reComputer Robotics User Manual

Introduction

The reComputer Robotics Series is a compact, high-performance edge AI computer designed for advanced robotics. Compatible with NVIDIA Jetson Orin Nano/Orin NX modules in Super/MAXN mode, it delivers up to 157 TOPS of AI performance. Equipped with extensive connectivity options—including dual Gigabit Ethernet ports, M.2 slots for 5G and Wi-Fi/BT modules, 6x USB 3.2 ports, 2x CAN, GMSL2 (via optional expansion), I2C, and UART—it serves as a powerful robotic brain capable of processing complex data from various sensors. Pre-installed with JetPack 6 and Linux BSP, it ensures seamless deployment.

Supporting frameworks like NVIDIA Isaac, Hugging Face, PyTorch, and ROS 2/1, the reComputer Robotics bridges large language model-driven decision-making with physical robotics control, such as motion planning and sensor fusion. Ideal for the rapid development of autonomous robots, it accelerates time-to-market with ready-to-use interfaces and optimized AI frameworks.

Feature

- **Robust Hardware Design**

A compact, high-performance edge AI computer. Compatible with NVIDIA Jetson Orin Nano/Orin NX modules in Super/MAXN mode, providing up to 157 TOPS of AI performance.

- **Multiple Interfaces for robotics**

Offers extensive connectivity options including dual Gigabit Ethernet ports, M.2 slots for 5G and Wi-Fi/BT modules, 6x USB 3.2 ports, 2x CAN, GMSL2, I2C, and UART, functioning as a powerful robotic brain for processing sensor data.

- **Application and Benefit**

Ideal for rapid development of autonomous robots, accelerating time-to-market with ready-to-use interfaces and optimized AI frameworks.

- **Immediately Go-to-Market**

Pre-installed JetPack on-device, support Super/MAXN mode, Linux OS BSP ready

Part list

- Jetson Orin™ NX 16GB/NX 8GB /Nano 8GB/Nano 4GB module x1
- Seeed Carrier Board (reComputer Robotics J401) x1
- 128GB NVMe SSD x1
- Aluminum Case and Heatsink with Fan x1
- XT30 to DC cable x 1
- USB Cable;Type A to Type C x1
- User Manual x1

Document History

Version	Date	Editor	Description
V0.5	2025/05/15	Chen Feijun	Initial version

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Chapter 1. Introduction

The user manual contains recommendations, guideline and data sheet for engineers and developers to follow to create modules for the expansion connectors on the reComputer Robotics J401 carrier board. As well as understand the capabilities of the other dedicated interface connectors and associated power solutions on the platforms.

The reComputer Robotics J401 carrier board is ideal for software development within the Linux environment, enabling a highly flexible and extensible development platform. Go to reComputer Robotics | Seeed Studio Wiki for access to software updates and the developer SDK supporting the OS image and host development platform that you want to use. The developer SDK includes an OS image that you will load onto your Jetson Orin Nano/NX device, supporting documentation, and application demonstration to help you get started.

The reComputer Robotics J401 carrier board supports all the Jetson Orin Nano Series and Jetson Orin NX Series module.

SKU	Product Name	Module
114110307	reComputer Robotics J3011	Orin Nano 4G
114110308	reComputer Robotics J3011	Orin Nano 8G
114110309	reComputer Robotics J4011	Orin NX 8G
114110310	reComputer Robotics J4012	Orin NX 16G
114110328	reComputer Robotics J3010 with GMSL extension board	Orin Nano 4G
114110329	reComputer Robotics J3011 with GMSL extension board	Orin Nano 8G
114110330	reComputer Robotics J4011 with GMSL extension board	Orin NX 8G
114110331	reComputer Robotics J4012 with GMSL extension board	Orin NX 16G
114110327	reComputer Robotics Carrier board	
114110332	reComputer Robotics GMSL board	

1.1 Jetson Orin Nano Module Feature List

Table 1. Jetson Orin Nano Module Feature List

	reComputer Robotics J3010	**reComputer Robotics J3011**
Applications Processor(AP)	NVIDIA Orin™ Nano 4GB	NVIDIA Orin™ Nano 8GB
AI Performance	Orin Nano 4GB – 34 TOPS(MAXN/Super)	Orin Nano 8GB – 67 TOPS(MAXN/Super)
GPU	512-core NVIDIA Ampere architecture GPU with 16 Tensor Cores	1024-core NVIDIA Ampere architecture GPU with 32 Tensor Cores
GPU Max Frequency	1020 MHz (MAXN/SUPER)	
CPU	6-core Arm® Cortex®-A78AE	
CPU Max Frequency	1.7 GHz (MAXN/SUPER)	
Memory	4GB 64-bit wide LPDDR5 DRAM(up to 34GB/s; 51 GB/s MAXN/SUPER)	8GB 128-bit wide LPDDR5 DRAM(up to 68GB/s; 102 GB/s MAXN/SUPER)
Power	7W - 10W - 25W	7W - 15W - 25W
Video Encode	1080p30 supported by 1-2 CPU cores	
Video Decode	1x 4K60 (H.265) 2x 4K30 (H.265) 5x 1080p60 (H.265) 11x 1080p30 (H.265)	
CSI camera	Up to 4 cameras (8 via virtual channels***) 8 lanes MIPI CSI-2 D-PHY 2.1 (up to 20Gbps)	
Mechanical	69.6mm x 45mm 260-pin SO-DIMM connector	

1.2 Jetson Orin NX Module Feature List

Table 2. Jetson Orin NX Module Feature List

	reComputer Robotics J4011	**reComputer Robotics J4012**
Applications Processor(AP)	NVIDIA Orin™ NX 8GB	NVIDIA Orin™ NX 16GB
AI Performance	Orin NX 8GB – 117 TOPS(MAXN/Super)	Orin NX 16GB – 157 TOPS(MAXN/Super)
GPU	1024-core NVIDIA Ampere architecture GPU with 32 Tensor	

	Cores	
GPU Max Frequency	1173 MHz	
CPU	6-core NVIDIA Arm® Cortex A78AE v8.2 64-bit CPU 2MB L2 + 4MB L3	8-core NVIDIA Arm® Cortex A78AE v8.2 64-bit CPU 2MB L2 + 4MB L3
CPU Max Frequency	2.0 GHz	
DL Accelerator	1 x NVDLA v2.0	2 x NVDLA v2.0
DL Max Frequency	1.23 GHz	
Vision Accelerator	1 x PVA v2.0	
Memory	8GB 128-bit wide LPDDR5 DRAM 102.4 GB/s	16GB 128-bit wide LPDDR5 DRAM 102.4GB/s
Power	10W - 15W - 25W - 40W	10W - 15W - 25W -40W
Video Encode	1x 4K60 (H.265) 3x 4K30 (H.265) 6x 1080p60 (H.265) 12x 1080p30 (H.265)	
Video Decode	1x 8K30 (H.265) 2x 4K60 (H.265) 4x 4K30 (H.265) 9x 1080p60 (H.265) 18x 1080p30 (H.265)	
CSI camera	Up to 4 cameras (8 via virtual channels***) 8 lanes MIPI CSI-2 D-PHY 2.1 (up to 20Gbps)	
Mechanical	69.6mm x 45mm 260-pin SO-DIMM connector	

1.3 Specification

Table 3. reComputer Robotics Carrier Board Specification

Carrier Board		
Storage	1x M.2 KEY M PCIe (M.2 NVMe 2280 SSD 128G included)	
Networking	M.2 KEY E	1x M.2 Key E for WiFi/Bluetooth module*
	M.2 KEY B	1x M.2 Key B for 5G module*
	Ethernet	2x RJ45 Gigabit Ethernet
I/O	USB	6x USB 3.2 Type-A (5Gbps);

		1x USB 3.2 Type-C (Host/DP 1.4) 1x USB 2.0 Type-C (Device Mode/Debug);
	Camera	1x 4 in 1 GMSL2(mini fakra)(optional board*)
	CAN	2x CAN0(XT30(2+2)) 3x CAN1(4-Pin GH 1.25 Header)
	Display	1x DP1.4(Type C Host)
	UART	1 x UART 4-Pin GH 1.25 Header
	I2C	2x I2C 4-Pin GH 1.25 Header
	Fan	1x 4-Pin Fan Connector (5V PWM) 1x 4-Pin Fan Connector (12V PWM)
	Extension Port	1x Camera Expansion Header(for GMSL2 board)
	RTC	1x RTC 2-pin 1x RTC Socket
	LED	3x LED(PWR, ACT and User LED)
	Pinhole Button	1x PWR 1x RESET
	DIP Switch	1x REC
	Antenna Hole	5x Antenna Hole
Power	19-54V XT30(2+2) (XT30 to 5525 DC Jack Cable included)	
Jetpack Version	Jetpack 6	
Mechanical	Dimensions (W x D x H)	130mm x 120mm x 66mm
	Weight	1100g
	Installation	Desk, Wall-mounting
Operating Temperature	-20℃~55℃(25W Mode) -20℃~50℃(MAXN Mode)	
Warranty	2 Years	
Certification	RoHS, REACH, CE, FCC, UKCA, KC	
Statement	remark with * need additional purchase	

Table 4. GMSL(MAX96712) Extension Board Specification

GMSL(MAX96712) Extension Board		
Chip Information	Deserializer Chip Model	MAX96712GTB/V
	Supported Serializer Chip Models	MAX9295A, MAX96705, MAX96717F, MAX96717G
Compatibility	Supported Jetson Module	Jetson Orin Nano/NX
	Supported Carrier Boards and Device Models	reComputer Robotics J401 Carrier Board; reComputer Robotics Series

Interface	GMSL2 Interface	1 x AMS29D-40MZ5-Z code Rosenberger HFM Connector
	GMSL2 Input	Support up to 4 channels of 6Gbps GMSL2 cameras
	MIPI Output	2 channels of 4 - lanes CSI2 (2.5Gbps/lane), each CSI2 interface with a maximum rate of 10Gbps
Connection	Connection Method	GMSL2 Fakra 1-to-4 M-M Cable
	POC Interface Feature	Support simultaneous power and data transmission
	Power Supply	12V/400mA

1.4 reComputer Robotics J401 Carrier Board Block Diagram

Figure 1. reComputer Robotics J401 Carrier Board Block Diagram

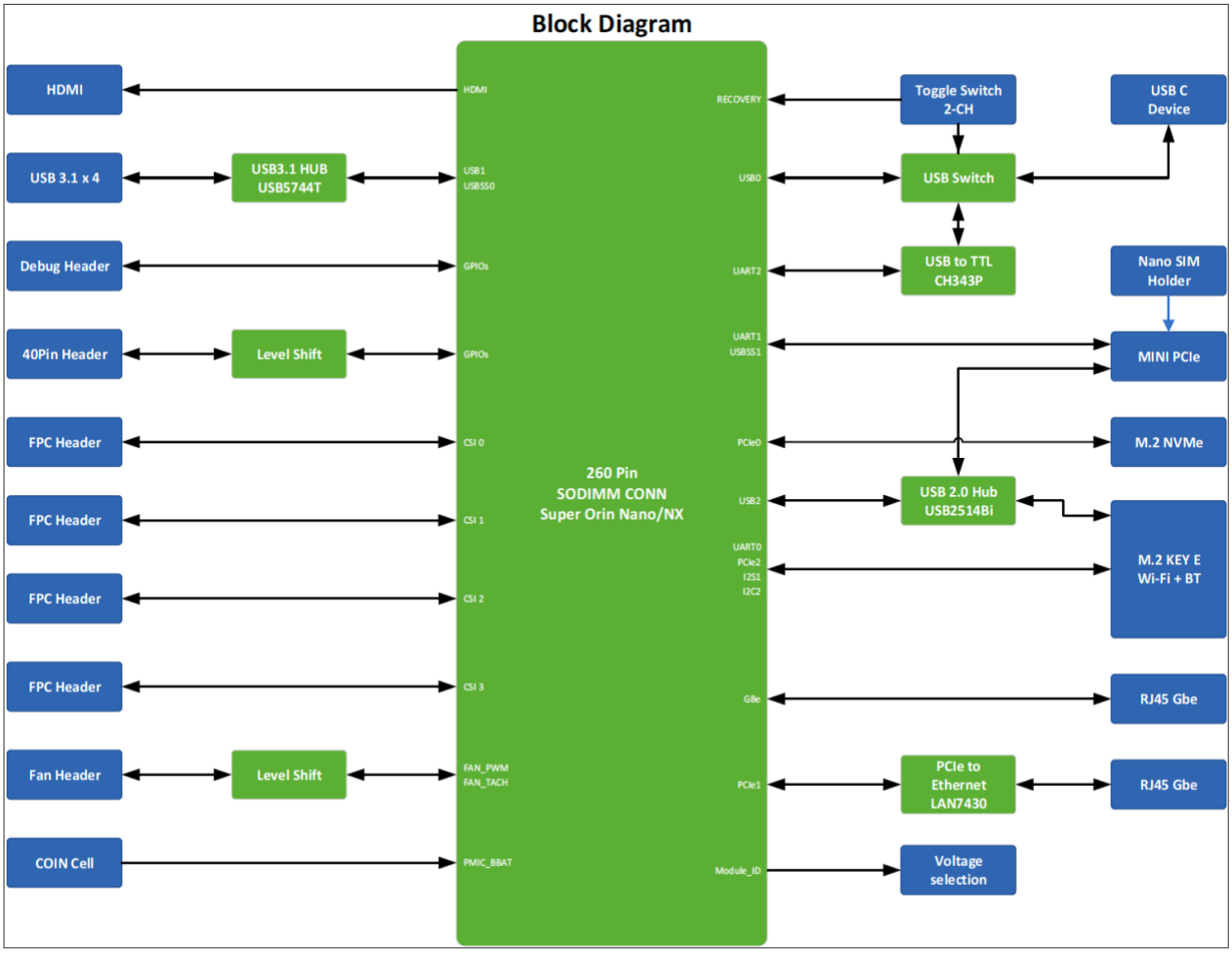
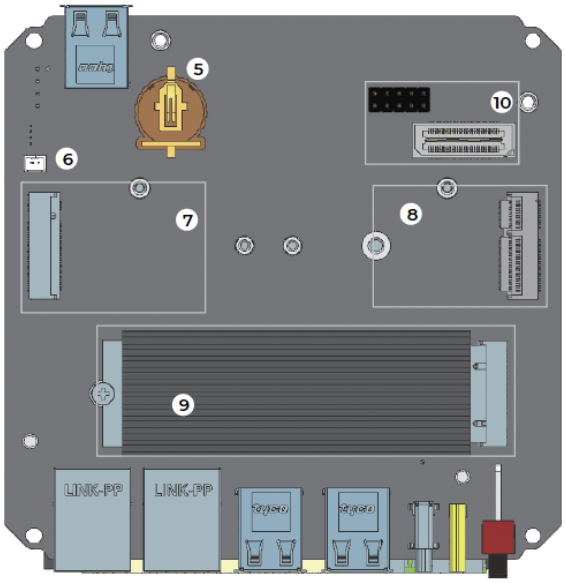


Figure 2. reComputer Robotics J401 Carrier Board Placement-Top View



5 RTC Battery Socket

6 RTC 2-Pin Header

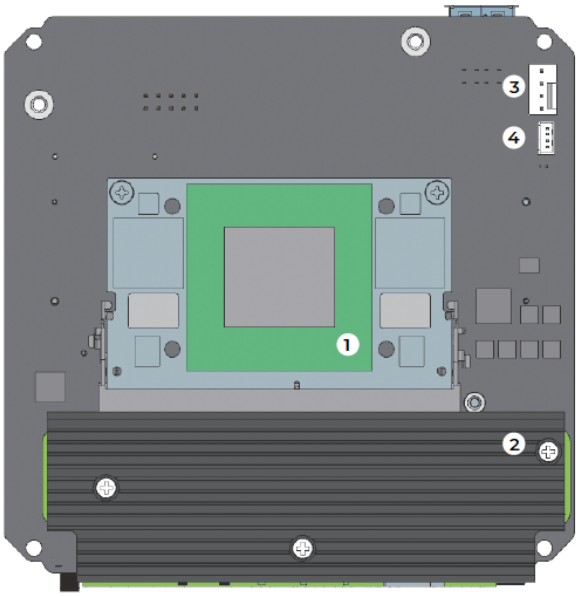
7 M.2 Key B Slot

8 M.2 Key E Slot

9 M.2 Key M Slot(with SSD)

10 Camera Expansion Header

Figure 3. reComputer Robotics J401 Carrier Board Placement-Bottom View



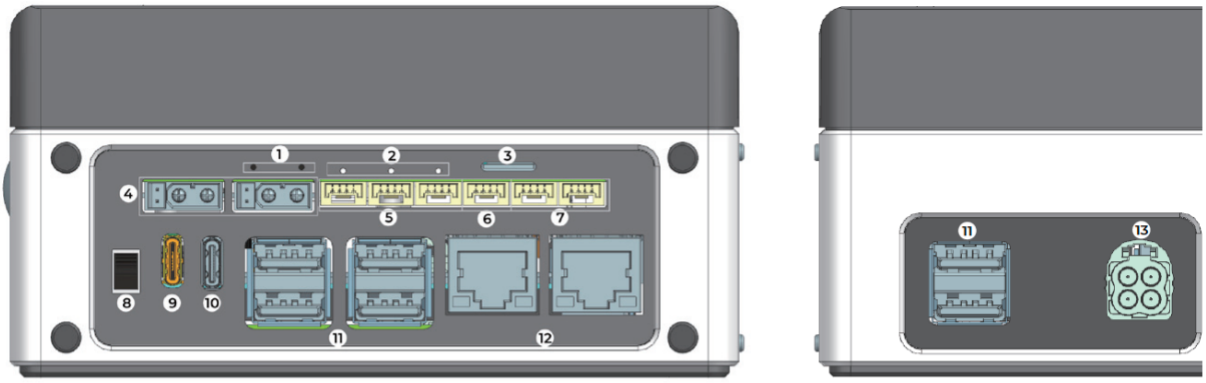
1 Nvidia Jetson Orin Module

2 Power Supply and JST Expansion Board

3 4-Pin Fan Connector (12V PWM)

4 4-Pin Fan Connector (5V PWM)

Figure 4. reComputer Robotics J401 Device Placement-Front/Back View



1. 2x Pinhole Button
2. 3x LED Indicator
3. SIM Card Slot
4. 2x XT30(2+2)
5. 3x CAN1 JST 4-Pin
6. UART JST 4-Pin
7. 2x IIC JST 4-Pin
8. DIP Switch
9. Type C USB 2.0
10. USB 3.2/ DP 1.4
11. 6x Type A USB 3.2
12. 2x RJ45 Ethernet Port
13. 1 for 4 GMSL Camera Connector

Chapter 2. Carrier Board Interfaces

Table 5. Interfaces of Carrier Board List

Port type	Port Name	Layout Number
USB Type-C Ports	USB 2.0 Type-C	J20
USB Type-C Ports	USB 3.2/ DP 1.4	J19
6 x USB Type-A	USB 3.2 Type-A	J7/J17/J18
Switch	REC & Debug	SW2
2 x RJ45	1000M ETH	J15/J16
5V Fan 4-Pin GH 1.25mm	5V Fan	J13
12V Fan 4-Pin SH 2.56mm	12V Fan	J6
M.2 Key M slot	M.2 Key M(NVMe)	J14
M.2 Key E slot	M.2 Key E	J13

M.2 Key B slot	M.2 Key B	J12
RTC Socket	RTC 3V	J9
RTC 2-Pin header	RTC 3V	J11
Camera Expansion Connector	CSI(Camera Serial Interface)	J8/J10
260-pin SO-DIMM connector	Module Connector	J4
Power Supply Board Connector		J5/J6

Table 6. Interfaces of Power Supply Board List

Port type	Port Name	Layout Number
2 x XT30(2+2)	DC19-54V	J4/J5
2 x I2C GH Header	I2C	J6/J7
1 x UART GH Header	UART	J8
3 x CAN1 GH Header	CAN1	J9/J10/J11
SIM card slot	SIM card slot	J1
2 x Pinhole Switch	Switch	SW1/SW2
Power Supply Board Connector		J5/J6

Legend	Ground	Power	Reserved

2.1 USB Ports

The carrier board supports several USB Connectors. There are 6x USB 3.2 Type A connectors with 5Gbps speed for Host mode only. And 1x USB 2.0 Type-C Connector supports Debug and Device Mode (including USB Force Recovery) switched by a REC switch. 1x USB 2.0 Type-C Connector supports both Host Mode and DP 1.4 display.

Table 7. USB List

Carrier Board			
1 x	USB 2.0 Type-C	Device Mode/Debug	J20

1 x	USB 3.2 Type-C/DP 1.4	Host Mode/Display	J19
2 x	USB 3.0 Type-A	Host Mode	J7
2 x	USB 3.1 Type-A	Host Mode	J17
2 x	USB 3.1 Type-A	Host Mode	J18

Table 8. USB 2.0 Type C Connector Pin Description – J20

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/Dir
A4/B9 A9/B4	GPIO00 (USB_VUSB_EN0)	87	USB0_VBUS_DET*	VBUS Supply	Power
A5	-	-	DAT_CC1	-	-
B5	-	-	DAT_CC2	-	-
A7	DN1	115	Type C_USB_DN	Orin Module USB1 2.0 Data/Debug UART2	Bidir
B7	DN2				
A6	DP1	117	Type C_USB_DP		
B6	DP2				
A8	-	-	-	-	-
B8	-	-	-	-	-
A1/B12	-	-	-	Ground	Ground
A12/B1	-	-	-		
Note: In the Type/Dir column, Output is to USB connectors. Input is from USB connectors. Bidir is for bidirectional signals.					

Table 9. USB 3.2 Type C/DP 1.4 Connector Pin Description – J19

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/Dir
A4/B9 A9/B4	-	-	VBUS_TYPEC	VBUS Supply	Power
A5	-	-	TYPEC_CC1	Connect to ANX7447	Bidir
B5	-	-	TYPEC_CC2		
A8	-	-	MUX_TYPEC_SB		Input

			U1		
B8	-	-	MUX_TYPEC_SBU2		
B10	-	-	MUX_TYPEC_RXN1	TYPE C front Receive Signals	Input
B11	-	-	MUX_TYPEC_RXP1		
A3	-	-	MUX_TYPEC_TXN1	TYPE C front Transmit Signals	Output
A2	-	-	MUX_TYPEC_TXP1		
A10	-	-	MUX_TYPEC_RXN2	TYPE C reverse Receive Signals	Input
A11	-	-	MUX_TYPEC_RXP2		
B3	-	-	MUX_TYPEC_TXN2	TYPE C reverse Transmit Signals	Output
B2	-	-	MUX_TYPEC_TXP2		
A7	Dn1	121	USB2_AP_N	Orin Module USB2 2.0 Data	Bidir
B7	Dn2				
A6	Dp1	123	USB2_AP_P		
B6	Dp2				
A1/B12	-	-	-	Ground	Ground
B1/A12	-	-	-		
Note: Orin Module USBSS1 and DP1 Signals are connected to AN7447 Chip.					

Table 10. USB 3.2 Type A Connector Pin Description – J7

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/Dir
USB 3.0 Type A (Bottom)					
1	VBUS_0	-	VDD_VBUS_C	VBUS Supply	Power
2	DN_0	-	PCIe_USB2_DN	USB 3.2 Data from Hub(PCIe2 to USB3.0)	Bidir
3	DP_0	-	PCIe_USB2_DP		
4	-	-		Ground	Ground
5	RX_N_0	-	USB2_SSRX_	USB 3.2	Input

			N	Receive Data from Hub(PCIe2 to USB3.0)	
6	RX_P_0	-	USB2_SSRX_P		
7	-	-	-	Ground	Ground
8	TX_N_0	-	USB2_SSTX_N	USB 3.2 Transmit Data from Hub(PCIe2 to USB3.0)	Output
9	TX_P_0	-	USB2_SSTX_P		
USB 3.2 Type A (Top)					
10	VBUS_1	-	VDD_VBUS_C	VBUS Supply	Power
11	DN_1	-	USB1_C_N	USB 3.2 Data from Hub(PCIe2 to USB3.0)	Bidir
12	DP_1	-	USB1_C_P		
13	-	-		Ground	Ground
14	RX_N_1	-	USB1_SSRX_N	USB 3.2 Receive Data from Hub(PCIe2 to USB3.0)	Input
15	RX_P_1	-	USB1_SSRX_P		
16	-	-	-	Ground	Ground
17	TX_N_1	-	USB1_SSTX_N	USB 3.2 Transmit Data from Hub(PCIe2 to USB3.0)	Output
18	TX_P_1	-	USB1_SSTX_P		
Note: 1. This USB port is converted from PCIe2. 2. The Type A is 5Gbps for all USB ports, and only supports USB Host, not Device mode. 3. The upper and lower USB ports share a current-limiting IC, with a total power supply capacity of 2.1A maximum output current(single can also be 2.1A). If over 2.4A, it will enter the over-current protection state. 3.The ports are hot-swappable					

Table 11. USB 3.2 Type A Connector Pin Description – J17

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/Dir
USB 3.2 Type A (Bottom)					

1	VBUS_0	-	VDD_VBUS_B	VBUS Supply	Power
2	DN_0	-	HUB_HSD4_N	USB 3.2 Data from USB3.1 GEN1 Hub	Bidir
3	DP_0	-	HUB_HSD4_P		
4	-	-		Ground	Ground
5	RX_N_0	-	HUB_SSRX4_N	USB 3.2 Receive Data from USB3.1 GEN1 Hub	Input
6	RX_P_0	-	HUB_SSRX4_P		
7	-	-	-	Ground	Ground
8	TX_N_0	-	HUB _SSTX4_N	USB 3.2 Transmit Data from USB3.1 GEN1 Hub	Output
9	TX_P_0	-	HUB _SSTX4_P		
USB 3.2 Type A (Top)					
10	VBUS_1	-	VDD_VBUS_B	VBUS Supply	Power
11	DN_1	-	HUB_HSD3_N	USB 3.2 Transmit Data from USB3.1 GEN1 Hub	Bidir
12	DP_1	-	HUB_HSD3_P		
13	-	-		Ground	Ground
14	RX_N_1	-	HUB_SSRX3_N	USB 3.2 Transmit Data from USB3.1 GEN1 Hub	Input
15	RX_P_1	-	HUB_SSRX3_P		
16	-	-	-	Ground	Ground
17	TX_N_1	-	HUB _SSTX3_N	USB 3.2 Transmit Data from USB3.1 GEN1 Hub	Output
18	TX_P_1	-	HUB _SSTX3_P		

Note:
1.The Type A is 5Gbps for all USB ports, and only supports USB Host, not Device mode.
2.The upper and lower USB ports share a current-limiting IC, with a total power supply capacity of 2.1A maximum output current(single can also be 2.1A). If over 2.4A, it will enter the over-current protection state.
3.The ports are hot-swappable

Table 12. USB 3.2 Type A Connector Pin Description – J18

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/Dir
USB 3.2 Type A (Bottom)					
1	VBUS_0	-	VDD_VBUS_A	VBUS Supply	Power
2	DN_0	-	HUB_HSD2_N	USB 3.2 Data from USB3.1 GEN1 Hub	Bidir
3	DP_0	-	HUB_HSD2_P		
4	-	-		Ground	Ground
5	RX_N_0	-	HUB_SSRX2_N	USB 3.2 Receive Data from USB3.1 GEN1 Hub	Input
6	RX_P_0	-	HUB_SSRX2_P		
7	-	-	-	Ground	Ground
8	TX_N_0	-	HUB_SSTX2_N	USB 3.2 Transmit Data from USB3.1 GEN1 Hub	Output
9	TX_P_0	-	HUB_SSTX2_P		
USB 3.2 Type A (Top)					
10	VBUS_1	-	VDD_VBUS_A	VBUS Supply	Power
11	DN_1	-	HUB_HSD1_N	USB 3.2 Transmit Data from USB3.1 GEN1 Hub	Bidir
12	DP_1	-	HUB_HSD1_P		
13	-	-		Ground	Ground
14	RX_N_1	-	HUB_SSRX1_N	USB 3.2 Transmit Data from USB3.1 GEN1 Hub	Input
15	RX_P_1	-	HUB_SSRX1_P		
16	-	-	-	Ground	Ground
17	TX_N_1	-	HUB_SSTX1_N	USB 3.2 Transmit Data from USB3.1 GEN1 Hub	Output
18	TX_P_1	-	HUB_SSTX1_P		
Note:					

1.The Type A is 5Gbps for all USB ports, and only supports USB Host, not Device mode.
2.The upper and lower USB ports share a current-limiting IC, with a total power supply capacity of 2.1A maximum output current(single can also be 2.1A). If over 2.4A, it will enter the over-current protection state.
3.The ports are hot-swappable

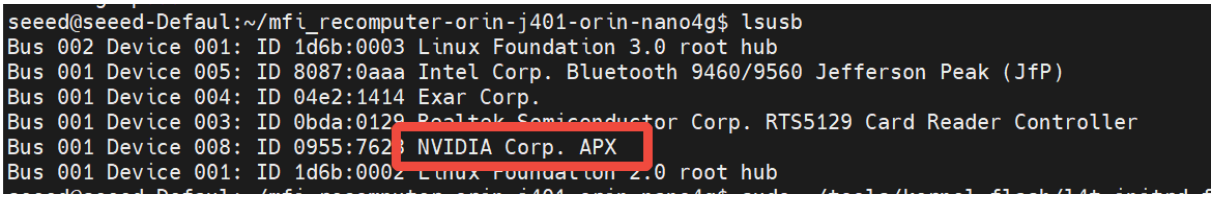
2.2 Switch and Type C USB 2.0

Table 13. Switch Function List

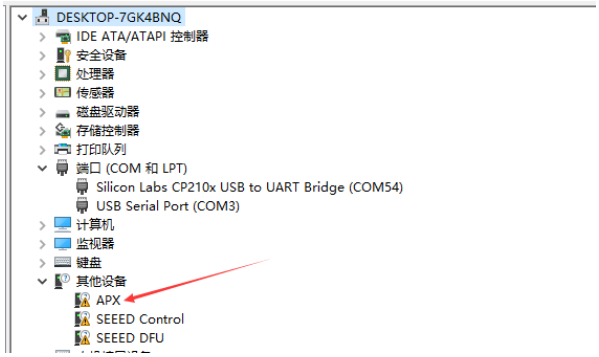
Mode	REC Switch	Operation Description	Status
Recovery Mode	ON	power on device after turning on REC button	Device will enter force recovery mode. Can flash the device via Type C USB 2.0 port.
Debug Mode	OFF	power on device before turning off REC button	The Type C USB 2.0 port will enter device mode. Can read the device log from this port
Configure Mode	OFF	After flashing OS, power on device after turning off REC button	Wait about 10s after power on, will enter to configuration page.

- Recovery Mode

Host computer: Linux system
Once enter the recovery mode, the device will be recognized as USB device, named 0955:xxxx NVIDIA Corp. APX.



Host computer: Windows system
Once enter the recovery mode, the device will be recognized as Serial device, named APX.



- Debug Mode

Connect the device to Host Computer while turn off the REC button, the reComputer Robotics will enter debug mode.

Open a serial debugging tool, select the corresponding serial port and set the baud rate as 115200. Debug log will be printed.

2.3 Gigabit Ethernet

There are 2 RJ45 Gigabit Ethernet on carrier board supported 10/100/1000M. ETH0 is the native Ethernet port, and the other one ETH1 is converted from PCIe.

Name	Type	Speeds	Layout Number
ETH0	Jetson native Gigabit Ethernet	10/100/1000 Mbit/s	J16
ETH1	Converted from PCIe	10/100/1000 Mbit/s	J15

Table 14. Ethernet RJ45 Connector Pin Description – J16

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/ Dir
11	GBE_MDI0_P	186	GBE_MDI0_P	Gigabit Ethernet MDI 0+	Bidir
10	GBE_MDI0_N	184	GBE_MDI0_N	Gigabit Ethernet MDI 0-	Bidir
3	GBE_MDI1_P	192	GBE_MDI1_P	Gigabit Ethernet MDI 1+	Bidir
12	-	-	-	MCT	-
6	-	-	-	MCT	-
1				MCT	
7				MCT	
4	GBE_MDI1_N	190	GBE_MDI1_N	Gigabit Ethernet MDI 1-	Bidir
3	GBE_MDI2_P	198	GBE_MDI2_P	Gigabit Ethernet MDI 2+	Bidir
2	GBE_MDI2_N	196	GBE_MDI2_N	Gigabit Ethernet MDI 2-	Bidir
8	GBE_MDI3_P	204	GBE_MDI3_P	Gigabit Ethernet MDI 3+	Bidir
9	GBE_MDI3_N	202	GBE_MDI3_N	Gigabit Ethernet MDI 3-	Bidir
16	-	-	-	Green LED Anode	Input
15	GBE_LED_LINK	188	GBE_LED_LINK	Green LED Cathode. On for 1000Mbps link. Off for 10/100Mbps.	Output
14				Yellow LED Anode	Input

13	GBE_LED_ACT	194	GBE_LED_ACT	Yellow LED Cathode. On indicates activity	Output
19 20	-	-	-	Shield Ground	Ground
Note: 1. Gigabit Ethernet (10/100/1000M) 2. Normal working condition: Green LED: always on, Yellow LED: flashing					

Table 15. Ethernet RJ45 Connector Pin Description – J15

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/ Dir
2	TD1+		TXRXA_P		Bidir
3	TD1-		TXRXA_N		Bidir
4	TD2+		TXRXB_P		Bidir
5	TD2-	-	TXRXB_N		Bidir
6	TD3+	-	TXRXC_P		Bidir
7	TD3-		TXRXC_N		Bidir
8	TD4+		TXRXD_P		Bidir
9	TD4-		TXRXD_N		Bidir
1	GND_CT		GND	Ground	Bidir
10	GND_CAP		GND_SHD		Bidir
14	GRNA			Green LED Anode	Input
13	GRNC		ETH_LED0	Green LED Cathode. On for 1000Mbps link. Off for 10/100Mbps.	Output
12	YLWA	-	-	Yellow LED Anode	Input
11	YLWC		ETH_LED1	Yellow LED Cathode. On indicates activity	Output
S1 S2	-	-	GND_SHD	Shield Ground	Ground
Note: 1. Gigabit Ethernet (10/100/1000M) 2. This network port is connected to the PCIe-to-Ethernet chip which is not built into the Orin module. 3. Normal working condition: Green LED: always on, Yellow LED: flashing					

2.4 M.2 Key M slot

Table 16. M.2 Key M slot Pin Description – J14

Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir Default
1	-	-	Ground	Ground
3				
5	PCIE0_RX3_N	155	PCIe IF #0 Lane 3 Receive	Input
7	PCIE0_RX3_P	157		
9	-	-	Ground	Ground
11	PCIE0_TX3_N	154	PCIe IF #0 Lane 3 Transmit	Output
13	PCIE0_TX3_P	156		
15	-	-	Ground	Ground
17	PCIE0_RX2_N	149	PCIe IF #0 Lane 2 Receive	Input
19	PCIE0_RX2_P	151		
21	-	-	Ground	Ground
23	PCIE0_TX2_N	148	PCIe IF #0 Lane 2 Transmit	Output
25	PCIE0_TX2_P	150		
27	-	-	Ground	Ground
29	PCIE0_RX1_N	137	PCIe IF #0 Lane 1 Receive	Input
31	PCIE0_RX1_P	139		
33	-	-	Ground	Ground
35	PCIE0_TX1_N	140	PCIe IF #0 Lane 1 Transmit	Output
37	PCIE0_TX1_P	142		
39	-	-	Ground	Ground
41	PCIE0_RX0_N	131	PCIe IF #0 Lane 0 Receive	Input
43	PCIE0_RX0_P	133		
45	-	-	Ground	Ground
47	PCIE0_TX0_N	134	PCIe IF #0 Lane 0 Transmit	Output
49	PCIE0_TX0_P	136		
51	-	-	Ground	Ground
53	PCIE0_CLK_N	160	PCIe IF #0 Reference Clock	Output
55	PCIE0_CLK_P	162		
57	-	-	Ground	Ground
59	-	-	Unused (Key)	Unused
61				
63				
65				
67	-	-	Unused	Unused
69				
71	-	-	Ground	Ground

73 75				

Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir Default
2 4	-	-	Main 3.3V Supply	Power
6 8 10	-	-	Unused	Unused
12 14 16 18	-	-	Main 3.3V Supply	Power
20 22 24 26 28 30 32 34 36 38	-	-	Unused	Unused
40	I2C2_SCL	232	General I2C #2 (optional)	Bidir/OD, 1.8V
42	I2C2_SDA	234		
44	SDMMC_DAT1	221	M.2 Key M Alert	Output, 1.8V
46 48	-	-	Unused	Unused
50	PCIE0_RST*	181	PCIe IF #0 Reset	Output, 3.3V
52	PCIE0_ CLKREQ*	180	PCIe IF #0 Clock Request	Input, 3.3V
54	PCIE_WAKE*	179	PCIe Wake (Level Shifted from 3.3V to 1.8V)	Input, 3.3V
56 58	-	-	Unused	Unused
60 62 64 66	-	-	Unused (Key)	Unused (Key)
68	-	-	32KHz Suspend Clock	Output, 3.3V
70	-	-	Main 3.3V Supply	Power

72				
74				
Note: For NVMe SSD 2280. Support PCIe Gen4.0.				

2.5 M.2 Key E slot

Table 17. M.2 Key E slot Pin Description – J13

Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir
1	Ground	-	Ground	Ground
3	USB_D+	123	PCIe USB Data	Bidir
5	USB_D-	121		
7	Ground	-	Ground	Ground
9	-	-	Unused	Unused
11				
13				
15				
17				
19				
21				
23				
33	Ground	-	Ground	Ground
35	PCIE1_TX0_P	174	PCIe #2 Transmit Lane0	Output
37	PCIE1_TX0_N	172		
39	Ground	-	Ground	Ground
41	PCIE1_RX0_N	169	PCIe #2 Receive Lane0	Input
43	PCIE1_RX0_P	167		
45	Ground	-	Ground	Ground
47	PCIE1_CLK_N	175	PCIe #2 Reference clock	Output
49	PCIE1_CLK_P	173		
51	Ground	-	Ground	Ground
53	PCIE1_CLKREQ*	182	PCIe #2 Clock Request	Bidir, 3.3V
55	PCIE_WAKE*	179	PCIe Wake	Input, 3.3V
57	Ground	-	Ground	Ground
59	-	-	Unused	Unused
61				

63	Ground	-	Ground	Ground
65	-	-	Unused	Unused
67				
69	Ground	-	Ground	Ground
71	-	-	Unused	Unused
73				
75	Ground	-	Ground	Ground

Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir
2	VDD_3V3_SYS	-	Main 3.3V Supply	Power
4				
6	-	-	Unused	Unused
8	I2S1_SCLK	226	I2S #1 Clock	Bidir, 1.8V
10	I2S1_LRCK	224	I2S #1 Left/Right Clock	Bidir, 1.8V
12	I2S1_SDIN	222	I2S #1 Data In	Input, 1.8V
14	I2S1_SDOUT	220	I2S #1 Data Out	Output, 1.8V
16	-	-	Unused	Unused
18	-	-	Ground	Ground
20	UART_WAKE	124	Bluetooth #2 Wake AP	Input, 3.3V
22	UART0_RXD	101	UART #0 Receive	Input, 1.8V
32	UART0_TXD	99	UART #0 Transmit	Output, 1.8V
34	UART0_CTS*	105	UART #0 Clear to Send	Input, 1.8V
36	UART0_RTS*	103	UART #0 Request to Send	Output, 1.8V
38	-	-	Unused	Unused
40	-	-	Unused	Unused
42	AP_WAKE_BT_M2		?	?
44	-	-	Unused	Unused
46	-	-	Unused	Unused
48	-	-	Unused	Unused
50	M2E_SUSCLK_32KHZ	210	Suspend Clock(32KHz)	Output, 3.3V
52	PCIE1_RST*	183	PCIe #0 Reset	Output, 3.3V
54	W_DISABLE2			
56	W_DISABLE1			
58	I2C2_SDA	234	General I2C	Bidir/OD,

60	I2C2_SCL	232	#2(optional)	1.8V
62	M2E_ALERT	212	M.2 Key E Connector Alert	Input, 1.8V
64	-	-	Unused	Unused
66				
68				
70				
72	VDD_3V3	-	Main 3.3V Supply	Power
74				
Note: Support Wi-Fi/Bluetooth module				

2.6 M.2 Key B(4G/5G) TBD

Table 18. M.2 Key B slot Pin Description - J4

Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir Default
1				
2	VCC_3.3V	—	Main 3.3v Supply	Power
3	—	—		
4	Ground	—	Ground	Ground
5	—	—		
6	—	—		
7	—	—		
8	USIM_VDD	—	SIM_PWR	
9	Ground	—	Ground	Ground
10	USIM_DATA	—	SIM_DATA	
11	—	—		
12	USIM_CLK	—	SIM_CLK	
13	—	—		
14	USIM_RST	—	SIM_RST	
15	Ground	—	Ground	Ground
16	—	—		
17	—	—		
18	Ground	—	Ground	Ground
19	—	—		
20	—	—		
21	Ground	—	Ground	Ground
22	PCIE_RST	218	PCIE_RST	Input,3.3v,Default Low,Active High
23	—	—		
24	—	—		
25	—	—		
26	Ground	—	Ground	Ground
27	Ground	—	Ground	Ground
28	—	—		
29	Ground	—	Ground	Ground
30	—	—		
31	—	—		
32	—	—		
33	—	—		
34	Ground	—	Ground	Ground
35	Ground	—	Ground	Ground
36	USB_DM	—	USB_DM	

37	Ground	—	Ground	Ground
38	USB_DP	—	USB_DP	
39	VCC_3.3V	—	Main 3.3v Supply	Power
40	Ground	—	Ground	Ground
41	VCC_3.3V	—	Main 3.3v Supply	Power
42		—		
43	Ground	—	Ground	Ground
44	USIM_PRESENCE	—	USIM_PRESE	
45	—	—		
46	—	—		
47	—	—		
48	—	—		
49	—	—		
50	Ground	—	Ground	Ground
51	—	—		
52	VCC_3.3V	—	Main 3.3v Supply	Power
Note: For 4G/5G LTE module(need to purchase additionally).				

2.7 REC Switch Header

Table 19. REC switch Header Pin Description - J15

Pin#	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/Dir Default
1	-	-		PC_LED-: Connects to LED Cathode to indicate System Sleep/Wake up(Off when system in sleep mode)	Input, 5V
2	-	-		PC_LED+: Connects to LED Anode (see above)	Output
3	UART2_RXD(DEBUG)	238	UART2_RXD	UART #2 Receive	Input, 3.3V
4	UART2_TXD(DEBUG)	236	UART2_TXD	UART #2 Transmit	Output, 3.3V
5	-	-		AC OK: Connect pins 5 and 6 to disable Auto-Power-On and require power button press.	Input, 3.3V
6	-	-		Auto Power-on disable: Pulled to GND. See Pin 5.	NaN
7	-	-		Ground	Ground
8	SYS_RESET*	239	SYS_RESET	Temporarily connect pins 7 and 8 to reset system.	Input, 1.8V
9	-	-		Ground	Ground

10	FORCE_RECOVERY*	214	FORCE_RECOVERY*	Connect pins 9 and 10 during power-on to put system in USB Force Recovery mode.	Input, 1.8V
11	-	-		Ground	Ground
12	SLEEP/WAKE*	240	PWR_BTN*	Connect pins 11 and 12 to initiate power-on if Auto-Power-On disabled (Pins 5 and 6 connected).	Input, 5V
Note: In the Type/Dir column, Output is to button header. Input is from button header. Bidir is for bidirectional signals.					

2.8 5V Fan Connector

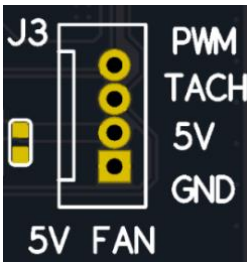


Table 20. 5V Fan Header Pin Description - J3

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/Dir Default
1	-			Ground	Ground
2	-			Main 5.0v Supply	Power
3	GPIO08(SDMMC_CD)	208	FAN_TACH	Fan Tachometer signal	Input, 5V
4	GPIO14(PWM)	230	FAN_PWM	Fan Pulse Width Modulation signal	Output, 5V
Note: 1.CPU on the SoM can control the fan automatically, fan turns on automatically when the temperature is too high. 2.Connect 4Pin 5V fan, you can control the fan speed, and detect the speed.					

2.9 12V Fan Connector

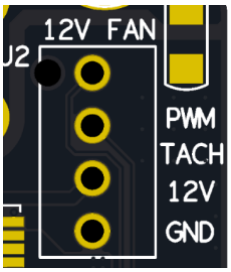


Table 21. 12V Fan Header Pin Description – J3

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/Dir Default
1	-			Ground	Ground
2	-			Main 12v Supply	Power

3	GPIO08(SDMMC_CD)	208	FAN_TACH	Fan Tachometer signal	Input, 5V
4	GPIO14(PWM)	230	FAN_PWM	Fan Pulse Width Modulation signal	Output, 5V
Note: 1.CPU on the SoM can control the fan automatically, fan turns on automatically when the temperature is too high. 2.Connect 4Pin 12V fan, you can control the fan speed, and detect the speed.					

2.10 RTC Battery Back-up Coin Cell Holder/2-Pin Connector

Interface	**Description**	**Layout Number**
Connect 3V button battery, 1.25MM pitch, 2Pin	clock can be timed and saved in case of power failure	J19
Connect 3V button cell, CR1220	clock can be timed and saved in case of power failure	J14
RTC: selects one of them to use.		

Table 22. RTC Battery Socket Pin Description -J19

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/Dir Default
1	-			Ground	Ground
2	PMIC_BBAT	235	BBAT	Power Management IC (PMIC) real-time clock battery back-up. Optionally used to provide backup power for the Real-Time-Clock (RTC). Charging is disabled on the hardware and non-rechargeable battery should be used by default.	Power

Table 23. RTC 2-Pin Header Pin Description -J14

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/Dir Default
1	-			Ground	Ground
2	PMIC_BBAT	235	BBAT	Power Management IC (PMIC) real-time clock battery back-up. Optionally used to provide backup power for the Real-Time-Clock(RTC). Charging is disabled on the hardware and non-rechargeable battery should be used by default.	Power

2.11 Camera Expansion Connector

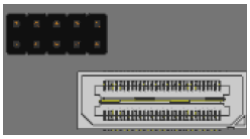


Table 24. 2x5 Header Pin Description -J8

Pin #	Module Pin Name	Net Name	Usage/Description	Type/Dir Default
1	-	VDD_12V_EXP	For GMSL camera Power supply	Power
2	-	VDD_12V_EXP		Power
3		CAM_I2C_SDA_1V8	I2C communication	
4		CAM_I2C_SCL_1V8		
5		SPI0_SCK_1V8	SPI communication	
6		VDD_3V3_SYS		Power
7		SPI0_CS0_1V8	SPI communication	
8		VDD_1V8		Power
9		VDD_5V_SYS		Power
10		GND		Ground

Table 25. High Speed Connector for CSI Pin Description -J8

Pin	Module Pin	Net Name	Usage/Description	Type/Dir

#	Name			Default
1	-	Ground	Ground	Ground
3	-	CSI0_D0_P		
5	-	CSI0_D0_N		
7	-	Ground	Ground	Ground
9	-	CSI0_CLK_P		
11	-	CSI0_CLK_N		
13	-	Ground	Ground	Ground
15	-	CSI0_D1_P		
17	-	CSI0_D1_N		
19	-	Ground	Ground	Ground
21	-	CSI2_D1_P		
23	-	CSI2_D1_N		
25	-	Ground	Ground	Ground
27	-	CSI2_CLK_P		
29	-	CSI2_CLK_N		
31	-	Ground	Ground	Ground
33	-	CSI2_D1_P		
35	-	CSI2_D1_N		
37	-	Ground	Ground	Ground
39	-	CAM_FRSYNC0_GPIO07_1V8		
41	—	CAM_I2C_SCL_1V8		
43	—	CAM_I2C_SDA_1V8		
45	—	I2C2_SCL		
47	—	I2C2_SDA		
49	—	CAM_RST_1V8		
51	—	CAM_FRSYNC1_GPIO13_1V8		
53		CAM_VDD_EN_3V3		
55		SPI0_SCK_1V8		
57		SPI0_CS0_1V8		
59		CAM_MUX_SEL		

Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir Default
2	Ground	—	Ground	Ground
4	—	CSI1_D0_P		
6	—	CSI1_D0_N		

8	Ground	—	Ground	Ground
10	—	CSI1_CLK_P		
12	—	CSI1_CLK_N		
14	Ground	—	Ground	Ground
16	—	CSI1_D1_P		
18	—	CSI1_D1_N		
20	Ground	—	Ground	Ground
22	—	CSI3_D0_P		
24	—	CSI3_D0_N		
26	Ground	—	Ground	Ground
28	—	CSI3_CLK_P		
30	—	CSI3_CLK_N		
32	Ground	—	Ground	Ground
34	—	CSI3_D1_P		
36	—	CSI3_D1_N		
38	Ground	—	Ground	Ground
40	—	GPIO01_CLK_1V8		
42		GPIO11_CLK_1V8		
44	—	VDD_1V8		Power
46	—	CAM0_PWDN		
48	—	CAM1_PWDN		
50	—	CAM0_MCLK		
52	—	VDD_3V3_SYS		Power
54		CAM1_MCLK		
56		SPI0_MOSI_1V8		
58		SPI0_MISO_1V8		
60		VDD_12V_EXP		Power
Note:				

2.13 XT30(2+2)

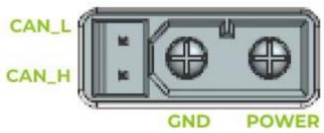


Table 26. XT30(2+2) Pin Description -J4/J5

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/Dir Default
1	-	-	-	Support Power In/Out from DC 19-54V	Power
2	-	-	-	Ground	Ground
3				CAN0_H	
4				CAN0_L	
Note: 1. Two XT30(2+2) connectors are connected. 2. CAN transmitter power is 5V.					

2.14 I2C GH-1.25 Header

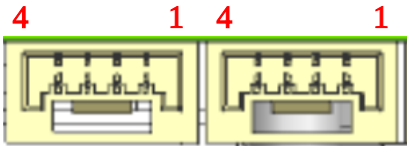


Table 27. I2C GH-1.25 Pin Description -J6

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/Dir Default
1	-	-	-	Ground	Ground
2	-	-	-	I2C1_SDA_3V3_LS	Data
3	-	-	-	I2C1_SCL_3V3_LS	Clock
4	-	-	-	VDD_I2C1	Power

Table 28. I2C GH-1.25 Pin Description -J7

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/Dir Default
1	-	-	-	Ground	Ground
2	-	-	I2C0_SDA_3V3_LS		Data
3	-	-	I2C0_SCL_3V3_		Clock

			LS		
4	-	-	VDD_I2C1	VDD_I2C1	Power

2.15 UART GH-1.25 Header

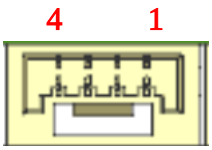


Table 29. I2C GH-1.25 Pin Description -J8

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/Dir Default
1	-	-	Ground	Ground	Ground
2	-	-	UART1_RXD_3V3	Receive data	
3	-	-	UART1_TXD_3V3	Transmit data	
4	-	-	VDD_UART	VDD_UART	Power

2.16 CAN1 GH-1.25 Header

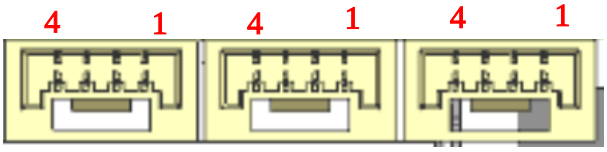


Table 30. CAN1 GH-1.25 Pin Description -J9/J10/J11

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/Dir Default
1	-	-	Ground	Ground	Ground
2	-	-	CAN1_L		
3	-	-	CAN1_H		
4	-	-	VDD_5V_CAN		Power

2.17 LED indicator

Table 31. LED Indicators Function List

LED Indicator	**Color**	**Status**	**Description**
PWR	Green	On	The device has been connected to power.
		Off	The device is not connected to power.

ACT	Green	Flash	will flash to signify SSD access.
User LED	RGB		Defined by User

2.18 Button

Table 32. Pinhole Button Function List

Button	Pin#	Corresponding signal name	Pin Type	Description
PWR	240	SLEEP/WAKE*	CMOS-5V	Configure system to enter sleep mode for pressing button to initiate power-on if Auto-Power-On disabled, long press for 10 seconds.
RESET	239	SYS_RESET*	Open Drain, 1.8V	When the power level is low, the module will be reset. When the power supply to the module is complete, raise the level to enable the power supply of the carrier board. Press it once.

Chapter 3. Mechanical Specification

Figure 5. Orthographic view of reComputer Robotics

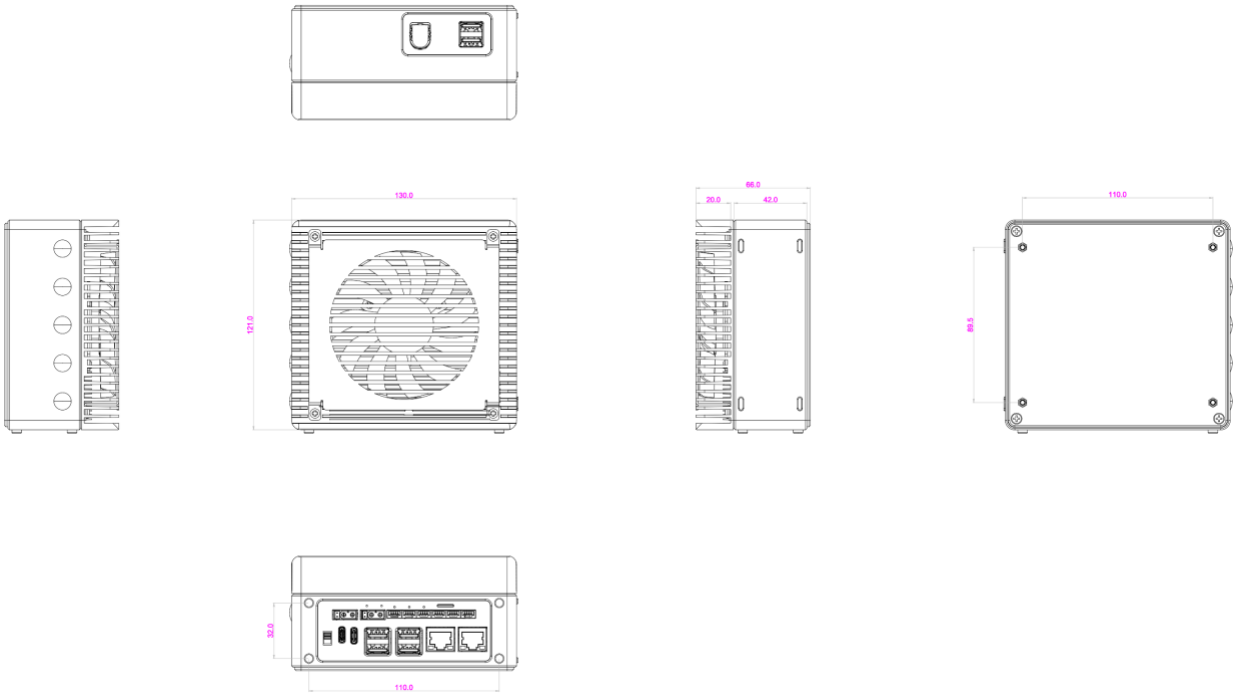
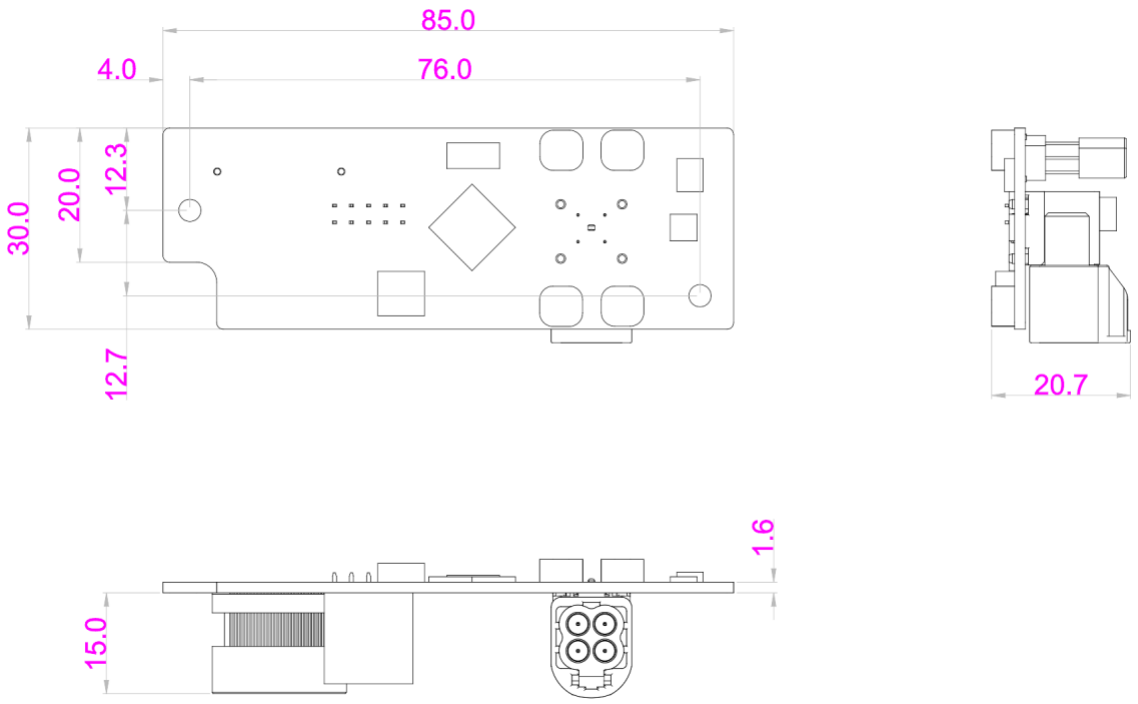


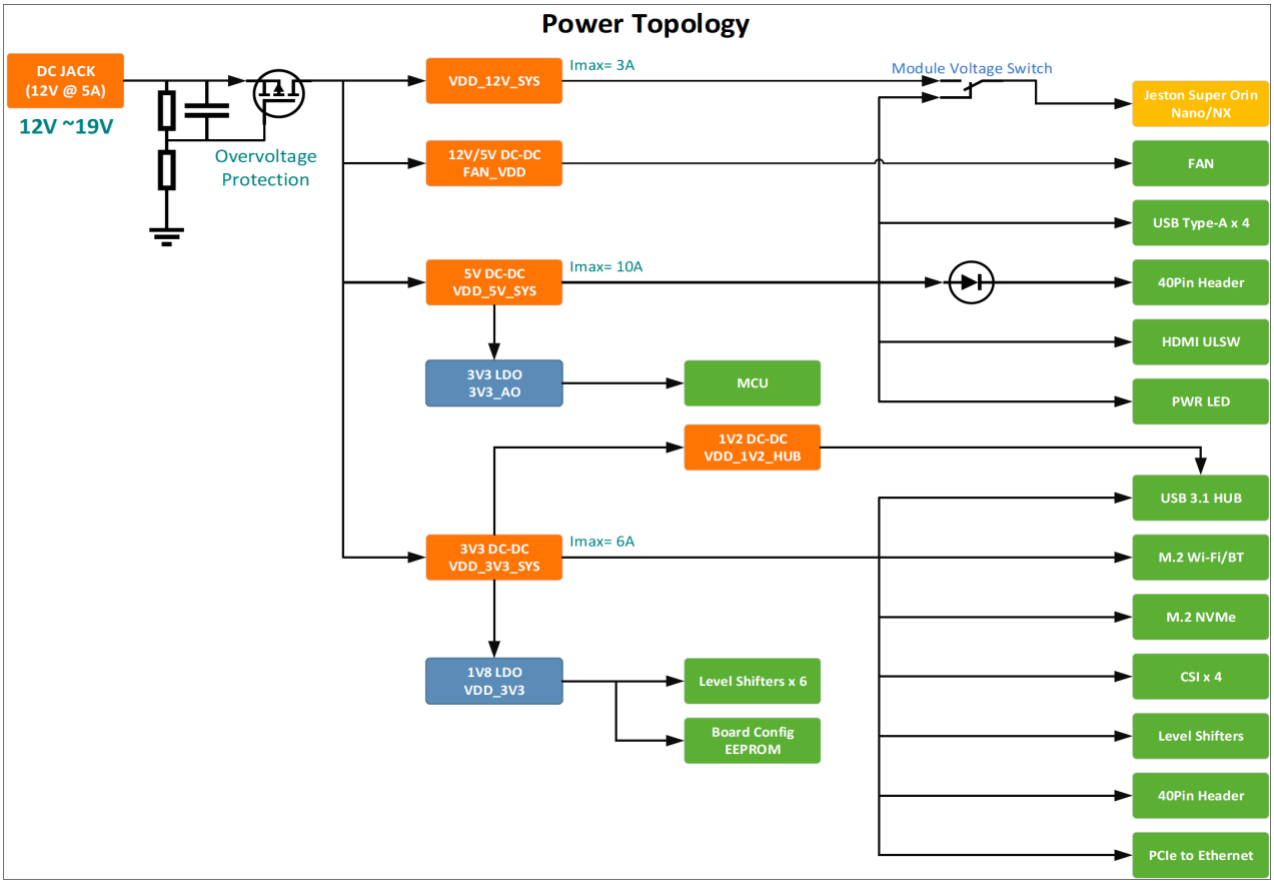
Figure 6. Orthographic view of reComputer Robotics J401 PCBA

Figure 7. Orthographic view of GMSL2(MAX96712) extension board PCBA



Chapter 4. Power Diagram

Figure 8. Power Diagram



Chapter 5. Environmental and Mechanical Screening

Table 33. Environment Testing

Test	Conditions	Results
Temperature Humidity Biased	60℃ / 85% RH, 168 hours, Power ON	Pass
Operational Low Temp	-20℃, 24 hours, Full load operation	Pass
Operational High Temp	60℃, 24 hours, Full load operation, 25W mode; 55℃, 24 hours, Full load operation, 40W mode	Pass
Connector Insertion Cycling	Insert/Withdraw SD card and connectors, 30 cycles	Pass
Random Vibration - 2G Non-Op	5-500 Hz, 2 Grms, 1 hour/axis, 3 axes total, non-operational	
Random Vibration - 1G Op	10-500 Hz, 1 Grms, 30 min/axis, 3 axes total, operational	

Chapter 6. Storage and Handling

Table 34. Storage Parameter List

Parameter	Description
Storage temperature	-40°C ~80°C
Storage humidity	95%RH
Storage life	2 years from Seeed shipment date to customers

Chapter 7. Configuring System

JetPack 6.2 is the latest production release of JetPack 6 until May 2025. This release includes Jetson Linux 36.4.3, featuring the Linux Kernel 5.15 and an Ubuntu 22.04-based root file system. The Jetson AI stack packaged with JetPack 6.2 includes CUDA 12.6, TensorRT 10.3, cuDNN 9.3, VPI 3.2, DLA 3.1, and DLFW 24.0. JetPack 6.2 supports new high-power Super Mode for NVIDIA Jetson Orin Nano and Jetson Orin NX production modules. With Super Modes, the Jetson Orin NX series achieves up to a 70% increase in AI TOPS, while the Jetson Orin Nano series delivers comparable AI TOPS improvements alongside a 50% boost in memory bandwidth. The improved performance delivers up to 2x higher generative AI inference performance on Jetson Orin modules. Learn more about performance boots with JetPack 6.2 in our latest blog.
Note: To use the compute stack of JetPack 6.2 on Jetson Linux 36.3, please refer to the NVIDIA JetPack SDK documentation.

7.1 Flashing OS

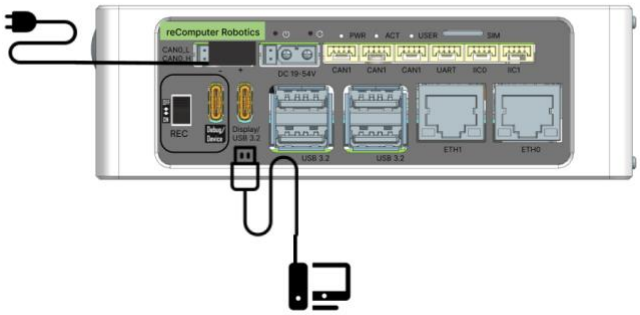
Prerequisites

- Host Computer with appropriate Ubuntu and Jetpack version
- reComputer Robotics J3010/J3011/J4011/J4012; reComputer Robotics J3010/J3011/J4011/J4012 with GMSL extension board; reComputer Robotics Carrier Board with Jetson Module
- USB Type-C data transmission cable
- Download the OS image from https://wiki.seeedstudio.com/recomputer_jetson_robotics_J401_getting_started/ to your host computer

Jetpack Version	Ubuntu Version(Host Computer)		
	18.04	20.04	22.04
JetPack 5.x	✅	✅	
JetPack 6.x		✅	✅

Note.

1. *Please prepare the flashing environment referring to the following list with correct Ubuntu Version and Jetpack version of Host Computer(Virtual Machine is not recommended).*
2. *Please refer to https://wiki.seeedstudio.com/recomputer_jetson_robotics_J401_getting_started/ for the custom jetpack BSP that Seeed Studio released.*



Step 1. Switch the REC switch button to turn `ON` Recovery mode.

Step 2. Power On the reComputer Robotics with the recommended power adapter.

Step 3. Connect the reComputer Robotics to the host computer via Type-C USB 2.0 Port located next to the REC button.

Step 4. Then you can find the reComputer device on your host computer in USB device mode.

```
(base) youjiang-ws@youjiangws-MS-7C94:~/Jetpack/super_j4011/jp6.2$ lsusb
Bus 006 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 005 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 004 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 003 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 002 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 001 Device 004: ID 1462:7c94 Micro Star International MYSTIC LIGHT
Bus 001 Device 005: ID 8087:0029 Intel Corp. AX200 Bluetooth
Bus 001 Device 003: ID 05e3:0608 Genesys Logic, Inc. Hub
Bus 001 Device 049: ID 0955:7423 NVIDIA Corp. APX
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
```

For Orin NX 16GB: 0955:7323 NVidia Corp. APX
For Orin NX 8GB: 0955:7423 NVidia Corp. APX
For Orin Nano 8GB: 0955:7523 NVidia Corp. APX
For Orin Nano 4GB: 0955:7623 NVidia Corp. APX

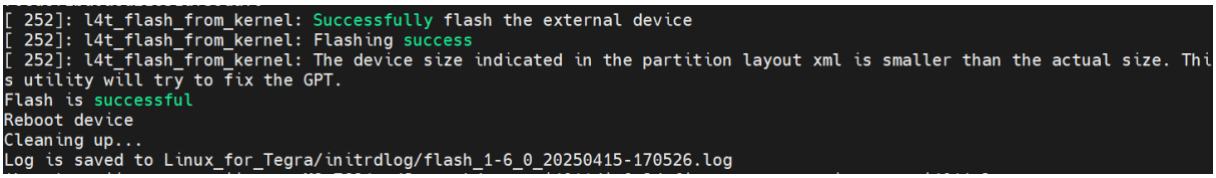
Step 5. Extract the OS image file you downloaded

```
sudo tar xpf mfi_xxxx.tar.gz
# For example: sudo tar xpf mfi_recomputer-robotics-orin-nx-8g-j401-6.2-36.4.3-2025-04-01.tar.gz
```

Step 6. Navigate to the unzipped directory and execute the following command to flash jetpack system to the NVMeSSD:

```
cd mfi_xxxx
# For example: cd mfi_recomputer-robotics-orin-j401
sudo ./tools/kernel_flash/l4t_initrd_flash.sh --flash-only --massflash 1 --
network usb0  --showlogs
```

You will see the following output if the flashing process is successful.



7.2 System Configuration via USB 2.0 device mode

Step 1. After flashing OS, turn `OFF` the REC button, then repower the reComputer.
Step 2. Connect a USB Type-C cable between DEVICE port and a host PC.
Step 3. Connect to Jetson device via host computer's serial terminal (115200 baud).
Step 4. Wait about 10 more seconds, will show up the configuration interface.
Step 5. Setting the User Name and Password by yourself.

Step 6. Then you can ssh the device for remote control.

Note.

1. If the host cannot recognize the COM port, install the serial driver by following this document.

7.3 GPIO Mapping

Install `gpiod` package

```
sudo apt-get install gpiod
gpioinfo
```

7.4 USB Read/Write Speed

Make sure that the USB devices (such as USB flash drives and external hard drives) are correctly connected to the USB interfaces of the reComputer, and that the devices are powered on.

- Read：

```
# check the USB device name as sda
sudo dd if=/dev/zero of=/dev/sda bs=1000M count=2 conv=fdatasync
```

- Write：

```
sudo dd if=/dev/sda of=/dev/null bs=1000M count=2
```

Result:

```
seeed@seeed-desktop:~/j40-mini$ sudo ./test_usb sda
[sudo] password for seeed:
2+0 records in
2+0 records out
2097152000 bytes (2.1 GB, 2.0 GiB) copied, 10.4219 s, 201 MB/s
2+0 records in
2+0 records out
2097152000 bytes (2.1 GB, 2.0 GiB) copied, 5.46385 s, 384 MB/s
seeed@seeed-desktop:~/j40-mini$
```

```
seeed@seeed-desktop:~/j40-mini$ sudo ./test_usb sda
2+0 records in
2+0 records out
2097152000 bytes (2.1 GB, 2.0 GiB) copied, 9.55986 s, 219 MB/s
2+0 records in
2+0 records out
2097152000 bytes (2.1 GB, 2.0 GiB) copied, 5.44248 s, 385 MB/s
seeed@seeed-desktop:~/j40-mini$
```

7.5 EEPROM

- Get the EEPROM address：

```
seeed@seeed-desktop:~$ sudo dmesg | grep at24
[    8.190237] at24 0-0050: 256 byte 24c02 EEPROM, read-only
[    8.190632] at24 0-0057: 32768 byte 24c256 EEPROM, writable, 8 bytes/write
```

- Read Speed：

```
sudo dd if=/sys/class/i2c-dev/i2c-0/device/0-0057/eeprom of=/dev/null
bs=10k count=10000 iflag=fullblock
```

- Write Speed:

```
sudo dd if=/dev/zero of=/sys/class/i2c-dev/i2c-0/device/0-0057/eeprom
bs=10k count=10000 iflag=fullblock
```

7.6 Wi-Fi/Bluetooth Scanning

Connect to wireless module to M.2 Key E slot, and connect the RF cable and antenna, for example, RTL8822CE Wireless NIC Kits or AW-CB375NF Wireless NIC kits.
PCIE ——> WiFi

```
# check for wireless interface name
iw dev
# replace "wlP7p1s0" with the interface name
# fill in the SSID of wireless network
sudo iwlist wlP7p1s0 scan | grep "SSID"
sudo nmcli device wifi connect "wifi_name" password "wifi_password" ifname
wlP7p1s0
```

USB ——> BlueTooth

```
# scan available bluetooth
bluetoothctl
scan on
```

7.7 SSD Card Testing

The read and write speed of SSD card depends on the type and capacity of the SSD card. If you need a higher read and write speed, please use an SSD card with a larger capacity and better performance.

- Write speed test:

create a new file then write in:

```
sudo sh -c 'mkdir -p /home/seeed/ssd && touch /home/seeed/ssd/test'
sudo dd if=/dev/zero  of=/home/seeed/ssd/test bs=1024M count=5 conv=fdatasync
```

- read speed test：

```
sudo dd if=/home/seeed/ssd/test  of=/dev/null  bs=1024M count=5 iflag=direct
```

```
seeed@seeed-desktop:~$ sudo dd if=/dev/zero of=/home/seeed/ssd/test bs=1024M count=5 con
v=fdatasync
5+0 records in
5+0 records out
5368709120 bytes (5.4 GB, 5.0 GiB) copied, 10.3201 s, 520 MB/s
seeed@seeed-desktop:~$ sudo dd if=/home/seeed/ssd/test of=/dev/null bs=1024M count=5 ifl
ag=direct
5+0 records in
5+0 records out
5368709120 bytes (5.4 GB, 5.0 GiB) copied, 5.48336 s, 979 MB/s
```

7.8 MAC address of Ethernet

- Write static MAC address to device:

You are allowed to write the Ethernet MAC address to device via the python script. Once restart the system, the MAC address is fixed and led of RJ45 port will light up.
gen_flash_mac.py

```
python gen_flash_mac.py 0x11
# the following parameter is a random hexadecimal number
```

If the MAC address is not written, the J8 Ethernet port indicator will not light up. Moreover, the MAC address of this Ethernet port is random every time it starts up.

- Read MAC address from device:

Method 1: via `ifconfig`

```
sudo apt install net-tools
ifconfig
```

```
seeed@seeed-desktop:~$ ifconfig
enP1p1s0: flags=4099<UP,BROADCAST,MULTICAST>  mtu 1500
        ether 46:40:11:00:23:d7  txqueuelen 1000  (Ethernet)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

enP8p1s0: flags=4099<UP,BROADCAST,MULTICAST>  mtu 1500
        ether 3c:6d:66:11:81:66  txqueuelen 1000  (Ethernet)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
        device interrupt 250  base 0x5000

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 3029  bytes 218971 (218.9 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 3029  bytes 218971 (218.9 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

wlP7p1s0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.49.115  netmask 255.255.255.0  broadcast 192.168.49.255
        inet6 fe80::fca0:2438:aed1:f08  prefixlen 64  scopeid 0x20<link>
        ether 54:ef:33:9b:92:b9  txqueuelen 1000  (Ethernet)
        RX packets 297042  bytes 1135054411 (1.1 GB)
        RX errors 0  dropped 486  overruns 0  frame 0
        TX packets 96867  bytes 10733167 (10.7 MB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

Method 2: via `ip addr` (Primitive command on linux)

```
ip addr show
```

```
seeed@seeed-desktop:~$ ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1
000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: enP1p1s0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc pfifo_fast state DOWN gr
oup default qlen 1000
    link/ether 46:40:11:00:23:d7 brd ff:ff:ff:ff:ff:ff
3: enP8p1s0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc mq state DOWN group defa
ult qlen 1000
    link/ether 3c:6d:66:11:81:66 brd ff:ff:ff:ff:ff:ff
4: wlP7p1s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default
qlen 1000
    link/ether 54:ef:33:9b:92:b9 brd ff:ff:ff:ff:ff:ff
    inet 192.168.49.115/24 brd 192.168.49.255 scope global dynamic noprefixroute wlP7p1s
0
       valid_lft 27954sec preferred_lft 27954sec
    inet6 fe80::fca0:2438:aed1:f08/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
5: can0: <NOARP,ECHO> mtu 16 qdisc noop state DOWN group default qlen 10
    link/can
```

7.9 Ethernet Testing

- Send:

```
iperf3 -c 'ip address' -R
```

```
seeed@seeed-super:~$ iperf3 -c 192.168.254.100 -R
Connecting to host 192.168.254.100, port 5201
Reverse mode, remote host 192.168.254.100 is sending
[  5] local 192.168.254.113 port 53828 connected to 192.168.254.100 port 5201
[ ID] Interval           Transfer     Bitrate
[  5]   0.00-1.00   sec   112 MBytes   941 Mbits/sec
[  5]   1.00-2.00   sec   112 MBytes   942 Mbits/sec
[  5]   2.00-3.00   sec   112 MBytes   942 Mbits/sec
[  5]   3.00-4.00   sec   112 MBytes   942 Mbits/sec
[  5]   4.00-5.00   sec   112 MBytes   942 Mbits/sec
[  5]   5.00-6.00   sec   112 MBytes   942 Mbits/sec
[  5]   6.00-7.00   sec   112 MBytes   942 Mbits/sec
[  5]   7.00-8.00   sec   112 MBytes   942 Mbits/sec
[  5]   8.00-9.00   sec   112 MBytes   942 Mbits/sec
[  5]   9.00-10.00  sec   112 MBytes   942 Mbits/sec
- - - - - - - - - - - - - - - - - - - - - - - - -
[ ID] Interval           Transfer     Bitrate         Retr
[  5]   0.00-10.04  sec  1.10 GBytes   940 Mbits/sec    0             sender
[  5]   0.00-10.00  sec  1.10 GBytes   942 Mbits/sec                  receiver

iperf Done.
seeed@seeed-super:~$
```

- Receive:

```
iperf3 -c 'ip address'
```

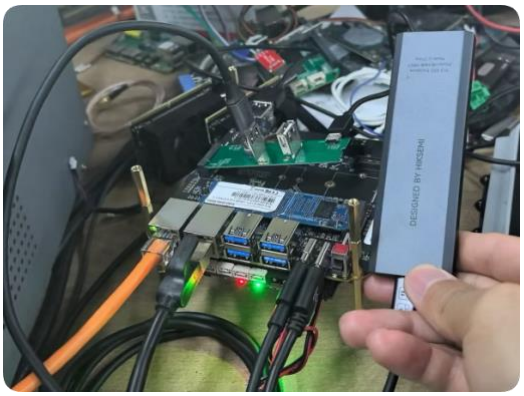
```
seeed@seeed-super:~$ iperf3 -c 192.168.254.100
Connecting to host 192.168.254.100, port 5201
[  5] local 192.168.254.113 port 56936 connected to 192.168.254.100 port 5201
[ ID] Interval           Transfer     Bitrate         Retr  Cwnd
[  5]   0.00-1.00   sec   113 MBytes   945 Mbits/sec    0    379 KBytes
[  5]   1.00-2.00   sec   111 MBytes   934 Mbits/sec    0    379 KBytes
[  5]   2.00-3.00   sec   111 MBytes   928 Mbits/sec    0    379 KBytes
[  5]   3.00-4.00   sec   111 MBytes   934 Mbits/sec    0    379 KBytes
[  5]   4.00-5.00   sec   111 MBytes   928 Mbits/sec    0    379 KBytes
[  5]   5.00-6.00   sec   110 MBytes   923 Mbits/sec    0    379 KBytes
[  5]   6.00-7.00   sec   111 MBytes   933 Mbits/sec    0    379 KBytes
[  5]   7.00-8.00   sec   112 MBytes   936 Mbits/sec    0    399 KBytes
[  5]   8.00-9.00   sec   111 MBytes   935 Mbits/sec    0    399 KBytes
[  5]   9.00-10.00  sec   111 MBytes   929 Mbits/sec    0    399 KBytes
- - - - - - - - - - - - - - - - - - - - - - - - -
[ ID] Interval           Transfer     Bitrate         Retr
[  5]   0.00-10.00  sec  1.09 GBytes   932 Mbits/sec    0             sender
[  5]   0.00-10.04  sec  1.08 GBytes   927 Mbits/sec                  receiver

iperf Done.
```

7.10 M.2 Key B

Preset Configuration:

M.2 B Key Pin	Signal Name	Control Command	H/L
67	M2B_PCIe_Reset	gpioset --mode=time --sec=2 2 14=0	L
6	M2B_POWER_OFF	gpioset --mode=time --sec=2 1 13=1	H
8	M2B_W_DISABLE1	gpioset --mode=time --sec=2 2 12=0	L

- **USB3.0**



```
seeed@seeed-desktop:~$ cd j40-mini/
seeed@seeed-desktop:~/j40-mini$ sudo ./test_usb sda
[sudo] password for seeed:
2+0 records in
2+0 records out
2097152000 bytes (2.1 GB, 2.0 GiB) copied, 11.6294 s, 180 MB/s
2+0 records in
2+0 records out
2097152000 bytes (2.1 GB, 2.0 GiB) copied, 6.144 s, 341 MB/s
seeed@seeed-desktop:~/j40-mini$
```

- **USB2.0**

```
seeed@seeed-desktop:~/j40-mini$ sudo ./test_usb sda
2+0 records in
2+0 records out
2097152000 bytes (2.1 GB, 2.0 GiB) copied, 59.2891 s, 35.4 MB/s
2+0 records in
2+0 records out
2097152000 bytes (2.1 GB, 2.0 GiB) copied, 55.0266 s, 38.1 MB/s
seeed@seeed-desktop:~/j40-mini$
```

- **GPIO**

Key B Pin	Net Name	Module Pin#	BGA No.	gpiod NO.	Control Examples	Result	Remark
6	M2B_POWER_OFF	127	PCC.01	1 13	gpioset --mode=time --sec=2 1 13=0 gpioset --mode=time --sec=2 1 13=1	OUTPUT : 1.8V OK	
67	M2B_PCIe_Reset	97	PZ.07	0 137	gpioset --mode=time --sec=2 2 14=0 gpioset --mode=time --sec=2 2 14=1	OUTPUT OK	Module low-level reset PCA9535RGER extended GPIO-Pin16
8	W_DISABLE1#_3V3				gpioset --mode=time --sec=2 2 12=1 gpioset --mode=time --sec=2 2 12=0	OUTPUT OK	need to be pulled down normally PCA9535RGER extended GPIO-Pin14
66	SIM_DETECT_1V8						5G Module Input
60	LAA_n79_Tx_EN_1V8	112	PN.01	0 85	gpioset --mode=time --sec=2 1 13=0 & gpioget 0 85 gpioset --mode=time --sec=2 1 13=1 & gpioget 0 85	INPUT: OK	Short with pin6 while testing
38	M.2_WLAN_Tx_EN_1V	93	PZ.04	0 134	gpioset --mode=time --sec=2 1 13=1 & gpioget 0	INPUT: OK	Short with pin6 while

	8				134 gpioset --mode=time --sec=2 1 13=0 & gpioget 0 134		testing
28	I2S0_LRCK	197	PI.02	0 53	gpioset --mode=time --sec=2 1 13=1 & gpioget 0 53 gpioset --mode=time --sec=2 1 13=0 & gpioget 0 53	INPUT OK	Short with pin6 while testing
26	W_DISABLE2#				gpioset --mode=time --sec=2 2 11=1 gpioset --mode=time --sec=2 2 11=0	OUTPUT OK	PCA9535RGER extended GPIO-Pin13
24	I2S0_SDIN	195	PI.01	0 52	gpioset --mode=time --sec=2 1 13=1 & gpioget 0 52 gpioset --mode=time --sec=2 1 13=0 & gpioget 0 52	INPUT OK	Short with pin6 while testing
22	I2S0_SDOUT	193	PI.00	0 51	gpioset --mode=time --sec=2 1 13=1 & gpioget 0 51 gpioset --mode=time --sec=2 1 13=0 & gpioget 0 51	INPUT OK	Short with pin6 while testing
20	I2S0_SCLK	199	PH.07	0 50	gpioset --mode=time --sec=2 1 13=0 & gpioget 0 50 gpioset --mode=time --sec=2 1 13=1 & gpioget 0 50	INPUT OK	Short with pin6 while testing
10	M2B_STATUS_LED						5G module output control for LED
23	M2B_WOWWAN_N	211	PAC.06	0 144	gpioset --mode=time --sec=2 1 13=0 & gpioget 0 144 gpioset --mode=time --sec=2 1 13=1 & gpioget 0 144	INPUT OK	Short with pin6 while testing
25	M2B_DPR_1V8	118	PQ.05	0 105	gpioset --mode=time --sec=2 2 13=1 gpioset --mode=time --sec=2 2 13=0	OUTPUT OK	PCA9535RGER extended GPIO-Pin15

- **4G module**

Connect the LTE module for dialing.

```
Welcome to minicom 2.8

OPTIONS: I18n
Port /dev/ttyUSB2, 10:37:13

Press CTRL-A Z for help on special keys


+CIEV: 7,1

+CRING: VOICE
##0
AT+CLC
+CRING: VOICE
##0
AT+CLCC
+CLCC: 1,1,0,1,0,"",128
+CLCC: 2,1,0,1,0,"",128
+CLCC: 4,1,4,0,0,"13556722917",128
+CLCC: 3,1,0,1,0,"",128

OK

+CRING: VOICE
##0

+CLIP: "13556722917",128,,,,0

+CRING: VOICE
##0

+CLIP: "13556722917",128,,,,0
```

- **5G module**

lsusb to check whether the NIC is correctly attached

```
seeed@seeed:~$ lsusb
Bus 002 Device 002: ID 0424:5744 Microchip Technology, Inc. (formerly SMSC)
Hub
Bus 002 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 001 Device 005: ID 343c:0000 xxxxxxxx USB Type-C Digital AV Adapter
Bus 001 Device 003: ID 0424:2740 Microchip Technology, Inc. (formerly SMSC)
Hub Controller
Bus 001 Device 004: ID 258a:000c HAILUCK CO.,LTD USB KEYBOARD
Bus 001 Device 002: ID 0424:2744 Microchip Technology, Inc. (formerly SMSC)
Hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 004 Device 003: ID 2c7c:0512 Quectel Wireless Solutions Co., Ltd. EM12-
G
Bus 004 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 003 Device 003: ID 0bda:c822 Realtek Semiconductor Corp. Bluetooth
Radio
Bus 003 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
```

```
seeed@seeed:~$ lsusb -t
/:  Bus 04.Port 1: Dev 1, Class=root_hub, Driver=xhci_hcd/4p, 5000M
    |__ Port 3: Dev 3, If 0, Class=Vendor Specific Class, Driver=option,
5000M
    |__ Port 3: Dev 3, If 1, Class=Vendor Specific Class, Driver=option,
5000M
    |__ Port 3: Dev 3, If 2, Class=Vendor Specific Class, Driver=option,
5000M
    |__ Port 3: Dev 3, If 3, Class=Vendor Specific Class, Driver=option,
5000M
    |__ Port 3: Dev 3, If 8, Class=Communications, Driver=, 5000M
    |__ Port 3: Dev 3, If 9, Class=CDC Data, Driver=, 5000M

seeed@seeed:~$ lsmod | grep option   # 确认 option 驱动已加载
option                 57344  0
usb_wwan               24576  1 option
usbserial              45056  2 usb_wwan,option
```

Step 1. Configurate ModemManager

```
# install modemmanager and restart service
sudo apt install modemmanager
sudo systemctl restart ModemManager
# check module be identified
mmcli -L   # should show like"/org/freedesktop/ModemManager1/Modem/0"
```

Step 2. Setting up APN

```
# create a hosting configuration file(taking China Mobile as an example)
sudo nmcli con add type gsm ifname "*" apn "CMNET" ipv4.method auto

# Activate the connection
seed@seeed:~/recomputer-robotics$ sudo nmcli con up "gsm"
Connection successfully activated (D-Bus active path:
/org/freedesktop/NetworkManager/ActiveConnection/3)

# Verify the module to be identified correctly
sudo apt install modemmanager
sudo systemctl restart ModemManager

# check module be recognized as correct mode
mmcli -L
/org/freedesktop/ModemManager1/Modem/0 [Quectel] EM12
```

```
# Check the detailed status of the module (IP allocation, carrier, etc.)
seeed@seeed:~$ mmcli -m 0
  --------------------------------
  General  |                 path: /org/freedesktop/ModemManager1/Modem/0
           |           device id: 1515755c475da8616b563661570bc65e87767ffa
  --------------------------------
  Hardware |         manufacturer: Quectel
           |                model: EM12
           |    firmware revision: EM12GPAR01A21M4G
           |            supported: gsm-umts, lte
           |              current: gsm-umts, lte
           |         equipment id: 869710033732169
  --------------------------------
  System   |               device:
/sys/devices/platform/bus@0/140c0000.pcie/pci0009:00/0009:00:00.0/0009:01:0
0.0/usb4/4-3
           |             drivers: option
           |              plugin: quectel
           |         primary port: ttyUSB2
           |                ports: ttyUSB0 (qcdm), ttyUSB2 (at), ttyUSB3 (at)
  --------------------------------
  Status   |       unlock retries: sim-pin (3), sim-puk (10), sim-pin2 (3),
sim-puk2 (10)
           |                state: connected
           |          power state: on
           |          access tech: lte
           |       signal quality: 60% (recent)
  --------------------------------
  Modes    |            supported: allowed: 2g, 3g, 4g; preferred: none
           |              current: allowed: 2g, 3g, 4g; preferred: none
  --------------------------------
  IP       |            supported: ipv4, ipv6, ipv4v6
  --------------------------------
  3GPP     |                 imei: 869710033732169
           |          operator id: 46011
           |        operator name: CHN-CT
           |         registration: home
           | packet service state: attached
  --------------------------------
  3GPP EPS | ue mode of operation: csps-2
  --------------------------------
  SIM      |     primary sim path: /org/freedesktop/ModemManager1/SIM/0
  --------------------------------
  Bearer   |               paths: /org/freedesktop/ModemManager1/Bearer/0
```

7.11 CAN Communication Test

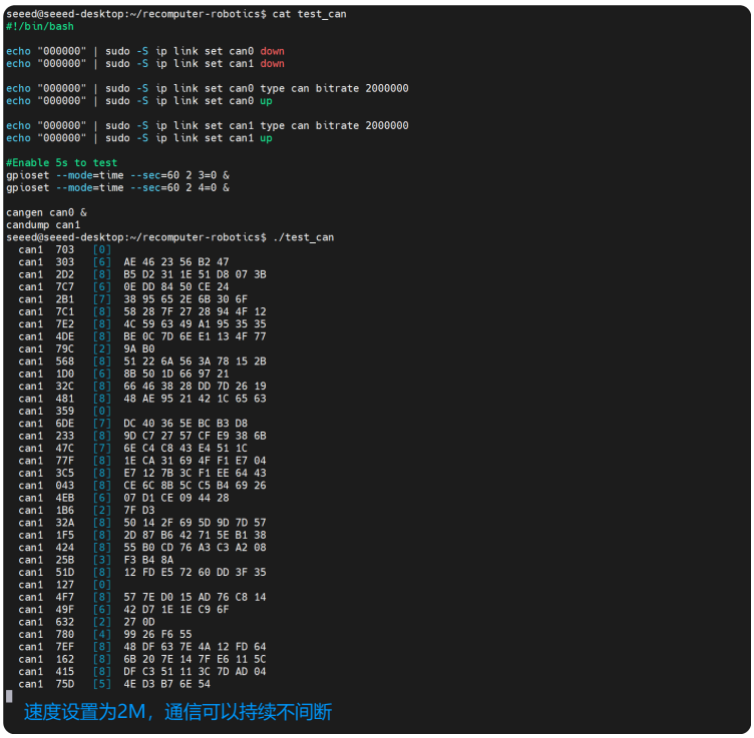
CAN ID	Signal Name	PCA9535RGER Pin
CAN0	CAN0_STBY_3V3	P03
CAN1	CAN1_STBY_3V3	P04

The reComputer Robotics supports three CAN communication modes to meet data transmission requirements across diverse scenarios:

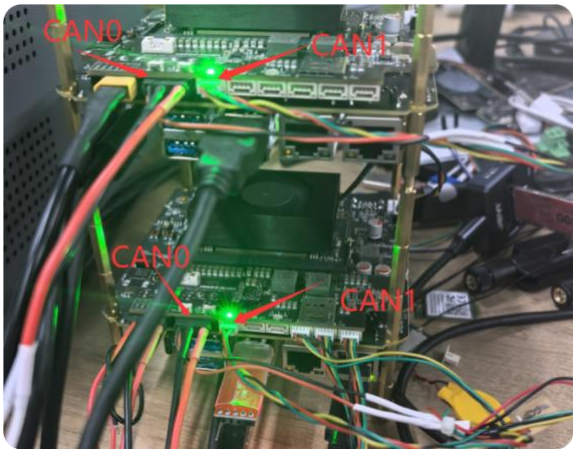
1. CAN Normal Mode

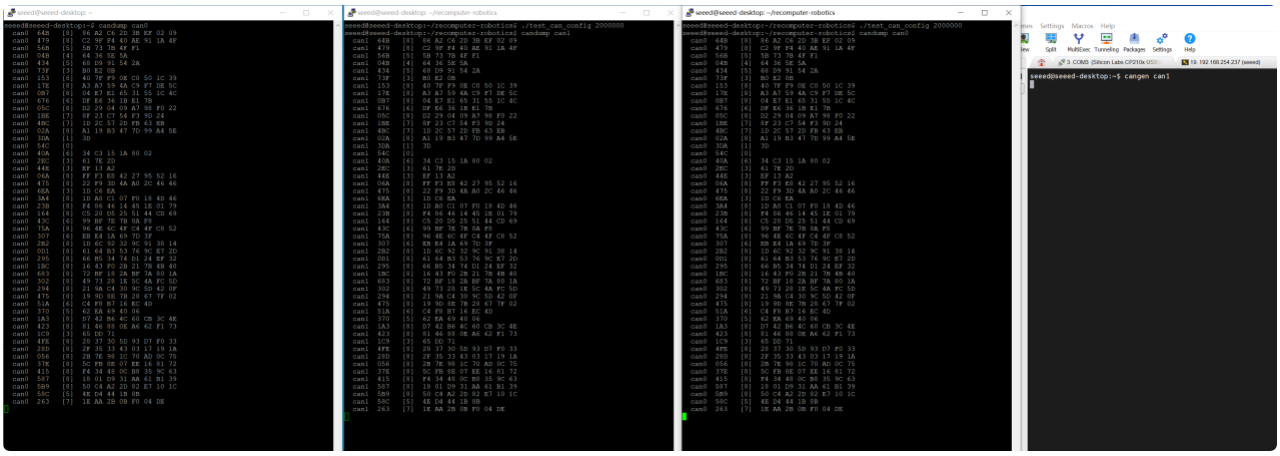
Operates on the standard CAN 2.0 protocol with a maximum communication baud rate of 2 Mbps, suitable for most industrial and in-vehicle environments.

For stable continuous data transfer, it is recommended to set the baud rate ≤ 2 Mbps to minimize data loss risks (Note: While the protocol theoretically supports up to 1 Mbps, this upper limit ensures compatibility with extended use cases).

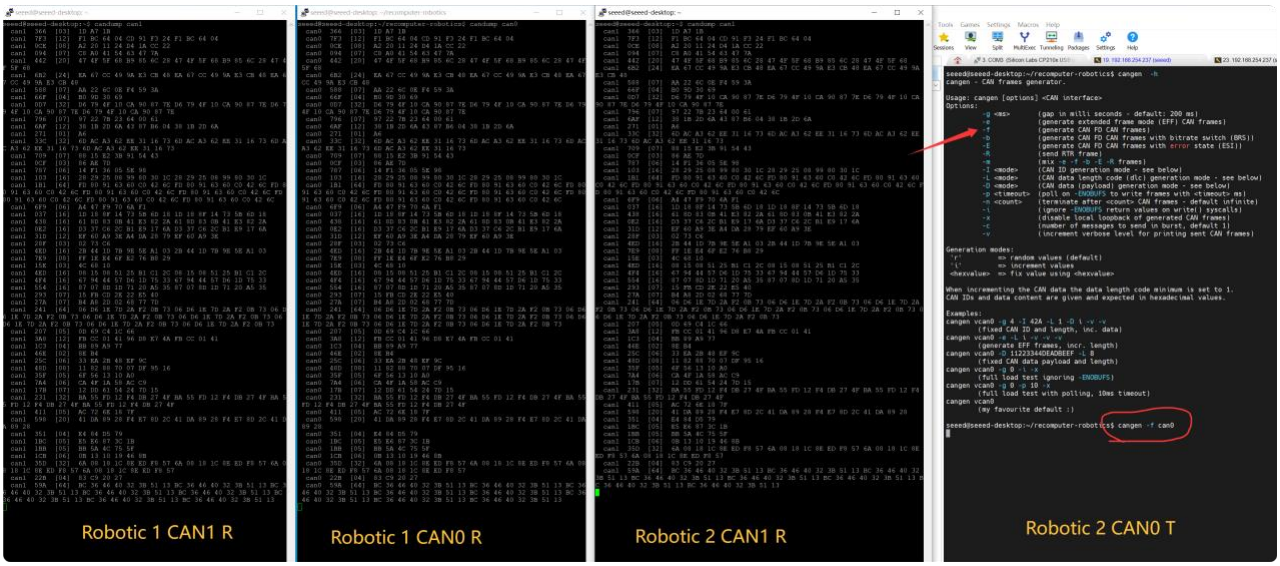


2. CAN Multi-Machine Communication (1T3R)
Enables network architecture with 1 transmitter node (1T) and 3 receiver nodes (3R), facilitating efficient data sharing among devices. Requires software configuration of node IDs and priorities to ensure stable multi-node communication.





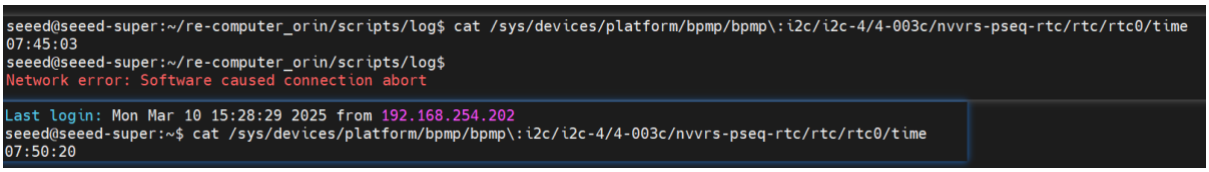
3. CAN FD Mode (CAN with Flexible Data Rate)
An extended CAN protocol supporting higher data rates (up to 8 Mbps) and larger data frames (up to 64 bytes).



7.12 RTC

When reading the RTC (Real-Time Clock) time, it is necessary to disconnect from the network or turn off the network time synchronization to test the accuracy of the RTC timing.

```
cat /sys/devices/platform/bpmp/bpmp\:i2c/i2c-4/4-003c/nvvrs-pseq-rtc/rtc/rtc0/time
```



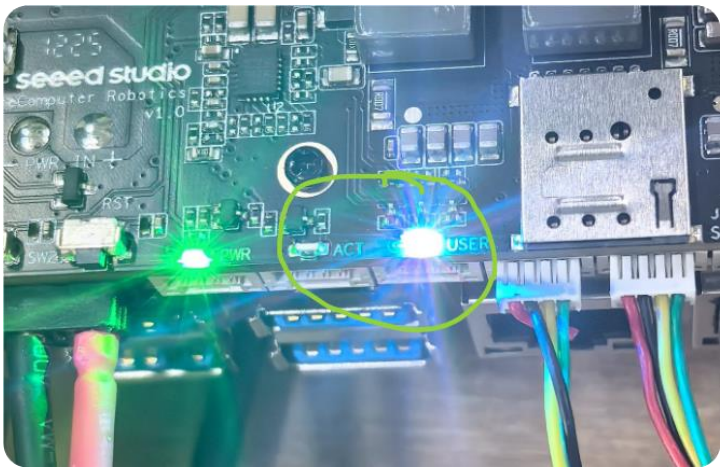
7.13 Fan

Control the PWM Fan via the following command:

```
# switch to root account
sudo -i
# write 100 to PWM control for setting fan speed
echo 100 > /sys/bus/platform/devices/pwm-fan/hwmon/hwmon1/pwm1
```

7.14 RGB LED

```
gpiochip2 - 16 lines:
        line   0: "LED_RED_3V3" unused input active-high
        line   1: "LED_BLUE_3V3" unused input active-high
        line   2: "LED_GREEN_3V3" unused input active-high
        line   3: "CAN0_STBY_3V3" unused input active-high
        line   4: "CAN1_STBY_3V3" unused input active-high
        line   5: "UART1_EN_3V3" unused input active-high
        line   6: "CAM_VDD_EN_3V3" unused input active-high
        line   7: "AP_WAKE_BT_3V3" unused input active-high
        line   8: "USB_HUB_RST_3V3" unused input active-high
        line   9: "PCIe_RST_3V3" unused input active-high
        line  10: "PCIe_ETH_RST_3V3" unused input active-high
        line  11: "M2B_W_DISABLE2#_3V3" unused input active-high
        line  12: "M2B_W_DISABLE1#_3V3" unused input active-high
        line  13: "M2B_DPR_3V3" unused input active-high
        line  14: "M2B_PCIe_RST_3V3" unused input active-high
        line  15:   "not_used"       unused   input  active-high
```



RED

```
#RED ON
seeed@seeed-desktop:~/recomputer-robotics$ gpioset --mode=time --sec=1 2 0=1
#RED OFF
seeed@seeed-desktop:~/recomputer-robotics$ gpioset --mode=time --sec=1 2 0=0
```

Blue

```
#Blue OFF
seeed@seeed-desktop:~/recomputer-robotics$ gpioset --mode=time --sec=1 2 1=0
#Blue ON
seeed@seeed-desktop:~/recomputer-robotics$ gpioset --mode=time --sec=1 2 1=1
```

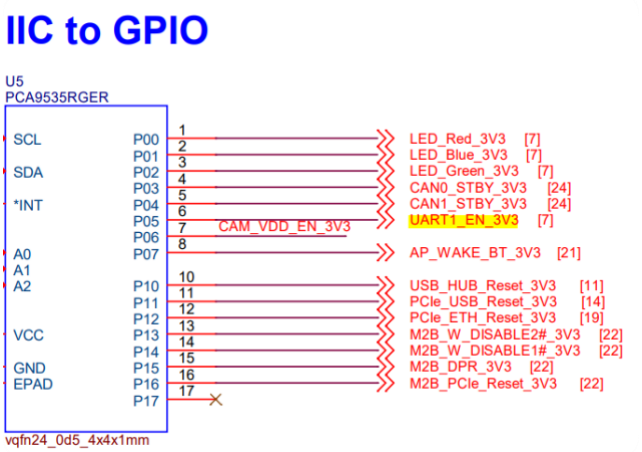
Green

```
#Green OFF
seeed@seeed-desktop:~/recomputer-robotics$ gpioset --mode=time --sec=1 2 2=0
```

```
#Green ON
seeed@seeed-desktop:~/recomputer-robotics$ gpioset --mode=time --sec=1 2 2=1
```

7.15 UART GH-1.25 Connector

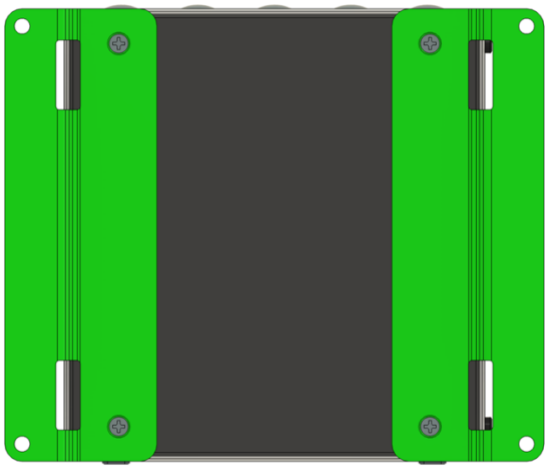
For functioning GH-1.25 UART connector correctly, you should enable "UART1_EN_3V3" first.

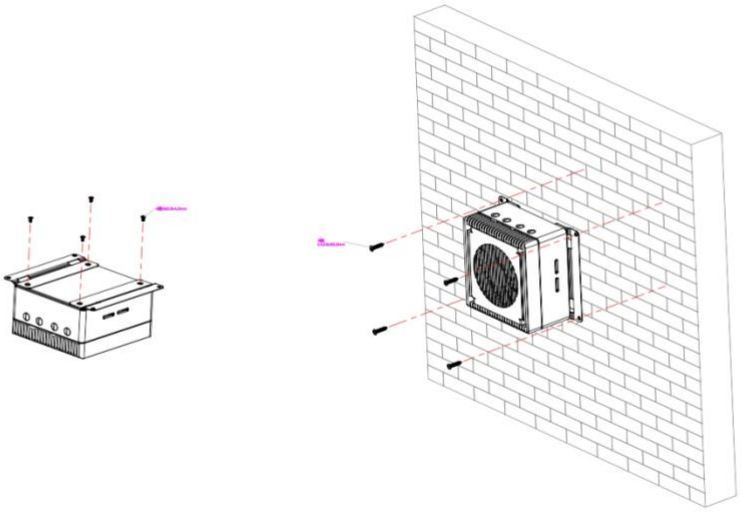


Chapter 8. Mounting Guide

Purchase an additional mounting panel and fix it on the screw holes behind the reComputer Robotics.

Figure Wall Mounting Installation Illustration





Chapter 9. Accessories List

Table 35. Accessories List

Interface	Product Name	SKU	Link	Remark
M.2 Key M Slot	128GB NVMe M.2 PCIe Gen3x4 2280 Internal SSD	112990226	Click to Purchase	Industrial M.2 NVMe 2280 SSD 128G included
	256GB NVMe M.2 PCIe Gen3x4 2280 Internal SSD	112990246	Click to Purchase	
	512GB NVMe M.2 PCIe Gen3x4 2280 Internal SSD	112990247	Click to Purchase	
	1TB NVMe M.2 PCIe Gen3x4 2280 Internal SSD	112990267	Click to Purchase	
	2TB NVMe M.2 PCIe Gen3x4 2280 Internal SSD	114993467	Click to Purchase	
M.2 Key E Slot	RTL8822CE Wireless NIC Kits	E24121001	Click to Purchase	
Power Adapter	Power Adapter (3P-Black-19V-4.74A)	313080684	Click to Purchase	
Power Cord	AC Power Cord - Type C5 US	313990332	Click to Purchase	
	AC Power Cord - Type C5 UK	313990328	Click to Purchase	
	AC Power Cord - Type C5 JP	106990469	Click to Purchase	
	AC Power Cord -Type C5 EU	106990468	Click to Purchase	
	AC Power Cord - Type C5 CN	106990470	Click to Purchase	
Mounting	Panel Metal Rack Mount Holder for reComputer Jetson	323030949		For Panel Mounting
Analyzer/ Adapter	CH340G USB to Serial (TTL) Module&Adapter	317990026	Click to Purchase	
USB	RPLiDAR S2 Low Cost 360° Laser Range Scanner - 30M Range	114992738	Click to Purchase	Compatible with a variety of USB devices
	RPLiDAR A3M1 360° Laser Scanner Kit - 25M Range	110991068	Click to Purchase	

	RPLiDAR A1M8-R6 360° Laser Scanner Kit - 12M Range	114992561	Click to Purchase	
	RPLiDAR C1M1-R2 Portable ToF Laser Scanner Kit - 12M Range	101090061	Click to Purchase	
	ReSpeaker USB Mic Array	107990193	Click to Purchase	
Mipi CSI	IMX219-130 8MP Camera with 130° FOV	114992262	Click to Purchase	
	IMX219-200 8MP Camera with 200° FOV	114992265	Click to Purchase	
	IMX219-160IR 8MP Camera with 160° FOV	114992264	Click to Purchase	
	IMX477R - Raspberry Pi HQ Camera	114993032	Click to Purchase	
	IMX708 - Raspberry Pi Camera Module 3 NoIR	114993029	Click to Purchase	
	OV5647-62 FOV Camera Module	114110129	Click to Purchase	
	OV5647-75 FOV Camera Module	114110127	Click to Purchase	

Chapter 10. Warranty & Support

10.1 Warranty

1. From the date of sale, the company provides 24 months free warranty for the products.
2. Warranty coverage is limited to products purchased from the official Seeed Studio website or authorized distributors. Customers need to keep receipts and purchase vouchers.
3. The products to be repaired shall be properly packaged and transported, and the customer shall be responsible for any loss or damage during transportation.
4. During the warranty period, the freight and maintenance costs arising from product quality failures shall be borne by Seeed Studio. If the warranty period exceeds 24 months, Seeed Studio will charge the fee for replacing parts according to the product failure, and the freight is borne by the user.
5. During the free warranty period, in case of any of the following events, Seeed Studio has the right to refuse service or charge materials and service fees at its discretion.

Product failure or damage caused by improper use by users.

The product label is damaged and the product information cannot be identified.

Even within the warranty period, if the product has functional issues or is difficult to repair due to improper customer use, unauthorized disassembly or modification, poor operating environment, improper maintenance, accidents, or other reasons. Seeed Studio reserves the right to make judgments on the above situations and collect maintenance fees.

Other unavoidable external factors cause product failure and damage.

The above warranty regulations are only applicable to the above Seeed Studio reComputer Robotics series, other products are not applicable!

10.2 Support

Quick start guide:

https://wiki.seeedstudio.com/recomputer_jetson_robotics_getting_started/

Tech support email:

If you encounter any issues while deploying or testing, please don't hesitate to contact our technical support team at techsupport@seeed.io, or refer to our online knowledge base, https://wiki.seeedstudio.com.

Customized service email:

For further information about customizations, welcome you to directly reach out at edge@seeed.cc, we will provide prompt reply.

Discord:

Discord community:
Welcome to join our official community, where you can exchange product-related questions and get relevant support.
https://discord.seeed.cc