu          |         Load Program        |      Path: \Program
1.Kernel Information        |      1.RS232                 |      1.K8400.SHX
2.Load Program              |      2.USB VCOM              |      2.TEST.SHX
3.Kernel Update             |      3.Bluetooth            |
4.Test                      |      4.SD Card              |
5.Bluetooth Menu            |                             |
```

Press the arrow keys to select a file. Then, press [ENTER] to view information of the program file.

```
File: K8400.SHX
Date: 2009/04/14
Time: 19:59
Size:
        373162 Bytes

[ESC]to abort
[ENTER]to confirm
```

1) If you have copied the desired program file(s) to your SD card, go to **System Menu | 6. Load Program** and select SD Card. You will see a list of all the files and directories on the SD card, as shown above.

2) Press the arrow keys [▲][▼] to select a file.

3) Press [ENTER] to view information of the program file.

4) Press [ENTER] to confirm downloading the program file to the mobile computer.

   Press [ESC] to abort the download task.

4.2.3 KERNEL UPDATE

The kernel might need to be updated to improve performance or due to other considerations.

▸ To download a kernel update (K*.shx), the procedure is the same as that for downloading a program.

▸ Any attempt to download an older version will be rejected.

▸ The system will restart itself right after downloading.

Warning: Do not turn off the mobile computer while downloading a kernel update or re-starting the mobile computer. Otherwise, it will crash the kernel forever. There is no way to recover it!
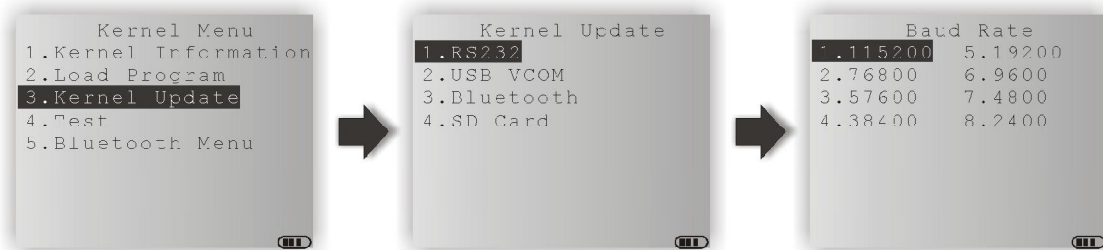
Note: CipherLab software, including download utilities, supports the following baud rate options: 115200/57600/38400/19200/9600 bps.

4.2.4 TEST & CALIBRATE

These tools are provided for manufacturing use.
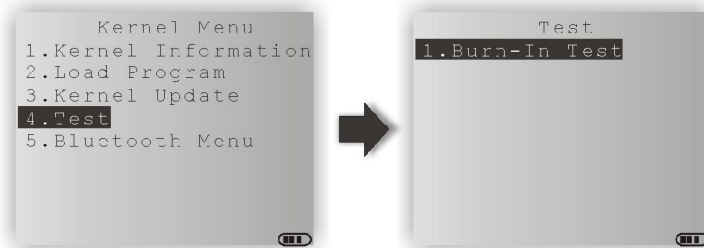
Warning!   You should not perform any of these tests.