HANDHELD COMPUTER

DF10

USER'S GUIDE

BC

Revision History

Revision	Date	Changes	Author
1.0.0	2023/02/15	Initial Release	Annabelle Wu

Notice

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FCC (Federal Communications Commission) Regulatory Compliance

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.

FCC 47 CFR Part 15 Subpart B
FCC 47 CFR Part 15 Subpart C
FCC 47 CFR Part 15 Subpart E
FCC§2.1093 (SAR)

Note:

This device 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 device generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions, the device may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this device 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 device and receiver.
- Connect the device to 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.

Important:

Changes or modifications to this product not authorized by MilDef Crete could void the electromagnetic compatibility (EMC) and wireless compliance and negate your authority to operate the product.

In order to maintain compliance with FCC regulations, compliant peripheral devices and shielded cables must be used with this device.

Specific Absorption Rate (SAR) information:

This device meets the government's requirements for exposure to radio waves. The guidelines are based on standards that were developed by independent scientific organizations through periodic and thorough evaluation of scientific studies .The standards include a substantial safety margin designed to assure the safety of all persons regardless of age or health. FCC RF Exposure Information and Statement the SAR limit of USA (FCC) is 1.6 W/kg averaged over one gram of tissue.

Device types:

Device has also been tested against this SAR limit. This device was tested for typical body-worn operations with the product kept 0mm from the body. To maintain compliance with FCC RF exposure requirements, use accessories that maintain an 0 mm separation distance between the user's body and the product. The use of belt clips, holsters and similar accessories should not contain metallic components in its assembly. The use of accessories that do not satisfy these requirements may not comply with FCC RF exposure requirements, and should be avoided.

EU Declaration of Conformity

CE

The device is hereby confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to the Electromagnetic Compatibility Directive (2014/30/EU), Radio Equipment Directive (2014/53/EU), and Low Voltage Directive (2014/35/EU), if used for its intended use and that the following standards have been applied:

1. **Safety**

   Applied Standard(s):

2. **Health**

   Applied Standard(s):

3. **Radio Frequency Spectrum Usage**

   Applied Standard(s):

4. **Electromagnetic Compatibility Directive**

   Applied Standard(s):

UKCA

The device is hereby confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility Directive 2016, Radio Equipment Directive 2017, and UKCA-Electrical Equipment (Safety) Regulation 2016, if used for its intended use and that the following standards have been applied:

1. **Safety**

   Applied Standard(s):

2. **Health**

   Applied Standard(s):

3. **Radio Frequency Spectrum Usage**

   Applied Standard(s):

4. **Electromagnetic Compatibility Directive**

   Applied Standard(s):

Power Conservation

This device consumes less power compared to conventional consumer computers. The power consumption may be further reduced by properly configuring the Power Management Setup.

It is recommended that the power saving features be enabled even when not running with battery power. Power Management features can conserve power without degrading system performance.

Power Safety

There are specific power requirements for your device:

- Only use an approved AC Adapter designed for this device.
- There is a 3-prong grounded plug for the AC Adapter. The 3rd prong is an important mechanism for ensuring product safety. Please do not neglect the importance of this mechanism. If you are unable to access a compatible outlet, please hire a qualified electrician for the outlet installation.
- When unplugging the AC power cord, please make sure to disconnect the cord by pulling from the plug head instead of pulling from the wire to prevent wire damage.
- Make sure the power outlet and any other extension cord(s) you use can support the total current load of all the connected devices.
- Before cleaning the device, please make sure it is disconnected from any external power source.

Warning

Before any upgrade procedures, make sure the power is turned off, and all the cables are disconnected (including telephone lines). Also, it is advisable to remove your battery to prevent turning on the device from accidentally.

Battery Precautions

- Only use batteries designed for this device. Using incompatible battery types may cause explosion, leakage, or damage to the device.
- Do not remove the battery while the device is powered on.
- Do not continuously use a battery that has been dropped, or that appears damaged (e.g., bent or twisted) in any way. Even if the device is able to continuously work with a damaged battery, the circuit damage may occur and possibly cause a fire.
- Always use the charger designed for this device to recharge the battery. Incorrect recharging may cause the battery to explode.
- Do not try to service a battery by yourself. For battery service or replacement, please contact your service representatives.
- Please dispose of the damaged battery promptly and carefully. Explosion or leakage may occur, if the battery is exposed to fire, improperly handled, or discarded.

Notice:

For safety, charging will stop if the internal temperature of the battery is out of range (<10°C; >45°C). Please note that charging could have stopped before the ambient temperature reaching these boundaries because the internal temperature of the battery does not equal to the ambient temperature.

Battery Disposal & Caution

The product that you have purchased contains a rechargeable battery. The battery is recyclable. At the end of its service life, under various state and local laws, it may be illegal to dispose of this battery into the municipal waste stream. Check with your local solid waste authority for recycling options or proper disposal. The danger of explosion may possibly occur if the battery is incorrectly replaced. Replace only with the same or the equivalent battery recommended by the manufacturer. Discard the used battery according to the manufacturer's instructions.

Water Resistance

The device has an standard rating of IP67 under IEC standard 60529 (maximum depth of 1 meter up to 30 minutes) and was tested under controlled laboratory conditions. Although it has excellent protection, please do not use it as a diving equipment. Splash, water, and dust resistance are not permanent conditions when using the product continuously in extreme environments and resistance might decrease as a result of normal wear. Also, please do not disassemble any part of your device because it might damage the resistance of your device.

Environmental Information, Material Safety & Recycling

All materials used in the manufacturing of this equipment are recyclable or environmentally friendly. Please recycle the packing materials in accordance with local regulations at the end of the product's service life.

Notice:

- The equipment may contain an insignificant amount of hazardous substances to health and the environment below the control level.
- To avoid releasing such substances into the ecosystem and to minimize the pressure on the natural environment, reuse or recycle most of the materials in a safe way after the product’s service life is encouraged.
- For more information on the collection, reuse and recycle of materials, please consult local or regional waste administrations. You can also contact your dealer for more information on the environmental details of the equipment.
- The crossed-out wheeled bin symbol indicates that the product (electrical and electronic equipment) should not be treated as a municipal waste. Please refer to local regulations for the disposal instructions.

TABLE OF CONTENTS

Chapter 1 – Getting Started

Unpacking

The following components come with your handheld computer. If anything is missing or damaged, please notify the dealer immediately.

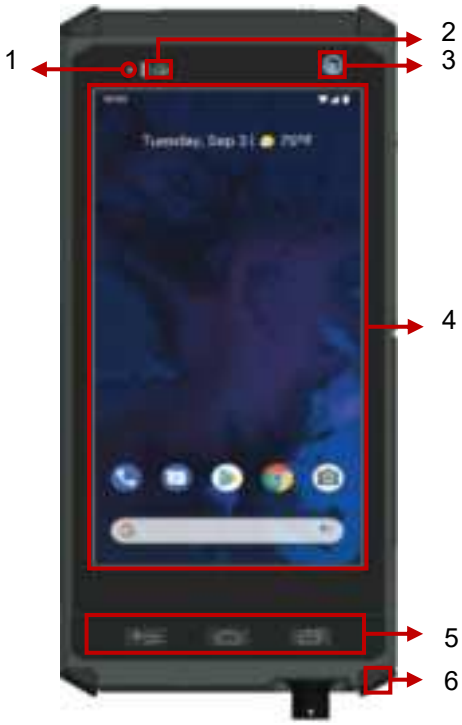
- Handheld Computer
- Rugged USB-C AC Adapter
- AC Power Cord
- Quick Guide

Note

- *The protective film attached on the screen is for shipping protection only. Please tear off the film before using to ensure that all of the functions can be operated normally.*

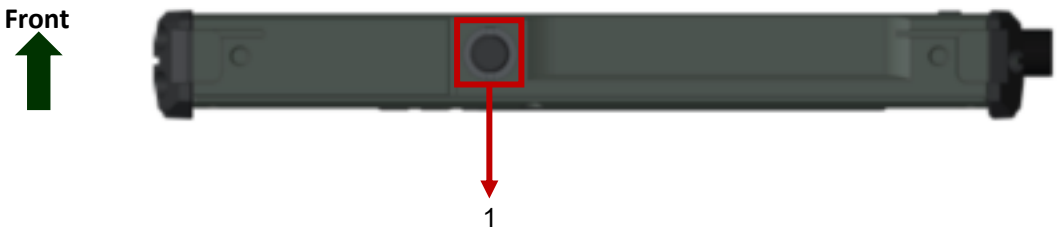
Appearance Overview

Front



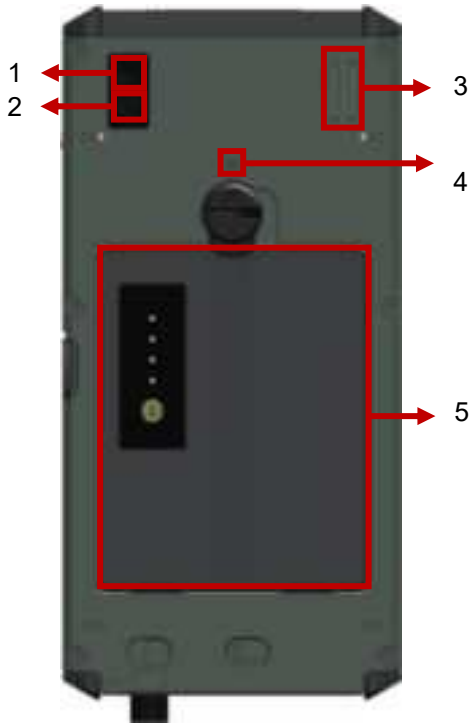
1. Charge Indicator x 1
2. Light Sensor
3. Front Camera x 1
4. Display
5. Function Keys x 3
6. Built-In Mic

Left



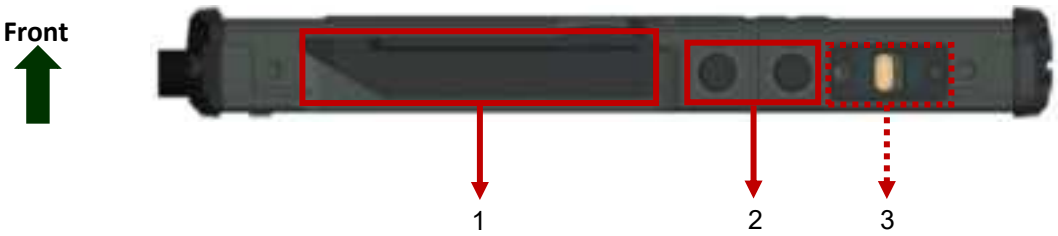
1. Power Button

Rear



1. Rear Camera x 1
2. Flash Light
3. Speaker
4. Bridge Battery Indicator x 1
5. Battery x 1

Right



1. Stylus Pen x 1
2. Volume Up/Down Button
3. Optional Invisible Mode Switch

Top

1. WLAN/BT/GNSS ANT

Bottom

1. USB 2.0 Type C Connector x 1
2. Optional Fischer Connector x 1
   (Choose for 1 Fischer Connector out of 5 signals)
   - USB 2.0 Host
   - MLAN
   - RS232
   - VGA
   - Audio

Mounting the Battery

How to Install a Battery

1. Mount the battery into the battery bay.
2. Tighten the battery lock with a coin or tool clockwise.

How to Remove or Replace a Battery

1. Unlock the battery lock with a coin or tool counterclockwise.
2. Remove and replace with a new battery
3. Tighten the battery lock with a coin or tool clockwise.

Using the MicroSD Card

A MicroSD Card Slot is designed beneath the battery bay on the rear side for storage expansion. It supports a maximum card capacity of 128GB with SD/ SDXC format.

How to Install & Remove a MicroSD Card

1. Unlock the battery lock counterclockwise and remove the battery.
2. Peel off the I/O board adhesive.
3. **Install**: Insert the SD card in the direction shown by the icon.

   Remove: Lightly press the card to slip out.
4. Stick back the I/O board adhesive.
5. Mount the battery back.
6. Tighten the battery lock clockwise.

How to Eject the MicroSD Card

To eject the card: Tap (Settings)→ (Storage) → (Eject)

Note

- *Eject the Micro SD card before removing it from the device.*
- *Please do not remove the card when the device is ON. Such action may cause data loss.*
- *Please do not attempt to force the card into the incompatible card slot, each card slot is specified for its respective card only.*

Chapter 2 – Operating Information

Workplace

A clean and moisture-free environment is preferred. Make room for air circulation. Remember to avoid areas from:

- Sudden or extreme changes in temperature.
- Extreme heat.
- Strong electromagnetic fields (near a television set, motor rotation area, etc.).
- Dust or high humidity.

If it is necessary to work in a hostile environment, please regularly maintain your workstation by cleaning dust, water, etc. to keep it in optimal condition.

Ruggedness

This handheld computer is designed with rugged features such as vibration, shock, dust, and rain/water protection. However, appropriate protection is still necessary while operating in harsh environments.

The device is also designed to withstand rainfall from the top with a mild wind blowing only. Please keep the handheld facing up, i.e., in common operating direction, to maintain water resistance. NEVER immerse the unit in water, or spray water at an upside-down system. Doing so may cause permanent damage.

All connectors could be corroded if being exposed to water or moisture. Corrosion would accelerate when the power is ON. Please take proper water-resistant measures for cable connections. The DC jack and cables are sealed and may be operated with water splashing while attached. All port covers should be in place when no cable is attached.

Power On

After the battery is securely mounted, press and hold the power button for approximately 3 seconds until the charge indicator lights orange or the display lights up. After turning on the power, the device will boot up with Android system.

Note

- *The device does not support power ON without a battery.*

Boot Up

When turning on the power, you will see “android” on the screen and the device will start to load the required boot up files and processes for operation. This start-up procedure is called “boot up”. The device requires approximately 30 seconds of Boot Up time before the OS is fully loaded.

After boot up, you will be presented with the desktop screen as below. You can create shortcuts of applications to the desktop, change the background wallpaper, and modify the display font size, etc.

Suspend Mode

Suspend Mode is an ideal state for the device when you wish to conserve battery life, need not stop wireless connectivity, and keep the device ready to resume back on a moment's notice. The device automatically suspends when it is not in use for 1 minute (default setting).

To Manually Enter Suspend Mode/ To Resume Operation

Press the power button to suspend the device or resume operation.

Shut Down

How to Power OFF

1. Press the power button and swipe up to unlock the device.
2. Press and hold the power button for approximately 3 seconds.
3. Tap (Power off) from the Power Option menu to turn OFF the power of the device.

How to Force Shut Down

In the event that the device hangs or stops responding, you can perform a force shut down by pressing and holding the power button for 8 seconds. Please note that any unsaved work or data will be lost this way.

Note

- *When losing power supply during operation (i.e., running out of battery), all unsaved work and data will be lost.*
- *When the device is OFF, all applications will be terminated, no wireless connection is established, and all unsaved data are lost.*
- *It is recommended to shut down the device when it is not in use for an extended period of time.*

Restart

How to Restart the Device

1. Press the power button and swipe up to unlock the device.
2. Press and hold the power button for approximately 3 seconds.
3. Tap  (Restart) from the Power Option menu to restart the device.

Screenshot

How to Make a Screenshot

1. Press the power button and swipe up to unlock the device.
2. Press and hold the power button for approximately 3 seconds.
3. Tap  (Screenshot) from the Power Option menu to screenshot.

Note

- *The screenshot image will be saved in ALBUM.*

Reset

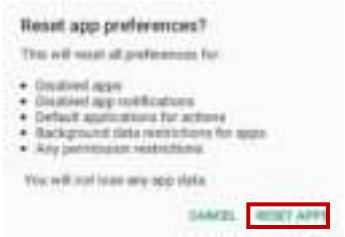
Reset is a process to restore the device to its initial state. Perform reset when encountering unsolved issues, or wish to erase settings and data.

How to Reset Network Setting

Tap (Settings) → (System) → (Advanced) → (Reset options) → Reset Wi-Fi, mobile & Bluetooth → RESET SETTINGS

How to Reset App Preferences

Tap (Settings) → (System) → (Advanced) → (Reset options) → Reset app preferences notification → RESET APPS



How to Perform Factory Reset

Tap (Settings) → (System) → (Advanced) → (Reset options) → Erase all data (factory reset) notification → Erase all data

Caution

- *Factory* reset will delete all data, files and apps in your device. Before performing the factory reset, you are advised to back up data and files you would like to keep.

Indicators

The device is designed with LED indicators and backlight keypads for easy and quick operations. The description of each LED indicators and function keys are for your operational reference.

LED Indicator	Description
Charge Indicator	- Lights Orange during charging. - Lights OFF when fully charged.
Bridging Battery Indicator	Lights Red only during low battery.

Function Key

Function Key	Description
	Return to previous page.
	Return to Home page.
	Show applications recently used.

Touchscreen

Equipped with a highly sensitive touch screen, you may navigate on the touch screen easily using the Stylus or your finger. A list of operating tips is provided below to help you operate the touch screen more effectively.

Operation	Description
Tap	- Single tap to open items such as application and select options. - Double tap an image to zoom in and out.
Drag	- Drag to move icons or select text and images.
Tap & Hold	- Tap and hold to show the actions available for that item.
Swipe	- Swipe to scroll through the Home screens or menu options. - Swipe up to unlock the device and to enter All Apps Screen. - Swipe down for Quick Settings Menu

Quick Settings Menu

You can find and change your settings with Quick Settings Menu.

How to Find All Quick Settings

- Quick Settings Menu → Swipe down again

How to Enable/ Disable a Function

- Tap the icon to turn ON/OFF the function.
- Tap and hold the icon to get more options.
- Drag the brightness bar for your preferences.

How to Add/ Remove a Setting

1. Quick Settings Menu → Swipe down again
2. Tap  (Edit) → Tap an hold the icon for your preferences
   - Drag the icon from “HOLD AND DRAG TO ADD TITLES” to "HOLD AND DRAG TO REARRANGE TITLES” to add a setting.
   - Drag the icon from "HOLD AND DRAG TO REARRANGE TITLES” to “DRAG HERE TO REMOVE” to remove a setting.

Adaptive Brightness

How to Adjust Brightness

- Tap (Settings) → (Display) → Brightness level → Drag the brightness bar for your preferences, or

- Quick Settings Menu → Swipe down again → Drag the brightness bar for your preferences

How to Enable Adaptive Brightness

- When Adaptive brightness function is ON, light sensor detects the ambient light and automatically adjust to the environment and activities.

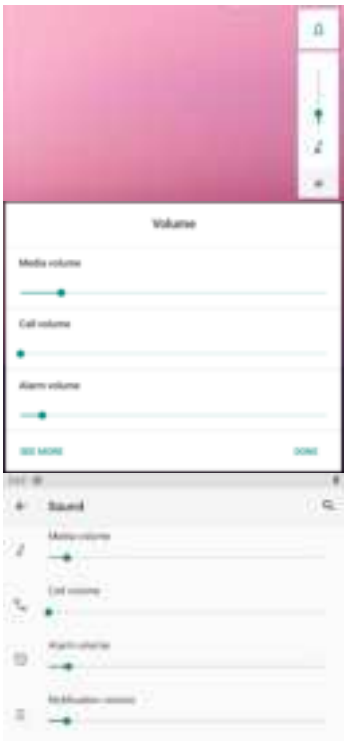
- Tap (Settings) → (Display) → Adaptive brightness → Enable

Note

➢ *The range of brightness is from 640 to 720 nits.*

Volume

How to Adjust Volume



- Press volume buttons → Adjust (Media) volume, or
- Press volume buttons → (Volume) → Drag the volume bars for your preferences, or
- Tap (Settings) → (Sound) → Drag the volume bars for your preferences

WLAN

WLAN, supporting IEEE 802.11 a/b/g/n/ac, allows the device to wirelessly connect to the Internet. Please follow the instructions below to set up the connection.

How to Enable WLAN

- Tap (Settings) → (Network & internet) → (WLAN) → Enable → Choose WLAN for your preferences → Enter passwords for the secured network

How to Enable Ethernet

- Tap (Settings) → (Network & internet) → (Ethernet) → Enable

How to Enable Hotspot

- Tap (Settings) → (Network & internet) → (Tethering) → Enable

Note

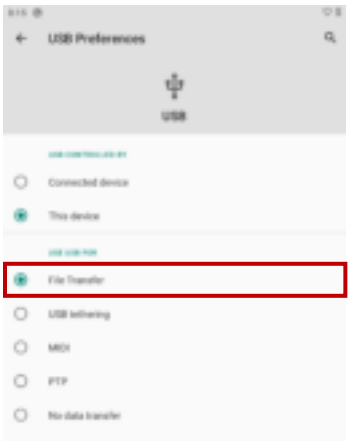
➢ *Please move the device closer to the access point if the connection quality is poor.*

USB

The device supports USB OTG to connect to another device via the USB for data transfer. Please follow the instructions below to set up the connection.

How to Transfer Files

1. Connect the device to a device with a USB-C cable.
2. Tap (Settings) → (Connected devices) → (USB) → File Transfer



Note

- *Battery remaining capacity is suggested to be at least 30% when using USB connection to transfer data and files.*

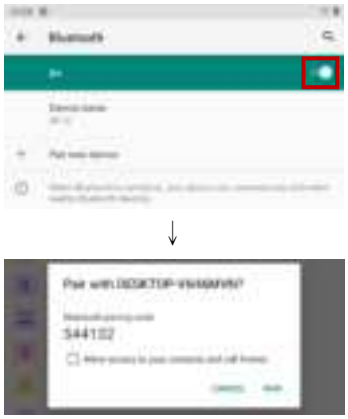
BT

BT allows the device to provide a short-range wireless communication protocol to connect to other devices. The device supports BT4.1 and it is also backward compatible.

Please follow the instructions below to set up the connection.

How to Enable BT and Pair a Device

1. Tap (Settings) → (Connected device) → (Pair new device).
2. Pair the device for your preferences.
3. Tap PAIR to communicate with the other device.



Note

- *Please make sure that the device you'd like to connect is discoverable. Otherwise, it will not show on the available device list.*
- *Please move the device closer to the device-to-pair if the connection quality is poor.*

Hot Swapping the Battery

To hot swap the battery

1. Check the power supply.

   -Whether the AC Adapter is attached;

   -Whether the bridge battery indicator lights OFF.
2. Loosen the battery locks counterclockwise.
3. Remove and replace the battery.
4. Fasten the battery locks clockwise.

Note

- *The replacement of battery should be avoided if the bridging battery indicator lights red.*

  Hot swapping should be completed within 2 minutes. The device will automatically shut down and unsaved data might be lost if the swapping time exceeds 2 minutes.

Connecting the USB-C AC Adapter

To connect with the USB-C AC Adapter

1. Plug the AC cord to the Adapter.
2. Plug the other end of the AC cord into the electrical outlet.
3. Attach the USB-C Jack into the charging port of the device firmly.
4. Fix the thumb screws clockwise.

Note

- *To ensure system stability, please connect your device to an external power source when operating at -20℃ ambient temperature.*
- *The AC Adapter's indicator lights green when the AC power is attached.*
- *For the device without batteries, Boot Up is recommended after the device is attached to the Power Adapter for approximately 3 seconds, so to ensure the power has been delivered to the device.*
- *Please refer to Chapter 3 for the detailed information on AC Adapter and Battery Pack.*

Chapter 3 – Managing Power

Rugged 60W USB-C AC Adapter

The AC Adapter automatically detects the AC line voltage (110V or 220V) and adjusts accordingly. It serves to power the device from an external AC source and charges the mounted battery.

Recommendations for the AC Adapter

- Use a properly grounded AC outlet.
- Use one AC outlet exclusively for the device. Having other appliances on the same line may cause interference.
- Use a power strip with built-in surge protection.

Battery

Battery Duration

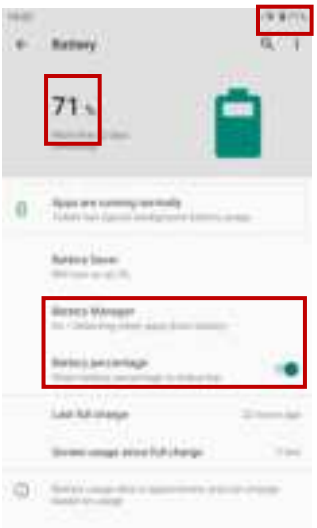
Device	Battery Life
When power is ON	● Approximately 6 hours with 100% battery equipped. ● The operating time depends on how and where the device is applied. Playing multimedia, setting backlight brightness high, and utilizing the device in a low temperature environment may be considerably power-consuming.
When power is OFF	● Approximately 180 days with 100% battery equipped. ● Though Shutdown Mode is designed, It is still suggested that the battery be charged every 3 months so to avoid over discharging.

Battery Percentage & Level

The power source will automatically switch to battery when the external power source is disconnected. You may check battery status from the status bar, settings or via the LED indicators on the battery. Each indicator corresponds to 25% battery level.

- **Settings**

  Tap (Settings) → (Battery)



Note

- *Enable **Battery Manager** to detect when application drains the battery.*
- *Enable **Battery Percentage** to show in status bar.*

- **LED Indicator on Battery**

Indicator (Bottom Upwards)	Battery Percentage
1	<25%
2	25% ~ 50%
3	50% ~ 75%
4	>75%

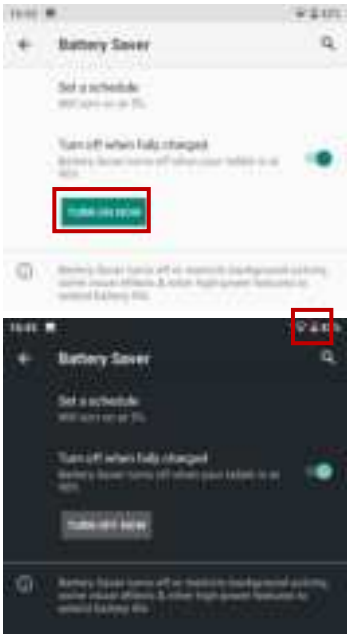
Note

- *Press the to show the battery indicator.*
- *The battery gauge is for reference only. Please do not expect it to show the exact amount of the power remaining. There is no memory effect on Lithium-Ion battery cells. However, discharge the battery to nearly empty every month will help to calibrate the internal gauge.*

Power Saving Tips

Please follow the instructions below to extend the battery life.

- **How to Enable Battery Saver**



1. Tap (Settings) → (Battery) → Battery Saver → TURN ON NOW, or

2. Tap (Settings) → (Battery) → Battery Saver → Set a schedule → Based on percentage → Drag the percentage bar for your preferences.

> ***Note***
>
> ➢ *When enabling **Battery Saver**, the device will turn into dark mode, and show at the status bar*

- Lower the intensity of the display in brightness control.
- Suspend the device (by Power button) when it is temporarily not in use.
- Turn off the device when it will not in used for a period of time.

Battery Low

When the battery is nearly exhausted, the device gives the following "Battery Low" warnings:

- Windows battery low warning.
- The Bridge Battery Indicator lights red.

Once "Battery Low" warnings occur, please follow the instructions below to avoid data loss.

- Save and close the files you are currently working on.
- Plug the AC Adapter to charge the battery.
- Replace with a fully charged one.

> ***Caution***
>
> *When battery capacity is very low, your device will shut down automatically and any unsaved data might be lost.*

Battery Charging & Discharging

Plug in the AC Adapter to start the battery charging, and the charge indicator lights orange when the battery is charging. If the battery charging is completed, the indicator will automatically light OFF, and the sense circuitry will stop high current charge within several minutes.

Battery Charging Time

Charging Time		DF10 (With Battery x 1)
AC Adapter	System ON	2.5 hours
	System OFF	2.5 hours

Note

- *The battery will not be charged if an incompatible AC adapter is chosen.*
- *For safety reasons, battery charging will spontaneously stop if high temperature (around 45℃) occurs.*

Battery Recalibration

Battery recalibration allows a user to calibrate the GAUGE IC parameter of the battery pack. When the battery stays fully charged or in a low charge state for a long period of time, it causes the battery gauge to have some minor discrepancies. Therefore, users are recommended to carry out battery recalibration to ensure the accuracy of battery GAUGE IC. To perform battery recalibration, please follow the steps below:

1. Update BIOS & EC to the latest version.
2. Mount the battery to the device, and connect it to the AC Adapter.
3. Enter the BIOS → Choose “Advanced menu” → Choose “Battery Recalibration” → Press “Enter”.
4. When the “Start Battery Recalibration” pop-up appears, press “Yes” to continue. (Before running the battery calibration, please make sure that the battery level must be LOWER than 95%; otherwise, the calibration cannot work.)
5. The recalibration is now processing. You can see the following recalibration status on the screen:
   - Calibration Frequency: How many times the calibration is processed
   - Battery Capacity: Current battery capacity
   - Battery Charge Mode: Charge/ Discharge
   - Battery Learning Mode: Normal (charge)/ Learn (discharge)
6. A pop-up appears when the calibration has completed. Then, click “OK”.
7. Press “Yes” to reboot the device when “Reset Without Saving” pop-up appears.

Note

- *Neither turn off the LCD nor the remove AC adapter during the calibration.*
- *Each cycle of recalibration process indicates “Charge to Full → Start Learn Mode → Discharge → Complete Learn Mode → Charge to Full”. It will take approx. eight hours to complete a cycle.*
- *It requires five cycles to complete the battery recalibration. Then the recalibration will stop automatically.*
- *If you want to terminate the calibration, simply shut down the device by pressing the Power Button; or, restart the device via the external keyboard by pressing "CTRL+ALT+DEL".*

Battery Shutdown Mode

The battery is designed with Shutdown Mode and it will automatically enter this mode to prolong its storage time and to avoid itself from over-discharging. Shutdown Mode will be activated under the below two situations.

- When the battery itself is not in use for over 15 days
- When the device with batteries is OFF.

The battery in Shutdown Mode may sustain for approximately 180 days. To deactivate Shutdown Mode, please connect battery to the device and then to the AC Adapter. The charge indicator lights orange means the deactivation of Shutdown Mode has completed.

Battery Storage Recommendations

Battery power will decrease gradually in storage. Self-discharge rate of rechargeable batteries is approximately 1% per day; however, this rate may vary according to the storage environment. High humidity and high temperature accelerate discharge, while very low temperature may “freeze” the battery chemicals thus decrease the capacity. The following are guidelines for battery maintenance:

- The battery should be removed if the device will not be used for a long period of time (approximately one month).
- The battery should have 50% charge remaining before it is removed from the device and be stored separately.

  The battery should be recharged to 50% according to the different storage temperatures below so to prevent from damages because of over-discharging.

Storage Temperature	Battery Charging Frequency
-20°C ~ +20°C	Every 6 months
-20°C ~ +45°C	Every 3 months
-20°C ~ +60°C	Every month

- The battery without using for more than 2 years may result in battery aging and it is not recommended to use.

Chapter 4 – Specifications

Operating System

Android™ 10

Processor

MediaTek MT8365

- Quad Core Arm® 2.0 GHz Cortex-A53 MPCore™
- 32KB L1 I-Cache and 32KB L1 D-Cache
- 512KB L2 Cache
- ARM® TrustZone® Security
- Supports USB2.0, SPI, UART, and I2C
- Core Voltage: 0.65V/0.7V/0.8V

Memory

- 3GB SDRAM
- LPDDR4
- 2133MHz
- -25°C ~ 85°C

Storage

ROM

- 128GB
- With eMMC
- Industrial Grade (-40°C ~ 85°C)

External MicroSD Card Slot

- Max. 128GB
- SD/SDXC supported

Graphics

MediaTek Mali-G52 3EEE MC1

- OpenGL ES 3.2/2.0/1.1

Embedded Controller

Microchip MEC1705Q

- SMBus Controller
- Interrupt Controller
- External GPIO Controller
- Flash Interface
- KBC Interface
- PS/2 Interface
- SPI Slave Interface

Display

- 5.7” LCD
- Resistive Multi-Touch Screen
- Optical Bonding
- Resolution : 720 x 1280 pixels
- Viewing Area (H x V) : 108 x 64.8 mm
- Dot Size (H x V) : 0.045 x 0.135 mm
- Contrast Ratio : 300
- Brightness (min ~ typ.) : with AMR 640 ~ 720 nits
  With AMR-MESH
- Viewing Angle : Vertical Top 45°; Bottom 55°
  Horizontal Left 60°; Right 60°
- Color : 16.7M
- Backlight : LED
- Interface : USB
- Surface Hardness : ≧ 3H
- Transmission : ≧ 74%

Note

- *Optional Invisible Mode On/Off controls all light sources on/off, including LCD backlight, LED Indicators, and Keypad backlight.*

Keypad

- Power button (front side)
- Membrane Function Keys with LED Backlight

Battery Pack

BDFA1A

- Lithium-Ion Rechargeable Battery
- Capacity : 2500 mAh
- Nominal Voltage Output : 7.2 V
- Maximum Charge Voltage : 8.4 V
- Voltage at End Discharge : 6.0 V
- Suggestion Charge Current : 2.0 A
- Suggest Continuous Discharge Current : 2.0 A
- Suggestion Maximum Discharge Current : 5.0 A
- End of charge condition : 220 mA
- Operating Temperature :(Charge) 10 ~ 45ºC
  :(Discharge) -30 ~ 60ºC
- Dimension (L x D x H) : 85 x 54.5 x 23.7 mm
- Weight : approximately 125 g

Rugged 60W USB-C AC Adapter

- Input : 100-240V, 50/60 Hz
- Output : 20V/3A
- Maximum Power : 60 Watts
- Power Delivery 3.0 supported
- Dimensions (L x D x H) : TBD mm
- Weight : TBD g

Certification

CE, FCC, UKCA, WEEE, REACH, RoHS2.0, IP65, Optional IP67, MIL-STD-810H, MIL-STD-461G, Optional G.A.

Case

- CNC milled Aluminum
- Color: NATO Green

Environment Specifications

- Operating Temperature : Standard: -20°C ~ +60°C
  : Optional : -30°C ~ +60°C
- Storage Temperature : - 40°C ~ +70°C

Dimensions & Weight

- Dimensions (L x W x H): 182 x 90 x 20 mm
- Weight: 480 g

Note

- *Weight is with Battery x 1, but without any option, and it varies depending on system configurations.*

Materials & Recycling

Plastic case	: Recyclable UL grade PC + ABS GE C2800 or C6200
Magnesium case	: AL6061T6
Button	: PET + Rubber
Bumper	: Silicone Rubber, TPU
PCB	: FR-4
Battery	: Rechargeable Lithium Ion
	(Electrochemistry system: LiCoO2+C=Li1-XCoO2+CLiX)
Packing	: Carton - Recycled/Recyclable Paper (Unbleached)
	Carrying Bag - Recyclable PE Fiber
	Quick Guide - Recycled/Recyclable Paper

Please recycle the parts according to local regulations.

MLAN Controller

SMSC LAN9514

- Four downstream ports, one upstream port
- Integrated 10/100 Ethernet MAC with full-duplex support
- Integrated 10/100 Ethernet PHY with HP Auto-MDIX
- Implements Reduced Power Operating Modes
- Minimized BOM Cost

Chapter 5– Optional Devices

Communication

MediaTek MT6631

WLAN

- IEEE 802.11 a/b/g/n/ac
- 2.4GHz/5GHz

BT

- BT 4.1 or 5.0
- 2.4GHz

GNSS

- GPS/ Glonass/ Beidou/ Galileo/ QZSS supported
- 1.575GHz

AZUREWAVE AW-NB177NF

- IEEE 802.11b/g/n radio — virtual simultaneous operation
- It also supports 20 and 40 MHz channels, allowing for PHY Layer throughput up to 150 Mbps
- SDIO interface
- Security–WEP, WPA/WPA2
- 802.11e QoS Enhancement (WMM)

GNSS Module (Optional)

u-blox NEO-M8N

- Tracking & Nav. sensitivity: -167dBm
- Antenna: Dual frequency (Receives GPS and GLONASS signals concurrently)
- Signal frequency:
- GPS: L1 1575.42 MHz
- GLONASS: L1 1602 MHz + k*562.5 kHz, where k is the satellite's frequency channel number (k = – 7,..., 5, 6).
- NEO-M8N can be configured to receive any single GNSS constellation or within the set of permissible combinations.

Camera

Front Camera: KLT JAL-KG7-V3F V4.2

- Fixed focus @ 60 cm
- Pixel: 2592 x 1944
- Interface: MIPI
- 1.4 µm x 1.4 µm pixel with OmniBSI+™ technology
- (High sensitivity, low crosstalk, and low noise)
- Optical size of 1/4"
- Automatic Image control functions:
  - Automatic exposure control (AEC)
  - Automatic gain control (AGC)
  - Automatic white balance (AWB)
  - Automatic black level calibration (ABLC)

Rear Camera: KLT KLT-J1MF-IMX214 V1.0

- Fixed focus @ 40 cm
- Pixel: 4224 x 3136
- Interface: MIPI
- With Exmor RS™ technology (High sensitivity, low noise, and high speed)
- Output video format of RAW10/8, COMP8/6

Sensor

L3GD20

- MEMS motion sensor: three-axis digital output gyroscope
- Interface: I^2C
- Embedded power down and sleep mode
- Embedded temperature sensor

LSM303DLHC

- Ultra-compact high performance e-compass 3D accelerometer and 3D magnetometer module
- Interface: I^2C
- Power-down and low-power mode
- 2 independent programmable interrupt generators for free-fall and motion detection
- Embedded temperature sensor

TDK MPU-6050

- MotionTracking device that combines a 3-axis gyroscope, 3-axis accelerometer, and a Digital Motion Processor™
- Interface: I^2C

Chapter 6 – Maintenance & Service

Cleaning

ALWAYS turn OFF the power, unplug the power cord and remove the battery before cleaning. The exterior of the system and display may be wiped with a clean, soft, and lint-free cloth. If there is difficulty removing dirt, apply non-ammonia, non-alcohol based glass cleaner to the cloth and wipe.

An air gun is recommended for cleaning water and dust. For salty water please clean with fresh water then blow-dry with an air gun.

Troubleshooting

Should the device fail to function properly, follow the troubleshooting steps below.

Power Problems

- **When I turn on the device, it does not respond.**
  - If you are using battery power, check if the battery is charged
  - If you are using AC power, ensure that the connection of AC Adapter is correct.

- **I cannot return from Suspend while on battery power**
  - The battery might be drained. Please attach the device to the AC power.
  - Hard reset the device by pressing the power button for 4 seconds.

Networking Problems

- **I cannot connect to a wireless WLAN network**

  Please ensure that:
  - The device is within the range of a wireless access point.
  - Check if the WLAN has been turned on.

- **I cannot connect to another device with BT network**

  Please ensure that:
  - Both devices have BT turned on.
  - The distance between the two devices is not over 10 meters/ 32 feet and that there are no large obstructions between the devices.
  - Both devices are compatible.

- **I cannot connect to a mobile broadband network**

  Do the following:
  - Check if GNSS has been turned on.
  - If you are outdoors, please move away from buildings or obstructions, and expose the device to open sky.
  - If you are indoors, please move closer to a window.

RMA & E-RMA Service

If troubleshooting solutions are unsuccessful, consult your dealer for RMA.

Shipping instructions

1. Remove any personal add-on devices or other media.
2. Use the original shipping container and packing materials, if possible.
3. If the original packing materials are not available, wrap the equipment with soft material (e.g., PU/PE form) then put the wrapped equipment into a hard cardboard shipping box.
4. Include a sheet with the following information: (Note: Please keep a copy of this sheet for your records.)
   - Name
   - Address
   - Unit serial number
   - Place and date of purchase or the original invoice number
   - Date of failure
   - A DETAILED description of the problems you have encountered including: The operating system, the add-on device installed (if any), the application software, the failure phenomenon, etc.
   - A list of the hardware/software configuration, if applicable.
5. Clearly mark the outside of the shipping box with the RMA #. If an RMA # is not present on the shipping box, receiving will be unable to identify it and it might be returned.
6. Unless prior arrangements have been made, the customer is responsible for all shipping costs. Unauthorized use of the company's shipping accounts is not permitted.

E-RMA

Instructions

1. Contact your dealer and provide users' names and passwords for authorization to E-RMA service.
2. Login E-RMA service platform

   Instructions: **Crete's website** www.mildef.com.tw → **SERVICE/SUPPORT menu → E-RMA**

3. Fill out the RMA Request Form to apply for an RMA number.

   *Please follow the instruction below for RMA Form Example:

   SERVICE/SUPPORT menu => E-RMA => Category => RMA Form Example
4. Check the status on the website after you receive the issued number.

Status descriptions

Status	Description
Approved	RMA number has been issued.
RCV	The device is received.
CHK	The device is in check.
REP	The device is in repair.
RPD	The device has been repaired.
FQC	The device is in function testing.
SHP	The device has been shipped.