

CASIO
IT-300 Series
Software Manual

(Version 1.01)

CASIO Computer Co., Ltd.

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Editorial Record

[illegible]

Preview

The features and specifications described in this reference manual give you the functional detail of the software integrated in the IT-300 series handheld terminals with Microsoft Windows Embedded Handheld 6.5 OS.

1. Product Overview

1.1 Model by Feature

The major features integrated in each model of the IT-300 series are shown below.

Table 1.1 List of available models

Model no.	Scanner	Extension slot	WLAN (802.11 b/g)	Bluetooth	Remarks
IT-300-15E	Laser	microSD	Yes	Yes	
IT-300-15C-CN	Laser	microSD	Yes	Yes	Chinese OS
IT-300E-35E*	Linear	microSD	--	Yes	

Notes

- “-CN” in the “Model no.” box denotes that the model is dedicated for China only.
- Model with “*” at its model number is for USA and Canada only.

1.2 Available Options

The following dedicated options are available for IT-300 series.

Table 1.2 List of options

Option	Product	Model no.	Remark
USB Unit		HA-J65US HA-J65US-CN	for China
Mini USB cable		HA-J80USBM HA-J80USBM-CN	for China
Mini USB Host conversion cable		HA-J81USBH HA-J81USBH-CN	for China
Battery Pack		HA-D20BAT-A HA-D20BAT-A-CN	for China
Dual Battery Charger		HA-D32DCHG HA-D32DCHG-CN	for China
AC adaptor for Dual Battery Charger (for HA-D32DCHG)		AD-S42120B-N AD-S42120BE-CN	without power cable accompanied for China
AC adaptor for USB Unit (for HA-J65US)		AD-S15050B-N AD-S15050BE-CN	without power cable accompanied for China
Screen Protect Sheet		HA-J90PS5	
Power Cable (for AD-S42120B-N, AD-S15050B-N)		AC-CORD-EU	for Europe
		AC-CORD-US	for USA/Canada
		AC-CORD-TW	for Taiwan
		AC-CORD-KR	for Korea
		AC-CORD-AU	for Australia/New Zealand

Note:

“-CN” in the “Model no.” box denotes that the model is dedicated for China only.

2. Functions

This chapter describes about detailed specifications of the functions implemented in the terminal and the dedicated options.

2.1 Basic Specifications

This chapter describes about the basic specifications of the functions implemented in the terminal.

2.1.1 Windows Embedded Handheld 6.5

The terminal integrates Microsoft® Windows Embedded Handheld 6.5 as its operating system. The operating system features with the following capabilities.

- Windows CE 5.0 based kernel
- Improved virtual memory control method
- UI with new touch panel
- MyPhone service which can synchronize and share schedule, contacts, and pictures via WEB
- Marketplace which can search and purchase mobile application
- InternetExploreMobile6 (based on IE6.0)
- RemoteDesktopMobile
- Open environment to easy development
- High speed processing possible due that many programs such as the OS module, the basic driver, and font file, etc. required for applications to run are transferred to the RAM from NAND disk.

Other Microsoft applications such as PocketWord and PocketExcel are not bundled.

2.1.2 Display

Basic Specifications

The VGA (480 x 640 dots) display mode is supported in the terminal.

Table 2.1

Specification		65,536 colors 2-way TFT LCD* (16 bpp, Red: 5 bits, Green: 6 bits, Blue: 5 bits)
Display size (Large)	X direction	480 dots
	Y direction	640 dots

Switching VGA and QVGA

The Windows Embedded Handheld OS integrated in devices including the Casio IT-300 cannot switch the display mode, from VGA to QVGA and vice versa, due to Microsoft requirement. This limits that the display resolution with the OS is VGA mode only.

However, the Windows Embedded Handheld OS features extended display function which offers various display modes detailed in the table.

Table 2.2

Specification of Display Resolution in Application		Display condition
Not specified		Display in QVGA mode with doubled size in X and Y directions.
Yes, specified	QVGA	Display in QVGA mode with doubled size in X and Y directions.
	VGA	Display in VGA mode as is.

Backlight Brightness

- Brightness of the backlight can be adjusted at the Control Panel, or using the relevant functions of the System Library.
- Brightness setting can be made in one of nine grades for power source either when the power is provided by an external power supply (by AC Adaptor connected via cradle, or AC Adaptor directly connected) or when the power is provided by the installed lithium-ion battery pack.
- Brightness setting can be made in application by using **ExtEscape()API** function.
- If the brightness is set to 1 (minimum), the backlight is turned off.
- With the power source by the installed lithium-ion battery pack, the system automatically controls the brightness at 50% level to curb power consumption. This does not require the running application to aware of the brightness control.
- The default is 9 (maximum) when an external power source is used or 7 when the lithium-ion battery pack is used.

The functions of the System Library relevant to the Backlight Brightness are as follows.

- SysGetBLBattery** : Retrieves brightness of the screen when the power is supplied by battery pack.
- SysSetBLBattery** : Sets up brightness of the screen for the power source supplied by battery pack.
- SysSetBLExpower** : Sets up brightness of the backlight for the power source supplied by external power.
- SysGetBLExpower** : Retrieves brightness of the backlight when the power is supplied by external power.
- SysGetBLMaximum** : Retrieves the maximum value of brightness for the backlight.

Backlight Auto Dimming

The Backlight at the Control Panel can be used to set up whether or not the Auto Dimming function is used and the waiting time until when dimming begins. The auto dimming is set effect only when the power is provided by the lithium-ion battery pack. It will not activate when an external power supply is used.

- If the terminal is left unused in idle state - absolutely no key input is made - while the power is turned on, the backlight will be automatically dimmed to save the power after a given period of time has been elapsed.
- While the terminal is being in the auto dimmed state, pressing key disables the auto dimming function and then resumes the ordinary brightness.
- While the Auto Dimming function has been set effect, the brightness can be set in one of eight grades. The default is 3. During the Auto Dimming function being set effect, the brightness cannot be set any brighter than the brightness illuminated by the backlight. The defaults are “Enable the auto dimming function” and “30 seconds” for waiting time period until when the Auto Dimming function activates.

Auto Backlight OFF

The Backlight at the Control Panel can be used to set up whether or not the Auto Backlight OFF function will be used and the waiting time until when the Auto Backlight OFF function activates. The Auto Backlight OFF function is operable for both when the power is provided by an external power source and when it is provided by the lithium-ion battery pack.

- If the terminal is left unused in idle state - absolutely no key input is made - with the power being turned on, the backlight will be automatically turned off to save the power.
- When the terminal is in the Auto Backlight OFF state, pressing a key disables the Auto Backlight OFF function and resumes the ordinary brightness.
- While the power is being provided by the lithium-ion battery pack and both the Auto Dimming function and the Auto Backlight OFF function have been set effect, either one of the functions with preset time period shorter than the other will have the priority. The default is “Enable the Auto Backlight OFF function” and “1 minutes for the waiting time” until when the Auto Backlight OFF function activates.

Flipping Display Screen

Flipping display screen at 90, 180 or 270 degree is supported.

- The relevant functions of the System Library can be used to set up an angle to flip the screen in application.
- With **ChangeDisplaySettingEx() API** function, flipping display screen at 90, 180 or 270 degree can be set in application.

See Microsoft Help for detail about **ExtEscape()** and **ChangeDisplaySettingEx() API** functions.

The functions of the System Library relevant to the Flipping Display Screen are as follows.

SysSet180Rotate : Sets up angle to flip the screen.

SysGet180Rotate : Retrieves the status of angle for flipping the screen.

Restrained Backlight Brightness by Temperature Sensor

When temperature in the terminal becomes extremely high, the backlight brightness is restrained. There are two stages to restrain the brightness. In first stage, setting up the brightness is limited to the range of 1 to 7 instead of the range 1 to 9. In second stage, setting up the brightness is further restrained to the range of 1 to 5.

If the brightness set in ordinary brightness or in a specific range with the Auto Dimming function (effect only when power source is supplied by the lithium-ion battery pack) is any brighter than the limited range affected by high temperature, the brightness is automatically adjusted to the maximum brightness in the limited range. However, the brightness resumes automatically its brightness when the temperature becomes lower.

2.1.3 Touch Panel

An input can be made to any portion of the touch panel. The touch panel has the following resolutions.

Table 2.3

High Resolution	X direction	480 dots
	Y direction	640 dots

- Capturing touch coordinates in X and Y directions and controlling the pointing are possible by application. Prior to using the touch panel for the very first time, calibrating the touch panel is required.

Tap Sound

The Control Panel can be used to set up tap sound in mute, low or loud.

Tap and Hold

By tapping and holding a specific object on the screen, the related pop-up menu appears.

Flipping Touch Panel Coordinates

When the screen flips, the coordinates of the touch panel also flip in unison.

Calibrating Touch Panel

Calibration on the touch panel can be initiated either using the Welcome wizard appeared after disk clean or by simultaneously pressing Fn and 4 keys.

The touch panel may require a periodical calibration if it slips off due to aged deterioration, voltage fluctuation, temperature change, etc. If it occurs on the screen of your terminal, perform the calibration by initiating one of the methods.

2.1.4 Keys

Keyboard Layout

The following is the keyboard layout employed in the terminal.

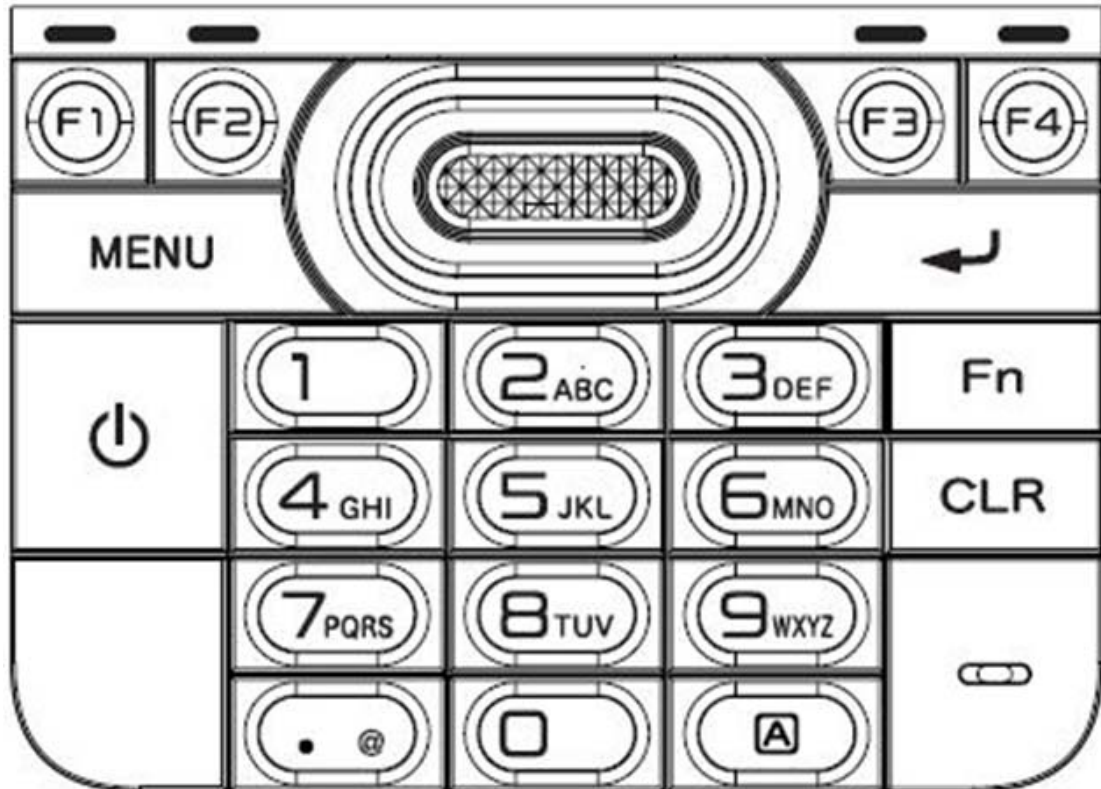


Figure 2-1

Key Assignments

The following are the key codes and function assignments.

Table 2.4 Control keys



KEY	Input mode		Operation	Remarks
Fn	---		Specialized key operation (toggle).	Fn mode is reset when a subsequent key input is made.
	Character input mode		Changes input mode. Navigate to Numeric → Alphabet (uppercase) → Alphabet (lowercase).	
	Fn mode		Changes input mode. Navigate to Numeric → Alphabet (lowercase) → Alphabet (uppercase).	
CLR	Character input mode	l	Deletes one character to the left.	
		A	Deletes one character to the left.	
		a	Deletes one character to the left.	
	Function mode	F	Performs as ESC key.	
	Character input mode	l	Performs as Enter key.	
		A	Performs as Enter key.	
		a	Performs as Enter key.	
	Function mode	F	Performs as Shift and Enter keys.	
↑	Character input mode	l	Performs as Cursor up key.	
		A	Performs as Cursor up key.	
		a	Performs as Cursor up key.	
	Function mode	F	Performs as Shift and TAB keys.	
↓	Character input mode	l	Performs as Cursor down key.	
		A	Performs as Cursor down key.	
		a	Performs as Cursor down key.	
	Function mode	F	Performs as TAB key.	
←	Character input mode	l	Perform as “Cursor left key”.	
		A	Perform as “Cursor left key”.	
		a	Perform as “Cursor left key”.	
	Function mode	F	Perform as “Cursor left key”.	
→	Character input mode	l	Perform as “Cursor right key”.	
		A	Perform as “Cursor right key”.	
		a	Perform as “Cursor right key”.	
	Function mode	F	Perform as “Cursor right key”.	
MENU	Character input mode	l		
		A		
		a		
	Function mode	F	Perform the registered application.	

Table 2.5 Function keys

KEY	Input mode		Operation	Remarks
F1	Character input mode	1	VK_F1	Perform left menu of bottom screen.
		A	VK_F1	
		a	VK_F1	
	Function mode	F	VK_F1	
F2	Character input mode	1	VK_F2	Perform right menu of bottom screen.
		A	VK_F2	
		a	VK_F2	
	Function mode	F	VK_F2	
F3	Character input mode	1	VK_F3	
		A	VK_F3	
		a	VK_F3	
	Function mode	F	VK_F3	
F4	Character input mode	1	VK_F4	
		A	VK_F4	
		a	VK_F4	
	Function mode	F	VK_F4	

Table 2.6 Trigger keys

KEY	Input mode		Operation	Remarks
Center Trigger	Character input mode	1	Trigger key (VK_OEM_CTRL)	
		A	Trigger key (VK_OEM_CTRL)	
		a	Trigger key (VK_OEM_CTRL)	
	Function mode	F	Trigger key (VK_OEM_CTRL)	

Table 2.7 Ten key

KEY	Input mode		Operation	Remarks
0	Character input mode	1	Performs as 0 key.	
		A	Performs as “- / ^\&=+%#* space” keys.	
		a	Performs as “- / ^\&=+%#* space” keys.	
	Function mode	F	Toggle the SIP panel	
1	Character input mode	1	Performs as 1 key.	
		A	Performs as “?!()<>[]{}” keys.	
		a	Performs as “?!()<>[]{}” keys.	
	Function mode	F	Turns on or off the backlight.	
2	Character input mode	1	Performs as 2 key.	
		A	Performs as “A”, ”B” and ”C” keys.	
		a	Performs as “a”, ”b” and ”c” keys.	
	Function mode	F	Turns on or off the key backlight	
3	Character input mode	1	Performs as 3 key.	
		A	Performs as “D“, ”E” and ”F” keys.	
		a	Performs as “d”, ”e” and ”f” keys.	
	Function mode	F	Brightens the contrast.	
4	Character input mode	1	Performs as 4 key.	
		A	Performs as “G”, ”H” and ”I” keys.	
		a	Performs as “g”, ”h” and ”i” keys.	
	Function mode	F	Initiates the calibration.	
5	Character input mode	1	Performs as 5 key.	
		A	Performs as “J”, ”K” and ”L” keys.	
		a	Performs as “j”, ”k” and ”l” keys.	
	Function mode	F	Darkens the backlight.	
6	Character input mode	1	Performs as 6 key.	
		A	Performs as “M”, ”N” and ”O” keys.	
		a	Performs as “m”, ”n” and ”o” keys.	
	Function mode	F	Brightens the backlight.	
7	Character input mode	1	Performs as 7 key.	
		A	Performs as “P”, ”Q”, ”R” and ”S” keys.	
		a	Performs as “p”, ”q”, ”r” and ”s” keys.	
	Function mode	F	Initiates the application registered in the registry below. [HKEY_LOCAL_MACHINE \ HARDWARE \ DEVICEMAP \ KEYBD] Fn7LaunchPath:sz (the path of application to initiate.)	

Continue.

Key Click Sound

The key click sound is generated when a key is pressed. However, it is not generated when the key is released or in mid-course of repeating the key input. The Control Panel can be used to set up the sound to mute, low or loud.

Enabling or Disabling Fn Key

For keys that perform specialized operations while the key input mode has been set to Function mode, “Enable” or “Disable” can be set on each individual key in the registry below to control the operations.

[HKEY_LOCAL_MACHINE\HARDWARE\DEVICEMAP\KEYBD]

Or, using the **SysSetFnKeyOperation** function of the System Library can achieve the same control operation explained above.

Table 2.8

Key	Setting Value	Meaning
DisableFn9	dword: 0 or 1	Enable or Disable
DisableFn8	dword: 0 or 1	Enable or Disable
DisableFn7	dword: 0 or 1	Enable or Disable
DisableFn6	dword: 0 or 1	Enable or Disable
DisableFn5	dword: 0 or 1	Enable or Disable
DisableFn4	dword: 0 or 1	Enable or Disable
DisableFn3	dword: 0 or 1	Enable or Disable
DisableFn2	dword: 0 or 1	Enable or Disable
DisableFn1	dword: 0 or 1	Enable or Disable
DisableFn0	dword: 0 or 1	Enable or Disable

The functions of the System Library relevant to the “Enabling or Disabling Fn Key” are as follows.

SysSetFnKeyOperation : Sets up “Enable” or “Disable” for the Fn key operation.


SysGetFnKeyOperation : Retrieves “Enable” or “Disable” status for the Fn key operation.

Function Mode Notification

When the Fn key is pressed, the WM_USER+0x502 message is issued to application. This enables the application to detect whether the Function mode has been set up enabled or disabled.

Enable or Disable the Key


The System Library can be used to make the setting on “Enable” or “Disable” for switching over the key input mode in application.

The functions of the System Library relevant to the “Enable or Disable the  Key” are as follows.

SysSetFnKeyLock : Sets up “Enable” or “Disable” for the Fn key to activate.

SysGetFnKeyLock : Retrieves “Enable” or “Disable” status for the Fn key to activate.

A Key Notification

When the  key is pressed, the WM_USER+0x506 message is issued to application. Using this notification, the application can detect whether the key input mode has been changed.

Enable or Disable Key Locks

The System Library can be used to enable or disable the operations of keys except for the Power and Trigger keys.

The functions of the System Library relevant to the “Permit or Prohibit Key Locks” are as follows.

- SysSetAllKeyLock** : Sets up “Enable” or “Disable” for lock with specified key.
- SysGetAllKeyLock** : Retrieves “Enable” or “Disable” status for lock with specified key.

Keys User Can Set

Initiating application

The following registry can be used to assign any application to the Fn+7, Fn+8 and Fn+9 keys.

[HKEY_LOCAL_MACHINE\HARDWARE\DEVICEMAP\KEYBD]

Table 2.9

Key	Setting Value
Fn7LaunchPath	sz: the full path of target application to initiate.
Fn8LaunchPath	sz: the full path of target application to initiate.
Fn9LaunchPath	sz: the full path of target application to initiate.

- Setting Key Codes

The System Library can be used to assign any key code to all the keys except the Fn key. Setting “Enable” or “Disable” for assigning key code is possible using the System Library.

The functions of the System Library relevant to the “Setting Key Codes” are as follows.

- SysSetNormalUserDefineKey** : Sets up key codes (in normal mode).
- SysGetNormalUserDefineKey** : Retrieves key codes (in normal mode).
- SysSetUserDefineKey** : Sets up user defined keys
- SysGetUserDefineKey** : Retrieves user defined keys

- The key codes after setting are valid only when the numeral input mode is set effect.

2.1.5 Audio

Basic Specifications

WAV playback, voice recording and playback are supported.

By using the Microsoft **SoftwareMixer** function, output sounds from multiple applications can be mixed and output (in 44.1 KHz, 16-bit stereo mixing).

Voice Recorder is integrated in the terminal as the sound system application to make it possible to perform WAV file streaming playback and local file playback in HTTP.

Audio and Buzzer use the same integrated speaker, therefore it is not possible to playback Audio and Buzzer sound at the same time. In this case, Buzzer sound has the priority.

Playback

Table 2.10

Sampling frequencies	KHz	8	11.025	12	16	22.05	24	32	44.1	48
	Mono	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Stereo	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Sampling frequencies other than those above are not supported.									
Stereo/Monaural	8-bit or 16-bit In reality, the integrated monaural speaker does not output sound in stereo.									

Recording

Table 2.11

Sampling frequencies	KHz	8	11.025	12	16	22.05	24	32	44.1	48
	Monaural	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Sampling frequencies other than those above are not supported.									
Stereo/Monaural	8-bit or 16-bit Monaural sound input only via the microphone.									

Setting Sound Volume

The “Volume & Sound” at the Control Panel can be used to set up sound volume in six grades from loud to low and ON/OFF of mute. A sound volume also can be set up using **Win32 API** function in application.

Audio ON/OFF

The audio system can be disabled to save the power. “Enable” or “Disable” for the audio system in the terminal is controlled using the System Library in application.

The functions of the System Library relevant to the Audio ON/OFF are as follows.

- SysAudioOff** : Turns off the audio virtually with the audio turned off.
- SysAudioOn** : Turns on the audio virtually with the audio turned on.
- SysGetAudioPowerState** : Retrieves “Enable” or “Disable” status for turning off the audio virtually.

2.1.6 Buzzer Sound

Basic Specifications

The buzzer sound in various modes such as scanning confirmation, alarm, warning, and other available sounds can be output via the integrated speaker. The sounds have four attributes and default values.

Table 2.12

Sound Mode	Frequency (Hz)	Time (millisecond)	Individual Mute	Attribute
Alarm	3500	150	ON or OFF	B_ALARM
Warning	3000	100	ON or OFF	B_WARNING
Scan end	3300	75	ON or OFF	B_SCANEND
User designated	--	--	ON or OFF	B_USERDEF

Setting Volume

The “Buzzer” at the Control Panel can be used to set up volume in three grades from loud, medium, low and ON/OFF of mute. Setting the volume is also possible using the System Library in application.

The functions of the System Library relevant to the Setting Volume are as follows.

- SysPlayBuzzer** : Sounds the buzzer.
- SysStopBuzzer** : Turns off the buzzer’s sound.
- SysSetBuzzerVolume** : Sets up sound volume of the buzzer.
- SysGetBuzzerVolume** : Retrieves sound volume of the buzzer.
- SysSetBuzzerMute** : Sets up sound volumes for all the parameters and individual mutes.
- SysGetBuzzerMute** : Retrieves the statuses of all the sound volumes and individual mutes.

2.1.7 Memory Management

The high speed and large capacity RAM (MobileDDR 256MB) and FlashROM (OneNAND Flash 256MB) are integrated in the terminal.

Although RAM has been used for RAM XIP (for OS), program memory (for program files to run) and object store (for storage of work data) in the previous Casio handheld terminals introduced in the past, non-volatile memory (FlashROM) is integrated to the Root folder in the terminal.

Your observation is required for the new method adopted in the terminal to manipulate the memory different from the previous Casio handheld terminals.

Notes:

- Patch file, program file and data are not lost even if the battery pack runs down. It is no longer needed to back up object store in the RAM.
- Although performing a full reset initializes object store (RAM) in the previous Casio handheld terminals, the new method initializes the RootDisk in the terminal.
- Formatting the UserDisk initializes registry, program file, and data to their factory defaults.
- UserDisk is divided into two blocks, RootDisk and FlashDisk. In the RootDisk, system file, registry, and patch driver, etc. are stored while backup data of backup tool and recovery tool are stored in the FlashDisk. This makes recovery of data from the FlashDisk possible in case of malfunction on the system.

RAM

The integrated RAM with a total capacity of 256 MB is used for the below purposes.

- DriverGlobal and buffer : Work area for driver, etc.
 - OS area : Area to deploy the OS to run.
 - Program memory : Program execution area including work area for the OS.
-
- The **DriverGlobal** is a fixed area allocated for work area of drivers. The camera buffer used in the digital camera integrated models deploys captured image data temporarily.
 - The OS files are deployed from the Kernel of the FlashDisk to the RAM in the terminal. This allows the OS to run quickly on the RAM. However, it takes time to deploy the OS files from the FlashDisk to the RAM in case when booting takes place after a full reset is performed or the lithium-ion battery runs down.
 - Object store equivalent of the RAM disk in the previous Casio handheld terminals is no longer integrated. If files are copied to Root and Windows folder under “My device” folder, this creates the same files in the UserDisk of FlashROM and secures data without performing backup in case the lithium-ion battery is not installed.
 - Although performing a full reset (all memory clear) deletes object store (RAM) in the previous Casio terminals, it deletes the RootDisk causing registry and system DB to be deleted and to initialize the system.
 - This does not allow to change the ratio between program memory and object store at the Control Panel.

FlashDisk

The FlashDisk has a total capacity of 256MB and is used for the below purposes.

- Boot area : Deploys the OS files to the RAM from the OS disk.
 - OS disk/Kernel : Stores the OS files. Boot loader is deployed in the RAM at time of booting.
 - User disk : A disk user can freely use. It comprises the RootDisk which is mounted in the system root folder and the FlashDisk.
 - Spare : A substitution sector of the FlashROM
-
- In the boot area, boot loader and etc. are stored to deploy the OS files/Kernel into the RAM.
 - In the OS disk, the OS module, drivers, integrated applications and etc. are stored.
 - The UserDisk different in its structure from RAM does not require a power to back up data in the disk, so data is not lost even if the terminal's memory backup battery runs down.
 - The FlashDisk is observed as \FlashDisk driver under "My Device" and stores backup data used to restore the system to the same condition before unstable condition occurs. Data stored in the FlashDisk for restoration is not deleted by performing a full reset.
 - Formatting the UserDisk deletes registry, patch files, program files and data, and initializes the system to the factory default.

Note:

Formatting on the UserDisk is carried out by a dedicated format tool in the Windows folder or by operating special keys. See the next chapter concerning the special keys operation.

2.1.8 Reset

The role of the boot loader in Windows Embedded Handheld (OAL) is to boot the OS after initializing the hardware. On the terminal, it is possible to carry out the special performances with special keys operation as described in the figure below.

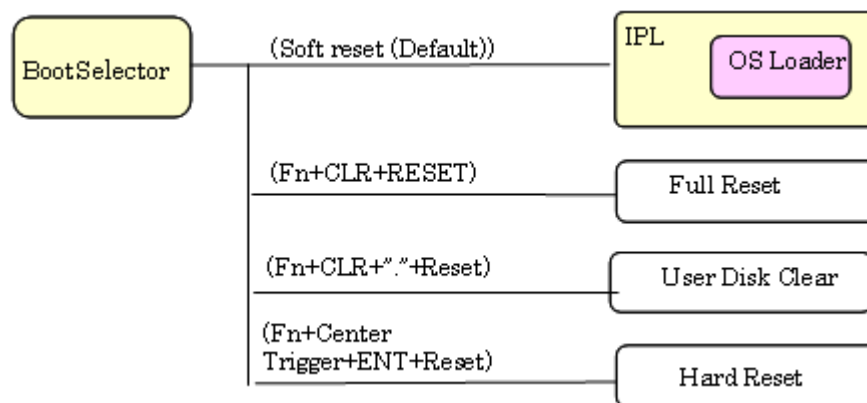


Figure 2-3

To reset the terminal, there are several ways to carry out it. The explanation below describes the methods to reset the terminal. See also Table 2.13.

Soft Reset

The operation requires pressing the reset switch on the back of the terminal. It initializes the program memory.

Full Reset

This operation is carried out if Fn and CLR keys are held down at the same time and then the reset switch is pressed for a period of one second or longer. It initializes the RAM and reloads the OS again from the OS disk to the RAM.

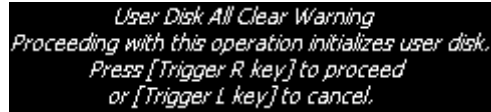
Hard Reset

This operation is carried out if Fn, Center Trigger and ENT keys are held down at the same time and then the reset switch is pressed. The RAM and Clock (RTC) are initialized and the OS files are reloaded into the RAM.

User Disk Clean

This operation is carried out if Fn and CLR and “.” keys are held down at the same time and then the reset switch is pressed for a period of one second or longer that formats the RootDisk and FlashDisk and initializes the RAM to the factory default and then reloads the OS files to the RAM.

A message (see Figure 2.4) to confirm memory initialization appears. The R Trigger key is used to confirm the User Disk Clean.



*User Disk All Clear Warning
Proceeding with this operation initializes user disk.
Press [Trigger R key] to proceed
or [Trigger L key] to cancel.*

Figure 2-4

After the R Trigger key is pressed twice, the UserDisk is formatted and the RAM is initialized to the factory default (see note).



*User Disk All Clear Warning
Proceeding with this operation deletes all data
stored in user disk.
Press [Trigger R key] to proceed
or [Trigger L key] to cancel.*

Figure 2-5

Notes:

- Distributor ID in E2PROM is not cleared by performing the **User Disk Clean**.
- The utility to carry out the **User Disk Clean** is available. See “DSKClean” for detail.

Power-on Reset

This is a state occurred on the terminal after the battery pack and memory backup battery are demounted and then put back into the terminal and then the Power switch is turned on for the first time. When the Power switch is turned on in this state, the Boot Loader performs reloading the OS files (RTC is initialized if it is necessary).

The table shows the respective states and data in the components and devices when the reset occurs.

Table 2.13

	RAM		RootDisk	FlashDisk	Registry	Clock (RTC)	E2PROM	
	OS Memory	Program Memory					Individual ID	Distributor ID
Soft Reset	No	Initialize	No	No	No	No	No	No
Full Reset	Reload	Initialize	Initialize	No	Initialize	No	No	No
Hard Reset	Reload	Initialize	No	No	No	Initialize	No	No
User Disk Clean	Reload	Initialize	Initialize	Initialize	Initialize	No	No	No
Power-on Reset	Reload	Initialize	No	No	No	No/Initialize	No	No

Note:

“No” in the table indicates that the content in memory is not initialized by the reset.

2.1.9 Memory Corruption Check

Checksum is carried out in order to detect whether the OS deployed in the memory is corrupted or not, and the OS is reloaded if it is necessary.

Table 2.14

	Confirm the checksum	OS load
On Soft Reset	Carried out	Carried out when error of checksum occurs.
On Full Reset, Hard Reset, User Disk Clean and Power-on Reset	-	Carried out
On Suspend and Resume (see notes)	No	No

Notes:

- The reason that the checksum is not carried out on suspending and resuming is for high-speed performance. But, memory corruption check is carried out to check if the RAM is in error status by any reason.
- The RAM corruption check is performed by writing fixed data (0x00 to 0xFF) into a fixed area (256 bytes area) in the RAM prior to performing the check, and the value written in the RAM is verified at a time of Resume. If an error is detected, warning message for memory corruption check is issued, and then reset is performed and the OS files are reloaded.

2.1.10 LED

Basic Specifications

There are two LEDs integrated in the terminal, one on the right side (Indicator 2) for the user notification and the other (Indicator 1) for charging battery complete notification.

Table 2.15

LED	Color	Description
Right side LED (Indicator 2)	Red	User notification (alarm), scanning bar code
	Green	Scanning bar code complete
	Blue	Connection established via Bluetooth
	Orange	Connection established via WLAN
	Cyan	Resume
	Magenta	ActiveSync
Left side LED (Indicator 1)	Orange	While charging battery pack.
	Green	Charging battery pack is complete.
	Red	Charging battery pack in error.

Notes:

- The user notification LED (Indicator 2) on the right side can be used to indicate various notifications by the OS and other notifications defined by the user.
- All colors available with the LED (Indicator 2) on the right side are indicated with the System Library.
- The charging battery complete LED (Indicator 1) on the left side cannot be controlled or manipulated for its ON/OFF state and any other colors with software.

User Notification (Alarm)

This indication mode is used for alarm notification and etc. The LED can be lit for a specific time with **CeSetUserNotification()API** function.

Table 2.16

Operating mode	Specification
Blink interval	ON in red for 1 second, OFF for 2 seconds
Continuous ON time	ON for 30 minutes (OFF when VDET is detected.)

Note:

Indication for scanning a bar code has the priority over other indications.

Scanning

This is used for notification of a scanning result which is controlled with the System Library.

Table 2.17

Operating mode	Specification	Attribute
Scanning complete	ON in green for a specified period of time, then OFF.	L_SCANOK
Scanning in error	ON in red for a specified period of time, then OFF.	L_SCANERR

Bluetooth Connection Status

This is used for notification of Bluetooth connection establishment status which is controlled with the System Library.

Table 2.18

Status Mode	Specification	Attribute
Connection established via Bluetooth	ON in blue for 1 second, OFF for 2 seconds	L_BT

Note:

Indication for scanning a bar code has the priority over other indications.

WLAN Connection Status

This is used for notification of WLAN connection establishment status which is controlled with the System Library.

Table 2.19

Status Mode	Specification	Attribute
Connection established via WLAN	ON in orange for 1 second, OFF for 2 seconds	L_WLAN

Notes:

- Indication for scanning a bar code has the priority over other indications.
- The indication color for WLAN status is the same with those used for WWAN and GPS statuses.

User Definition

This indication mode is used for other notifications freely defined by the user. The ON/OFF state and color to be lit can be controlled with the System Library.

Table 2.20

Status Mode	Specification
User definition	Color selection from red, green, blue, orange, cyan and magenta.
	Programmable for ON and OFF time periods
Continuous ON time period	30 minutes (OFF when VDET is detected)

Note:

Indication for scanning a bar code has the priority over other indications.

The functions of the System Library relevant to the User Definition are as follows.

- SysSetLED** : Sets up “Enable” or “Disable” for turning on the LED.
- SysGetLED** : Retrieves “Enable” or “Disable” status for turning on the LED.
- SysPrepareLED** : Prepares for turning on the LED.
- SysUpdateLED** : Turns on the LED.

2.1.11 Vibration

Basic Specifications

The vibration can be set up for five different notifications.

Table 2.21

Notification	Vibration Pattern	Setting	Default
Alarm	Default	ON or OFF	OFF
Warning	Default	ON or OFF	OFF
Bar code scan complete	Default	ON or OFF	OFF
Wireless incoming signal	Default	ON or OFF	OFF
User definition	User	ON or OFF	OFF

Vibration Interval

The vibration interval can be set in two different patterns, the default setting and a user defined setting.

Table 2.22

Pattern	Vibration Interval	Remarks
Default	“ON for 1 second, OFF for 1 second” x [times]	Maximum no. of times; 20
User definition	“Specified ON period, Specified OFF period” x [times] Setting range; 1/16 seconds to 16 seconds for ON period, 1/16 seconds to 1 second for OFF period	Maximum no. of times; 20

SysPlayVibrator function of the System Library can be used to control ON/OFF state for each occasion of the vibration and the vibration interval in user definition.

The functions of the System Library relevant to the “Vibration Interval” are as follows.

SysPlayVibrator : Turns on the vibration.

SysStopVibrator : Turns off the vibration.

SysSetVibratorMute : Sets up “Enable” or “Disable” for all the parameters for the vibration and individual mutes.

SysGetVibratorMute : Retrieves statuses of all the parameters for the vibration and individual mutes.

2.2 Laser Scanner

This chapter describes about detailed specifications of the integrated Laser Scanner (model dependant).

2.2.1 Basic Specifications

The following industrial standard bar code symbologies are supported by the integrated Laser Scanner.

Table 2.23 Supported symbologies

Symbology	Check Digit Calculation	No. of min. digits	No. of max. digits
EAN, UPC-A, UPC-B	Enable or Disable	8 (fixed)	13 (fixed)
EAN, UPC-A, UPC-B Addon	Enable or Disable	10 (fixed)	18 (fixed)
UPC-E	Enable or Disable	7 (fixed)	7 (fixed)
UPC-E Addon	Enable or Disable	9 (fixed)	12 (fixed)
Code39	Enable or Disable	2 (Note 3)	52
NW7	Enable or Disable	2 (Note 4)	63
Interleaved 2of5	Enable or Disable	4 (Note 5)	94
Industrial 2of5	Enable or Disable	2	67
Code93	Enable or Disable	1	70
Code128	Enable or Disable	1	98
MSI	Enable or Disable (Note 1)	1	57
IATA	Enable or Disable (Note 2)	1 (Note 6)	65 (Note 6)
GS1 DataBar Omnidirectional	Enable	14 (fixed)	14 (fixed)
GS1 DataBar Limited	Enable	14 (fixed)	14 (fixed)
GS1 DataBar Expanded	Enable	1	74 (Note 7)
GS1 DataBar Stacked	Enable	14 (fixed)	14 (fixed)
GS1 DataBar Expanded Stacked	Enable	1	74 (Note 7)

Notes:

1. MSI check digit

One of the following MSI check digit calculation methods can be selected.

- 1 digit, mod10
- 2 digit, mod10/mod11
- 2 digit, mod10/mod10

2. IATA check digit

One of the following IATA check digit calculation methods can be selected.

- Calculate number other than end 1 digit
- Calculate coupon number and numeric value segment
- Calculate numeric value segment
- mod10

3. Minimum digit on Code39 symbology

The no. of minimum digits can be set to one digit only when scanning Code39 symbology is enabled.

4. Minimum digit on NW7 symbology
The no. of minimum digits can be set to one digit only when scanning NW7 symbology is enabled.
5. Minimum digit on Interleaved 2of5 symbology
The no. of minimum digits can be set to two digits only when scanning Interleaved 2of5 symbology is enabled.
6. Minimum and maximum digits on IATA symbology
 - The no. of minimum digits can be set is 15 digits or 17 digits for the maximum only when the IATA check digit calculation is set to “Coupon number and Calculate data segment” or “Calculate just data segment”.
 - Setting the no. of minimum digits to 1 may result in higher error rate. Unless you need to change it to 1, leave the default (= 4) unchanged.
7. The maximum digit count for just numeric data is 74 digits, or the maximum digit count for just alphabet data is 41 digits.
8. Each no. of maximum digits in the table is defined by optimum condition affected by various factors including bar code printed quality, resolution, PCS, sun light, distance between the terminal and bar code to scan, etc. Depending on the condition of these factors, you may fail to read a bar code even if you set maximum digits in the table for that bar code symbology.
9. Setting the no. of minimum digits to 1 may result in higher error rate. Unless you need to change it to 1, leave the default (= 4) unchanged.
10. Code128 check digit can be set as disable, but generally please set enable. If you need to scan Code 128 without check digit by special reason, at this time only set this setting as enable. But when you set this setting as enable, there is possibility to misreading by barcode printed quality or reading condition, therefore please use this setting after check scanning operation carefully.

Check Digit Calculation

A bar code value is calculated in accordance with method, and then the calculation result and the check character at a specific position are compared. If they match each other, the scanning data is deemed correct. The calculation method differs according to each symbology.

Readable Digits

The actual readable digit on a bar code differs depending on the resolution and the scanning distance between the terminal and the bar code.

2.2.2 Scanning Method

The Laser Scanner has “scanning state” (emits laser beam to read a bar code) and “standby state” (scanning is halted and in standby state). These two states are controlled to start scanning bar code and stop the scanning.

Table 2.24 Scanning methods

Scan method	Description	Conditions for scanning to end	Timeout Yes or No
Single scan	Press Trigger key to start scanning. Scanning is stopped when either scanning is succeeded or one of the scan end conditions (right side) is met.	<ul style="list-style-type: none">• Timeout time has elapsed.• OBRClose function is called.	Yes
Continuous scan (controlled with Trigger key)	Press Trigger key to start scanning, and scanning will continue as long as the Trigger key is held down. Scanning will stop when either scanning is completed for just preset no. of times for scanning or one of the scan end conditions (right side) is met.	<ul style="list-style-type: none">• Timeout time has elapsed after scanning a bar code.• Scanning for the number of preset times is complete.• The Trigger key is released.• OBRClose function is called.	Yes
Continuous scanning (controlled by program)	Scanner library functions are used to start and stop scanning. The previous scanning data and scanning data overlapped with other scanning data will be disregarded. Also, to save the power during scanning, emitting laser beam will be turned off between laser emissions. (note 2)	<ul style="list-style-type: none">• Timeout time has elapsed after scanning the precious scanning.• Scanning end function is called while scanning continues.• OBRClose function is called.	Yes

Notes:

1. The scanning method set by default are “Continuous scanning (controlled with Trigger key)” and “No. of preset times for continuous scanning = 1”.
2. In condition where the parameter in the registry has been set, performing a full reset on the terminal makes emitting the laser beam is turned off intermittently between laser emissions possible.

The path of the registry is as follows.

Path : HKEY_LOCAL_MACHINE\Drivers\CASIO\Laser
Data-type : DWORD
Parameter : ScnBlk (1: valid, 0: invalid)

The functions of the Laser Scanner Library relevant to the Scanning Method are as follows.

OBRStartScanning	: Emits laser beam and start scanning a bar code.
OBRStopScanning	: Stops emitting laser beam and scanning a bar code.
OBRSetScanningType	: Sets up scanning mode.
OBRGetScanningType	: Retrieves the scanning mode.
OBRClose	: Sets up scanning disable status.
OBRSetScanningCounter	: Sets up the no. of times for continuous scanning.
OBRGetScanningCounter	: Retrieves the no. of times for continuous scanning.
OBRSetScanningTimeout	: Sets up a time period of timeout for scanning complete.
OBRGetScanningTimeout	: Retrieves timeout of scanning complete.

Multi-step Scanning

This method is for scanning a designated number of bar codes. Once scanning for the designated number of bar codes has been completed, the scanner closes and not scan again until reopened. Also, the same bar codes that have been scanned previously cannot be scanned again.

The functions of the Laser Scanner Library relevant to the Multi-step Scanning are as follows.

OBROpen	: Sets up scanning enable status.
OBRClose	: Sets up scanning disable status.
OBRSetScanningCounter	: Sets up the no. of times for continuous scanning.
OBRGetScanningCounter	: Retrieves the no. of times for continuous scanning.
OBRSetMultiStepReading	: Sets up the no. of bar codes to scan in multi-step scanning mode.
OBRGetMultiStepReading	: Retrieves the no. of bar codes to scan in multi-step scanning mode.

2.2.3 Scan Parameters

Conditions that allow scanning a symbology in a specific mode can be set for each readable symbology.

Readable Symbology

Bar code symbologies that are enabled or disabled for scanning can be specified. If only specific symbologies are to be scanned, set “Enable” for scanning on these symbologies only and “Disable” on other symbologies. This saves decode processing time and lowers error rate. The default is “Enable scanning on all the symbologies”.

Readable Digits

The no. of readable digits can be set for each symbology. If only specific no. of digits is to be scanned, specify it for each readable symbology. This saves decode processing time and lowers error rate.

Enable or Disable Check Digit

Check digit can be set to “Enable” or “Disable” for each readable symbology. Setting the check digit lowers error rate.

Table 2.25

Symbology	Check Digit Calculation	Default
EAN, UPC-A, UPC-B	Enable or Disable	Enable
EAN, UPC-A, UPC-B Addon	Enable or Disable	Enable
UPC-E	Enable or Disable	Enable
UPC-E Addon	Enable or Disable	Enable
Code39	Enable or Disable	Disable
NW7	Enable or Disable	Disable
Interleaved 2of5	Enable or Disable	Enable
Industrial 2of5	Enable or Disable	Enable
Code93	Enable or Disable	Enable
Code128	Enable or Disable	Enable
MSI	Enable or Disable	Enable
IATA	Enable or Disable	Disable
GS1 DataBar Omnidirectional	Enable	Enable
GS1 DataBar Limited	Enable	Enable
GS1 DataBar Expanded	Enable	Enable
GS1 DataBar Stacked	Enable	Enable
GS1 DataBar Expanded Stacked	Enable	Enable

The functions of the Laser Scanner Library relevant to the Scanning Parameters are as follows.

OBRSetScanningCode	: Sets up scanning with individual bar code symbology.
OBRGetScanningCode	: Retrieves scanning status with individual bar code symbology.
OBRSetCode39Option	: Sets up scanning with Code39 symbology.
OBRGetCode39Option	: Retrieves decode options of Code39 symbology.
OBRSetNW7Option	: Sets up scanning with NW-7 symbology.
OBRSetNW7OptionEx	: Sets up scanning with NW-7 symbology.
OBRGetNW7Option	: Retrieves decode options of NW-7 symbology.
OBRSetWPCAddonOption	: Sets up scanning with WPC Addon symbology.
OBRSetWPCAddonOptionEx	: Sets up scanning with WPC Addon symbology.
OBRGetWPCAddonOption	: Retrieves decode options of WPC Addon symbology.
OBRSetWPCOption	: Sets up scanning with WPC symbology.
OBRSetWPCOptionEx	: Sets up scanning with WPC symbology.
OBRGetWPCOption	: Retrieves decode options of WPC symbology.
OBRSetUPCEAddonOption	: Sets up scanning with UPC-E Addon symbology.
OBRSetUPCEAddonOptionEx	: Sets up scanning with UPC-E Addon symbology.
OBRGetUPCEAddonOption	: Retrieves decode options of UPC-E Addon symbology.
OBRSetUPCEOption	: Sets up scanning with UPC-E symbology.
OBRSetUPCEOptionEx	: Sets up scanning with UPC-E symbology.
OBRGetUPCEOption	: Retrieves decode options of UPC-E symbology.
OBRSetIDFOption	: Sets up scanning with Industrial 2of5 symbology.
OBRGetIDFOption	: Retrieves decode options of Industrial 2of5 symbology.
OBRSetITFOption	: Sets up scanning with ITF (Interleaved 2of5) symbology.
OBRGetITFOption	: Retrieves decode options of ITF (Interleaved 2of5) symbology.
OBRSetCode93Option	: Sets up scanning with Code93 symbology.
OBRGetCode93Option	: Retrieves decode options of Code93 symbology.
OBRSetCode128Option	: Sets up scanning with Code128 symbology.
OBRGetCode128Option	: Retrieves decode options of Code128 symbology.
OBRSetMSIOption	: Sets up scanning with MSI symbology.
OBRGetMSIOption	: Retrieves decode options of MSI symbology.
OBRSetIATAOption	: Sets up scanning with IATA symbology.
OBRGetIATAOption	: Retrieves decode options of IATA symbology.
OBRSetRSS14Option	: Sets up scanning with GS1 DataBar Omnidirectional symbology.
OBRGetRSS14Option	: Retrieves decode options of GS1 DataBar Omnidirectional symbology.
OBRSetRSSLimitedOption	: Sets up scanning with GS1 DataBar Limited symbology.
OBRGetRSSLimitedOption	: Retrieves decode options of GS1 DataBar Limited symbology.
OBRSetRSSExpandedOption	: Sets up scanning with GS1 DataBar Expanded symbology.

Continue.

OBRGetRSSExpandedOption	: Retrieves decode options of GS1 DataBar symbology.
OBRSetRSS14StackedOption	: Sets up scanning with GS1 DataBar Stacked symbology.
OBRGetRSS14StackedOption	: Retrieves decode options of GS1 DataBar Stacked symbology.
OBRSetRSSExpandedStackedOption	: Sets up scanning with GS1 DataBar Expanded Stacked symbology.
OBRGetRSSExpandedStackedOption	: Retrieves decode options of GS1 DataBar Expanded Stacked symbology.

Validation

Validation is carried out for a specified number of times in the range of 1 to 9 (Default = 3) to check if scanned data is valid, and then the data is output. The number of validations can be set either at the Control Panel or using the Laser Scanner Library.

The functions of the Laser Scanner Library relevant to the Validation are as follows.

- OBRSetCheckCounter** : Sets up the no. of validations for decoding data.
- OBRGetCheckCounter** : Retrieves the no. of validations for decoding data.

No. of Scanning Times

In “Continuous Scanning” mode, scanning continues for the preset number of scanning times in the range of 1 to 9 (Default = 1) and then it will stop in waiting mode. The number of times for scanning can be set either at the Control Panel or using the Laser Scanner Library.

The functions of the Laser Scanner Library relevant to the “No. of Scanning Times” are as follows.

- OBRSetScanningCounter** : Sets up the no. of times for continuous scanning.
- OBRGetScanningCounter** : Retrieves the no. of times for continuous scanning.

Scanning Period

Valid time period of scanning in the range of 1 to 9 (Default = 3) seconds after Trigger key is pressed down can be set either at the Control Panel or using the Laser Scanner Library. After the preset time has elapsed, the scanner goes into standby mode waiting for the Trigger key to be pressed down again.

The functions of the Laser Scanner Library relevant to the Scanning Period are as follows.

- OBRSetScanningTimeout** : Sets up a time period of timeout for scanning complete.
- OBRGetScanningTimeout** : Retrieves the timeout of scanning complete.

Double Scanning Prevention

This prevents scanning the same bar code twice while the “Continuous Scanning” mode has been set. Scanning the same bar code again is prohibited while the scanning continues for the preset number of times. However, the bar code can be scanned again when the “Continuous Scanning” newly starts.

2.2.4 Scan Output Format

Formats for outputting results of scanned bar codes can be set.

Table 2.26 Output Formats

Symbology	Standard	No. of digits	Output Format	Remark
WPC	JAN-13	13	FFMMMMMNNNNNNCT	T : Termination code See Table 2.29 for meaning of the notations. Excluding UPC-B, the mod10 check digit calculation is always performed
	EAN-13	13	FFMMMMMNNNNNNCT	
	JAN-8	8	FFMMMNCT	
	EAN-8	8	FFMMMNCT	
	JAN-13 addon+2	15	FFMMMMMNNNNNNCAAT	
	EAN-13 addon+2	15	FFMMMMMNNNNNNCAAT	
	JAN-13 addon+5	18	FFMMMMMNNNNNNCAAAAAT	
	EAN-13 addon+5	18	FFMMMMMNNNNNNCAAAAAT	
	JAN-8 addon+2	10	FFMMMMNCAAT	
	EAN-8 addon+2	10	FFMMMMNCAAT	
	JAN-8 addon+5	13	FFMMMMNCAAAAAT	
	EAN-8 addon+5	13	FFMMMMNCAAAAAT	
	UPC-A	13	0SMMMMMNNNNNNCT	
	UPC-B	13	0SMMMMMNNNNNNNT	
	UPC-A addon+2	15	0SMMMMMNNNNNNCAAT	
	UPC-B addon+2	15	0SMMMMMNNNNNNNAAT	
	UPC-A addon+5	18	0SMMMMMNNNNNNCAAAAAT	
	UPC-B addon+5	18	0SMMMMMNNNNNNNAAAAAT	
	UPC-A	12	SMMMMMNNNNNNCT	
	UPC-B	12	SMMMMMNNNNNNNT	
	UPC-A addon+2	14	SMMMMMNNNNNNCAAT	
	UPC-B addon+2	14	SMMMMMNNNNNNNAAT	
	UPC-A addon+5	17	SMMMMMNNNNNNCAAAAAT	
	UPC-B addon+5	17	SMMMMMNNNNNNNAAAAAT	

Continue.

WPC	JAN-13	14	0FFMMMMMMNNNNNCT	GTIN
	EAN-13	14	0FFMMMMMMNNNNNCT	GTIN
	JAN-8	14	0000000FFMMMNCT	GTIN
	EAN-8	14	0000000FFMMMNCT	GTIN
	UPC-A	14	00SMMMMMMNNNNNCT	GTIN
	UPC-B	14	00SMMMMMMNNNNNNT	GTIN
UPC-E (see note)	UPC-E	(7), 8	0MMNNNMCT	Last M: 0 to 2
		(7), 8	0MMMNN3CT	
		(7), 8	0MMMMN4CT	
		(7), 8	0MMMMMMNCT	Last N: 5 to 9
		(6), 7	MMNNNMCT	Last M: 0 to 2
		(6), 7	MMMNN3CT	
		(6), 7	MMMMN4CT	
		(6), 7	MMMMMNCT	Last N: 5 to 9
	UPC-E	14	0000000MMNNNMCT	GTIN Last M: 0 to 2
		14	0000000MMMNN3CT	GTIN
		14	0000000MMMMN4CT	GTIN
		14	0000000MMMMMNCT	GTIN Last N: 5 to 9
	UPC-E addon+2	(9), 10	0MMNNNMCAAT	Last M: 0 to 2
		(9), 10	0MMMNN3CAAT	
		(9), 10	0MMMMN4CAAT	
		(9), 10	0MMMMMMNCAAT	Last N: 5 to 9
		(8), 9	MMNNNMCAAT	Last M: 0 to 2
		(8), 9	MMMNN3CAAT	
		(8), 9	MMMMN4CAAT	
		(8), 9	MMMMMNCAAT	Last N: 5 to 9
	UPC-E addon+5	(12),13	0MMNNNMCAAAAAT	Last M: 0 to 2
		(12),13	0MMMNN3CAAAAAT	
		(12),13	0MMMMN4CAAAAAT	
		(12),13	0MMMMMMNCAAAAAT	Last N: 5 to 9
		(11),12	MMNNNMCAAAAAT	Last M: 0 to 2
		(11),12	MMMNN3CAAAAAT	
		(11),12	MMMMN4CAAAAAT	
		(11),12	MMMMMNCAAAAAT	Last N: 5 to 9
Code39		3 to Max	SBBB ----- BBCST	See Table 2.30 for meaning of the notations.
		3 to Max	SAAA ----- AACST	
		1 to Max	BBB ----- BBCT	
		1 to Max	AAA ----- AACT	
NW7		3 to Max	SDDD ----- DDDCST	See Table 2.31 for meaning of the notations.
		1 to Max	DDD ----- DDDCT	
Interleaved 2of5		2 to Max	DDD ----- DDDCT	See Table 2.32 for meaning of the notations. Only even number digits used for scanning readable digits.

Continue.

Industrial 2of5		2 to Max	DDD ----- DDDCT	See Table 2.33 for meaning of the notations. Only even number digits used for scanning readable digits.
Code93		1 to Max	AAA ----- AAAT	See Table 2.34 for meaning of the notations.
Code128	Code128	1 to Max	AAA ----- AAAT	See Table 2.35 for meaning of the notations.
		1 to Max	SBBB ----- BBCST	
	GS1-128	1 to Max	AAA ----- AAAT	See Table 2.36 for meaning of the notations.
		1 to Max	SBBB ----- BBCST	
		1 to Max	FAAA ----- AAAT	
		1to Max	GAAA ----- AAAT	
MSI		1 to Max	DDD ----- DDCCT	See Table 2.37 for meaning of the notations.
IATA		1 to Max	DDDDDDDDDD ----- CT	See Table 2.38 for meaning of the notations.
			PADDDDDDDDDDDDDDDCT	
GS1 DataBar Omnidirectional		16	01DDDDDDDDDDDDDDCT	See Table 2.39 for meaning of the notations.
		14	DDDDDDDDDDDDDDCT	
GS1 DataBar Limited		16	01DDDDDDDDDDDDDDCT	See Table 2.40 for meaning of the notations.
		14	DDDDDDDDDDDDDDCT	
GS1 DataBar Expanded		1 to 74	DD ---- DDDT	See Table 2.41 for meaning of the notations.
		1 to 41	AA ---- AAAT	
GS1 DataBar Stacked		16	01DDDDDDDDDDDDDDCT	See Table 2.39 for meaning of the notations.
		14	DDDDDDDDDDDDDDCT	
GS1 DataBar Expanded Stacked		1 to 74	DD ---- DDDT	See Table 2.41 for meaning of the notations.
		1 to 41	AA ---- AAAT	

Note:

“C” will not be appended to the output if the no. of scanning digits described in parentheses in the table above is applicable.

Table 2.27 WPC symbology

F	Country flag
M	Manufacturer code
N	Product code
S	Number system character
A	Addon data
T	Termination code
C	Mod10 check digit

Table 2.28 Code39 symbology

A	ASCII conversion post data
B	ASCII conversion pre-data
C	Mod43 check digit. Becomes data if there is no check digit attached.
S	Start and stop characters

Table 2.29 NW7 symbology

S	Start and stop characters (any one of a, b, c and d)
D	Data
C	Mod16 check digit. Becomes data if there is no check digit attached.

Table 2.30 Interleaved 2of5 symbology

D	Data
C	Mod10 check digit. Becomes data if there is no check digit attached.

Table 2.31 Industrial 2of5 symbology

D	Data
C	Mod10 check digit. Becomes data if there is no check digit attached.

Table 2.32 Code93 symbology

A	ASCII conversion post data
B	ASCII conversion pre-data
C	Mod47 check digit. Becomes data if there is no check digit attached.
S	Start and stop characters

Table 2.33 Code128 symbology

A	ASCII conversion post data
B	ASCII conversion pre-data

Table 2.34 GS1-128 symbology

C	Mod47 check digit
S	Start and stop characters
F	Code ID (only “]C1”, GS1-128)
G	GS (only 1Dh,GS1-128)

Table 2.35 MSI symbology

D	Data
C	Mo10 and Mod11 check digits. Becomes data when there is no check digit attached.

Table 2.36 IATA symbology

D	Data
C	Check digit (IATA). Becomes data when there is no check digit attached.
P	Coupon No
A	Airline No

Table 2.37 GS1 DataBar Omnidirectional symbology

D	Numeric data
C	Mod10 check digit

Table 2.38 GS1 DataBar Limited symbology

D	Numeric data
C	Mod10 check digit

Table 2.39 GS1 DataBar Expanded symbology

D	Numeric data
A	Alphabet data

The functions of the Laser Scanner Library relevant to the “Scanning Output Formats” are those listed on page 39. See page 39.

Termination Codes

Choose one of the following five termination codes to attach to the end of decoded data.

- CR
- LF
- CR+LF
- TAB
- No termination code (default)

The functions of the Laser Scanner Library relevant to the Termination Codes are as follows.

OBRSetSuffixChar : Sets up suffix control code appended to decoding data.

OBRGetSuffixChar : Retrieves suffix control code appended to decoding data.

Output Buffer

The scanner scans a bar code and outputs the scanned data using one of the following methods described in the table.

Table 2.40

Output Method	Description
OBR buffer output (see note)	<ul style="list-style-type: none">- Scanned data is output to memory in the Laser Scanner driver.- Scanned data already output to the memory can be captured using the Laser Scanner Library.
Key message output	<ul style="list-style-type: none">- Scanned data can be output with the window message to the specified window handle.- The window handle is specified using the Laser Scanner Library.
Clipboard output	<ul style="list-style-type: none">- Scanned result is copied to the clipboard and then output to the edit control focused by caret.
Keyboard output	<ul style="list-style-type: none">- Scanned result is output as a keyboard event to the edit control focused by caret.- About Remote desktop connection <p>For issued output data correctly which characters displayed combination with Shift key like alphabet large letter or marks, the following registry setting should be enabled.</p> <p>Registry path name : HKEY_LOCAL_MACHINE\Drivers\CASIO\Laser Name : RDPOutput Data type : DWORD Setting value : 0 : Disable 1 : Enable Default value : 0 : Disable</p> <p>The upper setting value will be available to driver after reset operation. And after enable this registry setting, keyboard output is adjusted speed for exactly output data is correct, therefore output completed time will be increased compared than disable setting.</p>

Note:

When a bar code is scanned, its decoded data including the symbology and data size are stored in the memory of the Laser Scanner driver. This output method has the following features.

- Capture the bar code symbology and data size.

- Capture the data at any timing the user prefers.
- The length of one piece of data is up to 98 characters (maximum) and up to 9 labels can be stored in the memory. If any new data scanned after exceeding over 9 labels stored already in the memory will be disregarded.

The functions of the Laser Scanner Library relevant to the Output Buffer are as follows.

OBROpen	: Sets up scanning enable status.
OBRSetBuffType	: Sets up decoding data output mode.
OBRGetBuffType	: Retrieves decoding data output mode.
OBRGetc	: Retrieves one character from OBR buffer.
OBRGets	: Retrieves character string for one bar code from decoding data storage buffer.
OBRGetStatus	: Retrieves OBR buffer status.
OBRClearBuff	: Clears OBR buffer.

Conditions for Terminating Scanning

Scanning is terminated when any one of the following conditions is met.

- Scanning is succeeded.
- Preset timeout period has elapsed.
- OBR buffer becomes a full.
- An abnormal condition is detected in the scan module.

Scan Completion Notification

When scanning is complete, a notification is issued to the application using one of the methods described in the table. Each notification method can be set to either “Enable” or “Disable”. The default is “Notification with window message”.

Table 2.41

Method	Description
Window message	A window message is issued to the specified window handle. Also, the conditions for scanning completion can be retrieved by referring to <i>wParam</i> parameter of the window message.
Event	A predefined event in the registry is issued. The conditions of scanning completion can be retrieved using the Laser Scanner Library.
None	No message or event is issued when scanning is complete.

The functions of the Laser Scanner Library relevant to the “Scan Completion Notification” are as follows.

OBRSetScanningNotification : Sets up scanning complete notification.

OBRGetScanningNotification : Retrieves scanning complete notification.

Event Name

The predefined event name which is issued for event notification can be changed in the registry described below. If there is no value set in the registry, the default event name,

OBRScanningEvent, is used.

[HKEY_LOCAL_MACHINE\Drivers\CASIO\Laser]

Table 2.42

Key Name	Value to set
EventName	sz: Any name

Capturing Event Factors

When a notification for scanning completion is issued with “Event”, factors which made the scanning succeeded are automatically recorded. The recorded factors are also retrieved using the Laser Scanner Library.

The function of the Laser Scanner Library relevant to the “Capturing Event Factors” is as follows.

OBRGetLastEventStatus : Retrieves last event status.

Setting Specific Operation Unique to Code128 Symbology

The terminal supports specific operations unique to the Code128 symbology that are initiated when certain conditions are met at a time of scanning a symbol of the Code128 symbology.

Table 2.43

Symbology	Condition	Performance
Code128	At time of scanning a symbol of Code128 that includes the FNC2 function character.	Scanned symbol data including the FNC2 function character is temporarily stored in the scanner until when a next symbol is scanned. The stored data is automatically added at the forefront of the subsequent scanned symbol data to be output. (See note)
	At time of scanning a symbol of Code128 symbology that includes the FNC4 function character(s).	The value “128” is added automatically to a data character in ASCII of scanned symbol located next to the FNC4 function character. If two sequentially laid FNC4 function characters in a symbol are scanned, either other group of two sequentially laid FNC4 function characters within the same symbol are read, or “128” is added automatically to each subsequent ASCII character data laid next to the two FNC4 function characters until the last.

Note:

The size of combined symbol data including the FNC2 function character is limited to 98 characters (maximum). If the size of any combined symbol data exceeds the maximum number of characters, the previous combined symbol data that have been scanned right before the exceeded combined symbol data are output.

The functions of the Laser Scanner Library relevant to the “Setting Specific Operation Unique to Code128 Symbology” are as follows.

OBRSetCode128Option : Sets up scanning with Code128 symbology.

OBRGetCode128Option : Retrieves decode options of Code128 symbology.

2.2.5 Scan Result Notification

When scanning a bar code is complete, a notification about the scanning result can be indicated to the user via either LED or buzzer. Each indication method can be set to “Enable” or “Disable”.

Table 2.44

Indication method	Setting	When succeeded	When failed (note 1)	Scanning interrupted (Trigger key released)	OBR buffer full (note 2)	Default
LED	Mode 1	ON in green	None	None	ON in green	Mode 1
	Mode 2	ON in green	ON in red	None	ON in green	
	Mode 3 (Disable)	None	None	None	None	
Buzzer	Enable	Scan completion sound	None	None	Warning sound	Enable
	Disable	None	None	None	None	
Vibrator	Enable	Vibration	None	None	None	Disable
	Disable	None	None	None	None	

Notes:

- Scanning fails when one of the errors occurs.
 - A bar code with the number of digits which exceeds over the specified range is scanned.
 - Check digit calculation error occurs.
- Full ASCII conversion error occurs in scanning bar code of Code39 symbology or Code128 symbology.
- If the “OBR buffer output” method has been set effect as scanned data output method, the condition occurs if scanning takes place while data for 9 labels are stored already in the OBR buffer.

The functions of the Laser Scanner Library relevant to the “Scan Result Notification” are as follows.

- OBRSetLED** : Sets up LED notification.
- OBRGetLED** : Retrieves the status of LED notification.
- OBRSetBuzzer** : Sets up buzzer notification.
- OBRGetBuzzer** : Retrieves the status of buzzer notification.
- OBRSetVibrator** : Sets up vibrator notification.
- OBRGetVibrator** : Retrieves the status of vibrator notification.

2.2.6 Expanded Features

Scan Width Control

If the laser emits on several bar codes located near each other, scanning may fail. By narrowing the laser beam emission width, scanning can be focused onto only one bar code, not onto the other one located near by. The laser beam emission width can be set to one of the four modes as shown in following figure. The Laser Scanner Library can be used to set it. The default is “No control on laser beam emission width”.

- No control on laser beam emission width (default)
- Wide
- Standard
- Narrow

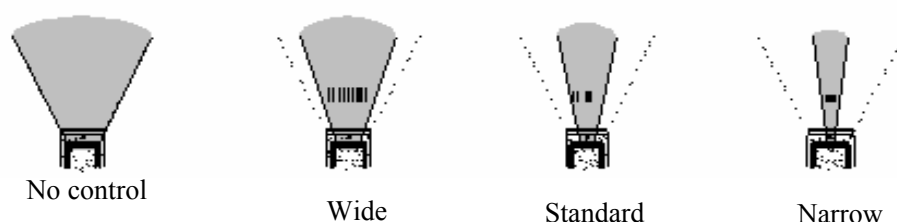


Figure 2-6

The setting values are stored in EEPROM, and read out at time of resetting. Laser calibration (see note below) adjusts each setting value for the laser beam emission width. The setting values adjusted must be registered in the registry. The values in the registry will have the priority.

Notes:

- Each scanner module integrated in the terminal has an individual performance different from others. To minimize this characteristic difference, the laser calibration must be performed on each terminal using the dedicated reference bar code.
- Setting up the scan width control function in one of four modes while the setting gain (see page 52) is set up in Auto mode may cause a deterioration of scanning bar codes that are printed in a poor quality. If you need to set up the scan width control function, select the setting gain in Mode 0 to Mode 3. Or, if you select the setting gain in Auto mode, select the scan width control function in “No control on laser beam emission width” mode only.

The functions of the Laser Scanner Library relevant to the “Scan Width Control” are as follows.

OBRSetSwingAngle : Sets up swing angle control mode.

OBRGetSwingAngle : Retrieves the status of swing angle control mode.

Scan Verification Beam

If scanning takes place with the laser beam emitted onto multiple bar codes located near each other, it is difficult to distinguish by the user which bar code was correctly scanned. In such the condition, if a laser beam can be emitted again on to the same bar code verifying the actual scanned bar code the user wishes to scan and a notification about it is issued to the user, the scanning can be succeeded without having any difficulty or confusion. The Laser Scanner Library can be used to set “Enable” or “Disable” for this Scan Verification Beam function. The default is “Disable the scan verification beam function”.

The functions of the Laser Scanner Library relevant to the “Scan Verification Beam” are as follows.

- OBRSetFocus** : Sets up the scan verification beam.
- OBRGetFocus** : Retrieves the status of the scan verification beam.

Setting Trigger Key

Various keys such as Cursor key and Center Trigger key on the front can be set as scanning trigger key. The default is only Center Trigger key.

The trigger keys explained in the above explanation are model dependant.

The functions of the Laser Scanner Library relevant to the “Setting Trigger Key” are as follows.

- OBRSetScanningKey** : Sets up Trigger keys.
- OBRGetScanningKey** : Retrieves the status of Trigger keys.

Noise Filter

If the background of printed bar code is white color, a noise tends to be generated easily during scanning causing the error rate to increase. To reduce such the noise, the Noise Filter function is available with the terminal. Two methods, software noise filter and ASIC noise filter, are available. However, the ASIC noise filter has been set always effect by the system. Thus, it is not possible for the user to reset it in the Read operation tab of Setting Scanner.

Table 2.45

Filter	Description	Merit	Demerit
Software noise filter	A software process removes noise. In determining the blank at the leading edge of the bar code, if there is a bar width smaller than a certain value, it will be bonded to the fore and aft data, the noise eliminated and the determination made. Also, the time in the range of 1 to 8 seconds from scanning to the time the software filter initiates can be set. The default is 3 seconds.	Effective when scanning leading edge blank of bar code using laser module noted for easily picking up noise.	If initial bar is extremely thin, it will be determined as noise and eliminated, which may mean that the bar code cannot be scanned.

The functions of the Laser Scanner Library relevant to the Noise Filter are as follows.

- OBRSetFilter** : Sets up noise filter mode.
- OBRGetFilter** : Retrieves noise filter mode.
- OBRSetFilterOnTimer** : Sets up start time for noise filter.
- OBRGetFilterOnTimer** : Retrieves start time for noise filter.

Setting Gain

The gain setting, Mode 0 to Mode 3 and Auto Mode, integrated on the laser module can be selected. Selecting an optimum gain mode enhances scanning performance especially for bar code distanced far away from the terminal and bar code printed in high-resolution (“PCS”).

Table 2.46

Gain Mode	Description
Mode 0 (Default)	<ul style="list-style-type: none"> • Standard mode <p>This mode generates ordinary scanning performance for bar codes with various printing qualities and in various scanning conditions.</p>
Mode 1	<ul style="list-style-type: none"> • Low sensitive mode <p>This mode enhances scanning performance for bar codes especially with low PCS. However, for bar codes with other levels of PCS, the mode is not recommended.</p>
Mode 2	<ul style="list-style-type: none"> • High sensitive mode <p>This mode enhances scanning performance for bar codes distanced far away from the terminal. However, for bar codes distanced near the terminal the performance is relatively inferior.</p>
Mode 3	<ul style="list-style-type: none"> • Super sensitive mode <p>This mode enhances scanning performance for bar codes with thin white bars or black thin bars or stained bars. For other conditions, the mode is not recommended.</p>
Auto Mode	<ul style="list-style-type: none"> • Automatic gain change mode <p>This mode carries out the gain modes one by one set in the registry below to perform scanning. If decoding a scanned bar code succeeds in one of the gain modes set in the registry, that gain mode is memorized and fixed temporarily for subsequent scanning with a few bar codes. This allows changing gain mode by reducing the deterioration of response from scanning. In this gain mode, the rate of success in scanning can be improved for bar codes in print quality and scanning conditions that the gain mode is good at. Contrarily to other gain modes, it may cause the response from scanning to be worse.</p> <p>Registry for automatic gain change mode: Location : [HKEY_LOCAL_MACHINE\Drivers\CASIO\Laser] Parameter: GainPtr=A (DWORD value)</p> <p>8 : Gain Mode 3 4 : Gain Mode 2 2 : Gain Mode 1 1 : Gain Mode 0</p> <ul style="list-style-type: none"> • Select one of the listed values above for the parameter A. Set a sum of values in the parameter if you select several modes at a time. Ex. Modes 0, 1, 2, 3 => Values 8+4+2+1 => 15 => Set “15” in the parameter A. • Default is 15. The gain mode changes Mode 0 to 3 and then Auto Mode. • Change made in the registry will be effect by performing a reset on the terminal. <p>If the Auto Mode is set without the registry being existed, all the gain modes are automatically performed one by one.</p>

Notes:

- Setting up the setting gain in Auto mode while the scan width control function is set up may cause a deterioration of scanning bar codes that are printed in a poor quality. If you need to set up the scan width control function, select the setting gain in Mode 0 to Mode 3. Or, if you select the Auto mode of the setting gain, select the scan width control function in “No control on laser beam emission width” mode only.

The functions of the Laser Scanner Library relevant to the Setting Gain are as follows.

OBRSetGainControl : Sets up gain control.

OBRGetGainControl : Retrieves gain control.

Configuration File

The various setting values can be stored in a file and resumed. The setting file storage location and its name are “\Documents and Settings\System Settings\OBRDRV.ini”. If there is no such the setting file, the default values are used to initiate scanning.

Table 2.47

Symbol ogy	Parameter	Description	Range	Default	Setting	
Readable Bar Code	READCODE	Enable or disable scanning the symbologies. (note 1)	1	131071	1:	Enable Code39
			2		2:	Enable NW-7
			4		4:	Enable WPC Addon
			8		8:	Enable WPC
			16		16:	Enable UPC-E Addon
			32		32:	Enable UPC-E
			64		64:	Enable IDF
			128		128:	Enable ITF
			256		256:	Enable Code93
			512		512:	Enable Code128
			1024		1024:	Enable MSI
			2048		2048:	Enable IATA
			4096		4096:	Enable GS1 DataBar Omnidirectional.
			8192		8192:	Enable GS1 DataBar Limited.
			16384		16384:	Enable GS1 DataBar Expanded.
			32768		32768	Enable GS1 DataBar Stacked.
			65536		65536	Enable GS1 DataBar Expanded Stacked.
CODE 39 Option	CODE39_MIN	Valid minimum digits	2	2		
	CODE39_MAX	Valid maximum digits	52	52		
	CODE39_OUTFORMAT	Output format	0	0	0:	Output Code39 bar code with start and stop characters.
			1		1:	Output Code39 bar code without start and stop characters.
			2		2:	Output Code39 bar code after Full ASCII conversion and with start and stop characters.
			3		3:	Output Code39 bar code after Full ASCII conversion and without start and stop characters.

Continue.

	CODE39_CHKD	Check digit calculation	0	0	0:	Disable
			1		1:	Enable
	CODE39_CHKCH	Check character output	0	1	0:	Disable
			1		1:	Enable
NW 7 Option	NW7_MIN	Valid minimum digits	2	2		
	NW7_MAX	Valid maximum digits	63	63		
	NW7_OUTFORMAT	Output format	0	0	0:	Output NW7 bar code with start and stop characters.
			1		1:	Output NW7 bar code without start and stop characters.
	NW7_CHKD	Check digit calculation	0	0	0:	Disable
			1		1:	Enable
	NW7_CHKCH	Check character output	0	0	Disable (fixed)	
WPC Addon Option	WPCADDON_MIN	Valid minimum digits	10	10	Fixed	
	WPCADDON_MAX	Valid maximum digits	18	18	Fixed	
	WPCADDON_OUTFORMAT	Output format	0	0	0:	Output WPC Addon bar code with “0” at the forefront.
			1		1:	Output WPC Addon bat code without “0” at the forefront.
	WPCADDON_CHKD	Check digit calculation	0	1	0:	Disable
			1		1:	Enable
	WPCADDON_CHKCH	Check character output	1	1	Enable (fixed)	
WPC Option	WPC_MIN	Valid minimum digits	8	8	Fixed	
	WPC_MAX	Valid maximum digits	13	13	Fixed	
	WPC_OUTFORMAT	Output format	0	0	0: Output WPC bar code with “0” at the forefront.	
			1		1: Output WPC bar code without “0” at the forefront.	
			14		14: Output WPC bar code in GTIN format.	
	WPC_CHKD	Check digit calculation	0	1	0:	Disable
			1		1:	Enable
	WPC_CHKCH	Check character output	1	1	Enable (fixed)	
UPCE Addon Option	UPCEADDON_MIN	Valid minimum digits		9	Fixed	
	UPCEADDON_MAX	Valid maximum digits		12	Fixed	
	UPCEADDON_OUTFORMAT	Output format		0	0:	Output UPCE Addon bar code with “0” at the forefront.
					1:	Output UPCE Addon bar code without “0” at the forefront.

Continue.

	UPCEADDON_CHKD	Check digit calculation		1	0:	Disable
					1:	Enable
	UPCEADDON_CHKCH	Check character output		1	0:	Disable
					1:	Enable
UPC-E Option	UPCE_MIN	Valid minimum digits	7	7	Fixed	
	UPCE_MAX	Valid maximum digits	7	7	Fixed	
	UPCE_OUTFORMAT	Output format	0	0	0: Output UPC-E bar code with “0” at the forefront.	
			1		1: Output UPC-E bar code without “0” at the forefront.	
			2		2: Output UPC-E bar code in GTIN format.	
	UPCE_CHKD	Check digit calculation	0	1	0:	Disable
			1		1:	Enable
	UPCE_CHKCH	Check character output	0	1	0:	Disable
			1		1:	Enable
IDF Option	IDF_MIN	Valid minimum digits	2	2		
	IDF_MAX	Valid maximum digits	67	67		
	IDF_OUTFORMAT	Output format	0	0	Output IDF bar code in no format (fixed).	
	IDF_CHKD	Check digit calculation	0	1	0:	Disable
			1		1:	Enable
	IDF_CHKCH	Check character output	0	1	0:	Disable
			1		1:	Enable
ITF Option	ITF_MIN	Valid minimum digits	4	4		
	ITF_MAX	Valid maximum digits	94	94		
	ITF_OUTFORMAT	Output format	0	0	Output ITF bar code in no format (fixed).	
	ITF_CHKD	Check digit calculation	0	1	0:	Disable
			1		1:	Enable
	ITF_CHKCH	Check character output	0	1	0:	Disable
			1		1:	Enable
CODE 93 Option	CODE93_MIN	Valid minimum digits	1	3		
	CODE93_MAX	Valid maximum digits	70	70		
	CODE93_OUTFORMAT	Output format	0	0	Output Code93 bar code in no format (fixed).	
	CODE93_CHKD	Check digit calculation	0	1	0:	Disable
			1		1:	Enable
	CODE93_CHKCH	Check character output	0	0	Disable (fixed)	

Continue.

CODE128 Option	CODE128_MIN	Valid minimum digits	1	2		
	CODE128_MAX	Valid maximum digits	98	98		
	CODE128_OUTFORMAT	Output format (note 4)	0	0	0:	Output Code128 bar code after Full ASCII conversion.
			1		1:	Output Code128 bar code without Full ASCII conversion performed.
			2		2:	Output GS1-128 bar code only.
			6		6:	Output GS1-128 bar code only with code ID (note 2).
			10		10:	Output GS1-128 bar code only after Fnc→ GS conversion.
			2		2:	Output GS1-128 bar code only.
			4		4:	Output GS1-128 bar code with code ID attached.
			8		8:	Output GS1-128 bar code after Fnc→ GS conversion (note 2).
			16		16:	Output Code128 bar code without Full ASCII conversion performed.
			32		32:	Output GS1-128 bar code without Full ASCII conversion performed. (note 2)
			64		64	Output Code128 bar code or GS1-128 bar code with FNC2 combined.
			128		128	Output Code128 bar code or GS1-128 bar code with expanded FNC4 and ASCII conversion performed.
	CODE128_CHKD	Check digit calculation	0	1	0:	Disable
			1		1:	Enable
	CODE128_CHKCH	Check character output	0	0	Disable (fixed)	

Continue.

MSI Option	MSI_MIN	Valid minimum digits	1	1		
	MSI_MAX	Valid maximum digits	57	57		
	MSI_OUTFORMAT	Output format	0	0	No (fixed)	
	MSI_CHKD	Check digit calculation	0	1	0:	No calculation
			1		1:	1 digit, mod 10
			2		2:	2 digits, mod11/mod 10
			3		3:	2 digits, mod10/mod10
	MSI_CHKCH	Check character output	0	1	0:	Disable
			1		1:	Enable
IATA Option	IATA_MIN	Valid minimum digits	1	4		
	IATA_MAX	Valid maximum digits	65	65		
	IATA_OUTFORMAT	Output format	0	0	Disable (fixed)	
	IATA_CHKD	Check digit calculation	0	0	0:	No check digit calculation
			1		1:	Calculation for all digits except the last digit
			2		2:	Calculation for coupon no. and data
			3		3:	Calculation for data block only
			4		4:	mod10
	IATA_CHKCH	Check character output	1	1	Enable (fixed)	
GS1 DataBar Omnidirectional Option	RSS14_MIN	Valid minimum digits	14	14	Fixed	
	RSS14_MAX	Valid maximum digits	14	14	Fixed	
	RSS14_OUTFORMAT	Output format	0	0	0:	Output GS1 DataBar Omnidirectional bar code in standard format.
			1		1:	Output GS1 DataBar Omnidirectional bar code without A.I. (note 4)
	RSS14_CHKD	Check digit calculation	1	1	Enable (fixed)	
	RSS14_CHKCH	Check character output	1	1	Enable (fixed)	
GS1 DataBar Limited Option	RSSLTD_MIN	Valid minimum digits	14	14	Fixed	
	RSSLTD_MAX	Valid maximum digits	14	14	Fixed	
	RSSLTD_OUTFORMAT	Output format	0	0	0:	Output GS1 DataBar Limited bar code in standard format.
			1		1:	Output GS1 DataBar Limited bar code without A.I. (note 3)
	RSSLTD_CHKD	Check digit calculation	1	1	Enable (fixed)	
	RSSLTD_CHKCH	Check character output	1	1	Enable (fixed)	
GS1 DataBar Expanded Option	RSSEXP_MIN	Valid minimum digits	1 to 74	1		
	RSSEXP_MAX	Valid maximum digits	1 to 74	74		
	RSSEXP_OUTFORMAT	Output format	0	0	Output GS1 DataBar Expanded bar code in no format (fixed).	
	RSSEXP_CHKD	Check digit calculation	1	1	Enable (fixed)	
	RSSEXP_CHKCH	Check character output	1	1	Enable (fixed)	

Continue.

GS1 DataBar Stacked Option	RSS14_MIN	Valid minimum digits	14	14	Fixed	
	RSS14_MAX	Valid maximum digits	14	14	Fixed	
	RSS14_OUTFORMAT	Output format	0	0	0:	Output GS1 DataBar Stacked in standard format.
			1		1:	Output GS1 DataBar Stacked without A.I. (note 4)
	RSS14_CHKD	Check digit calculation	1	1	Enable (fixed)	
	RSS14_CHKCH	Check character output	1	1	Enable (fixed)	
GS1 DataBar Expanded Stacked Option	RSSEXP_MIN	Valid minimum digits	1 to 74	1		
	RSSEXP_MAX	Valid maximum digits	1 to 74	74		
	RSSEXP_OUTFORMAT	Output format	0	0	Output GS1 DataBar Expanded Stacked bar code in no format (fixed).	
	RSSEXP_CHKD	Check digit calculation	1	1	Enable (fixed)	
	RSSEXP_CHKCH	Check character output	1	1	Enable (fixed)	
Read Mode Option	READMODE	Setting scanning mode	0	1	0:	Single scanning
			1		1:	Continuous scanning (with Trigger key)
Gain Option	GAIN	Setting gain	0	0	0:	Mode 0
			1		1:	Mode 1
			2		2:	Mode 2
			3		3:	Mode 3
			128		128:	Auto Mode (note 4)
Buzzer Control Option	BUZZER	Setting buzzer	0	1	0:	Disable
			1		1:	Enable
LED Control Option	LEDCTRL	Setting LED	0	2	0:	Disable
			1		1:	Enable
			2		2:	Enable. Disable when fail.
Out Buff Control Option	OUTBUFF	Setting output method	0	0	0:	Output to OBR buffer.
			2		2:	Output to key.
			3		3:	Output to clipboard.
			4		4:	Output to keyboard event.
Suff Char Option	ENDCODE	Termination code	0	4	0:	<CR>
			1		1:	<LF>
			2		2:	<CR> + <LF>
			3		3:	<TAB>
			4		4:	No termination code

Continue.

Multi-step Read Option	MULTISTEP	Multi-step reading	0	0	0:	Standard read
			1		1:	Multi-step read
Comp Counter Option	CMPCNT	No. of verifications	1 to 9	3		
Read Counter Option	READCNT	No. of times to scan in continuous read mode	1 to 9	1		
Scan Time Option	SCANTIME	Timeout period in second	1 to 9	3		
	FILTERMODE	Noise filter mode (note 1)	0	0	0:	Disable noise filter
			1		1:	Enable software noise filter
			2		2:	Enable hardware noise filter
	FILTERCNT	Period of time in second between when scanning starts and when the noise filter initiates.	1 to 8	3		
Scanning Key Option	KEY	Setting Trigger key (note 1)	4	256	4:	Multi key (Key code : 0xe0)
			8		8:	Cursor ← key
			16		16:	Cursor → key
			32		32:	Cursor ↑ key
			64		64:	Cursor ↓ key
			256		256:	Center Trigger key
Laser Swing Option	SWING	Setting scan width control mode	0	0	0:	No control
			1		1:	Wide
			2		2:	Standard
			3		3:	Narrow
						(note 4)
Laser Focus Option	FOCUS	Setting scan verification beam	0	0	0:	Disable
			1		1:	Enable
Notification Option	NOTIFICATION	Setting scan complete notification (note 1)	1	1	1:	Notification via window message
			2		2:	Notification via event
Decode Level Option	LEVEL	Setting decode level	0	1	0:	Standard level
			1		1:	High level (dual decode system)
			256		256:	Steady

Continue.

Decode Customize Option	BARWIDTH	Setting correction value of thickness of bars	0	0	0:	No correction
			1		1:	Thin black bar
			2		2:	Thin black bar (Max)
			3		3:	Thin white bar
			4		4:	Thin white bar (Max)
			5		5:	Thick black bar
			6		6:	Thick black bar (Max)
			7		7:	Thick white bar
			8		8:	Thick white bar (Max)
	MARGINCHECK	Setting threshold values for right and left margins	0	0	0:	Maximum
			1		1:	Middle
			2		2:	Narrow
			3		3:	Minimum
Learning Decode Option	LEARINING	Setting learning mode	0	0	0:	Disable
			1		1:	Enable

Notes:

1. To set up multiple bar code symbologies effect, specify a sum of the symbology values you wish to scan.
2. To set up multiple output methods effect, specify a sum of each value of the output methods you wish to set. However, if you set “GS1-128 without Full ASCII conversion”, “GS1-128 with code ID attached” and “GS1-128 Fnc → GS conversion” effect at the same time, “GS1-128 without Full ASCII conversion” has the priority over the other settings. Thus, the settings are disabled.
3. A.I. is the abbreviation of Application Identifier which is attached at the forefront of bar code of GS1 DataBar Omnidirectional, GS1 DataBar Limited, and GS1 Stacked symbologies.
4. Setting up the scan width control function in one of four modes while the setting gain is set up in Auto mode may cause a deterioration of scanning bar codes that are printed in a poor quality. If you need to set up the scan width control function, select the setting gain in Mode 0 to Mode 3. Or, if you select the setting gain in Auto mode, select the scan width control function in “No control on laser beam emission width” mode only

The functions of the Laser Scanner Library relevant to the Configuration File are as follows.

- OBRSaveConfigFile** : Saves all settings for the scanner driver into the configuration file.
- OBRLoadConfigFile** : Retrieves and then loads the configuration file into the scanner driver.
- OBRSetDefaultSymbology** : Sets up default status of the Laser Scanner driver.

Dual Decoder System

Mode	Description
Standard Mode	Standard Mode This mode is used standard mode only for scanning.
High Mode	<p>The dual decoders system initially decodes a scanned bar code data using the standard decoder, but if decoding fails, it uses the following additional decoder to scan the same bar code. This dual decoders system supports the bar code symbologies listed below.</p> <ul style="list-style-type: none">- Code39- Code128- EAN <p>With the decoding system used for the previous CASIO handheld terminals, decoding is processed with a mean value of one module adding bar thickness of each black bar and white bar for one character when performing binaryzation or quardruplezation of bar thickness. However, this method does not accurately decode a bar code if it is formed with unbalanced bar thickness between white bars and black bars.</p> <p>The dual decoders system can solve it by calculating separately each mean value of black bars and white bars for such a bar code with unbalanced thickness of white and black bars by changing the threshold level of decoding.</p>
Steady Mode	<p>This mode is available to accurate scanning operation by scanning under bar ratio check is set strictly condition in decode logic.</p> <p>Then it is available to prevent to mis-reading the following barcodes type.</p> <ul style="list-style-type: none">- Code128- EAN <p>About the uppers barcode type, bar ratio check is strictly than standard mode. Then scanning operation will be accurate. But when you scan bad quality printing barcode, it is possible that scanning response will be slower than standard mode.</p> <p>Other barcode scanning performance is same as standard mode.</p>

The functions of the Laser Scanner Library relevant to the Dual Decoder System are as follows.

OBRSetDecodeLevel : Sets up decoding level.

OBRGetDecodeLevel : Retrieves decoding level.

Customizing the Decoder

According to the scan environment and the bar code printed material's quality, the decoder can be customized to efficiently improve scanning performance. First, to maintain scanning performance with the normal decoding logic, perform decoding using with the decoder and if it does not succeed the decoding, customize it so that the decoding can be performed for a better scanning performance.




Table 2.48 Customizing the elements

Element	Description
Change margin of the right and left threshold values	Used to change the threshold values of right and left side marginal spaces which are allocated for areas colored in white on the left and right sides of a bar code.
Change of compensation values of the thickness and thinness of a bar.	Used to thicken or thin each bar of bar code for a specified value and then decode it. Value for thickening or thinning each bar can be changed.

Changing the Threshold Values for Right and Left Margins

When a bar code is printed inside of quadrangle, scanning may not be possible because there is not enough left and/or right marginal space. By making change on the right and left marginal threshold values, scanning a bar code becomes possible. See the table below.

Table 2.49

When the left marginal space is narrow.	
When the right marginal space is narrow.	
When both right and left marginal spaces are narrow.	

The functions of the Laser Scanner Library relevant to the “Changing the threshold values for Right and Left margins” are as follows.

OBRSetMarginCheckRatio : Sets up a threshold value for right and left side space margins.

OBRGetMarginCheckRatio : Retrieves the threshold value for right and left side space margins.

Changing the Thickness of Bars

If bars that form a bar code are printed thick because blurring or scratchy white bars (spaces between two bars) are printed thinly, the bar ratio will not be correct causing scanning incorrectly. Adjusting the thickness of these bars makes scanning the bar code possible. This method is applicable if all bars of a bar code are either too thick or too thin because the method is applied to the whole of a bar code.

The functions of the Laser Scanner Library relevant to the “Changing the thickness of bars” are as follows.

OBRSetBarWidthAdjustment : Sets up the adjustment of thickness of bars.

OBRGetBarWidthAdjustment : Retrieves the adjustment set for the thickness of bars.

Decode Learning Function

This function is to automatically change parameters for criteria and threshold level used to judge on decoding bar code data so that scanning a bar code printed in poor quality can be improved. However, after changing the relevant parameters for the **Decode Learning** function, the individual scanning characteristics of each terminal may be degraded. To avoid such degrade, the integrated decoding system starts decoding with the standard decoder and then changes with the customized decoder if decoding at the first stage fails. If the decoding at the end of the process does not succeed, the **Decode Learning** function is used to ensure it to be succeeded. Setting either “Enable” or “Disable” for the function to be effect can be set. See the decoding process flow in the following figure.

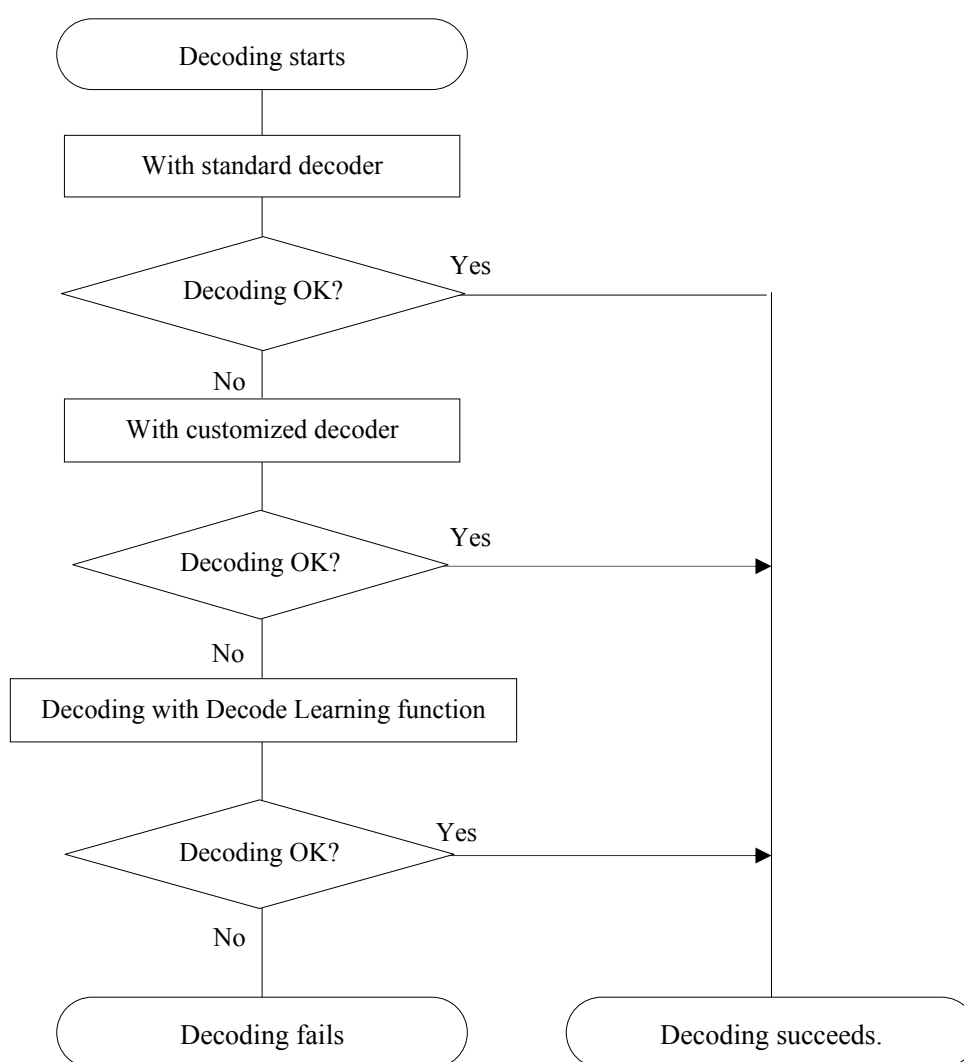


Figure 2-7

The functions of the Laser Scanner Library relevant to the “Decode Learning function” are as follows.

OBRSetDecodeLearningMode : Sets up the decoder learning mode.

OBRGetDecodeLearningMode : Retrieves the decoder learning mode.

Supported Symbolologies

Below is a list of the symbolologies which can be effectively scanned using the **Decode Learning** function.

- EAN, JAN, UPC-A, UPC-B
- EAN, JAN, UPC-A, UPC-B Add-ons
- UPC-E
- UPC-E Add-on
- Code39
- NW7
- Interleaved 2of5
- Industrial 2of5
- Code93
- Code128
- MSI
- IATA

List of Parameters Subject to Change

The parameters subject to change are those which can be altered using the **Customize** function and those listed below.

Table 2.50 Customizing the elements

Element	Description
Changing Character Spacing Threshold Values	Enables the threshold values of the bars forming the character spacing (the white space between characters formed by multiple black and white bars) to be responsively modified.
Changing guard bar and delineator threshold values	Enables the threshold values of guard bars (EAN, JAN, UPC-A Right, Left and Center guard bars and UPC-E Right and Left guard bars) and delineators (the white spaces between Add-ons and non-Add-on bars) to be responsively modified.
Changing Thick Bar Determination Threshold Values	Enables the threshold values for determining thick bars to be responsively modified.
Changing Thick Bar Determination Criteria	Enables the bars which form the criteria for determining thick bars (i.e. StartBAR, CenterBAR, Margin etc.) to be responsively modified.
Changing Calculation Method for Thick bar Determination	Enables the operator to switch between the following two calculation methods for determining thick bars. <ul style="list-style-type: none">- Calculate combined ratio of black and white bars- Calculate separate ratios of black and white bars
Changing Noise Filter Threshold Values	Enables the noise filter threshold values to be modified.
Changing Character Discrepancy Threshold Values	Enables the threshold values for the total value of bars comprising a single character to be responsively modified.
Changing Minimum and Maximum Bar Threshold Values	Enables the threshold values for the minimum and maximum bars of the bars forming a single character to be responsively modified.

Changing Character Spacing Threshold Values

The decoder identifies wide character spacing as an anomalous pattern, which may result in the inability to scan. Disabling the character spacing determination function overcomes this problem. Depending on the barcode system, some codes may have character spacing while others may not. This change is effective for those codes which have character spacing. The symbologies on which this change is effective are listed below.

- Code39
- NW7
- Industrial 2of5
- IATA

While Industrial 2of5 and IATA symbologies do not have character spacing, it is possible to enable or disable the check which is carried out to determine the ratio of the white bars located between the black bars.

Changing Guard Bar and Delineator Threshold Values

When scanning EAN, JAN, UPC-A, and UPC-E symbologies, it may not be possible to scan due to irregular guard bar ratios. Similarly, when reading Add-on symbology, it may not be possible to scan due to irregular delineator ratios. This problem can be overcome by disabling the guard bar and delineator check functions.

The guard bar element is only present in EAN, JAN, UPC-A, and UPC-E symbologies while the delineator element is only present in Add-on symbology. This change is effective on the following symbologies.

- EAN, JAN, UPC-A, UPC-B
- EAN, JAN, UPC-A, UPC-B Add-ons
- UPC-E
- UPC-E Add-on

Changing Thick Bar Determination Threshold Values

Scanning may be hampered by misidentification of the bar pattern which occurs when only the thick or thin bars are printed or when the gap between the thick and thin bars is slight. This problem can be eliminated by changing the threshold values for determining thick bars. This change is effective on the following symbologies.

- Code39
- NW7
- EAN, JAN, UPC-A, UPC-B
- EAN, JAN, UPC-A, UPC-B Add-ons
- UPC-E
- UPC-E Add-on
- Industrial 2of5
- Interleaved 2of5
- Code93
- Code128
- IATA

Changing Thick Bar Determination Criteria

Optical and print characteristics may result in discrepancies in the thickness of black and white bars, thereby preventing accurate ratios from being obtained during scanning. By checking the left guard bar and central bar, the black and white bar discrepancies are obtained and incorporated into the thick bar determination. Changing the position of the bars to be checked can enhance the scanning accuracy of bar codes which contain some bars with anomalous ratios.

Depending on the bar code system, some codes may have left guard bars and center bars while others may not. This change is effective for those codes which have the elements. The symbologies on which this change is effective are listed below.

- EAN, JAN, UPC-A, UPC-B
- EAN, JAN, UPC-A, UPC-B Add-ons
- UPC-E
- UPC-E Add-on

Changing Calculation Method for Thick bar Determination

Optical and print characteristics may result in discrepancies in the thickness of black and white bars, thereby preventing accurate ratios from being obtained during scanning. This means that scanning may not be possible when the ratios of the black and white bars are not uniform. This problem can be overcome by analyzing the black and white bars separately.

Depending on the bar code system, this method of analyzing the black and white codes separately is effective for some symbologies but not for others. The symbologies on which this analysis method is effective are listed below.

- EAN, JAN, UPC-A, UPC-B
- EAN, JAN, UPC-A, UPC-B Add-ons
- UPC-E
- UPC-E Add-on
- Code39
- NW7
- Code93
- Code128

Changing Noise Filter Threshold Values

A combination of laser module optical characteristics and barcode printing conditions can generate noise within the bar code scanning data resulting in the inability to scan. This problem can be dealt with by removing noise. This is achieved by identifying all data at or below a prescribed threshold value as noise and removing it when detected by linking it to preceding and subsequent data.

Changing Character Discrepancy Threshold Values

When a comparison of the total value of bars comprising each character is performed during scanning and said value is either too large or too small compared to that of the other characters, it is processed as an anomalous pattern. This may result in the inability to scan due to the ratio of a single character becoming either larger or smaller than the others. This problem can be overcome by disabling the character discrepancy check.

Depending on the bar code system, some symbologies perform character discrepancy checks while others do not. This change is effective for those symbologies which perform character discrepancy checks. The symbologies which perform this check are as follows.

- EAN, JAN, UPC-A, UPC-B
- EAN, JAN, UPC-A, UPC-B Add-ons
- UPC-E
- UPC-E Add-on

Changing Minimum and Maximum Bar Threshold Values

When the thickest bar or thinnest bar among those comprising each character exceeds or falls below the upper or lower thresholds respectively during scanning, they are processed as anomalous patterns. For this reason, scanning may not be possible when a single bar is excessively thick or thin, or when thick or thin bars are excessively thick or thin. This problem can be overcome by disabling the minimum and maximum bar check function.

Depending on the bar code system, some symbologies perform minimum and maximum bar checks while others do not. This change is effective for those symbologies which perform minimum and maximum bar checks. The symbologies which perform this check are as follows.

- NW7
- Interleaved 2of5

Parameter Precedence Change Function

The operating order of the relevant parameters used in success decoding bar code data with the Decode Learning function can be advanced for precedence. This advance will result in quick response of continuously scanning multiple bar codes with similar quality. Since the precedence order is stored in the RAM memory, it will be reset to the default order if a reset is performed on the terminal.

Erratic Scanning Avoidance Function

This function retrieves the bar code quality rank by calculating the decoder easiness when scanning a bar code. If the quality rank of scanned bar code is relatively low, the error rate becomes high causing an erratic scanning to occur. To suppress the error rate, the function automatically makes judgment on scanning with such the bar code as “Failure”.

Enabling or Disabling the Decode Learning Function

The Decode Learning function can be switched to either “Enable” or “Disable”. This switch can be made using the functions or settings file provided by the Laser Scanner Library.

Note:

Enabling the Decode Learning function improves the scanning performance for poorly printed bar codes. However, it may also increase the likelihood of erroneous scanning depending on the bar code you scan. The following settings should therefore be used in conjunction with the Decode Learning function in order to prevent erroneous scanning.

- Turn off the scanning functions for reading all symbologies other than those to be scanned.
- Turn off the scanning functions for reading symbologies that exceed the maximum readable digits of the symbologies you wish to scan. This applies to only symbologies that allow setting for the maximum readable digits.
- Set the check digit effect. This applies to symbologies for which the check digit can be set.

2.2.7 Power Control

In order to save the power, the power is not supplied to the laser scan module and the ASIC module for laser beam control both integrated in the terminal during the laser beam is not irradiating. It is supplied to these modules when the laser beam is to be irradiated, and turned off again when the laser beam is not irradiated.

2.3 USB

This chapter describes about detailed specifications of the USB.

2.3.1 Basic Specifications

Switching USB

- Switches between USB Client (USB Function) and USB Host.
- Switching between USB Client (USB Function) and USB Host is carried out by a signal from the cradle. This cannot be performed in application.
- Avoid switching USB while the USB device is connected to the cradle and the terminal is recognizing the USB device. Switching can be performed once the USB device is disconnected.
- **USBIsHost API** function can be used to capture the current USB Client (USB Function)/Host status.

USB Client (USB Function)

- Supports the USB 1.1 full speed.
- Communicates with “wceusbsh.dll” on PC side.
- Communication with PC can be established via ActiveSync.
- Communication with PC can be established via FLCE/LMWIN (this case, ActiveSync must be disabled.)

USB Host

- Supports the USB 1.1 full speed.
- Supports USB-MODEM, USB-LAN, and USB-Storage.
- USB device is disconnected when the terminal is suspended.
- Does not support WakeOn Ring and WakeOn LAN.
- Does not support communication via USB HUB.

USB-MODEM

- Supports the USB Communication Class (CDC: ACM).
- Communication with modem via virtual COM port can be established.
- Dial up via USB modem can be possible by selecting USB modem at the setting of connection under Windows Embedded Handheld.

USB-LAN

- Can be connected to network via the TCP/IP protocol using the TCP/IP Wrapper Driver.

USB-Storage

- Supports USB-Storage.

2.3.2 COM Port

COM ports used with the USB are as follows.

Table 2.51

USB Function	COM2
USB-MODEM	COM5

2.3.3 Product ID

USB product ID is as follows.

Table 2.52

USB Product ID	0x00CE
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2.3.4 Vendor ID

USB vendor ID is as follows.

Table 2.53

USB Vendor ID	0x045E
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2.4 Bluetooth

This chapter describes about detailed specifications of the Bluetooth.

2.4.1 Basic Specifications

Version

Bluetooth[®] Version 2.0 + EDR

Master

The master establishes a connection with Bluetooth equipment in slave mode waiting for connection with the master.

Client (Slave)

The client (slave) becomes in waiting mode for communication initiated by the master.

Security/Encryption

This performs security (PassKey exchange) and encryption as laid down in the Bluetooth standard.

AFH

This automatically or manually limits and controls radio wave frequency band to be employed in Bluetooth communication.

Fast Connection

This is to convert radio frequency for Bluetooth communication into transmission pattern which allows connection establishment quickly.

EDR (Enhanced Data Rate)

If the communication partner supports also EDR, the EDR is set as radio wave type automatically by negotiation with the partner device. There is no setting required for the EDR mode. Communication speed via the EDR between the two terminals is approximately 500 Kbps maximum.

2.4.2 Communication Profiles

The Bluetooth profiles described in the table are supported.

Table 2.54

Function	Purpose
GAP (General Accessible Profile)	Used in the substructure segment of Bluetooth communications such as device discovery, link establishment and security.
SDP (Service Discovery Profile)	Used to search for currently usable services provided by the partner Bluetooth equipment.
Serial Profile (Client)	In Bluetooth serial communication, this is used for connection to other Bluetooth equipment.
Serial Profile (Server)	In Bluetooth serial communication, this is used for acceptance of connection request from other Bluetooth equipment.
DUN (Dial-Up Network)	This is used in dial up communication via Bluetooth mobile phone.
HID (Human Interface Device)	This is used in connection with Bluetooth HID profile keyboard.

Bluetooth communication applications and communication methods as well as profile relationships are as follows.

Table 2.55

Partner Bluetooth Equipment	Communication Application	Profile
Bluetooth mobile phone, Bluetooth modem, etc.	Dial up	DUN
Bluetooth printer	Printing to printer	Serial Profile
PC for Bluetooth + ActiveSync	Connection with host PC	Serial Profile

2.4.3 Security

This feature supports security functions laid down in the Bluetooth standard. The Bluetooth security is divided into authentication and encryption.

These are realized by the use of PassKey (otherwise known as PIN code). PassKey is a shared (common) authentication key used when forming a connection and trust relationship (bonding) with Bluetooth equipment. A maximum of 16 characters (in ASCII code) can be used, but there may be limitations on the no. of digits and usable characters due to the specifications of partner Bluetooth equipment. Also PassKey input must be done within 30 seconds from a time when PassKey input request is generated. Note that PassKey input is not required once “device trust” has been established with Bluetooth equipment in previous connection. However, the partner Bluetooth equipment must have also the trust relationship in memory.

Encryption is carried out using a link key generated after PassKey exchange and a cipher key generated from a 128-bit random number. Here, the partner Bluetooth equipment also must support the encryption. PassKey exchange is required for Bluetooth connection when encryption is set enabled.

2.4.4 COM Port

The following is the COM ports used with the Bluetooth.

Table 2.56

Serial Profile (Client)	COM6 / COM7
Serial Profile (Server)	
DUN (Dial-Up Network)	COM7

Case of using CASIO Bluetooth library

Table 2.57

Serial Profile (Client)	COM6
Serial Profile (Server)	COM7

Simultaneous Use of Multiple Bluetooth COM Ports

Multiple Bluetooth COM ports by Serial profile can be opened simultaneously to use. At this time, you should specify COM port at each Bluetooth devices.

About procedure of connection using multiple Bluetooth devices in Microsoft Stack, please refer the following URL.

<http://msdn.microsoft.com/en-us/library/aa916877.aspx>

2.4.5 Process After Communication Interruption

With Bluetooth communication, there is a chance that the communication link may be interrupted due to radio wave conditions in air. An error occurred during the communication is detected by carrying out **WriteFile API** function, **ReadFile API** function, etc.

In case where the communication is interrupted, carry out the normal Bluetooth interruption process using the Bluetooth tool or in application and then retry to establish the same connection for communication. If the normal Bluetooth interruption process is not made, unconformity in the Bluetooth stack will occur so that the lower layer is disconnected whereas the upper layer is still being connected causing the retry of establishing the connection is not possible.

2.4.6 Process During Suspend and Resume

When the terminal goes into suspend mode while Bluetooth is being used, the power to the Bluetooth module integrated in the terminal will be automatically turned off. After that, when the terminal resumes operation mode, the power to the Bluetooth module will be also turned on automatically. Once the power is turned off, all the parameters related to Bluetooth communication return to their initial states. These parameters must be set again in the Bluetooth module by initializing the Bluetooth stack. If the Bluetooth tool or the Bluetooth Library is used, it will automatically detect “suspend” and “resume” modes, and automatically initialize the Bluetooth stack.

2.4.7 Setting SR Mode Parameter

When carrying out Bluetooth communication, the connection will be established by transmitting radio waves by master Bluetooth equipment to slave Bluetooth equipment. Note that it may take time sometime to make the establishment depending on a type of the partner Bluetooth equipment. Here, by altering the SR mode parameter (used in Bluetooth connection), radio waves sent out when the master Bluetooth equipment makes the establishment will change, and may reduce the time required to establish the communication. The SR mode parameter can be set in the following registry.

[HKEY_CURRENT_USER\SOFTWARE\RXBT\HCI]

Table 2.58

Key	Setting Value	Description
DEFAULT_PAGE_SCAN_REP_MODE	dword: 0, 1, or 2	0: R0, 1: R1, 2: R2

Notes:

- Change the SR mode parameter prior to establishing Bluetooth connection.
- Even if the SR mode parameter is changed, the time required to establish connection with the partner Bluetooth equipment may not be reduced.

2.4.8 Simultaneous Use with WLAN

Since Bluetooth employs the same frequency range (2.4GHz ISM band), Bluetooth cannot be operated concurrently with WLAN. However, it is possible to make mutual interference less by following the instruction without turning off the power of either device.

- If the partner Bluetooth device supports AFH (Adaptive Frequency Hopping)
 - Separate the frequency range definitely for Bluetooth and for WLAN.
 - If AFH is used at the automatic setting mode, according to the inherent characteristics of AFH function Bluetooth causes interference to the frequency range which WLAN uses. In this case, specify the frequency range with the Bluetooth connection tool which Bluetooth should not use, in other words, the frequency range which WLAN uses.
 - Confirm that the Bluetooth device of the communication partner supports AFH function. Bluetooth connection should be established first by the terminal to the Bluetooth device. If this is carried out in the opposite way, there is possibility that AFH function does not run due to that the frequency range set by the terminal cannot be used.
 - As usable frequency range for Bluetooth is restricted by AFH function, mutual interference among Bluetooth devices or interference from other device are apt to be suffered. If the performance of Bluetooth communication ranks important, set the frequency range for Bluetooth as wide as possible. This is a matter of trade-off for WLAN.
- If the partner Bluetooth does not support AFH (exclusive use of Bluetooth and WLAN)
 - Confirm that WLAN communication has been finished before performing Bluetooth connection. If Bluetooth connection is performed while WLAN is used, radio wave from Bluetooth will significantly affect WLAN communication. Communication error by interference by Bluetooth radio wave can be reduced if Bluetooth communication is started after receiving data via WLAN.
 - Confirm that Bluetooth communication has been finished and Bluetooth connection is terminated before WLAN communication starts.
 - If another terminal fails to perform communication via WLAN/Bluetooth, keep the terminal away from this terminal as far as possible and start to operate Bluetooth again.
 - For WLAN communication to carry out, operate the terminal as close to Access-Point (for WLAN) as possible. As it is assumed that Bluetooth devices are operated near by the user, affect by interference mainly occurs on WLAN device. If the terminal distances from the Access-Point, affect by interference generated by Bluetooth device will increase causing LAN communication to fail. If this happens, place the terminal as near to the Access-Point as possible and operate WLAN communication again.

Note:

Even if either one of the methods described above has been determined to be effect, thorough check and assessment on the site and for system designs must be carried out prior to simultaneously operating Bluetooth and WLAN communications.

2.4.9 Communication Range

The communication range for Bluetooth communication between two Bluetooth devices should be 3 meters or less. If there is an obstacle exists on the path that blocks radio wave, the actual range may become shorter. Secure free path for maximum range.

2.5 WLAN

The IEEE802.11 b/g WLAN is operable with integrated WLAN module (model dependant). The IEEE802.11 b/g standard utilizes 2.4 GHz ISM (“Industry Science Medical”) frequency band, which is used for short range wireless communication.

Device Name

On the terminal, the device name used to capture data, with **DeviceloControl** function, about the WLAN driver is “SDIO86861”.

2.5.1 Basic Features

Roaming

This function automatically switches Access-Point in environment where two or more Access-Points with identical SSID code exist.

Power Saving

This saves the power by automatically turning off the power to the integrated WLAN module in the terminal when communicating does not take place.

AdHoc

This operation mode provides a direct communication between wireless equipments without the use of Access-Point. Note, however, that the AdHoc mode is not recommended to operate because connection problem may occur.

WEP

This is an encryption that uses RC4 method for safe communication. It supports 40-bit (64-bit) and 104-bit (128-bit).

TKIP

TKIP supports against the weakness of WEP encryption.

AES

Advanced Encryption Standard (AES) is available for encryption method.

Enhanced Encryption

In order to address WEP vulnerabilities, the driver supports WEP key transmission, the new encryption method TKIP and the AES-developed TKIP. However, AES typically requires encoding and decoding hardware. The terminal supports AES and is compatible with WPA2.

802.1x Security

This can strengthen authentication and establish a safe and reliable communication via WLAN. In general, this interlinks with TKIP and AES. It supports PEAP-EAP-MS-CHAP-V2 and EAP-TLS.

2.5.2 Expanded Features

Power ON/OFF Control

The power to the integrated WLAN module can be controlled in application. Turning off the power when the WLAN module is not in use can save power, prevent line congestion and allow the on-board use of the terminal in aircraft. However, it is recommended to consult a cabin crew prior to use of it.

Operation Configuration File

The operation configuration file can be used to set each default value of the WLAN settings.

Resume Operation

After the terminal went into suspend mode and then returned in resume mode during wireless operation, this will automatically establish connection again with the Access-Point to enable continuous wireless communication.

Out of Range/In Range

This will automatically establish connection again with the Access-Point to enable continuous wireless communication when the terminal returns within the range from out side of the range of the Access-Point during wireless operation. This will automatically reconnect to the Access-Point if connection establishment with the Access-Point cannot be maintained due to noise or interference, or roaming is not possible for some reason.

2.5.3 Roaming

This feature automatically switches one Access-Point to another in where two or more Access-Points with the identical SSID code exist are installed.

1. Searches for Access-Points that can communicate with the terminal, and lists up radio wave status of each Access-Point.
2. Compares radio wave status of the currently connected Access-Point with those for the listed Access-Points.
3. If the comparison proves that one of the listed Access-Points has a better radio wave status than the one currently being connected with the terminal, the terminal will make a request of roaming to that Access-Point.
4. If roaming permission comes from the Access-Point to the terminal, the roaming will complete. Note that if the roaming fails, the connection establishment will be disconnected and then connected again.

Notes:

- In some cases, the Access-Point may request the terminal for forcible roaming or reconnection with another Access-Point.
- If connection establishment of the Access-Point being connected with the terminal is terminated due to some reasons such as turning off the power on it, the terminal may be forced to make a connection with another Access-Point.
- If it takes time for Access-Point to correspond for roaming request made by the terminal, the reconnection process may be initiated.
- If **DeAuthentication** or **DisAssociation** message issued by the Access-Point that is being connected with the terminal is received by the terminal after roaming completed, the connection establishment between the Access-Point and the terminal may be interrupted temporarily and then connected again.

2.5.4 Zeroconfig

This feature coordinates with the module firmware and the WLAN driver to perform some of the WLAN link management and the Network management.

- If multiple SSIDs are registered as prioritized connections, attempt to establish connection will be performed to each registered SSID. In this case, the interval of time period for reconnecting will become prolonged. If the reconnection time ranks important, register one SSID only as prioritized connection.
- Reconnection loop process will initiate when a disconnection notification is issued by the module, or when Association fails.
- The reconnection loop process will end when the terminal succeeds connection establishment with one of the multiple SSIDs registered as prioritized connections.

Connection Process

Zeroconfig will instruct the WLAN driver and the WLAN module to make connection when finding an Access-Point registered in the prioritized SSID list. Each firmware of the driver and the module both instructed initiates necessary process following the rule of IEEE802.11 b/g standard to make connection with the Access-Point. If multiple SSIDs are registered as prioritized connections in the prioritized SSID list, attempt to establish connection with each SSID will be made.

Disconnection Process

In the following cases 1 to 3, the connection establishment via WLAN with Access-Point will be disconnected. Firmware in the WLAN module judges on the disconnection and carries out the necessary roaming process.

1. When the radio wave quality in air deteriorates because of interference from other radio devices, noise, WLAN communication in the same channel with other WLAN device, or in adjacent channel.
2. When the terminal distances from Access-Point, or when radio wave weakens due to obstacle.
3. When another Access-Point that can allow roaming to avoid the poor conditions described in the situations 1 and 2 above cannot be sought.

Resume Process

The following processes are carried out when the terminal takes place in the resume mode.

- Unloading the driver
- Loading the driver
- Initializing
- Seeking Access-Point
- Creating the Access-Point list
- Establishing connection with Access-Point
- Changing the Tasktray icon

2.5.5 Channels

The no. of WLAN channels set by default at the factory is “1CH-13CH” (13 channels) compatible with the ETSI standard (EU radio standard).

2.5.6 WLAN Setting with Configuration File

The configuration file can be used to set the default values for the WLAN settings. By loading the configuration file into the terminal, setting to configure the WLAN operations can be easy.

- The configuration file is “\Documents and Settings\System Settings\WLANCFG.ini”.
- If no configuration file is available, WLAN operation is initiated with the default settings.

Timing to Load the File

The timing for loading the configuration file is when a reset or a full reset is performed on the terminal. However, if any one of the following cases occurs, setting with the default values in the configuration file will not take place.

- The file itself does not exist.
- The format is wrong.
- “Disable configuration file” has been set in the WLANCFG parameter.

Creating Configuration File

The configuration file can be created and edited with **WLAN Settings tool** at the Control Panel. Using a general editor, a configuration file can be also created.

WEP key must be created in advance with an encrypted character string using the **WLAN Setting tool** and then copy and paste it to the configuration file. WLAN settings made with Microsoft’s WLAN setting will be ignored in the configuration file.

File Format

The file format of configuration file is INI format which follows restrictions described below.

- The maximum size of the configuration file is 60 Kbytes.
- A line starting with “;” is regarded as comment. It does not regard as comment if located in mid-line.
- The separator for KEY and VALUE is “=”. Space and tab, etc., also are included in either KEY or VALUE. If a space is inserted after “=”, for example, in “SSID= tunami”, the SSID value includes the space (“ ”)+tunami.
- At the end of line, CR/LF or CR or LF must be attached.
- The maximum length of line is 256 bytes.
- Section name, KEY and VALUE are not case-sensitive.

WLAN Section

General setting for the WLAN settings is made in this section.

Table 2.59

KEY	VALUE
WLANPOWER	Set turning the power to the integrated WLAN module on or off. 1: Power ON 0: Power OFF
POWERSAVE	Set the power save mode effect selecting either value. 1: Enable the power save. 0: Disable the power save.
WLANCFG	Enable or disable the configuration file. 1: Enable the file. 0: Disable the file.
RoamingRSSIlevel	Set roaming threshold value in dBm.
RoamingAvailableTime	Set time period in second to start roaming again.
RoamingRSSISpan	Set difference of roaming radio wave intensity in dBm.
BandConfig	Set communication speed selecting either value. 0: IEEE802.11b 1: IEEE802.11 b/g
MAX_SCAN_TIME	Set time period per channel in millisecond to seek Access-Point.
SCAN_CHANNELS	Set channels in successive hexadecimal codes to use. Example 123456789ABCD : Choose all channels. 16B : Choose 1Ch, 6Ch, 11Ch.
WLAN_CFG_TOOL	Select a tool, either NETUI or WLANCONFIG, that appears when the WLAN icon is selected.

STATIC Section

This section specifies parameters necessary for the integrated WLAN module to establish connection with Access-Point.

Table 2.60

KEY	VALUE
SSID	Set SSID.
ADHOC	Set Infrastructure or AdHoc mode selecting either value. 1: Infrastructure 0: AdHoc
WEP	Set WEP to be included or not. 1: Without WEP 0: With WEP
KEYINDEX	Set WEP key INDEX in the range of 0 to 3.
KEYDATA	Using the WLAN Setting tool, set encrypted WEP key data selecting either value. 20 bytes for 40-bit WEP 52 bytes for 108-bit WEP
SECURITY	Set security selecting one of the values. NONE WEP WPA WPA2
AUTH	Set authentication selecting one of the modes. OPEN PEAP TLS PSK
WEP_OPEN_KEYINDEX	Set WEP key INDEX in Open Authentication in the range of 1 to 4.
WEP_OPEN_KEY	Set WEP key.
WPA_PEAP_USER	Set user name of WPA_PEAP.
WPA_PEAP_PASS	Set password of WPA_PEAP.
WPA_PEAP_DOMAIN	Set domain name of WPA_PEAP.
WPA_PEAP_VALIDATESERVER	Set WPA_PEAP server certificate to be valid or not selecting either value. 0: Server certificate invalid 1: Server certificate valid
WPA_TLS_DOMAIN	Set domain name of WPA_TLS.
WPA_TLS_VALIDATESERVER	Set WPA_TLS server certificate to be valid or not selecting either value. 0: Server certificate invalid 1: Server certificate valid
WPA_TLS_CERTIFICATE	Set friendly name of WPA_TLS client certificate.
WPA_PSK_KEY	Set WPA_PSK key length in the range of 16 to 128 bytes.
WPA2_PEAP_USER	Set user name of WPA2_PEAP.
WPA2_PEAP_PASS	Set password of WPA2_PEAP.

Continue.

WPA2_PEAP_DOMAIN	Set domain name of WPA2_PEAP.
WPA2_PEAP_VALIDATESERVER	Set WPA2_PEAP server certificate to be valid or not selecting either value. 0: Server certificate invalid 1: Server certificate valid
WPA2_TLS_DOMAIN	Set domain name of WPA2_TLS.
WPA2_TLS_VALIDATESERVER	Set WPA2_TLS server certificate to be valid or not selecting either value. 0: Server certificate invalid 1: Server certificate valid
WPA2_TLS_CERTIFICATE	Set friendly name of WPA2_TLS client certificate.
WPA2_PSK_KEY	Set WPA2_PSK key length in the range of 16 to 128 bytes.

Examples of Settings for STATIC Section

Example 1; If WEP is used.

```
[STATIC]
SSID=tunami
ADHOC=0
WEP=1
KEYINDEX=0
KEYDATA= 5C1E1455A2D504920483C59EA19AC2AB3F12821273BD2A17A9BE
```

Example 2; If WEP is used.

```
[STATIC]
SSID=tunami
SECURITY=WEP
AUTH=OPEN
WEP_OPEN_KEYINDEX=1
WEP_OPEN_KEYDATA=
5C1E1455A2D504920483C59EA19AC2AB3F12821273BD2A17A9BE
```

Example 3; If WPA or PSK is used.

```
[STATIC]
SSID=tunami
SECURITY=WPA
AUTH=PSK
WPA_PSK_KEY=5C1E1455A2D504920483C5EABE
```

Example 4; If WPA or PEAP is used.

```
[STATIC]
SSID=tunami
SECURITY=WPA
AUTH=PEAP
WPA_PEAP_USER=user
WPA_PEAP_PASS=pass
WPA_PEAP_DOMAIN=domain
WPA_PEAP_VALIDATESERVER=1
```

Example 5; If WPA or TLS is used.

```
[STATIC]
SSID=tunami
SECURITY=WPA
AUTH=TLS
WPA_TLS_USER=user
WPA_TLS_DOMAIN=domain
WPA_TLS_CERTIFICATE=certname
WPA_TLS_VALIDATESERVER=1
```


TCIP/IP Section

This section sets the integrated WLAN module's IP address.

Table 2.61

Key	VALUE
DHCP	Set "Enable" or "Disable" on the DHCP. If "1: Enable DHCP" is selected, the subsequent settings are not necessary to set. 1: Enable DHCP. 0: Disable DHCP.
IPADDRESS	Set IP address.
SUBNETMASK	Set subnet mask.
DEFAULTGATEWAY	Set default gateway.
DNS1	Set primary DNS server address.
DNS2	Set secondary DNS server address.
WINS1	Set primary WINS server address.
WINS2	Set secondary WINS server address.

Example ; Configuration File

```
[WLAN]
WLANPOWER=1
POWERSAVE=1
WLANCFG=1
BandConfig=1
RoamingRSSIlevel=-78
RoamingAvailableTime=15
RoamingRSSISpan=1
RoamingAvailableTime=60
BandConfig=1

MAX_SCAN_TIME=105
SCAN_CHANNELS=123456789ABCDE
WLAN_CFGTOOL=WLANCONFIG

[STATIC]
SSID=TSUNAMI
ADHOC=0
SECURITY=WEP=1
AUTH=OPEN
WEP_OPEN_KEYINDEX=01
KEYDATA= 5C1E1455A2D504920483C59EA19AC2AB3F12821273BD2A17A9BE

WEP_OPEN_KEY=516DFEC900486137CB9D8C82993F184B508A916F5B5E733A0159

[TCP/IP]
DHCP=0
IPADDRESS=192.168.1.100
DEFAULTGATEWAY=192.168.1.100
SUBNETMASK=255.255.255.0
DNS1=192.168.1.101
DNS1=192.168.1.102
WINS1=192.168.1.103
WINS2=192.168.1.104
```

2.6 Power Control

This chapter describes about detailed specifications of the power controls.

2.6.1 Monitoring Low Voltage

Four levels of the low voltage monitor control are provided for the terminal.

Table 2.62

	Description	Action	Next Startup
VDET1	Warning against low voltage of the battery pack	Issues warning message for low voltage of the battery pack.	-
VDET2	Turning off the power due to low voltage of the battery pack	Turns off the power.	Resume (with warning at time of startup)
VDET3	Emergency turning off the power due to low voltage of the battery pack	Forces the terminal to turn off the power.	Warm boot (with warning at time of startup)
VDETCF	Turning off the power due to low voltage of card	Turns off the power.	Resume (with warning at time of startup)

Battery Pack

The following shows statuses and levels available for the battery pack.

Normally the battery status is checked once every five seconds. Taking last immediate ten data of the power voltage from AD converter, its average is calculated to classify the status into three levels, either “Almost exhausted (10% of the capacity or less)”, “Low (30% of the capacity or less)”, “O.K. (30 % of the capacity or more)”. When VDET1 occurs, the level is at 10% of the capacity.

Table 2.63

Status/Level		Notation	Description
Status	External	External power	Power via AC Adaptor is being supplied, and charging the battery pack is complete.
	Recharge	Recharging	Power via AC Adaptor is being supplied, and charging the battery pack continues.
	Normal	Main battery	Operating power by the battery pack is being supplied.
Level	1	O.K.	The battery pack has been fully charged or has a sufficient capacity.
	2	Low	The battery voltage level is at 30% or less.
	3	Almost exhausted	The battery voltage level is at 10% or less.

Memory Backup Battery

The following shows levels available for the memory backup battery.

The terminal's system checks the status of the backup battery every five minutes. Since power source of charging the memory backup battery is supplied by the battery pack, charging it may not be carried out sufficiently if the battery pack has not been accommodated for a long period or is not being fully charged. In other words, the memory backup battery will be normally charged if the battery pack has a sufficient level of battery capacity. Prior to operating the terminal, be sure that the memory backup battery is charged fully; otherwise the RAM content may not be held when the battery pack is demounted.

Table 2.64

Level	Notation	Description
1	O.K.	The memory backup battery has been fully charged or has a sufficient capacity.
2	Almost exhausted	The level of the memory backup battery capacity is at 10% or less.

User Notification Methods

The terminal's system issues a WM_POWERBROADCAST message when the battery pack or memory backup battery runs down into "Almost exhausted" state. Detail of the message is as follows:

Table 2.65

Battery	Message	wParam	lParam	Interval of notification
Battery Pack	WM_POWERBROADCAST	PBT_APMBATTERYLOW	0	5 seconds
Memory backup Battery	WM_POWERBROADCAST	PBT_APMOEMEVEN	SUBBATTERYLOW	5 minutes

```
#define WM_POWERBROADCAST    0x0218
#define PBT_APMBATTERYLOW    0x0009
#define PBT_APMOEMEVEN       0x000B
```

When the status of the memory backup battery is detected, the following value is set in the *lParam* parameter.

```
#define SUBBATTERYLOW        0x200
```

The status of both battery pack and memory backup battery can be monitored with Microsoft's **GetSystemStatusEx2()** API function in your application to retrieve the status values described in the table.

Table 2.66

Member	Description	Returned Value
ACLineStatus	Retrieves the status of AC power.	AC_LINE_OFFLINE : AC power is off. AC_LINE_ONLINE : AC power is on.
BatteryFlag	Retrieves the status of battery pack.	BATTERY_FLAG_HIGH : OK BATTERY_FLAG_LOW : Low BATTERY_FLAG_CRITICAL : Almost exhausted. BATTERY_FLAG_CHARGING : Under charging
BatteryLifePercent	Retrieves the remaining capacity of battery pack every 10% level.	In the range of 10 to 100%
BackupBatteryFlag	Retrieves the status of memory backup battery.	BATTERY_FLAG_HIGH : OK BATTERY_FLAG_LOW : Almost exhausted
BatteryChemistry	Retrieves the type of the operating battery.	BATTERY_CHEMISTRY_LION : Battery pack BATTERY_CHEMISTRY_ALKALINE : Dry-cell battery

Note:

IT-300 does not support power source from dry-cell battery.

2.6.2 Power ON Factors

The following is the power ON factors. These factors can be set enabled or disabled using the System Library.

Power ON Factors

- The Power key is pressed while the power is off.
- A time period set for the Alarm function elapsed.
- The terminal is mounted on cradle while the power is being supplied by AC Adaptor via the cradle.
- Trigger key is pressed.
- Reset switch on the back of the terminal is pressed.

The functions of the System Library relevant to the “Power ON Factors” are as follows.

SysSetBootup : Sets up “Enable” or “Disable” for turning on the power.

SysGetBootup : Retrieves “Enabled” or “Disable” status for turning on the power.

Power ON Disable Factors

Factors that do not allow turning on the power are as follows.

- When the battery pack's voltage level is not sufficient enough to start up the terminal (VDET2 level or less).
- The battery cover lock switch (at the battery compartment) is open.

2.6.3 Power OFF Factors

The following is the power OFF factors.

- The Power key is pressed while the power is on.
- Neither key input, disk access, nor communication is performed within a preset time period.
- Output voltage from the battery pack is low (VDET2, VDET3) (see note below).
- The battery cover lock switch is open.
- Internal temperature in the terminal exceeds the limit set by the system (see note below).

Note:

The warning message appears a next time when the power is turned on.

Power OFF Time

When either VDET2, BCVR, VDETCF, or VDET3 occurs, the power is turned off after the respective time periods elapse.

Table 2.67

VDET2	Turning off (resume OFF) the power after 200 milliseconds.
BCVR	
VDETCF	
VDET3	Forced to turn off the power after 200 microseconds. When the power is turned on next time, VDET3 is reset.

2.6.4 Control on Power Key

Time Period after Pressing the Power Key

It takes approximately one second for the system to recognize turning on or turning off the power after the Power key is pressed down.

Disable Power Key after Turning On the Power

After turning on the power, the Power key is set disabled for a certain period of time. This prevents turning off the power while various drivers are being loaded. This time period can be set with the System Library.

The functions of the System Library relevant to the "Disable Power Key after Turning on the Power" are as follows.

SysSetOffMaskTime : Sets up a period of time for disabling turning off the power.

SysGetOffMaskTime : Retrieves time period set for disabling turning off the power.

Disable Power Key after FlashDisk Is Accessed

After the FlashDisk is accessed, the Power key will be set disabled for a certain period of time. This prevents turning off the power while the FlashDisk is being accessed. This time period can be set with the System Library.

The functions of the System Library relevant to the "Disable Power Key after FlashDisk Is Accessed" are as follows.

SysSetStorageOffMaskTime : Sets up a period of time for disabling turning off the power after the use of storage.

SysGetStorageOffMaskTime : Retrieves time period set for disabling turning off the power after the use of storage.

Disable Turning Off the Power

It is possible to disable turning off the power with the Power key using the System Library. This feature can be applicable to the cases below.

- Need to disable turning off the power with the Power key for a certain period of time.
- If application must be closed before the system turns off the power.

If the Power key is pressed down while the Power key is set disabled, the system broadcasts a message, WM_POWERBROADCAST (PBT_APMSUSPEND), to application software without turning off the power. The message is issued only once when the Power key is pressed for the first time after the "Disable Turning Off the Power" has been set enabled.

The functions of the System Library relevant to the "Disable Turning Off the Power" are as follows.

SysDisablePowerOff : Sets up "Disable" for turning off the power on the terminal.

SysEnablePowerOff : Sets up "Enable" or "Disable" for turning off the power on the terminal.

SysGetPowerOff : Retrieves "Enable" or "Disable" status for turning off the power on the terminal.

2.6.5 Power Saving

Idle

The power is saved by putting the CPU into **idle state** when event standby status is detected by either the terminal or application running on the terminal. The peripheral devices are in operating state while the CPU is in the idle state.

Auto Power OFF (APO)

The power is automatically turned off (“APO”) if no key input, no disk access, or no communication is made during a preset time period. Setting the APO function enabled or disabled, and a time period to activate the function can be performed using the System Library.

The functions of the System Library relevant to the Auto Power OFF (APO) are as follows.

- SysDisableAPO** : Sets up “Disable” for turning off the power automatically.
- SysEnableAPO** : Sets up “Enable” for turning off the power automatically.
- SysGetAPO** : Retrieves “Enable” or “Disable” status for turning off the power automatically.

Dimming and ABO (Auto Backlight OFF)

The backlight is automatically dimmed or turned off if no key input, no disk access, no communication, and etc., is made during the preset time period. Setting a time period before starting dimming or turning off the backlight (Auto Backlight OFF), and “Enable” or “Disable” on the dimming and the Auto Backlight OFF functions can be set at the Control Panel.

CPU Clock Frequency Control

The CPU clock frequency is changed to one of the frequencies described in the following table depending on the CPU load or user designation. It can be changed at the Control Panel or using the System Library. The default is “AUTO”. Note however that the CPU frequency is not changed to 13 MHz in the Auto mode if WLAN operation has been set effect.

Table 2.68

Mode	Frequency
POWERSAVE	208 MHz
NORMAL	312 MHz
TURBO	624 MHz
AUTO	Automatically changes frequency to 104, 208, 312, 624, or 60 MHz depending on the CPU load.

The functions of the System Library relevant to the “CPU Clock Frequency Control” are as follows.

- SysSetCPUMode** : Sets up the CPU frequency control.
- SysGetCPUMode** : Retrieves the status of the CPU frequency control.
- SysSetDefaultCPUMode** : Returns the CPU speed setting to the factory default.

Virtual Power OFF/WLAN Standby

This is standby mode for WLAN operation. The System Library is used in application to turn off the LCD, keys and set the CPU frequency to “POWERSAVE” mode to save the power. Other peripheral devices are in operating state.

Table 2.69

Display	OFF
KEY	Lock
APO	Prohibit
Turning off the power with the Power key	Prohibit
CPU clock frequency	POWERSAVE

2.6.6 CPU Power Mode

The following shows the power modes operable on the terminal.

Table 2.70

Mode	Description
Discharge	State in that the battery pack and the super capacity have been discharged. Neither content in the RAM nor the RTC is backed up.
RTC backup	State in that only the RTC is being backed up. The content in the RAM is not backed up.
SLEEP mode	State in that the power on the terminal is turned off, and peripheral devices are also turned off. The RTC and the content in the RAM are backed up.
RUN mode	State in that the terminal is running or application is running on the terminal.
POWERSAVE	The CPU is running at 208 MHz.
NORMAL	The CPU is running at 312 MHz.
TURBO	The CPU is running at 628 MHz.
AUTO	The CPU is running at either 104, 208, 312, 624, or 60 MHz depending on the CPU load.
IDLE mode	State in that the terminal or application is waiting for an event to occur.
DeepIdle	If the CPU clock frequency has been set to “AUTO” mode, and the backlight is turned off, the CPU runs at 13MHz (“DeepIdle” mode). Note however that the CPU will be in ordinary “Idle” state, not DeepIdle mode, if periodical accesses are made to the integrated WLAN module.

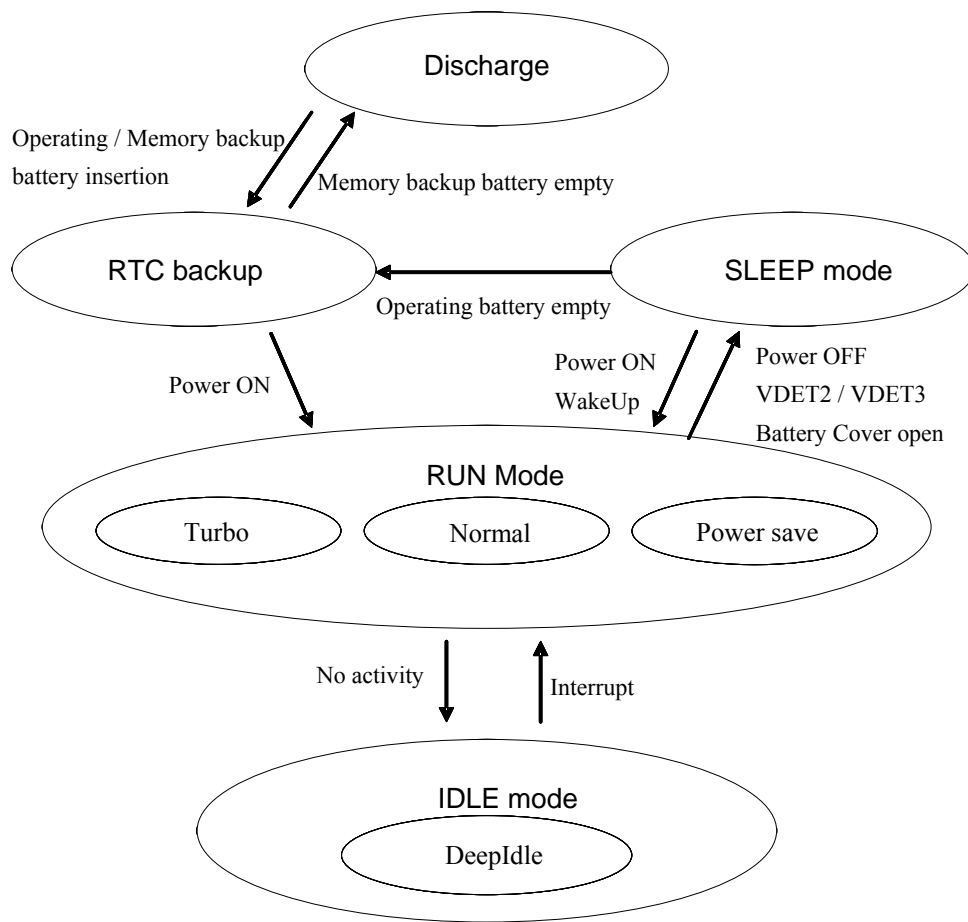


Figure 2-8

2.6.7 Virtual OFF by Application

The Virtual OFF is a function and its main object is to save power. Internally, the terminal is running normally but it seems to be with the power being turned off – unable to display and input a key. This function is mainly used to provide the terminal user with fast resume from standby state in WLAN communication.

Virtual OFF State Transition

The state transition diagram of Virtual OFF is below. The system has a mode named Virtual OFF and the state transits ON State and OFF State in the mode. The transition is triggered by the message issued by pressing the Power key.

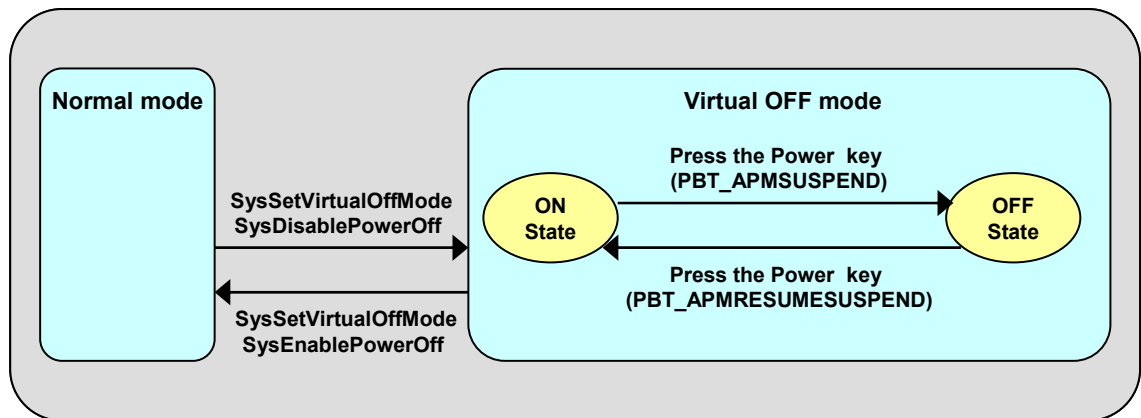


Figure 2-9

How to Set Virtual OFF Mode in Application

In order to set the Virtual OFF mode, call **SysSetVirtualOffMode** and **SysDisablePowerOff** functions of the System Library. In this mode, the Power Management alternately issues the following messages every time the Power key is pressed.

1. When the Power key is pressed to turn off the power:
WM_POWERBROADCAST (PBT_APMSUSPEND)
2. When the Power key is pressed to turn on the power:
WM_POWERBROADCAST (PBT_APMRESUMESUSPEND)

In the diagram in Figure 2.14, the application receives PBT_APMSUSPEND message at the first press of the Power key and then changes the state to OFF State in the Virtual mode. And then the application receives PBT_APMRESUMESUSPEND message and returns to ON State.

The application undertakes the transition to OFF State in the Virtual OFF mode. For example, the application disables display, key input, and etc. and turns off the power to devices in idle.

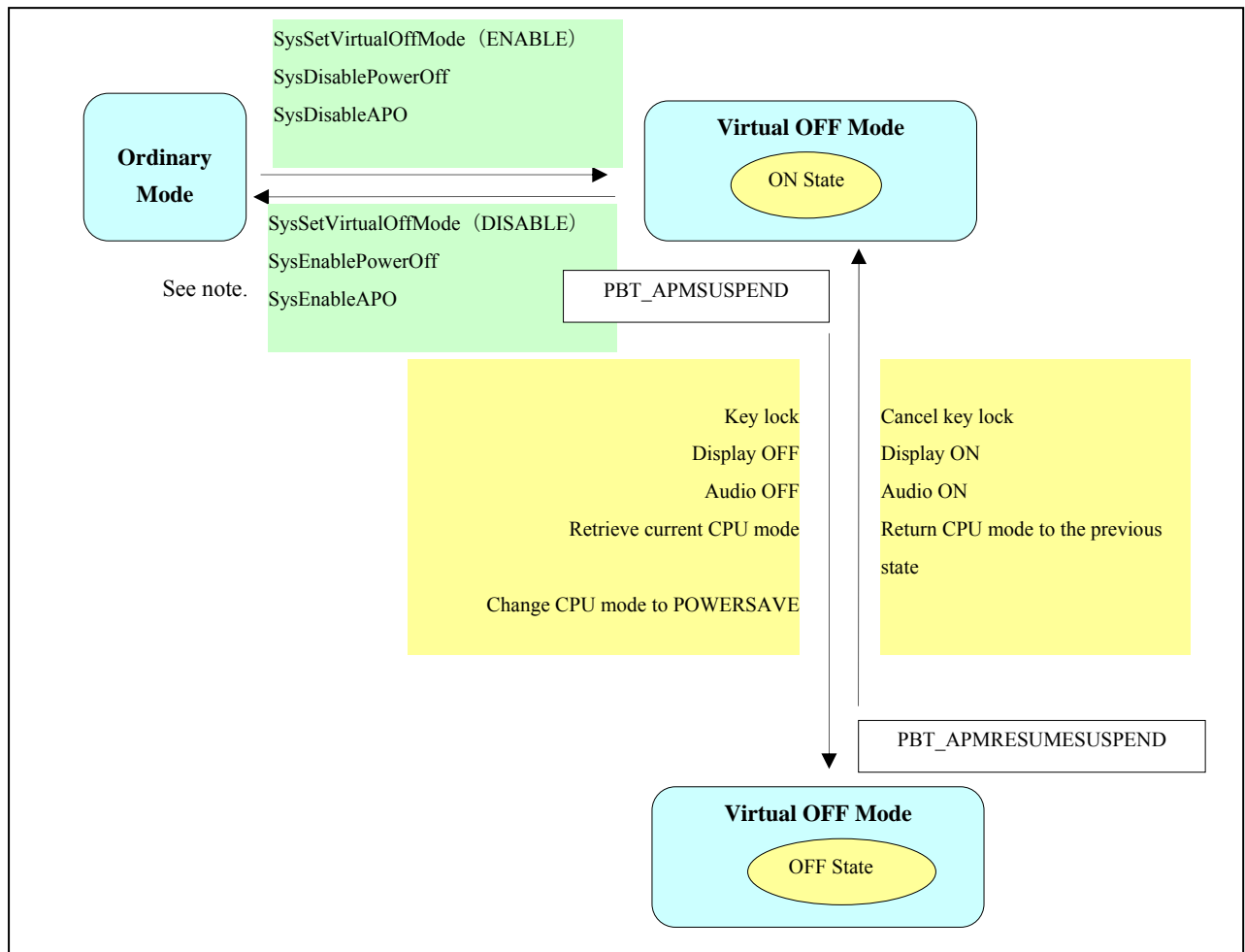


Figure 2-10

Notes:

- If the application receives the low battery warning message (PBT_APMBATTERYLOW), the application should reset the Virtual OFF mode and warn the user of low battery. If the user continues to operate the terminal ignoring resetting the Virtual OFF mode, turning off the power will occur (ordinal process to turn off the power) due to low voltage of the battery. This causes a confusion and makes the user unable to judge whether the terminal cannot resume from the Virtual OFF mode or troublesome caused by the battery ran out.
- During the Virtual OFF mode, if low battery or turning off the power by opening the battery cover lock switch occurs, there will be discrepancy between the expected condition the application assumes at the next time of starting up and actual condition. For turning off the power in ordinary process, the discrepancy is caused by two kinds of setting, one should be reset and the other to be saved. These settings must be set to ON state again in the Virtual OFF mode when the application receives the Power On message (PBT_APMRESUMESU|SPEND).

The functions of the System Library relevant to the “Virtual Off” are as follows.

SysDisablePowerOff : Set up ”Disable” for turning off the power on the terminal.

SysSetVirtualOffMode : Sets up “Enable” or “Disable” for virtual turning off the power.

SysSetVirtualOffModeEx : Sets up “Enable” or “Disable” for virtual turning off for panel, screen, key operations, prohibition on APO, prohibition on turning off the power, and setting CPU speed.

SysGetVirtualOffMode : Retrieves “Enable” or “Disable” status for virtual turning off the power.

2.6.8 Virtual OFF by System

The virtual off function by system is not supported by the terminal.

2.6.9 Charging/Supplying the Power

The optional Dual Battery Charger (HA-D32DCHG) can be used to charge battery packs (two at a time). Mounting the terminal on USB Cradle (HA-H60IO), Cradle-type Battery Charger (HA-H30CHG), or Ethernet Cradle (HA-H62IO) allows charging the battery pack while it is installed in the terminal and supplying the power to the terminal.

2.6.10 Temperature Control

If temperature rise is detected in the terminal when running at the highest clock frequency (under such the condition that the CPU speed at “TURBO”, the integrated WLAN module in active mode, etc.), a warning message (see Figure 2.16) appears and the power is turned off to protect the integrated devices in the terminal.

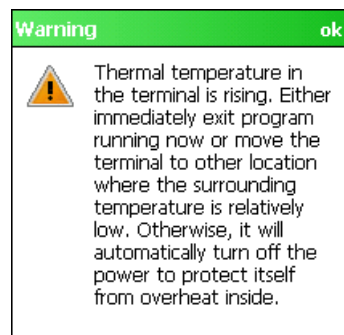


Figure 2-11

Either turn off the power and leave the terminal unused for a while or move the terminal to a location where the surrounding air temperature is cooler.

If the power is turned off due to the temperature limit, a warning message (see Figure 2.17) appears when the power is turned on a next time.

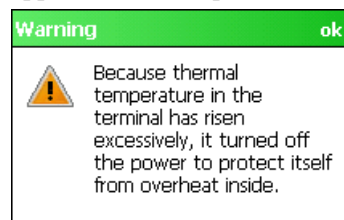


Figure 2-12

2.7 Security

This chapter describes about detailed specifications of the security.

2.7.1 Setting Password for Terminal

This is the password setting implemented in the terminal. Your password can be set at the Control Panel. Click the **Lock** icon to initiate the **Password Settings** screen, and then enter your password in each field.

2.7.2 Setting Encryption on SD Card

This function encrypts file in SD card which is integrated in the terminal (Windows Embedded Handheld device) so that the file in the SD card cannot be read by other Windows Embedded Handheld device.

2.7.3 Setting Individual ID

Individual ID is written into a predetermined area in the FlashDisk in the factory. Distributor code (a code used to protect distributor developed software from illegal copying by an unauthorized party) is saved in other area different from the individual ID. The individual ID incorporates the product code and serial number etc. and always becomes a unique code different from other units of the IT-300 series. The System Library can be used to read the individual ID set on each unit of the terminal.

The function of the System Library relevant to the “Setting Individual ID” is as follows.

SysGetDeviceIDCode : Retrieves Device ID.

3. Settings

The Settings are display and change program of terminal each setting.

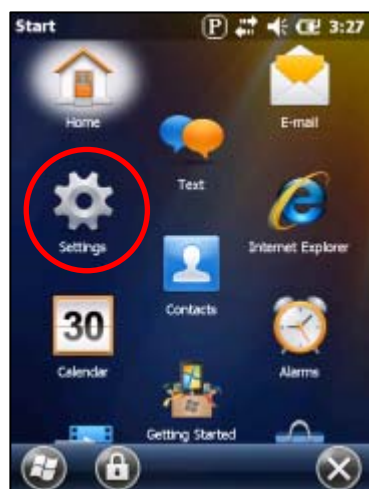


Table 3.1 Personal Tab

Applet	Description	Location	CASIO	MS
Lock	Changes owner password and security options.	<Settings>		Yes
Sounds & Notifications	Sets up type and its sound volume.	< Settings >		Yes
Home	Customizes the Home screen.	< Settings >		Yes
Clock & Alarms	Changes the date, time, and alarm settings.	< Settings >		Yes
Power	Changes the power management options.	< Settings >		Yes
Bluetooth	Bluetooth Setting	< Settings >		Yes
Buttons	Changes the parameters concerned with operations by the keyboard.	< Settings >> Personal >		Yes
Owner Information	Changes owner's personal profile.	< Settings >> Personal >		Yes
About	Displays the terminal version information.	< Settings >> System >		Yes
Certificates	Displays the terminal's digital certificate.	< Settings >> System >		Yes
Customer Feedback	Enables Customer Feedback possible.	< Settings >> System >		Yes
Encryption	Enables the terminal to encrypt files in storage card.	< Settings >> System >		Yes
Error Reporting	Enables the terminal to issue Error Report.	< Settings >> System >		Yes
Remove Programs	Displays the information about installed programs.	< Settings >> System >		Yes
Memory	Displays the usage of main memory and storage card memory.	< Settings >> System >		Yes
Regional Settings	Changes display methods of numeric value, currency, date and time.	< Settings >> System >		Yes
Screen	Switches the screen orientation. Realigns the touch screen. Increases or decreases the size of text on the screen.	< Settings >> System >		Yes
Task Manager	Switches to a running program. End a running program.	< Settings >> System >	Yes	

Scanner Setting	Changes Laser Scanner settings.	< Settings >> System >	Yes	
Backlight	Changes the backlight brightness.	< Settings >> System >	Yes	
Buzzer	Sets up buzzer sound volume.	< Settings >> System >	Yes	
CPU Speed	Sets up the CPU's clock frequency.	< Settings >> System >	Yes	
Version Info	Displays the terminal version information.	< Settings >> System >	Yes	
USB Connection	Checks USB connection status.	< Settings >> System >	Yes	
Storage Manager	Display storage area information and execute error check	< Settings >> System >	Yes	
Vibrator	Sets up vibration	< Settings >> System >	Yes	
NetSearch	Displays a list of partners via WLAN.		Yes	
Beam	Enables the terminal to receive all incoming beams.	<Settings>><Connections>		Yes
Connections	Connection Manager	<Settings>><Connections>		Yes
Domain Enrollment	Controls the terminal to your network.	<Settings>><Connections>		Yes
Network Cards	Configures network adapters.	<Settings>><Connections>		Yes
USB to PC	Enables advanced network functionality.	<Settings>><Connections>		Yes
Wireless Manager	Enables or disables network devices.	<Settings>><Connections>		Yes
WLAN Power	Sets up the powers for WLAN.	<Settings>><Connections>	Yes	
WLAN Settings	Sets up the parameters required for WLAN configuration.	<Settings>><Connections>	Yes	

3.1 Lock

This applet is to set up a password that is used to start up the terminal.

Password Tab



Figure 3-1

Prompt if phone unused for

Check the checkbox if password input is required every time the terminal is turned off and then turned on during the time period selected in the pull-down menu. For example, selecting “0” in the pull-down menu makes the password enter screen pop up every time when the terminal is turned on asking the user to enter a password before starting any operation. Or, removing the check causes the password enter screen not to pop up irrespective of time period selected in the pull-down menu.

Password type

Select one of the password types in the pull-down menu you would like to use.

- **Simple PIN** indicates a numeric password.
- **Strong alphanumeric** indicates a password that uses uppercase and lowercase letters, numbers, and symbols such as punctuation.

Password

This field is for entering your own password.

Confirm

This field is for entering the same password again entered in the **Password** field for confirmation purpose.

3.2 Sounds & Notifications

This applet is to set up event sounds and notification options.

Sounds Tab

This tab is to set up “Enable” or “Disable” for sound types of each event listed in the figure below.

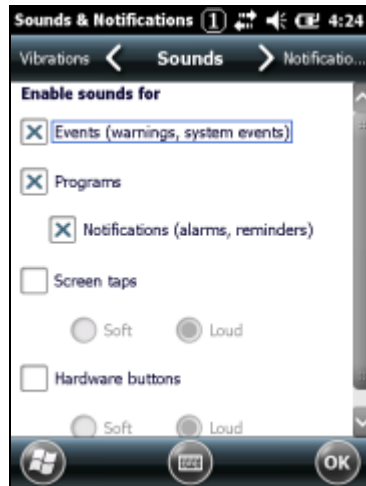


Figure 3-2

Check the checkbox of each event you wish to set up sound.

Notifications Tab

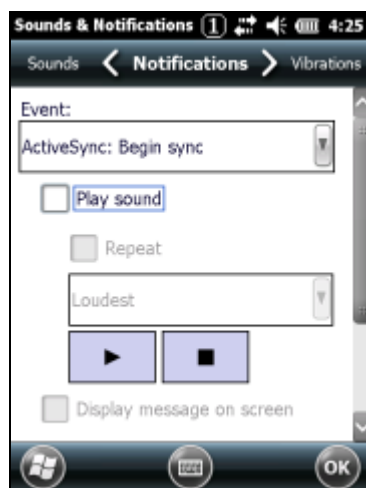


Figure 3-3

In the **Event** pull-down menu, tap an event name and then set up the relevant options for how you want to be notified. The options include special sound, message, and flashing light. Even if you disable all the options, you can still be notified by the icon of event.

3.3 Home

This applet is used for customizing the Home screen.

Appearance Tab

This tab is used for changing the appearance of the Today screen.



Figure 3-4

To change the current theme, highlight a new theme in the **Select a theme for your device** menu.

To change the background image in the Today screen, follow the steps below.

1. Select the **Use this picture as the background** checkbox and tap **Browse** button to make a list of your picture files appear.
2. In **Folder**, select the folder that contains the picture you want to use.
3. In **Type**, select the file type of the picture.
4. Tap the file name of the picture you want to use.

Items Tab

This tab is used for changing the items that appear in the Today screen.



Figure 3-5

To add or remove items in the Today screen, check the checkbox next to each item name to add, or remove the check to remove. To change the listed order of an item displayed in the Today screen, select the item and tap **Move Up** button for upper position or **Move Down** button for lower position.

3.4 Clock & Alarms

This applet is for setting date, time and time zone.

Time Tab

This tab is for setting time zone, time and date.



Figure 3-6

Alarms Tab

This tab is for setting alarms.



Figure 3-7

To set alarms, follow the steps below.

1. Tap **< Description >** and enter a name for the alarm.
2. Tap a day of the week for the alarm. You can select multiple days by tapping each desired day of the week.
3. Tap time to open a clock and set time for the alarm.
4. Tap 📖 to specify a type of alarm you want.

3.5 Power

This applet is used to view the status of batteries and set power management options.

Battery Tab

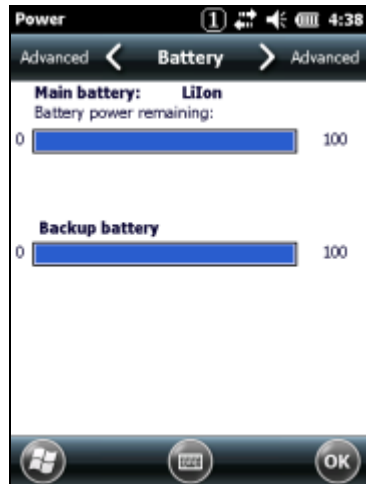


Figure 3-8

This tab provides information about status of operation battery (lithium-ion battery pack) and backup battery.

Advanced Tab

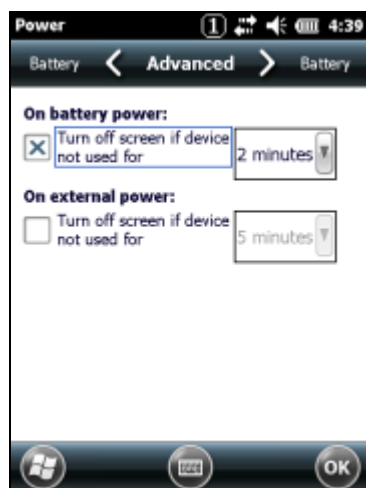


Figure 3-9

To conserve battery power, select the checkbox for condition that you want the terminal to turn off its power automatically if no access to the terminal is made during the selected time period in the pull-down menu located on the right side of the checkbox.

3.6 Bluetooth

Execute to communicate with Bluetooth devices.

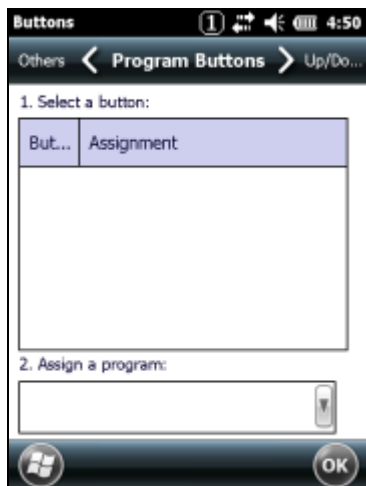


☒ 3-1

3.7 Buttons

Perform to set application into program buttons.

But there is no program button in IT-300 model, therefore can not assign program as default condition.

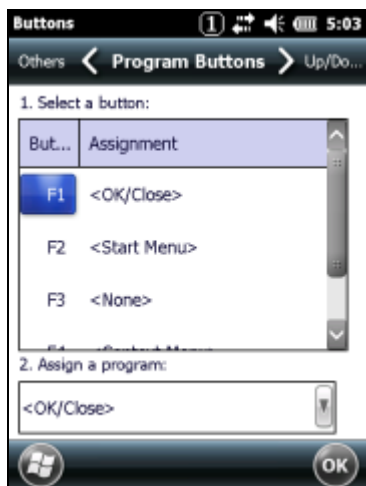


☒ 3-2

When you use system library function and define virtual application key which defined by Microsoft, and add virtual keycode into registry setting, then you can use this setting tool.

Examples

When you set the next page setting, you can assign any program into 4 function keys. <F1> - <F4>.



☒ 3-3

Sample program (VB.NET)

Assign virtual key code VK_APP1(&HC1), VK_APP2(&HC2), VK_APP3(&HC3), VK_APP4(&HC4) into F1, F2, F3, F4 key and registry virtual key code.

Imports Microsoft.Win32

Module Module1

```
Public iUserDefineKeyBufF1() As Integer = {&H200 Or &HC1 Or &H20000, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0}
Public iUserDefineKeyBufF2() As Integer = {&H200 Or &HC2 Or &H20000, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0}
Public iUserDefineKeyBufF3() As Integer = {&H200 Or &HC3 Or &H20000, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0}
Public iUserDefineKeyBufF4() As Integer = {&H200 Or &HC4 Or &H20000, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0}
```

Sub Main()

```
SysSetUserDefineKey(KEY_MODE_NUM, KEYID_F1, iUserDefineKeyBufF1)
SysSetUserDefineKey(KEY_MODE_NUM, KEYID_F2, iUserDefineKeyBufF2)
SysSetUserDefineKey(KEY_MODE_NUM, KEYID_F3, iUserDefineKeyBufF3)
SysSetUserDefineKey(KEY_MODE_NUM, KEYID_F4, iUserDefineKeyBufF4)
```

```
SysSetUserDefineKeyState(True)
```

Dim key1 As RegistryKey

' ===== Registry write operation =====

```
key1 = Registry.LocalMachine
key1 = key1.CreateSubKey("Software\Microsoft\Shell\Keys\40C1")
key1.SetValue("Name", "F1")
key1.SetValue("Flags", 0)
key1.Close()
```

```
key1 = Registry.LocalMachine
key1 = key1.CreateSubKey("Software\Microsoft\Shell\Keys\40C2")
key1.SetValue("Name", "F2")
key1.SetValue("Flags", 0)
key1.Close()
```

```
key1 = Registry.LocalMachine
key1 = key1.CreateSubKey("Software\Microsoft\Shell\Keys\40C3")
key1.SetValue("Name", "F3")
key1.SetValue("Flags", 0)
key1.Close()
```

```
key1 = Registry.LocalMachine
key1 = key1.CreateSubKey("Software\Microsoft\Shell\Keys\40C4")
key1.SetValue("Name", "F4")
key1.SetValue("Flags", 0)
key1.Close()
```

End Sub

End Module

3.8 Owner Information

This applet is for setting information related to the owner.

Identification Tab



Figure 3-10

Name

This field is for specifying the owner's name inputting alphabets from the Input Panel appeared at the lower part on the screen.

Company

This field is for specifying name of the company that the owner belongs to.

Address

This field is for specifying an address.

Telephone

This field is for specifying a phone number.

E-mail

This field is for specifying an e-mail address.

Notes Tab



Figure 3-11

Notes

Using this field, a memo can be freely written.

3.9 About

This applet is used for displaying and setting parameters concerned with the internal system of the terminal.

Version Tab

This tab displays OS version, integrated CPU name and available RAM size.

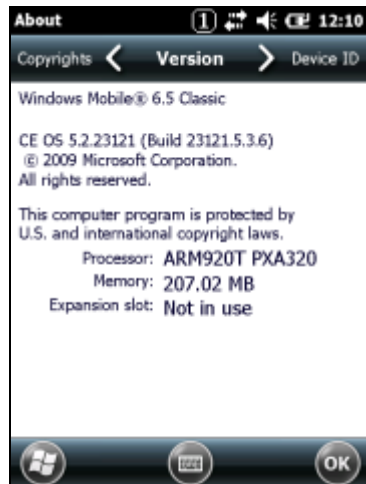


Figure 3-12

Device ID Tab

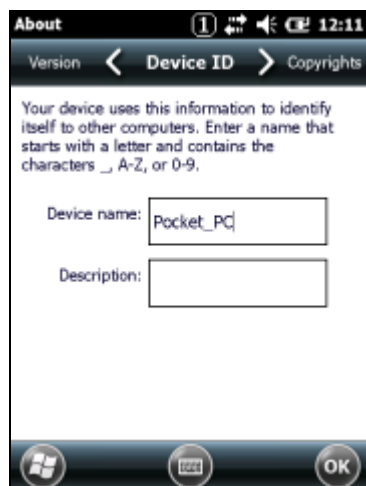


Figure 3-13

Device name:

This field is for setting device name for the terminal itself. Spaces with device name entered in the field are not allowed.

Description:

This field is to enter text string for the device description.

Copyrights Tab

This tab is for displaying the OS copyright information.

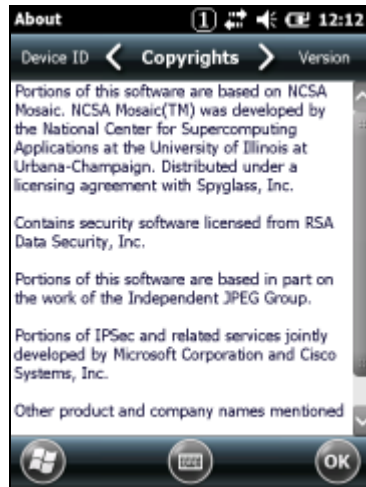


Figure 3-14

3.10 Certificates

This applet is used for editing certificates trusted by the user.

Personal Tab

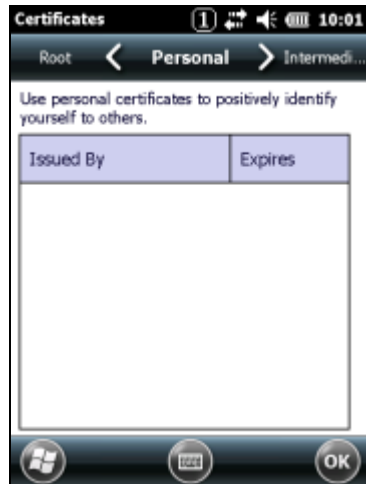


Figure 3-15

Personal certificates identify the user of the terminal.

Intermediate Tab

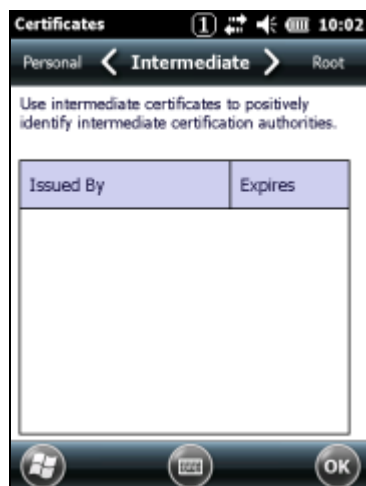


Figure 3-16

Intermediate certificates help authenticate certificates received from other hosts.

Root Tab

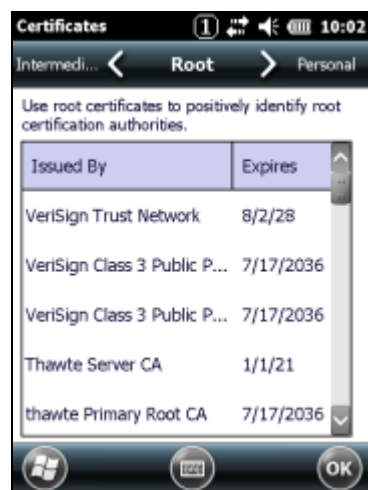


Figure 3-17

Root certificates authenticate certificates received from other hosts.

3.11 Customer Feedback

This applet is for enabling Customer Feedback.

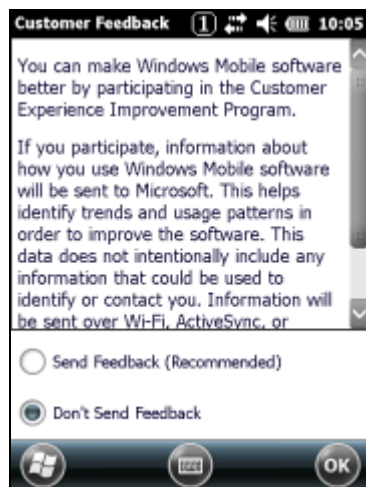


Figure 3-18

While Customer Feedback is enabled, general usage information is collected and sent to Microsoft. No personally identifiable information is collected, and there are no airtime charges to you.

3.12 Encryption

This applet is for enabling to encrypt files placed on storage cards.



Figure 3-19

Encrypt files when placed on a storage card

Encrypted files are opened just like other files, provided you are using the terminal that encrypted them. There is no separate step for you to take to read these files.

3.13 Error Reporting

This applet is for enabling Error Reporting.

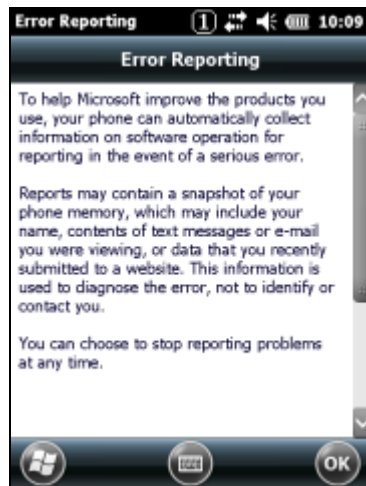


Figure 3-20

While Error Reporting is set enabled, serious error information is collected and sent to Microsoft.

3.14 Remove Programs

This applet is used to display all programs installed in the terminal and delete them. To remove a program, highlight the program in the field (see Figure 3.57) you want to remove, and tap **Remove** button.



Figure 3-21

Note:

Programs burnt in the ROM in the terminal cannot be deleted.

3.15 Memory

This applet is used to view the usage of main memory and storage card memory.

Main Tab

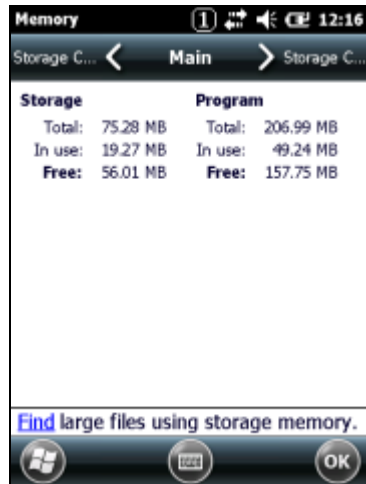


Figure 3-22

The amount of memory allocated to file and data storage versus program storage is displayed, as well as the amount of memory in use versus the available memory.

Storage Card Tab

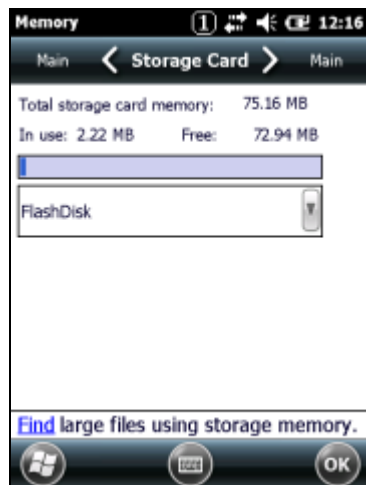


Figure 3-23

You can see how much memory is available on a storage card that is inserted into your terminal.

3.16 Regional Settings

This applet is for setting display method and format of your regional items such as numeric value, currency, date, and time.

Region Tab

This tab is for selecting your language and regional items. The items you select determine which options are selected by default on the other tabs.



Figure 3-24

Number Tab

This tab is for setting display format of numeric value.

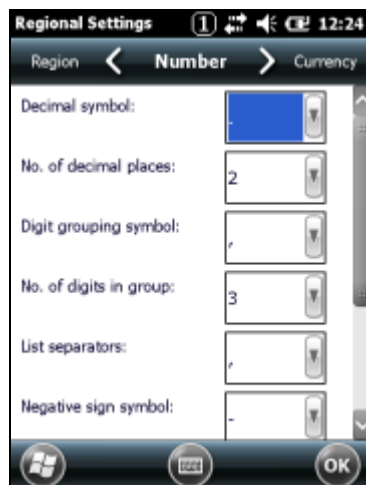


Figure 3-25

Currency Tab

This tab is for setting display format of currency.

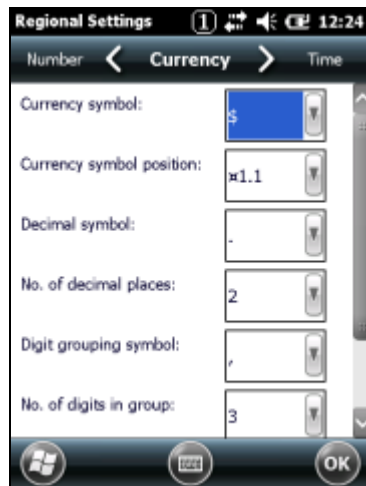


Figure 3-26

Time Tab

This tab is for setting display format of time.

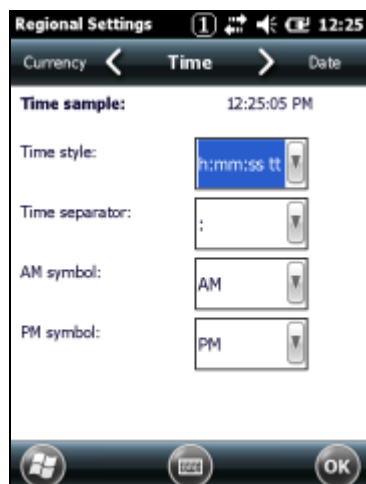


Figure 3-27

Date Tab

This tab is for setting display format of date.



Figure 3-28

3.17 Screen

This applet is for changing the screen orientation, aligning the screen, and adjusting the text size.

General Tab

This tab is for changing the screen orientation and aligning the screen.

To change the screen orientation, tap one of the **Orientation** radio buttons.

To realign the touch screen, tap **Align Screen** button and follow the instruction appeared.



Figure 3-29

Clear Type Tab

This tab is for enabling a font-smoothing technology.

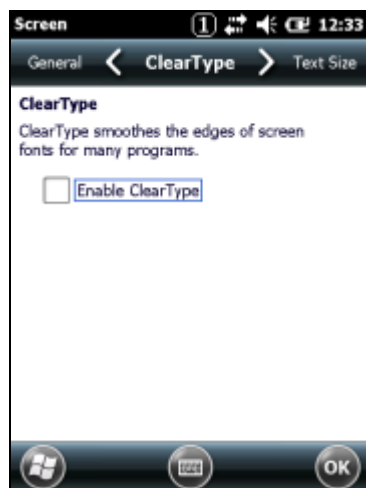


Figure 3-30

Text Size Tab

This tab is to adjust the text size.

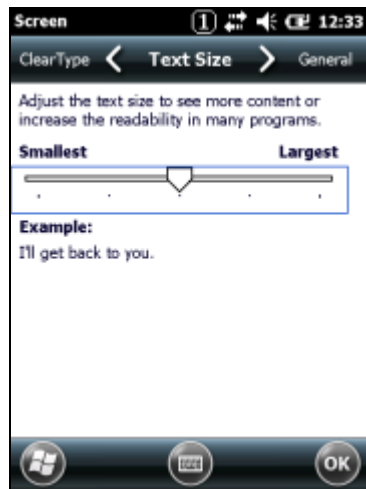


Figure 3-31

To adjust the text size, move the slider right or left to increase or decrease the text size.

3.18 Task Manager

This applet is used to view running tasks, switch tasks, and stop tasks.



Figure 3-32

1. To switch to selected program, tap the program that you want to use and navigate to **Menu** → **Switch To**.
2. To stop running program, tap the program that you want to stop and tap **End Task**.
3. To stop all running programs, navigate to **Menu** → **End All Tasks**.

Table 3.2 Menu in the applet

Menu	Description
End Task	Ends the selected program.
Menu	
Switch To	Switches to the selected program.
End All Tasks	Ends all running programs.
View	
Applications	Displays all running programs.
Processes	Displays all running processes.
Sort By	
Memory	Displays program list sorted by memory size.
CPU	Displays program list sorted by CPU usage.
Name	Displays program list sorted by name.
Refresh	Updates to the latest information.
Exit	Exits the Task Manager.

3.19 Scanner Setting

This applet is to change the settings for the integrated Laser Scanner (model dependant). For detail about each parameter, refer to Chapter 2.2 “Laser Scanner”.

Read barcode Tab

This tab is for specifying bar code symbologies to scan. Multiple bar code symbologies can be specified.

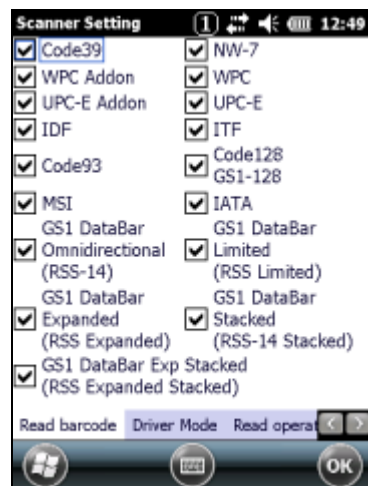


Figure 3-33

Driver Mode Tab

This tab is to set “Enable” or “Disable” for scanning each bar code symbology of the symbologies listed in **Read barcode** tab and its parameters listed below.

- Min (No. of minimum readable digits)
- Max (No. of maximum readable digits)
- Output format
- Check-digit
- Check-digit output

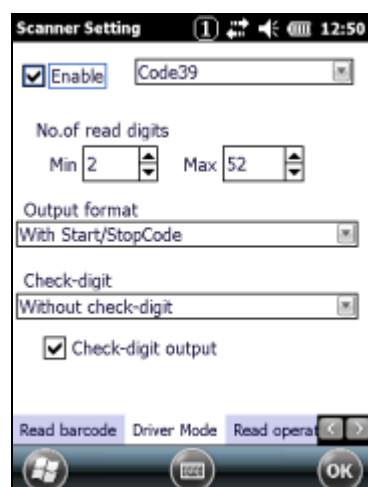


Figure 3-34

Read operation and Read operation 2 Tabs

These tabs are to set the following parameters related to scanning bar code symbologies. Choose a mode you wish to set in each pull-down menu.

Options of read mode in Read operation Tab (see Figure 3.60)

- Selection of the read method, “Continuous read” or “Single read”.
- Selection of beam width for the scan width control function, “Wide”, “Middle” and “Narrow”.
- Selection of the scan verification beam function, “Disable” or “Enable”.
- Selection of the decoded data output destination, “OBR buffer”, “Clipboard”, or “Keyboard”.
- Selection of termination code, “Disable termination code”, “CR”, “LF”, “CR”, “LF”, or “TAB”.
- Selection of the decoding level, "Normal" or "High" or "Steady".
- Selection of the read mode, “Normal read” or “Gradation read (= Multi step read)”.
- Selection of the filter function, “With or without filter” or “With soft filter”. Note that other filter modes in the pull-down menu are not operable with the terminal.

Options of mode in Read operation 2 Tab (see Figure 3.61)

- Selection of the gain, Gain Mode0 to Mode3 or Auto.
- Selection of the learning decode function, “Learning Decode ON” or “Learning Decode OFF”.

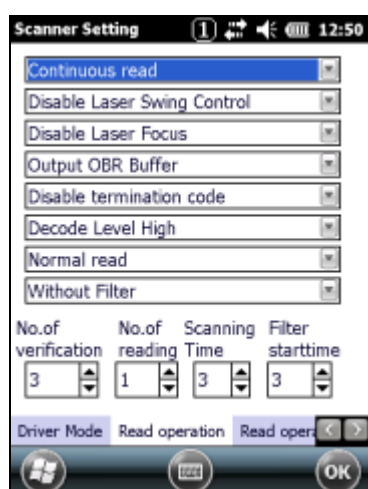


Figure 3-35

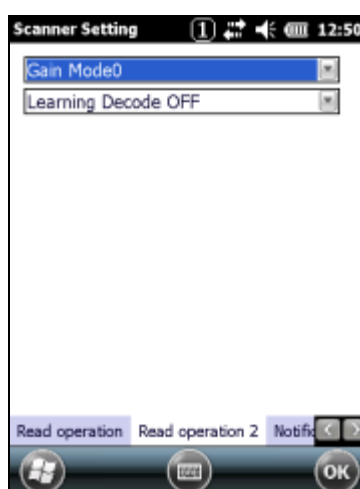


Figure 3-36

Notification Tab

This tab is to set up notification method selecting one of the methods listed below. The notification is issued when scanning a bar code is complete.

- Lights up the LED.
- Sounds the buzzer.
- Vibrator

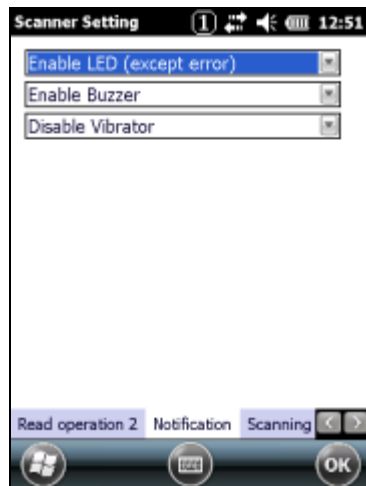


Figure 3-37

Scanning Key Tab

This tab is to set up “Enable” or “Disable” for each key of the keys listed below as the scan trigger key.

- [L] Key (Left direction on the Cursor key)
- [R] Key (Right direction on the Cursor key)
- [U] Key (Up direction on the Cursor key)
- [D] Key (Down direction on the Cursor key)
- Center Trigger (Center Trigger key)

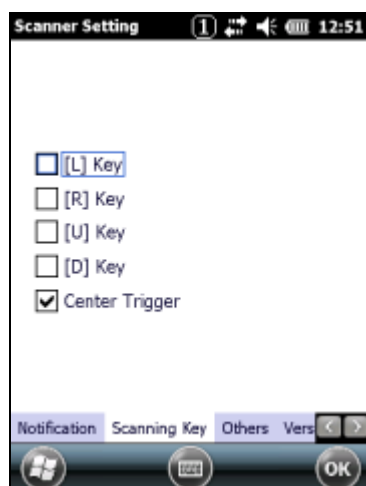


Figure 3-38

Others Tab

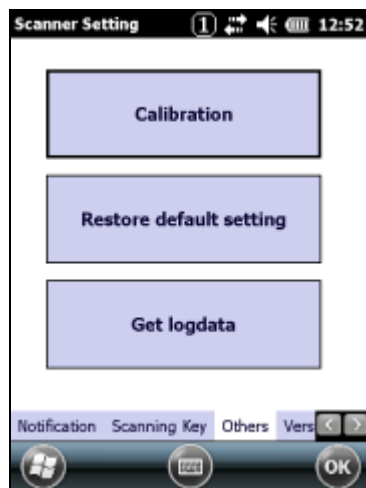


Figure 3-39

Calibration Button

This button displays the OBR calibration screen to set up the calibration of laser beam swing angle. Follow the guidance appeared on the screen to complete the calibration.

The swing angle has been set at the factory prior to shipment. Only if it is almost certain that the swing angle is not right, adjust it in this mode.

Restore default setting Button

This button resets setting contents and restores all the settings to the defaults.

Get logdata Button

This button captures log information for both scanner and decoder units. The following are the log file names.

- Scanner unit: “\ObrLog.dat”
- Decoder unit: “\DecodeLog.dat”

Version Tab

This tab displays version information for the Laser Scanner setting tool.



Figure 3-40

3.20 Backlight

This applet is for setting brightness for the power source provided by either installed battery or external power source from the dedicated AC Adaptor directly connected to the terminal or connected via cradle, the backlight auto dimming, and the backlight auto off.

Note:

Do not remove the check from **Turn off backlight when a button is pressed or the screen is tapped** checkbox in both Battery Power Tab (see Figure 3.20) and External Power Tab (see Figure 3.21). The backlight does not turn on when turning on the power with Power key or the backlight auto off function does not perform correctly if the check is removed.

Battery Power Tab

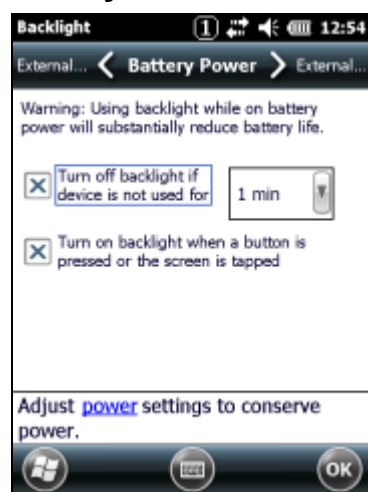


Figure 3-41

To set the backlight auto off, select **Turn off backlight if device is not used for** checkbox, and a period of elapse time in the pull-down menu.

External Power Tab

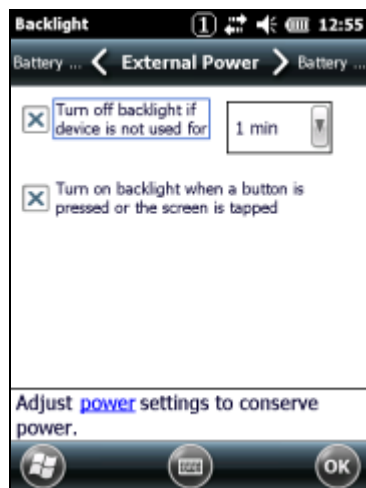


Figure 3-42

To set the backlight auto off, select **Turn off backlight if device is not used for** checkbox, and a period of elapse time in the pull-down menu.

Battery Brightness Tab

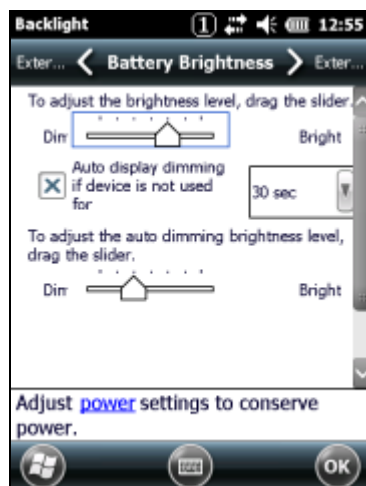


Figure 3-43

Brightness level

The upper slider is for specifying brightness in one of nine grades which becomes effect while battery pack is being used as the power source.

Auto dimming brightness

The lower slider is for specifying brightness in one of eight grades which becomes effect when the auto brightness dimming mode starts up. This auto brightness dimming mode is operable only during battery pack is used as the power source.

External Brightness Tab



Figure 3-44

Brightness level

The slider is for specifying brightness in one of nine grades which becomes effect while an external power supply - by the dedicated AC Adaptor connected directly to the terminal or connected via cradle - is used as the power source.

3.21 Buzzer

This applet is to set up “Enable” or “Disable” for buzzer sound and its sound volume in one of the three grades (minimum, medium, and maximum) for each event. Setting on the sound volume can be checked by clicking the respective triangle buttons on the right side.

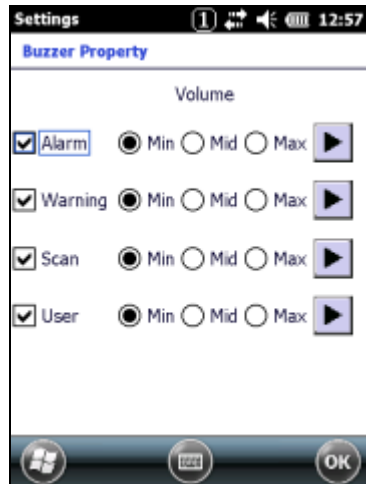


Figure 3-45

3.22 CPU Speed

This applet is for setting the CPU operating speed.

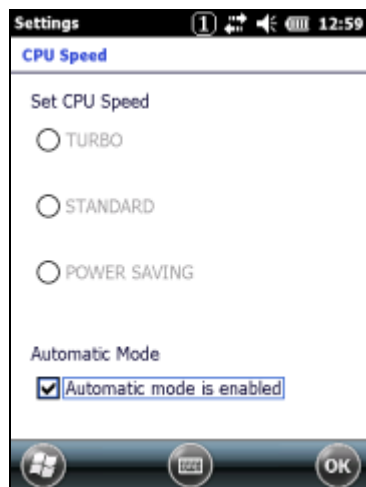


Figure 3-46

TURBO

This mode sets the CPU frequency to 624 MHz. The mode is disabled when the Automatic Mode is set effect.

STANDARD

This mode sets the CPU frequency to 312 MHz. The mode is disabled when the Automatic Mode is set effect.

POWER SAVING

This mode sets the CPU frequency to 208 MHz. The mode is disabled when the Automatic Mode is set effect.

Automatic Mode

This mode automatically switches the CPU frequency to either **TURBO**, **STANDARD**, or **POWER SAVING** mode according to the load on the CPU. Check the checkbox to set the mode.

3.23 Version Info

This applet is used to display each version number of the OS, boot section, loader, and service pack integrated in the terminal.



Figure 3-47

3.24 USB Connection

This applet displays connection establishment with PC or other device in USB mode. It is also used to change the connection related parameter settings.

Status Tab



Figure 3-48

Can be connected to PC message appears in the tab (see Figure 3.69) when the terminal is connected to PC in USB Client mode (USB Function mode).

Connect Utility Tab

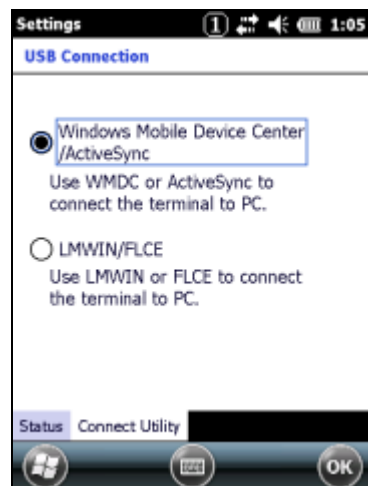


Figure 3-49

Windows Mobile Device Center/ActiveSync

Set this radio button effect to establish connection in Windows Mobile Device Center (or ActiveSync) between the terminal and PC via the USB connection. The radio button has been set effect by default.

LMWIN/FLCE

Set this radio button effect to establish connection in LMWIN (or FLCE) between the terminal and PC via the USB connection.

3.25 Storage Manager

This applet displays the FlashDisk information.



Figure 3-50

Properties Button

This button displays the Partition properties screen to enable formatting and management with the FlashDisk.

Partition Properties Screen

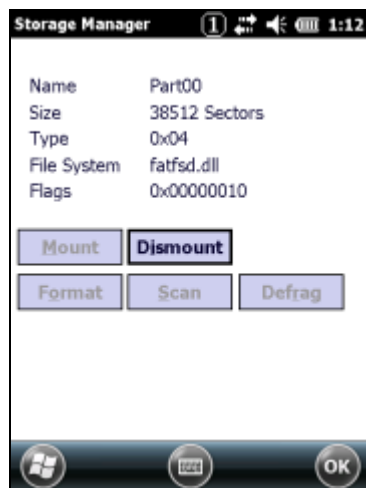


Figure 3-51

Mount Button

This button mounts the partition.

Dismount Button

This button dismounts the partition.

Format Button

This button displays the Format window to enable formatting on the partition. It is not possible if the partition is mounted.

Scan Button

This button displays the Scan window to enable verification check for the partition.

Defrag Button

This button displays the Defrag window to enable defrag for the partition.

Notes:

- This utility doesn't carry out the **User Disk Clear**. See "Reset" for detail.
- The utility that carries out the **User Disk Clear** is available. See "DSKClean" for detail.

Format Screen

This screen is for specifying format parameters for the partition.

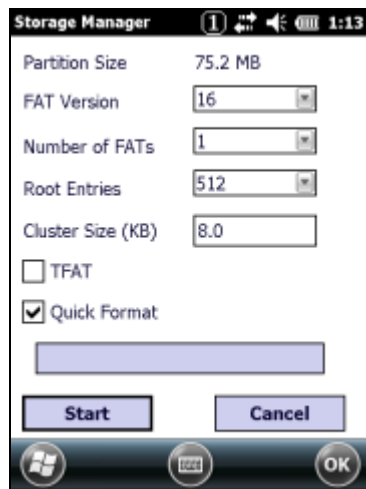


Figure 3-52

Start Button

This button displays confirmation dialog to enable start of formatting on the partition.

Cancel Button

This button displays a confirmation dialog to cancel the formatting.

Scan Screen

This screen is for specifying scan parameters for the partitions.

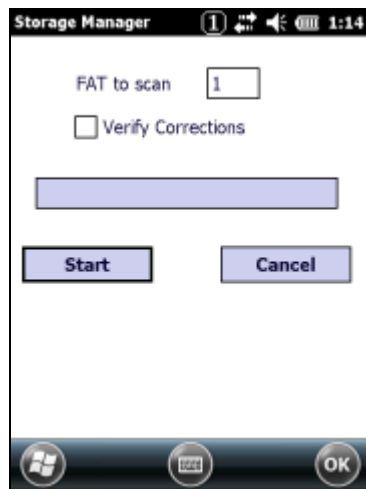


Figure 3-53

Start Button

This button displays a confirmation dialog window to enable scanning the partition.

Cancel Button

This button displays a confirmation dialog window to cancel the scanning.

Defrag Screen

This screen is for specifying defrag parameters for the partition.

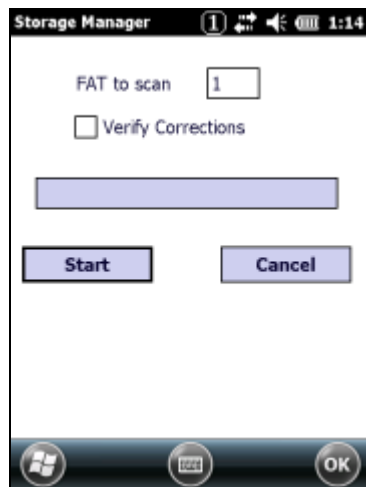


Figure 3-54

Start Button

This button displays a confirmation dialog window to enable defrag for the partition.

Cancel Button

This button displays a confirmation dialog window to cancel the defrag.

3.26 Vibrator

This applet is perform to set vibrator setting.

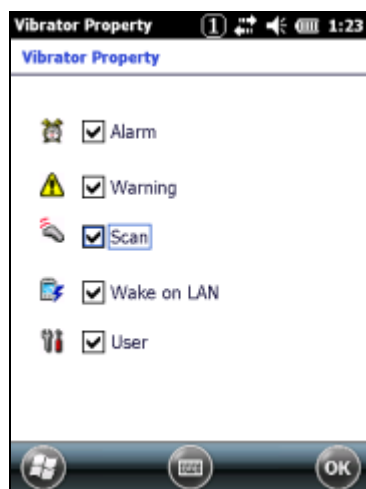


Figure 3-55

3.27 NetSearch

This application displays a list of partner stations communicable with the terminal via WLAN.

- Partner stations on the list can be sorted in the order of field intensity, station name and channel.
- Field intensity for the partner station currently being established with the terminal is displayed in green.
- The information appeared in the screen is updated every five seconds.
- The remote station's WLAN standard IEEE802.11 b/g icon is displayed at the head of the station name.
- A key symbol icon is displayed for stations that use encrypted communication.

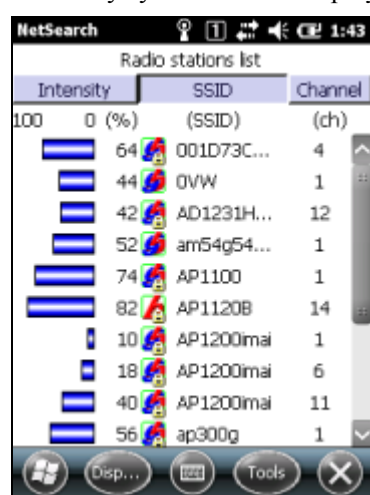


Figure 3-56

Table 4.3 Menus in the application

Menu	Description
Display	
List View(<u>1</u>)	Displays a list of partner stations.
Detail View(<u>2</u>)	Displays screen showing information in detail about the partner station.
Options	Displays a screen for setting partner station parameters for searching.
About	Displays version information.
Exit(<u>0</u>)	Closes the NetSearch.
Tools	
Ping(<u>4</u>)	Displays the Ping utility screen.
Signal(<u>5</u>)	Displays the Signal screen.

Detail Information About Partner Station

The screen displays the following detail about the partner station.

- SSID
- WLAN standard
- No. of channels operable
- Intensity (%)
- Encryption
- MAC address
- Status
- IP address
- Physical address

Navigate to **Start** → **Programs** → **Communication** → **NetSearch** icon to initiate the screen.

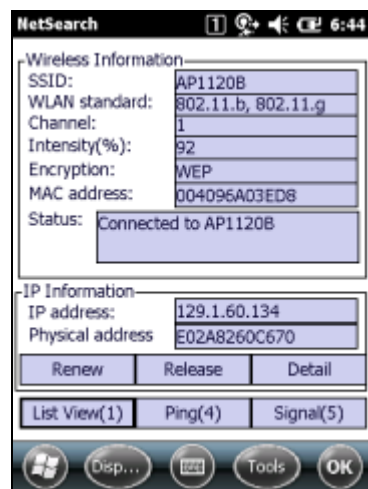


Figure 3-57

Detail Button

This button displays the log of IP in detail.

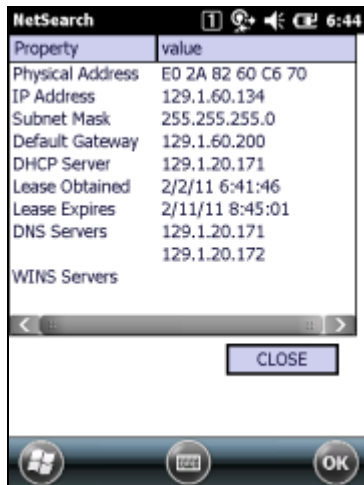


Figure 3-58

Ping(U4U) Button

This button (see Figure 4.45) displays the PingUtility screen.

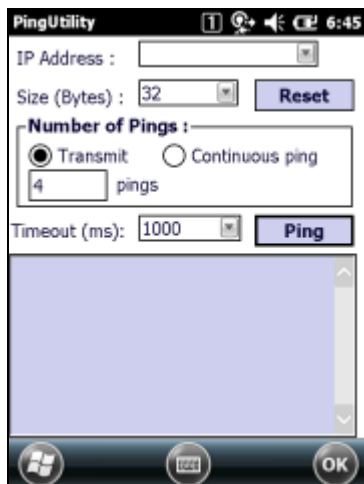


Figure 3-59

Signal(U5U) Button

This button (see Figure 4.45) displays the signal strength in dBm and with a yellow straight line that also indicates the signal strength in percent for the operator to judge if the signal in air is ample enough to continue WLAN operation

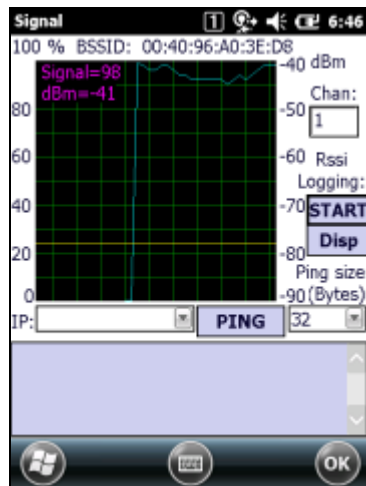


Figure 3-60

Options Screen

Navigate to **Start** → **Program** → **Communication** → **NetSearch** icon → **Display** and then choose **Options** in the menu to display the following screen.

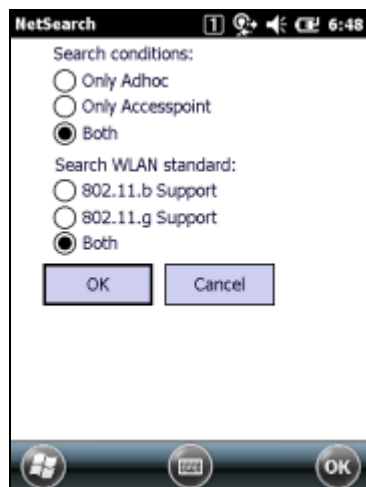


Figure 3-61

Search conditions

Choose a partner station to be searched via a way of either **Only AdHoc** or **Only Accesspoint** or **Both**.

Search WLAN Standard

Choose a partner station to be searched via a WLAN standard either **802.11.b Support** (IEEE802.11b standard) or **802.11.g Support** (IEEE802.11g standard) or **Both**.

3.28 Beam

This applet is for enabling to receive all incoming Bluetooth beams.



Figure 3-62

To enable you to receive all incoming beams, check the **Receive all incoming beams** checkbox.

Note:

To conserve battery power, make the **Receive all incoming beams** effect only for a period you are receiving beamed files.

3.29 Connections

This applet is for setting up multiple network connections.

Tasks Tab

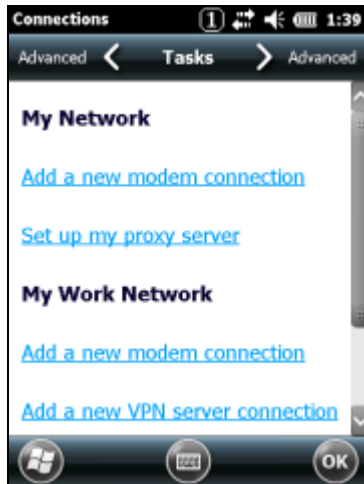


Figure 3-63

Advanced Tab

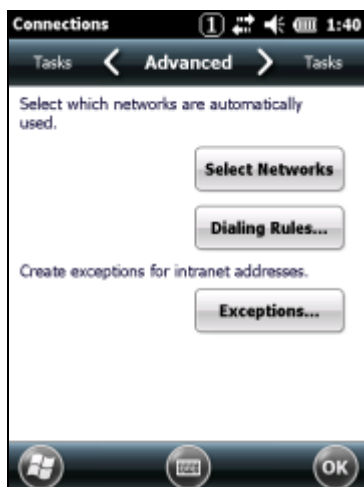


Figure 3-64

3.30 Domain Enrollment

This applet is used to enroll the terminal to your company network.

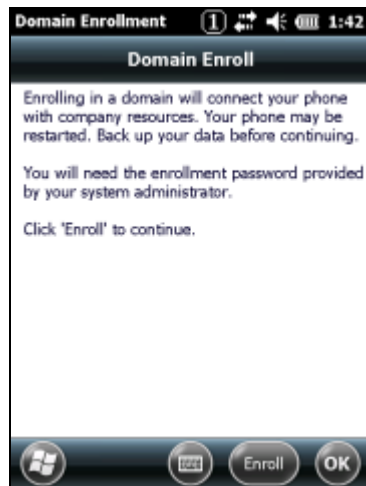


Figure 3-65

3.31 Network Cards

This applet is used to configure network adapters.

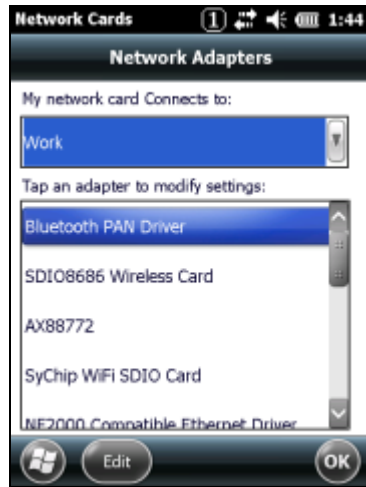


Figure 3-66

The installed network adapter drivers are listed here.

Tap the adapter that you want to configure.

Note:

In some cases, this applet is displayed as the "**Network Adapter**" tab of the "**Wireless Configuration**" applet.

3.32 USB to PC

This applet is for enabling advanced network functionality.

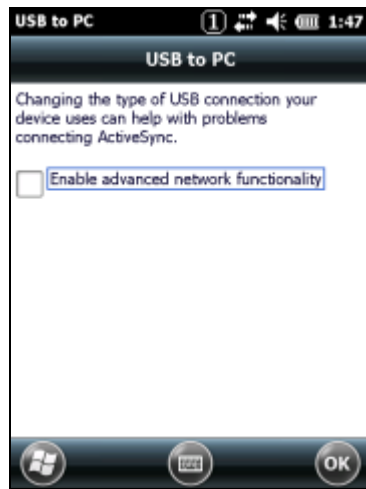


Figure 3-67

To troubleshoot an ActiveSync cable connection, select **Enable advanced network functionality** checkbox.

3.33 Wireless Manager

This applet is for enabling, disabling, and configuring all the wireless capabilities.



Figure 3-68

3.34 WLAN Power

This applet is to set up the settings for power to the integrated WLAN module and to display the detected status of the power.

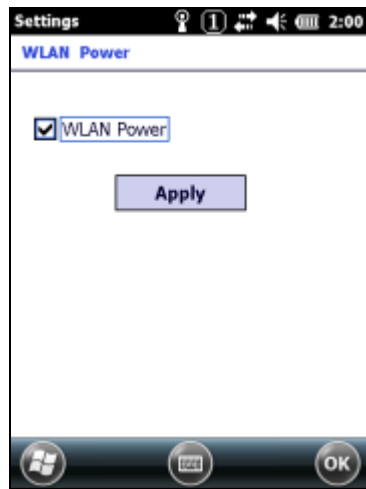


Figure 3-69

WLAN Power Enable

Check this box to supply the power to the integrated WLAN module.

3.35 WLAN Settings

This applet is to set up the parameters for WLAN configuration.

The **WLANConfig** setting tool starts up by displaying the WLAN settings stored in the **ini** file if it exists in the terminal, or the default WLAN settings if the file does not exist, and then displays **IP** tab.

IP Tab



The screenshot shows the 'WLANConfig' applet window. At the top, there's a title bar with 'WLANConfig' and system icons. Below the title bar, there are two radio buttons: 'Enable DHCP' (selected) and 'Configure IP'. Under 'Configure IP', there are input fields for IP, MASK, GateWay, DNS1, DNS2, WINS1, and WINS2, each with a placeholder 'x x x'. At the bottom of the main area are 'OK' and 'Cancel' buttons. Below the main area is a tab bar with 'Basic', 'IP' (selected), 'WLAN', and 'Detail Settings'. At the very bottom is a Windows-style taskbar with a Start button, a 'WLAN' button, and an 'OK' button.

Figure 3-70

Basic Tab

This tab sets up SSID and Security. Click the radio button of Authentication to set “Open” for WEP. Choose either 128 bit radio button or 64 bit radio button for Key Length. For Key Index, up to four kinds of key can be registered.

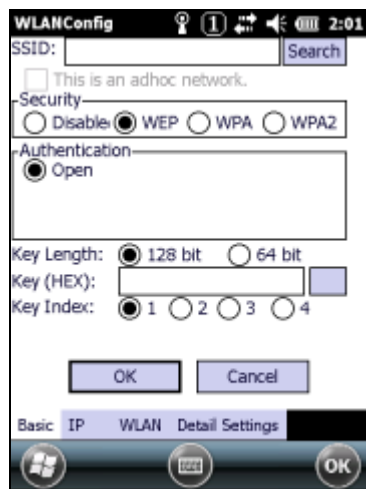


Figure 3-71

Search Button

This button invokes the **NetSearch** utility.

Security, Authentication

Choose one of the four radio buttons in the **Security** field. By clicking **WPA** or **WPA2** radio button, authentication in either **PSK**, **EAP-PEAP**, or **EAP-TLS** can be set up. If **PSK** is selected in **Authentication**, input a key in the **Key** field to register.

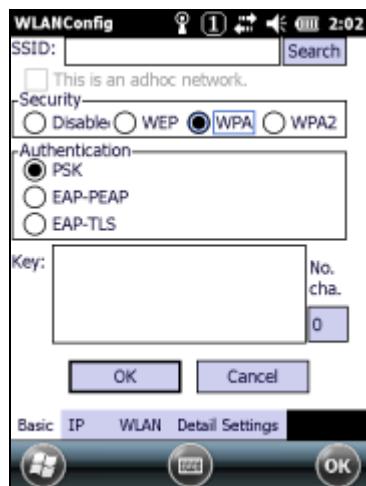


Figure 3-72

If **EAP-PEAP** or **EAP-TLS** is selected, user name, domain validate server, and etc. can be set up.

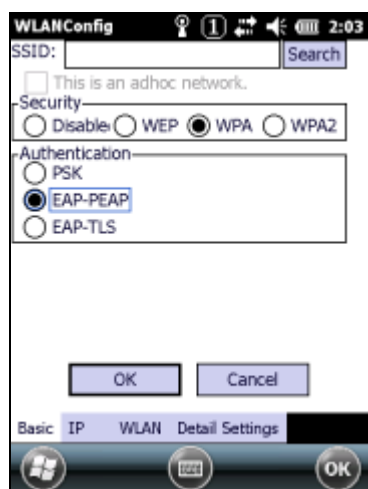


Figure 3-73

WLAN Tab

This tab sets up the basic WLAN settings such as power to the WLAN module, power save mode, WLAN standard, and the threshold level (RSSI level) of roaming.

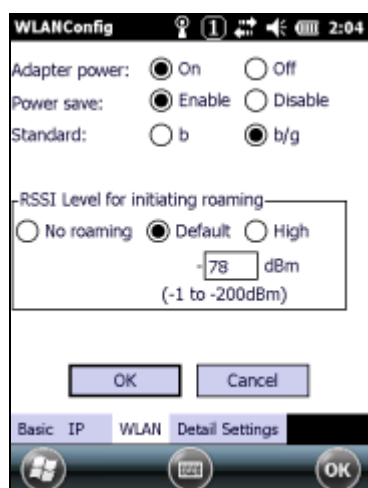


Figure 3-74

Detail Settings Tab

This tab sets up the detailed settings. It sets up whether or not to show popup window when WLAN is not connected to a network. AdHoc connection, all security settings and a comment for the configuration file (“ini” file) can also be set up. For **Advance Settings** and **Version** buttons, refer to the explanation below.

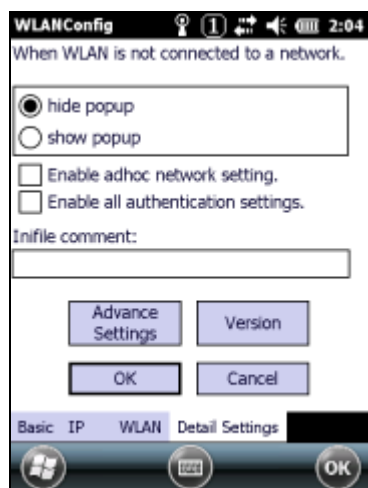


Figure 3-75

Advance Settings Button

This button displays a window of **Advance Settings**. The window sets up frequency channels from nos. 1 to 13 (see note) used in WLAN operation and detailed settings for roaming.

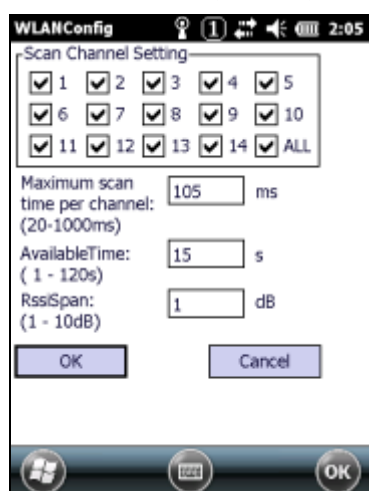


Figure 3-76

Note:

The relevant European standard (“ETSI”) limits the number of channels to 13 only.

Version Button

This button displays version information about the application currently running.



Figure 3-77

If **ok** button in Figure 3.117 is clicked, following “Infile Save Options” screen appears. This screen is to save the settings you made on each tab of **Basic**, **IP**, **WLAN**, and **Detail** of the WLANConfig tool. Clicking **OK** button saves the settings made on the four tabs to the ini file, and then starts up the terminal to run in WLAN operation. Or, clicking **Cancel** button saves the settings to the ini file, but does not start up the terminal. The settings do not become effect until when a reset on the terminal is performed a next time.

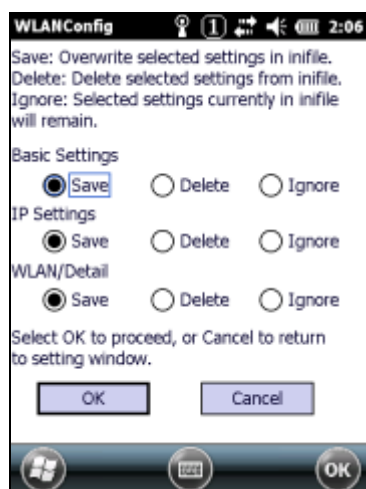


Figure 3-78

4. Application Programs

Once an application program is launched by navigating to **Start** → **Programs** menu, the application's operation menu is displayed to continue the process.

The following are the application programs implemented in the terminal

Table 4.1

Applet	Description	CASIO	MS
Today	Default screen	-	Yes
Games	Solitaire and Bubble Breaker	-	Yes
ActiveSync	ActiveSync client	-	Yes
Backup Tool	Backs up and restores user data to/from FlashDisk.	Yes	-
Calculator	Nine-digit calculator	-	Yes
Calendar	Personal appointment management tool	-	Yes
Contacts	Personal contact management tool	-	Yes
Copy Devices	Copies user data between two terminals.	Yes	-
File Explorer	File management program	-	Yes
FLCE	Client for data upload and download	Yes	-
Getting Started	Shortcut menus for setting up the terminal	-	Yes
Internet Explorer	Displays web pages for Internet and Intranet.	-	Yes
Laser Scanner Demo	Demonstrates the features of scanning bar codes.	Yes	-
Laser Scanner Read	Scans bar codes.	Yes	-
LCD Display	LCD display Demo	Yes	-
Buzzer / Vibration	Buzzer and Vibration Demo	Yes	-
E-mail	Electronic mail client	-	Yes
Messenger	Windows Live Messenger	-	Yes
Notes	Takes a quick note.	-	Yes
Pictures & Videos	Shows digital pictures and videos.	-	Yes
Remote Desktop Mobile	Remote desktop client.	-	Yes
Search	Searches for files and other items.	-	Yes
Task Manager	Displays running programs.	-	Yes
Tasks	Personal task management tool	-	Yes
Windows Live	Windows Live client	-	Yes
Windows Media	Windows Media Player	-	Yes
WLAN Barcode Setting	This is tool for WLAN setting by using barcode scanning operation.	Yes	-
System Barcode Setting	This is tool for System setting by using barcode scanning operation.	Yes	-
System Settings	This is tool for the following System setting together.	Yes	-
Mobile Module Updater	This is tool for update module.	Yes	-
LogViewer	Display collected detail log tool	Yes	-
Auto rescue tool	Data rescue tool from terminal by hardware problem	Yes	-
System Switcher	Switch desktop mode between CASIO original and Microsoft standard	Yes	-

Document Viewer	This tool can display Microsoft Word, Excel, PowerPoint and Adobe PDF type file.	Yes	-
-----------------	--	-----	---

4.1 Today

When you turn on the terminal for the first time each day, you will see the Today screen. You can also display it by tapping the Today's icon. On the Today screen, you can see important information at a glance for the day.

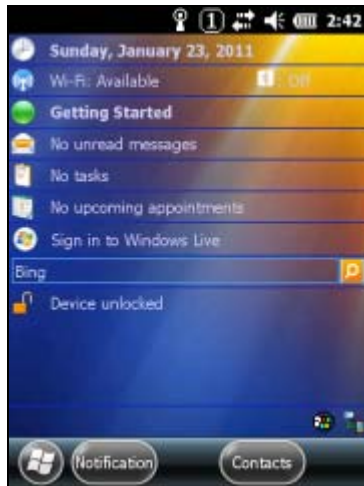


Figure 4-1

4.2 Games

The terminal comes with one game; Solitaire.



Figure 4-2

4.3 ActiveSync

This application is an ActiveSync client program for the terminal to communicate with PC.



Figure 4-3

4.4 Backup Tool

This tool backs up user's data into the memory card and then restores it to deploy the backed up data in the terminal.

Applicable data for backup and restoration with the tool

- Files on the FlashDisk (except OS components)
- Registry
- Received mails
- Cookie of browser and temporally files
- Certificates

Note:

Changed sizes of the memory area, password and stylus correction related information are not backed up.

Medium to restore data;

Memory card (micro SD, ...), FlashDisk folder of the device

Password for Back Up Process

For security purpose, a password can be set which is required at a time of starting up the backup process. This password does not allow backed up data in memory card to be restored unless it is correctly entered when the restoration is initiated.

Note that the password does not also allow automatic restoration with the automatic backup tool if password has been set.

Backup Process

1. Navigate to **Programs** → **Utility** and then double click **Backup Tool** icon. The screen appears. Choose a memory card in the pull-down menu and click **Backup now** button.

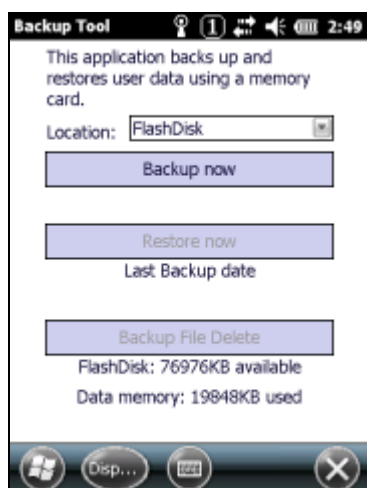


Figure 4-4

2. If you require a password to set in the screen appeared after clicking **Backup now** button, enter a password in **Password** field and then press F3 key (= Tab key) to confirm. Enter the same password in **Confirm Password** field and then press F2 key (= Back Tab keys). Click **Yes** button to complete the entering of password. Otherwise **No** button to return to the previous screen.
3. If you choose **Yes** button in the step above, **Backup in Progress** screen appears and the backup process is initiated. While the backup continues, do not operate any key on the keyboard or on the right and left sides.

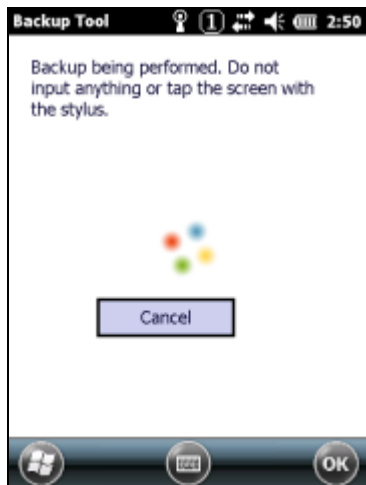


Figure 4-5

4. When the backup is complete, a buzzer sounds in a short period indicating the completion. Click **ok** button in the popup message screen.

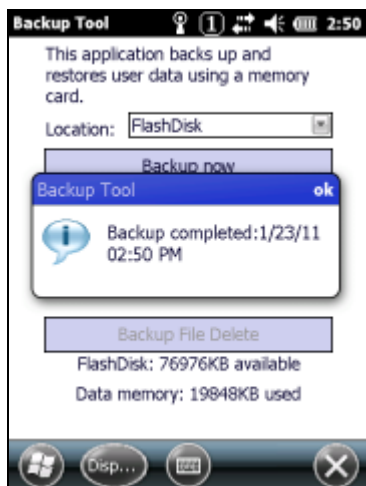


Figure 4-6

Restoration Process

1. Press **Restore now** button.

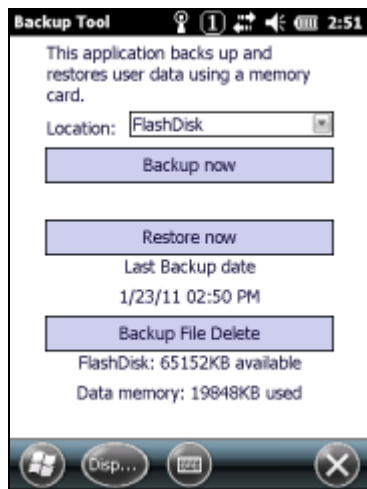


Figure 4-7

2. Enter the same password in **Password** field if it has been set up at a time of the backup process and click **Yes** button. Or, click **No** button to return to the previous screen.

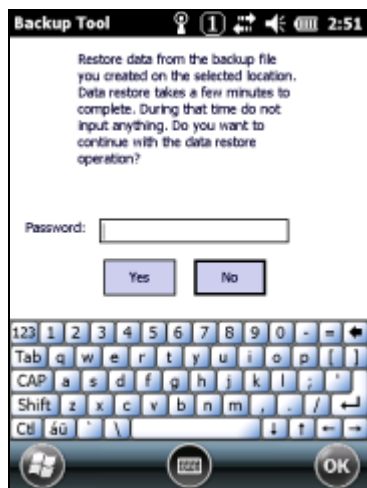


Figure 4-8

3. If you choose **Yes** button in Figure 4.8, **Restore in Progress** dialogue screen appears indicating the initiation of restoration. While this screen is being appeared, do not operate any key on the keyboard or on the right and left sides.

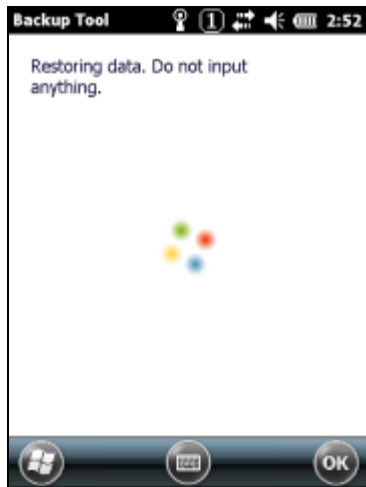


Figure 4-9

4. When the restoration is complete, a buzzer sounds in a short period indicating the completion. Click **ok** button in the popup message screen and **X** button at upper-right corner in the screen to close the tool.



Figure 4-10

Initiating the Tool at Command Line

The following explains how to initiate the backup tool at command line.

```
CF_Backup.exe <option> <target> [<password>]
```

Parameters in the command line;

option

B: Specify the backup process.

R: Specify the restoration process.

In the <option> field, specify either B or R. Character of the selection to enter is not case-sensitive.

target

Storage directory of backup file

password

A password to set up if required.

Notes:

- Depending on the size of data to back up or to restore, it may take a few ten seconds to a few minutes.
- To carry out the backup and restoration processes, it is recommended to use the dedicated AC Adaptor (AD-S42120B) connected directly to the terminal or via cradle to power the terminal.

Troubleshooting

Table 4.2 Error messages

Process	Error message	Cause
Backup	Memory backup was cancelled because no storage card is loaded or because of insufficient storage card capacity. Correct the problem and try again.	There should be a file still kept being opened.
	An error occurred while writing the backup file to card. Return to the menu, delete the backup file that was created, and try again.	Due to insufficient memory capacity, temporary file of the backup file cannot be saved in mid-course.
	Memory backup was cancelled due to low battery power! Replace batteries and try it again.	Due to low battery power, the backup file cannot be saved.
Restoration	Restore failed because the data file could not be written.	Due to insufficient memory capacity, temporary file of the backup file and the backup file cannot be exchanged.
	Restore failed because the backup file could not be read.	Backup file cannot be read due to the corruption of the file.
	Restore was cancelled due to low battery power! Replace batteries and try it again.	Due to low battery power, the backup file cannot be read.
	The password was not correctly confirmed. Be sure that the confirmation password exactly matches the password.	The password entered does not match to the password created in the backup process.

4.5 Calculator

The application can be used to operate nine-digit calculator.



Figure 4-11

4.6 Calendar

Calendar is a program that helps you manage your schedule. Appointments and meetings in the Calendar can be viewed using a variety of different formats, and you can set alarms to notify you upcoming appointment times.



Figure 4-12

To create a new Appointment, navigate to **Menu → New Appointment**.

See Table 4.3 for menus of the application.

Table 4.3 Menus in the application

Menu	Description
Day	Switches to the Day view.
Week	Switches to the Day view.
Month	Switches to the Week view.
Year	Switches to the Month view.
Agenda	Switches to the Agenda view.
Menu	
New Appointment	Creates a new Appointment.
Beam Appointment ...	Sends the selected Appointment via IrDA or Bluetooth.
Delete Appointment	Deletes the selected Appointment.
Reply	
Reply	Replies the meeting notice.
Reply All	Replies the meeting notice to all attendees.
Go to Today	Displays the Appointments of today.
Go to Date	Displays the Appointments of specified day.
Edit	
Cut	Cuts the selected Appointment.
Copy	Copies the selected Appointment.
Paste	Pastes the Appointment that are cut or copied.
Tool	
Options ...	Sets up options for Appointment.
View	
Agenda	Switches to the Agenda view.
Day	Switches to the Day view.
Week	Switches to the Week view.
Month	Switches to the Month view.
Year	Switches to the Year view.
Filter	
All Appointments	Displays all Appointments.
No Categories	Displays all Appointments with no category.

4.7 Contacts

Use Contacts to store and manage the names, addresses, phone numbers, and email addresses of friends, co-workers, customers, etc.



Figure 4-13

To create a new Contact, tap **New**.

To find a contact, do one of the following:

- Begin entering a name in the provided text box until the contact you want is displayed.
- Use the alphabetical index displayed at the top of the contact list.
- Filter the list by category. In the contact list, navigate to **Menu** → **Filter**.

Table 4.4 Menus in the application

Menu	Description
New	Creates a new Contact.
Menu	
Edit	Edits the selected Contact.
Send Contact	
Beam	Sends the selected Contact via IrDA or Bluetooth.
Copy Contact	Copies the selected Contact.
Delete Contact	Deletes the selected Contact.
Options ...	Sets up options for Contact.
View By	
Name	Displays contact list sorted by name.
Company	Displays contact list sorted by company.
Filter	
All Contacts	Displays all Contacts.
Recently Viewed	Displays Contacts you have recently added, edited, or viewed.
No Categories	Displays all Contacts with no category.
Select Contacts	
Several	Select several Contacts.
All	Select all Contacts.

4.8 Copy Devices

This tool is used Bluetooth communication function between devices and available to copy data from master terminal to target terminal.

* Copy available data is same as backup tool.

- Master terminal
Terminal which execute some software installation or some control panel setting
- Target terminal
Terminal which execute to install or setup same as master terminal

Procedure of copy device

Master terminal

1. Select target device and start copy



☒ 4-1

Press "Send Start" button

The following 4 job will be executed in send routine

- Create backup file (execute backup tool)
- Get device ID of target device
- Search target device
- Send backup file

2. Execute data sending

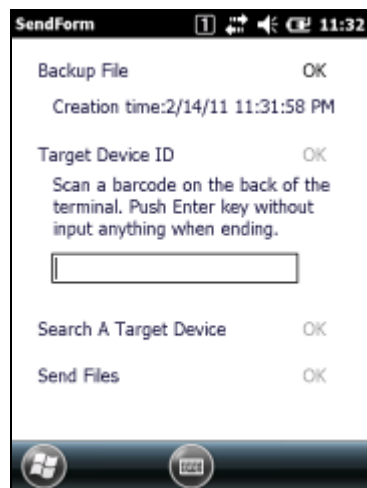


图 4-2

This is data send screen.

Operation method

Create backup file

Create backup file for sending to satellite terminal

1. Check backup file (¥¥FlashDisk¥¥Backup¥¥Backup.dat) is existed in master terminal.
2. If backup file is existed, the following message will be appeared. And when you select "Yes", backup tool will be started and create backup file. If you select "No", there is no action.



☒ 4-3

3. If backup file is not existed, backup tool will be started and create backup file.
4. When this operation is succeed, display "OK" and execute next step. If this operation is not succeed, display "NG" and do not execute any next operation.

Get Device ID of target machine

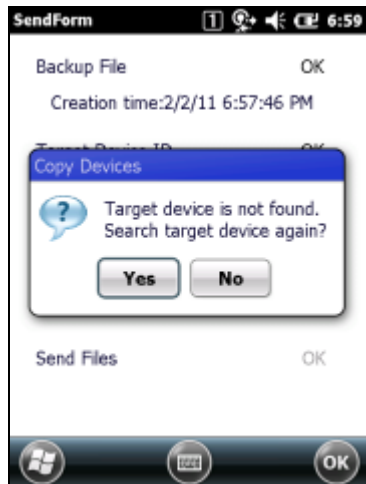
Scan target device ID (Code128 barcode located in back side of main body), then decide target machine.

1. Scan device ID of target device and display this result in text box. Or input device ID by manual operation and press Enter key.
 - Device ID is checked large / small letter.
2. When scan is succeed or press Enter key, display "OK", and execute next step. If failed, display "NG", and do not execute next routine.

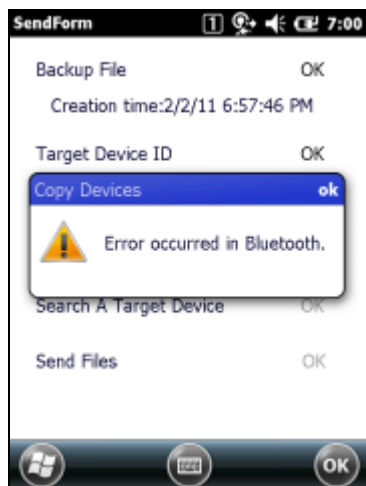
Search target device

Search target device by Bluetooth communication and set to communication available condition.

1. Search target device on Bluetooth communication.
(Bluetooth communication is available to search maximum 64 devices.)
2. If target device can not find Bluetooth communication, the following message will be appeared. When you select "Yes", search again, when you select "No", condition will be error.



3. If scan is succeed, display "OK" and execute next step. If failed, the following message is appeared and display "NG" then do not execute next step.



Search target device

Send backup file to target device.

1. Send backup file to target device by Bluetooth connection
2. If send operation is succeed, display "OK", if failed, display "NG".

Target terminal

1. Start to receive

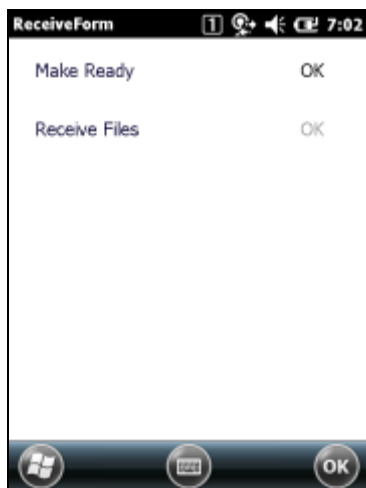


Press "Receive Start" button.

The following 3 step will be execute in this receive routine.

- Preparing receive
- Receive backup file
- Execute restore operation (execute backup tool)

2. Start to data receiving



Display data receive screen.

Note :

Do not press reset switch in target device while data receiving.

Because device ID will be changed in this target machine.

If you press reset switch and device ID is changed, when you execute full reset operation, then device ID will be returned original.

Operation method

Prepare Bluetooth receive

Create backup file for sending to satellite terminal

1. Prepare Bluetooth receiving
2. If succeed, display "OK" and execute next step, if failed, the error message and "NG" will be displayed and do not execute next step.

Receive backup file

Receive backup file from master device.

1. Backup file will be received from master device which connected with Bluetooth connection. If already backup file is existed, current backup file will be deleted. If master device do not start to send within 3 minutes (or no response), the following message will be appeared.
2. When receive operation is succeed, display "OK" and execute next step. If failed, message and "NG" will be displayed and do not execute next step.

Execute restore operation

Execute restore operation according to backup file which receive from mater device.

1. Backup tool start and execute restore operation according to backup file which received from master device
2. If restore is success, display "OK" and if failed, display "NG".

4.9 File Explorer

This application is a file management program. It can copy files, transmit files, delete files, create folders and delete folders.

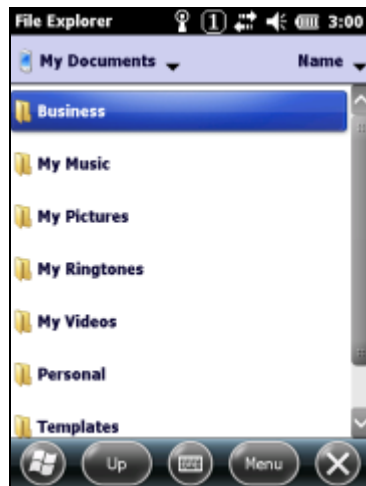


Figure 4-14

Table 4.5 Menus in the application

Menu	Description
Up	Opens the parent folder.
Menu	
Go To	
My Documents	Opens the My Documents folder.
My Device	Opens the root folder.
Folders ...	Opens the upper folder.
Open Path	Opens the network share.
Refresh	Updates the list with latest information.
Show All Files	Displays all files.
Sort By	
Name	Displays the list sorted by name.
date	Displays the list sorted by date.
Size	Displays the list sorted by size.
Type	Displays the list sorted by file type.
Send ...	Creates a new e-mail message with the selected file attached.
Beam File ...	Sends the selected file via IrDA or Bluetooth.
New Folder	Creates a new folder.
Rename	Changes the specified file and folder names.
Delete	Deletes the specified file and folder.
Edit	
Undo	Returns to the previous operation.
Cut	Cuts the selected file and folder.
Copy	Copies the selected file and folder.
Paste	Pastes the file and folder that are cut or copied.
Paste Shortcut	Creates a shortcut for the file and folder that are cut or copied.
Select All	Chooses all the files and folders that are displayed.

4.10 FLCE

This application enables the terminal to communicate with a PC with the LMWIN utility being running. The communication between the terminal and the PC is established via cradle.

Input Command Line Screen



Figure 4-15

Screen During Transmission

While the communication continues, the following screen will appear. Refer to LMWIN Utility Manual available separately for detail of the operation.



Figure 4-16

4.11 Getting Started

This application displays shortcut menus for setting up the terminal.

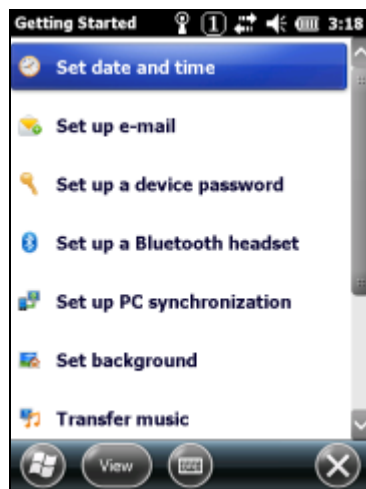


Figure 4-17

4.12 Internet Explorer

This application displays web pages on the Internet and Intranet.



Figure 4-18

Table 4.6 Menus in the application

Menu	Description
Favorites	Displays the Favorites menu.
Menu	
Favorites	Displays the Favorites menu.
Add to Favorites	Adds the current page to the Favorites menu.
Go to Web Address	Focuses on the Address Bar.
Zoom Out	Displays the current page smaller.
Home Page	Returns to the homepage.
History	Changes the display to a page listed in the history.
Forward	Changes the display to the previous page displayed prior to returning.
Refresh	Updates the current page to the latest information.
View	
Text Size	Specifies the displayed font size.
Full Screen	Hides the main menu, toolbar, etc.
Mobile	Changes the displayed page size to reduction mode.
Desktop	Keeps the same layout and size as on a desktop computer.
Tools	
Send Link	Creates a new e-mail message with a link to the current page.
Properties	Displays the property of page.
Option	Sets up options for security, etc.
Copy/Paste	
Make Selection	Starts text selection mode.
Paste	Pastes text that are cut or copied.

4.13 Laser Scanner Demo

You can execute some demonstration for laser scanner.

Execute file is located the following folder.

\\Program Files\\CASIO\\DEMO\\LaserDemo.exe

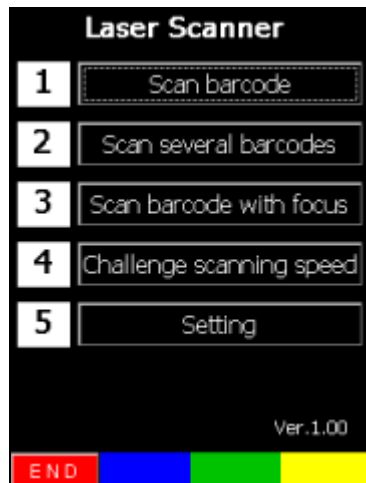


Figure 4-19

Scan barcode



Figure 4-20

Display scanning barcode data. At this time, you can change the following setting.

- Change scan method
- Change scan method
- For difficult scanning barcode
 - Change gain mode setting
 - Change decode level setting

Scan several barcodes

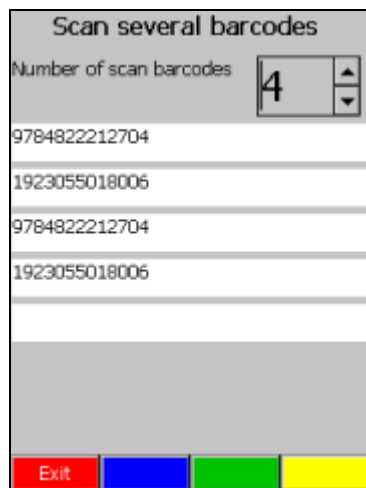


Figure 4-21

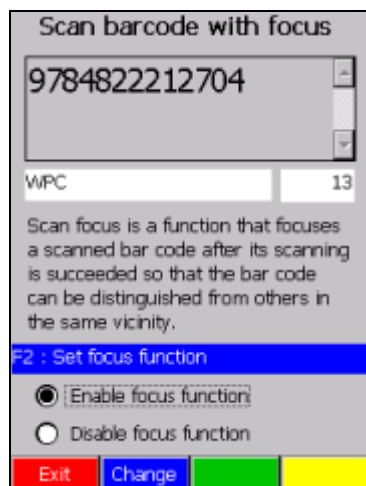
You can scan several barcodes continuously.

And scanned data will be displayed in this screen.

Scanning barcode number range is from 2 to 5.

When you press trigger key, before scanned data will be cleared.

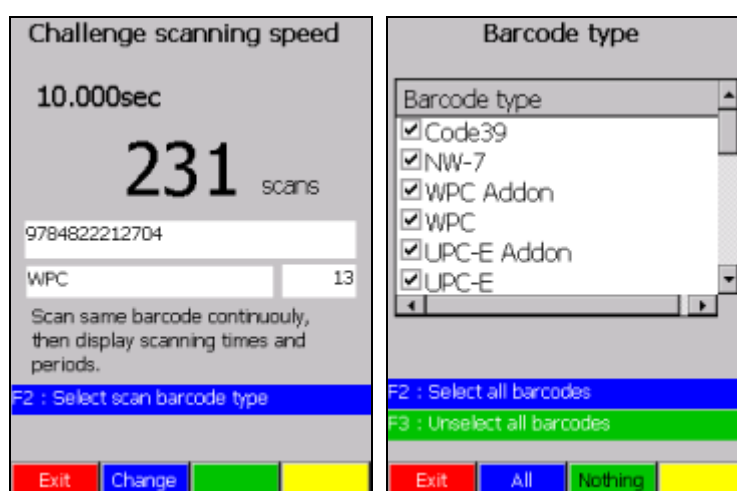
Scan barcode with focus



Display scanning barcode data. At this time, you can change the following setting.

- Set focus function

Challenge scanning speed



Scan same barcode continuously, then display scanning times and periods.

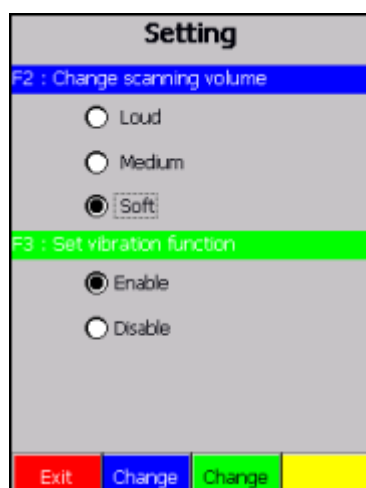
Maximum scanning period is 10 seconds.

Default available barcode setting is below.

- Code39
- Codabar(NW-7)
- WPC
- UPCE

For confirming high scanning performance, we would like to recommend to set only scanning barcode type.

Setting




This setting will be available in all scanning demonstration except "Challenge scanning speed" demo. This demo is set vibration function is off for keeping high performance.

4.14 Laser Scanner Read

After scanning a bar code by the integrated Laser Scanner, a result of the scanning is output. The output method for the scanning result is defined by the settings made in “Laser Setting”.

Operation Procedures

2. Start up laser scanning. The  icon appeared in the Taskbar indicates that the scanning application is being started up.
3. Start up an application that receives a result of scanning bar code.
4. Scanning a bar code will take place when Trigger key is pressed.
5. The scanning will end when the Trigger key is released or when the preset time elapses. The scanning result is output to the application.

Notes:

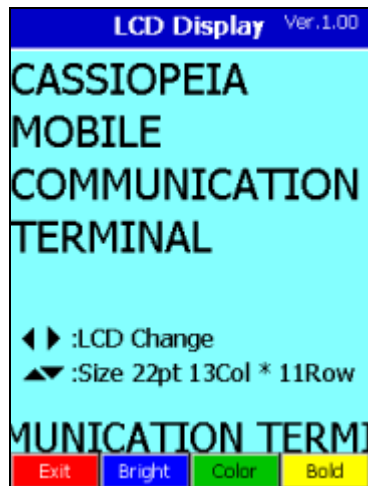
- To exit the laser scanning application, click the icon in the Taskbar and then choose **Exit** menu.
- The clipboard output method copies data of scanning bar code into the clipboard by pasting it (by executing the keyboard event (Ctrl and v keys)). Therefore, data of scanning cannot be output to application that does not support the paste operation (the keyboard event (Ctrl and v keys)).
- The laser scanning application cannot run simultaneously with other application that occupies the integrated Laser Scanner.

4.15 LCD Display

This application is display some different pattern LCD Display.

Execute file is located the following folder.

\\Program Files\\CASIO\\DEMO\\LCDDemo.exe



4.16 Buzzer / Vibration

This application is sound some different pattern buzzer and vibration.

Execute file is located the following folder.

\\Program Files\\CASIO\\DEMO\\BuzzerDemo.exe



4.17 E-mail

This application sends and receives electronic mail that supports the POP3 or IMAP4.

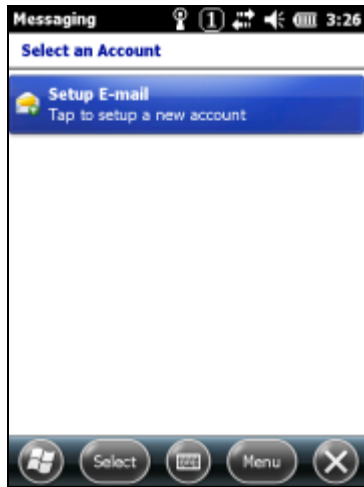


Figure 4-22

To set up a new account, see “**Setting Up e-mail Account**”.

Message List Screen

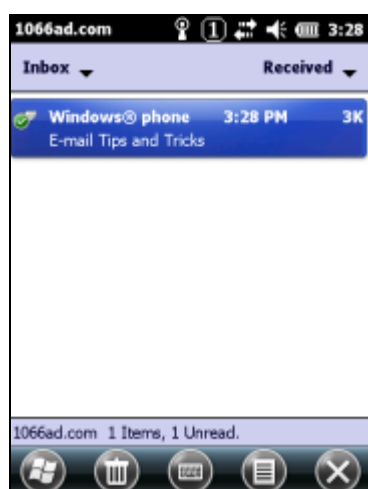


Figure 4-23

Table 4.7 Menus in the Message List Screen

Menu	Description
Delete	Deletes the selected message.
Menu	
New	Creates a new message.
Reply	
Reply	Replies to the selected message.
Reply All	Replies to sender and CC'ed recipients of the selected message.
Forward	Forwards the selected message.
Mark as Read	Marks the selected message as read.
Move ...	Moves the selected message to other folder.
Go to	
Folders ...	Changes current folder.
Tools	
Sort By	Changes sort order of the message list.
Message Type	Displays message list sorted by message type.
From	Displays message list sorted by sender's address.
Received	Displays message list sorted by received date.
Subject	Displays message list sorted by subject.
Manage Folders ...	Creates or modifies folders.
Empty Deleted Items	Empties the Deleted Items folder.
Clear	Deletes all messages in Inbox.
New Account ...	Creates new account.
Options ...	Sets up options for security, etc.
Select Message	
All	Selects all messages.
All Below	
Several	Selects several messages.
Send/Receive	Sends and receives messages.

Viewing Screen

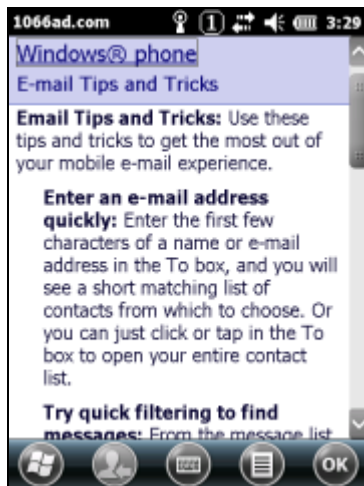


Figure 4-24

Table 4.8 Menus in the Viewing Screen

Menu	Description
Reply	Replies to the message.
Menu	
Delete	Deletes the message.
Reply	
Reply	Replies to the message.
Reply All	Replies to sender and CC'ed recipients of the message.
Forward	Forwards the message.
Mark as Unread	Marks the message as unread.
Move ...	Moves the message to other folder.
View	
Text Size	Changes the text size.
Language	Changes the language.
Download Message	Downloads current message with attachments.
Send/Receive	Sends and receives messages.

Writing Screen

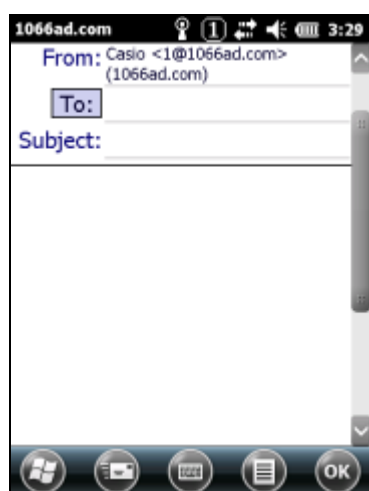


Figure 4-25

Table 4.9 Menus in the Writing Screen

Menu	Description
Send	Sends the message.
Menu	
Add Recipient ...	Adds another contacts to recipient.
Check Names	Searches for name stored in Contacts.
Insert	
Picture	Inserts a picture into the message as attachment.
Voice Note	Inserts a voice mail into the message as attachment.
File	Inserts a file into the message as attachment.
My Text	Inserts a preset or frequently used phrase.
Save to Draft	Saves the message to Draft folder.
Spell Check	Checks the spelling.
Cancel Message	Cancels the message to Draft folder.
Message Option ...	Sets up options for the message.

Setting Up e-mail Account

To set up an e-mail account, follow the steps below.

1. Navigate to **Setup E-mail** or navigate to **Menu** → **Tool** → **New Account**. The screen shown below appears.



Figure 4-26

2. Enter your **E-mail address** and **Password**.
3. Tap **Next**. The screen shown below appears.

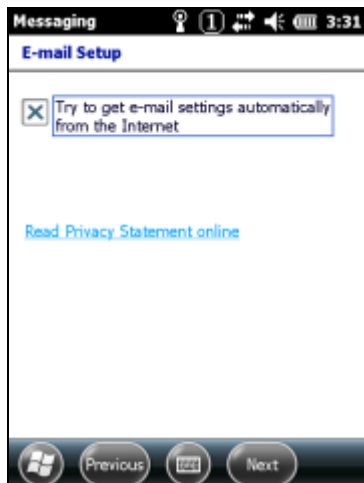


Figure 4-27

4. To allow Auto configuration to connect to the Internet, obtain e-mail server settings (if possible) and enter this information for you, select **Try to get e-mail settings automatically from the Internet** checkbox.
5. Tap **Next**. Auto configuration attempts to download necessary e-mail server settings, so you do not need to enter them manually.

6. When Auto configuration has finished, tap **Next**. The screen shown below appears.

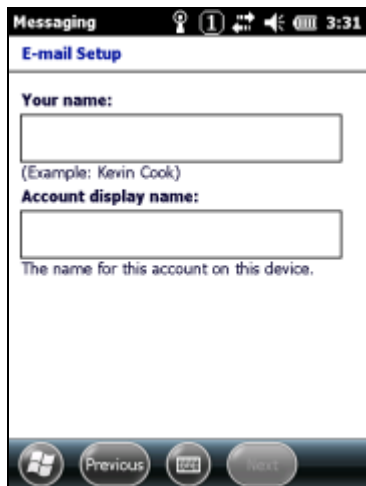


Figure 4-28

7. Enter **Your name** (the name you want displayed when you send e-mail) and **Account display name** that displays in Messaging.
8. Tap **Next**. The screen shown below appears.

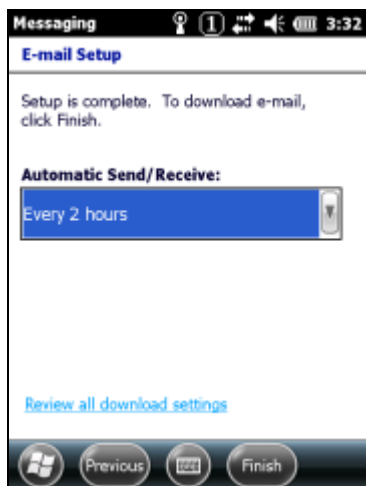


Figure 4-29

9. Select the intervals for downloading new messages from the **Automatic Send/Receive** pull-down menu.
10. Tap **Finish**.

Before tapping **Finish**, you can tap Options to access additional settings. For example:

- Limit the number of messages that are downloaded.

If Auto configuration is unsuccessful or if you have an account you access using a VPN server connection, contact your ISP or network administrator for the following information and enter it manually:

Table 4.10

Setting	Description
User name	Enter the user name assigned to you by your ISP or network administrator. This is often the first part of your e-mail address, which appears before the at sign (@).
Password	You have the option to save your password, so you do not need to enter it each time you connect to your e-mail server.
Domain	Not required for an account with an ISP. May be required for a work account.
Account type	Select POP3 or IMAP4.
Account name	Enter a unique name for the account, such as Work or Home. This name cannot be changed later.
Incoming mail server	Enter the name of your e-mail server (POP3 or IMAP4).
Outgoing mail server	Enter the name of your outgoing e-mail server (SMTP).
Require SSL connection	Select this to ensure you always receive e-mail for this account using an SSL connection. This enables you to receive personal information more securely. Please note that if you select this and your ISP does not support an SSL connection, you will not be able to connect to receive e-mail.
Outgoing mail requires authentication	Select this if your outgoing e-mail server (SMTP) requires authentication. Your user name and password from above will be used.
Use separate settings	Select this if your outgoing e-mail server requires a different user name and password than the ones you entered before.
Outgoing server settings:	
User name	Enter your user name for the outgoing e-mail server.
Password	Enter your password for the outgoing e-mail server.
Domain	Enter the domain of the outgoing e-mail server.
Require SSL for outgoing mail	Select this to ensure you always send e-mail from this account using an SSL connection. This enables you to send personal information more securely. Note that if you select this and your ISP does not support an SSL connection, you will not be able to send e-mail.

4.18 Messenger

You can use Windows Live Messenger on the terminal to chat with friends or co-workers. You must have a Windows Live ID and password to use this service.

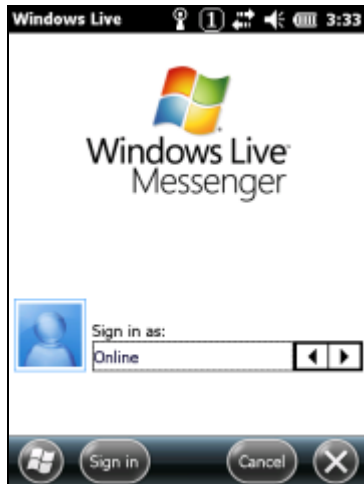


Figure 4-30

4.19 Notes

This application enables you to jot a quick note.

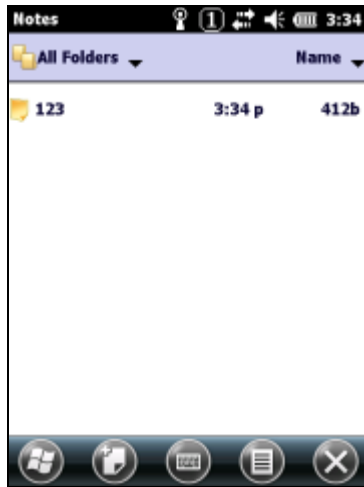


Figure 4-31

To create a new note, tap New.

To edit an existing note, tap the file name.

Table 4.11 Menus in the List view

Menu	Description
New	Creates a new note.
Menu	
View Recording Toolbar	Shows or hides Recording Toolbar.
Rename/Move	Renames or moves the selected notes.
Delete	Deletes the selected notes.
Create Copy	Creates a copy of the selected note.
Select All	Selects all notes in the list.
Send ...	Creates a new e-mail message with the selected note attached.
Beam ...	Sends the selected note via IrDA or Bluetooth.
Options ...	Sets up options for Recording.

Recording Toolbar

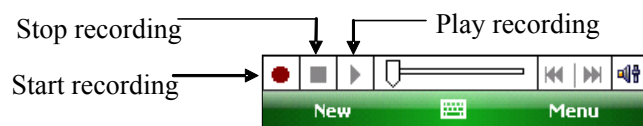


Figure 4-32

To begin recording, tap the Record button.

To end recording, tap the Stop button.

Editing Screen



Figure 4-33

Table 4.12 Menus in the Editing Screen

Menu	Description
New	Creates a new note.
Menu	
View Recording Toolbar	Shows or hides Recording Toolbar.
Draw	Turns Draw mode on or off.
Undo	Undoes the last action.
Redo	Redoes the last Undo command.
Cut	Cuts the selected items in the current note.
Copy	Copies the selected items in the current note.
Paste	Pastes the items that are cut or copied.
Edit	
Clear	Deletes the selected items in the current note.
Select All	Selects all items in the current note.
Zoom	Changes the display size.
Tools	
Rename/Move	Renames or Moves the current note.
Delete	Deletes the current note.
Send ...	Creates a new e-mail message with the current note attached.
Beam ...	Sends the current note via IrDA or Bluetooth.

4.20 Pictures & Videos

Viewing Screen



Figure 4-34

To edit the picture, navigate to **Menu** → **Edit**.

Table 4.13 Menus in the Viewing Screen

Menu	Description
Send	Creates a new e-mail message with the picture attached.
Menu	
Zoom	Opens the sub window for zooming the picture.
Play Slide Show	Plays pictures as slide show.
Set as Today Background ...	Sets current picture as a Today's wallpaper.
Beam Picture	Sends current file via IrDA or Bluetooth.
Save	
Save to Contacts ...	Attaches current picture to the Contact item.
Save As ...	Saves the picture with new name.
Edit	Switches to the Editing Screen.
Properties	Displays the property of current file.
Options ...	Sets up options for rotation, etc.
Send to your space	Sends current file to your Windows Live space.

Editing Screen

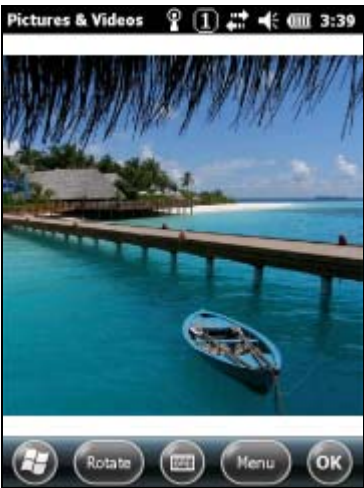


Figure 4-35

Table 4.14 Menus in the Editing Screen

Menu		Description
Rotate		Flips the picture 90 degree.
Menu		
Crop		Crops the picture by drawing a box.
Auto Correct		Adjusts the brightness and contrast levels of the picture.
Undo		Undoes the last action.
Revert to Saved		Reloads the last version of the image from the file.
Save As ...		Saves the picture with new name.

4.21 Remote Desktop Mobile

This application is the RDP6.0 based remote desktop client.



Figure 4-36

The following is the procedure.

1. Perform the following.
 - In **Computer**, enter the name of the computer to which you want to connect.
 - Enter your **User name** and **Password**.
 - Enter **Domain**, if required.
 - Select **Save password**.
2. Tap **Connect**.

To improve display performance for Remote Desktop Mobile, tap **Options** to select optimum parameters.

4.22 Search Phone

The application can search for files and other items stored in the terminal in the My Documents folder or in a storage card.

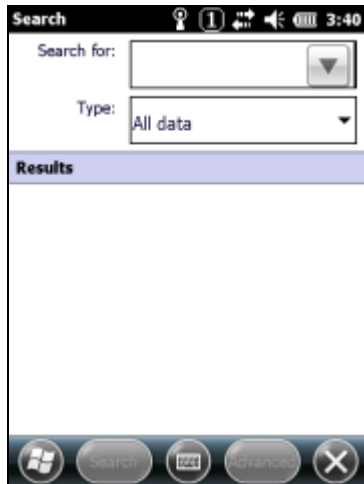


Figure 4-37

To search for a file or an item, follow the steps below.

1. Enter the file name, word, or other information you want to **Search for** field.
2. In **Type** pull-down menu, select a data type to help narrow your search.
3. Tap **Search**.

4.23 Tasks

This application lets you keep track of jobs and tasks you need to do.

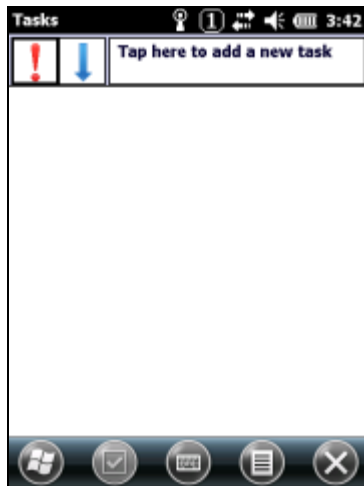


Figure 4-38

To create a new Appointment, tap **Tap here to add a new task** or navigate to **Menu → New Task**.

Table 4.15 Menus in the application

Menu	Description
Complete	Marks the selected Task as completed.
Menu	
New Task	Creates a new Task.
Beam Task ...	Sends the selected Task via IrDA or Bluetooth.
Delete Task	Deletes the selected Task.
Edit	
Cut	Cuts the selected Task.
Copy	Copies the selected Task.
Paste	Pastes Task that are cut or copied.
Options ...	Sets up options for Task.
Sort By	
Status	Displays Task list sorted by Status.
Priority	Displays Task list sorted by Priority.
Subject	Displays Task list sorted by Subject.
Start Date	Displays Task list sorted by Start Date.
Due Date	Displays Task list sorted by Due Date.
Filter	
All Tasks	Displays all Tasks.
Recently viewed	Displays Tasks you have recently added, edited, or viewed.
No Categories	Displays all Tasks with no category.
Active Tasks	Displays all Tasks with a start date before and on the current date.
Completed Tasks	Displays all Tasks marked completed.

4.24 Windows Live

You can use Windows Live on the terminal to find information on the web. You must have a Windows Live ID and password to use this service.

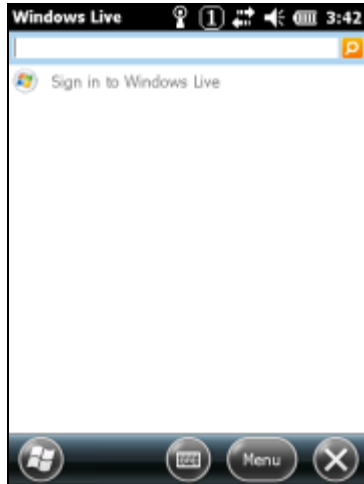


Figure 4-39

4.25 Windows Media

The terminal includes Windows Media Player Mobile, a program that plays music and videos. It can play media files that are stored on the terminal as well as songs and videos that you stream from the Internet.

The media player also plays streaming TV, if this service is available from your provider.

Windows Media Player Mobile also helps you organize your media files. After you save media files to your terminal, you can create playlists of both music and video files.

Windows Media Player Mobile gives you access to the following folders:

- My Music, which holds sound files downloaded to your terminal, and any files that you add.
- My Videos, which holds video files downloaded to your terminal, and any files that you add.
- My TV, which holds television programs downloaded to your terminal.
- My Playlists, which holds the playlists that you create.

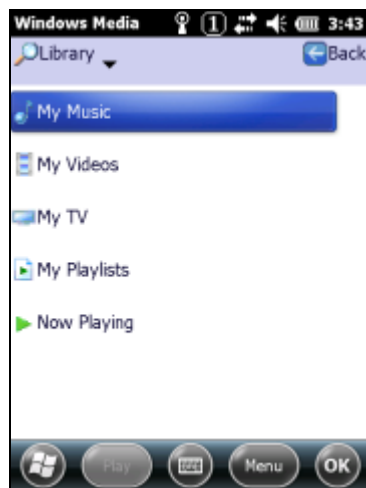


Figure 4-40

Table 4.16 Menus in the Library view

Menu	Description
Play	Plays the selected file.
Menu	
Queue Up	Adds the selected file to the playlist.
Delete from Library	Deletes the selected file from Library.
Now Playing	Switches to Now Playing Screen.
Library	Changes to another library.
Update Library ...	Updates the library manually.
Open File ...	Plays music or video stored in the terminal.
Open URL ...	Plays music or video stored on the Internet.
Properties	Displays the property of the selected file.

Playing Screen



Figure 4-41

Table 4.17 Menus in the Play Screen

Menu	Description
Now Playing	Switches to Now Playing Screen.
Menu	
Library	Switches to Library view.
Play/Pause	Starts or pauses the playing of a file.
Stop	Ends the playing of a file.
Shuffle/Repeat	
Shuffle	Plays the playlist randomly.
Repeat	Plays the playlist repeatedly.
Full Screen	Hides the main menu, toolbar, etc.
Options ...	Sets up options for playing.
Properties	Displays the property of the current file.
About	Displays version information.

Now Playing Screen

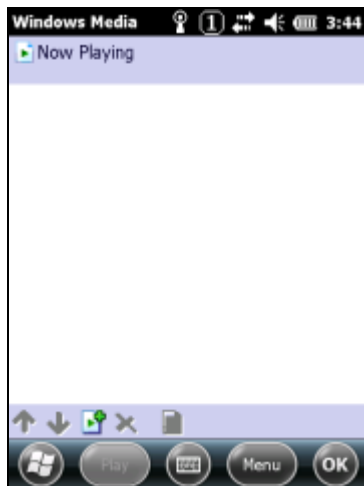


Figure 4-42

Table 4.18 Menus in the Now Playing Screen

Menu	Description
Play	Plays the selected file.
Menu	
Library	Switches to Library view.
Move Up	Moves the selected file up in the playlist.
Move Down	Moves the selected file down in the playlist.
Remove from Playlist	Removes the selected file from the playlist.
Shuffle/Repeat	
Shuffle	Plays the playlist randomly.
Repeat	Plays the playlist repeatedly.
Save Playlist	Saves the playlist.
Clear Now Playing	Removes all items from the playlist.
Error Details	Displays detail error message.
Properties	Displays the property of the selected file.

4.26 WLAN Barcode Setting

This is tool for WLAN setting by using barcode scanning operation.

Before using this tool, you need to prepare barcode sheet which is set WLAN setting.

(About more detail of this tool, please refer help of WLAN barcode print tool.)

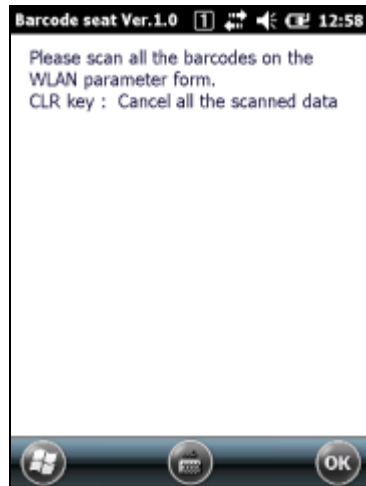


Figure 4-43

4.27 System Barcode Setting

This is tool for System setting by using barcode scanning operation.

Before using this tool, you need to prepare barcode sheet which is set System setting.

(About more detail of this tool, please refer help of System barcode print tool.)

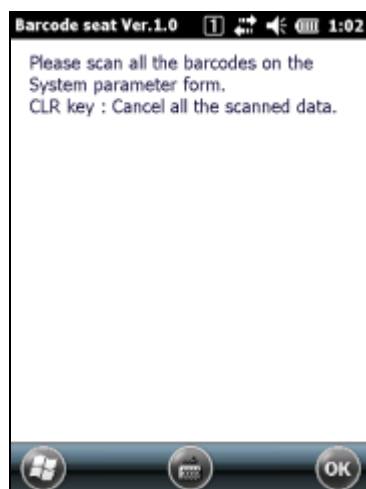


Figure 4-44

4.28 System Settings

This is tool for the following System setting together.

- System
- Power Saving 1(CPU speed)
- Power Saving 2(Battery Power (Suspend time))
- Power Saving 3(Battery Power (Brightness))
- Power Saving 4(AC Power (Suspend time))
- Power Saving 5(AC Power (Brightness))
- Volume
- Sounds
- Buzzer
- Vibrator
- Keyboard
- Connections

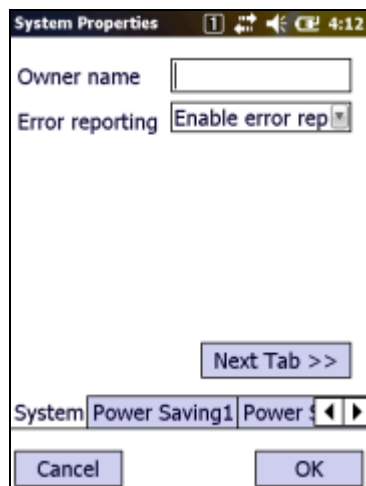


Figure 4-45.

4.29 Mobile Module Updater

This is tool for update module.

(For more detail, please refer Mobile Module Updater manual.)

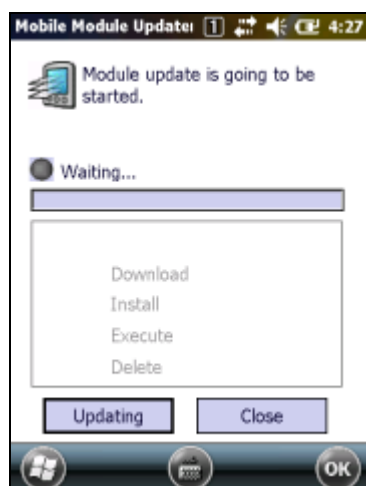


Figure 4-46

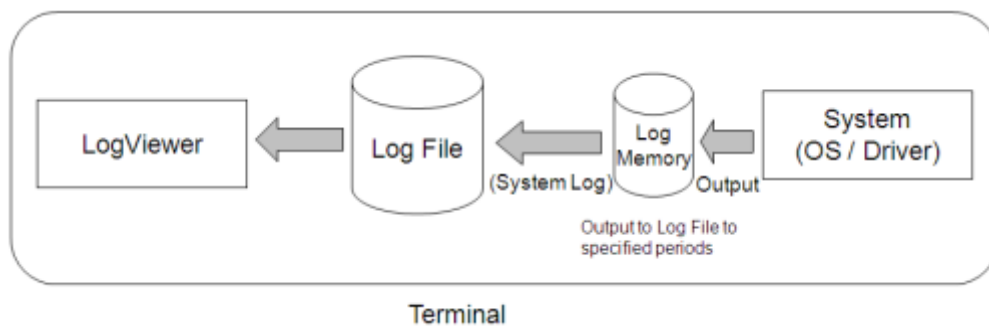
4.30 LogViewer

Overview

The Logging Tool is a tool that the SE uses to analyze causes when a fault occurs. It can be used to view the following logs on the terminal.

- System logs
These are logs output by the OS and drivers.

The logs are stored in the log file. They can be viewed using the terminal log viewer. At regular intervals (180 seconds), system logs collect logs that the system outputs to log memory and output them to the log file.



Output log information

The output log information is tabulated below.

No.	Item	Contents	System logs	Execution logs
1	Date and time generated	Date and time of log output	<input type="radio"/>	<input type="radio"/>
2	Host name	Host name	<input type="radio"/>	<input type="radio"/>
3	User name	In system logs, this is the name of the terminal owner.	<input type="radio"/>	<input type="radio"/>
4	Device ID	The device ID for the terminal	<input type="radio"/>	<input type="radio"/>
5	Models	The terminal model No.	<input type="radio"/>	<input type="radio"/>
6	Build No.	The build No. of the terminal OS	<input type="radio"/>	<input type="radio"/>
7	Service pack	The Version No. of the service pack	<input type="radio"/>	<input type="radio"/>
8	Execution source	In system logs, this is the name of the output source process.	<input type="radio"/>	<input type="radio"/>
9	Process name	In system logs, this differentiates between OS, drivers and boot.	<input type="radio"/>	<input type="radio"/>
10	Log attribute	This differentiates between information, error and warning.	<input type="radio"/>	<input type="radio"/>
11	Message	Output message	<input type="radio"/>	<input type="radio"/>
12	Other terminal status	Status of each power supply type Power supply status CPU clock	<input type="radio"/>	
13	Terminal name	Name of log output source terminal		<input type="radio"/>
14	Version No.	The version No. of the execution source		<input type="radio"/>
15	Event type	This differentiates between start, progress and exit.		<input type="radio"/>
16	Process ID	This is the ID of the process that output the log.		<input type="radio"/>
17	Group ID	The parent ID of the process ID		<input type="radio"/>
18	User identifier text	An identification text string defined by the user		<input type="radio"/>
19	User-defined value	Flag information set by the user		<input type="radio"/>

System Log Collection

System log collection is the function that collects logs that the system outputs to log memory, at regular intervals.

Start

Under the initial settings, a shortcut for System Log Collection (MoLogSys.exe) is registered in the Startup group (Log.lnk). It starts when the terminal is reset.

Stop

Run \Windows\MoLogStop.exe to stop system log collection.
Stop logging before using the backup tool to backup data.

Terminal Log Viewer

The Terminal Log Viewer has the following functions.

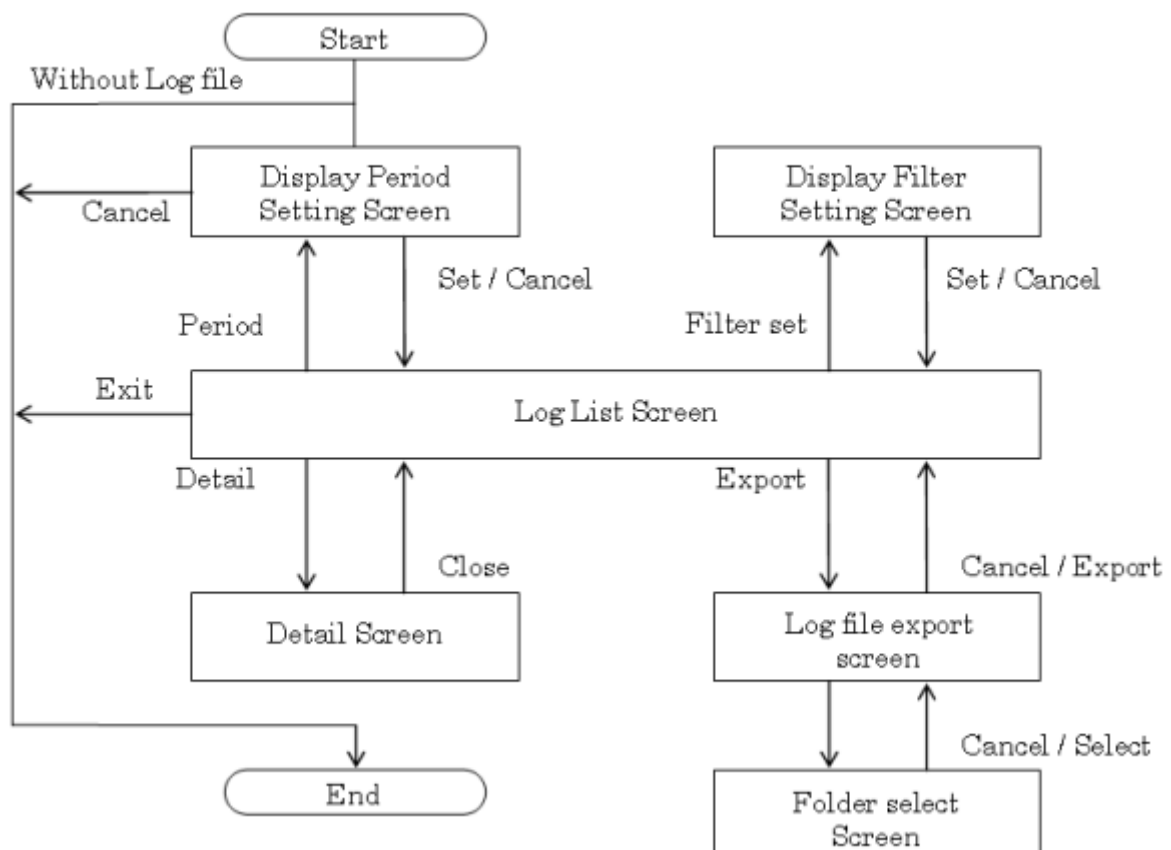
Functions	Overview
Subject range specification	Specify the time range for which to display logging files.
Display condition specification	Specify the range, in terms of other conditions, for which to display logging files.
List display	A summary of all logs subject to display is listed.
Details display	Detailed information is displayed for the log selected in the list display.
Export	Move or copy log files on the terminal into the specified folder.

Procedure

Start the terminal Log Viewer from Programs - Utilities - Terminal Log Viewer.

Screen transitions

The screen transitions are as follows:



Displayed logs

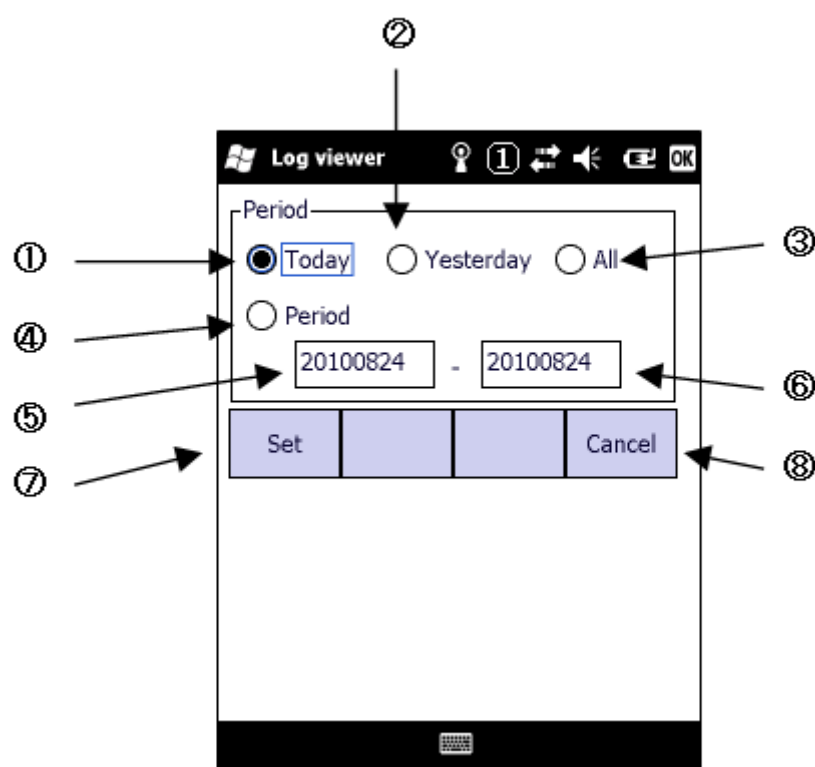
The following logs are displayed on each screen.

No.	Item	Display condition setting	List	Details	Remarks
1	Date generated	—	△	○	*
2	Time generated	—	○	○	
3	Process ID				
4	Group ID				
5	Event type	○	○	○	
6	Host name				
7	Terminal name				
8	User name	○		○	
9	Execution source	○		○	
10	Process name	○	○	○	
11	Version No.			○	
12	Message		△	○	*
13	Log attribute		○	○	
14	Log type	○	△		
15	Device ID				
16	Models				
17	Build No.				
18	Service pack				
19	User identifier text	○		○	
20	User-defined value 1			○	
21	User-defined value 2			○	
22	User-defined value 3			○	

* Only the log selected on the List screen is displayed.

Display Range Settings screen

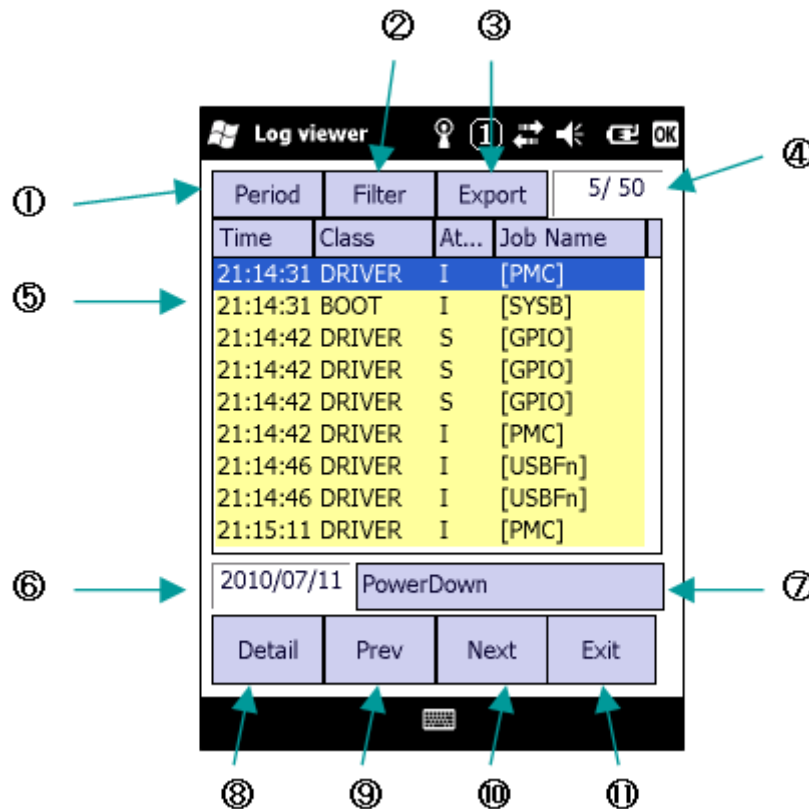
Use the Display Range Settings screen to specify the range of logs on the terminal to be loaded.



No.	Item	Contents
1	Today	Only display today' s logs.
2	Yesterday	Only display yesterday' s logs.
3	All	Display all logs on the terminal.
4	Period	Specify the period for display.
5	Start date	This applies to period specification. Specify the start date of the period in the format YYYYMMDD.
6	End date	This applies to period specification. Specify the end date of the period in the format YYYYMMDD.
7	Set	Enable setting content and display the list screen.
8	Cancel	Discard the settings and, if this is the startup screen, terminate the command. If this is displayed from the List screen, go back to that screen.

List screen

The List screen displays logs in a list format.



No.	Item	Contents
1	Period	Display the Display Range Settings screen and reload logs according to the conditions if the settings have changed.
2	Filter	Display the Display Conditions Settings screen and reload logs according to the specified conditions if the condition settings have changed.*
3	Export	Display the Log File Output screen.
4	Page display	Indicates the currently-displayed page and the total number of pages.
5	List	Display a list of logs matching the specified range or conditions The list is displayed in page units, with one page being the range that can be displayed on one page.
6	Date and time generated	The date and time when the log selected in the list was generated are displayed.
7	Message	Any message concerning the log selected in the list is displayed.
8	Details	Opens a details screen for the log selected in the list.
9	Previous	This is enabled if the list extends to multiple pages and the second or later page is currently displayed. It displays the previous page.
10	Next	This is enabled if the list extends to multiple pages and the page currently displayed is not the last. It displays the next page.
11	Exit	Close the List Display screen and terminate the command.

* The text on the buttons varies as shown below, depending on whether or not there are set

conditions.

No set conditions: "Filter"

Conditions have been set: "Change"

The display specification for the list area is as shown below.

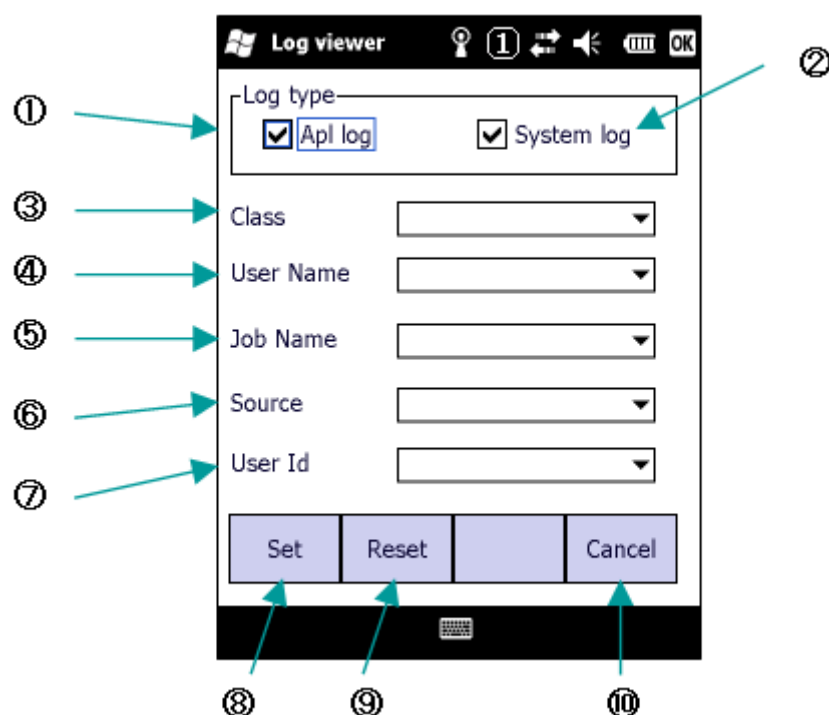
① Time	② Class	③ At...	④ Job Name
03:58:36	DRIVER	I	[PMC]
03:58:37	BOOT	I	[SYSB]
03:58:48	DRIVER	S	[GPIO]

⑥ points to the first time value (03:58:36).
⑦ points to the first class value (DRIVER).
⑧ points to the first attribute value (I).
⑨ points to the first job name value ([PMC]).

No.	Item	Contents
1	Time header	Sort the displayed logs by date and time generated, in ascending or descending order.
2	Class header	Sort the displayed logs by Class, in ascending or descending order.
3	Attribute header	Sort the displayed logs by attribute, in ascending or descending order.
4	Job name header	Sort the displayed logs by process name, in ascending or descending order.
5	Item area background color	Change the background colors used for the types of displayed logs. System logs : Yellow Execution logs : White
6	Time	The times the displayed logs were generated are displayed in the format HH:MM:SS. Double click on this item to display the Details screen.
7	Class	Indicates the types of logs on display clearly, with text and color. System logs are indicated as either "OS", "Driver" or "Boot". Execution logs are indicated as either "Information", "Start", "Normal termination", "Abnormal termination", "Progress" or "Other (value displayed)".
8	Attribute	The log attributes of the logs on display are clearly indicated by colors. One of the following is displayed: "I" : Information "W" : Warning "E" : Error "S" : Monitoring successful "F" : Monitoring failed
9	Job name	Indicates the Job name for the displayed log.

Display Condition Settings screen

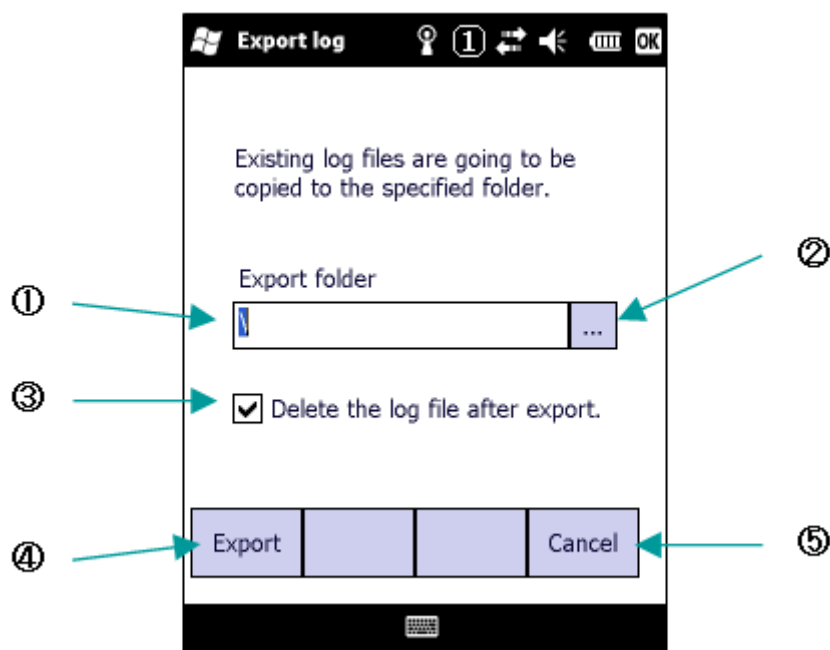
Use the Display Condition Settings screen to specify which of the loaded logs to display.



No.	Item	Contents
1	Apl log	Not used
2	System logs	Specify display of system logs. On: Display Off: Do not display
3	Event Class	Specify event type conditions. Blank : Do not use as a condition Other : Extract according to the specified value
4	User name	Specify user name condition. Blank : Do not use as a condition Other : Extract according to the specified value
5	Job Name	Specify process name condition. Blank : Do not use as a condition Other : Extract according to the specified value
6	Execution source	Specify execution source condition. Blank : Do not use as a condition Other : Extract according to the specified value
7	User identifier	Specify user identifier condition. Blank : Do not use as a condition Other : Extract according to the specified value
8	Set	Set the specified content and go back to the list screen.
9	Reset	Cancel the set conditions and go back to the list screen.
10	Cancel	Discard the set content and go back to the list screen.

Log File Export screen

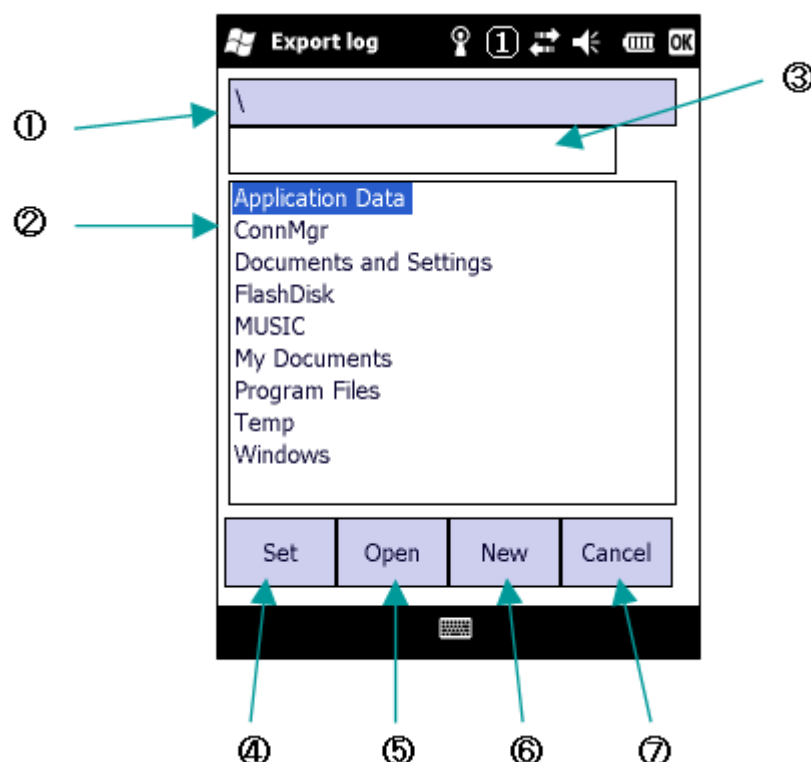
Use the Log File Output screen to move or copy log files to the specified folder.



No.	Item	Contents
1	Export destination folder	Specify the destination folder for copying or moving logs.
2	Folder Selection button	Display the Folder Selection screen and set the selection result as the output destination folder.
3	Delete check box	This is only enabled during offline operation. Check to move logs.
4	Export	Execute copying or movement.
5	Cancel	Close this screen with no further action.

Folder Selection screen

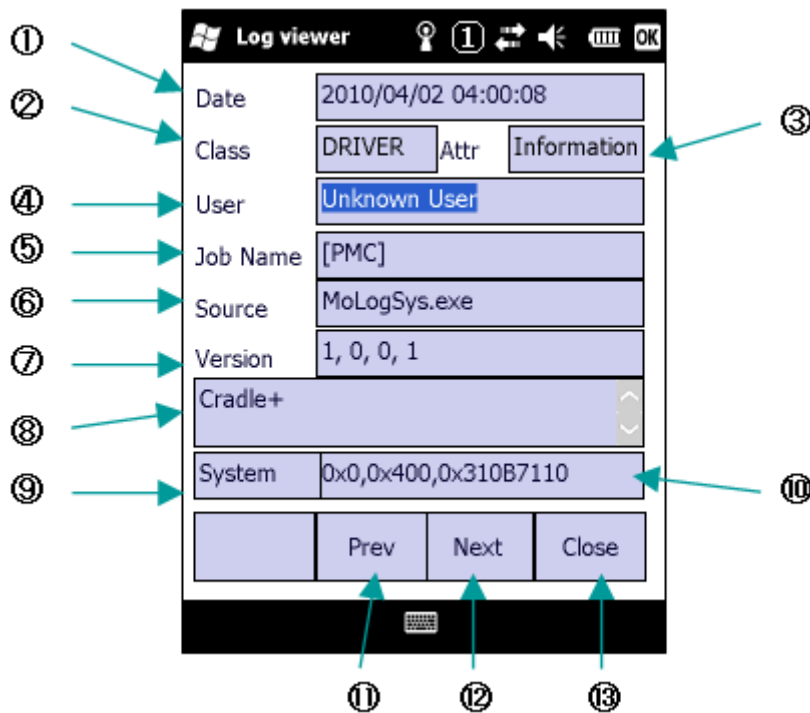
Use the Folder Selection screen to select the folder from which to copy or move log files.



No.	Item	Contents
1	Selected path	Displays the path to the currently-displayed folder.
2	Folder list	Displays items for moving to higher-level folders and a list of folders existing at the current path. Double click on an item to move to the selected folder.
3	Input new folder	This is the input field for creating a new folder.
4	Set button	This enables the currently displayed and selected path and goes back.
5	Open button	This moves to the location selected on the folder list.
6	New button	This enables the Input New Folder area.
7	Cancel button	This discards the current settings.

Details screen

Opens a details screen for the the log selected in the list, and displays detailed information.



No.	Item	Contents
1	Date and time generated	Displays the generation time of the displayed log, in the format YYYY/MM/DD HH:MM:SS.
2	Event Class	Displays the event class of the logs on display clearly, in color and text. System logs are indicated as either "OS", "Driver" or "Boot". Execution logs are indicated as either "Information", "Start", "Normal termination", "Abnormal termination", "Progress" or "Other (value displayed)".
3	Attribute	Displays the attributes of the logs on display clearly, in color and text. One of the following is displayed: "I" : Information "W" : Warning "E" : Error "S" : Monitoring successful "F" : Monitoring failed Others Display values as they stand
4	User name	Display the user name for the displayed log.
5	Job Name	Displays the process name for the displayed log.
6	Execution source	Displays the execution source for the displayed log.

7	Version	Displays the version of the displayed log.
8	Message	Displays messages for the displayed log.
9	User identifier	Displays the user identifier for the displayed log, if one has been set.
10	User-defined Data	If there is any user-defined data for the displayed log, it is displayed with commas as separators.
11	Previous	Displays the previous log on the List screen.
12	Next	Displays the next log on the List screen.
13	Close	Closes this screen and displays the List screen.

Log Files

There are two types of log files:

- Output files
The output file for the current log
The storage folder is \FlashDisk\Molog (initial setting).
If the specified capacity (initial setting is 40KB) is exceeded, the next setting is the backup file.
- Backup file
This is the file to move data to if the specified capacity of the output file is exceeded.
The storage folder is \FlashDisk\Molog\Backup (initial setting).
If the total of the file sizes in the storage folder exceeds the specified capacity (initial setting is 120KB), log files are deleted, starting with the oldest.

Log Files have the following file names.

Item	Contents
Name	MoLog<YYYY><MM><DD>_<NNN>. csv*

※ <YYYY><MM><DD> is the date the file was generated.

<NNN> is a serial number (three digits, decimal) used in the event that multiple logs exist on the same day. It is a numerical string starting from "001". The number of files on the same date is limited to 999.

Customization

Terminal operation settings file

To customize, create the ini file below and reboot the terminal.

Item	Contents
Placement location	\FlashDisk\System Settings
File name	MoLog. ini

No.	Name	Contents	Default
1	Logging section		
2	Mode	Collection operation 0=Not processed 1=Offline	1
3	FileLimitSize	File size (bytes)	40KB
4	LogCapacity	File size waiting for processing (bytes)	120KB
5	LogFolder	Log file output destination folder	\FlashDisk\Molog
6	SendFolder	Folder for storing files awaiting processing	\FlashDisk\Molog\Backup
7	SysLogInterval	The system log collection interval (s) *	180

* This is enabled for models which allow system log collection. Logs will not be collected if "0" is specified.

4.31 Auto rescue tool

This tool is for saving data from out of order terminal by hardware reason.

Release function

This tool can be created data backup file from out of order terminal.

(except can not power on terminal)

Copy this tool's file to correct location into microSD card, then backup file will be created in this microSD inside by starting this tool.

Module configuration

The following file will be located into microSD card.

Module name	Detail
CE\ARM\AutoRun.exe	Application
CE\ARM\Setup.exe	Application

Start method

Case of power ON condition terminal, this tool will be started automatically by inserting microSD card.

Case of power OFF condition terminal, this tool will be started automatically by reset operation.

Exit method

When this tool is succeed, all color LED (except red color) will be change to turned on and also notice by vibration (10 times /100msec period).

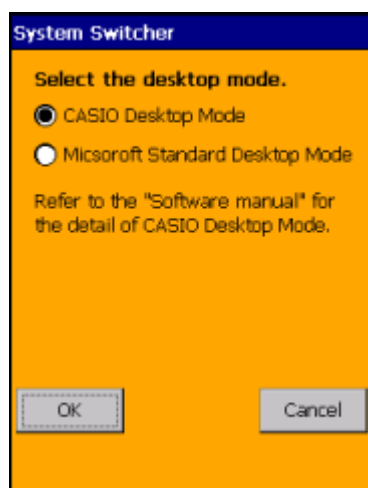
When this tool is failed, red color LED will be blinking and notice by vibration (10 seconds).

Note : backup available data is related with backup tool.

4.32 System Switcher

You can select desktop mode from the following type by using this tool.

- CASIO Desktop Mode
- Microsoft Standard Desktop Mode



Start Methods:

After starting IT-300, Press Fn + MENU key, then this tool will be started.

Notes:

When you change this CASIO Desktop Mode, this condition will be keep until execute full reset or user disk clear operation, therefore please use this tool with careful.

About different between "CASIO Desktop Mode" and "Microsoft Standard Desktop Mode"

"CASIO Desktop Mode" release the following specification and support operation environment.

- Hide Desktop
- Hierarchical application launcher
- Gesture scroll
- Call launcher by MENU key
- Display running application list / Call selected one
- All exit running application
- Relation between business information
- Waiting WLAN connection
- Virtual OFF operation
- Auto reset
- Relation module update

For more detail, please refer "Active Menu User's Manual".

"Microsoft Standard Desktop Mode" is used Microsoft Today screen.

Microsoft Standard Desktop Mode



CASIO Desktop Mode



4.33 Document Viewer

This tool can display Microsoft Word, Excel, PowerPoint and Adobe PDF type file.

Supported files

File type	Extension
PDF Ver1.3 – 1.7 format	.pdf
Microsoft Word 97-2003/2007 format	.doc, .docx
Microsoft Excel 97-2003/2007 format	.xls, .xlsx
Microsoft PowerPoint 97-2003/2007 format	.ppt, .pptx
Text	.txt
Image	.gif, .jpg, .bmp, .png

When you click upper type format file from file explorer directly, you can display detail file detail as below.



Operation method by ten key

Ten key	Operation detail
1	Zoom out
2	Rotate 0 or 90
3	Zoom in
4	Previous page
5	Fit to height
6	Next page
7	First page
8	Full screen
9	Last page
0	Fit to width
-	Fit to page

5. Utilities

The utilities listed in the table below are mainly used as a co-process or auxiliary program in user applications.

Table 5.1

Utility	Description	CASIO	MS
FCHKCE	Confirms a result of data upload/download.	Yes	--
Auto Setup	Carries out automatically application at time of reset on the terminal.	Yes	--
SIP	Software Input Panel	Yes	Yes
TextEditor	Rich text editor	Yes	--
CT Client	Measures the WLAN communication status.	Yes	--
DiskClean	Format user disk and initialize RAM as the same status of the factory prior to shipment.	Yes	--

MS; Microsoft

5.1 FCHKCE

This utility checks a result of data upload/download. See the LMWIN Utility manual for detail.

5.2 Auto Setup

This utility automatically sets up a specified application.

Execution Timing

The timing for executing “Auto Setup” is as follows.

When the terminal is reset;

The utility carries out **Setup.exe** in the FlashDisk.

Location of application for automatically starting up with Auto Setup

Location of applications to be automatically set up with this utility is **CEIARM** folder of the FlashDisk.

Customizing in the Registry

Performances of the “Auto Setup” can be automatically customized by changing the parameters in the following registry.

[HKEY_LOCAL_MACHINE\Drivers\CASIO\UTIL]

Table 5.2




Key	Setting Value	Description
FLSETUP	sz: “1”	Carries out Setup.exe for the FlashDisk at a time of reset on the terminal.

Notes:

- Once the registry is deleted, the applicable application does not automatically start up.
- The registry is initialized to its factory setting by performing a full reset on the terminal.
- Since automatic startup of applications with the utility is performed every time when a reset is performed on the terminal, it should be avoided by controlling the automatic startup for each applicable application.

5.3 SIP

When you press "Fn" key and "0" key, Software Input Panel will be displayed.
And when you execute same operation, SIP will be disappeared.

BIG SIP(CASIO)	Standard SIP (Microsoft)
	
(Default setting)	
	
You can change SIP method by press keyboard icon. (keep to press keyboard icon several seconds.)	

5.4 TextEditor

This utility can display and edit text files such as log files and ini files.



Figure 5-1

Table 5.3 Menus in the application

Menu		Description
File		
New		Creates new text.
Open ...		Displays existing document file.
Save		Saves document file by overwritten.
Save As ...		Saves document file with a specified name.
Recent Files		Displays recently displayed document file names.
Version		Displays version information.
Edit		
Undo		Restores the previous operation.
Cut		Cuts document in the selected range.
Copy		Copies document in the selected range.
Paste		Pastes document specified for cut or copy.

5.5 CT Client

This utility performs status checking in the WLAN communication together with PC based server.

Note:

Refer to the “WLAN Survey Tool” manual for detail.

5.6 DSKClean

This utility formats the user disk and initializes RAM to the factory condition, and reloads OS again from OS disk. This procedure is called **User Disk Clean**. See “Reset” for detail.

Starting Up the User Disk Clean

1. Double tap **DSKClean.exe** located under Windows folder. Then screen shown in Figure 5.2 appears. Tap **OK** button to continue the rest of the operation.

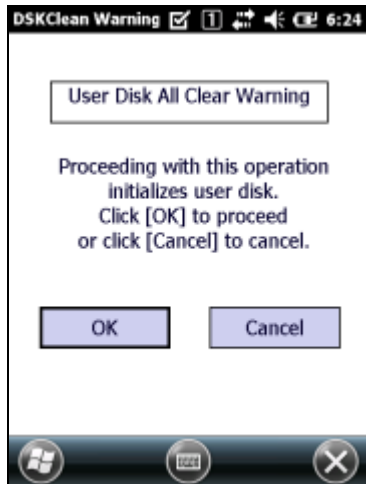


Figure 5-2

2. The screen below appears to confirm the operation. Tap **OK** button to continue.

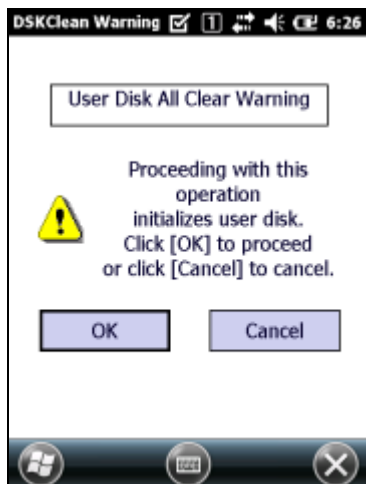


Figure 5-3

3. The screen below appears, and then approximately 5 seconds later formatting the user disk and initializing RAM will automatically start.

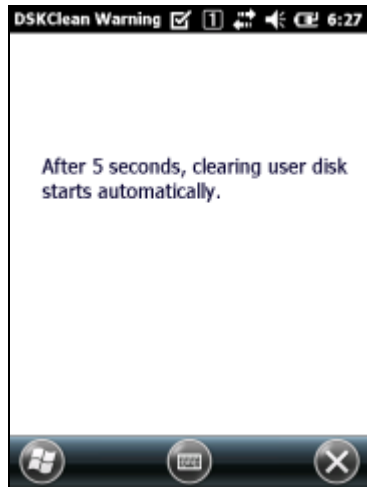


Figure 5-4

4. After formatting the user disk and initializing RAM are complete, the terminal suspends and then automatically reloads the OS from the OS disk.

6. PC Application Programs

The following are applications run on the host PC which is linked to the terminal via cradle.

Table 6.1

Application	Description	CASIO	MS
ActiveSync	Carries out data link with the terminal.	--	Yes
Windows Mobile Device Center	Carries out data link with the terminal.	--	Yes
LMWIN	Carries out data upload/download.	Yes	--
FCHK	Checks and confirms a result data upload/download.	Yes	--

MS; Microsoft.

6.1 ActiveSync

By linking with the ActiveSync client installed in the terminal, this utility makes communication with the terminal possible. It is available from the following site.

<http://www.microsoft.com/windowsmobile/activesync/activesync45.msp>

Note:

Be sure to download the version 4.5 or later of ActiveSync for the operations described in this reference manual.

6.2 Windows Mobile Device Center (WMDC)

The Windows Mobile Device Center (“WMDC”) performs data communication with the terminal. Window Vista users can use the WMDC to connect the terminal to PC (users of Windows XP and all previous operating systems should refer to Chapter 6.1 ActiveSync).

The Windows Mobile Device Center (WMDC) can be downloaded at the URL below.

<http://www.microsoft.com/windowsmobile/devicecenter.msp>

Notes:

- The terminal cannot establish connection via the Windows Mobile Device Center without first modifying its factory settings. In order to establish connection, it is necessary to use the USB connection configuration tool to change the terminal’s settings when connecting the terminal to PC.
- Be sure to use Windows Mobile Device Center 6.1 or later version. An earlier version of the WMDC does not support the IT-300 and other Windows Mobile OS devices.

6.3 LMWIN

This utility interoperates with the FLCE installed in the terminal to perform data upload and download. It is an option available separately. See LMWIN Utility manual for detail.

6.4 FCHK

This utility checks and confirms results of data upload/download. See LMWIN Utility manual for detail.