Important Safety Instructions

Pay close attention to the following safety instructions before performing any of the operation. Basic safety precautions should be followed to protect yourself from harm and the product from damage:

• Operation of the product should be carried out by suitably trained, qualified, and certified personnel only to avoid risk of injury from electrical shock or energy hazard.
• Disconnect the power cord from the wall outlet when installing or removing main system components, such as the motherboard and power supply unit.
• Place the system on a stable and flat surface.
• Use extreme caution when working with high-voltage components.
• When handling parts, use a grounded wrist strap designed to prevent static discharge.
• Keep the area around the system clean and clutter-free.
• Keep all components and printed circuit boards (PCBs) in their antistatic bags when not in use.
• Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.

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5.3.5 ACPI Configuration
5.3.6 Trusted Computing
5.4 Hardware Health Event Monitoring Screen
5.5 Security Screen
5.6 Boot Screen
5.7 Exit Screen
Chapter 1 Introduction

1.1 Package Contents

- iBOX-420-DL Barebone System with:
  - iBOX-420-DL Chassis
  - Motherboard (pre-installed)
  - *The barebone system does not include memory, hard drive and mSATA SSD.
- Power Adapter (36W/12V) & Power Plug
- SATA Data and Power Cable
- mSATA Screw
- VESA Mount Bracket & Screw Package
- Support CD
- Quick Installation Guide

Because the hardware specifications might be updated, the content of this documentation will be subject to change without notice.

If any items are missing or appear damaged, contact your authorized dealer.
### 1.2 Product Specifications

<table>
<thead>
<tr>
<th>iBOX-420-DL</th>
<th>Barebone</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU</strong></td>
<td>Intel® Apollo Lake N4200/N3350 Processor</td>
</tr>
<tr>
<td><strong>OS</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Chipset</strong></td>
<td>Intel® N4200/N3350 SoC</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>Supports DDR3L, 2 x SO-DIMM slots, Max. 8GB</td>
</tr>
<tr>
<td><strong>eMMC</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>HDD</strong></td>
<td>Supports 1 x 2.5&quot; SATA HDD*</td>
</tr>
<tr>
<td><strong>mSATA slot</strong></td>
<td>Optional</td>
</tr>
<tr>
<td><strong>LAN</strong></td>
<td>Gigabit LAN</td>
</tr>
<tr>
<td><strong>WiFi</strong></td>
<td>Optional</td>
</tr>
<tr>
<td><strong>Front I/O</strong></td>
<td>1 x USB 3.0, 1 x Audio-out with MIC-In</td>
</tr>
<tr>
<td><strong>Rear I/O</strong></td>
<td>1 x HDMI, 2 x DP, 2 x USB 3.0, 2 x LAN, 1 x Kensington lock</td>
</tr>
<tr>
<td><strong>Power Unit</strong></td>
<td>36W/12V Adapter</td>
</tr>
<tr>
<td><strong>Dimension</strong></td>
<td>135mm (W) x 44.5mm (H) x 110mm (D)</td>
</tr>
<tr>
<td><strong>VESAs</strong></td>
<td>Bracket included, supports 75 x 75 and 100 x 100 mm</td>
</tr>
<tr>
<td>Volume (Liters)</td>
<td>0.6L</td>
</tr>
<tr>
<td>----------------</td>
<td>------</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>0°C~50°C</td>
</tr>
</tbody>
</table>

*For iBOX-420-DL, it is not recommended to install 2.5” HDD. If you install the 2.5” HDD, please keep the iBOX-420-DL in a vertical position to ensure better cooling performance.*
Chapter 2 Product Overview

This chapter provides diagrams showing the location of important components of the iBOX-420-DL.

2.1 Front View

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Headphone &amp; Microphone</td>
</tr>
<tr>
<td>2</td>
<td>USB 3.0 (Type A)</td>
</tr>
</tbody>
</table>
2.2 Rear View

*To use DisplayPort as a display output, please connect your monitor/display to HDMI Port when installing OS system.
This DisplayPort only supports DP to D-Sub dongle and does not support DP to HDMI dongle and DP to DVI dongle.

* There are two LEDs on the LAN port. Please refer to the table below for the LAN port LED indications.

<table>
<thead>
<tr>
<th>Activity / Link LED</th>
<th>Speed LED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status</td>
<td>Description</td>
</tr>
<tr>
<td>Off</td>
<td>No Link</td>
</tr>
<tr>
<td>Blinking</td>
<td>Data Activity</td>
</tr>
<tr>
<td>On</td>
<td>Link</td>
</tr>
</tbody>
</table>

### No. Description

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kensington Lock Slot</td>
</tr>
<tr>
<td>2</td>
<td>DC-In</td>
</tr>
<tr>
<td>3</td>
<td>*DisplayPort</td>
</tr>
<tr>
<td>4</td>
<td>HDMI</td>
</tr>
<tr>
<td>5</td>
<td>USB 3.0 (Type A)</td>
</tr>
<tr>
<td>6</td>
<td>RJ-45</td>
</tr>
</tbody>
</table>
## 2.3 Inside View

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>WiFi Module Slot</td>
</tr>
<tr>
<td>2</td>
<td>mSATA Slot</td>
</tr>
<tr>
<td>3</td>
<td>SO-DIMM Slots</td>
</tr>
<tr>
<td>4</td>
<td>SATA 3.0 Connector</td>
</tr>
<tr>
<td>5</td>
<td>Clear CMOS Pad</td>
</tr>
<tr>
<td></td>
<td><em>Clear CMOS Pad allows you to clear the data in CMOS. To clear CMOS, disconnect the power supply and short the Clear CMOS Pad.</em></td>
</tr>
<tr>
<td>6</td>
<td>Hard disk drive tray (compatible with 2.5&quot; SATA HDD)</td>
</tr>
</tbody>
</table>

SO-DIMM memory, hard drive and mSATA SSD are not included with this system.
Chapter 3 Hardware Installation

This chapter helps you install or remove important components.

3.1 How to Remove the Bottom Case

1. Remove the four screws on the bottom case.
2. Then lift up and remove the bottom panel.
3.2 How to Install the WiFi Module (Optional)

1. Locate the WiFi Module slot on the motherboard.

2. Carefully insert the WiFi Module into the slot.

3. Tighten the screw to secure the WiFi Module to the motherboard.
3.3 How to Install the mSATA SSD

1. Locate the mSATA slot on the motherboard.

2. Carefully insert the mSATA SSD into the slot.

3. Tighten the screw to secure the mSATA SSD to the motherboard.
3.4 How to Install the 2.5-inch Hard Drive

1. Remove the four screws on the bottom case. Then lift up and remove the bottom panel.

2. Attach the HDD cage to the bottom panel and secure it using the four screws.
   Then connect the SATA cable to the HDD.
3. Connect the SATA Data and Power Cable to the motherboard.

4. Then reinstall the bottom panel.
3.5 How to Install the Memory Modules  
(DDR3 Low Voltage (1.35V))

🌟 1. The iBOX-420-DL requires DDR3L SO-DIMM (1.35V).
2. For dual channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR3L SO-DIMM pairs.

⚠️ The SO-DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation.

1. Carefully insert the SO-DIMM memory modules into the slot at a 30-degree angle.

![Diagram of memory module insertion](image1.png)

2. Push down until the modules snap into place.

![Diagram of module snap](image2.png)
3.6 How to Install the VESA Bracket

1. Attach the two screws to the base of the iBOX-420-DL.

2. Attach the VESA Bracket to the rear of a compatible display using the four screws. *Choose mounting holes depending on the mounting hole pattern of your LCD screen (75 mm × 75 mm or 100 mm × 100 mm).

3. Mount the iBOX-420-DL by sliding it into place.
3.7 Positions of the iBOX-420-DL

The iBOX-420-DL can be placed in vertical or horizontal position.

Horizontal Position

Wall-mounted

DC-IN Jack on Top
Chapter 4 Software and Utilities Operation

4.1 Installing Drivers

The Support CD that comes with the motherboard contains necessary drivers and useful utilities that enhance the motherboard’s features.

Running The Support CD

To begin using the support CD, insert the CD into your CD-ROM drive. The CD automatically displays the Main Menu if “AUTORUN” is enabled in your computer. If the Main Menu does not appear automatically, locate and double click on the file “ASRSETUP.EXE” in the Support CD to display the menu.

Drivers Menu

The drivers compatible to your system will be auto-detected and listed on the support CD driver page. Please click Install All or follow the order from top to bottom to install those required drivers. Therefore, the drivers you install can work properly.

Utilities Menu

The Utilities Menu shows the application software that the motherboard supports. Click on a specific item then follow the installation wizard to install it.

To improve Windows 7 compatibility, please download and install the following hot fix provided by Microsoft.
“KB2720599”: http://support.microsoft.com/kb/2720599/en-us
Chapter 5 UEFI SETUP UTILITY

5.1 Introduction

This section explains how to use the UEFI SETUP UTILITY to configure your system. You may run the UEFI SETUP UTILITY by pressing <F2> or <Del> right after you power on the computer, otherwise, the Power-On-Self-Test (POST) will continue with its test routines. If you wish to enter the UEFI SETUP UTILITY after POST, restart the system by pressing <Ctl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.

Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen.

5.1.1 UEFI Menu Bar

The top of the screen has a menu bar with the following selections:

Main
For setting system time/date information

Advanced
For advanced system configurations

Tool
Useful tools

H/W Monitor
Displays current hardware status

Security
For security settings

Boot
For configuring boot settings and boot priority

Exit
Exit the current screen or the UEFI Setup Utility
5.1.2 Navigation Keys

Use < ← > key or < → > key to choose among the selections on the menu bar, and use < ↑ > key or < ↓ > key to move the cursor up or down to select items, then press <Enter> to get into the sub screen. You can also use the mouse to click your required item.

Please check the following table for the descriptions of each navigation key.

<table>
<thead>
<tr>
<th>Navigation Key(s)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ / -</td>
<td>To change option for the selected items</td>
</tr>
<tr>
<td>&lt;Tab&gt;</td>
<td>Switch to next function</td>
</tr>
<tr>
<td>&lt;PGUP&gt;</td>
<td>Go to the previous page</td>
</tr>
<tr>
<td>&lt;PGDN&gt;</td>
<td>Go to the next page</td>
</tr>
<tr>
<td>&lt;HOME&gt;</td>
<td>Go to the top of the screen</td>
</tr>
<tr>
<td>&lt;END&gt;</td>
<td>Go to the bottom of the screen</td>
</tr>
<tr>
<td>&lt;F1&gt;</td>
<td>To display the General Help Screen</td>
</tr>
<tr>
<td>&lt;F7&gt;</td>
<td>Discard changes and exit the SETUP UTILITY</td>
</tr>
<tr>
<td>&lt;F9&gt;</td>
<td>Load optimal default values for all the settings</td>
</tr>
<tr>
<td>&lt;F10&gt;</td>
<td>Save changes and exit the SETUP UTILITY</td>
</tr>
<tr>
<td>&lt;F12&gt;</td>
<td>Print screen</td>
</tr>
<tr>
<td>&lt;ESC&gt;</td>
<td>Jump to the Exit Screen or exit the current screen</td>
</tr>
</tbody>
</table>
5.2 Main Screen

When you enter the UEFI SETUP UTILITY, the Main screen will appear and display the system overview.
5.3 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, Storage Configuration, Super IO Configuration, ACPI Configuration and Trusted Computing.

Instant Flash

Save UEFI files in your USB storage device and run Instant Flash to update your UEFI.

Setting wrong values in this section may cause the system to malfunction.
### 5.3.1 CPU Configuration

#### Intel SpeedStep Technology

Intel SpeedStep technology is Intel's new power saving technology. Processors can switch between multiple frequencies and voltage points to enable power saving. The default value is [Enabled]. Configuration options: [Enabled] and [Disabled]. If you install Windows® OS and want to enable this function, please set this item to [Enabled]. This item will be hidden if the current CPU does not support Intel SpeedStep technology.

> Please note that enabling this function may reduce CPU voltage and lead to system stability or compatibility issues with some power supplies. Please set this item to [Disabled] if above issues occur.

#### CPU C States Support

Enable CPU C States Support for power saving. It is recommended to keep C1, C6 and C7 all enabled for better power saving.

#### Intel Virtualization Technology

When this option is set to [Enabled], a VMM (Virtual Machine Architecture) can utilize...
the additional hardware capabilities provided by Vanderpool Technology. This option will be hidden if the installed CPU does not support Intel Virtualization Technology.

**VT-d**

Intel® Virtualization Technology for Directed I/O helps your virtual machine monitor better utilize hardware by improving application compatibility and reliability, and providing additional levels of manageability, security, isolation, and I/O performance.

**Power Gear**

Toggle between three operational modes (Eco, Normal and Sport) to maximize performance or conserve energy.

- Eco Mode: Reduces your computer’s performance and saves energy.
- Normal Mode: Balance performance with power consumption.
- Sport Mode: Use more power to achieve the highest performance.
5.3.2 Chipset Configuration

DRAM Frequency

If [Auto] is selected, the motherboard will detect the memory module(s) inserted and assign the appropriate frequency automatically.

Share Memory

Configure the size of memory that is allocated to the integrated graphics processor when the system boots up.

Onboard HD Audio

Enable/disable onboard HD audio. Set to Auto to enable onboard HD audio and automatically disable it when a sound card is installed.

Onboard LAN1

This allows you to enable or disable the Onboard LAN 1 feature.

Onboard LAN2

This allows you to enable or disable the Onboard LAN 2 feature.
Deep S5

Mobile platforms support Deep S5 in DC only and desktop platforms support Deep S5 in AC only. The default value is [Disabled].

Restore on AC/Power Loss

Select the power state after a power failure. If [Power Off] is selected, the power will remain off when the power recovers. If [Power On] is selected, the system will start to boot up when the power recovers.
5.3.3 Storage Configuration

<table>
<thead>
<tr>
<th>SATA Controller(s)</th>
<th>[Enabled]</th>
<th>Enables or disables the Chipset SATA Controller. The Chipset SATA controller supports the 2 black internal SATA ports (up to 300MB/s supported per port).</th>
</tr>
</thead>
<tbody>
<tr>
<td>SATA Mode Selection</td>
<td>[AHCI]</td>
<td>[Disabled]</td>
</tr>
<tr>
<td>SATA Aggressive Link Power Management</td>
<td>[Enabled]</td>
<td>[Disabled]</td>
</tr>
<tr>
<td>Hard Disk S.M.A.R.T</td>
<td>[Enabled]</td>
<td>[Disabled]</td>
</tr>
<tr>
<td>SATA1 / Not Detected</td>
<td>[Enabled]</td>
<td>[Disabled]</td>
</tr>
<tr>
<td>LS1 / Not Detected</td>
<td>[Enabled]</td>
<td>[Disabled]</td>
</tr>
<tr>
<td>SDD eMMC Support</td>
<td>[Enabled]</td>
<td>[Disabled]</td>
</tr>
<tr>
<td>MMC / BONDR3(1,2GB)</td>
<td>[Enabled]</td>
<td>[Disabled]</td>
</tr>
</tbody>
</table>

### SATA Controller(s)

Use this item to enable or disable the SATA Controller feature.

### SATA Mode Selection

Use this to select SATA mode. The default value is [AHCI Mode].

**AHCI (Advanced Host Controller Interface) supports NCQ and other new features that will improve SATA disk performance but IDE mode does not have these advantages.**

### Aggressive Link Power Management

Use this item to configure SATA Aggressive Link Power Management.

### Hard Disk S.M.A.R.T.

Use this item to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) feature. Configuration options: [Disabled] and [Enabled].
5.3.4 Super IO Configuration

**COM1 Configuration**

Use this to set parameters of COM1. Select COM1 port type: [RS232], [RS422] or [RS485].

**WDT Timeout Reset**

This allows users to enable/disable the Watch Dog Timer timeout to reset system. The default value is [Disabled].
5.3.5 ACPI Configuration

Suspend to RAM

Use this item to select whether to auto-detect or disable the Suspend-to-RAM feature. Select [Auto] will enable this feature if the OS supports it.

ACPI HPET Table

Use this item to enable or disable ACPI HPET Table. The default value is [Enabled]. Please set this option to [Enabled] if you plan to use this motherboard to submit Windows® certification.

Onboard LAN Power On

Use this item to enable or disable onboard LAN to power on the system.

RTC Alarm Power On

Use this item to enable or disable RTC (Real Time Clock) to power on the system.
5.3.6 Trusted Computing

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security Device Support</td>
<td>Enables or disables BIOS support for security device.</td>
</tr>
<tr>
<td>Active PCR banks</td>
<td>SHA-1, SHA256</td>
</tr>
<tr>
<td>Available PCR banks</td>
<td>SHA-1, SHA256</td>
</tr>
<tr>
<td>SHA-1 PCR Bank</td>
<td>(Enabled)</td>
</tr>
<tr>
<td>SHA256 PCR Bank</td>
<td>(Enabled)</td>
</tr>
<tr>
<td>Pending operation</td>
<td>(None)</td>
</tr>
<tr>
<td>Platform Hierarchy</td>
<td>(Enabled)</td>
</tr>
<tr>
<td>Storage Hierarchy</td>
<td>(Enabled)</td>
</tr>
<tr>
<td>Endorsement Hierarchy</td>
<td>(Enabled)</td>
</tr>
<tr>
<td>TPM 2.0 UEFI Spec Version</td>
<td>(TSS 1.2)</td>
</tr>
<tr>
<td>Physical Presence Spec Version</td>
<td>(TSS)</td>
</tr>
<tr>
<td>TSS InterfaceType</td>
<td>(Auto)</td>
</tr>
<tr>
<td>Device Select</td>
<td>(Auto)</td>
</tr>
<tr>
<td>Onboard TPM</td>
<td>(Enabled)</td>
</tr>
</tbody>
</table>

Security Device Support

Enable or disable BIOS support for security device.
5.4 Hardware Health Event Monitoring Screen

In this section, it allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed, and the critical voltage.

**CPU Fan 1 Setting**

Select a fan mode for CPU Fan 1, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature.
5.5 Security Screen

In this section you may set or change the supervisor/user password for the system. You may also clear the user password.

**Supervisor Password**

Set or change the password for the administrator account. Only the administrator has authority to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

**User Password**

Set or change the password for the user account. Users are unable to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

**Secure Boot**

Enable to support Windows Secure Boot.
5.6 Boot Screen

This section displays the available devices on your system for you to configure the boot settings and the boot priority.

Boot From Onboard LAN

Use this item to enable or disable the Boot From Onboard LAN feature.

Setup Prompt Timeout

This shows the number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

Bootup Num-Lock

If this item is set to [On], it will automatically activate the Numeric Lock function after boot-up.

Full Screen Logo

Use this item to enable or disable OEM Logo. The default value is [Enabled].
CSM (Compatibility Support Module)

Enable to launch the Compatibility Support Module. Please do not disable unless you’re running a WHCK test. If you are using Windows 8 64-bit UEFI and all of your devices support UEFI, you may also disable CSM for faster boot speed.

Launch PXE OpROM Policy

Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only.

Launch Video OpROM Policy

Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only.
### 5.7 Exit Screen

<table>
<thead>
<tr>
<th>Save Changes and Exit</th>
<th>Exit system setup after saving the changes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discard Changes and Exit</td>
<td>F10 key can be used for this operation.</td>
</tr>
<tr>
<td>Discard Changes</td>
<td></td>
</tr>
<tr>
<td>Load UEFI Defaults</td>
<td></td>
</tr>
<tr>
<td>Launch EFI Shell from filesystem device</td>
<td></td>
</tr>
</tbody>
</table>

#### Save Changes and Exit
When you select this option the following message, “Save configuration changes and exit setup?” will pop out. Select [OK] to save changes and exit the UEFI SETUP UTILITY.

#### Discard Changes and Exit
When you select this option the following message, “Discard changes and exit setup?” will pop out. Select [OK] to exit the UEFI SETUP UTILITY without saving any changes.

#### Discard Changes
When you select this option the following message, “Discard changes?” will pop out. Select [OK] to discard all changes.

#### Load UEFI Defaults
Load UEFI default values for all options. The F9 key can be used for this operation.

#### Launch EFI Shell from filesystem device
Attempts to Launch EFI Shell application (Shell64.efi) from one of the available filesystem devices.