

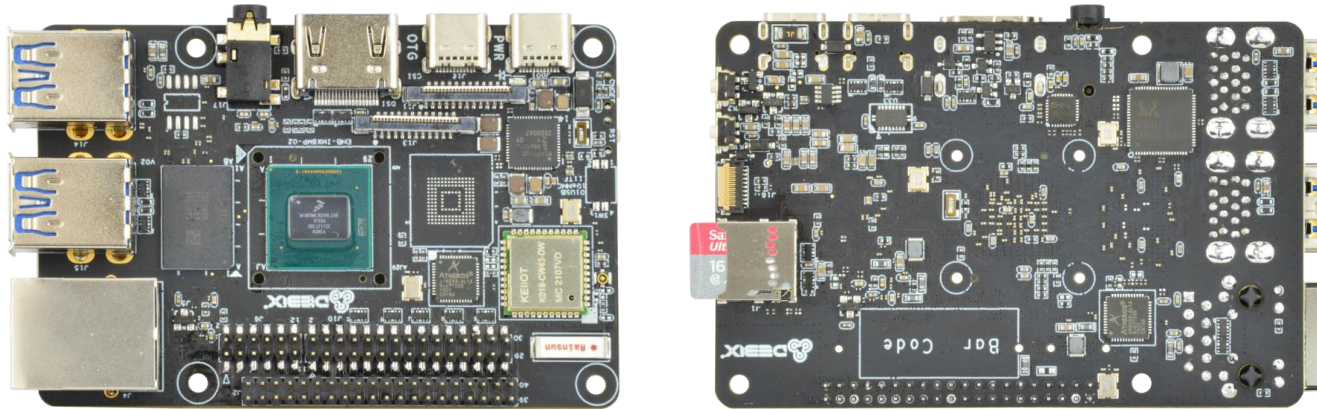


DEBIX Model A Product Features and Applications

February 21st, 2022



DEBIX Model A Overview



(Size: 85 x 56mm)

System

CPU	NXP i.MX 8M Plus (default), 4 x ARM Cortex-A53, comes with an integrated neural processing unit (NPU) that delivers up to 2.3 TOPS. Industrial grade CPU runs at 1.6GHz, and commercial grade CPU runs at up to 1.8GHz. (i.MX 8M Plus series CPU optional)
Memory	2GB LPDDR4 (4GB/6GB optional)
Storage	Default: TF card (Onboard 8GB/16GB/32GB/64GB eMMC optional)
Operating System	Android 11, Yocto, Ubuntu

I/O Interfaces

Gigabit Ethernet	1 x RJ45 with POE power supply (need POE power supply module) 1 x pin header (without network transformer)
WIFI & BT	2.4G & 5G dual-frequency WIFI, BT5.0
USB	4 x USB 3.0 Host Type-A, 1 x USB 2.0 OTG Type-C
Audio	1 x Headphone and Mic combo port
HDMI	1 x HDMI OUT

Expansion

40-Pin Double-Row 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

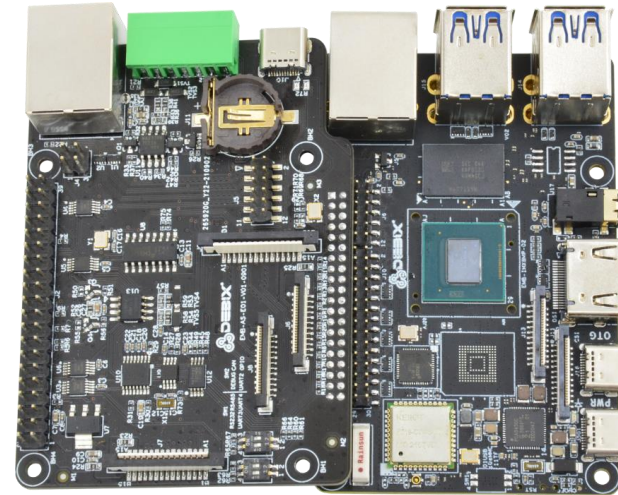
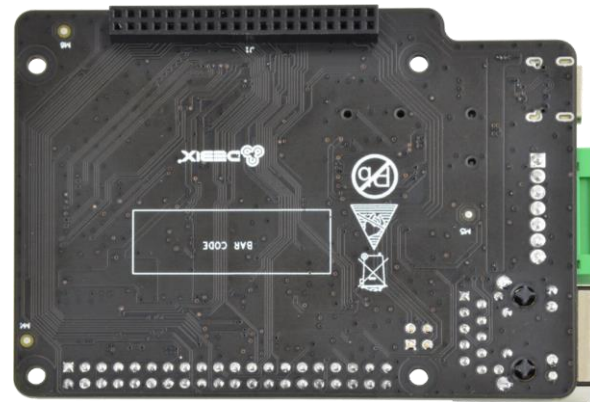
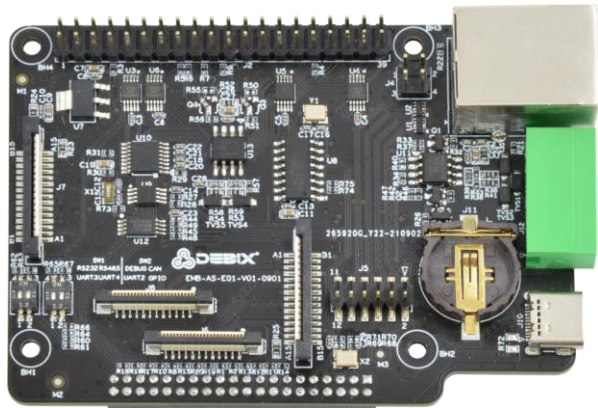
Power Supply	DC 5V/3A Type-C
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Mechanical & Environmental

Size	85.0 x 56.0mm
CPU Temperature	-40°C to 105°C

DEBIX Model A I/O Board (Add-on Board)

- Adds one RJ45 1000M network interface and PoE capability to your DEBIX Model A
- Series ports (RS232, RS485) and CAN transceiver to allow connection with more industrial equipment
- Strong expansion ability to bring unlimited possibilities



I/O Interfaces

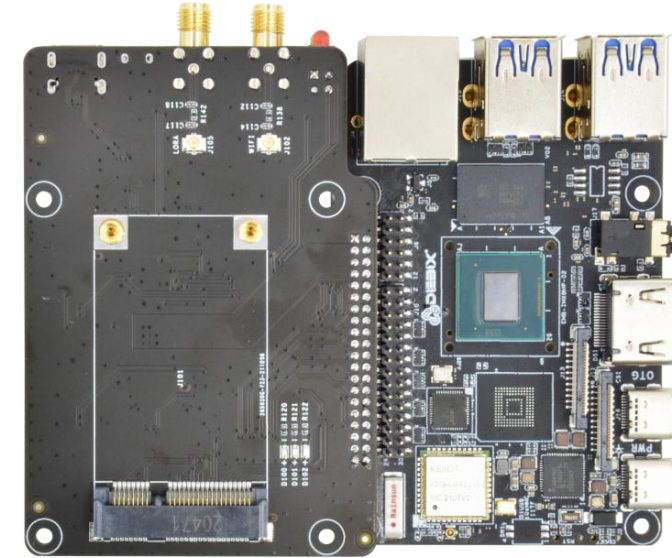
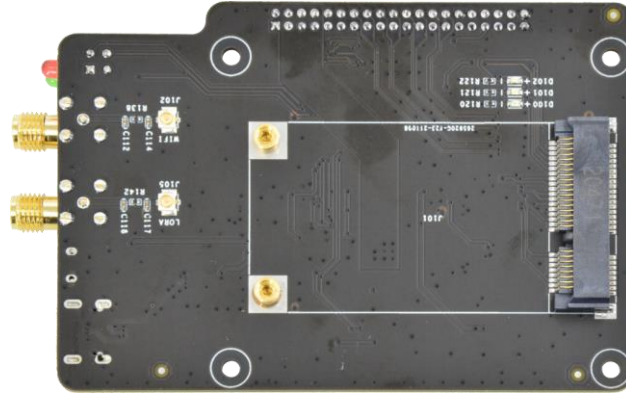
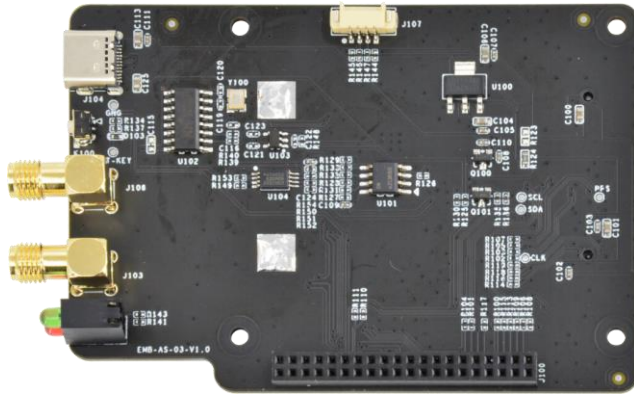
Network	1 x RJ45 Gigabit Network 1 x POE (Compatible with Raspberry Pi)
USB	1 x USB Debug Type-C
RTC	1 x RTC
Serial Ports	1 x RS232 1 x RS485
CAN	1 x CAN Transceiver
DIP Switch	2 x 2bit DIP Switch (used for selecting USB-Debug, RS232, RS485 and CAN)

Expansion

40-Pin Double-Row Headers	1) 3 x TTL UART, 2 x SPI, 2 x I2C, 2 x PWM, 2 x CLKO, 2 x CAN, 1 x I2S (Dedicated interfaces can be reused as GPIO ports) 2) 1 x SPDIF Digital Audio Input/Output
MIPI CSI	1 x MIPI CSI
MIPI DSI	1 x MIPI DSI
E2PROM	1 x 2-Kbit E2PROM

DEBIX Model A LoRa Board (Add-on Board)

- Adds one Mini PCIe interface for LoRa module
- Comes with LoRa antenna and Wifi antenna



I/O Interfaces

Serial Ports	1 x DEBUG
USB	1 x USB Type-C DC 5V Input
Mini PCIe	1 x Mini PCIe (LoRa Module Interface)
Buttons	1 x Bluetooth Pairing Button
LED	1 x Operation Indicator, 1 x Pairing Indicator
External Antenna	1 x LoRa Antenna Connector, 1 x Wifi Antenna Connector
EEPROM	1 x 2-Kbit EEPROM
Clipper Chip	1 x CryptoAuthentication

Processor Key Features

High-Performance Power-Efficient

High-Performance

- Dual/Quad-core Cortex-A53 cores up to 1.8 GHz;
- Cortex-M7 up to 800MHz (task offload, power optimizations)
- 3D GPU and VPU enables efficient video and display
- DDR4, LPDDR4 (Inline ECC)

Power-Efficiency

- Dynamic Voltage Frequency Scaling (DVFS), power gating, clock gating.
- Built in 14nm FinFET LPC technology for low-power & high-performance

Machine Learning, Vision & Voice

Machine Learning

- Neural Network Accelerator up to 2.3 TOPS

Vision System

- 2x MIPI-CSI (4-lane) with PHY
- Camera ISP: 2x187MPix or 1x375MPix scale, de-warp

Low-Power Voice

- Low Power Voice Accelerator

Advanced Multimedia

Video

- 1080p60 video decoding (H.265, H.264, VP9, VP8)
- 1080p60 video encoding (H.265, H.264)
- 2D and 3D GPU

Audio

- 18x I2S TDM (32-bit @ 768KHz),
- DSD512,
- SP/DIF Tx + Rx
- 8-ch PDM Mic input
- HDMI 2.0b Tx + eARC
- ASRC
- 8ch PDM DMIC input for voice capture

Connectivity & Interfaces

Display Interfaces

- 1x MIPI-DSI
- 1x HDMI 2.0b Tx (+eARC)
- LVDS (4/8-lane) Tx
- Up to 3 display simultaneously

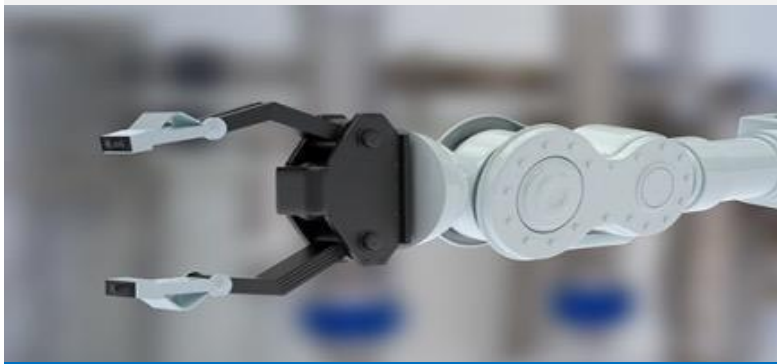
High Speed Interfaces

- 3x SDIO 3.0 for boot / storage / Wi-Fi (max flexibility)
- 1x PCIe 3.0 to connect to high-performing Wi-Fi solutions and other systems
- 2x Gigabit Ethernet with IEEE 1588, AVB (one with TSN, one with IEEE)
- 2x USB 3.0/2.0 OTG with PHY
- 2x CAN or CAN FD

Target Applications

Machine Learning & Industrial Automation

- Machine Vision and Robot Controller
- Industrial Computer, Gateways, HMI
- Printers and Scanners
- Machine Visual Inspection
- Factory Automation



Smart Home, Building & City

- Safety, Security and Surveillance
- Fleet Analytics
- Traffic Monitor and Flow Optimization
- Vision Payment Systems
- Targeted Advertisement
- Service Drones
- Alarm and AI Server Hubs
- Home Patient and Elderly Monitor



Consumer & Pro Audio/Voice Systems

- Surround sound and sound bars
- Audio/video receiver
- Immersive Audio Products
- Wireless or networked smart speakers
- Personal Assistant
- Voice-assisted products



DEBIX Model A Case Study

Case 1. Parking location recognition system

We use the AI algorithm of the i.MX 8M Plus processor to realize the identification of the car when it enters and leaves the parking lot, and accurately locate its parking position. The owner can check the position of the car at any time through the APP on the mobile phone to find the car quickly.



DEBIX Model A Case Study

Case 2. Water surface object recognition system

We use the AI algorithm of the i.MX 8M Plus processor to recognize objects on the water surface of reservoirs and swimming pools, and the monitoring system is connected with the alarm device to realize automatic alarms for dangerous situations such as someone falling into water and rising water, etc.



DEBIX Model A Case Study

Case 3. Industrial control and warning system

Using DEBIX Model A's dual Gigabit network, multiple serial ports, and its 2.3 TOPS NPU, it allows connection and control of peripheral devices in the industrial field to build a centralized control and processing system.



DEBIX Model A Case Study

Case 4. Truck safety system

We utilize the video encoding & decoding capabilities and network functionalities of the i.MX 8M Plus processor to build a monitoring system composed of 6 webcams, and it supports local storage of videos and display on one screen. Based on the i.MX 8M Plus with a NPU, it provides an intelligent safety management system for truck drivers to effectively reduce accidents because of blind spot.



DEBIX Model A Case Study

Case 5. Handheld optical fiber and set-top box network test system

i.MX 8M Plus processor features dual cameras, multiple serial ports, and multi-network interaction, we combine these features and produce this test machine which supports the collection and display of 4 independent video signals, including face recognition, HDMI IN, document photography, and optical fiber cross-section monitoring. It achieves the communication control of multiple professional devices and realizes the interactive communication of multiple networks such as wired network, Wi-Fi and 4G.



Thanks For Watching



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