**DEBIX Q&A V1.0**

**Common questions**

1. What is DEBIX and what features does it have?

DEBIX is essentially a single board computer, which can be widely used in artificial intelligence, machine study and industry 4.0 applications.

* Powerful Quad Core Arm ® Cortex ® -A53 CPU with a Neural Processing Unit (NPU) operating at up to 2.3 TOPS.
* Dual image signal processors (ISP) and one camera inputs for an effective advanced vision system.
* The multimedia capabilities include video encode (including h.265) and decode, 3D/2D graphic acceleration, and multiple audio and voice functionalities.
* Real-time control with Cortex-M7. Robust control networks supported by dual CAN FD and dual Gigabit Ethernet with Time Sensitive Networking (TSN).
* High industrial reliability with DRAM inline ECC.
* Designed for severe environmental conditions and industrial grade temperature requirements. The wide CPU temperature range of -40°C to 105°C makes it suitable for extreme operation environments like public transportation and industrial control etc.
* The credit card form factor board contains 40 GPIO ports. This allows DEBIX to give full processor performance while being free from application restrictions in physical space.
* Support mainstream operating systems including Android, Ubuntu and Yocto.
1. Which manufacturing standards does DEBIX comply with?

We have conducted extensive compliance tests on the DEBIX model for China and other countries/regions such as Europe, etc.

1. Can DEBIX be used in commercial areas?

Yes, DEBIX can be used in commercial areas. Please note that many software in the DEBIX OS Release Version are GPL-licensed, which has certain requirements. The most important thing is that you must provide access to the source code if needed, and it isn't a difficult thing.

1. Is DEBIX suitable for industrial applications?

Yes, it is. DEBIX has been successfully used in industrial areas.

1. Does it support audio or video input?

DEBIX supports MIPI CSI Video Input and a Headphone Mic Input/SPDIF Digital Audio Input.

1. What is the size of DEBIX?

The size of DEBIX is 85.60 x 56 x 21mm (or 3.37 x 2.21 x 0.83 inches), There is a slight overlap between the SD card and the connector protruding from the edge.

1. How is the performance of DEBIX?
2. Multiple cores and high-speed memory:

 4 or 2 x Cortex-A53 cores run at up to 1.8GHz;

Cortex-M7 up to 800MHz;

32bit DDR4 and LPDDR4 up to 4.0GT/s;

1. Advanced machine learning and vision:

 Neural Processing Unit (NPU): up to 2.3 TOPS;

Dual image Signal Processors (ISP): Resolution reaches 12MP and the max. input rate is 375M pixels/s;

Camera Interfaces: 2 x MIPI CSI;

1. Advanced multimedia and display:

 Video decoding: 1080p60, h.265/4, VP9, VP8;

Video coding: 1080p60, h.265/4;

GPU: 16 GFLOPS (high precision) OpenGL ES 3.1/3.0, Vulkan, Open CL 1.2FP, OpenVG 1.1;

Audio: 18 x I2S TDM, DSD512, S/PDIF Tx + Rx, 8-channel PDM Mic In, eARC, ASRC;

Low-power voice accelerator: Cadence Tensilica HiFi 4 DSP @800 MHz;

Display: MIPI-DSI, HDMI 2.0a Tx, LVDS (4/8-lane) Tx;

1. High-speed interface:

 2 x Gigabit Ethernet, supports AVB, IEEE 1588, EEE and 1 x w/TSN;

 2 x Dual-purpose USB 3.0/2.0, with Type-C PHY;

 3rd Gen. PCIe;

 3 x SDIO 3.0;

 2 x CAN FD;

1. Industrial reliability:

 DDR inline ECC for LPDDR4 and DDR4;

14 FinFET technology to realize low soft error rate (SER);

1. Operating system:

 Linux, Android, Yocto;

1. Packaging and temperature:

 FCBGA, 15 x 15 0.5 mm interval;

 Commercial grade : 0℃ to 95℃ Tj;

 Industrial grade: -40℃ to 105℃ Tj;

1. Can it be used as a desktop replacement?

DEBIX, with a faster kernel, additional memory and greatly improved I/O, is a very good desktop replacement.

1. Is it possible to connect two or more DEBIX together to make a faster computer?

Yes, but you can't make a powerful computer by simply bolting it together to play games at a faster speed. You can network computers to build a cluster computer system, but you need to modify the software to work in this distributed manner.

1. What should I do if the flashing fails?

You can restore it through re-programming the SD card.

**Hardware questions**

1. What hardware interfaces does DEBIX have?

|  |
| --- |
| **I/O Interface** |
| Network | 10/100/1000M LAN1 x RJ45 with POE power supply (need POE power supply module)1 x Pin headers (without network transformer) |
| Wi-Fi & BT | 2.4G&5G Dual Frequency Wi-Fi, Bluetooth 5.0 |
| USB | 4 x USB 3.0 Type-A Host, 1 x USB 2.0 Type-C OTG |
| Audio | 1 x Headphone L&R Out, 1 x Headphone Mic In |
| HDMI | 1 x HDMI Out |
| **Expansion** |
| 40Pin Double-Row Pin Headers | （1）3 x UART, 2 x SPI, 2 x I2C, 2 x CAN, 1 x PWM, 2 x GPIO, dedicated interfaces can be reused as GPIO ports（2）1 x SPDIF digital audio input/output（3）5V power supply, system reset, ON/OFF |
| LVDS | 1 x LVDS: single & dual channel 8bit, double-row pin headers |
| MIPI CSI | 1 x MIPI CSI, support 4Lane FPC socket |
| MIPI DSI | 1 x MIPI DSI, support 4Lane FPC socket |
| PCIe | 1 x PCIe, support PCIe X1 FPC socket |
| **Power Supply** |
| Power Input | DC 5V/3A Type-C |

1. Where is the power switch?

The On/Off and reset buttons are located next to the power supply interface. DEBIX supports Automatic Power On. When you need to shut down the device, if you are using DEBIX Desktop, just click the power button in the upper right corner of the desktop, and then select Shutdown. If you are not using the desktop, you can enter sudo poweroff at the console to shutdown. After the LEDs are off, you should wait one second to ensure that the SD card can complete its wear leveling tasks and write operations. And then you can safely unplug DEBIX. Failure to close DEBIX properly may damage your SD card, which means you must re-mirror it.

1. Does it support adding additional memory?

No, it doesn't. The RAM on DEBIX is a separate chip on the motherboard and cannot be upgraded after purchase.

1. Why is the clock speed of my DEBIX running slower than advertised?

The clock speed is lower than the advertised speed in idle time. As the workload of the CPU increases, the clock speed will increase until it reaches the maximum value (the specific situation varies by CPU model). If the CPU starts to overheat, the situation is more complex: When the device reaches a certain temperature, the clock speed is throttled to prevent overheating.

1. Does it support overclocking?

Yes, it supports. But overclocking will void your warranty. Due to the way silicon chips are produced, each device supports a different degree of overclocking. For a capable and stable system, we recommend that you do not overclock your DEBIX.

1. What is its operating temperature range? Does it need a heat sink?

DEBIX uses industrial grade CPU and the CPU operating temperature range is -40°C~105°C. The CPU temperature will increase as the CPU usage increases, and you may find it beneficial to use a heat sink. If you just like its appearance, putting an appropriately sized radiator on it will not damage DEBIX.

1. What kind of display device can be used?

You can use display device with HDMI or LVDS interface.

1. Does the HDMI port support CEC?

Yes, it does.

1. Why is VGA not supported?

Although DEBIX doesn't have a VGA interface, you can use an active adapter to solve this problem. Please note that passive HDMI to VGA cable is not applicable and make sure the active adapter you purchased has an external power supply. An HDMI to VGA adapter without an external power supply often fails to work.

1. Does it support adding a touch panel?

Yes, it does.

1. Does it support sound transmission via HDMI?

Yes.

1. How about standard audio input and output?

There is a standard 3.5mm interface for audio output (speaker). You can add any supported USB microphone, or you can use the I2S interface to add a codec for additional audio I/O.

1. Is it safe to only unplug the power supply?

No, we don't recommend you to do this, it may damage your SD card. We recommend using the sudo poweroff or sudo shutdown command before disconnecting the power. This ensures that any unfinished file transactions are written to the SD card and the SD card is in inactive status. Unplugging the power supply while the SD card is working can sometimes cause damage.

1. What should I do if the power is off unexpectedly?

Power failure can cause problems to various electronic devices, and DEBIX is no exception. If the power is turned off without a normal shutdown, the SD card may be damaged. This is because the system may write into the SD card when the power is off, leaving the SD card file system in an invalid state. Therefore, if you cannot prevent power interruptions, one way to make the system safer is to limit writing to the SD card, or even stop it completely. You can disable swap, enable logging to RAM, and disable systemd-timesyncd, all of which greatly reduce accesses to the SD card.

1. Can I power the motherboard through a USB hub?

It depends on the USB hub. Some hubs comply with the USB 2.0 standard and only provide 500mA per port, which is not enough to power your DEBIX.

1. Can I use the battery or wall socket to power DEBIX?

Running DEBIX directly on the battery requires more attention, and it may damage your DEBIX. However, if you are a practised user, you can give it a try. For example, the four most common AA rechargeable batteries can provide 4.8V when fully charged. Technically 4.8V is just within the tolerance of DEBIX, but as the battery runs out, the system quickly becomes unstable. While four AA alkaline (non-rechargeable) batteries can provide 6V voltage, which exceeds the acceptable tolerance range and may damage your DEBIX. By using a buck and/or boost circuit, you can ensure stable 5V voltage (or using a charger set specifically designed to output a stable 5V from several batteries). These devices are usually sold as emergency battery chargers for mobile phones.

1. What are the power requirements?

DC 5V/3A input with Type-C interface.

1. Is Power Over Ethernet (POE) feasible?

Yes, but it need to be equipped with a POE power supply module.

1. Is there a detailed definition of GPIO pins?

Yes, please refer to the DEBIX User Manual.

1. What size SD card is needed?

Micro SD card.

1. What capacity of SD card does it support?

Although the minimum capacity of 8GB should be enough for most people, we have tried SD cards up to 128GB and they all work well. You can also connect a USB flash disk or mobile hard disk to provide additional storage capacity.

1. Can I boot DEBIX through a USB-connected hard disk instead of an SD card?

No, it doesn’t support.

1. Does it has built-in wireless network?

DEBIX has built-in 2.4G & 5G WiFi.

1. Does it has built-in bluetooth?

There’s a built-in bluetooth 5.0.

1. What models of cameras are supported?

OV5640, etc.

1. How about the resolution?

DEBIX supports maximum resolution of 1080p60 and it has superb codecs (h.265, h.264, VP9, VP8).

1. Why can’t I start it?

When it fails to start, please check whether the power supply is connected correctly and whether the voltage is high enough.

1. Why is DEBIX so hot?

All electronic devices become hot in operation, and DEBIX is no exception.

1. Does DEBIX only support one display when I play video in full screen?

No. DEBIX supports MIPI and HDMI dual display for default.

1. What is the touch rotation angle of the touch screen?

90 degrees.

1. How to add a power button to DEBIX?

There is a power button on the left side of the board, and the GPIO interfaces reserve the access of the ON/OFF button.

**Software questions**

1. What operating system does it support?

It supports Ubuntu 20.04, Android 11 and Yocto+Qt.

1. Does it support Windows 10?

No, it doesn’t.

1. How to update DEBIX?

It is important to keep your system up-to-date with security updates and bug fixes for any applications you may be using. You can do this easily by opening a terminal window and running the following command: sudo apt update.

1. Can PC or Mac software be run on DEBIX?

No, DEBIX only supports ARM64 linux software.

1. Does it support running Android system?

Yes, it supports Android 11.

1. Will it run old software?

In general, you need to see if it supports programming for Armv6, Armv7, or Armv8 architectures on Linux. In most cases, the answer is yes. There is nothing more direct than using DEBIX and testing it to find out the answer!

1. How to share documents from DEBIX with windows computers?

You can share files with windows computers via samba or ftp.

1. How to run the program at startup?

After Linux is loaded, it will initialize the hardware and device drivers, and then run the first process init. Init continues the boot process according to the configuration file and starts other processes. Usually, the modification is placed in script files in the following directory:

 /etc/rc or

 /etc/rc.d or

 /etc/rc?.d

You can make init start other programs automatically, such as editing /etc/rc.d/rc.local file (this file is usually the last script started by the system), adding a line "xinit" or "startx" at the end of the file and entering X-Window directly after booting up.

1. How to run the program at a specific time?

Linux has a daemon called crond, whose main function is to periodically check the contents of a set of command files in the /var/spool/cron directory and execute the commands in these files at a set time. Users can create, modify, and delete these command files through the crontab command.

For example, create a file crondFile with the content "00 9 23 Jan \* HappyBirthday". After running the "crontab cronFile" command, the system will automatically execute the "Happy Birthday" program at 9:00 am on January 23 ("\*" means no matter what day is the day of the week).

1. What codecs does it support?

1080p60 H.265, H.264, VP9, VP8 coding and 1080p60 H.265, H.264 decoding.

1. Does it support networking?

Yes, it supports. DEBIX has 1000BaseT wired Ethernet and one network interface (pin headers) without network compiler.

1. Why there’s no response when I am entering the password?

If it is a graphical interface, you can check the status of your input method;

If it is a text interface, the password is not displayed when entering the password. After you enter the correct password, just press the enter key.

1. Why is there no real-time clock?

Due to insufficient space there's no real-time clock. There are two sets of I2C pin headers reserved, and an RTC clock module can be connected by yourself.

1. How to modify the software source of the Ubuntu system?

(1) Back up the original file (optional step)

 sudo cp /etc/apt/sources.list /etc/apt/sources.list.bak

(2) Open the /ect/apt/sources.list file, comment or delete the existing software source, and then add the software source you need.

(3) Update: sudo apt-get update

1. After inserting the USB device, I enter lsusb in the terminal and couldn't find any information about this device.
2. Test the USB interface. For example, after you connect a USB mouse, execute lsusb to check if there is a mouse connected.
3. The peripherals cannot be identified. It is recommended to check whether other devices can be identified normally.
4. How to modify the sleep mode?

In Settings-Power, there are "press the key to sleep" and "scheduled sleep" for options.

1. How to configure the wireless network card when using a system without a desktop?
2. Turn on the power of the wireless network card

iwconfig wlan0 txpower on

The signal light of the wireless network should be on.

1. List wireless networks in the area

iwlist wlan0 scan

1. Assuming you want to connect to the network MyHome MyHome (essid is MyHom), then enter the command

iwconfig wlan0 essid "MyHome"

If the network is encrypted and the password is 0123456789, then enter the command

iwconfig wlan0 essid "MyHome" key 0123-4567-89

1. Use FileZilla in Windows 10 but fail to connect DEBIX.

Please check whether the ip address is the same with the ip address on the board!

Please check whether the ip address on window 10 has the same network segment with the IP address on DEBIX.

1. How to configure the sound card?

Use root to log in and then run /usr/sbin/sndconfig, and you will see the interface for selecting sound card types. Generally you can select Sound Blaster. After selection you need to set relevant resources, in this process you can use TAB key and direction keys to make selections and then press OK. If you hear the voice of Linus (the founder of Linux), it means that the sound card is set up successfully.

1. How to run jar file?
2. Install JDK

 sudo apt-get update

 sudo apt-get install openjdk-8-jdk

1. Run the file

 java -jar file name.jar

1. How to change the language into Chinese？

Setting Interface: settings - Region & Language - Manage Installed Languages - select Chinese - click Restart

1. How to synchronize network time?

Adjust the time zone to the local area, once connected to the internet, the time will be updated synchronously.

1. How to use PuTTY to log in to DEBIX?
2. Open PuTTY and enter the IP address of DEBIX to log in.
3. When you first log in you need to confirm the connection key, please press "Yes" to confirm. This prompt only appears when logging in for the first time.
4. After logging in, you will be prompted to enter the user name and password, and then you can log in to the DEBIX command line.
(Note: the default DEBIX user name/password is debix/debix)
5. How to enable SSH service?

(1) Find the sshd service configuration file sshd\_config in the /etc/ssh/ directory and open it with the Vim editor; remove the "#" before the monitor port and monitor address in the file; then enable the remote login; finally, enable the use of user name and password as connection verification; save the file and exit

(2) If the connection fails, please enter ps -e | grep sshd to check whether the sshd service is enabled

(3) In order to avoid manual start of sshd service every time at startup, you can add the sshd service to the self-starting list and enter systemctl enable sshd.service

(4) You can enter systemctl list-unit-files | grep sshd to see if the sshd service is set to start automatically

1. How to modify the keyboard layout?

Modify the attribute value of XKBLAYOUT in /etc/default/keyboard, the current value is us, and it can be changed to cn, and then call the setupcon command to take effect directly

1. How to set the resolution of DEBIX VNC?

vncserver -geometry resolution

1. How to configure DEBIX’s WiFi and SSH without display device and keyboard?

Read the SD card which has finished flashing with a computer. Create a new wpa\_supplicant.conf file in the boot partition (DEBIX's /boot directory), fill in the content according to the following reference format and save the wpa\_supplicant.conf file.

|  |  |
| --- | --- |
| 123456789101112131415161718 | country=CNctrl\_interface=DIR=/var/run/wpa\_supplicant GROUP=netdevupdate\_config=1 network={ssid="WiFi-A"psk="12345678"key\_mgmt=WPA-PSKpriority=1} network={ssid="WiFi-B"psk="12345678"key\_mgmt=WPA-PSKpriority=2scan\_ssid=1} |

Instructions and configuration examples of WiFi with different security:
#ssid: ssid of the network
#psk: password
#priority: Connection priority, a larger number means higher priority (a negative number is unacceptable)
#scan\_ssid: You need to specify the value to 1 when connecting to hidden WiFi

If your WiFi has no password

|  |  |
| --- | --- |
| 1234 | network={ssid="name of your wireless network（ssid）"key\_mgmt=NONE} |

If your WiFi uses WEP encryption

|  |  |
| --- | --- |
| 12345 | network={ssid="name of your wireless network（ssid）"key\_mgmt=NONEwep\_key0="your wifi password"} |

If your WiFi uses WPA/WPA2 encryption

|  |  |
| --- | --- |
| 12345 | network={ssid="name of your wireless network（ssid）"key\_mgmt=WPA-PSKpsk="your wifi password"} |

If you are not sure about the WiFi encryption mode, you can open /data/misc/wifi/wpa/wpa\_supplicant.conf through root explorer on your Android phone to view the WiFi information.

If the Access denied prompt appears when connecting to DEBIX via ssh, it means that the ssh service is not enabled. If you want to enable it manually, you can create a new file (a blank file is acceptable) in the boot partition like WiFi configuration and name it ssh (use lowercase and do not have any extensions).

1. Log in to DEBIX without a display device and unknown IP?

Use the network segment scanning tool, the software will automatically detect the network segment where the computer is located, and automatically determine the scanning range. (For example, the computer IP is 192.168.1.101, and the scanning range is 192.168.1.\*), find the device whose manufacturer is "DEBIX".

If you have the login authority of the router (such as home network), you can also directly query the IP address assigned to DEBIX by the router on the management interface of the router.

1. When a HDMI monitor and 3.5mm earphone or speaker are connected at the same time, how to specify one of them as the audio output device?

Open settings - audio

1. What are the steps to install and configure vsftpd on DEBIX?
2. Install vsftpd

sudo apt-get install vsftpd

(2) Restart the vsftpd service

service vsftpd restart

(3) Access DEBIX via FTP on the PC side

Enter in the address bar: ftp:\\192.168.1.x

Enter user name and password as prompted

1. How to use systemd to set boot startups under Linux?

Create a \*.service file (\* is the service name, such as myscript.service)

Use root user and save this file to the /etc/systemd/system directory:

sudo cp myscript.service /etc/systemd/system/myscript.service

Then you can try to start the service with the following command:

sudo systemctl start myscript.service

Stop the service:

sudo systemctl stop myscript.service

Set automatic run at boot:

sudo systemctl enable myscript.service

The systemctl command can also be used to restart or disable it.

1. How to take a screenshot on DEBIX?

PrtSc: Take a screenshot of the entire screen and save it to the Pictures directory.

Shift + PrtSc: Take a screenshot of a certain area of the screen and save it to the Pictures directory.

Alt + PrtSc: Take a screenshot of the current window and save it to the Pictures directory.

Ctrl + PrtSc: Take a screenshot of the entire screen and save it to the clipboard.

Shift + Ctrl + PrtSc: Take a screenshot of a certain area of the screen and save it to the clipboard.

Ctrl + Alt + PrtSc: Take a screenshot of the current window and save it to the clipboard.

The screenshot will be automatically saved in the Pictures folder

1. What’s the mounting method of fstab and mobile hard disk?

DEBIX supports automatic mounting of USB storage devices, and it can also be mounted by modifying /etc/fstab;

1. Does it support automatic mounting of external USB storage devices?

Yes.

1. How to modify the startup animation of DEBIX?

If you want to modify the startup animation, please provide the bmp picture for us to add to the kernel image.

1. How to modify the hostname of DEBIX?

Run hostnamectl to view the hostname of the current system

Use the following command to change the hostname:

hostnamectl set-hostname [YOUR NEW HOSTNAME]