Helix 520 / Karbon 520 Industrial Computer

UEFI BIOS Manual

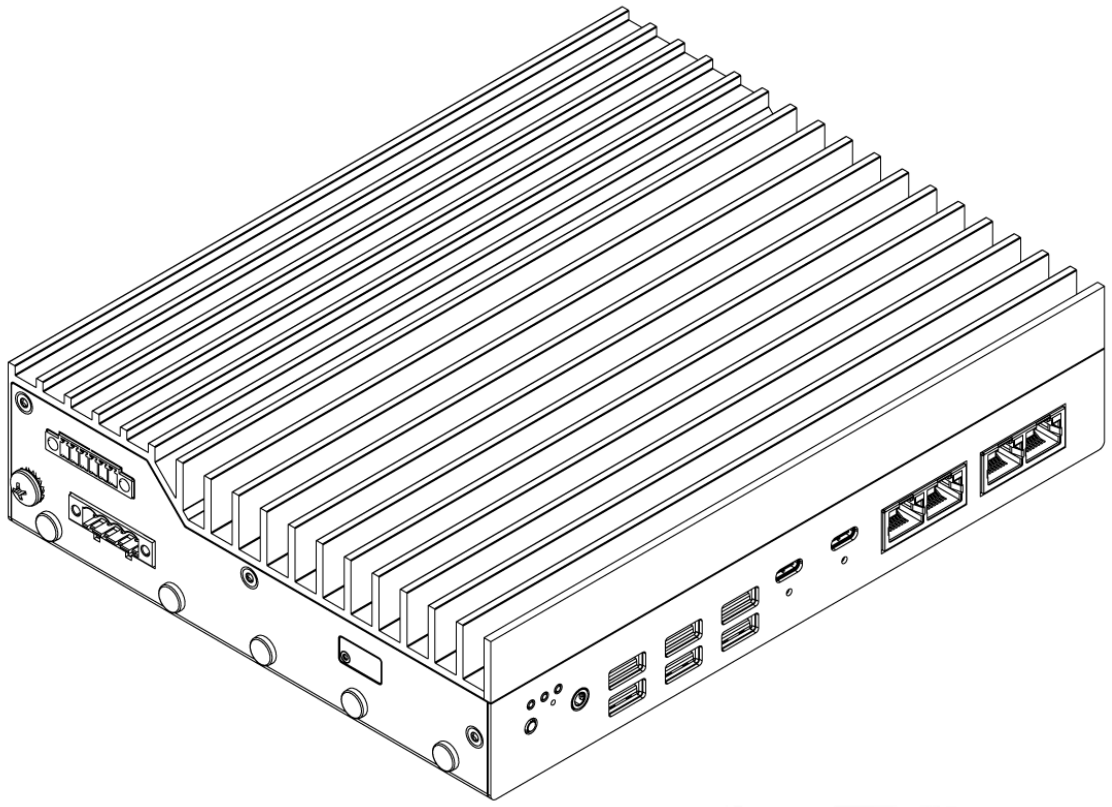

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Table of Contents

1 - Revision History

Revision	Description	Date
1.0	Initial Release	05/23/2025

2 - Introduction

This Helix 520 series BIOS Manual covers Onlogic Custom Features. Additional content pertaining to other configurable elements may be added in subsequent versions of this manual.

3 - BIOS POST Controls

BIOS POST supports the “hot keys” shown in the table below.

Hotkey	Function
DEL	Enter BIOS Setup Menu
F10	Boot manager

4 - Navigating the Setup Menu

To access the BIOS setup menu, hold the Delete key on the keyboard while turning the system on. After a few seconds, the BIOS front page menu is shown (see below).

On each menu, the selected option is shown in white, other options are shown in blue, and read-only options are shown in gray. Some menus have multiple screens, which are shown at the top of the screen. The active screen is shown with a gray background and inactive screens are shown with blue backgrounds.

BIOS menus are navigated by pressing keys on the keyboard:

- F1 shows help on available keyboard shortcuts
- ↑/↓ arrow keys select the option above or below the currently-selected option
- →/← arrow keys activate the screen to the right or left of the currently-activated screen
- Enter activates the selected option. If that option is a menu, that menu is opened. If the selected option is a configurable option, a dialog box is opened to enter a new value.
- F5/F6 change the selected option to its previous or next value
- Esc returns to the previous menu
- F9 restores all options to their factory default values
- F10 saves all options and restarts the system

5 - Configurable Settings

5.1 - Front Page > Administer Secure Boot

Secure Boot verifies the digital signatures of boot software to ensure only trusted software loads during a computer's startup. Supervisor password is required to change settings of secure boot.

5.2 - Advanced > OnLogic Feature Configuration

The OnLogic Feature Configuration menu contains the following options:

- **Pseudo G3**

  A power management state that mimics the behavior of a full power-off (G3) while actually maintaining a low-power state, allowing for faster wake-up times.

- **Intrusion Detect (require a DIO expansion card)**

  If enabled, the following action can be taken when intrusion is detected:

  - Perform Power Cycle - Forced power-off and on
  - Power button emulation - Power button pressing behavior
  - No Action

5.3 - Advanced > Console Redirection Configuration

Console redirection allows the input and output of a computer's console to be rerouted to another device or location, often for remote management or troubleshooting.

5.4 - Advanced > SIO NCT6126D

- **Fan Control**

  Fan Hat Control
  - Default mode: Thermal Cruise

  PCIe Riser Fan Control
  - Default mode: Thermal Cruise

- **Hardware Monitor**

  Temperature
  - Rear_Temp: Power Input Entrance area temperature
  - Riser_Temp: Riser card temperature
  - Front_Temp: Remote Power Button Area temperature

  Voltage
  - VINPUT: Input voltage

    - VCELL: RTC battery voltage
    - V1.8: 1.8V rail voltage
    - V3.3: 3.3V rail voltage
    - VRTC: RTC voltage
    - V1.25: 1.25V rail voltage

  Fan Speed
    - Fan_HAT_FAN_RPM
    - PCIe_Riser_Fan_RPM

- **Watch-Dog Timer**

  The OS built-in driver refreshes the Watch-Dog Timer periodically. If the system hangs, the driver stops refreshing the WDT. The expiration of the timer will trigger a hardware reset to reboot the system. The WDT length range is 1 to 255 minutes.

5.5 - Advanced > System Agent (SA) Configuration -> Graphics Configuration

- **Primary Display**

  When the primary display setting is set to "Auto" and iGFX is enabled with an external GPU card installed and a monitor **is** connected, the BIOS will direct video output to the external card.

  When the primary display setting is set to "Auto" and iGFX is enabled with an external GPU card installed and a monitor **is not** connected, the system will reboot and switch to the internal graphics.

6 - Front Panel Factory Reset Button

If the BIOS detects the 5-sec assertion of FAC_RST_R_N at power-on. The BIOS will do the following.

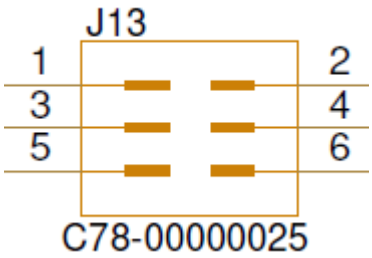
- Resets default UEFI settings to OnLogic factory defaults
- Clears any custom defaults
- Clears any UEFI passwords (Power On and Boot)

To conduct a factory reset of the system, do the following:

1. Hold factory reset button while in a powered off state
2. While holding the reset button, press power button to power the system on
3. After 5-seconds, release the factory reset button
4. The screen will show "System will reboot to reset to default." and will prompt the user to press “ok”
5. The system will reset
6. The reset to default completes

7 - Factory Reset Jumper Setting

A header(J13) with a jumper is mounted on the motherboard to enable/disable the factory reset function.



1-2: FACTORY RESET ENABLE (**DEFAULT**)
2-4: FACTORY RESET DISABLE

8 - Voltage Fault

Voltage fault only relates to the RTC batteries. If the RTC voltage is below 2.5V, the BIOS will show a warning message indicating "Low RTC battery. Press any key to continue" and will hold for a keyboard press before continuing. If the user does not press any key for 30 seconds, BIOS will continue the boot process. The Error LED will blink to indicate a fault. Refer to the Error LED Section below.

9 - Error LED

The Error LED is effectively controlled by BIOS based on the following conditions:

Faulty condition	Error LED	When to detect
No DIMMs installed	Constant on	At BIOS boot-up
No boot device found	Slow blinking	At BIOS boot-up
RTC coin cell battery < 2.5V	Fast blinking	At BIOS boot-up

Blinking frequencies:

- Slow blinking: 0.5 Hz (Blinks once every two seconds)
- Medium blinking: 1 Hz (Blinks once every second)
- Fast blinking: 4 Hz (Blinks four times every second)

10 - Secure Flash

BIOS Secure Flash is a security measure that protects the BIOS from unauthorized modifications by requiring digitally signed BIOS updates. This ensures that only legitimate firmware can be installed. Only OnLogic signed BIOS images can be updated to the system.

11- Secure boot

BIOS Secure Boot is a security feature that prevents malicious software from loading during your PC's startup. It works by verifying the digital signatures of boot components (like the bootloader and operating system) against a database of trusted keys stored in the firmware. If a signature doesn't match or is on a revoked list, the system will not boot, protecting against rootkits and other pre-boot malware.

To enable Secure Boot, do the following. After enabling it, System will only boot to signed EFI boot files or Operating Systems.

1. Go to the security page to set Supervisor Password. Then save & exit
2. Go to “Administer Secure Boot” of the front page to enable secure boot

12 - On-board MCU, DIO, and CANBus Features

Refer to HX520 MCU user manual and Technical Resources available to download at https://support.onlogic.com/.