CipherLab

User Guide

1800Config

For CP50 Series Mobile Computers

DOC Version 1.00

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RELEASE NOTES

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INTRODUCTION

The CipherLab 1800Config is a user-friendly utility for use with CP50 Series Mobile Computers. It is specifically designed for the CP50 users to tweak the settings on CipherLab 1800 Series with a few clicks.

- CipherLab 1800 Series, in compliance with EPC Gen 2 Class 1 UHF standard, is a handheld UHF RFID reader. It is also referred to as an RFID gun for its shape.

- CipherLab 1800 Series is specifically designed to read the Electronic Product Code (EPC) contained in a tag. It can be used as a stand-alone reader, or it can be used with various CipherLab mobile computers, 8/9/CP Series, via Bluetooth.

This user guide covers basics on RFID technology, how to install the CipherLab 1800Config, and finally, how to manage the settings. We recommend that you read the document thoroughly before use and keep it at hand for quick reference.

Thank you for choosing CipherLab products!

RFID BASICS

WHAT IS RFID?

RFID stands for Radio-Frequency IDentification. It is the use of a wireless non-contact system, makes use of radio frequencies to transfer data from a tag, for the purposes of automatic identification and tracking.

Today, Ultra-High Frequency (UHF) RFID is emerging as a premier technology for automating the identification and tracking of commodities and collecting valuable information on their whereabouts, contents, physical state and more.

WHAT IS AN RFID TAG?

An RFID tag contains electronically stored information that can be read from up to several meters away. The tag information, in its simplest format, is a unique 96-bit Electronic Product Code (EPC) that typically contains item information, such as description, type of commodity, and the company that produces the item.

- The tag can be used to track and manage inventory, assets, food, livestock and other animals, etc.
- The tag can be affixed to an object and be read if passed near a reader, whether it is visible or not. It can be read even if it is covered by another object, such as a case, box, carton or container.

COMPARE RFID TAGS AND BARCODES

RFID tags are an improvement over barcodes because...

- Tags can be read and written. Data stored on RFID tags can be changed, updated and locked.
- Tags can be read hundreds at a time, while barcodes can only be read one at a time.
- Tags, whether visible or not, can be read within range of a reader, while barcodes need to be within line of sight of a reader.

WHAT IS EPC?

The Electronic Product Code (EPC) is a universal identifier that provides a unique identity for a physical object. It is designed to facilitate business processes and applications that need to track all categories of physical objects.

EPC DATA STRUCTURE

The EPC is a string of numbers and letters, usually consisting of a header and three sets of data partitions (or fields).

- The header of EPC identifies which coding scheme is used.
- The "EPC Filter Value" makes it easier to read desired tags in an environment where there may be other tags present, such as reading a pallet tag in the presence of a large number of item-level tags. The available "Filter Values" are different depending on the type of EPC. With certain types of EPCs, no filter value is available at all, such as GID.

  For more details on the EPC Filter Value, please refer to EPCGlobal specification. (http://www.gs1.org/gsmp/kc/epcglobal/tds/tds_1_1_rev_1_27-standard-20050510.pdf).
- Each EPC coding scheme has its own set of valid fields.

Header	EPC Filter Value	Field #1	Field #2	Field #3
SGTIN	See Filter.	Company Prefix	Item Reference	Serial Number
SSCC	See Filter.	Company Prefix	Serial Reference	Unallocated
SGLN	See Filter.	Company Prefix	Location Reference	Extension Component
GRAI	See Filter.	Company Prefix	Asset Type	Serial Number
GIAI	See Filter.	Company Prefix	Individual Asset Reference	N/A
GSRN	See Filter.	Company Prefix	Extension / Serial Reference	Reserved
GDTI	See Filter.	Company Prefix	Document Type	Serial
GID	N/A	General Manager Number	Object Class	Serial Number
DoD	See Filter.	Government Managed Identifier	N/A	Serial Number
ADI	See Filter.	CAGE / DoDAAC	Part Number	Serial Number

EPC CODING SCHEME

There are fifteen different coding schemes supported, as listed in the table below.

EPC Scheme	Tag Encodings	Typical Use
Serialized Global Trade Item Number (SGTIN)	SGTIN-96 SGTIN-198	Trade item
Serialized Shipping Container Code (SSCC)	SSCC-96	Pallet load or other logistics unit load
Global Location Number With or Without Extension (SGLN)	SGLN-96 SGLN-195	Location
Global Returnable Asset Identifier (GRAI)	GRAI-96 GRAI-170	Returnable/reusable asset
Global Individual Asset Identifier (GIAI)	GIAI-96 GIAI-202	Fixed asset
Global Service Relation Number (GSRN)	GSRN-96	Service relation (e.g., loyalty card)
Global Document Type Identifier (GDTI)	GDTI-96 GDTI-113	Document
General Identifier (GID)	GID-96	Unspecified
US Department of Defense Identifier (DoD)	USDOD-96	US Dept. of Defense supply chain
Aerospace and Defense Identifier (ADI)	ADI-var	Aerospace and defense - aircraft and other parts and items

EPC FILTERING

Except for making use of the filter value, you may filter tags based on the values of the fields of the tag's EPC encoding. Let's take SGTIN for example.

- Field #1 identifies the manufacturer.
- Field #2 identifies the product type (stock keeping unit or SKU).
- Field #3 is the serial number unique to the item.

You may use the first field Company Prefix to search for items which are produced by a particular company, or use the second field Item Reference to search for items which are classified under a specific product code. See EPC filter settings.

Header	EPC filter value	Field #1	Field #2	Field #3
E.g. SGTIN-96	See Filter.	Company Prefix	Item Reference	Serial Number

Chapter 1

INSTALLATION

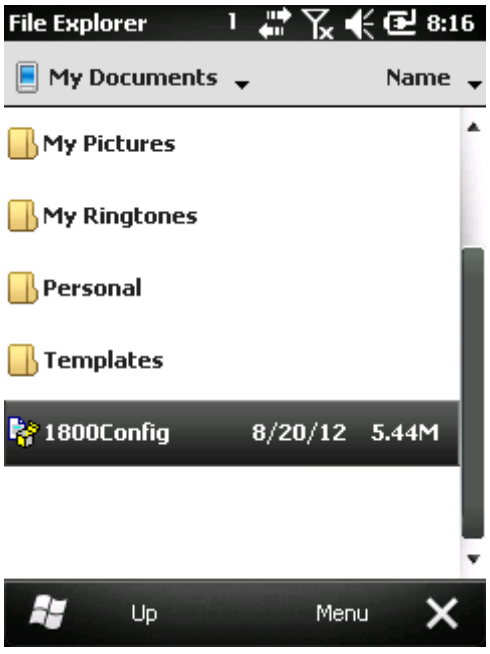
1.1 INSTALLING THE 1800CONFIG

Follow the steps below to install the 1800Config utility to the mobile computer.

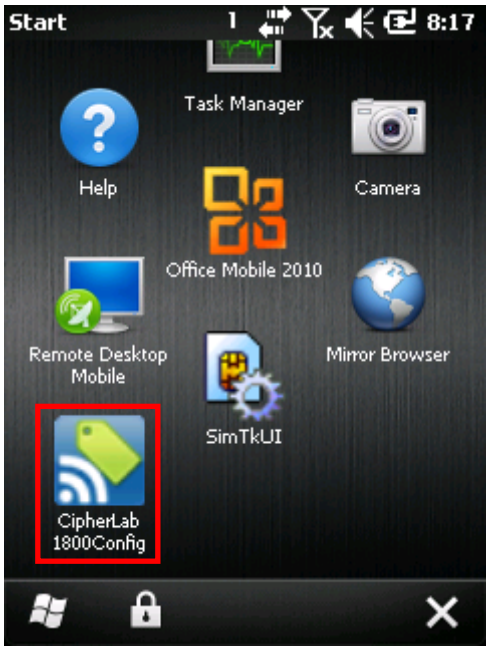
1) Connect the mobile computer to PC via the USB cable.

2) Copy the 1800Config.CAB file from PC to the mobile computer via ActiveSync (Win XP) or Windows Mobile Device Center (Win 7).

3) Tap on the 1800Config.CAB file to run the installation. See left below.

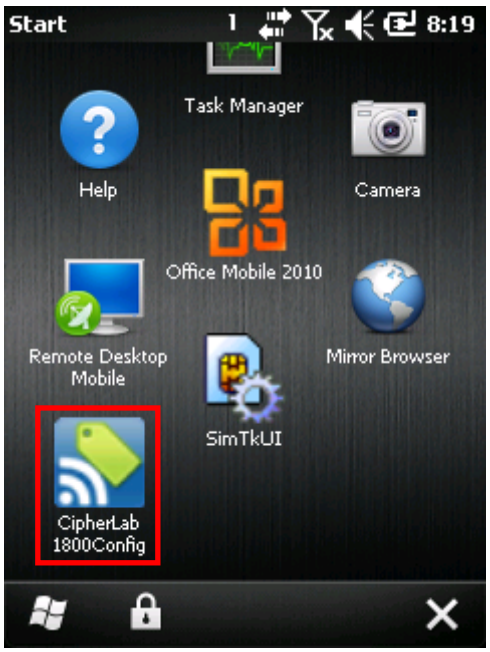


4) The program shortcut appears in the **Start Menu**.



1.2 RUNNING THE 1800CONFIG

1) Tap on the program shortcut in the **Start Menu**.



2) The main screen appears.

Note: If there's 1800 device connected, its device information will be displayed.

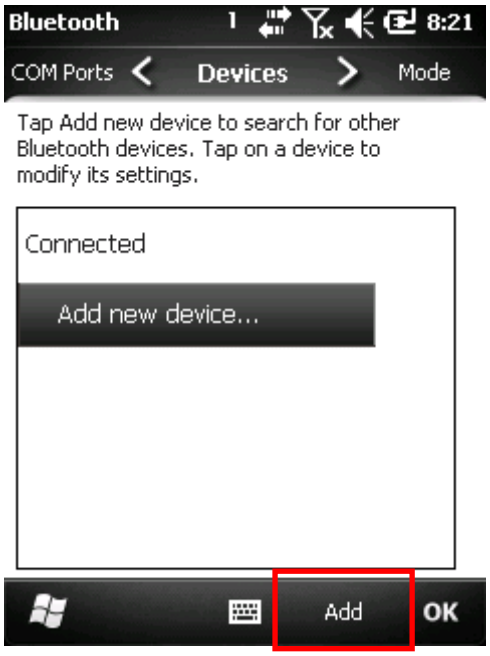
1.2.1 CONNECT WITH 1800

1) Tap on **Connect** from the main screen.

2) Choose a paired Bluetooth device if there's any.

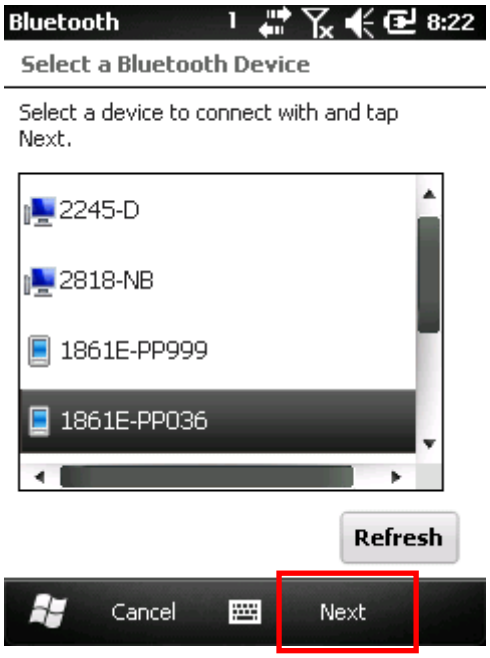
Otherwise, tap on the Bluetooth setting's icon.

3) Bluetooth setting's window opens up. Tap on **Add**.



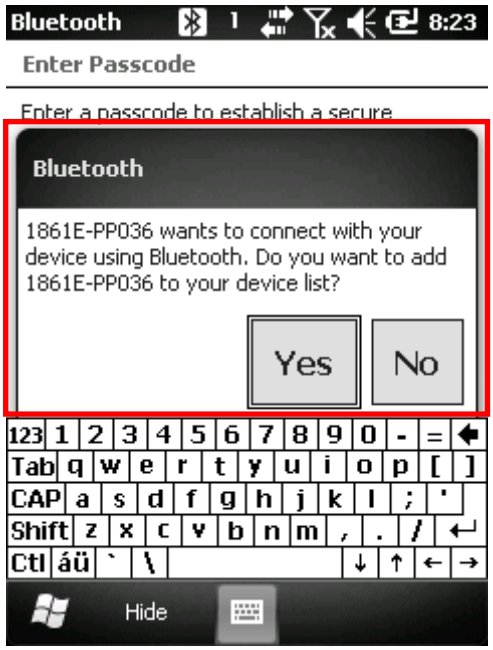
4) It will start searching for Bluetooth devices nearby.

5) Select the 1800 device that you want to connect with. Tap on **Next**.

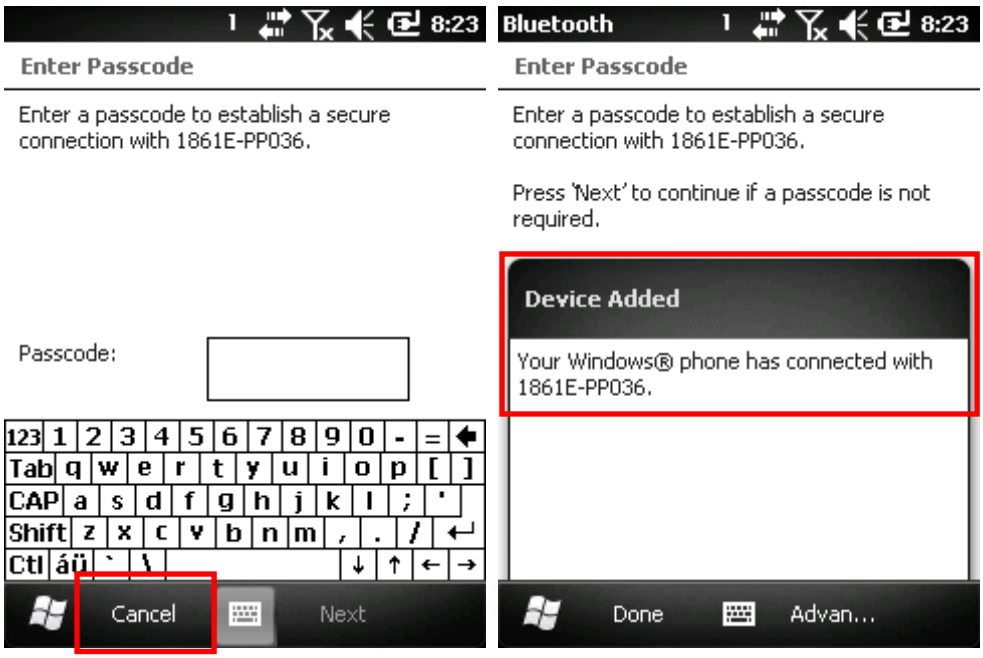


6) Enter a passcode if necessary. Tap on **Next**.

7) Add the paired device to your device list if necessary.



8) Tap on **Cancel** to finish the pairing task.

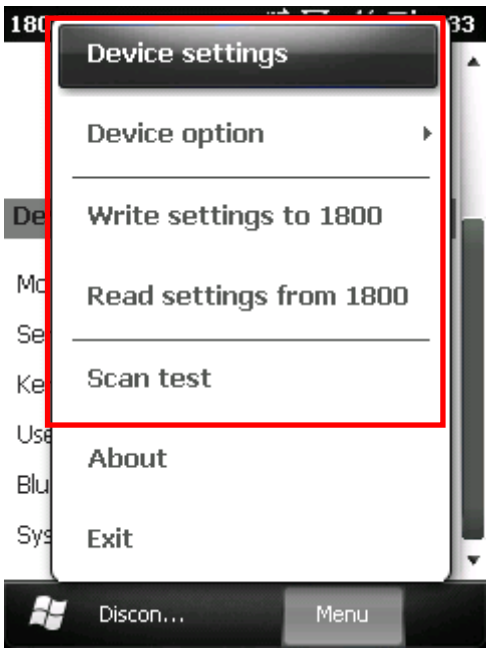


1.2.2 EXPLORE THE 1800CONFIG MENU

Tap on **Menu** to explore what the 1800Config utility can do.

- Device settings → See Chapter 2.
- Device option → See Chapter 3.
- Write settings to 1800 → See Chapter 4.
- Read settings to 1800 → See Chapter 4.
- Scan test → See Chapter 5.

You may edit settings from scratch, save them as user defaults, and clone settings using Import/Export. After configuration, tap on **Menu | Write settings to 1800** to update the settings on the 1800 device.

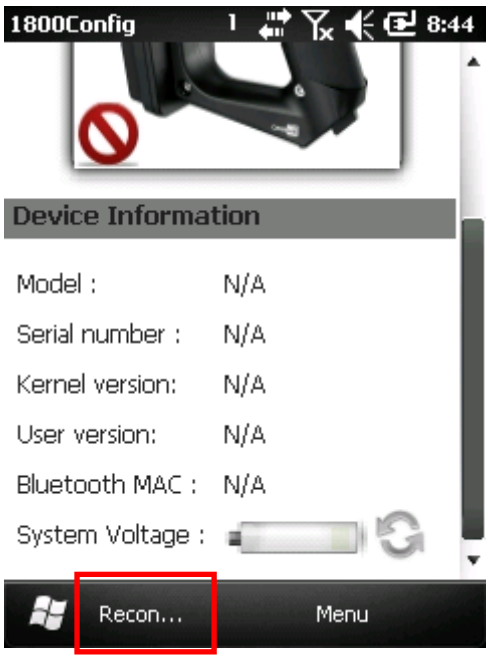


1.2.3 DISCONNECT

Tap on **Disconnect** from the main screen. The connection will be dropped.

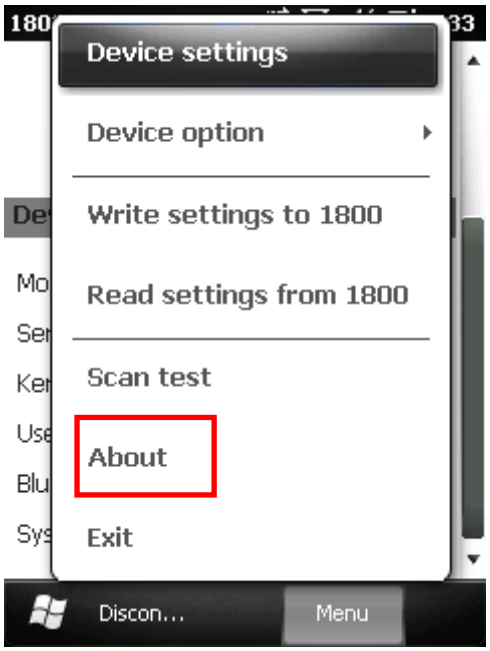
1.2.4 RECONNECT

When the 1800 device enters power-saving mode, the connection will be dropped. Tap on **Reconnect** from the main screen.



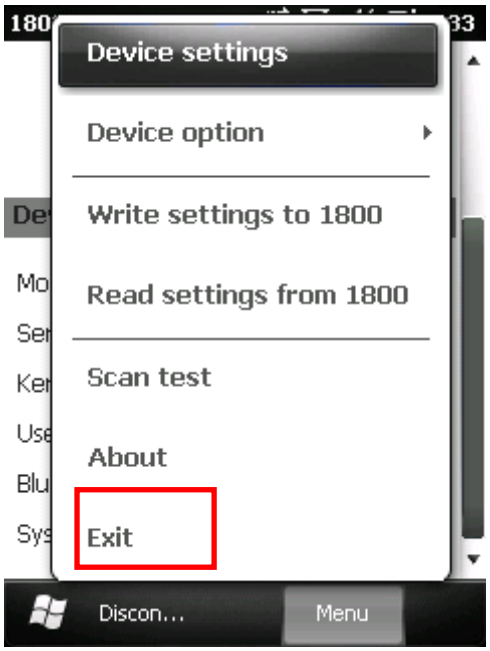
1.2.5 ABOUT

Tap on **Menu | About** to view the version information.



1.2.6 EXIT

Tap on **Menu | Exit** to exit the utility. The connection will be dropped.

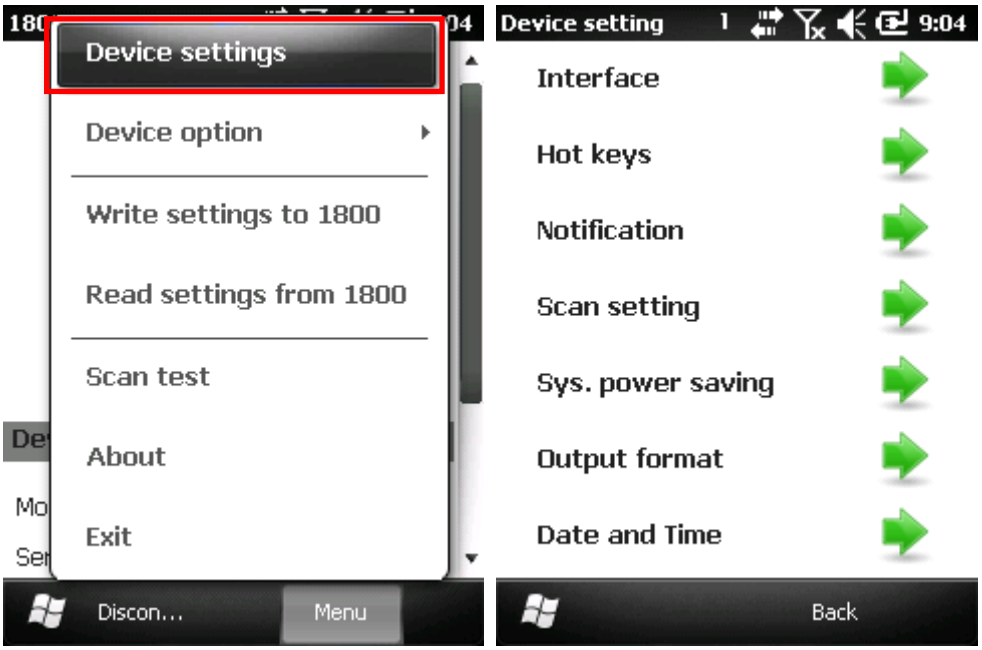


Chapter 2

DEVICE SETTINGS

Once connected, the device picture and information will be displayed on the main screen.

Tap on **Menu | Device setting** to see all the tasks you can do with the 1800 device.



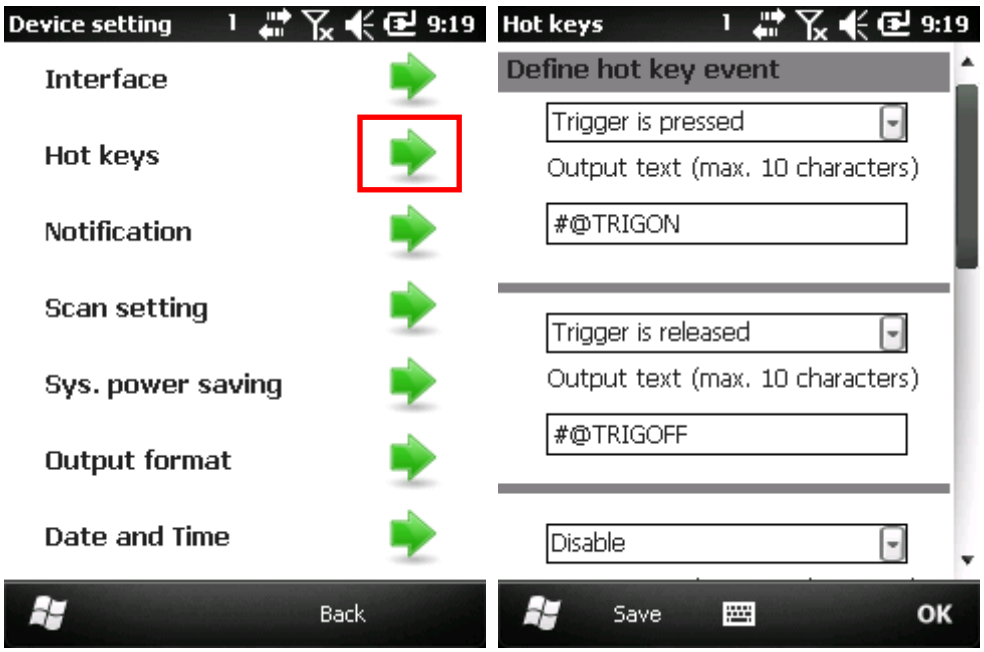
2.1 INTERFACE

Set the communication settings between the 1800 device and CP50.

- Decide whether to use passcode (or PIN) for authentication. If applied, proceed to specify PIN (default to 0000).
- Decide whether to make device discoverable. By default, it is enabled for establishing initial connection. You may disable it later so the device is invisible to other Bluetooth devices.
- Decide whether to enable the power-saving functionality. By default, it is enabled so that the device listens to the Bluetooth network at a reduced rate.
- Decide whether to enable Secure Simple Pairing (SSP). The CP-50 supports SSP, if pairing with other devices ensure they support SSP Mode.

2.2 HOT KEYS

Assign output text to key events when in Ext. Mode (Alternate Mode).



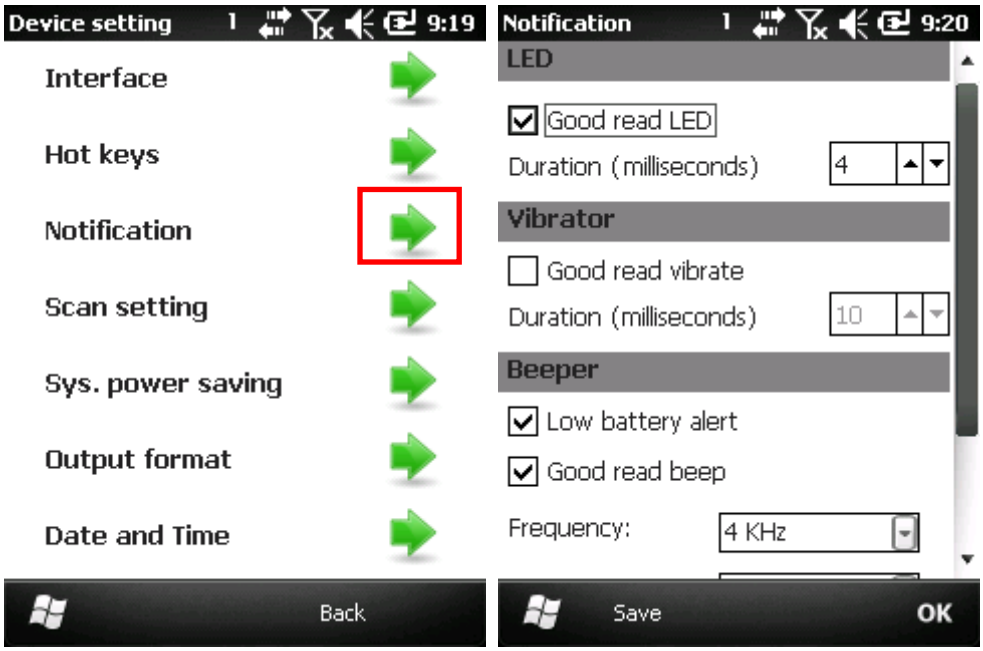
For example, this can be used to control the barcode reader on the CP50 mobile computer that the 1800 device is connected to. When the 1800 device is in Ext. mode (by sliding the switch under the trigger), pressing the trigger will send "#@TRIGON" to CP50, and the text will be accepted as a command to trigger the SCAN key on CP50.

Available key events are:

- Trigger down event
- Trigger up event
- F1 press
- F1 release
- F2 press
- F2 release
- F1 press + Trigger down
- F2 press + Trigger down

2.3 NOTIFICATION

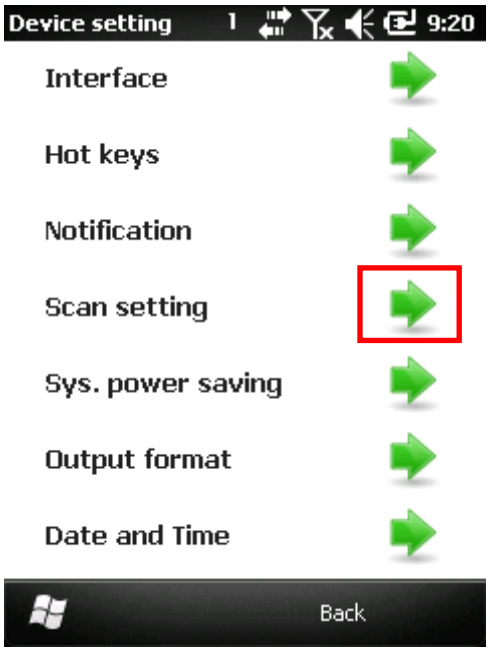
By default, all Good Read notifications are enabled except vibration. When the 1800 device reads a tag successfully, you will hear a beep and the light indicator will come on.



Notifications	Description
LED	By default, the light indicator is used to notify for a Good Read. You may specify how long the light stays on (1~254, milliseconds).
Vibrator	The vibrator is provided as an option to notify for a Good Read. You may enable it and specify how long the vibration stays on (1~254, milliseconds).
Beeper	By default, the beep is used to notify for system notifications, low battery alert and Good Read. ⊙ Adjust system volume if necessary. ⊙ By default, a warning beep is given when the battery gets low. De-select it if you prefer not to be warned. ⊙ Change Good Read frequency and duration if necessary.

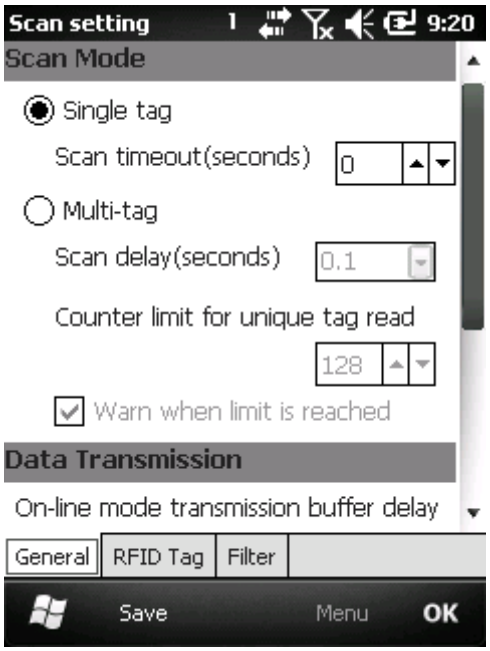
2.4 SCAN SETTING

Set the scan settings, including EPC encoding schemes and filtering, that best meet your application.



2.4.1 GENERAL

Choose scan mode. Set data transmission delays and RFID signal strength.

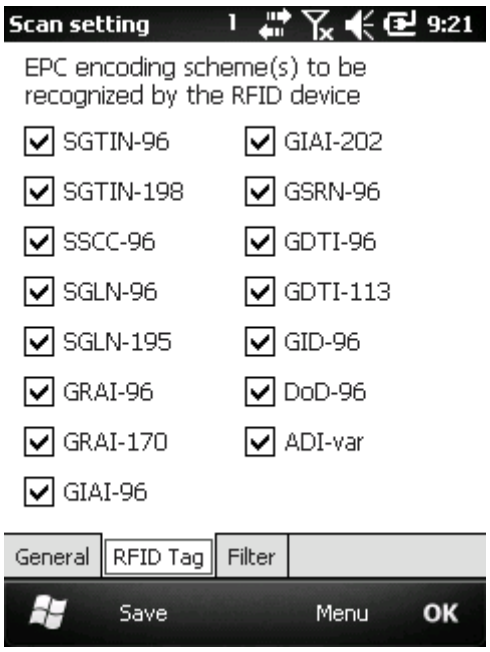


Scan Mode	Description
Single tag mode	When in "Single tag" mode, the device starts scanning for tags when the trigger is held down, and it won't stop scanning until (1) a tag is read, (2) the time interval specified (1~254 sec.) expires, or (3) the trigger has been released. By default, the time interval is set to zero, which means no time limit while scanning for tags.
Multi-tag mode	When in "Multi-tag" mode, the device starts scanning for tags as long as the trigger is held down, and it won't stop scanning until the trigger has been released. Select an appropriate scan delay if necessary. A sequential scanning will not be started until a previous scanning is done and the scan delay time expires. By default, it is set to read up to 128 unique tags. If tag counting is not desired, set it to 0. When the device reads a unique tag, which means the tag has never been read so far, it will save the tag info to a list used for counting. When the counter limit is reached, it will give a warning beep and discard in-coming readings.

Data Transmission	Description
On-line mode transmission buffer delay	While connecting to CP50 via Bluetooth, it is possible the 1800 device might get out of range. The transmission buffer is for temporary data storage. By default, there is no delay between each data record while tag data is being received in the buffer. Select an appropriate delay time if necessary.
Memory mode data transmission delay	By default, there is no delay between each data record while tag data is being transmitted back to CP50 in batch. Select an appropriate delay time if necessary.
RFID Signal Strength	**Description**
Min. ~ Max.	By default, the RFID signal strength is maximized. Adjust it if necessary.

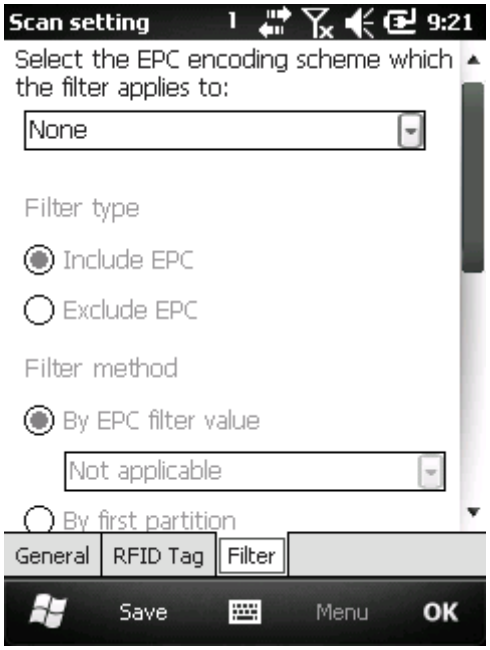
2.4.2 RFID TAG

Select EPC encoding scheme(s) that need to be recognized by the device.



2.4.3 FILTER

Further to the EPC encoding scheme(s) recognizable to the device, you may filter tags for one specific encoding scheme.



Filter Type	Description
None / Include EPC / Exclude EPC	By default, no filtering is applied to any EPC encoding scheme. Select an appropriate option if necessary. ⊙ Choose "Include EPC" if you want the RFID device to read a specific tag (decided by encoding scheme) that contains the specified EPC information. Proceed to choose a filter method. ⊙ Choose "Exclude EPC" if you want the RFID device to avoid reading a specific tag (decided by encoding scheme) that contains the specified EPC information. Proceed to choose a filter method.
Filter Method	**Description**
By EPC filter value / By GS1 Company Prefix / By Item Reference	If filtering is applied, choose an available filtering method. See EPC data structure. For more details on the EPC Filter Value, please refer to EPCGlobal specification.

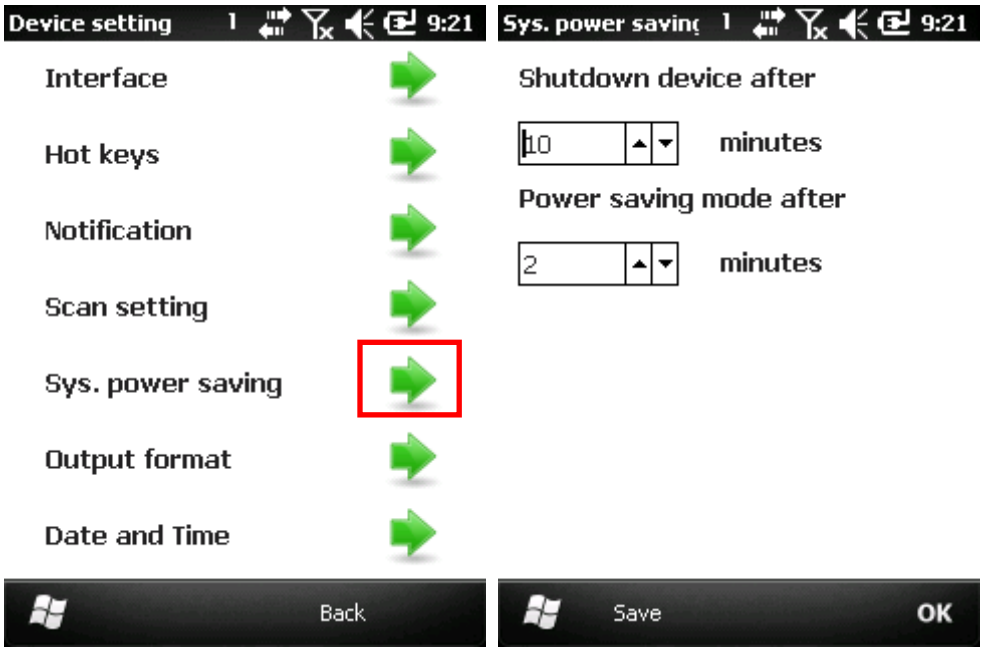
2.5 SYSTEM POWER-SAVING

2.5.1 SHUTDOWN DEVICE

Specify when to shut down the 1800 device when it is found idle for a period of time.

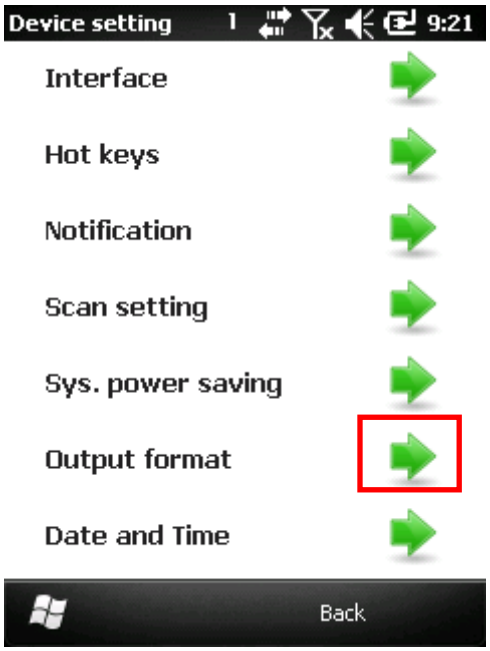
2.5.2 POWER-SAVING MODE

Specify when to force the 1800 device to enter power-saving mode when it is found idle for a period of time.



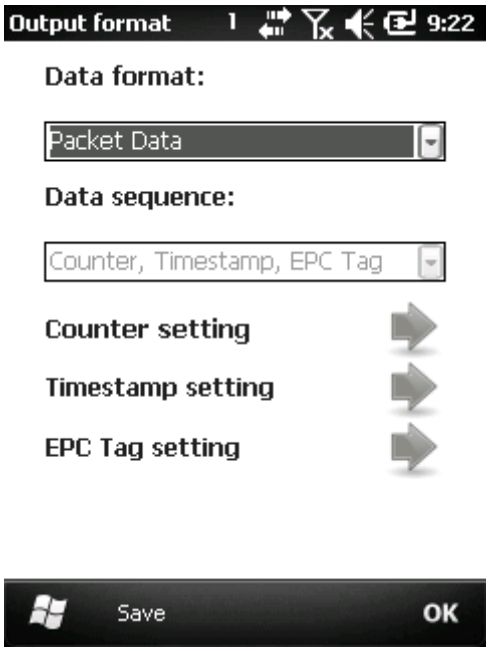
2.6 OUTPUT FORMAT

The utility allows you to configure in which format the collected tag data will be output. Set output data format if necessary.



2.6.1 DATA FORMAT AND SEQUENCE

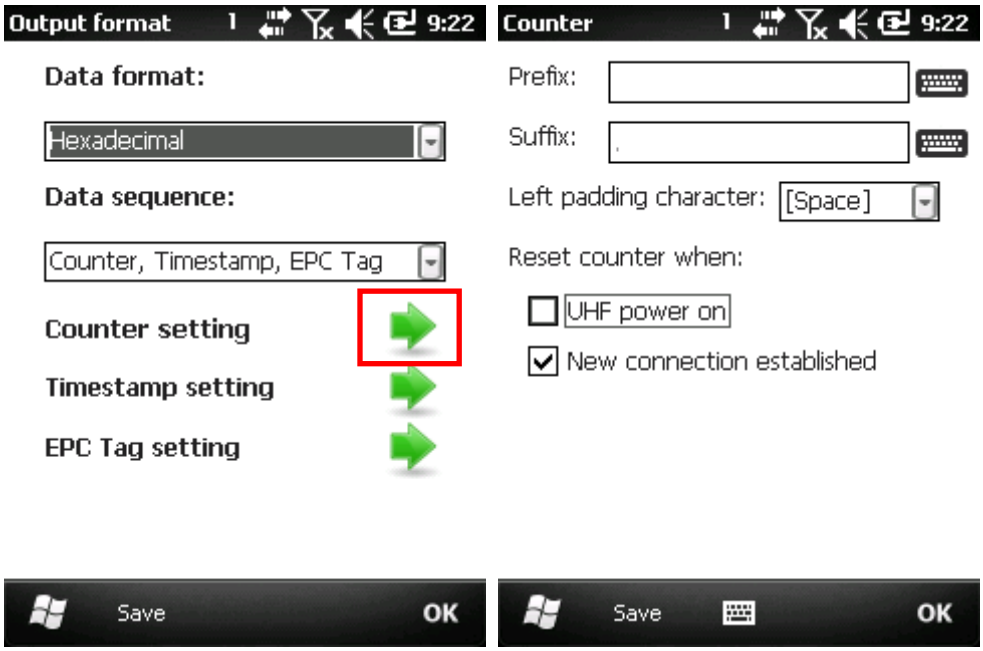
Select a data format.



Output Format	Description
Data format	By default, each data record is output as "Packet data". ⊙ Select "Hexadecimal" if necessary. Proceed to set output sequence and its detail. ⊙ Select "ASCII" if necessary. Proceed to set output sequence and its detail.
Data sequence	Available options are as shown in the drop-down list. Select an appropriate one and set detail.

2.6.2 COUNTER SETTING

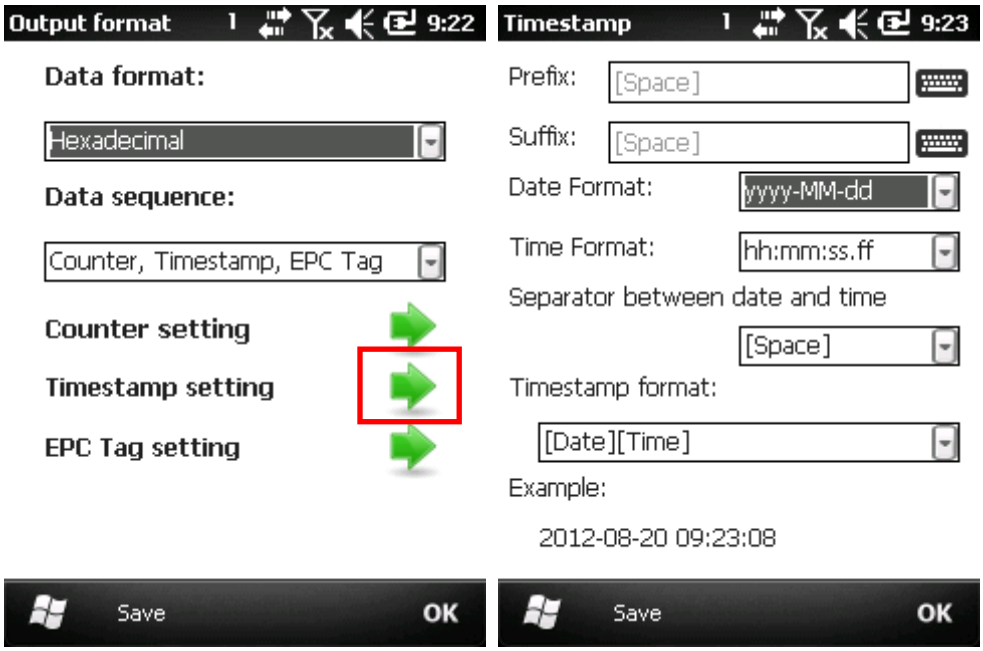
Specify counter detail when data is output in "Hexadecimal" or "ASCII"



Counter	Description
Prefix / Suffix	Click the keyboard icon to specify prefix/suffix if necessary. Max. 8 characters are allowed.
Left padding character	By default, it is set to add the space character to the left of the counter data. The 6-digit counter starts at " 1" ([Space][Space]1) and ends at "999999". You may choose to use the number character "0" instead, so that the counter will start at "000001".
Reset counter when...	Decide whether to reset the data counter in the following conditions. ⊙ Select "UHF power on" if reset counter is desired when the device is re-started or the device enters Ext. mode (by sliding the switch under the trigger). ⊙ By default, "New connection established" is selected, so that it will reset counter for each new Bluetooth connection. De-select it if necessary.

2.6.3 TIMESTAMP SETTING

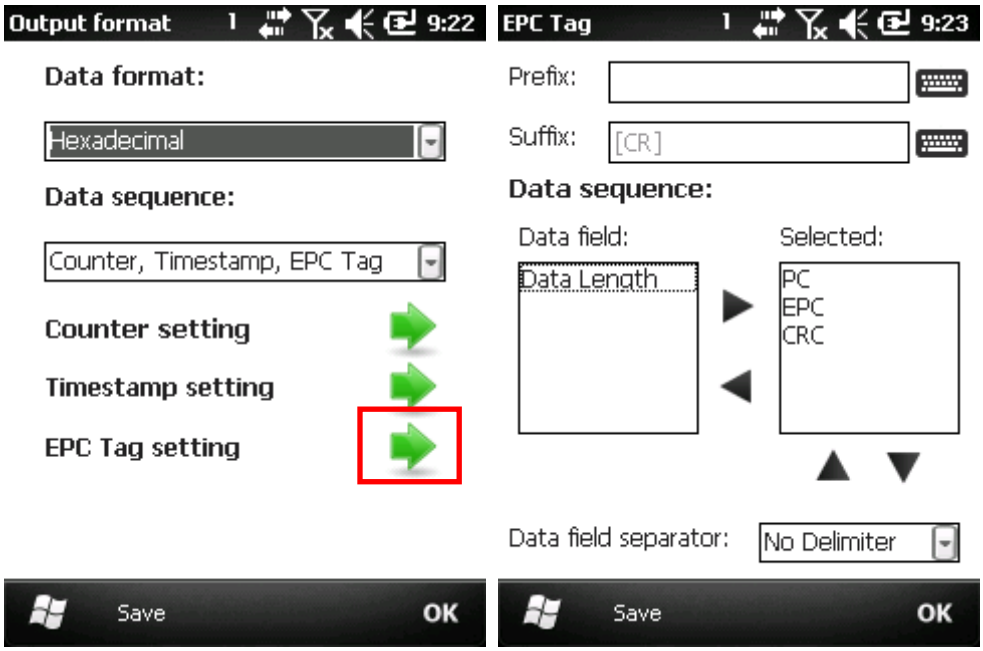
Specify timestamp detail when data is output in "Hexadecimal" or "ASCII"



Timestamp	Description
Prefix / Suffix	Click the keyboard icon to specify prefix/suffix if necessary. Max. 8 characters are allowed.
Date format / Time format	Available options are as shown in the drop-down list. Select an appropriate one and see the example.
Separator between date and time	By default, it is set to add the space character to separate the Date and Time. You may choose to use the dash or comma character instead. See the example.
Timestamp format	Available options are as shown in the drop-down list. Select an appropriate one and see the example.

2.6.4 EPC TAG SETTING

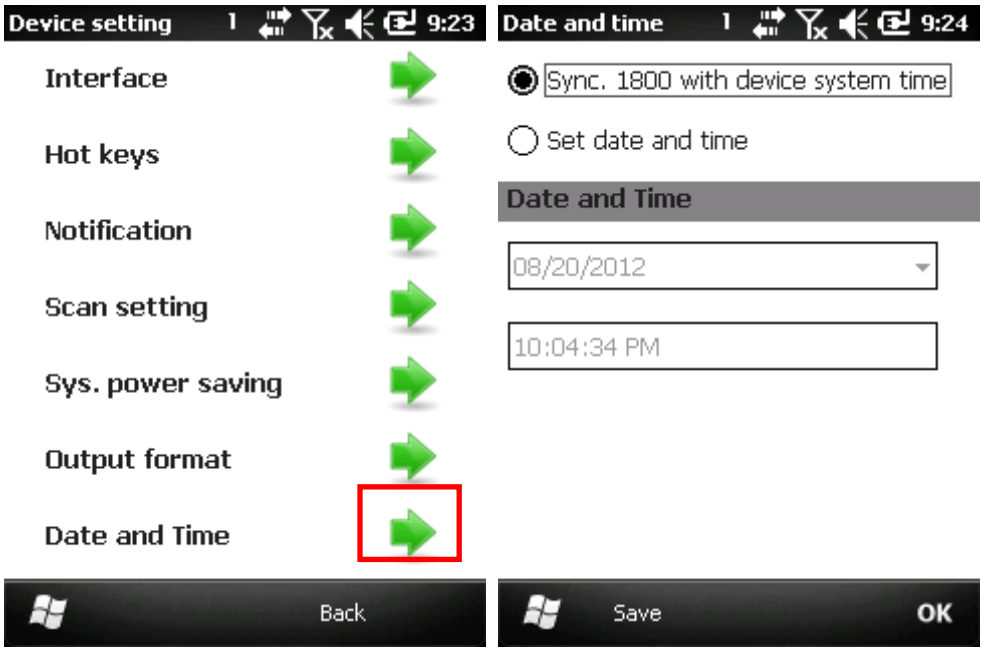
Specify EPC tag detail when data is output in "Hexadecimal" or "ASCII"



EPC Tag	Description
Prefix / Suffix	By default, the Carriage Return (CR) character is specified as the suffix. Click the keyboard icon to specify prefix/suffix if necessary. Max. 8 characters are allowed.
Data sequence	Available fields are Data Length, PC, EPC and CRC. ⊙ From the data field on the left, select one and click on the Right button [>] to add to the selected list on the right. ⊙ From the selected (fields) on the right, select one and click on the Left button [<] to remove it from the selected list. You may click on the Up and Down buttons to manage the orders of the selected fields.
Data field separator	By default, there is no data field separator. You may choose to use the tab, comma or period character to separate the data fields.

2.7 DATE AND TIME

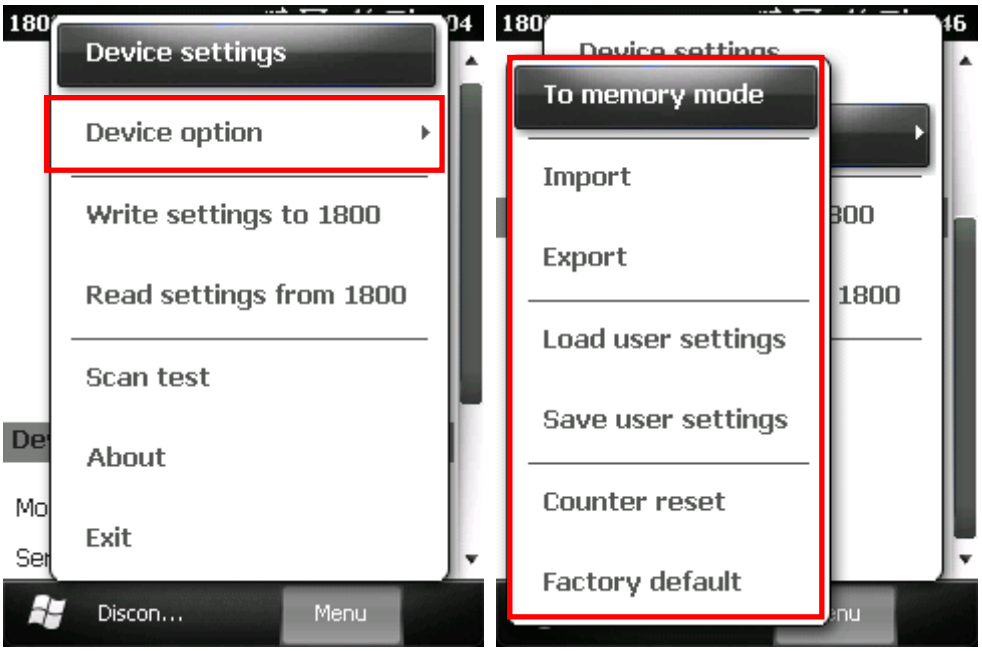
Set the clock on the device. Choose to synchronize with CP50 or set a specific date/time.



Chapter 3

DEVICE OPTIONS

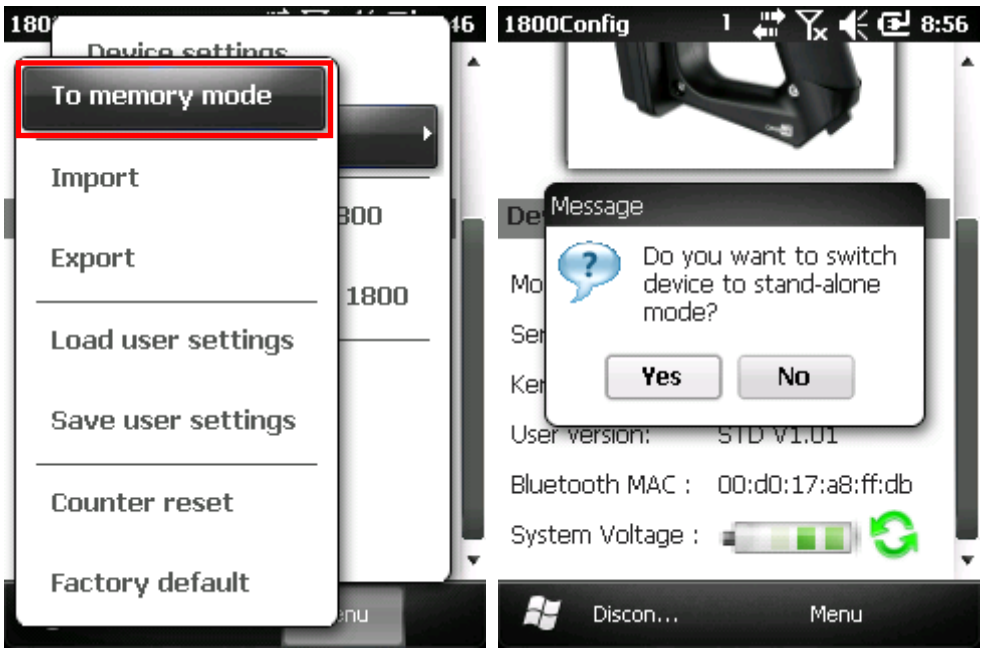
The 1800Config utility allows you to set the 1800 device to Memory mode, import/export settings, save/load user settings, etc. Tap on **Menu | Device option**.



3.1 OPERATING MODE

Change the operating mode if necessary.

- **On-line mode**: The 1800 device is connected with CP50 via Bluetooth, so that the tag data it reads can be sent to CP50 in a real-time way.
- **Memory mode**: Tap on **To memory mode**, the 1800 device is set to work without establishing any connection with others. The tag data it reads is kept in the memory and needs to be uploaded to PC at a later time. No real-time connection is allowed in this mode!

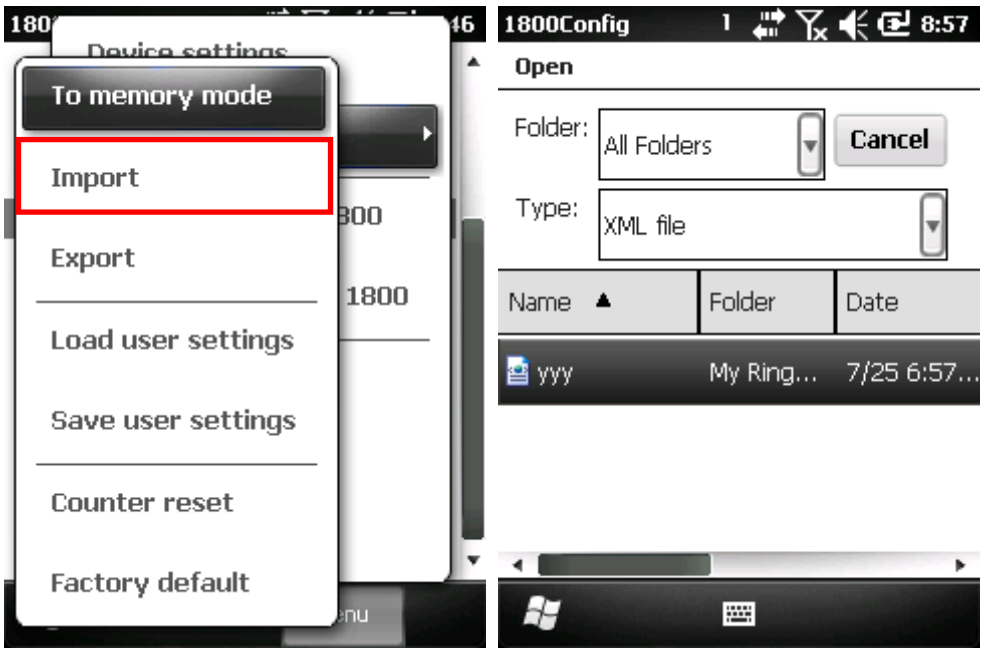


3.2 CONFIGURATION FILE

All the 1800 device settings are saved to a configuration file (.xml). It's made easy to clone settings and deploy to a great other 1800 devices.

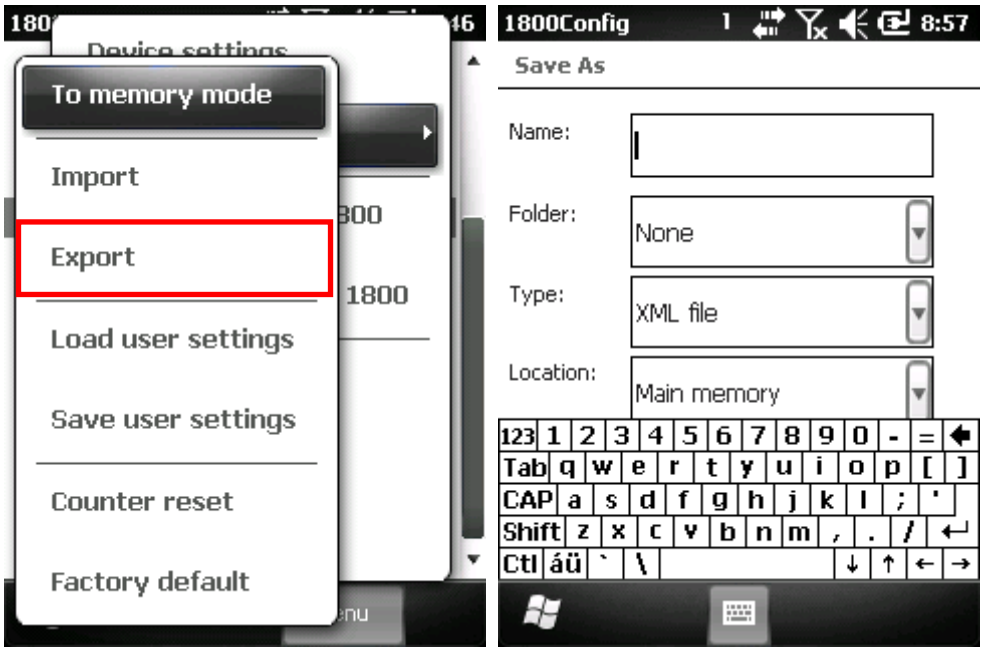
3.2.1 IMPORT

Tap on **Import** to open an existing configuration file (.xml). Modify the device settings if necessary.



3.2.2 EXPORT

Tap on **Export** to save the settings to a new configuration file (.xml).



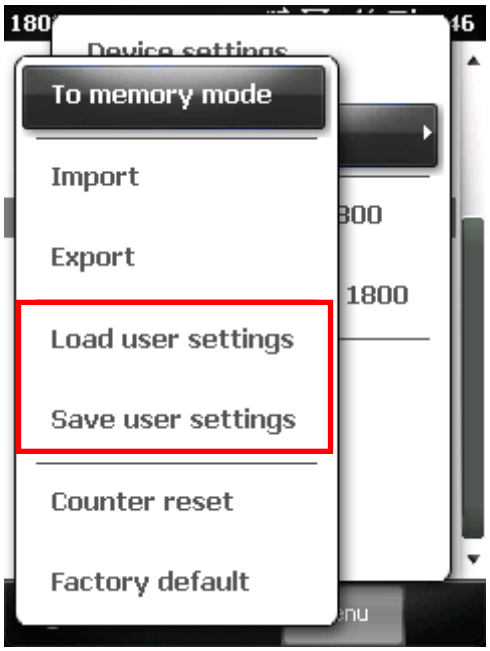
3.3 USER DEFAULT

3.3.1 SAVE USER SETTINGS

Tap on **Save user settings** to save a copy of the current settings as user defaults. Restore user defaults if necessary.

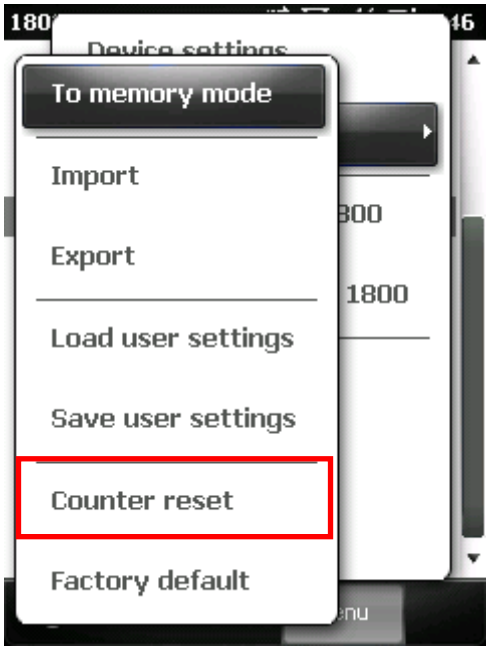
3.3.2 LOAD USER SETTINGS

Tap on **Load user settings** if you have ever saved a copy of user settings. The user defaults will overwrite the current settings.



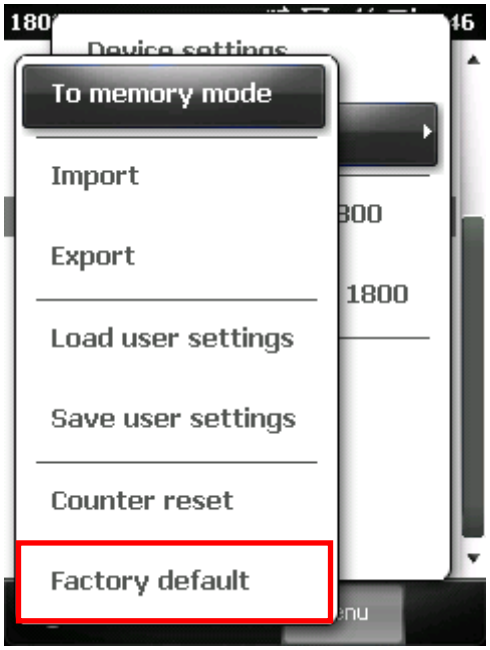
3.4 RESET COUNTER

Tap on **Counter reset** to reset the tag counter when it's in Multi-tag scan mode.



3.5 RESET TO DEFAULTS

Tap on **Factory default** to reset the settings to factory defaults.



Chapter 4

READ OR WRITE SETTINGS

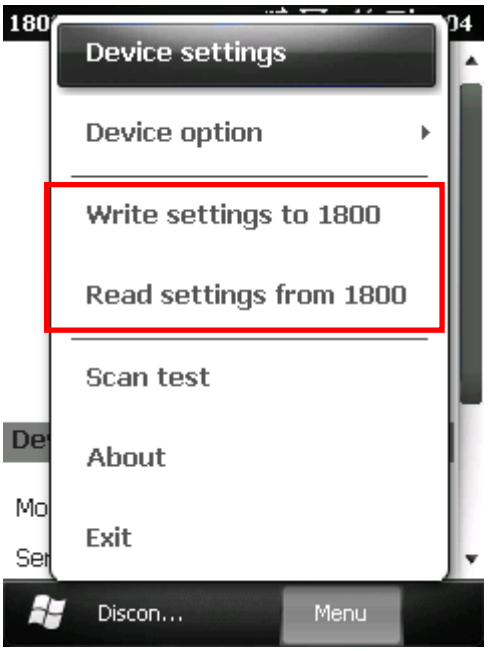
Instead of editing settings from scratch, an alternative is to read settings from the 1800 device. Modify and write the settings back.

4.1 READ SETTINGS

Tap on **Menu | Read settings from 1800** to read the settings from the device.

4.2 WRITE SETTINGS

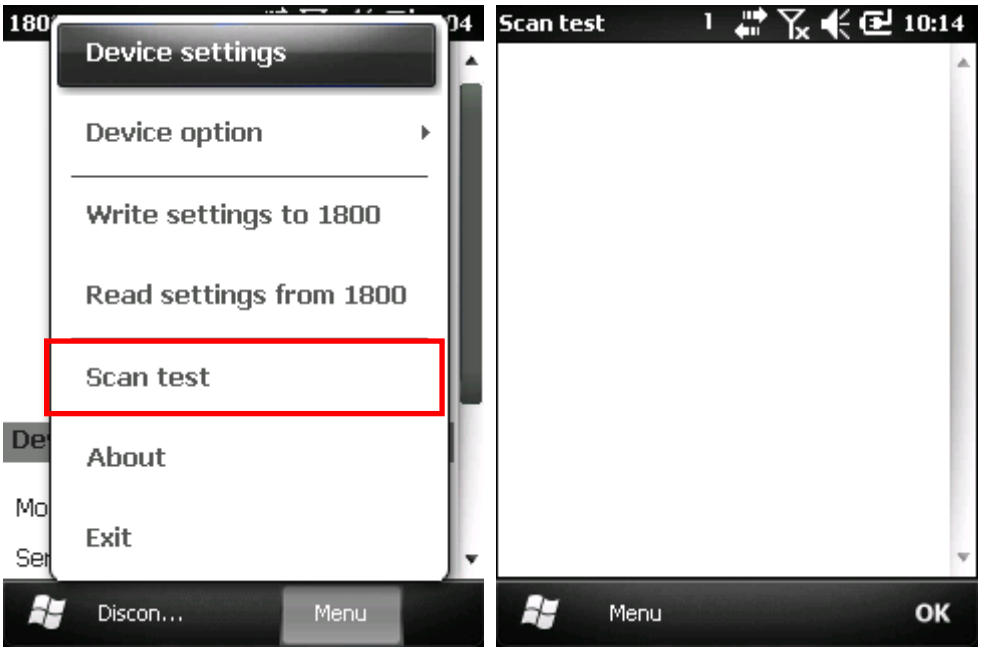
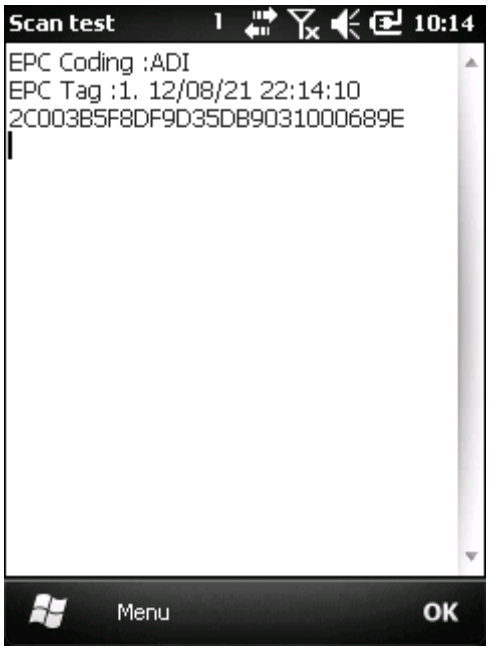
Tap on **Menu | Write settings to 1800** to update the device with the current settings.



Chapter 5

SCAN TEST

After configuration, you may run the scan test to verify whether the device settings are configured correctly. Tap on **Menu | Scan test** and have the 1800 device ready for reading tags.



Press the trigger on the 1800 device to read a tag. See the test result below.