

CipherLab Reference Manual

Android™ 6.0, Marshmallow

Mobile Computer 9700 Series

Version 1.02



PREFACE

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CONTACT

For product consultancy and technical support, please contact CIPHERLAB's sales representative in your local area. You may also visit CIPHERLAB web site for more information.

CIPHERLAB CO., LTD.
Website: <http://www.CipherLab.com>

SAFETY NOTICES

FOR PRODUCT WITH RF FUNCTIONS

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

FOR CANADA

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

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe B prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques," NMB-003 édictée par l'Industrie.

FOR UNITED STATES

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

- ▶ Reorient or relocate the receiving antenna.
- ▶ Increase the separation between the equipment and receiver.
- ▶ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ▶ Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FOR PRODUCT WITH LASER



CAUTION

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

SAFETY PRECAUTIONS

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

- ▶ The use of any batteries or charging devices which are not originally sold or manufactured by CipherLab will void your warranty and may cause damage to human body or the product itself.
- ▶ DO NOT disassemble, incinerate or short circuit the battery.
- ▶ DO NOT expose the scanner or the battery to any flammable sources.
- ▶ For green-environment issue, it's important that batteries should be recycled in a proper way.
- ▶ Under no circumstances, internal components are self-serviceable.

CARE & MAINTENANCE

- ▶ The mobile computer is rated IP65, however, the mobile computer can get damaged when being exposed to extreme temperatures or soaked wet.
- ▶ When the enclosure of the mobile computer gets dirty, use a clean and wet cloth to wipe off the dust. DO NOT use/mix any bleach or cleaner. Always keep the LCD dry.
- ▶ For a liquid crystal display (LCD) or touch screen, use a clean, non-abrasive, lint-free cloth to wipe dust off the screen. DO NOT contact the surface with any pointed or sharp object.
- ▶ If you want to put away the mobile computer for a period of time, download the collected data to a host computer, and then take out the battery pack. Store the mobile computer and battery pack separately.
- ▶ When the mobile computer resumes its work, it takes some time for the main and backup batteries to become fully charged.
- ▶ If you shall find the mobile computer malfunctioning, write down the specific scenario and consult the sales representative in your local area.
- ▶ Keep the mobile computer away from any magnets and magnetic fields to prevent the laser engine from malfunctioning.

OTHER NOTICES

- ▶ During no any information transmission, the EUT can automatically discontinue transmission and become standby mode for power saving.
- ▶ The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

FCC RADIATION EXPOSURE STATEMENT

- ▶ This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

- ▶ **Caution!**
Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

- ▶ **Antennas**
Only use the supplied antenna. Unauthorized antennas, modifications or change to the antennas could violate FCC regulations and void the user's authority to operate the equipment.

- ▶ For operation within 5.15 ~5.25GHz /5.25 ~5.35GHz/5.47 ~5.725GHz frequency range, it is restricted to indoor operations to reduce any potential for harmful interference to co-channel Mobile Satellite System (MSS) operations. The band from 5600-5650MHz will be disabled by the software during the manufacturing and cannot be changed by the end user. This device meets all the other requirements specified in Part 15E, Section 15.407 of the FCC Rules.

- ▶ The availability of some specific channels and/or operational frequency bands are country dependent and are firmware programmed at the factory to match the intended destination. The firmware setting is not accessible by the end user.

RELEASE NOTES

Version	Date	Notes
1.01	Feb 20, 2016	▶ Update
1.00	Nov 23, 2016	▶ Initial release

E-Label Operation method

Please follow below step to see FCC certificate information:

Setup → About Phone → Certificate

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INTRODUCTION

Thank you for choosing CipherLab products. CipherLab introduces 9700 Series Mobile Computer. Powered by Android™ 6.0 Marshmallow, the mobile computer delivers better user experience and advances enterprise mobile computing.

The mobile computer has transfective LCD to hold up the readability in a wide range of light conditions, courtesy of the supplementary backlight enabled by a built-in ambient light sensor. Also on board is a G-sensor to save power according to the mobile computer's motion and posture. G-sensor also enables screen orientation when the device is posed sideways or upright. Furthermore, the mobile computer has integrated a built-in e-compass and gyroscope, both of which provide useful functions in navigation.

The series sports satisfactory data connections by integrating a communication port for direct data exchange. For wireless data connection, it hosts a Bluetooth and 802.11a/b/g/n/ac module.

Dedicated to data capture, the mobile computer has essential 1D (laser) reader or 2D imager. Rated with IP65, the rugged 9700 is light-weighted and easy to operate, and will be your good help on field works.

ABOUT THIS DOCUMENT

This guide distills the information about 9700 Series Mobile Computer. Subjects discussed include the mobile computer's physical features, platform basics, software and applications, and part of the accessories to boost the mobile computer's performance.

We recommend that you keep one copy of this manual at hand for the quick reference for necessary maintenance.

FEATURES

- ▶ Rugged yet smoothened outlined
- ▶ IP65-rated tough form to survive drop, shock, heat, cold, and impervious to moisture/dust
- ▶ Android™ 6.0 Marshmallow OS, Cortex A53 2.0 GHz CPU
- ▶ 2GB DDR SDRAM to run application programs
- ▶ 16 GB NAND flash to store OS, applications, settings and so on
- ▶ Storage expansion: Up to 32GB MicroSDHC
- ▶ Sunlight-readable screen to enhance the viewability of outdoor use
- ▶ Ambient light sensor to enable supplementary backlight for LCD and keypad
- ▶ G-sensor for power management and screen orientation
- ▶ 2 symmetric side-triggers for ambidextrous scanning
- ▶ Total data solution — supports Bluetooth, 802.11a/b/g/n/ac

INSIDE THIS PACKAGE

The mobile computer ships with the following items. Save the box and packaging material in case of future need to store or deliver the mobile computer.

- ▶ Mobile Computer
- ▶ Rechargeable Li-ion battery pack (standard/high capacity)
- ▶ Stylus
- ▶ Quick Start Guide
- ▶ Snap-on Charging and Communication Cable (USB or RS-232) (optional)
- ▶ Power Adapter (optional)
- ▶ AC Power Cord(optional)
- ▶ Earphone Jack Cover(optional)

ACCESSORIES

Optional accessories to enhance the mobile computer's performance are:

- ▶ Snap-on Charging and Communication Cable (USB or RS-232)
- ▶ Pistol Grip
- ▶ Snap-On Car Charger
- ▶ 4-Slot Battery Charger

RELATED DOCUMENTATION

Log in to GoBetween to access related documentation about the 9700 mobile computer from the CipherLab Central Service (CCS) platform. Download the GoBetween desktop or mobile device application, or launch the GoBetween Lite web application from the following site: <http://ccs.cipherlab.com/>.

USE MOBILE COMPUTER

Before the mobile computer takes part in your work, get to know it first. This chapter includes the basic features of the mobile computer including the power supply, memory, and the units that bridge users with the mobile computer. This chapter helps you set the mobile computer to work at the earliest.

1.1. TAKE A TOUR

This section shows the major components on the mobile computer and inside battery chamber. You will also learn how to power on/off the mobile computer and how the mobile computer gives information about its status.

1.1.1. OVERVIEW

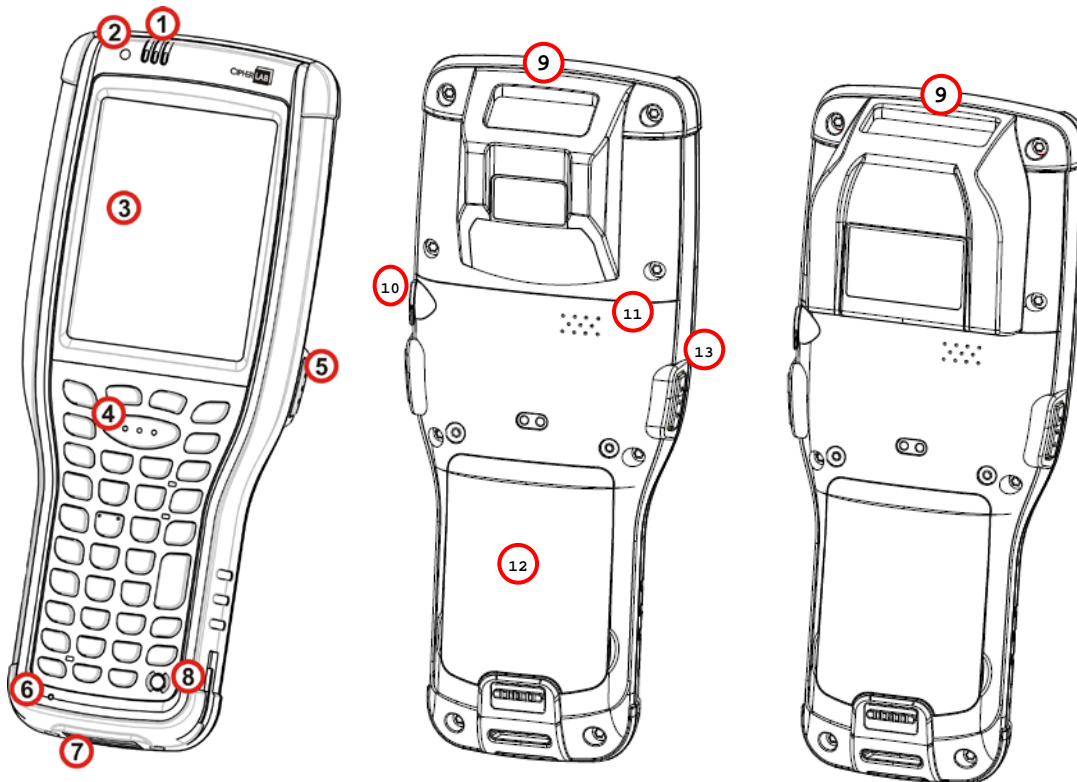



Figure 1: Overview

No.	Description	No.	Description
1	Status LED (refer to Notifications)	2	Light sensor
3	Touch screen	4	Scan key
5	Side-trigger (user definable)	6	Microphone
7	Direct charging & communication port	8	Power key
9	Scan window	10	Headset jack
11	Speaker	12	Battery
13	Side-trigger (user definable)		

1.2. POWER ON/OFF MOBILE COMPUTER


POWER ON

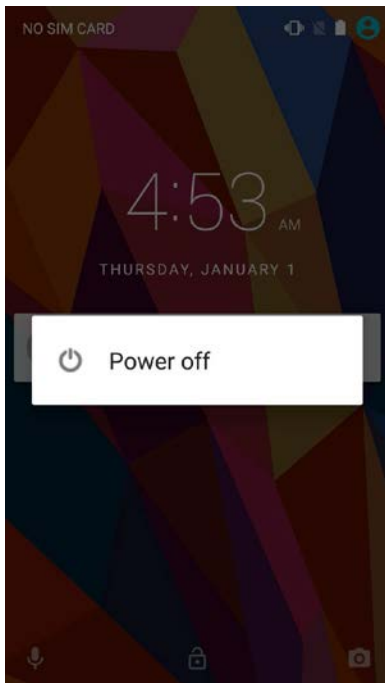
To power on the device, press and hold the Power button . The device will open to show the home screen.

Note:

For the device to power on, the battery cover must be secured in place.

POWER OFF

To power off the device, press and hold Power button  for more than three seconds. An onscreen button will appear on-screen which allows you to power off the device. Make sure all user data and tasks have been stored before tapping **Power off**.



1.3. NOTIFICATIONS

The mobile computer features visible, audible, and tactile feedback to draw users' prompt awareness of the mobile computer's contiguous events such as barcode reading, wireless/mobile data connections, and battery charging.

STATUS LED

Three LED lights are located on the upper-right corner of the mobile computer. Their functions are:

Matter	LED Color	Action	Description
Battery Charging (Left)	Green, Orange, Red	Green, solid	Battery is fully charged.
		Orange, solid	Battery is being charged, and the battery level is sufficient to power on the mobile computer.
		Red, solid	Battery is being charged, however the battery level is insufficient to power on the mobile computer.
		Red, blinking fast	Battery charging error has occurred, for instance, charging temperature is below 0°C or above 35°C, or adapter is plugged in but no battery is present.
Radios (Middle)	Blue	Blue, blinking	Wi-Fi or Bluetooth in use.
Scanning Good Read (Right)	Green	Green, flashes once	Indicates good reading of the scanned barcode. Enable/Disable this LED light on the Reader Config Notification Settings page. To set the good read LED via API deployment, see the 9700 Programming Guide for details.

SPEAKER

The mobile computer has a speaker on the back for audio signaling and playback.

The speaker sounds for system events, application warnings, on-screen item selection and physical keypad stroke. In noisy environments, the speaker remains efficacious with the help of a Bluetooth headset.

The speaker also sounds for successful barcode reading, which can be controlled on the Reader Config Notification Settings page.

VIBRATOR

The mobile computer owes its tactile feedback to the vibrator built inside. Vibration delivered to the mobile computer alerts users of its current status.

Working based on user's sense, the vibrator is particularly helpful when the mobile computer is serving in a noisy environment.

Same as the speaker and LED light, the vibrator also works for good barcode reading. Enable/disable vibration and set its duration on the Reader Config Notification Settings page. Alternatively, program the vibrator through API deployment to have it vibrate when a successful reading occurs.

1.4. BATTERY

The 9700 mobile computer is fed by two batteries, main battery pack and backup battery. The main battery is removable and replaceable from the battery chamber while the backup battery is mounted on the main board inside the mobile computer.

When the mobile computer is shipped, the main battery is stored in a package separated from the mobile computer, which keeps it in good condition for future use.

MAIN BATTERY

The main battery is a Li-ion battery pack which comes in two different capacities, a 3.7V, 3600mAh battery which takes approximately 4 hours to charge to full, and a 3.7V, 5400mAh battery which takes around 6 hours to charge to full. The working time of the mobile computer varies by its working states. A battery icon seated on the taskbar will show the remaining main battery level.

See also [Install/Remove Main Battery](#) for installing the main battery.

BACKUP BATTERY

The backup battery is settled on the main board inside the mobile computer. It is a 3.6V, 15mAh rechargeable Ni-MH battery. When the main battery is absent or depleted, the backup battery takes over to feed the mobile computer. Without the main battery, a fully charged backup battery retains the data in the DRAM and holds the system in suspension for 30 minutes (as long as the wireless modules are inactive).

The backup battery is rechargeable by the main battery pack. It takes 36 hours to charge it to full.

Note:

(1) On initial use of the mobile computer, it is recommended that a fully charged main battery is placed in the main battery compartment for at least three days, in order to allow the backup battery to charge to a full state.

(2) When removing the main battery pack, actual data retention time will depend on the backup battery level. Check backup battery level before replacing the main battery to ensure your data is retained.

1.4.1. INSTALL/REMOVE MAIN BATTERY

Follow the steps below to install the main battery:

Place the main battery pack into the battery chamber with the contact pins facing down. Fix the upper end first, and press the lower end down until the battery “clicks” into place.

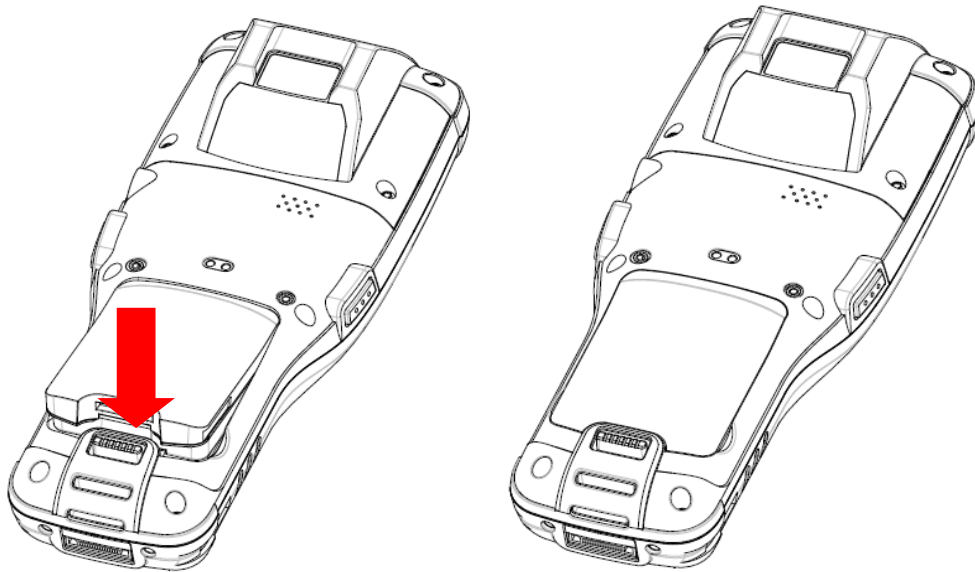


Figure 2: Install main battery

Follow the steps below to remove the main battery:

- 1) A battery latch is located at the lower end of the main battery. Push the latch down and the battery will be released.

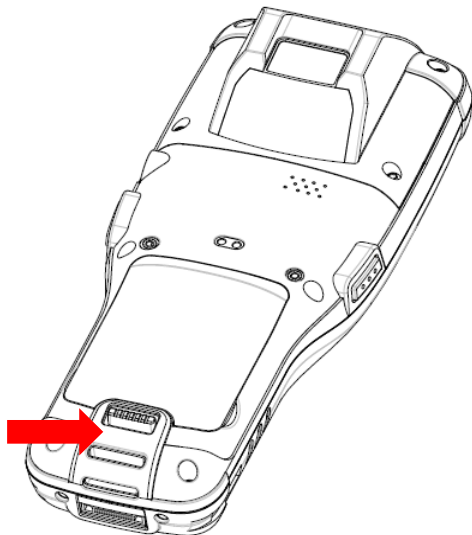


Figure 3: Remove main battery

-
- Note:
- (1) When main battery level drops to low level, charge it ASAP or replace it with a charged battery.
 - (2) Always turn off the mobile computer to replace the main battery pack.
 - (3) Any improper handling may reduce battery life.
-

1.4.2. CHARGE BATTERIES

Due to shipment, it is likely that the main battery and backup battery won't be fully charged when you receive the package. Before setting the mobile computer to work, charge the main battery to full by direct charging via a power adapter (with the help of a Snap-on Charging & Communication Cable).

Some key facts about charging batteries:

Charging Time

- ▶ **Main battery:** It takes approximately 4 hours to charge the 3.3V, 3600mAh main battery, and approximately 6 hours to charge the 3.3V, 5400mAh main battery. The battery charging LED above the touch screen lights red or orange during charging (depending on the battery level at the moment), and lights green when the mobile computer is completely charged. See [Status LED](#) for details about the LED indicator.
- ▶ **Backup battery:** The backup battery is a 3.6V, 15mAh Ni-MH battery which is rechargeable by the main battery. It takes around 36 hours to charge it to full, however it does not need to be fully charged for the mobile computer to work.

Charging Temperature

- ▶ It is recommended that batteries be charged at room temperature (18°C~25°C) for optimal performance.
- ▶ Charging stops when temperature drops below 0°C or exceeds 35°C. In this case the battery charging LED will be continuously blinking in red.

Power Consumption

- ▶ When all radios (802.11 a/b/g/n/ac, Bluetooth) are active on battery power, main battery level will drop substantially.
- ▶ In order to prevent the system from shutting down due to depletion of the main battery, we suggest that you keep a fully charged battery for replacement or have the mobile computer access the radios on external power.

The following guides how to charge batteries.

DIRECT CHARGING USING SNAP-ON CABLE

Direct charging of the mobile computer relies on the Snap-on Charging & Communication Cable (hereinafter "snap-on cable"). There is a power jack on the connector of this cable to connect external power.

Prior to charging, install the main battery as described in [Install/Remove Main Battery](#). Then follow the steps below:

- 1) Attach the snap-on cable to the mobile computer.
- 2) Plug the head of the power adapter cord into the power jack located on the snap-on cable's connector.
- 3) Connect the power adapter to a power outlet.

To output data to your PC or laptop, connect the snap-on cable (either through USB or RS-232 connection) to it.

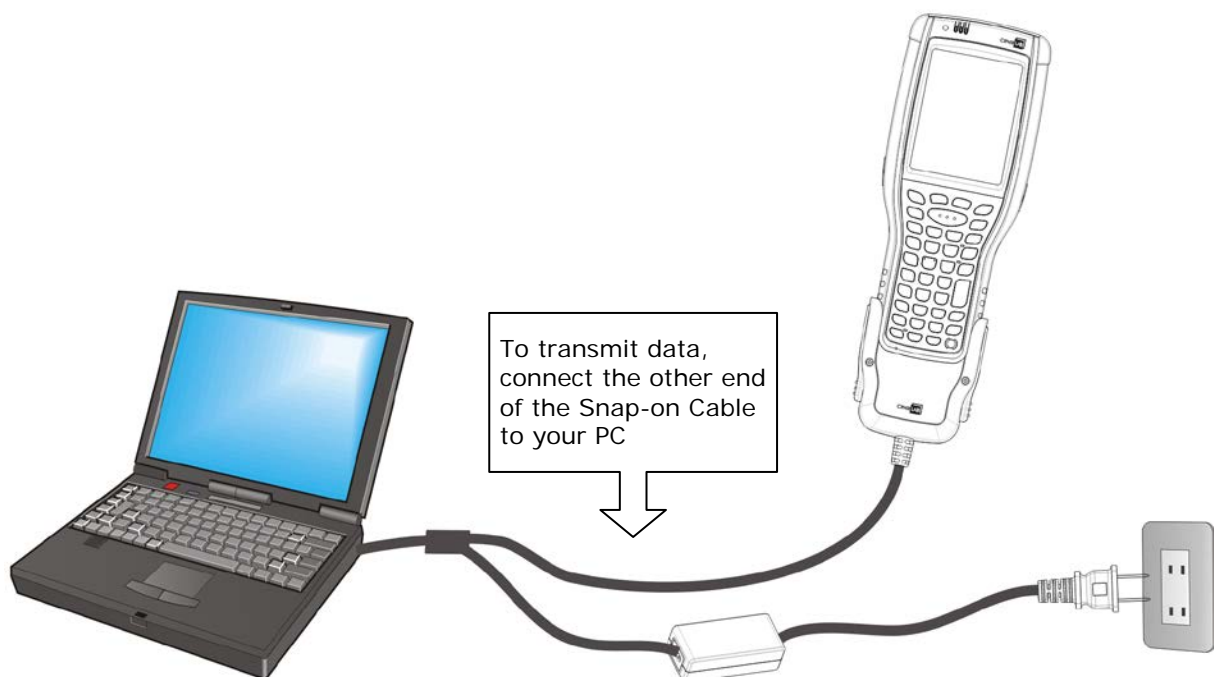


Figure 4: Direct Charging Using Snap-on Cable

SPECIFICATIONS

PLATFORM, PROCESSOR & MEMORY

Operating System & CPU

OS Version	Android™ 6.0, Marshmallow
CPU	Cortex A53 2.0 GHz Processor

Memory

RAM	2GB DDR SDRAM
Flash	16GB Flash ROM
Expansion Slot	One expansion slot, supports MicroSDHC up to 32GB

COMMUNICATIONS & DATA CAPTURE

Communications

USB Host/Client	USB 2.0
WPAN	Built-in module for Bluetooth version 2.1 + EDR Class II connectivity +BLE
WLAN	Built-in Cisco® CCX v4 certified module for 802.11 a/b/g/n/ac networking

Data & Image Capture

Barcode Reader	Ordering options include
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- STANDARD READER UNIT**
 - ▶ Laser (Symbol SE955)
 - ▶ 2D imager (Symbol SE4500)
- LARGE READER UNIT**
 - ▶ 2D imager with decoder board (Symbol SE4500+PL4507)
 - ▶ Extended range laser (Symbol SE1524)
 - ▶ Near/far 2D imager (Intermec EX25)

ELECTRICAL CHARACTERISTICS

Batteries

Main Battery Pack	Standard capacity battery: 3.7V, 3600 mAh Large capacity battery: 3.7V, 5400 mAh Rechargeable Li-ion battery Charging time: approximately 4 hours for standard battery / 6 hours for large capacity battery
Backup Battery	3.7V, 200 mAh Rechargeable NiMH battery (charged via main battery) Data retention for 30 minutes Charging time: approximately 36 hours

Power Adapter

Power Supply Cord for	Input	AC 100~240V, 50/60 Hz
Snap-on Cable	Output	DC 5V, 4A

Operating Time

Minimum 13 hours for standard capacity battery/19 hours for large capacity battery performing scanning once per 20 seconds, with LCD at 50% backlight and speaker on (at default volume) at 25°C, Bluetooth off and IEEE 802.11 a/b/g/n/ac on.

PHYSICAL CHARACTERISTICS

Color Tap Screen Display

Display	3.5" Transflective 65K Color TFT-LCD
Resolution	VGA 480 (W) x 640 (H)

Keypad

Layout	Numeric keypad (30-key), Numeric & Function keypad (38-key), or Alphanumeric keypad (53-key)
Backlight	White LED backlight for display and keypad

Notifications

Status LED	Three LEDs for showing scanning good read, radio connection status and battery charging status
Audio	<ul style="list-style-type: none">▶ Integrated with speaker and microphone▶ 2.5mm 4-ring headset jack▶ Bluetooth headset supported
Vibrator	0.45G force

Sensors

Built-in Sensors	G-sensor
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Enclosures

Materials	Plastic & metal
Dimensions	214 mm (L) x 87 mm (W) x 47 mm (H) with battery
Weight	447g with 3600mAh battery; 478g with 5400mAh battery

ENVIRONMENTAL CHARACTERISTICS

Temperature

Operating ^{Note}	-20 °C to 50 °C / -4°F to 122°F
Storage	-30 °C to 70 °C / -22°F to 158°F (without battery) -30 °C to 60 °C / -22°F to 140°F (with battery)
Charging	0 °C to 35 °C / 32°F to 95°F (with battery)

Humidity

Operating	5% to 95%, non-condensing (Max 60°C / 140°F)
Storage	5% to 95%, non-condensing (Max 60°C / 140°F)

Resistance

Impact Resistance	Multiple 1.8 m (5.9 ft.) drops to concrete, meets and exceeds applicable MIL-STD 810G specifications
Tumble Test	500 tumbles (1,000 drops) at 1 m (1.6 ft) and 1,000 tumbles (2,000 drops) at 0.5 m (0.8 ft.) per applicable IEC tumble specifications
Splash/Dust Resistance	IP65 per applicable IEC 60529 sealing specs
Electrostatic Discharge	± 15 kV air discharge, ± 8 kV direct/indirect contact discharge

Note: CipherLab will not be held responsible for the mobile computer's malfunction incurred by the operation outside operating temperature range.
