# *HANDHELD COMPUTER*

# *DH8*

# *USER'S GUIDE*

BC

## Revision History

| Revision | Date | Changes | Author |
|---|---|---|---|
| 1.0.5 | 2025/07/09 | Update Notice info.<br>Update Getting Started info.<br>Update Operating info.<br>Update Shutdown Mode info.<br>Update Specification info.: Memory, Environmental Specifications | Annabelle Wu |
| 1.0.4 | 2023/08/24 | Update Specifications info.: Case and Certifications<br>Correct e-RMA info.: MilDef Crete's Website | Annabelle Wu |
| 1.0.3 | 2023/07/17 | Update Power info.: Rugged 60 W USB-C AC Adapter<br>Update Power info.: Battery Pack (BDH82A)<br>Update Certification info.: Add RCM | Annabelle Wu |
| 1.0.2 | 2023/06/27 | Update Trademark info.<br>Add Unpacking info.<br>Change "BT" to "Bluetooth®" | Annabelle Wu |
| 1.0.1 | 2023/01/05 | Correct Specifications: Materials and Recycling info.<br>Correct Appearance Overview: Rear Diagram<br>Correct Operating Information: RF Device Control Panel Diagram<br>Correct Operating Information: Hot Swapping the Battery Diagram<br>Correct Battery Percentage & Level: LED Indicator Diagram<br>Correct BIOS Setup: RF Device Control Diagram | Annabelle Wu |
| 1.0.0 | 2022/11/18 | Initial Release | Annabelle Wu |

## Notice

***Important:***

- *Please read the entire User's Guide before using the handheld.*
- *Please pay more attention when you see these notices:*
  - ***Warning:*** *Failure to follow instruction may cause in personal injury or death.*
  - ***Caution:*** *Failure to follow instruction may cause damage to handheld or equipment.*
  - ***Note:*** *It reminds the user of certain instructions.*

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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.

**Radiation Exposure Statement:**

This device meets the government's requirements for exposure to radio waves. This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission of the U.S. Government.

The exposure standard for wireless devices employing a unit of measurement is known as the Specific Absorption Rate, or SAR. The SAR limit set by the FCC is 1.6W/kg
RF exposure warning

**Regulatory Information/ Disclaimers:**

Installation and use of this device must be in strict accordance with the instructions included in the user documentation provided with the product. Any changes or modifications (including the antennas) made to this device that is not expressly approved by the manufacturer may void the user's authority to operate the device.

The manufacturer is not responsible for any radio or television interference caused by unauthorized modification of this device, or the substitution of the connecting cables and equipment other than the manufacturer specified. It is the responsibility of the user to correct any interference caused by such unauthorized modification, substitution or attachment. The manufacturer and its authorized resellers or distributors will assume no liability for any damage or violation of government regulations arising from failing to comply with these guidelines.

## 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):

   EN 62368-1: 2020+A11:2020

2. **Health**

   Applied Standard(s):

   EN 62311 : 2020
   EN 50332-2: 2013

3. **Radio Frequency Spectrum Usage**

   Applied Standard(s):

   EN 300 328 V2.2.2 (2019-07)

   EN 301 893 V2.1.1 (2017-05)

   EN 303 413 V1.2.1 (2021-04)

4. **Electromagnetic Compatibility Directive**

   Applied Standard(s):

   EN 55032: 2015+A11:2020 Class B

   EN 61000-3-2: 2019+A1:2021 Class D
   EN 61000-3-3: 2013+A1:2019
   EN 55035: 2017+A11:2020

   ETSI EN 301 489-1 V2.2.3 (2019-11)

   ETSI EN 301 489-17 V3.2.4 (2020-09)

   ETSI EN 301 489-19 V2.2.0 (2020-09)

## 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):
   BS EN 62368-1: 2020+A11:2020

2. **Health**
   Applied Standard(s):
   BS EN 62311 : 2020

3. **Radio Frequency Spectrum Usage**
   Applied Standard(s):
   ETSI EN 300 328 V2.2.2 (2019-07)
   ETSI EN 301 893 V2.1.1 (2017-05)
   ETSI EN 300 413 V1.2.1 (2021-04)

4. **Electromagnetic Compatibility Directive**
   Applied Standard(s):
   BS EN 55032: 2015+A11:2020 Class B
   BS EN 61000-3-2: 2019+A1:2021 Class D
   BS EN 61000-3-3 (2013+A1:2019)
   BS EN 55035: 2017+A11:2020
   ETSI EN 301 489-1 V2.2.3 (2019-11)
   ETSI EN 301 489-17 V3.2.4 (2020-09)
   ETSI EN 301 489-19 V2.2.0 (2020-09)

## Power Conservation

This handheld consumes less power compared to conventional consumer computers. The power consumption may be further reduced by a proper configuration of the Power Management Setup.

It is recommended to enable the power-saving features even when not running with battery power. Power Management features can conserve power usage without degrading system performance.

## Power Safety

***Warning:***

- *To avoid injury, read **Power Safety** and **Battery Precautions** before using the handheld.*
- *Before any upgrade procedures, make sure to turn off the power and disconnect all cables (including telephone lines). Also, it is recommended that you remove the battery to prevent accidentally turning on the handheld.*

There are specific power requirements for your device:

- Only use an approved AC Adapter designed for this handheld.
- 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 handheld, please make sure it is disconnected from any external power source.

## Battery Precautions

- Only use batteries designed for this handheld. Using incompatible battery types may cause explosion, leakage, or damage to the handheld.
- Do not remove the battery while the handheld 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 handheld 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 handheld to recharge the battery. Incorrect recharging may cause the battery to explode.
- Do not attempt 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.

***Note:***

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

## Water Resistance

The device has an optional 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.

***Note***

- *Standard handheld has been tested and complied with IP65 before shipping. If the handheld has been disassembled, it will no longer comply with IP65.*
- *IP65 is tested without I/O caps.*
- *IP657 is not compliant when the I/O ports are attached with external connectors.*
- *The above criteria applied to optional IP67.*

## 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 handheld 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.

***Note:***

➢ *This product contains battery. At the end of the product's service life, the handheld and battery should be disposed separately from household waste. The disposal should be in accordance with the local environmental laws and guidelines.*

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# Chapter 1 – Getting Started

## Unpacking

**Caution:**

- *Fully charge the battery before using it for the first time.*
- *Make sure that the battery is installed or the handheld is connected to AC power.*
- *Safety instructions are provided in related sections throughout the User's Guide. Please read through the manual and any accompanying documents before starting to use the product.*

The following components come with your handheld and may vary by configuration if there is any missing or damaged, please notify your sales representative immediately.

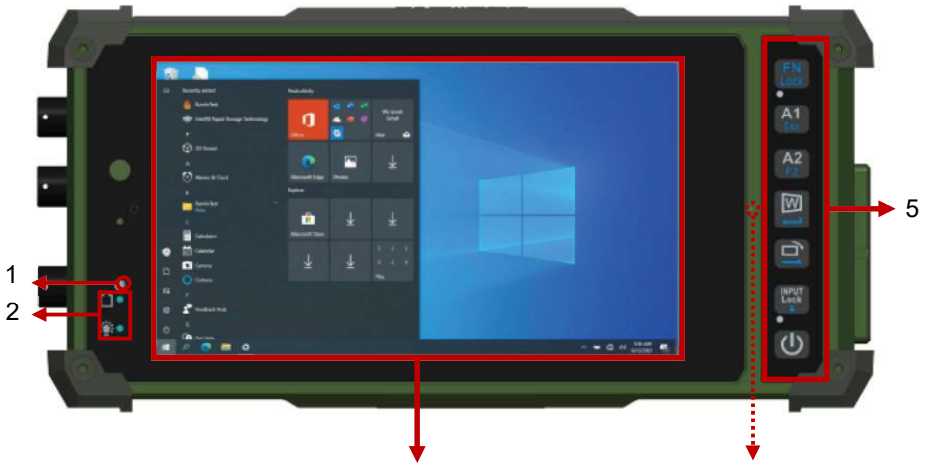
- Handheld Computer Unit
- Rugged USB-C AC Adapter
- AC Power Cord
- Quick Guide


**Note:**

- *Specifications may vary by configuration and availability.*

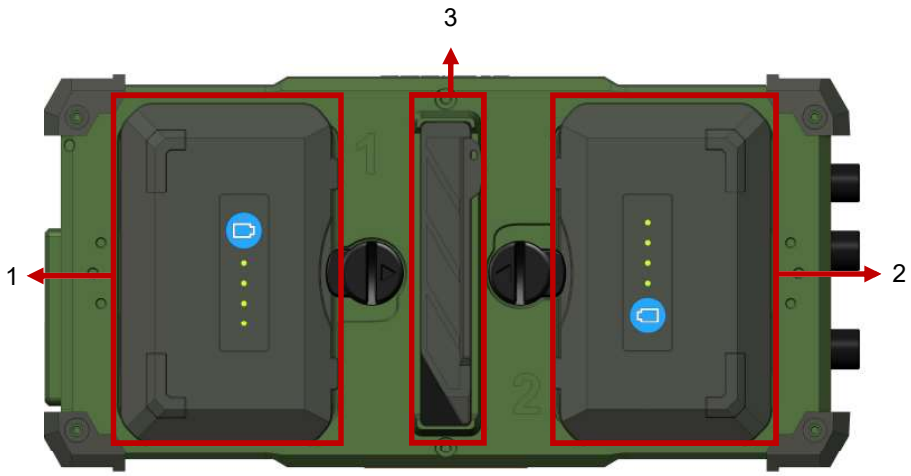
## Appearance Overview

### Front



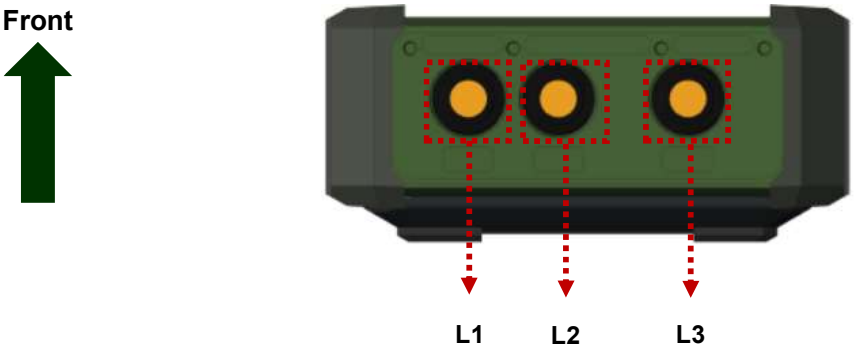

1. Light Sensor
2. LED Indicators
3. Display
4. Optional Embedded Digital Mic
5. Keypads

### Rear




1. Primary Battery x 1
2. Secondary Battery x 1
3. Stylus Pen x 1

## Left




1. L1~L3*: Optional Fischer I/O x 3
   Choose for 3 Fischer Connectors out of 4 signals; non-repeatable
   - USB 2.0
   - Audio
   - GLAN
   - COM**

   **BIOS selectable: RS232/ RS422/RS485; default: RS232

   *L3: Trade-off with Optional Invisible Mode Switch

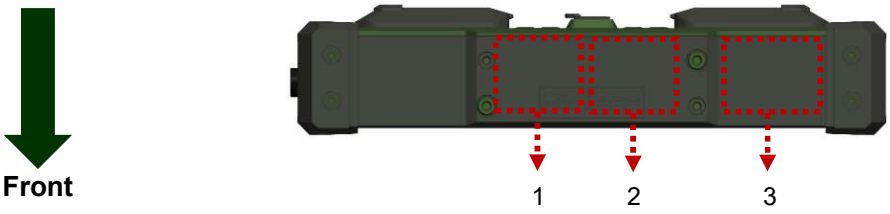
***Note***

➢ *Fischer Options from L1 to L3: USB 2.0→Audio→GLAN→COM.*

## Right

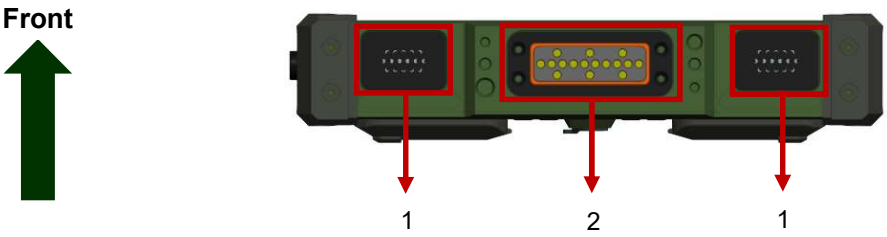

1. USB 3.2 Gen.2 Type-C x 1

## Top




1. Optional WLAN/Bluetooth® Main ANT
2. Optional GNSS ANT
3. Optional WLAN Aux. ANT

## Bottom




1. Speaker
2. Docklite Connector (16 pin POGO)

# 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 handheld by cleaning dust, water, etc. to keep it in optimal condition.

## Ruggedness

This handheld device 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 handheld 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.

## Installing Operating System

The device is designed to operate with Microsoft Windows 10/ Windows 11 64-bit Operating System. Please connect your device to an external USB-interface drive to start the OS installation.

***Note***

- *A USB external device may be required during installation to connect with an external USB-interface ODD, as the System USB port may not supply enough power. Please attach the USB hub with an extra power supply to complete the installation.*
- *Though Intel IOTG has not yet announced to support Windows 11 LTSC, in-house Windows 11 tests have been done and confirmed passed.*

## Boot Up & POST

The standard operating procedure to turn on your handheld is via the power button. Press and hold the power button (approximately 3 seconds) until it beeps. The handheld will boot up and start with the Operating System (OS) installed.

### Boot Up

By pressing and holding the power button, the handheld will turn on and load the Operating System (OS) into the system memory. This start-up procedure called as “boot up”.

### Power ON Self-Test (POST)

Each time the handheld turned on, the BIOS will automatically perform a self-test of its memory and hardware devices.

## Shut Down

### Shut down

Directly click (Shut down) from your OS to turn OFF the power. Before shutting down, remember to save any unfinished works and close the applications to prevent your SSD from suffering possible data loss or damage. Shutting down will turn OFF the power of the handheld. If you wish to turn on the handheld again, you are required to press the power button. Under Windows 10/ Windows 11, please shut down directly by

**Click (Start) → Click (Power) → Click (Shut down)**

### Force Shut Down

In the event that your handheld hangs or stops responding, you can perform a force shut down by pressing and holding the power button for 4~5 seconds. Please note that any unsaved work or data may be lost this way.

## Sleep & Hibernate

### Sleep

Under mode, the system will temporarily save your work into the handheld's RAM. If you wish to start the handheld again, please press the power button to resume. Under Windows 10/ Windows 11, please enter this mode directly by

**Click (Start) → Click (Power) → Click (Sleep)**

### Hibernate

Under mode, the system will save your work into SSD. If you wish to start your handheld again, please press and hold the power button (approximately 2 seconds) until the display lights on. Under Windows 10/ Windows 11, please enter this mode directly by

**Click (Start) → Click (Power) → Click (Hibernate)**

## LED Indicators

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

| LED Indicator | Description |
|---|---|
|  | **Power/ S3 Indicator**<br>Green/ Flashing Green* |
|  | **Charging/ Battery Low Indicator**<br>Orange/ Flashing Orange |

*Power indicator pulsates slowly during S3.

## Keypads

| Keypad | 1st Layer (White Legend) | 2nd Layer (Blue Legend) |
|---|---|---|
| FN Lock | FN Lock | |
| A1 Esc | A1 | Esc |
| A2 F2 | A2 | F2 |
| W | Windows | Enter |
| | Rotation | → |
| INPUT Lock | Input Lock | ↓ |
| | Power Button | |

FN Lock Fn Lock Key is used to enable 2nd layer functions. To enable these functions, please

1. Press the Fn Lock Key.
2. Fn Lock Indicator will light green.
3. Press the Fn Lock Key again to cancel the function.

INPUT Lock Input Lock Key is used to avoid unexpected inputs from keypads and touchscreen. To lock inputs, please

1. Press the Input Lock Key.
2. Input Lock Indicator will light green.
3. Press the Input Lock Key again to cancel the function.

Rotation Key is applied to rotate the display. The default display for the device is in portrait orientation, and if the landscape orientation is preferred, please

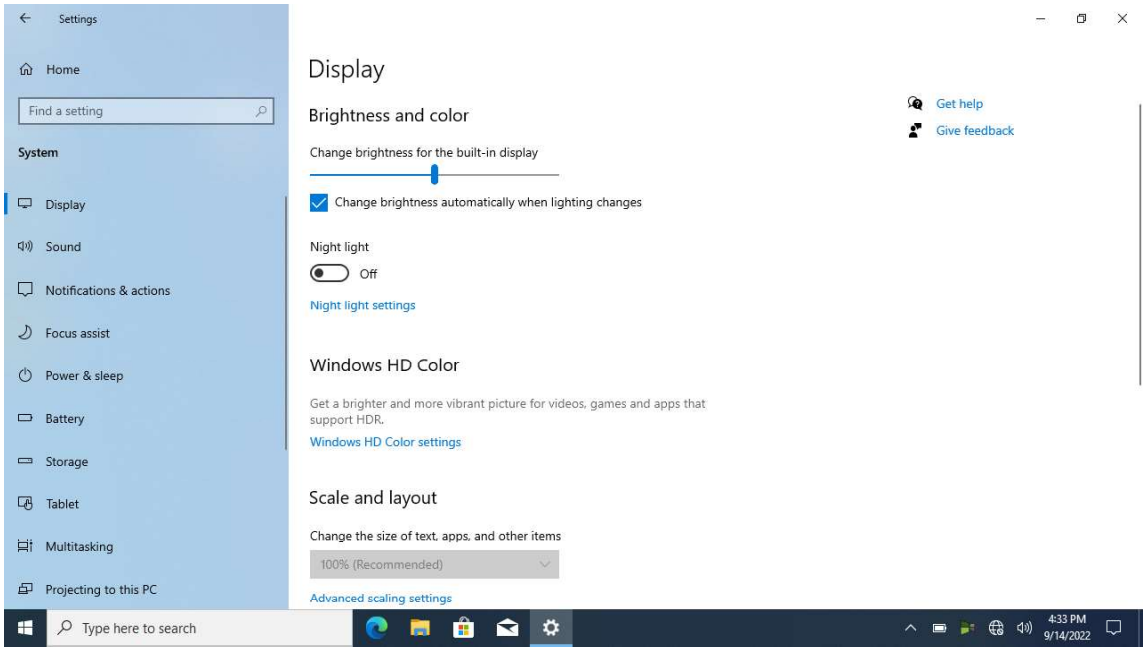
1. Press the Rotation Key.
2. Press the Rotation Key again to return to default display.

## Adaptive Brightness

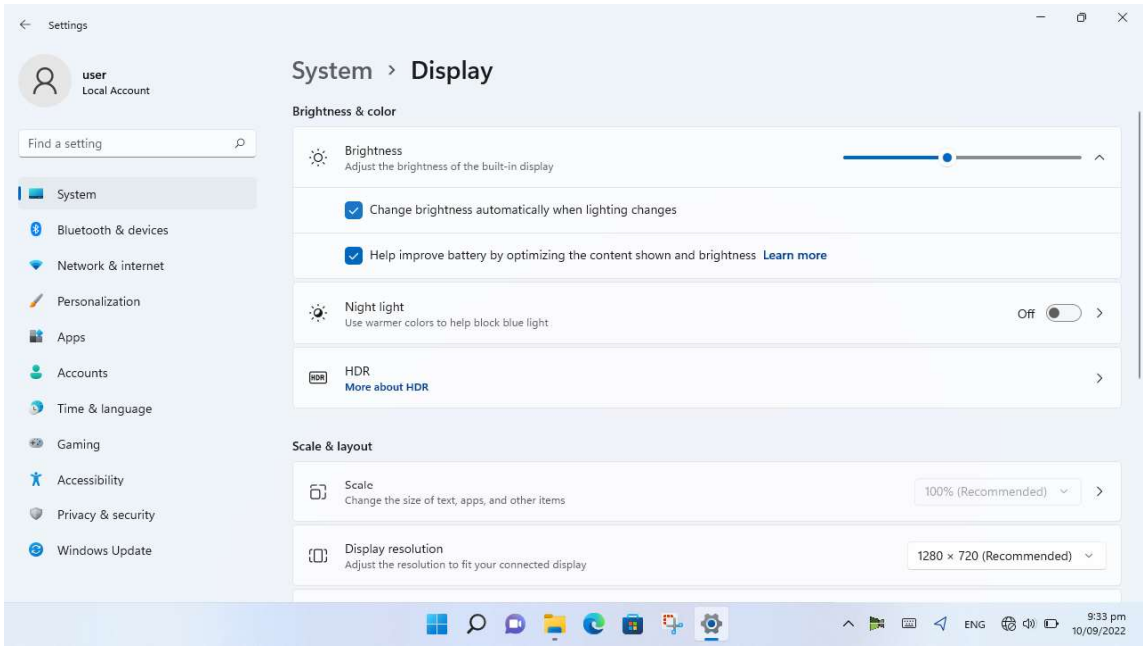
Light sensor mainly is to modify the display backlight by dynamically monitoring the brightness of the environment. Under Windows 10/ Windows 11, you can enable/disable light sensor directly by

**Click (Start) → Click (Settings) → Click (System) → Click (Display) → Click "Change brightness automatically when light changes"**

### Windows 10



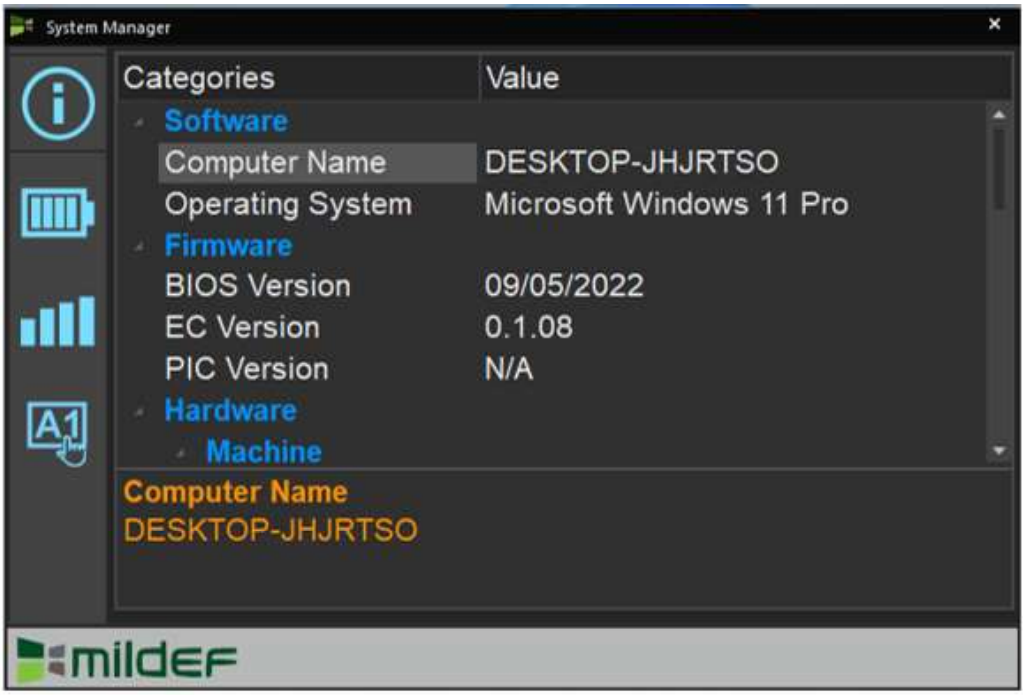

### Windows 11



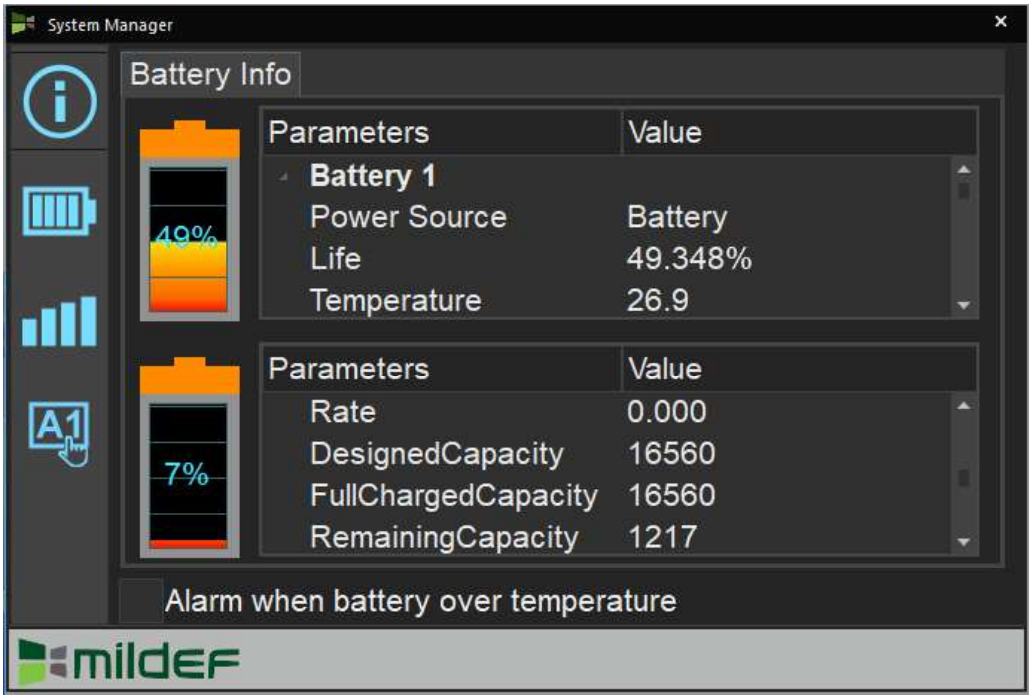
## System Manager

System Manager is an application which allows users to access information of the handheld.

### 1. System Information

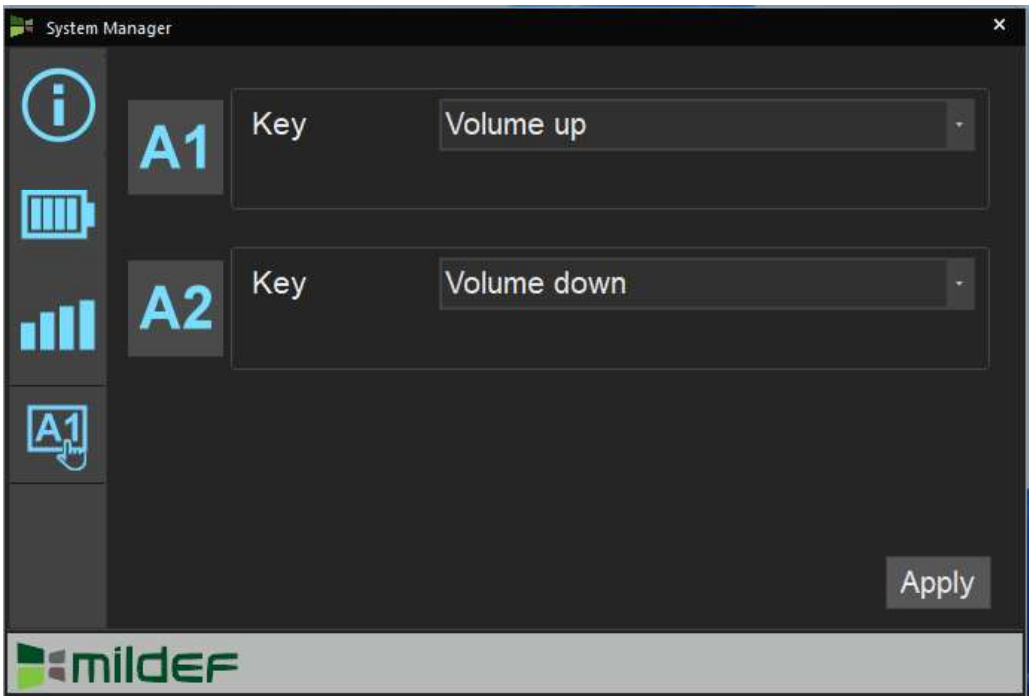



### 2. Battery Information

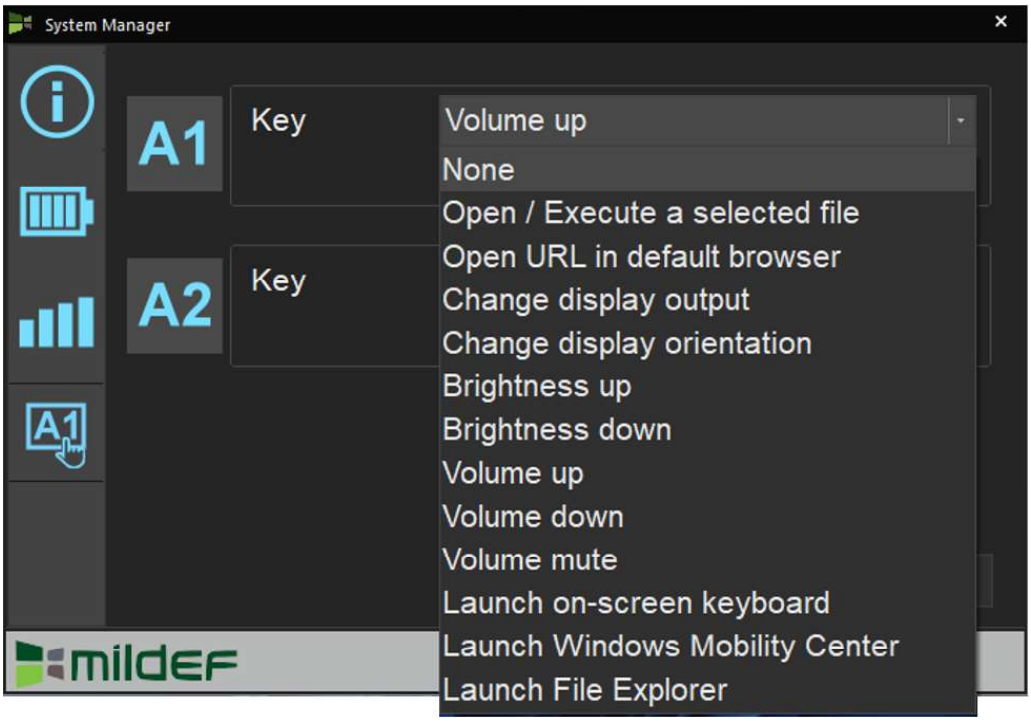


### 3. RF Device Control Panel


### 4. Function Key Control Panel



## 5. Key Function List




***Note***

- *"System Manager" is a universal app, the contents may vary depending on the system configurations.*
  *Programmable keys (A1 and A2) are only settable by the Administrator Account.*

## Hot Swapping the Battery

**Caution:**

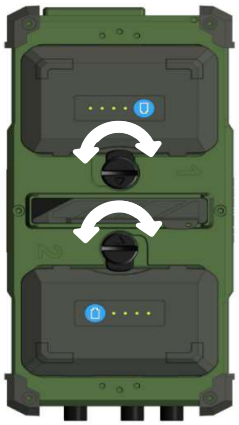
- *Hot swapping should be avoided can be only performed when the other battery percentage is sufficient enough.*

To hot swap the battery

1. Check the power supply.

   -Whether the AC Adapter is attached;

   -Whether the other battery percentage is sufficient enough.
2. Loosen the battery locks counterclockwise.
3. Remove and replace the battery.
4. Fasten the battery locks clockwise.



## Connecting the USB-C AC Adapter

1. Plug the USB-C Jack into the charging port of the handheld and fix the thumb screws clockwise firmly.
2. Plug the female end of the AC cord into the AC adapter and the male end into the electrical outlet.

   The charge indicator lights orange when charging and turns off when fully charged.


**Note**

- *To ensure system stability, please connect your handheld to external power source when operating below 0℃ and above 60℃ ambient temperature.*
- *The AC Adapter's indicator lights green when the AC power is attached.*
- *For the handheld without batteries, Boot Up is recommended after the handheld is attached to the AC Adapter for approximately 3 seconds, so to ensure the power has been delivered to it.*

# Chapter 3 – Managing Power

## Rugged USB-C AC Adapter

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

**Recommendations for the AC Adapter**

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

## Battery

The power source will automatically switch to the battery when the external power supply, such as the AC Adapter, is disconnected from the handheld.

The following section provides battery related information, operation, as well as power-saving tips.

**Battery Duration**

| Device | Battery Life |
|---|---|
| **When power is ON** | • Approximately 6 hours with two 100% batteries equipped.<br>• The operating time depends on how and where the handheld 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 two 100% batteries equipped.<br>• 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

You may check battery status from Windows or via the LED indicators on the battery.

- **LED Indicator on Battery**

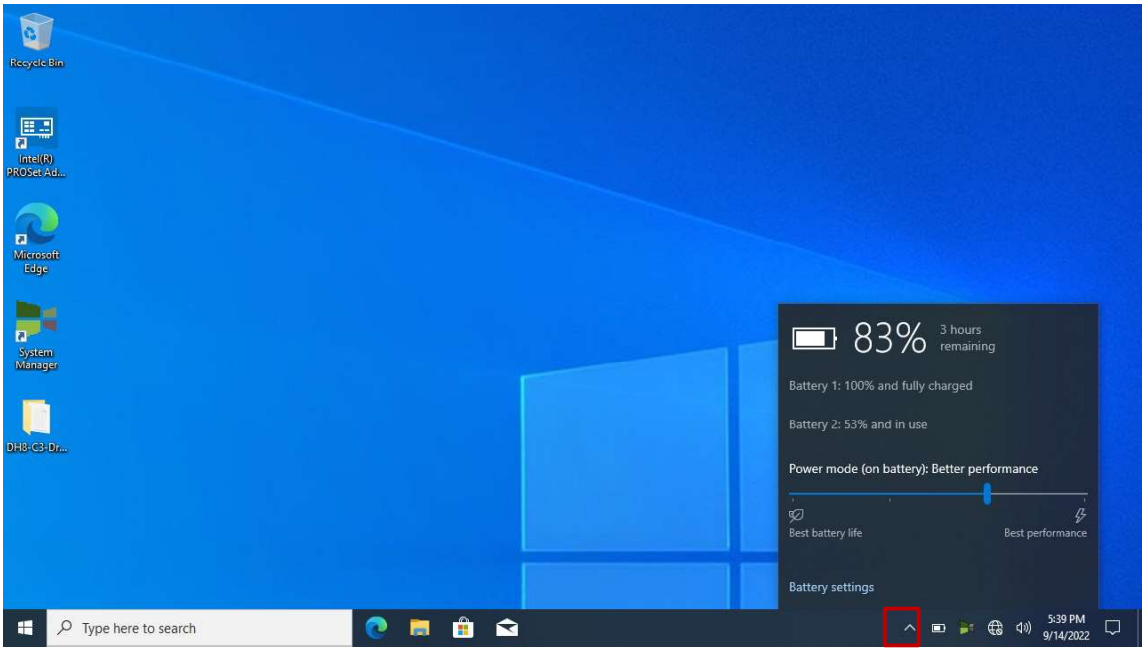
  Each indicator corresponds to 25% battery level.

| Indicator (From Left to Right) | Battery Percentage |
|---|---|
| 1 | <25% |
| 2 | 25% ~ 50% |
| 3 | 50% ~ 75% |
| 4 | >75% |

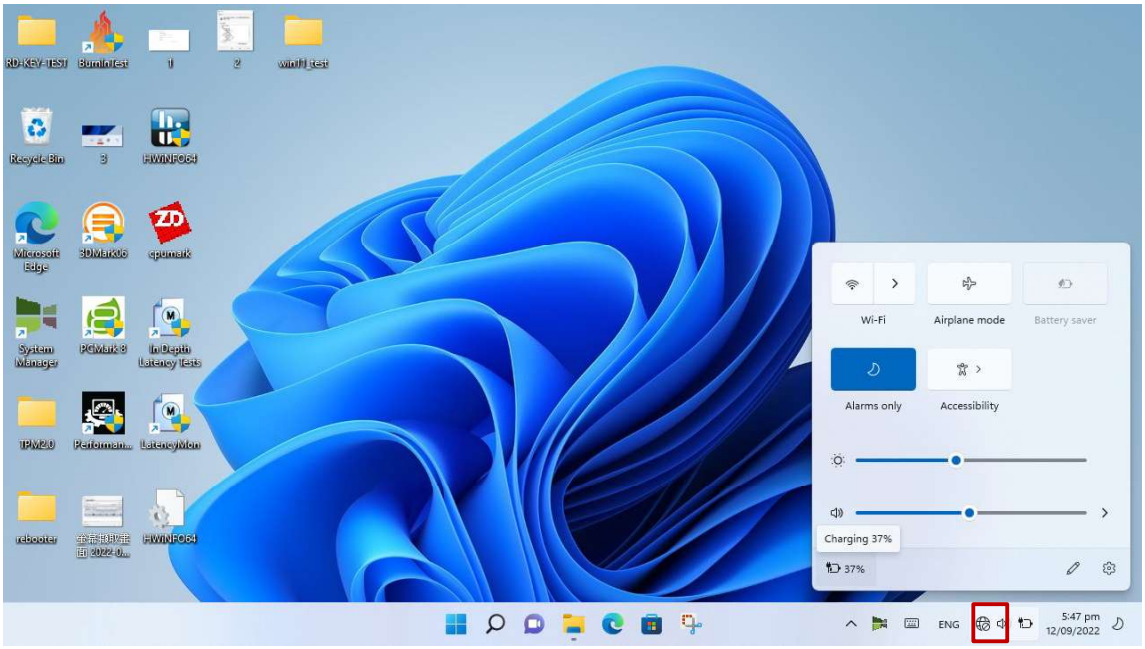
***Note***

- *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.*

- **Windows 10**



- **Windows 11**




***Note***

- *It is recommended to mount the secondary battery after the status reading of the primary battery is completed in OS, which is to ensure the stability of battery status.*

**Power Saving Tips**

The handheld comes with an intelligent power-saving feature. You may extend the battery life by:

- Set up power saving functions in Operating System Power Management options (e.g., Windows Power Options).
- Lower the intensity of the display in brightness control.
- Turn the computer into standby (by Sleep or Power button) when it is temporarily not in use.
- Shut down the handheld when it will not in used for a period of time.

### Battery Low

**Caution:**

- *When the battery capacity is drained, your handheld will shut down automatically and any unsaved data might be lost.*

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

- Windows battery low warning.
- The battery indicator flashes Orange.

During "Battery Low" warnings, 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 batteries.
- Replace the battery with a fully charged one.

### Battery Charging & Discharging

The system is compatible with fast charging. Connect to the AC Adapter to start the battery charging. The charge indicator lights orange when charging. When the battery charging is completed, the indicator will automatically light OFF, and the sense circuitry will stop high current charge within several minutes..

When the device is connected to AC Adapter, the primary battery will be charged first, followed by the second battery; while the device is powered by the battery, the second battery will be discharged first, and then the primary one.

| Battery | Charging (With AC Adapter attached) | Discharging (Without AC Adapter attached) |
|---|---|---|
| **Primary Battery** | First priority | Second priority |
| **Secondary Battery** | Second priority | First priority |

### Battery Charging Time

| Charging Time | | DH8 (With Battery x 1) | DH8 (With Battery x 2) |
|---|---|---|---|
| **AC Adapter** | **System ON** | 2.5 hours | 5 hours |
| | **System OFF** | 2.5 hours | 5 hours |

***Note:***

- *Use only the AC adapter designed for the handheld to charge the battery.*
- *The actual charging time depends on the physical environment when using the laptop.*
- *For safety purpose, charging/discharging will stop if the internal temperature of the battery is out of range (<10°C; >45°C). Please note that charging/discharging 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 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 Shut Down 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:

- When the battery itself is not in use for over 45 days

The battery in Shutdown Mode may be sustained for approximately 180 days. To deactivate Shutdown Mode, please connect battery to the handheld 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 decreasing the capacity. The following are guidelines for battery maintenance:

- The battery should be removed if the handheld 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 handheld and stored separately.
- The battery should be recharged to 50% according to the different storage temperatures below so to prevent damage 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.

## ACPI Support

This device supports ACPI (Advanced Configuration and Power Interface) for power management. With ACPI and an ACPI-compliant operating system (such as Microsoft Windows), this feature will allow you to reduce the power consumption and conserve energy. By supporting ACPI, the AC Adapter LED and the Power indicator LED will show in different ways. The followings are detailed descriptions of LED indicators and their meanings:

**Sleep**

AC Adapter LED is ON (while connecting with power)
Power LED indicator is flashing Green; other LED indicators are OFF

**Hibernate**

AC Adapter LED is ON (while connecting with power)
Power LED indicator is OFF; other LED indicators are OFF

**Shut Down**

AC Adapter LED is ON (while connecting with power)
Power LED indicator is OFF; other LED indicators are OFF

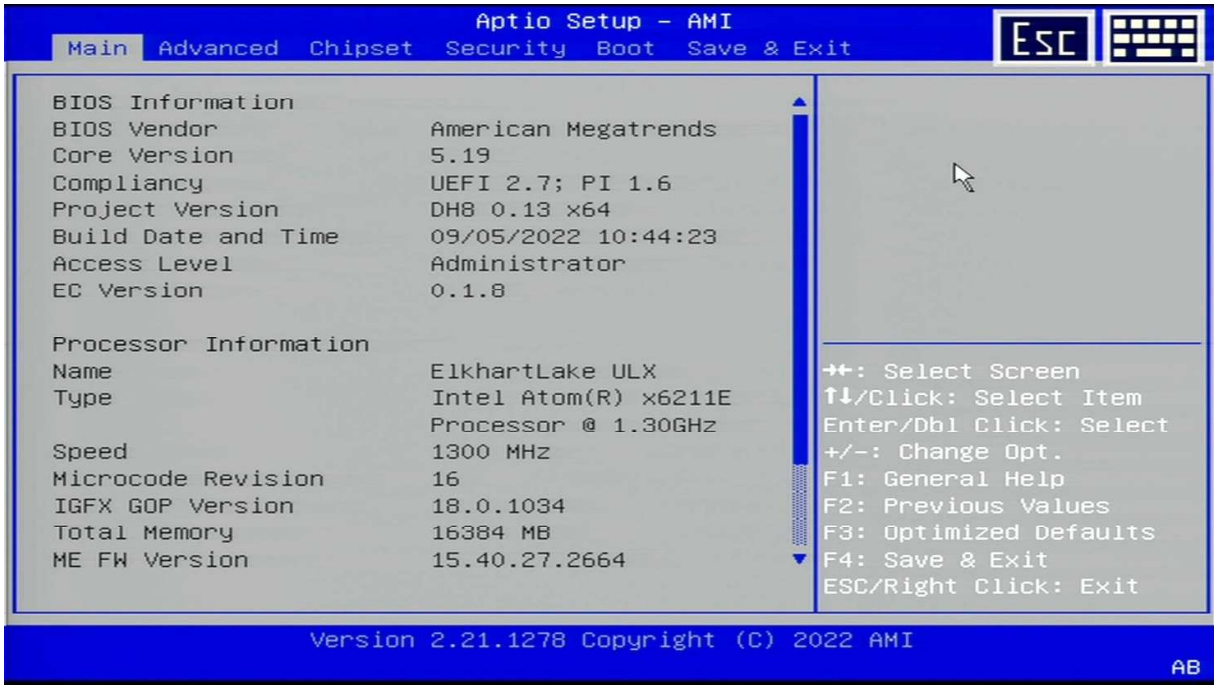
# Chapter 4 – BIOS Setup

> ***Caution:***
>
> ➢ *Incorrect settings may cause system malfunction. To correct it, restore the Optimized Defaults with **[F3]**.*

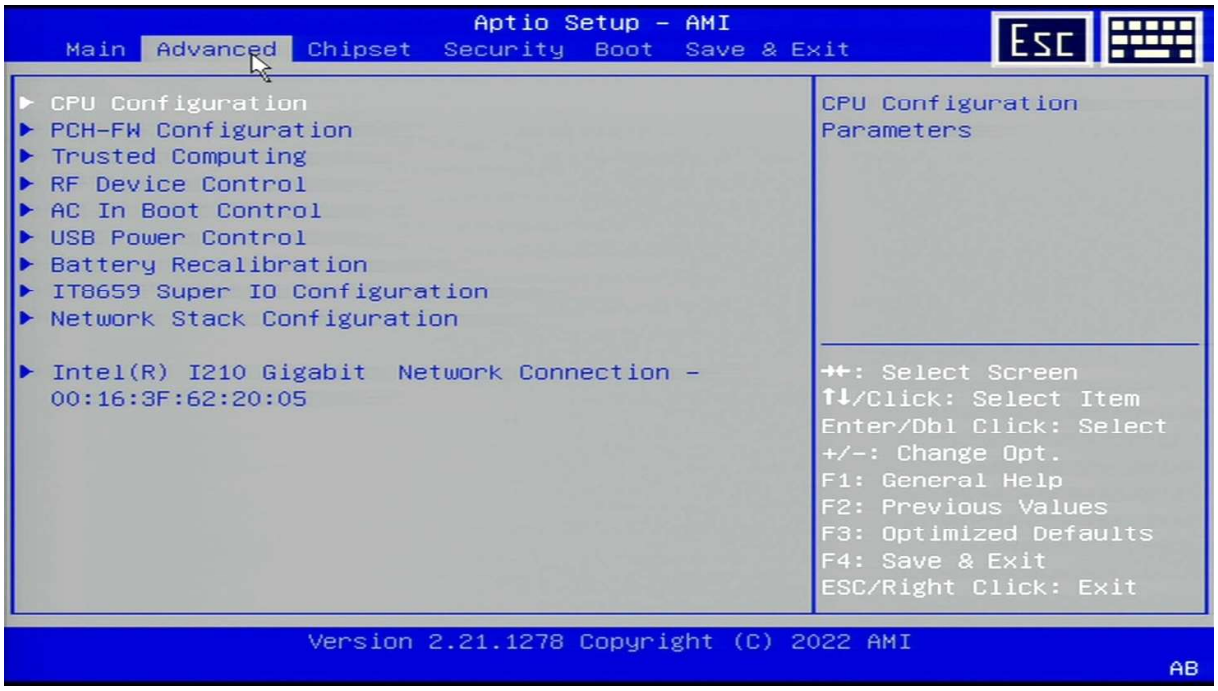
When connected with the external keyboard, under FN Lock, press ⏻, followed by **[F2]** at boot up to enter BIOS setup. Use arrow keys to select options and **[+/-]** to modify them. When finished, move to "**Exit**" and press **[Enter]**, then confirm save by pressing **[Y]**. The BIOS setup can be done with the touch screen mode as well.

> ***Note:***
>
> ➢ *The contents may vary depending on configurations.*

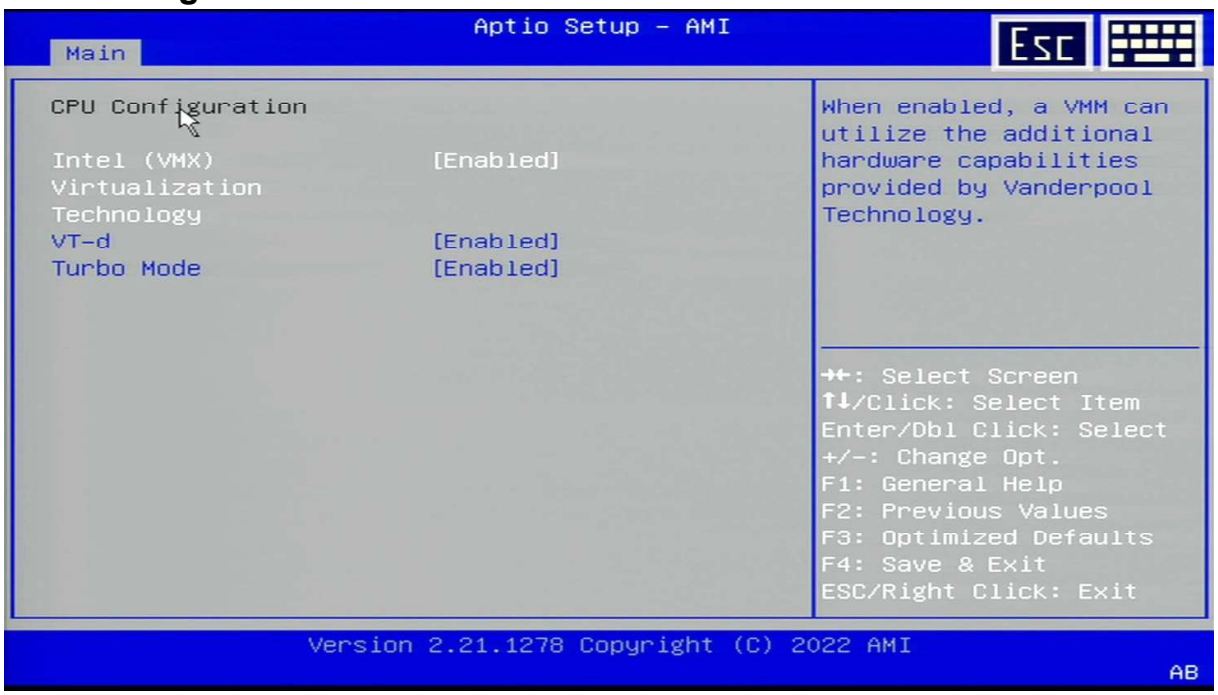
## Main Menu



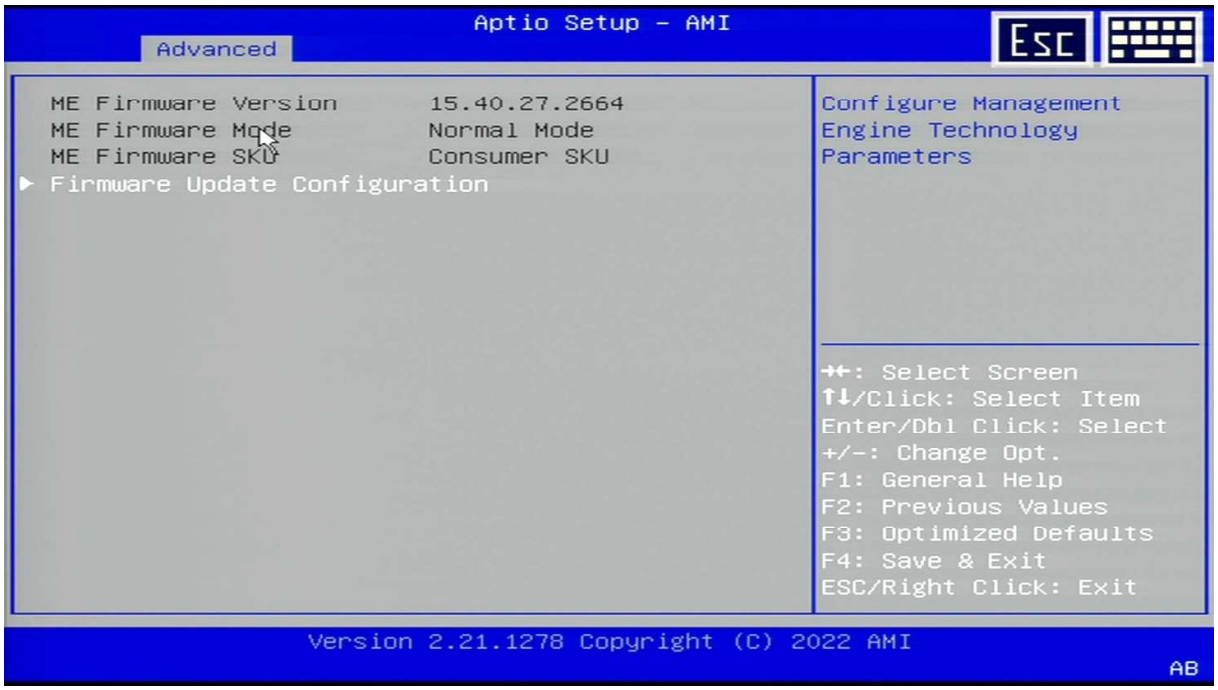
## Advanced Menu



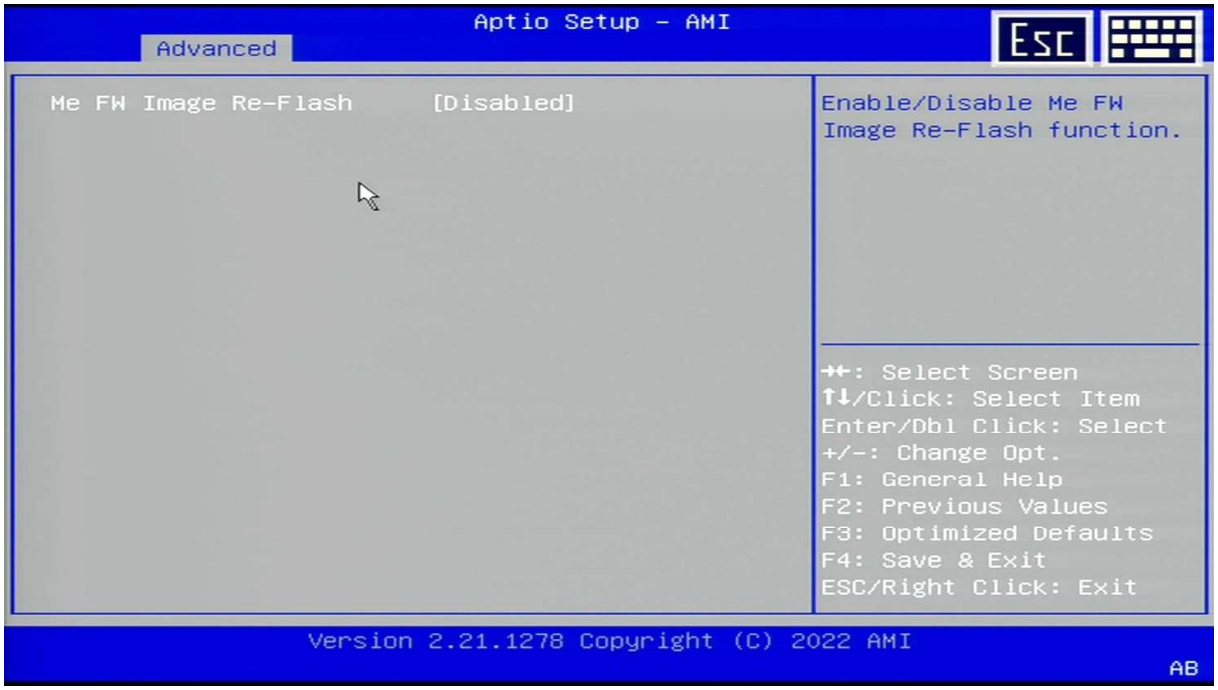

## CPU Configuration



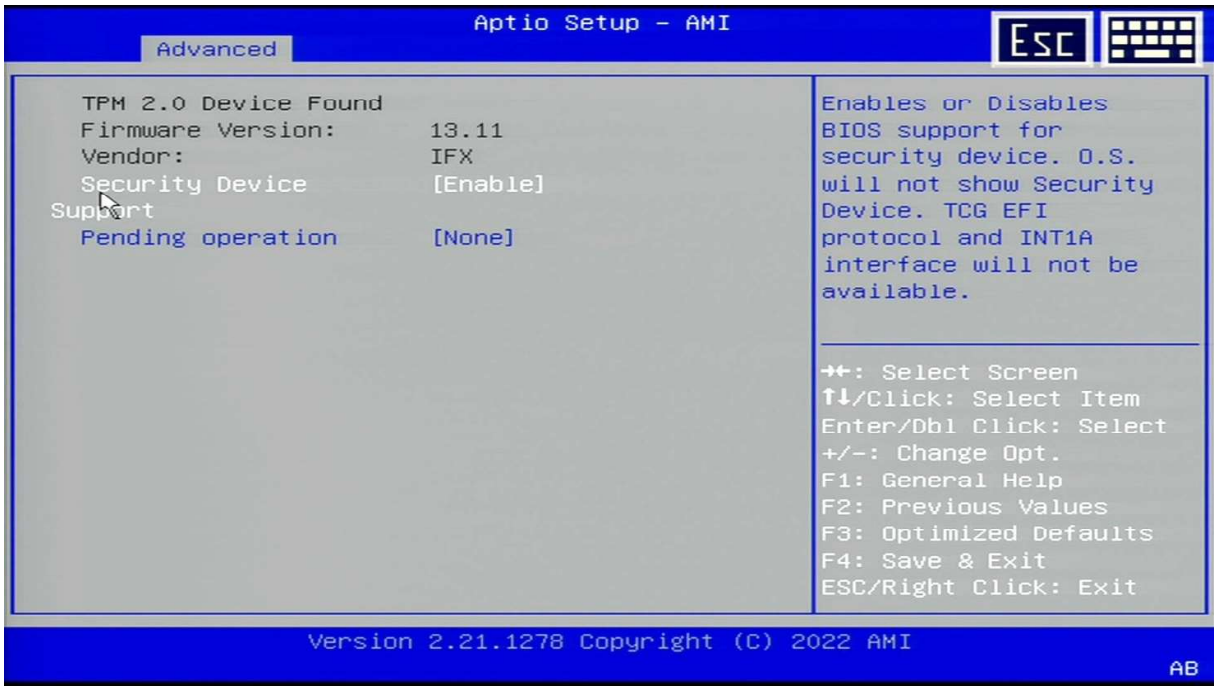
## PCH-FW Configuration



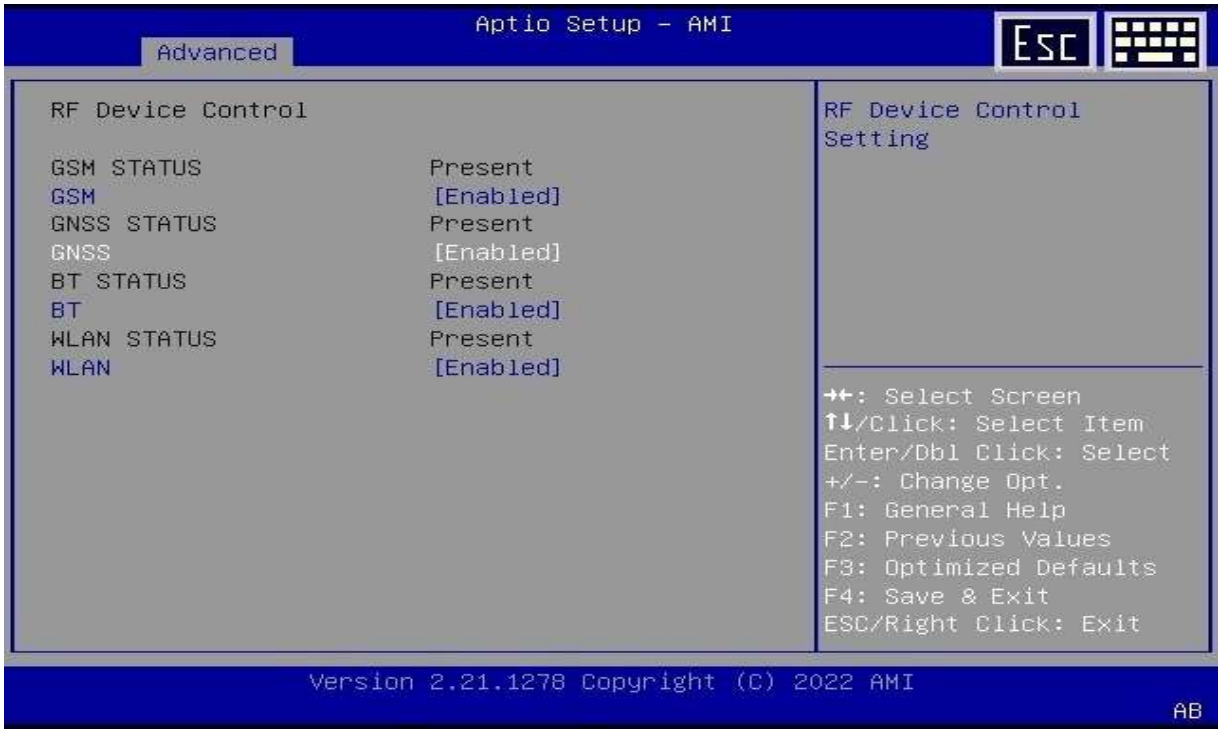

## Firmware Update Configuration Sub-Menu



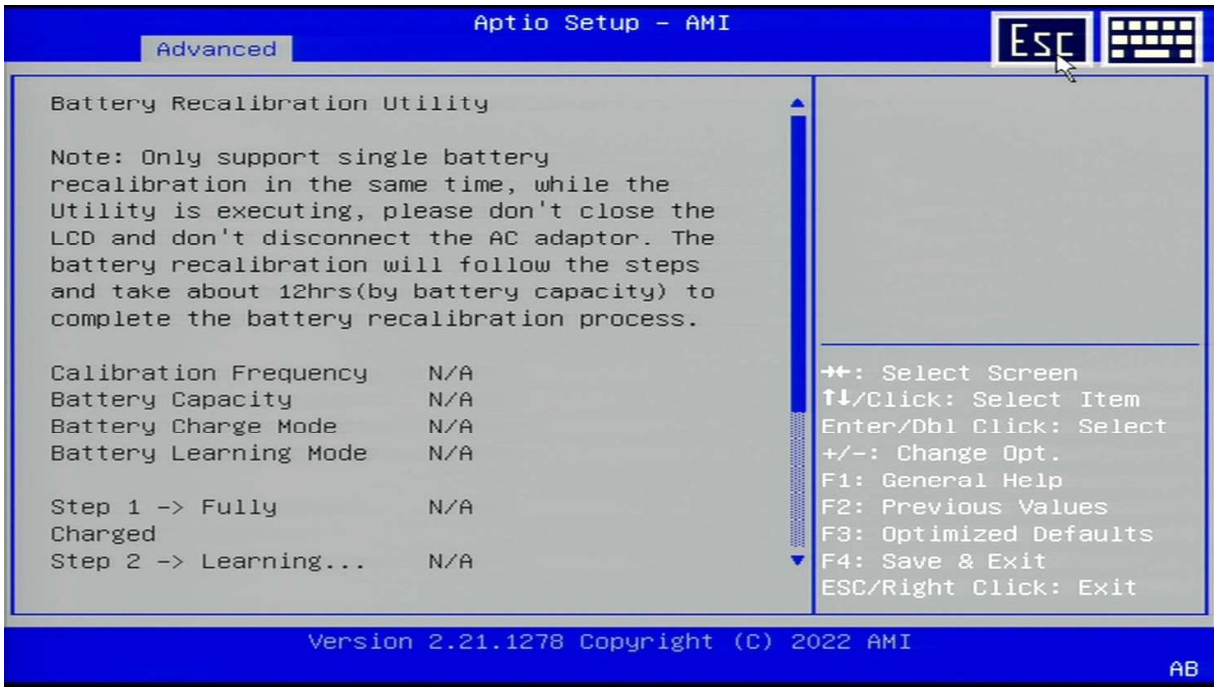
## Trusted Computing

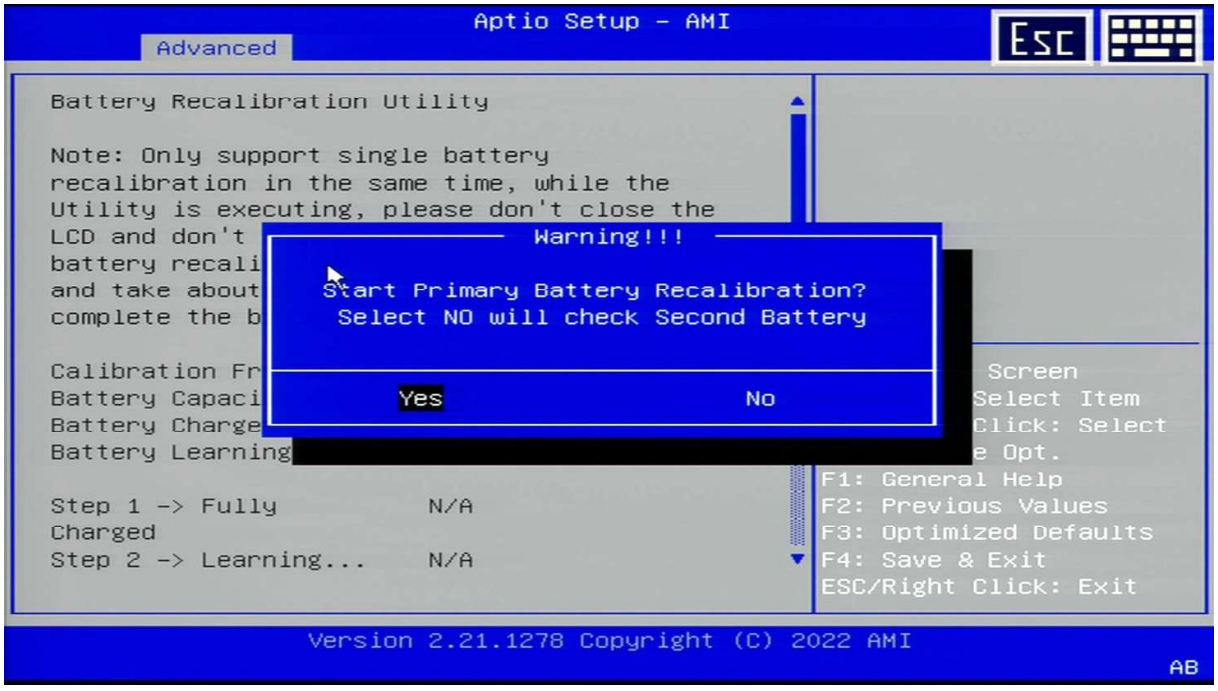



## RF Device Control

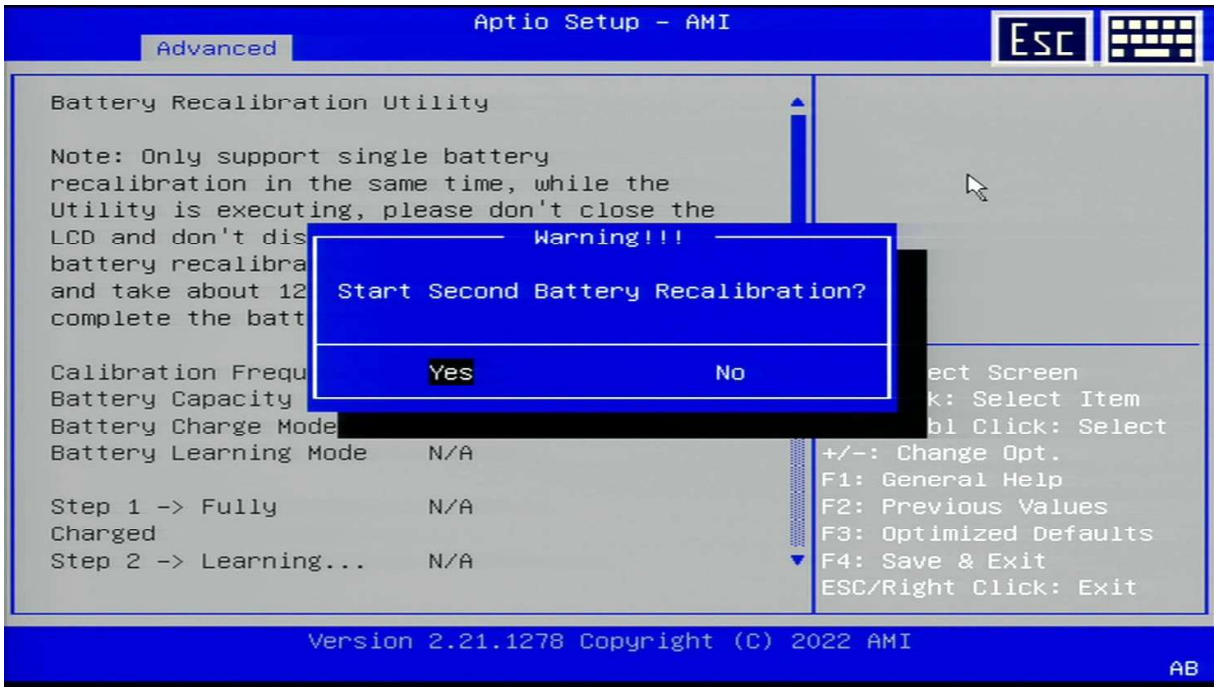


## Battery Recalibration

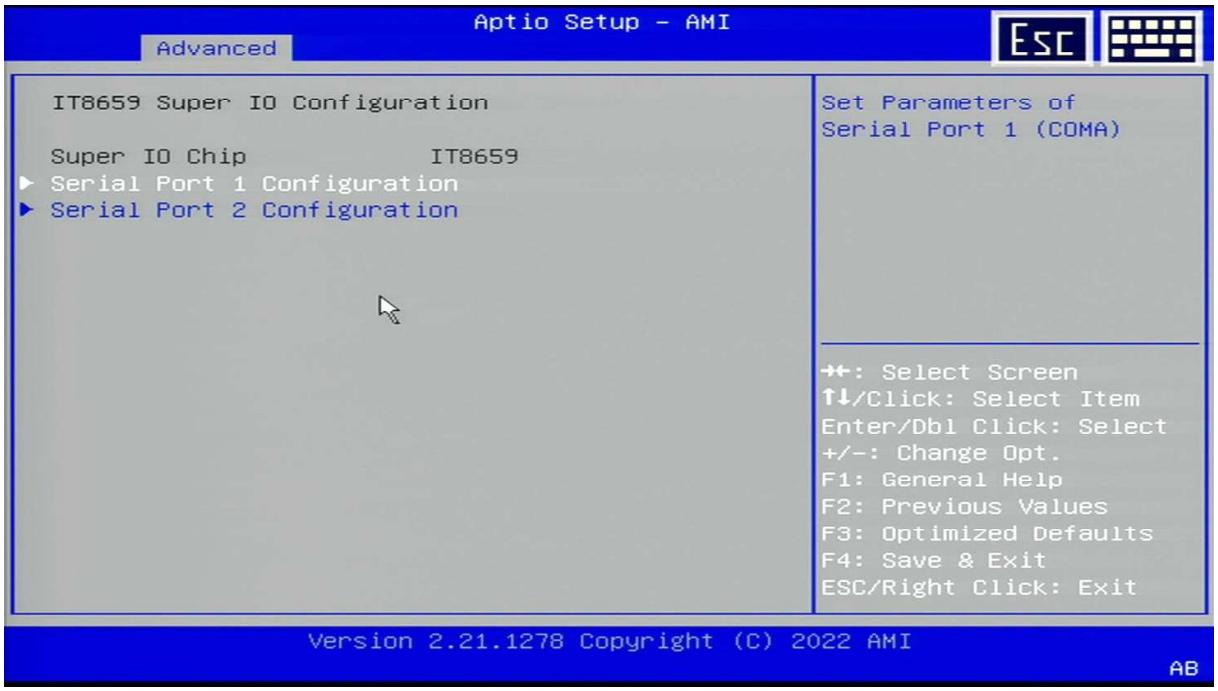


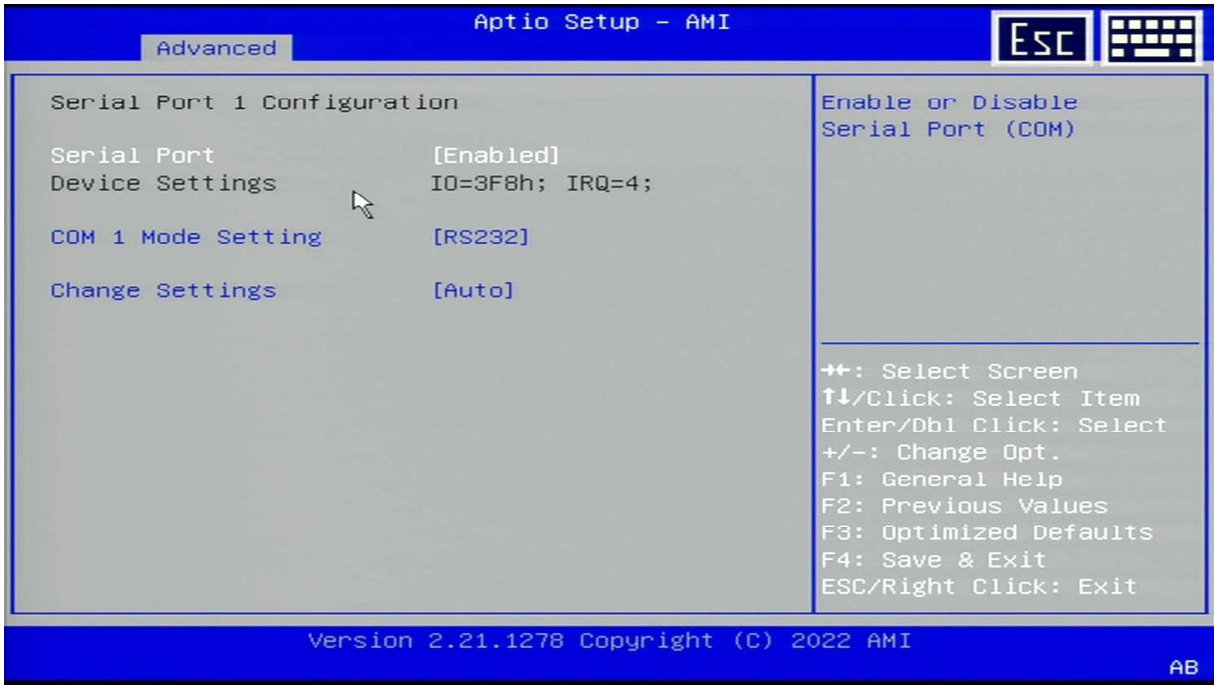



## Battery Recalibration (Cont.)

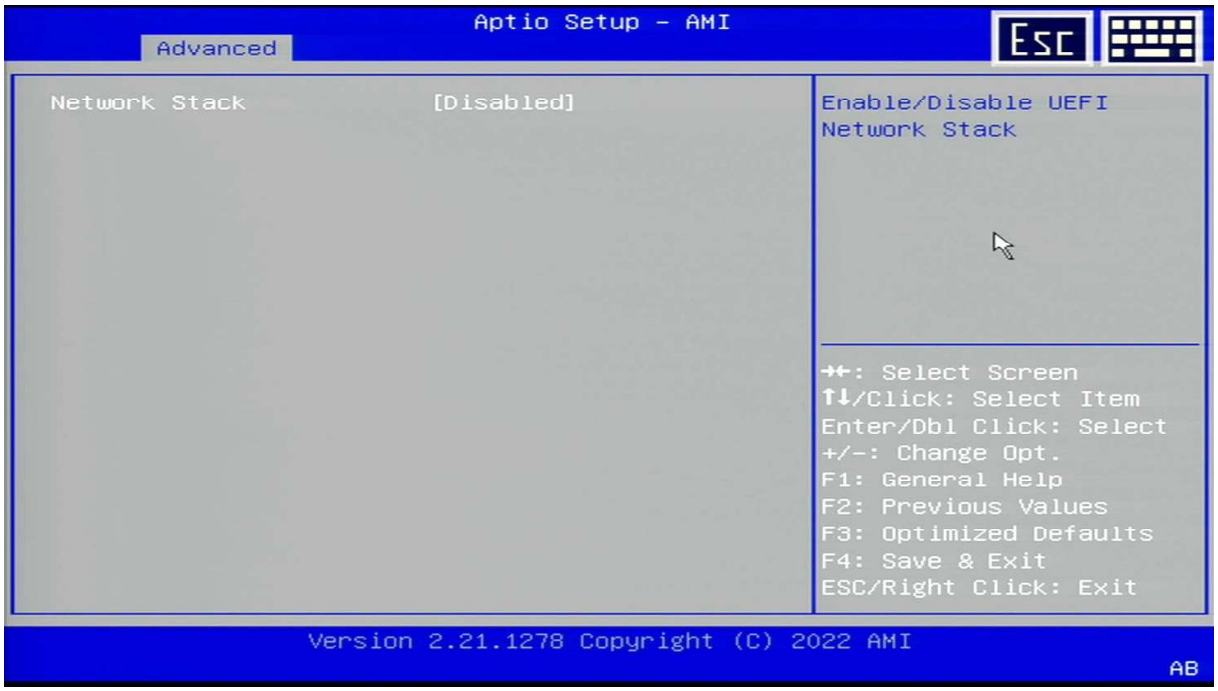


## IT8659 Super IO Configuration

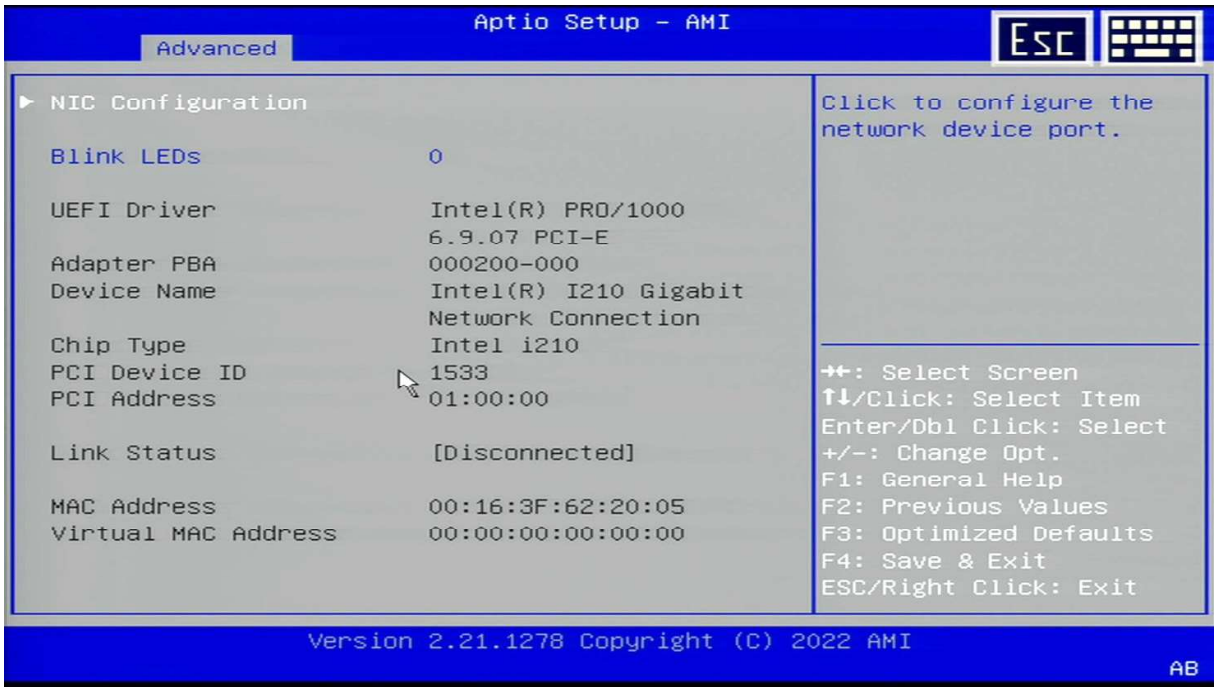


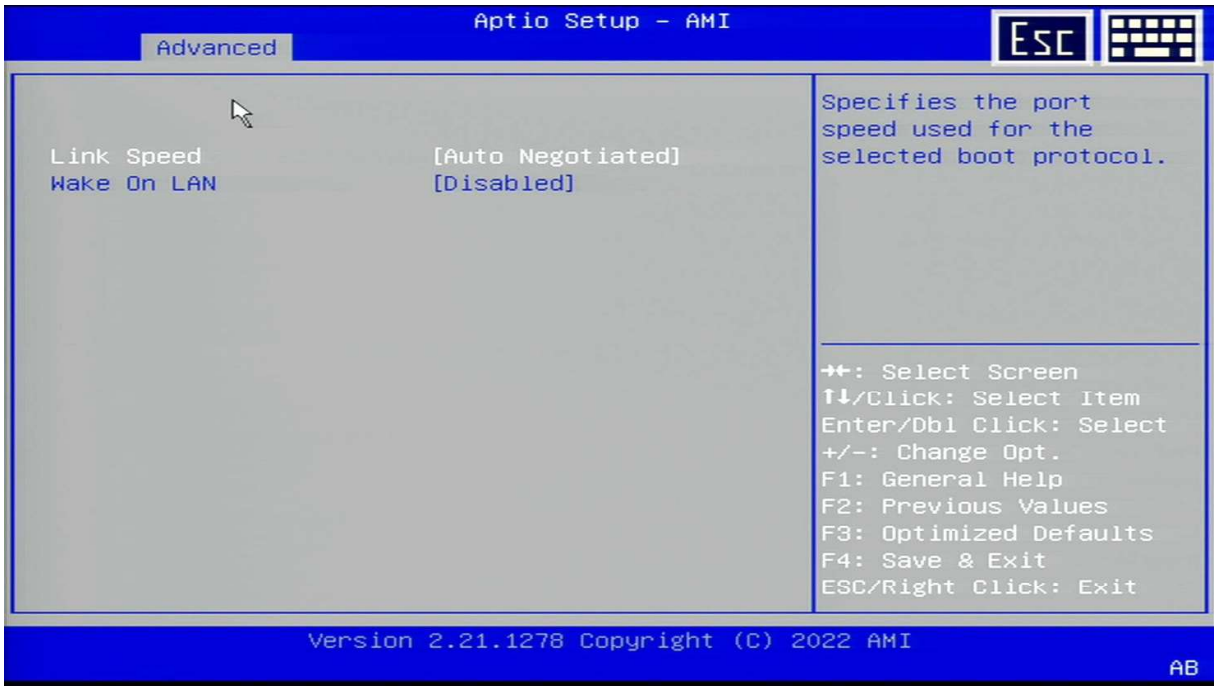
## Network Stack Configuration



## Intel® I210 Gigabit Network Connection

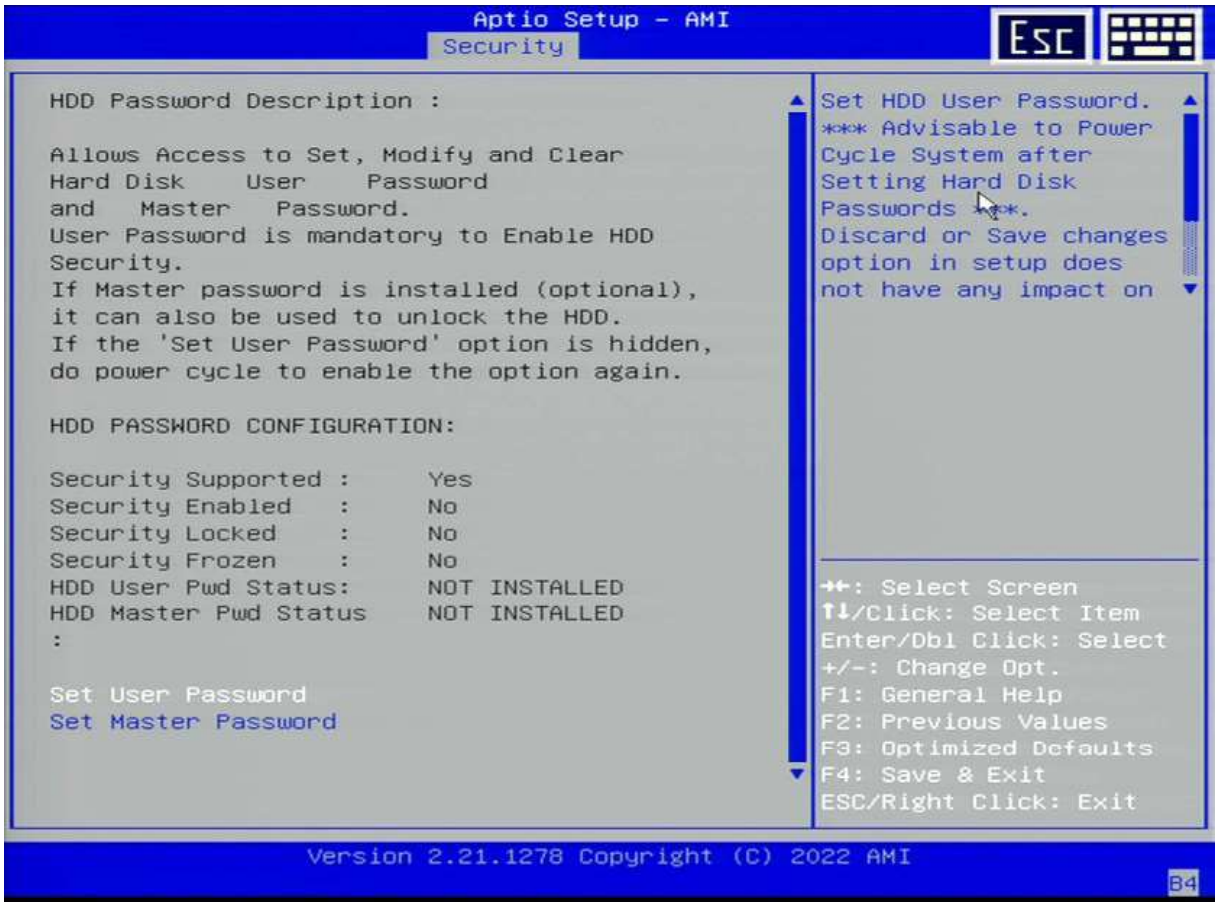



## NIC Configuration Sub-Menu



## Security Menu

## HDD Security Configuration Sub-Menu



### Setting Password

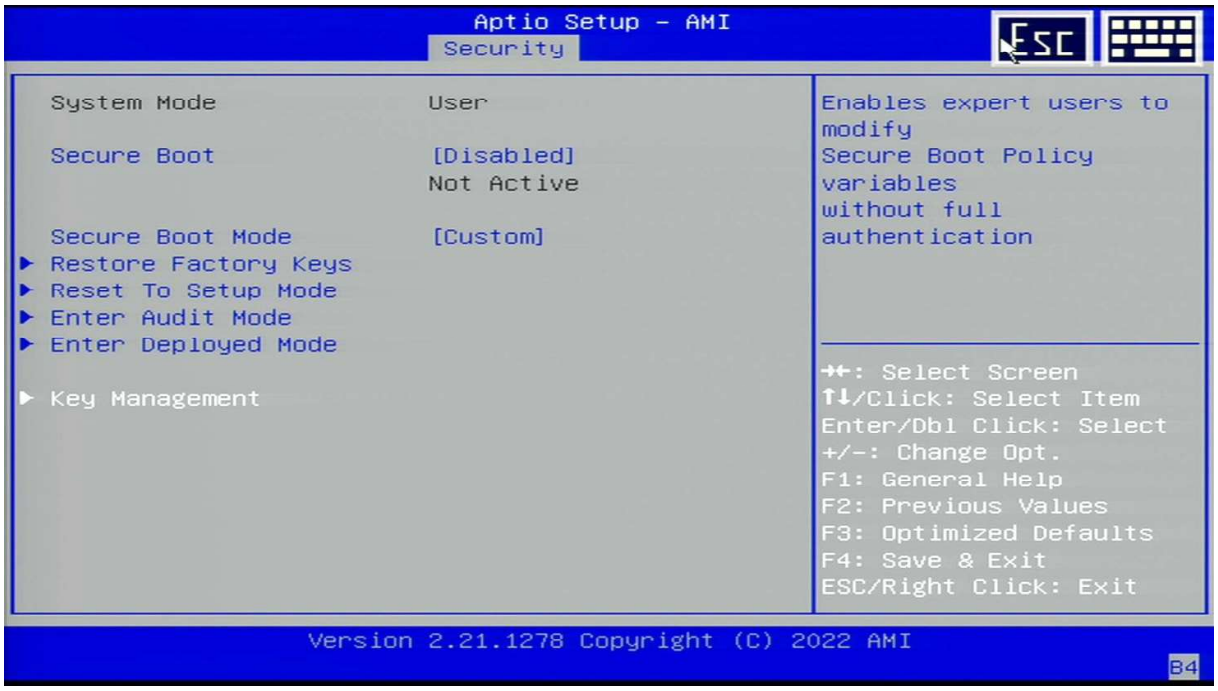
> **Caution:**
>
> - *The Master Password must be set in advance than the User Password.*
> - *If the user does not set a Master Password, they will be unable to access the system if they forget their User Password.*
> - *Clearing the Master Password in the BIOS setup clears the current User Password simultaneously.*

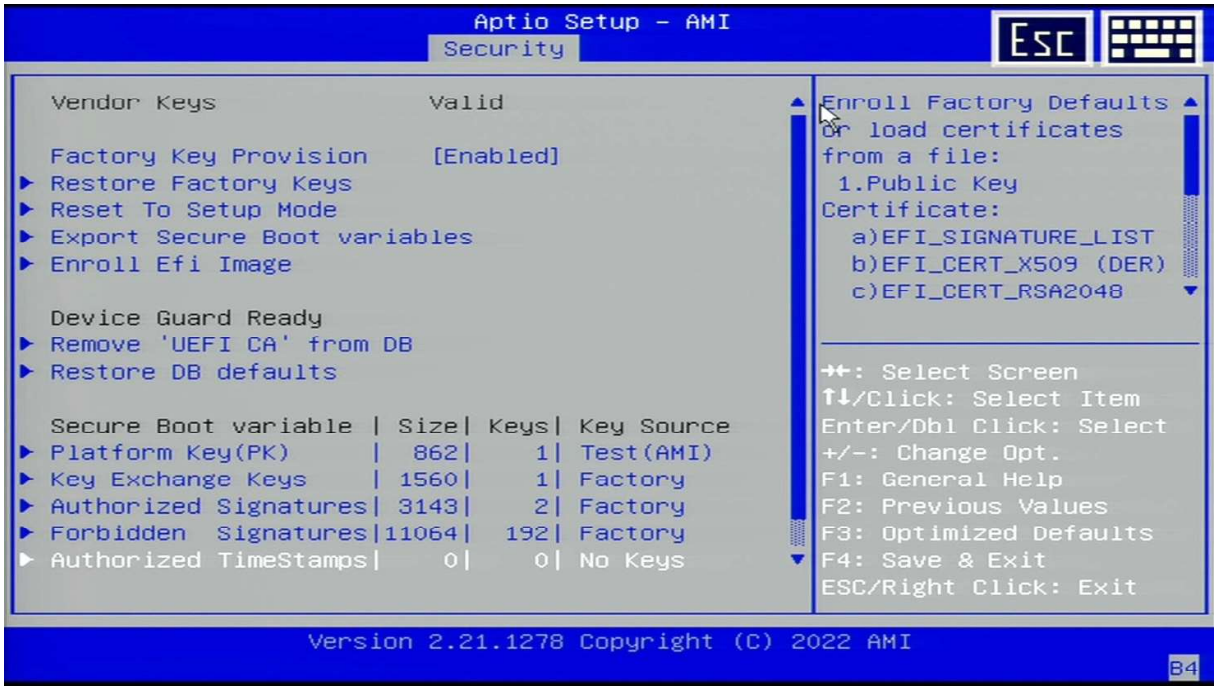
1. Once you set HDD passwords successfully, you must enter the user password to boot in the future. The master password provides an alternative entry in case the user password is lost.
2. Clearing the master password in the BIOS setup will also clear the current user password. The master password served as a backup key, and is suggested not to be changed frequently.
3. You can set your master password and user password with a length between 1 and 32 characters. If you want to clear current password, type nothing when creating a new password.
4. After you set a password, “Pwd Status” will change from “NOT INSTALLED” to “INSTALLED”, and the “security enabled” status will change to “YES”.
5. Your setting will take effect after reboot.

### Resetting Password

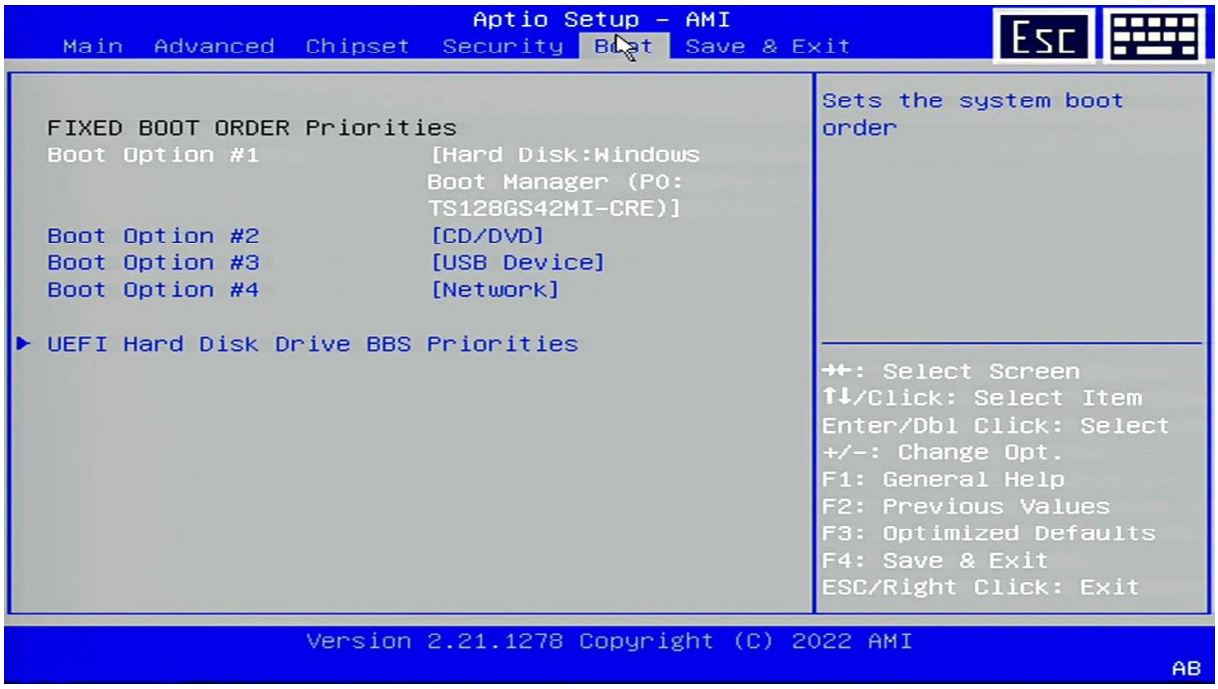
1. After typing an invalid user password three times, a message will show “HDD is locked”. Pressing “Enter” will leave the screen message.
2. Press “F2” immediately to enter the BIOS setup where the lost user password could be cleared with the master password.
3. Once the HDD is locked, users have no right to access. You can only re-enter with the correct user password or clear it with the master password.
4. A warm boot will cause HDD Security Frozen in the selection. Only a cold boot can lift the HDD Security frozen and allow further operations in the BIOS setup. (After a cold boot, users can try to enter again with the correct user password or just reset it with the master password)

## Secure Boot Sub-Menu



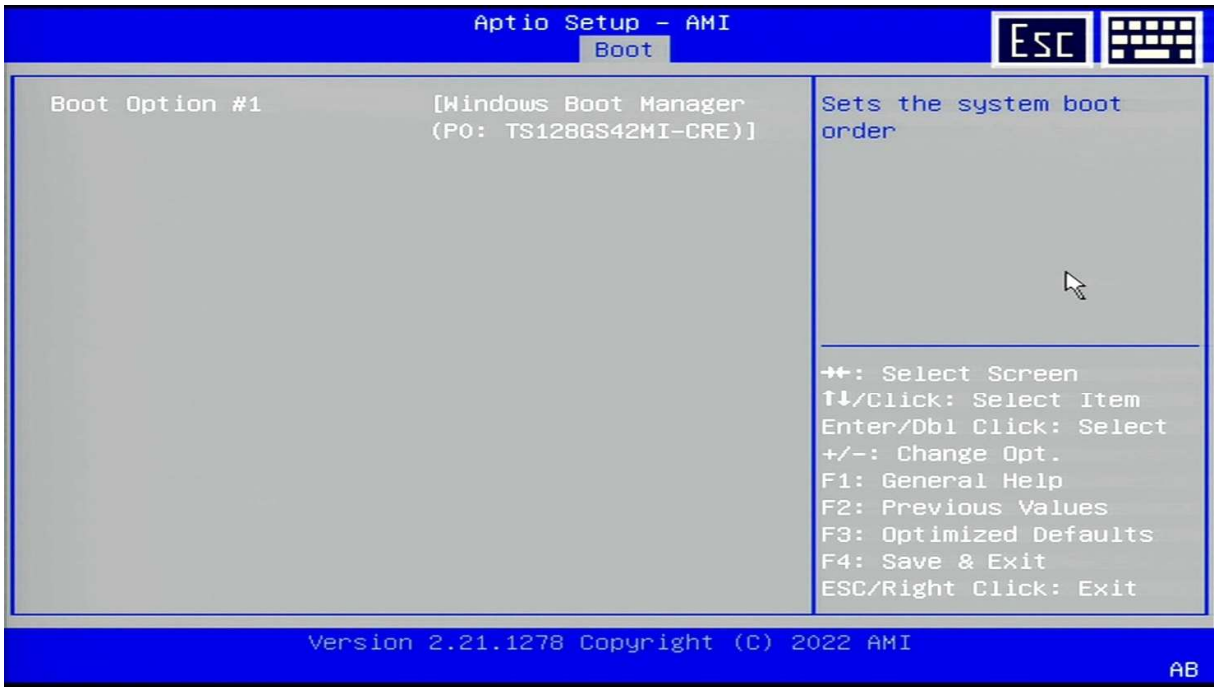



## Boot Menu

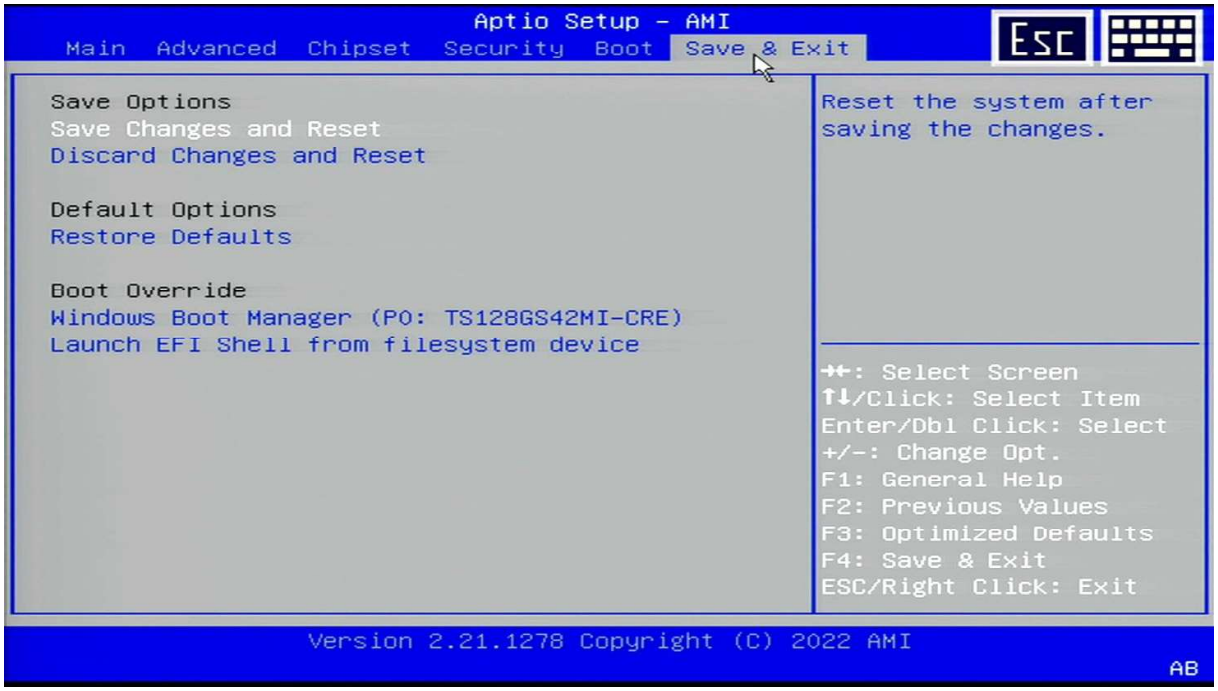



***Note***

- *The system will try to boot from device on top then the 2nd and so on. If there is more than one device in each category, only the device on top of sub-menu can boot up.*



## Save & Exit Menu



# Chapter 5 – Drivers and Applications

The latest drivers and utilities will be available on Crete's website. To download the drivers and utilities, please follow the instructions below by

**Visit** Crete's website www.mildefcrete.com → **SERVICE/SUPPORT menu** → **DRIVERS & UTILITIES**

***Caution:***

- *Please install the chipset driver first.*

Via Device Manager in Windows, you may perform "Driver Update" and check if there are drivers that still needed to be installed for your device. If any driver is missing, please consult your dealer.

***Note***

- *If the system requests for a reboot after installing drivers, please reboot your device before installing other drivers.*

# Chapter 6 – Specifications

## Platform

Intel® Elkhart Lake Platform

## Processor

Intel Atom® x6211E Processor (1.5 MB L2 Cache, up to 3 GHz)

## Memory

Max. 32GB

- DDR4 SO-DIMM x 1, 3200 MHz
- 8GB/16GB/32GB
- Industrial Grade

## Storage

- M.2 2242 SATAIII SSD
- 128GB/256GB/512GB/1TB
- Industrial Grade

## Graphics

Intel® UHD Graphics

## Display

- 5.7”
- Optical Bonding
- Resistive Multi-Touch Screen
- Resolution : 1280 x 720 pixels
- Brightness (Min. ~ Typ.) : 560 ~ 640 nits
- Optional Invisible Mode On/Off
- Optional Protection Film

***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

## Audio

- HD audio codec and amplifier
- Stereo Speaker
- Optional Embedded Digital Mic

***Note***

➢ *Devices with Optional Embedded Digital Mic support voice memos and microphone during calls, and users may adjust the microphone boost in "Microphone Properties" in Windows.*

## I/O Ports

**Right**

- Amphenol USB 3.2 Gen.2 Type-C x 1

**Left**

- L1~L3*: Optional Fischer I/O x 3
  Choose for 3 Fischer Connectors out of 4 signals; non-repeatable
  - USB 2.0
  - Audio
  - GLAN
  - COM**

  **BIOS selectable: RS232/ RS422/RS485; default: RS232

  *L3: Trade-off with Optional Invisible Mode Switch

**Bottom**

- 16-pin Docklite POGO Connector

**Top**

- Optional WLAN/ Bluetooth®/GNSS Antenna

## Security

BIOS password is available to safely secure your computer. TPM (Trusted Platform Module) version 2.0 is also supported, preventing unauthorized access to your device.

## Power

**Battery Pack (BDH82A)**

- Type : Prismatic Lithium Ion Cell
- Capacity : 7.2V/2700mAh (2S1P)
- Operating Temperature : Charge: 0 ~ 55ºC
  : Discharge: -30 ~ 60ºC
- Dimensions (L x D x H) : 85 x 54.5 x 23.7 mm
- Weight : approximately 125 g

**USB-C Port**

- Input Voltage: 20V
- Input Current: 3A

**Rugged 60 W USB-C AC Adapter**

- Input Voltage : 100V ~ 240V
- Input Frequency : 50/60 Hz
- Output Voltage : 20V
- Output Current : 3A
- Maximum Power : 60 Watts
- Dimensions (L x D x H) : 153 x 61 x 41 mm
- Weight : 770 g

## Certification

CE, FCC, UKCA, RCM, WEEE, REACH, RoHS, IP65, Optional IP67, MIL-STD-810H, Optional MIL-STD-461G (G.A.), Optional MIL-STD-461G (G.N.)

## Case

- CNC milled Aluminum
- Color: NATO Green
- Stylus Pen available

## Environment Specifications

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

***Note***

- *At +60°C, the temperature protection is activated and auto-adjusts the LCD brightness to below 300 nits.*
- *To ensure system stability, please connect your laptop to external power source when operating below 0°C and above 60°C ambient temperature.*

**Instant Cold Boot via AC Mode*
***Cold Boot via AC Mode*
****via AC Mode.*

## Dimensions & Weight

- Dimensions (L x W x H): 201 x 99 x 44.5 mm
- Weight: 905 g

***Note***

- *Weight and dimensions vary from configurations and optional accessories.*
- *Length is 204 mm with Optional Fischer Options.*
- *Weight is with Battery x 2, but without any option, and it varies depending on system configurations.*

## Materials & Recycling

| | |
|---|---|
| Plastic case | : Recyclable UL grade PC + ABS GE C2800 or C6200 |
| Metal case | : Aluminum alloy, 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.

# Chapter 7 – Optional Devices

## Communication

- **WLAN / Bluetooth®**
  - Intel® AX210
  - Board Form Factor : M.2 2230 E-Key Card
  - WLAN Certified : 802.11 a/b/g/n/ac/ax
  - Bluetooth® : Bluetooth® 5.3
  - Interface : PCIe (WLAN)/ USB (Bluetooth®)

- **GNSS**
  - U-blox M9N
  - Interface : USB

## Military Fischer Connector

Optional Fischer connectors provide solutions for users to operate the device in harsh environments. Signals designed for usage include USB2.0, COM (RS232/RS422/RS485), GLAN, and Audio.

# Chapter 8 – Maintenance and Service

## Cleaning

***Caution:***

- *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, or 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 able to supply charge.
- If you are using AC power, ensure that the connection of AC Adapter is correct.

**I cannot return from Hibernation while on battery power**

- The battery might be drained. Please plug the handheld into AC power.
- Hard reset the device by pressing the power button for 4 seconds

**Unexpected or improper shutdown causes BIOS to reset to Optimized Default**

- This could be a power problem. Please connect the AC adapter to fix the abnormal shutdown problem.

- Minimize the configuration, i.e., remove extra peripherals and devices.
- Remove the modules one by one (SSD, Battery, etc.).
- Remove the software suspected.
- Set BIOS fail-safe default.
- Re-install operating system and application software.