FCU3501 Embedded Control Unit

It is based on Rockchip RK3588/RK3588J, features a 4×Cortex-A76 + 4×Cortex-A55 architecture with A76 up to 2.4GHz and A55 up to 1.8GHz. It supports 8K codec, has an NPU of 6 TOPS, and allows expansion with a Hailo-8 26TOPS M.2 card. Ideal for edge AI intelligent transportation, factories, and buildings. With fanless passive cooling design, it has passed rigorous environmental and EMC tests to ensure stable and reliable operation.

4×A76+4×A55 Architecture	2.4 GHz Main Frequency	CE/FCC/RoHS Certification
-40℃~+85℃ Temperature Range	6TOPS NPU	26TOPS Computing Card

Product Features:

- 4×A76+4×A55
- 8K video with the same encoding and decoding, decoding up to 8K @ 60fps
- Rich Software Support: Docker, MySQL, FTP Server, ModBus-TCP, ModBus-RTU, OpenVPN, MQTT, OpenSSL, OpenSSH
- Certification: FCC, CE, RoHS
- Support Hailo-8 26 TOPS M. 2 card
- Temperature Range : -40 ℃ ~ + 85 ℃

SoM Basic Parameters:

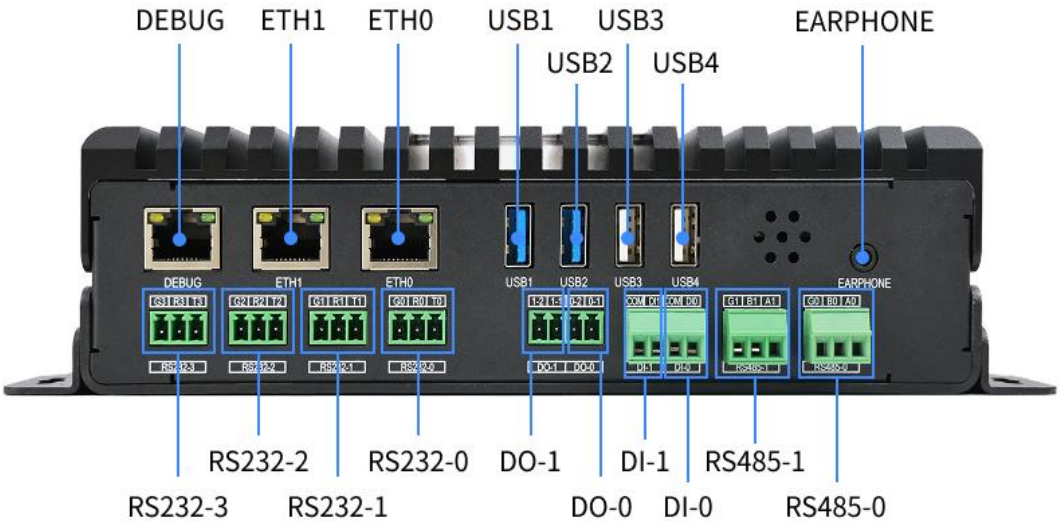
Processor	**Rockchip RK3588/RK3588J** **RK3588 CPU：**4×Cortex-A76@2.4GHz+4×Cortex-A55@1.8GHz **RK3588J CPU：**4×Cortex-A76@1.6GHz+4×Cortex-A55@1.3GHz **NPU:** 6 TOPS, supporting INT4/INT8/INT16/FP16 mixed operation **GPU：**Mali-G610 MP4, OpenGLES 1.1, 2.0, 3.2, OpenCL 2.2, Vulkan1.2 **VPU：** **Hardware Decoding:** •H.265, VP9: up to 8K@60fps •H.264: up to 8K@30fps •AV1: up to 4K@60fps **Hardware Encoding:** •H.265/HEVC, H.264/AVC: up to 8K@30fps
RAM	8/16 GB LPDDR4x

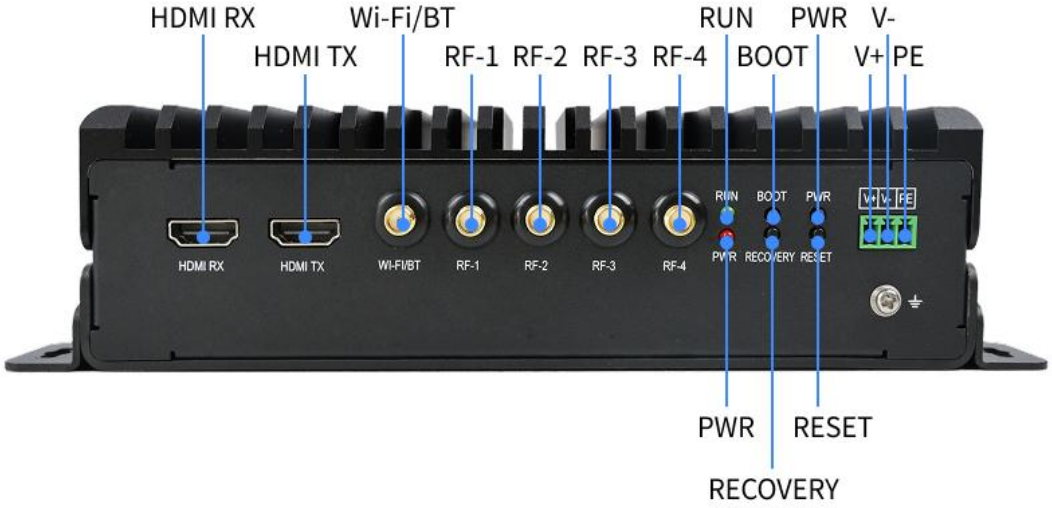
ROM	64/128 GB eMMC
Operating Temperature	-40℃~+85℃
Working Voltage	Rated DC 24V, supporting wide voltage 9V-36V, with reverse connection protection and over current protection
Complete Machine Size	Dimensions: 196.5x140.5x56.5mm (232.5x140.5x56.5mm with mounting ears)
Heat Dissipation	Passive cooling, no fan
Total Weight	2.04kg (including 5G module and computing power card)

Interface Introduction:

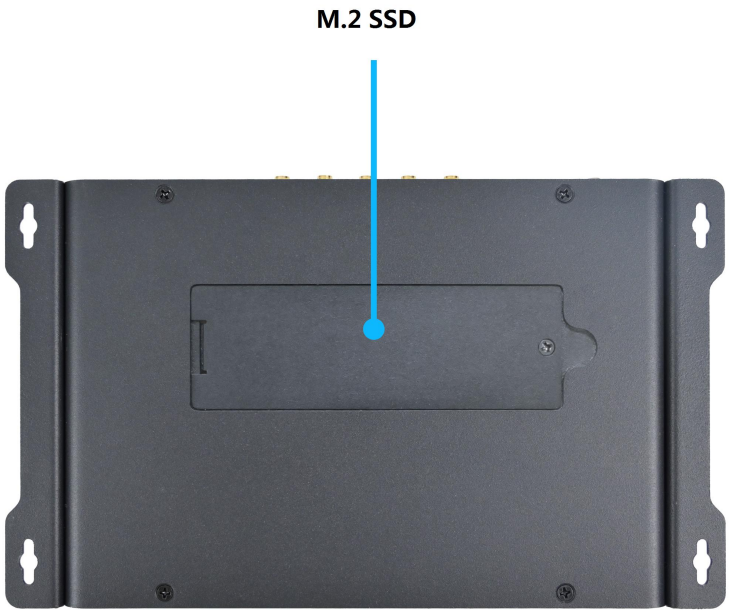
Function	Interface Numbers	Description
EtherNet	2	Support 10/100/1000 Mbps data transmission rate.
USB2.0	2	Led out via Type - A connector, 5V/0.5A output.
USB3.0	2	Led out via Type - A connector, 5V/1A output.
HDMI TX	1	Led out via standard HDMI socket; Support up to 7680x4320@60Hz.
HDMI RX	1	Led out via standard HDMI socket; Support up to 4K@60Hz.
TF	1	Support TF card for expanded storage and OS burning.
DEBUG	1	RJ45 connector, RS232 level. Connect to a computer via a console debugging cable for debugging.
Audio	1	Built - in speaker supporting headphone output.
WiFi&BT	1	Support WIFI4 and Bluetooth 4.2.
M.2	1	4G/5G（EM05/RM500U）
M.2	1	M.2 hard drive.
M.2	1	Support HaiLo - 8 computing power card.
RS485	2	Isolated RS485 level converter, using 3 - pin 15EDGK - 3.81 green terminal block.
RS232	4	Isolated RS232 level converter, using 3 - pin 15EDGK - 3.81 green terminal block.
DI	2	2 x optocoupler - isolated signal input, dry contact access.
DO	2	2 x relay - isolated output, dry contact output.
KEY	4	Four buttons : reset, power on/off, MASKROM, RECOVERY.
LED	2	1 x power supply normally on LED;

Interface Diagram:





Note: Dimensional tolerance ± 0.5mm



Software Support:

OS	Forlinx Desktop 22.04（Ubuntu22.04）
Software Support:	Docker
	MySQL
	FTP Server
	ModBus-TCP
	ModBus-RTU
	OpenVPN
	MQTT
	OpenSSL
	OpenSSH

Product Materials:

Materials List	Hardware and software user manuals, outline drawings, factory images, tools, DEMO, application notes *

*: Abundant information to be provided after product release

Order Model List:

Specification Model	Configuration	Temperature Range	RAM	ROM	Supply
FCU3501+3588J-C188GSE64GI	8GB Basic Version	-40℃~85℃	8GB	64GB	Mass Production
FCU3501+3588J-C188GSE64GI	8GB Computing Power Extended Version	-40℃~85℃	8GB	64GB	Mass Production

Note:

1) **The computing power expansion version comes with an additional Hailo-8 26TOPS M.2 computing power card compared to the basic version;**
2) **4/5G module, 4/5G antenna is optional module (both need to be purchased separately).**

Power Consumption

No.	Test Project	Voltage(V)	Power(W)
1	No-load starting peak power	24	11.5
2	No-load standby power	24	8.3
3	CPU pressure + memory + eMMC read-write pressure test + full interface operation	24	12.3
4	CPU pressure + memory + eMMC read and write pressure test + full interface operation + M.2 hard disk read and write	24	12.5
5	CPU pressure + memory + eMMC read-write pressure test + full interface operation + 5G operation + M.2 hard disk read-write + HDMI display	24	14.2
6	CPU pressure + memory + eMMC read-write pressure test + full interface operation + 5G operation + M.2 hard disk read-write + HDMI display + Hailo-8 operation	24	15.5

Note: The above data are the test results under normal working conditions. The strength variation of the 5G signal, the manufacturer and specifications of the M.2 hard drive, and the USB - connected devices will all have a certain impact on the overall power consumption of the device.

