CipherLab
Reference Manual

Terminal

8200/8230/8260

Version 1.00

CIPHER LAB

IMPORTANT NOTICES

FOR USA

This equipment has been tested and found to comply with the limits for a **Class B** digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

▶ Reorient or relocate the receiving antenna.

▶ Increase the separation between the equipment and receiver.

▶ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

▶ Consult the dealer or an experienced radio/TV technician for help.

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.

FOR CANADA

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of Industry Canada.

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.

Cet appareil numerique respecte les limites de bruits radioelectriques applicables aux appareils numeriques de Classe B prescrites dans la norme sur le material brouilleur: "Appareils Numeriques," NMB-003 edictee par l'Industrie.

FOR HAND-HELD PRODUCT WITH RF FUNCTIONS

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator & your body. It only operated in hand-held used.

If you only transfer data to the host wirelessly, please keep the minimum distance 20 cm between machine & your body.

FOR PRODUCT WITH LASER

CAUTION

This laser component emits FDA / IEC Class 2 laser light at the exit port. Do not stare into beam.

SAFETY PRECAUTIONS

RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

▶ The use of any batteries or charging devices, which are not originally sold or manufactured by CipherLab, will void your warranty and may cause damage to human body or the product itself.

▶ DO NOT disassemble, incinerate or short circuit the battery.

▶ DO NOT expose the scanner or the battery to any flammable sources.

▶ For green-environment issue, it's important that batteries should be recycled in a proper way.

▶ Under no circumstances, internal components are self-serviceable.

CARE & MAINTENANCE

▶ This mobile computer is intended for enterprise logistics use. The mobile computer is rated IP 52, however, it may do damage to the mobile computer when being exposed to extreme temperatures or soaked wet.

▶ When the body of the mobile computer gets dirty, use a clean and wet cloth to wipe off the dust. DO NOT use/mix any bleach or cleaner. Always keep the LCD dry.

▶ For a liquid crystal display (LCD), use a clean, non-abrasive, lint-free cloth to wipe dust off the screen. DO NOT use any pointed or sharp object to move against the surface.

▶ If you want to put away the mobile computer for a period of time, download the collected data to a host computer, and then take out the battery pack. Store the mobile computer and battery pack separately.

▶ When the mobile computer resumes its work, the main and backup batteries will take a certain time to become fully charged.

▶ If you shall find the mobile computer malfunctioning, write down the specific scenario and consult your local sales representative.

RELEASE NOTES

Version	Date	Notes

1.00　　　Mar. 21, 2011　Initial release

CONTENTS

INTRODUCTION

Answering industrial demands for ruggedized, light-weight and versatile computers, the 8200 Series Mobile Computer is specifically designed for enterprise logistics use.

This line of product comes with built-in Bluetooth technology and allows for optional module for 802.11b/g connectivity, enabling real time sharing of performance.

The 8200 Series Mobile Computer is bundled with powerful and rich features to ensure success in timely processing of information, and thus, makes an ideal choice for inventory control, shop floor management, warehousing and distribution operations. Being programmable, this handy device can run custom applications or terminal emulation applications.

This manual serves to guide you through how to install, configure, and operate the mobile computer. We recommend you to keep one copy of the manual at hand for quick reference or maintenance purposes. To avoid any improper disposal or operation, please read the manual thoroughly before use.

Thank you for choosing CipherLab products!

GETTING FAMILIARIZED WITH 8200
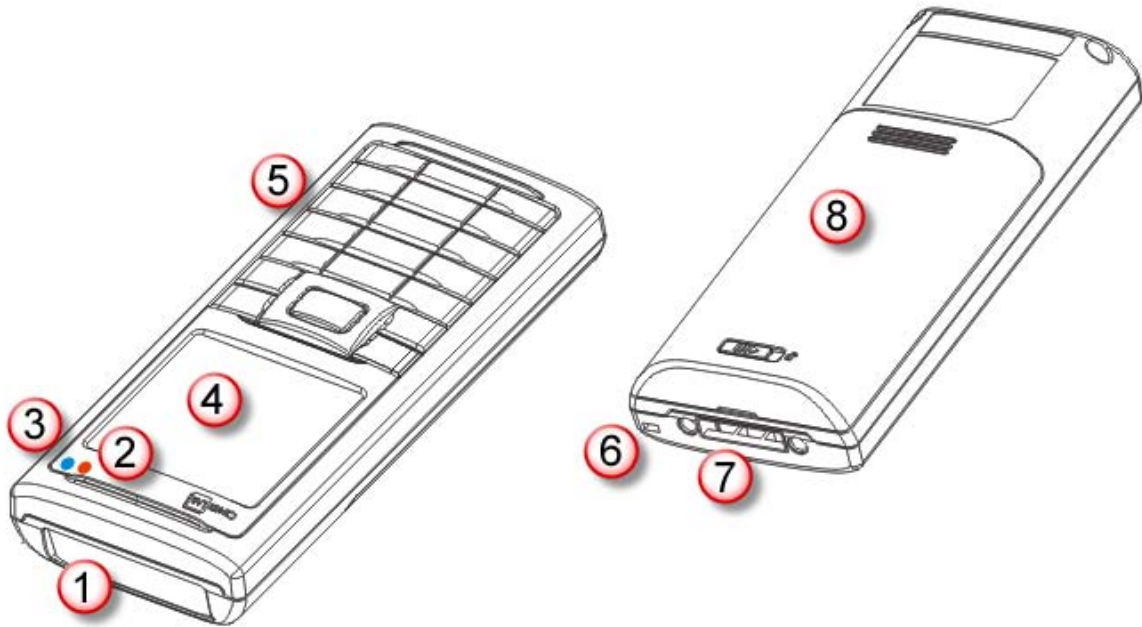
Figure 1: Overview

No.	Description	No.	Description
1	Scanning window	2	LED for Good Read and battery charging
3	LED for wireless communications	4	LCD screen
5	Keypad, 24 keys	6	Wristband
7	Communication/charging port	8	Battery compartment

FEATURES

▸ Ergonomic design — ruggedized yet streamlined, with wristband for secure hold
▸ Built tough to survive drop test and sealed against moisture/dust to IP 52
▸ Up to 8 GB high capacity memory card (microSDHC) supported
▸ Flexible wireless solutions — Bluetooth or 802.11b/g
▸ FTP client support — 802.11b/g
▸ Graphic monochrome LCD supports double-byte characters and bitmap graphics
▸ Programmable feedback includes speaker, LED indicators and vibrator
▸ Quick link to any backend database through MIRROR Emulator programs for VT100/220 and IBM 5250 emulation
▸ Easy customization of data collection applications through FORGE Application Generator (AG) programs for preloaded AG Runtime, batch and WLAN versions available
▸ Programming support includes BASIC & C compilers
▸ Accessories include pistol grip.

INSIDE THE PACKAGE

The following items are included in the package. Save the box and packaging material for future use in case you need to store or ship the mobile computer.

▸ 8200 Series mobile computer
▸ Rechargeable Li-ion battery pack
▸ Wristband
▸ Standard USB cable
▸ Universal power adaptor
▸ Product CD
▸ Quick Start Guide

ACCESSORIES

Rich choices of optional accessories are available for you to enhance the total performance of the mobile computer.

▶ Pistol Grip (detachable)
▶ Spare rechargeable Li-ion battery

GETTING STARTED

INSERTING BATTERY & MEMORY CARD

For shipping and storage purposes, save the mobile computer and the main battery in separate packages. This will keep both batteries in good condition for future use.

Note: Any improper handling may reduce the battery life.

1) Hold the mobile computer still and slide the release latch to the right to unlock the battery cover.

2) Slide off the battery cover.

3) Use your finger to slide the locking plate towards its hinge to unlock the SD card holder.

4) Flip up the SD card holder.

5) Insert your memory card (microSD or microSDHC) to the SD card holder.

6) Push the SD card holder down.

7) Slide the locking plate away from its hinge to secure the card.

8) Slide the battery pack into the battery compartment at a proper angle (30°~45°) so that the metal contacts of the battery are met with the charging contacts inside the compartment. Make sure that the battery is snugly fit into the compartment.

9) Replace the battery cover.

10) Slide the release latch to the left to lock it firmly.

Note: For a new battery, make sure it is fully charged before use. Always prepare a spare battery pack, especially when you are on the road.
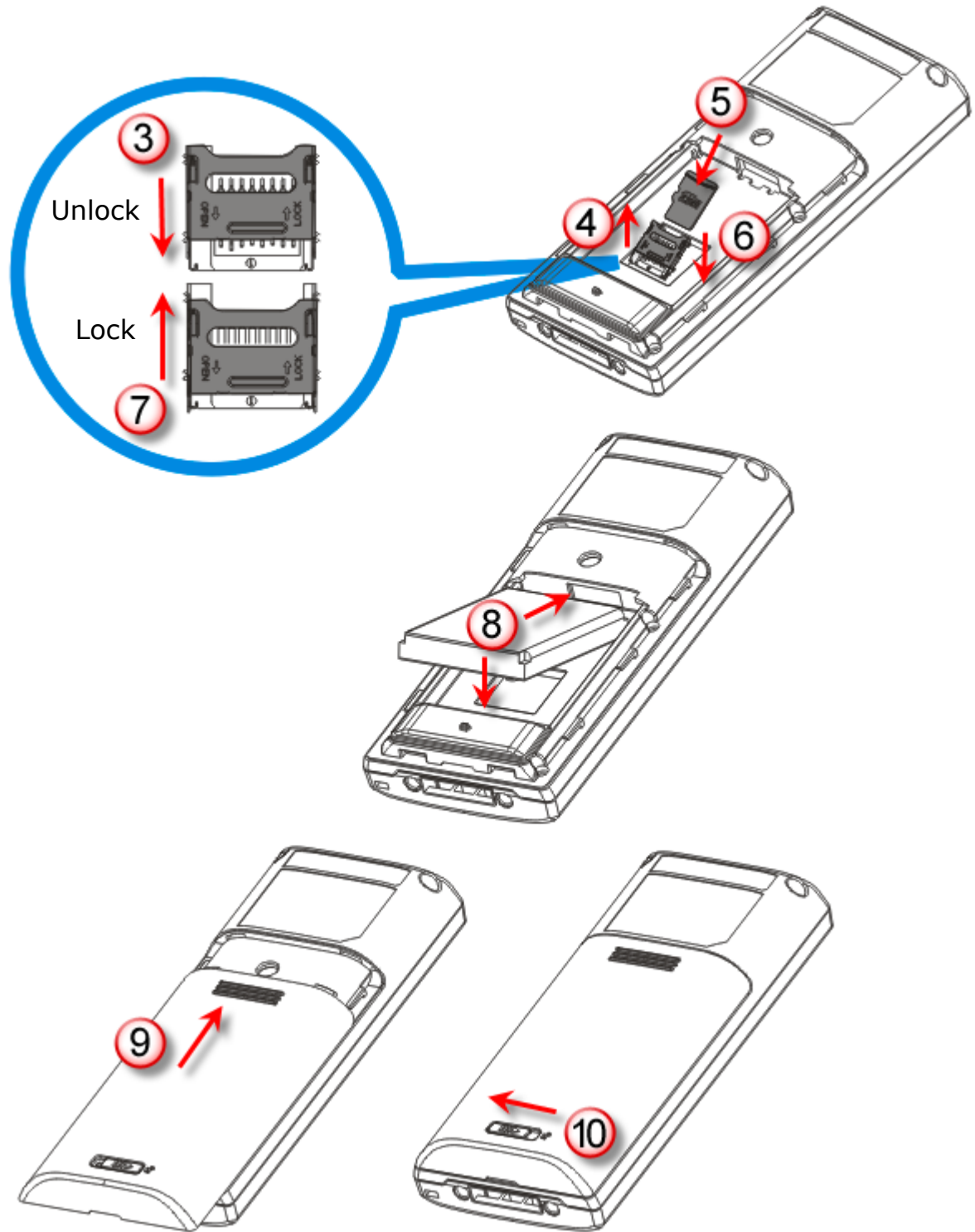
Figure 2: Installing the Main Battery & Memory Card

INSTALLING PISTOL GRIP

This contoured pistol grip enables intuitive trigger-and-scan operation, which is very helpful in scan intensive applications.

When a pistol grip is necessary, install it to the mobile computer by following these steps:
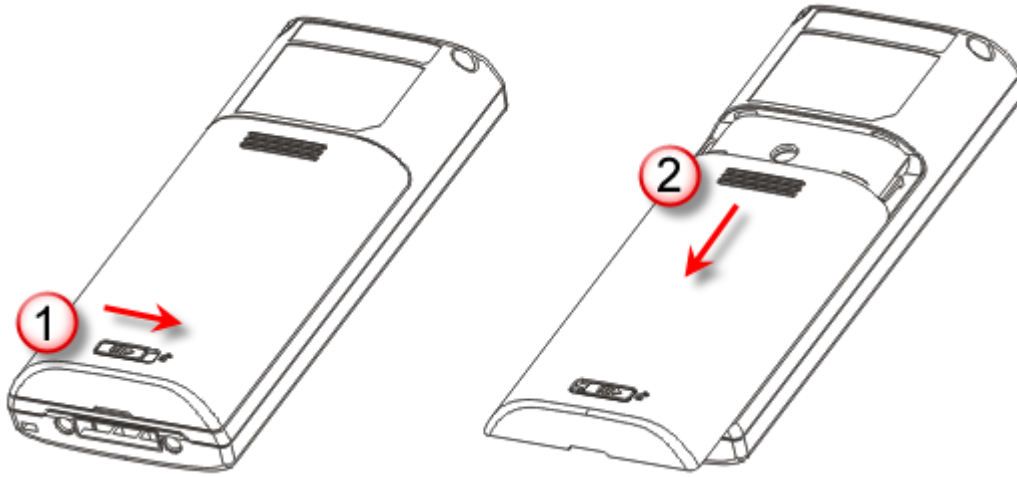
1) Hold the mobile computer still and slide the release latch to the right to unlock the battery cover.

2) Slide off the battery cover.

3) Insert the pistol grip into place (is like replacing the battery cover).

4) Slide the release latch to the left to lock it firmly, and turn on the mobile computer to test the trigger.
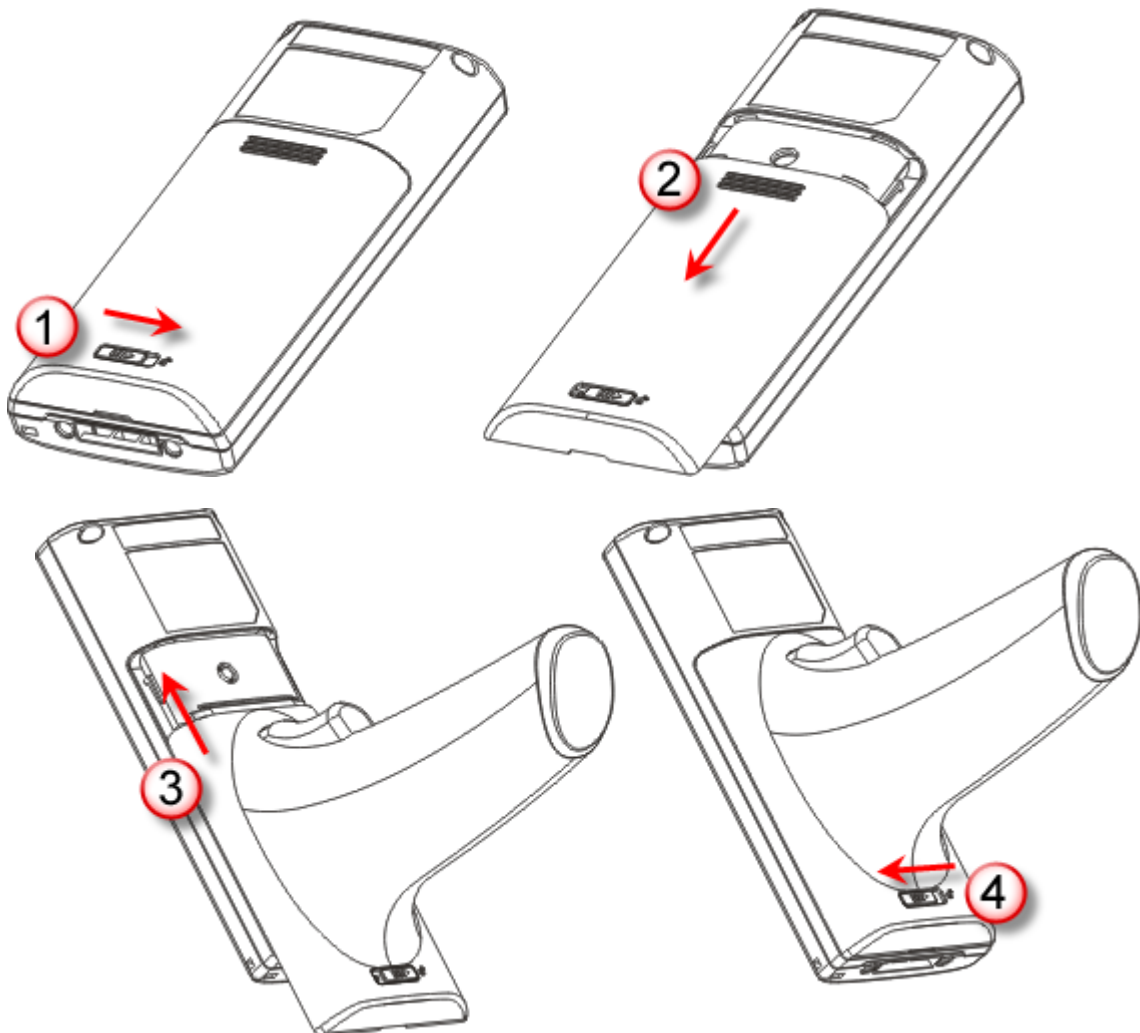
Figure 3: Installing the Pistol Grip

INITIAL CHARGING

The main and backup batteries may not be charged to full for shipment. When you first receive the package, you will need to charge the main battery to full before using the mobile computer.

Note: Battery charging stops when the temperature drops below 0°C or exceeds 40°C. It is recommended to charge the battery at room temperature (18°C to 25°C) for optimal performance. For initial charging, it takes approximately 2.5 hours to charge the battery to full (from the adaptor).

Because the internal backup battery is constantly charged from the main battery, the initial charging requires inserting the battery pack to the mobile computer for charging. This will have both the main and backup batteries charged at the same time. It takes at least 72 hours to fully charge the backup battery. However, it is not necessary to fully charge the backup battery for the mobile computer to work.

Note: In order to charge the backup battery to full, you must insert the main battery and leave it for at least 72 hours, whether the mobile computer is in use or not.

SETTING LOCAL TIME

If you need to set your local time, go to **System Menu** | **2**. **Settings** | **1**. **Clock**. Refer to 錯誤! 找不到參照來源。.

POWER MANAGEMENT

For any portable device, power management is a critical issue especially when you are on the road. Below are some tips to help you save battery power.

Warning: Using backlight, wireless connectivity, and peripherals while on battery power will substantially reduce battery power.

▶ To speed up charging the mobile computer, turn off the mobile computer and use the charging/communication cable.

▶ Bring a second battery pack on the road.

▶ Stop wireless connectivity, Bluetooth or 802.11b/g that is not in use.

▶ Go to **System Menu** | **2**. **Settings** | **2**. **Backlight**, and configure backlight period, luminosity, as well as the shade effect. Refer to 錯誤! 找不到參照來源。.

▶ Go to **System Menu** | **2**. **Settings** | **4**. **Auto Off**, and configure the amount of idle time that must pass before the system will shut down automatically. Refer to 錯誤! 找不到參照來源。.

USING 8200 MOBILE COMPUTER

This chapter explains the features and usage of the 8200 Series Mobile Computer. The 8200 family includes:

▶ 8200   Batch type
▶ 8230   Bluetooth Class 2 + 802.11b/g
▶ 8260   Bluetooth Class 2

IN THIS CHAPTER

1.1 BATTERY

1.1.1 MAIN BATTERY

The mobile computer is powered by a rechargeable 3.7 V/1200 mAh Li-ion battery pack. When the mobile computer is turned on, it takes approx. 2.5 hours to charge it to full from the power adaptor (using cable) or approx. 4 hours from the USB cable (at 500 mA).

For power-saving purpose, always turn off the backlight while working in a well-lit area. When the backlight is on for extended periods of time, the main battery will become low sooner than expected.

The smart battery icon on the LCD screen shows the status of power consumption. There are two ways to monitor a low battery charge or discharged battery from the screen.

▶ Examine the level of the 4-bar battery icon
▶ Monitor voltage level (see 3.5 Power)

1.1.2 BACKUP BATTERY

The backup battery on the main board takes charge when the main battery is removed or drained out. When fully charged, the 3.0 V/18 mAh rechargeable Lithium button cell helps retain data in SRAM and maintain the running of the real-time clock and calendar for at least 25 days without the main battery. In the meantime, you have to replace the main battery as soon as possible. It takes at least 72 hours to fully charge the backup battery. However, it is not necessary to fully charge the backup battery for the mobile computer to work.

▶ Monitor voltage level (see 3.5 Power)

1.1.3 CAUTION OF LOW BATTERY CHARGE

The battery pack is the only power source for the mobile computer to work. It also charges the backup battery on the main board so that the data stored in SRAM can be retained properly. Therefore, when the main battery charge goes low, you need to replace the battery pack with a charged one or charge it as soon as possible. Most of all, you should upload important data on a regular basis.

Warning: Data loss may occur with SRAM during low battery condition. Always save data before running out of power or keep a fresh battery for replacement.

1.2 MEMORY

The collected data can be sent back to a host computer immediately over wireless networks, or stored in memory (SRAM) and upload later. The mobile computer is equipped with a calendar chip for accurate time/date logging. When the main battery is removed or drained, the backup battery on the main board is to retain the contents of SRAM and maintain the running of real-time clock and calendar for at least 25 days, on condition that the backup battery has already been fully charged.

If you want to put away the mobile computer for a couple of days, you should be aware that data loss occurs when both the main and backup batteries discharge completely. Therefore, it is necessary to upload data and files before putting away the mobile computer!

1.2.1 READ-ONLY MEMORY (ROM)

8 megabytes flash memory for storing core, OS, application programs, font, etc.

1.2.2 RANDOM-ACCESS MEMORY (RAM)

Options include 4 or 8 megabytes SRAM for storing data. Its contents will be retained by the backup battery.

1.2.3 SD CARD

Secure Digital (SD) card is a flash memory data storage device. Up to 8 GB high capacity memory card (microSDHC) is supported. Refer to Inserting Battery & Memory Card for how to insert the microSD or microSDHC card. For more details, refer to 1.8 SD Card.

Note: (1) When SD card is present, the card icon will appear on the screen and flash while being accessed.
(2) For an SD card that has never been used on 8200, a message like "Found New SD Card" will be displayed allowing users to scan the card for memory check. If the action is canceled then, memory check can still be performed via System Menu — 錯誤! 找不到參照來源。.

1.3 KEYPAD

The mobile computer is equipped with a keypad of 24 keys for system setup, user entry and so on. The keypad comes with programmable LED backlight, like the screen. Refer to 1.4 LCD for screen & backlight settings.

Silicon rubber has been chosen for their durability and prompt feedback. The key click can be configured through programming or via **System Menu**. Refer to 錯誤! 找不到參照來源。.

1.3.1 24-KEY LAYOUT

The layout of the 24-key keypad is similar to that of a telephone, which includes alphanumeric, navigation and function keys, as well as assorted characters. Refer to Appendix III — 錯誤! 找不到參照來源。 for color-coded keys.
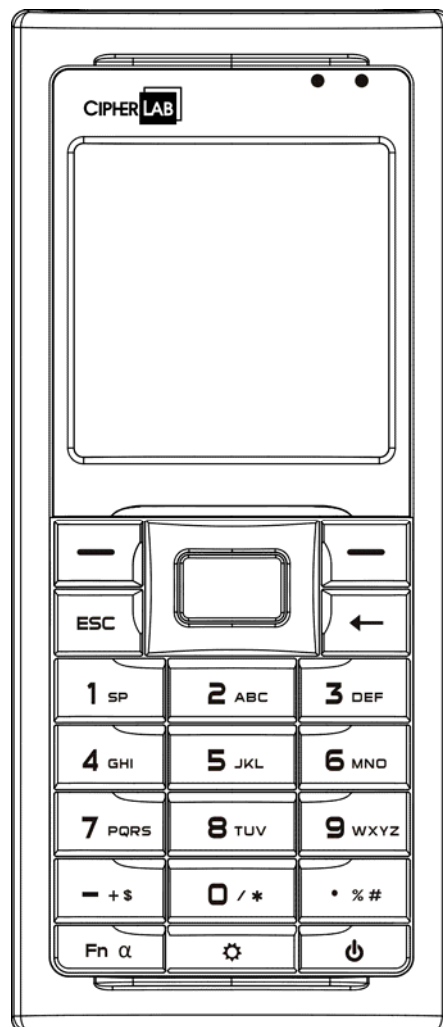

Figure 4: 24-key Layout

This alphanumeric keypad is set to numeric mode by default. The [Fn α] key serves as a toggle among numeric, alpha (lower-case alphabetic), and ALPHA (upper-case alphabetic) input modes, as well as function mode.

Note: It is not necessary to hold down the [Fn α] key.

The associated icon will appear on the lower-left corner of the screen in a sequence as shown below.

Status Icon	Function/Alpha Key	Input Mode
(none)	N/A	Numbers
A	Press [Fn α] one time	Upper-case alphabetic
a	Press [Fn α] two times	Lower-case alphabetic
F	Press [Fn α] three times	Function Mode

When in alpha mode, it takes turns to show alphabets and number when you keep pressing the same key; each press must not exceed one second. For example, keep pressing the number key [2], it will take turns to show "A", "B", "C" or "2" for upper-case, and "a", "b", "c" or "2" for lower-case.

▶ When you first press the number key [2], it will produce the letter "A" or "a".

▶ When you press the number key [2] twice (the time interval must not exceed one second), it will produce the letter "B" or "b".

▶ When you press the number key [2] three times (the time interval between each press must not exceed one second), it will produce the letter "C" or "c".

▶ When you press the number key [2] four times (the time interval between each press must not exceed one second), it will produce the number "2".

In order to get the desired character, you will need to press the same key, one to four times (the time interval between each press must not exceed one second). Only when you stop pressing the same key for longer than one second or you press another key, will the system send the real key code to the application program.

When in function mode, the [Fn α] key works with a number key. Press the [Fn α] key three times, and its associated icon **F** will be displayed on the screen. Press the second key, say [5], to complete the key combination and access the function [F5]. Press [Fn α] again and the icon **F** will go off.

Below briefly describes the functions of common keys on the mobile computer.

SCAN

The yellow key is used to work as the ENTER key by default.

▶ When the reader function is enabled, this yellow key is set to trigger the scan engine so that it can read a barcode.

ENTER

The two keys on each upper side of the **SCAN** key are user-friendly and convenient for either right-handed or left-handed operator. Normally, it is used for command execution or input confirmation.

ESC (Escape)

This key is on the left lower side of the **SCAN** key. Normally, it is used to stop and exit the current operation.

Navigation Pad

The 4-way navigation pad around the **SCAN** key is used to move the cursor left, up, down, or right.

▶ While pressing [✿], they can be used to adjust the luminosity and contrast of the screen backlight.

Backspace

This key is **Backspace** by default. If this key is being held down for more than one second, a `clear` code will be sent.

Function/Alpha Key

This key is a modifier key that requires pressing a second key to get the yellow-coded letter (A~Z) or symbol printed above the second key, or the function (F0~F9) of the second key.

Icon	Description
A	This icon appears when you press the [Fn α] key one time, indicating it is set to alphabetic mode for typing upper-case alphabetic letters.
a	This icon appears when you press the [Fn α] key two times, indicating it is set to alphabetic mode for typing lower-case alphabetic letters.
F	This icon appears when you press the [Fn α] key three times, indicating it is set to the function mode. Then, press another key ([0] ~ [9]) to get the desired function. ▶ To get the value of another key combination modified by the function key, keep pressing another key ([0] ~ [9]) to produce the result. ▶ To exit the function mode, press [Fn α] again and the icon will go off.

Backlight Configuration Key

This key is used to turn ON/OFF the backlight of the LCD and keypad. Also, while pressing [⚙], the navigation keys can be used to adjust the luminosity and contrast of the screen backlight.

Key	Description
[⚙] + [Right]	Press these keys at the same time to increase the contrast.
[⚙] + [Left]	Press these keys at the same time to decrease the contrast.
[⚙] + [Up]	Press these keys at the same time to increase the luminosity.
[⚙] + [Down]	Press these keys at the same time to decrease the luminosity.

Power Key

In order to prevent an accidental press of the POWER key, you need to hold down this key for approximately 1.5 seconds to turn ON/OFF the mobile computer.

Note: (1) Functionality of keys is application-dependent. The system will send the associated key code to the application program, and it is up to the application program to interpret the key code.
(2) When a status icon appears on the screen, it indicates a certain mode is activated and it is not necessary to hold down the modifier key.

1.4 LCD

The mobile computer comes with a FSTN graphic LCD, 160 by 160 pixels resolutions, which can be programmed to display text or graphics, such as specific font and company logo, to meet varying application needs.

Options	Font Size (pixels)	Characters by lines
English font	Font size 6×8 (pixels)	26 characters by 18 lines
	Font size 8×16 (pixels)	20 characters by 9 lines
Chinese font	Font size 12×12 (pixels)	13 characters by 12 lines
	Font size 16×16 (pixels)	10 characters by 9 lines
Other language fonts, company logo…	Programmable	

Note: The bottom line (ICON_ZONE) is reserved to display status icons, such as the battery icon.

1.4.1 ADJUSTING THE BACKLIGHT

The backlight of screen and keypad helps ease reading under dim environments. It can be turned on and adjusted decreasingly or increasingly by the following key combinations. Keep pressing the key combination until the luminosity or contrast is decreased or increased to a desired level. Alternatively, the luminosity and contrast can be configured through programming or via **System Menu**. Refer to 錯誤! 找不到參照來源。 and 錯誤! 找不到參照來源。 .

Note: Using backlight while on battery power will substantially reduce battery power. We suggest that you dim the backlight while working in a well-lit area or have it set to be automatically turned off when not in use.

Key Combination	Action
[✿]	Toggle ON/OFF the backlight
[✿] + [Up]	Turn ON the backlight and increase the luminosity of LCD
[✿] + [Down]	Turn ON the backlight and decrease the luminosity of LCD
[✿] + [Right]	Turn ON the backlight and increase the contrast of LCD
[✿] + [Left]	Turn ON the backlight and decrease the contrast of LCD

Note: Hold down the first key, and keep pressing the second key for adjustment.

1.5 NOTIFICATIONS

1.5.1 STATUS LED

There are two dual-color LED indicators above the screen. Both can be programmed to provide information that helps diagnosing. For example, if you are using AG runtime, you will be informed of the scanning result immediately. LED1 is used for "Good Read" and will become solid green upon reading a barcode successfully.

▶ LED1 is used to provide information on the charging status and barcode decoding.
▶ LED2 is used to provide information on wireless communications.
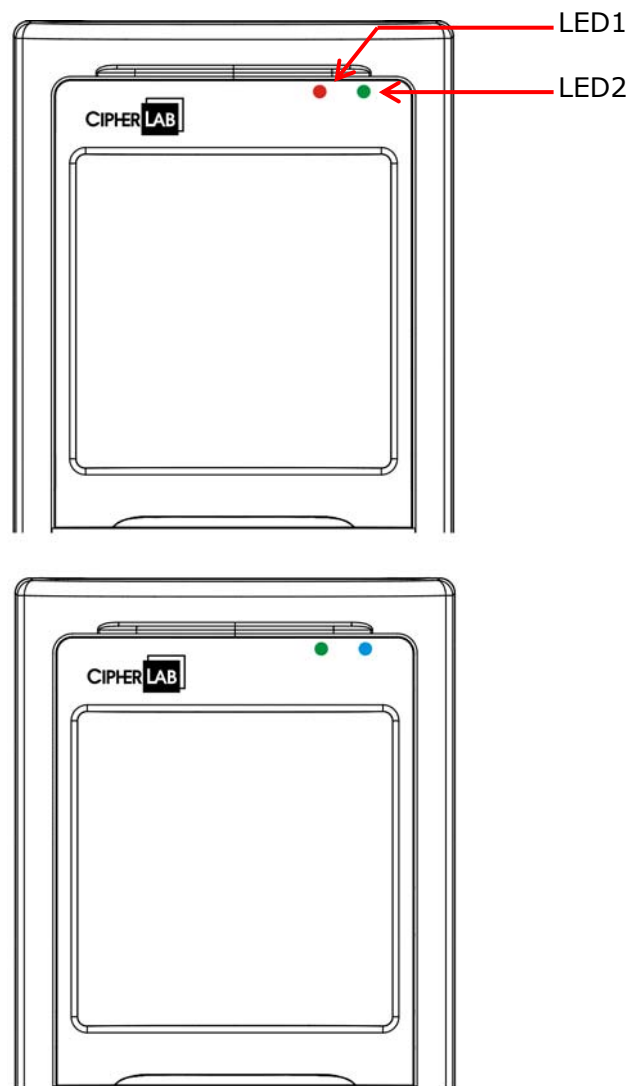
Figure 5: LED Indicators

LED1: Red/Green	Red	Green
User Power ON	User definable	User definable ▸ Solid green for Good Read by default
Power Off, Battery Charging	System default ▸ Flashing red: Charging	System default ▸ Flashing green: Charging done
Charging Error	System default ▸ Flashing red and green: Charging error occurs	

LED2: Blue/Green	Blue	Green
Bluetooth	System default ▸ Flashing blue, quickly: Waiting for connection or connecting ▸ Flashing blue, slowly: Connected	---
Wi-Fi	---	System default ▸ Flashing green, quickly: Waiting for connection or connecting ▸ Flashing green, slowly: Connected

1.5.2 AUDIO

The mobile computer has a mono or stereo speaker at the bottom, which can be programmed for status feedback. It is used to play sounds for events in the programs, or play audio files such as .WAV files. Its volume can be configured through programming or via **System Menu**. Refer to 錯誤! 找不到參照來源。. In particular, its frequency and duration are software programmable for Good Read in the provided terminal emulation programs. In noisy environments, you may consider connecting to a Bluetooth headset instead.

1.5.3 VIBRATOR

The mobile computer is integrated with a vibrator, which can be programmed for status feedback. It can be helpful when working in noisy environments. In particular, the vibrator is software programmable for Good Read in the provided terminal emulation programs.

1.6 DATA CAPTURE

A wide variety of scan engines is available for delivering flexibility to meet different requirements. Depending on the scan engine integrated, the mobile computer is capable of scanning barcodes of a number of symbologies that are enabled by default while running the preloaded AG runtime. Refer to 3.3.1 Reader for functional test.

If you need to scan barcodes that are encoded in a symbology, which is disabled by default in AG runtime, **FORGE Application Generator** (ForgeAG.exe) allows configuring symbology settings, as well as reader settings. First, enable the desired symbologies, and then, download the application settings to the mobile computer.

Note: For details on configuring reader and symbology settings, please refer to the documentation of the software you use.

Varying by the scan engine installed, the supported symbologies are listed below.

▸ 1D CCD scan engine
▸ 1D Laser scan engine
▸ 2D scan engine

Note: In AG or CipherNet runtime, not all of the symbologies are enabled by default. Instead of running any of them, you can develop your own applications to control the scan engine for data collection.

Symbologies Supported (Default Setting: Enable/Disable)		CCD/Laser	2D
Codabar		Enabled	Enabled
Code 11			Enabled
Code 93		Enabled	Enabled
Composite Code	CC-A/B		Disabled
	CC-C		Disabled
	TCIF Linked Code 39		Enabled
MSI		Disabled	Enabled
Plessey		Disabled	
Postal Codes			Enabled
Telepen		Disabled	
Code 128	Code 128	Enabled	Enabled
	GS1-128 (EAN-128)	Enabled	Enabled
	ISBT 128	Enabled	Enabled
Code 2 of 5	Industrial 25 (Discrete 25)	Enabled	Enabled
	Interleaved 25	Enabled	Enabled
	Matrix 25	Disabled	Disabled

	Chinese 25		Disabled
	Coop 25	Disabled	
Code 3 of 9	Code 39	Enabled	Enabled
	Trioptic Code 39		Disabled
	Italian Pharmacode (Code 32)	Disabled	Disabled
	French Pharmacode	Disabled	
EAN/UPC	EAN-8	Enabled	Enabled
	EAN-8 Addon 2	Disabled	Disabled
	EAN-8 Addon 5	Disabled	Disabled
	EAN-13	Enabled	Enabled
	EAN-13 & UPC-A Addon 2	Disabled	Disabled
	EAN-13 & UPC-A Addon 5	Disabled	Disabled
	Bookland EAN (ISBN)	Disabled	Disabled
	UPC-E0	Enabled	Enabled
	UPC-E1	Disabled	Disabled
	UPC-E Addon 2	Disabled	Disabled
	UPC-E Addon 5	Disabled	Disabled
	UPC-A	Enabled	Enabled
GS1 DataBar (RSS)	GS1 DataBar Omnidirectional (RSS-14)	Disabled	Enabled
	GS1 DataBar Truncated	Disabled	Enabled
	GS1 DataBar Stacked	Disabled	Enabled
	GS1 DataBar Stacked Omnidirectional	Disabled	Enabled
	GS1 DataBar Limited (RSS Limited)	Disabled	Enabled
	GS1 DataBar Expanded (RSS Expanded)	Disabled	Enabled
	GS1 DataBar Expanded Stacked	Disabled	Enabled
2D Symbologies	PDF417		Enabled
	MicroPDF417		Enabled
	Data Matrix		Enabled
	Maxicode		Enabled
	QR Code		Enabled

1.7 CHARGING & COMMUNICATIONS

Normally, the mobile computer ships with a USB cable for charging and communications.

USB Interface Cable

Task	USB Cable
Charging	USB direct charging ▶ 500 mA: USB icon ▶ 100 mA: Highlighted USB icon ▶ 0 mA: Disable charging for 8200 5 V charging from the adaptor (Plug icon)
Communications	USB Virtual COM — If using FORGE Application Generator software, you may use a download utility to receive data on your computer; otherwise, run HyperTerminal.exe to receive data directly. USB HID — Run a text editor on your computer to receive data directly. USB Virtual COM_CDC — If using FORGE Application Generator software, you may use a download utility to receive data on your computer; otherwise, run HyperTerminal.exe to receive data directly.

Note: (1) If you are using USB Virtual COM for the first time, you must install its driver from the CD-ROM. Driver version 5.3 or later is required. Please remove older versions! The virtual COM port will not be assigned until the USB port is in use.
(2) If you are using USB Virtual COM_CDC for the first time, you must install its driver from the CD-ROM. USB CDC driver installer is available in the "Windows" folder, which will copy a vendor-supplied INF file to Windows.
(3) For Standard USB cable, it will release COM port in the following conditions: (i) detach the cable from the mobile computer directly。

1.7.1 INTERFACE CABLE OPTIONS

For charging via the USB cable, the standard charging current is 500 mA. However, we recommend you to connect the power adaptor to speed up charging the battery.

▸ If you connect the mobile computer to a USB hub, the charging current may be insufficient. In that case, change the charging current to 100 mA after connecting the USB cable. It will take a longer time to charge to full. Refer to 錯誤! 找不到參照來源。.
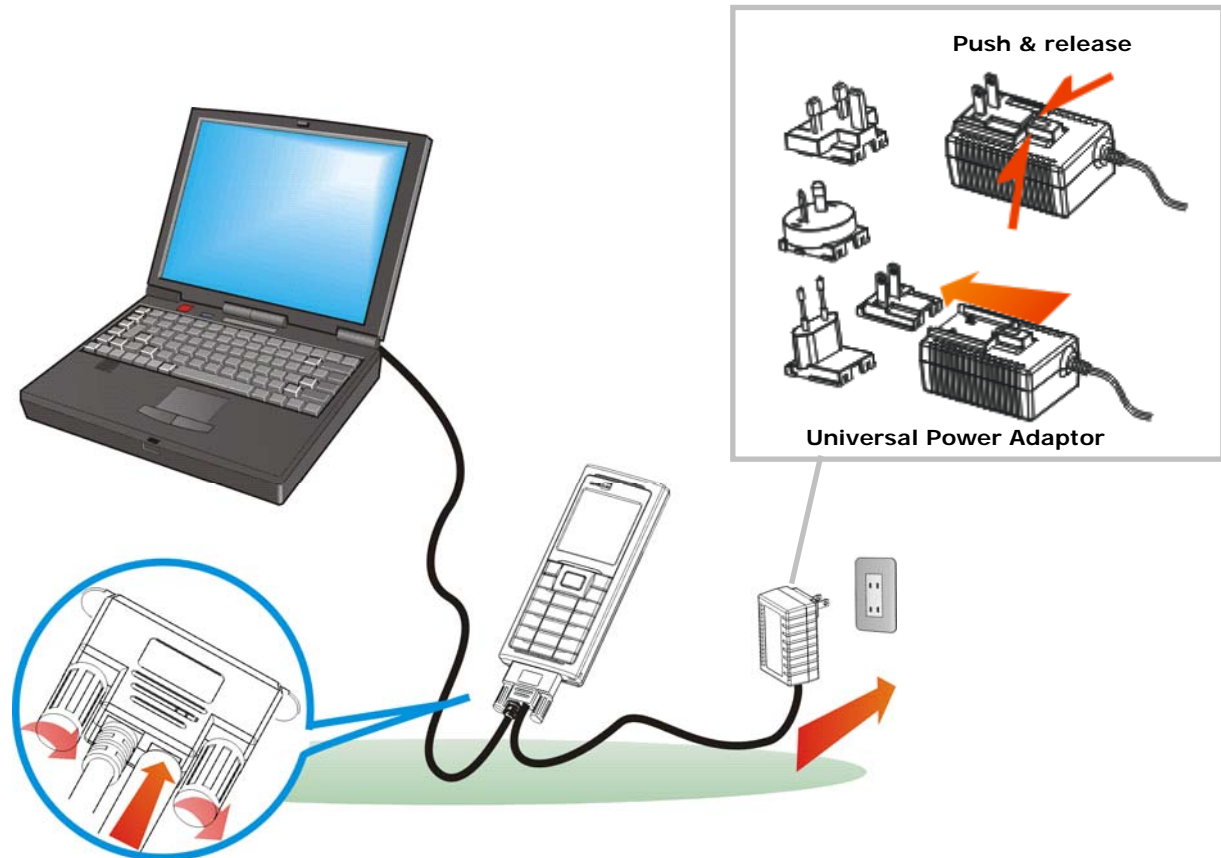

Figure 6: Using USB cable

Warning: The mobile computer is not allowed to function when it is solely on USB power and without a battery loaded. It will display a warning message "Battery Missing" along with an audible alert. In that case, you should install the battery before restarting.

1.8 SD CARD

SD card can be accessed directly by using the provided functions in user application. Yet, when 8200 is equipped with SD card and connected to your computer via the USB cable, it can be treated as a removable disk (USB mass storage device) as long as it is configured properly through programming or via **System Menu | 8. Next Page | 1. SD Card Menu | 1. Run As USB Disk**. Refer to 錯誤! 找不到參照來源。.

Note: (1) DAT files created on SD card by previous BASIC runtime are not compatible in file format with new BASIC runtime, starting from version 1.10.
(2) While running BASIC application, the size of DAT files on SD card can be calibrated. Go to **System Menu | 8. Next Page | 1. SD Card Menu | 2. Access SD Card | 4. Check File Size** to refresh the size of "A:\BASICRUN\TXACTn.DAT" (n=1~6).

1.8.1 FILE SYSTEM

For 8200 Series, it supports FAT12/FAT16/FAT32 and allows formatting the card through C programming or via **System Menu | 8. Next Page | 1. SD Card Menu | 2. Access SD Card**. Based on the capacity of the card, it will automatically decide the FAT format:

Card Capacity	FAT Format	Sectors per Cluster
$\leq$ 32 MB	FAT12	32
$\leq$ 1 GB	FAT16	32
$\leq$ 2 GB	FAT16	64
$\leq$ 8 GB	FAT32	8

1.8.2 DIRECTORY

Unlike the file system on SRAM, the file system on SD card supports hierarchical tree directory structure and allows creating sub-directories. Several directories are reserved for particular use.

Reserved Directory	Related Application or Function	Remark
\Program	▶ System Menu | Load Program ▶ Program Manager | Download ▶ Program Manager | Activate ▶ Kernel Menu | Kernel Update ▶ UPDATE_BASIC()	Store programs to this folder so that you can download them to 8200: ▶ C program — *.SHX ▶ BASIC program — *.INI and *.SYN

\BasicRun	BASIC Runtime	Store DAT and DBF files that are created and accessed in BASIC runtime to this folder.
		Their permanent filenames are as follows:

		DAT Filename		
		DAT file #1	TXACT1.DAT	
		DAT file #2	TXACT2.DAT	
		DAT file #3	TXACT3.DAT	
		DAT file #4	TXACT4.DAT	
		DAT file #5	TXACT5.DAT	
		DAT file #6	TXACT6.DAT	
		DBF Filename		
		DBF file #1	Record file	F1.DB0
			System Default Index	F1.DB1
			Index file #1	F1.DB2
			Index file #2	F1.DB3
			Index file #3	F1.DB4
		DBF file #2	Record file	F2.DB0
			System Default Index	F2.DB1
			Index file #1	F2.DB2
			Index file #2	F2.DB3
			Index file #3	F2.DB4
		DBF file #3	Record file	F3.DB0
			System Default Index	F3.DB1
			Index file #1	F3.DB2
			Index file #2	F3.DB3
			Index file #3	F3.DB4
		DBF file #4	Record file	F4.DB0
			System Default Index	F4.DB1
			Index file #1	F4.DB2
			Index file #2	F4.DB3
			Index file #3	F4.DB4
		DBF file #5	Record file	F5.DB0
			System Default Index	F5.DB1
			Index file #1	F5.DB2
			Index file #2	F5.DB3
			Index file #3	F5.DB4

\AG\DBF \AG\DAT \AG\EXPORT \AG\IMPORT	Application Generator (a.k.a. AG)	Store DAT, DBF, and Lookup files that are created and/or accessed in Application Generator to this folder.

1.8.3 FILE NAME

A file name must follow 8.3 format (= short filenames) — at most 8 characters for filename, and at most three characters for filename extension. The following characters are unacceptable: " * + , : ; < = > ? | [ ]

▶ On 8200 Series, it can only display a filename of 1 ~ 8 characters (the null character not included), and filename extension will be displayed if provided. If a file name specified is longer than eight characters, it will be truncated to eight characters.

▶ Long filenames, at most 255 characters, are allowed when using 8200 equipped with SD card as a mass storage device. For example, you may have a filename "123456789.txt" created from your computer. However, when the same file is directly accessed on 8200, the filename will be truncated to "123456~1.txt".

▶ If a file name is specified other in ASCII characters, in order for 8200 to display it correctly, you may need to download a matching font file to 8200 first.

▶ The file name is not case-sensitive.

Chapter 2

LEARNING SOFTWARE ARCHITECTURE

This chapter mainly describes the software inside the mobile computer. It consists of three modules — Kernel, System, and Application; each has a function menu.

When a menu is displayed, you may select an item by either of the following ways:

▶ Press the arrow keys [Up] and [Down] to move the highlight bar.

▶ Press the number key that corresponds to the item number.

▶ Follow the on-screen instructions to change a specific setting, or press [ESC] to return to a previous page or menu.
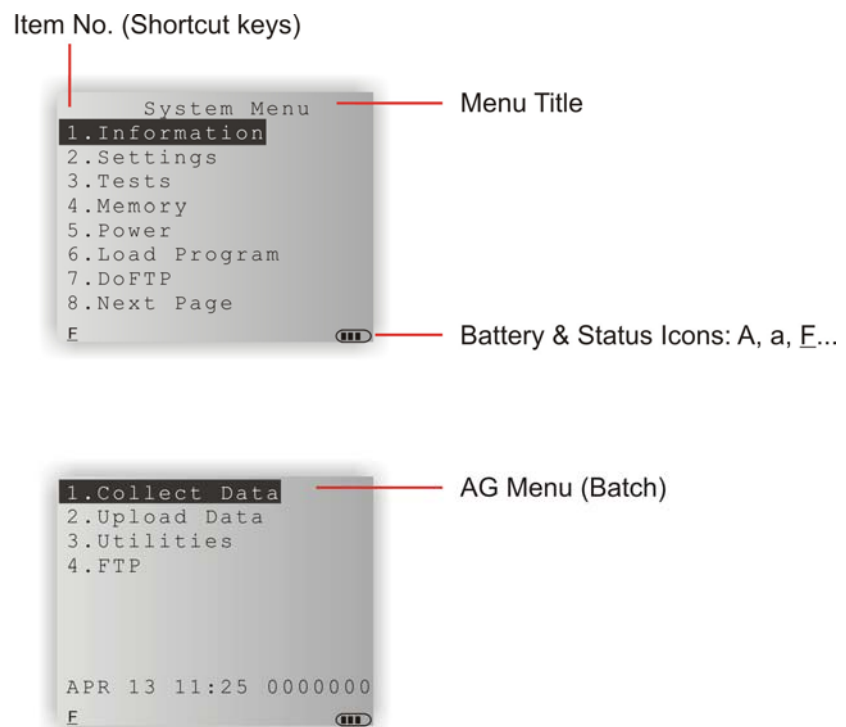
On each screen, the bottom line displays status icons, such as:

▶ The 4-bar battery icon indicates the current power status.

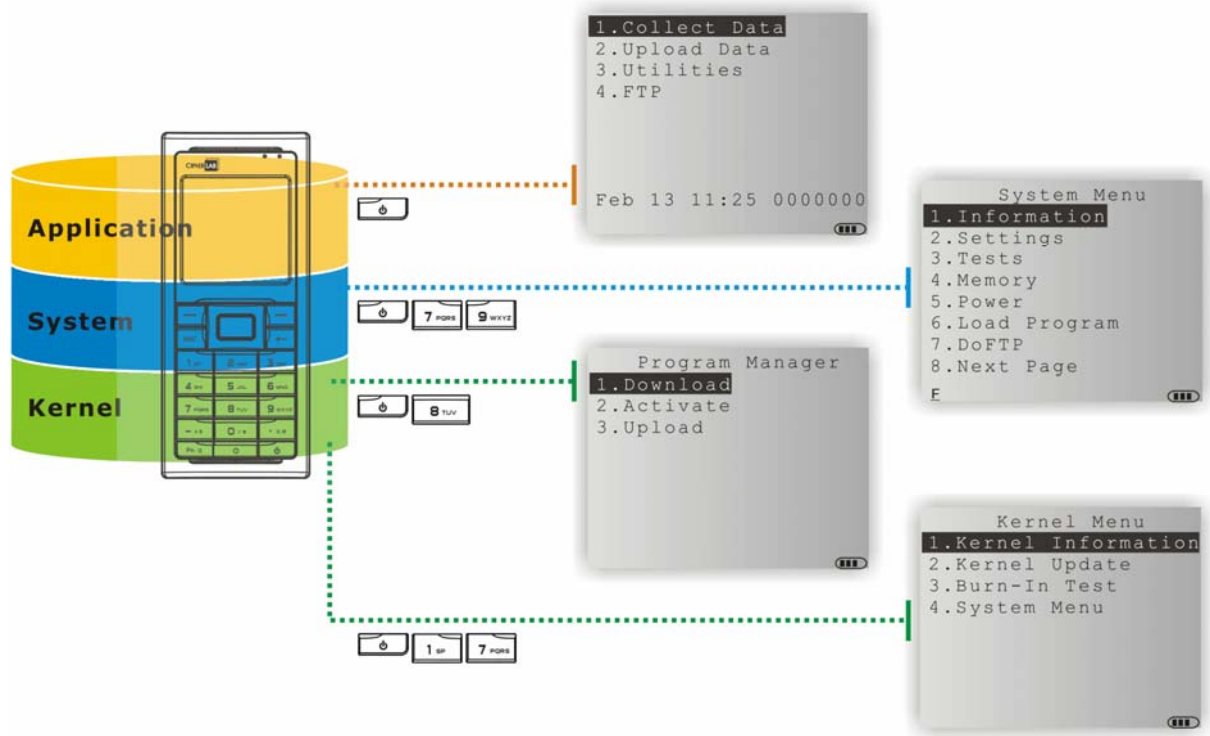▶ The status icon of input mode or function mode is controlled by the [Fn α] key.

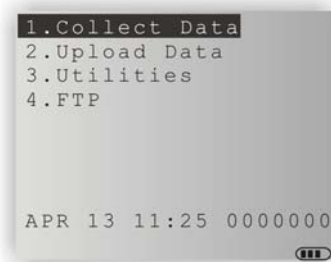*Figure 7: Software Architecture*

IN THIS CHAPTER

2.1 APPLICATION MODULE

The mobile computer ships with software package on the CD-ROM. It includes **FORGE Application Generator** (batch and WLAN versions), **MIRROR Emulator** (VT and 5250 versions), download utilities, etc.
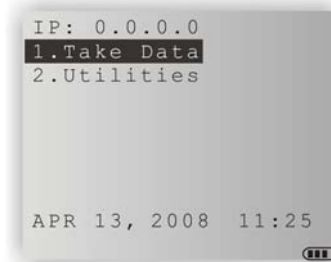
2.1.1 FORGE APPLICATION GENERATOR (AG)

For easy development of applications, the mobile computer is preloaded with AG runtime. When you turn on the mobile computer, it displays the Main Menu of AG application, as shown below.

Batch AG

```
1.Collect Data
2.Upload Data
3.Utilities
4.FTP



APR 13 11:25 0000000
```

WLAN AG

```
IP: 0.0.0.0
1.Take Data
2.Utilities



APR 13, 2008  11:25
```

Note: Batch AG supports automatically uploading data to a host computer when the upload interface is properly configured. Once the mobile computer is connected via the USB Virtual COM cable, there will be a moving hourglass icon displayed on the upper-right corner of the screen, indicating the mobile computer is ready for auto upload.

Before using the mobile computer to collect data, you need to configure the application with the companion tool on your computer. This time-saving development tool helps create application templates on your computer.

For details on the AG application, please refer to separate user manual.

Application Generator	AG Runtime	Companion Tool on PC End
Batch AG	U8200.SHX	ForgeAG.exe
WLAN AG	WU8200.SHX	AG8200WLAN.exe

Note: FORGE Application Generator (AG) software package includes
(1) a companion tool for quickly developing your application — Batch or WLAN AG;
(2) several download utilities to make it versatile in use.

2.1.2 MIRROR EMULATOR (CIPHERNET)

The mobile computer supports VT100/220 and IBM 5250 terminal emulation for accessing a backend database. Instead of using **FORGE Application Generator**, you may download the terminal emulation program, i.e. CipherNet Runtime, to the mobile computer. Refer to 錯誤! 找不到參照來源。. Then, run individual companion tool on your computer.

For details on the **MIRROR Emulator** application, please refer to separate user manuals.

Terminal Emulation	CipherNet Runtime	Companion Tool on PC End
VT100/220	82xx-VT.SHX	CipherNet-VT.exe
IBM 5250	82xx-5250.SHX	CipherNet-5250.exe

2.1.3 USER PROGRAM

You may need to develop your own application program. For developing custom applications, CipherLab provides BASIC and C compilers through licensing. For detailed information, please contact your sales representative.

2.2 SYSTEM CONFIGURATION & CORE

For managing system configurations and multiple programs, each mobile computer comes with **System Menu**, **Program Manager**, and **Kernel Menu**. Refer to the following chapters on how to configure the 8200 Series Mobile Computer, regarding system configurations and program download.

2.2.1 SYSTEM MENU

System Menu is bundled with BASIC Runtime or user programs that are written in "C". It is provided for system configuration, functionality testing, downloading font file and program.

2.2.2 KERNEL

Kernel is the innermost core of the OS. It provides services for updating the kernel and bootloader, and repairing the system.

2.2.3 PROGRAM MANAGER

Program Manager is part of the kernel. You may download as many as seven application programs.

SPECIFICATIONS

Model Designation		8200	8230	8260	
Wireless Communications	Bluetooth Class 2	–	√	√	
	802.11b/g	–	√	–	
Readers	Barcode Reader	▸ CCD (linear imager) ▸ Standard Laser ▸ 2D Imager			
Electrical Characteristics	Main Battery	Rechargeable Li-ion battery – 3.7 V, 1200 mAh			
	Working Time	Laser, one scan per 5 seconds, without backlight: ▸ 124 hours in batch mode ▸ 40 hours in Bluetooth mode (8260 in power saving mode) ▸ 20 hours in Wi-Fi mode (1 broadcast packet per second)			
	Backup Battery	▸ Rechargeable Lithium button cell – 3.0 V, 18 mAh ▸ Data retention – at least 25 days			
	Power Adaptor	▸ Input: AC 100~240 V, 47/63 Hz ▸ Output: DC 5 V, 3 A ▸ Operating Temperature: 0 °C to 40 °C			
Physical Characteristics	CPU	32-bit Toshiba CMOS type, 60 MHz			
	Memory	▸ Program memory – 8 MB flash ▸ Data memory – onboard SRAM, options include 4 or 8 MB			
	Display	Graphic LCD, 160 x 160 pixels, FSTN with LED backlight programmable ▸ Font size 6x8: 26 characters by 18 lines ▸ Font size 8x16: 20 characters by 9 lines ▸ Font size 12x12: 13 characters by 12 lines ▸ Font size 16x16: 10 characters by 9 lines			
	Keypad	24 rubber keys, LED backlight programmable			
	Indicators	Two dual-color LEDs – red/green and blue/green, programmable			
	Vibrator	0.45G, programmable			
	Audio	Integrated with one mono or stereo speaker ▸ Bluetooth headset supported			
	Expansion Slot	microSDHC, up to 8 GB			

	Enclosure Material	Rubber & ABS plastic	
	Dimensions	CCD:	136 mm (L) 58 mm (W) 25 mm (H)
		Laser/2D:	136 mm (L) 58 mm (W) 32 mm (H)
	Weight	Approx. 150 g (Laser, battery included)	
Environmental Characteristics	Temperature	Operating:	-10 °C to 60 °C
		Storage:	-20 °C to 70 °C
		Charging:	-10 °C to 40 °C
	Humidity	Operating:	10% to 90% non-condensing
		Storage:	5% to 95% non-condensing
	Impact Resistance	1.2 m, 5 drops per 6 sides	
	Tumble Test	1000 times at 1 meter	
	Splash / Dust Resistance	IP 52	
	Electrostatic Discharge	± 15 kV air discharge, ± 8 kV contact discharge	
Programming	Development Tools	C and BASIC	
	Software & Utilities	FORGE Application Generator (AG), AG utilities;	
		MIRROR Emulator (CipherNet) for VT100/220, IBM 5250 emulation;	
		Download utilities, testing tools, etc.	
Accessories		▶ Pistol Grip ▶ Spare rechargeable battery pack	