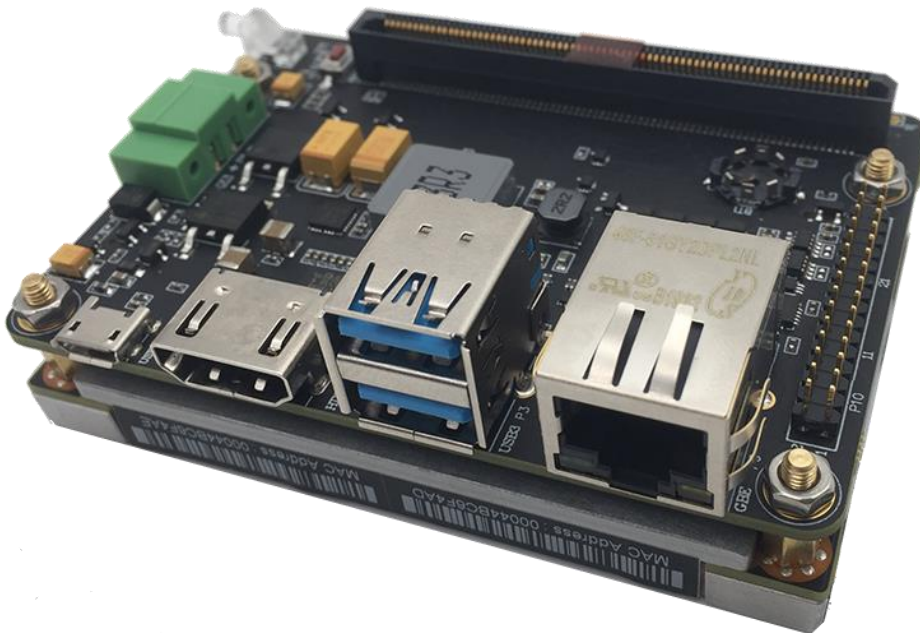


Y-C1 Carrier Board Specification



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Document History

Version	Date	Description of Change
V1.0	December 21, 2019	Initial Release
V1.1	February 20, 2020	Added Y-C1 order model description , added LED indicator color description

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Electronic components and circuits are very sensitive to electrostatic discharge, although the company will do anti-static protection design on the main interface of the board when designing circuit board products, but it is difficult to do anti-static safety protection for all components and circuits. Therefore, it is recommended to follow esd safety precautions when handling any circuit board component. Esd protection measures include but are not limited to the following:

- During transportation or storage, place the card in an ESD bag and do not take it out until installation.
- Release the static electricity before touching the board. Wear a discharge grounding wrist strap.
- Operate the circuit board only in electrostatic discharge safety area.
- Avoid moving circuit boards in carpeted areas.
- Avoid direct contact with electronic components on the board by edge contact.

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Chapter 1. Introduction

The Y-C1 is a low-cost, small form factor carrier board for NVIDIA® Jetson™ TX1/TX2/TX2-4GB/TX2i series core modules, suitable for compact deployment needs. For industrial deployment applications, the main interface is designed for electrostatic safety protection, and a high-reliability power supply application scheme is adopted. The input power supply has overvoltage and reverse polarity protection functions, and has a wealth of external interfaces. All board devices use wide temperature models.

1.1 Product Specifications

- 2 USB3.0 ports (5Gbps bandwidth per port, 1A output current)
- 2 CAN (onboard CAN transceiver)
- 3 3.3V level common serial ports (UART), 1 3.3V level Debug serial port (UART)
- 1 Gigabit Ethernet (10/100/1000 BASE-T)
- Four 3.3V bit programmable GPIOs
- 1 RTC battery pin header
- 1 Type 621 RTC battery holder
- 1 HDMI 2.0 port (Max 6Gbps, 24bpp, 4096x2160@60Hz)
- 1 SD card interface
- 1 x 3.3V I2C interface
- 1 fan control interface
- Configurable power-on mode (default is power-on self-start)
- Onboard encryptor for encryption protection of applications
- User-accessible on-board tri-color LED indicators within the operating system
- Board size: 87mm×60mm×16mm
- Power requirements: +7V~+19V
- Working temperature: -40~+85°C
- Weight: 51g

***CAN bus interface function is not available when used with Jetson TX1 module**

1.2 Order Information

Model	Function
Y-C1	NVIDIA Jetson™ TX1/TX2/TX2-4GB/TX2i Core modules with compact mounts
Y-C1-L	Non-soldering multifunctional high speed signal expansion connector (P7) version Y-C1 carrier board

Taobao Store Address: <https://shop333807435.taobao.com/>

Jingdong Store Address: <https://mall.jd.com/index-11467104.html?from=pc>

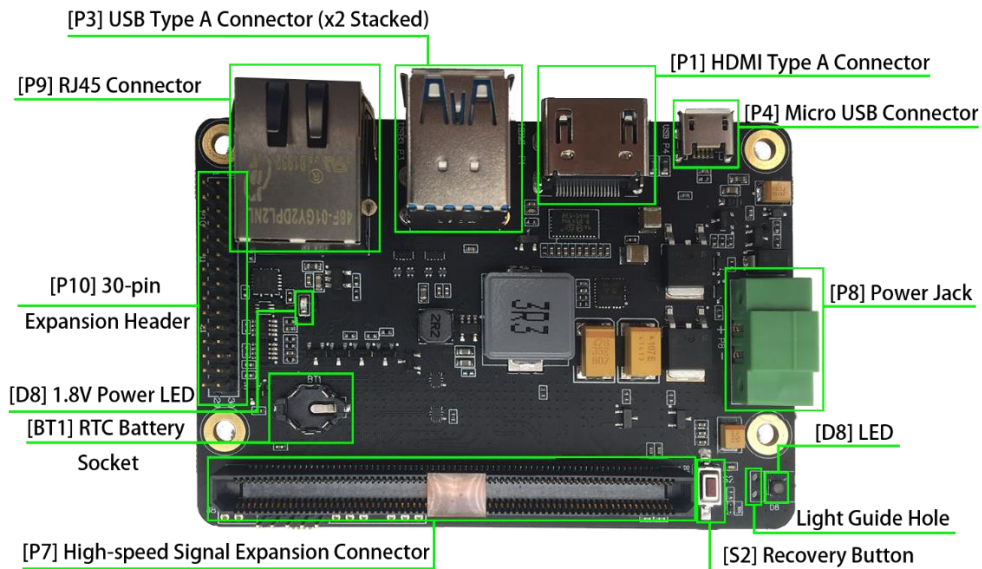
Ali International Station Address: <https://plink-ai.en.alibaba.com/>

1.3 Standing finish

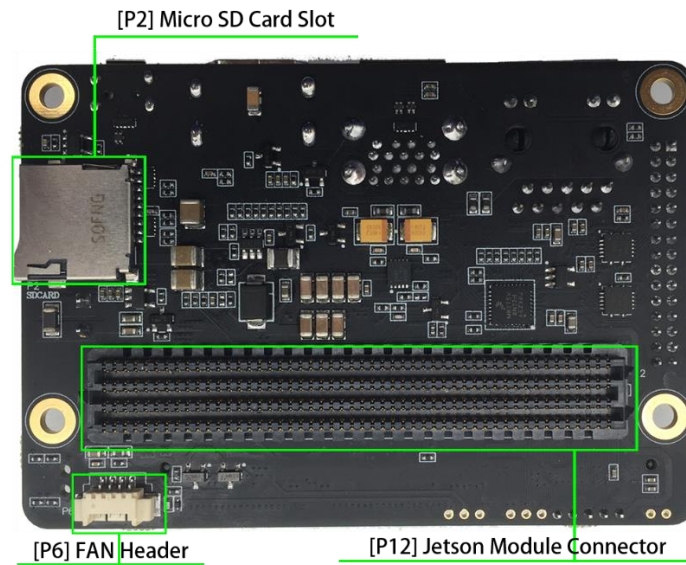
The Y-C6 fitting includes a 2.0mm spacing multifunctional pin connector (J17) outer lead line and a bag of screw packs. The screw package contains a screw pack and a power cord connector (male head) for fixing the load plate.



Chapter 2. Interface Function Description



Y-C1 Front Interface Description



Y-C1 Back Interface Description

2.1 Buttons

Button	Description	Usage
S2	Recovery button	Used to enter Force Recovery Mode. Button is held down while either system is first powered on, or by pressing and releasing reset button while recovery button is pressed.

2.2 LED Indicators

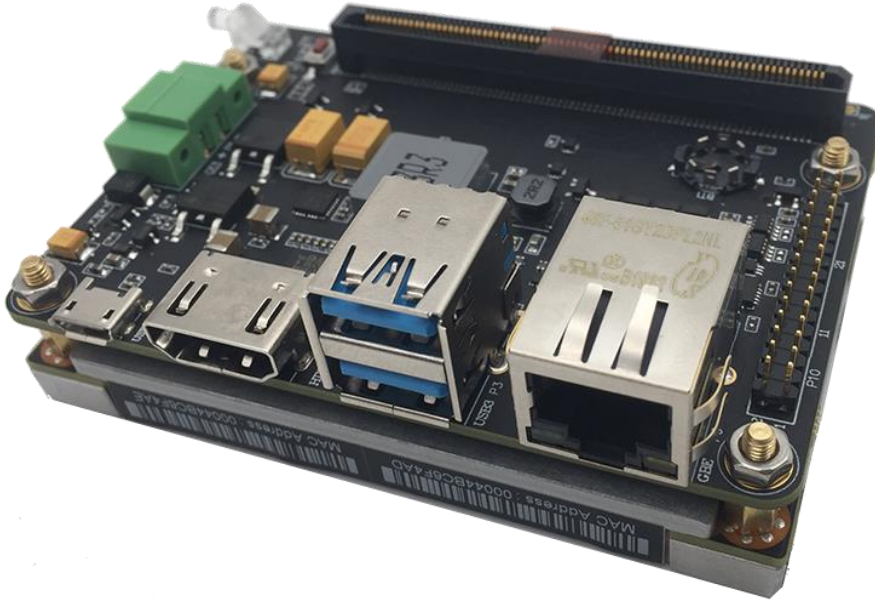
LED	Description														
D9	1.8V power status indicator														
D8	Three-color multifunctional status indicator light														
	<table border="1"> <thead> <tr> <th>Tri-color lamp status</th> <th>State to explain</th> </tr> </thead> <tbody> <tr> <td>The green lights are shining</td> <td>TX2 core module works properly</td> </tr> <tr> <td>Green light on</td> <td>The input voltage is less than the system startup voltage</td> </tr> <tr> <td>Blue lights flashing</td> <td>Wait for the power button to be pressed to start up</td> </tr> <tr> <td>Cyan lights (blue + green) shine</td> <td>Load board working, TX2 core module not working</td> </tr> <tr> <td>Purple lights (blue + red) shine</td> <td>Operating system shutdown</td> </tr> <tr> <td>Red lights flashing</td> <td>Entered maintenance mode</td> </tr> </tbody> </table>	Tri-color lamp status	State to explain	The green lights are shining	TX2 core module works properly	Green light on	The input voltage is less than the system startup voltage	Blue lights flashing	Wait for the power button to be pressed to start up	Cyan lights (blue + green) shine	Load board working, TX2 core module not working	Purple lights (blue + red) shine	Operating system shutdown	Red lights flashing	Entered maintenance mode
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Red lights flashing	Entered maintenance mode														

2.3 Functional Connector

Connector	Description
P1	HDMI Type A Connector
P2	Micro TF Card Slot
P3	USB 3.0 Type A Connector (x2 Stacked)
P4	Micro USB Connector, supporting Device mode only (including USB Recovery)
P5 J8	Keep interface
P6	Fan-Header (4-pin)
P7	150Pin multifunctional high-speed signal extension connector
P8	Power Jack
P9	RJ45 Ethernet, RA, Female
P10	Multi-function pin connector (30pin, 2.0mm pitch)
P11	Location hole for LED indicator light guide
P12	High-speed connector for connecting the Jetson series of core modules
BT1	RTC Battery Socket

Chapter 3. Installation and Use

3.1 Installation effect drawing



3.2 Method of use

- 1) Make sure all external systems are powered off
- 2) Install the TX1/TX2 core module on the P12 (400 Pin board-to-board connector). During the installation process, please pay attention to the alignment between the connectors, apply even force, and install the fixing screws.
- 3) Install the necessary external cables. (E.g.: Display cable to HDMI monitor, Power input cable to power the system, USB cable to connect keyboard and mouse...)
- 4) Connect the power cord to the power supply (see 4.4 Power cord connection steps for details).
- 5) The default setting of Y-C1 is to automatically power on, turn on the power and the system starts to work.
- 6) For systems without protective enclosures, after the system is powered on, please avoid moving the entire system, and it is strictly forbidden to directly touch the circuit board and its electronic components with your body.

3.3 Recovery mode

Jetson TX1/TX2 core modules can work in normal mode and recovery mode. In Recovery mode, file system update, kernel update, Boot loader update, BCT update and other operations can be performed.

The steps to enter Recovery mode are as follows:

- a) Turn off the system power supply.
- b) Use a Micro-USB cable to connect the Y-C1's Micro-USB port (P4) to the Jetson development host USB port.
- c) Press and hold the RECOVERY button (S2) to supply power to the system for more than 3 seconds, then release the RECOVERY button
- d) The system enters Recovery mode, at which point subsequent operations can be performed.

Chapter 4. Board card interface definition description

4.1 Core module interface [P12]

Function	Connect the NVIDIA Jetson Series Xavier TX1 / TX2 core module
Identification	P12
Type / Model	Samtec: SEAM-50-03.5-S-08-2-A-K
Pound definition	For pin definitions for this connector, refer to the NVIDIA Jetson TX1/TX2 Core Module data book for pin definitions



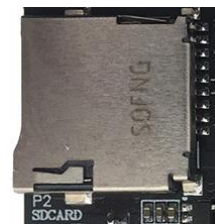
4.2 Fan interface [P6]

Function	Connect the external cooling fan												
Identification	P6												
Type/Model	Molex PicoBlade Header												
Pound definition	<table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>GND</td> <td>2</td> <td>+5V</td> </tr> <tr> <td>3</td> <td>TACH</td> <td>4</td> <td>PWM</td> </tr> </tbody> </table> <p>Pin 1 position: marked in the red box on the right picture.</p>	Pin	Signal	Pin	Signal	1	GND	2	+5V	3	TACH	4	PWM
Pin	Signal	Pin	Signal										
1	GND	2	+5V										
3	TACH	4	PWM										



4.3 Micro SD Card Slot [P2]

Function	Micro SD (TF) card slot																								
Identification	P2																								
Type/Model	Micro SD (TF)																								
Pound definition	<table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>SDIO_DATA2</td> <td>2</td> <td>SDIO_DATA3</td> </tr> <tr> <td>3</td> <td>SDIO_CMD</td> <td>4</td> <td>SDIO_VCC</td> </tr> <tr> <td>5</td> <td>SDIO_CLK</td> <td>6</td> <td>GND</td> </tr> <tr> <td>7</td> <td>SDIO_DATA0</td> <td>8</td> <td>SDIO_DATA1</td> </tr> <tr> <td>9</td> <td>GND</td> <td>10</td> <td>SDIO_CD</td> </tr> </tbody> </table>	Pin	Signal	Pin	Signal	1	SDIO_DATA2	2	SDIO_DATA3	3	SDIO_CMD	4	SDIO_VCC	5	SDIO_CLK	6	GND	7	SDIO_DATA0	8	SDIO_DATA1	9	GND	10	SDIO_CD
Pin	Signal	Pin	Signal																						
1	SDIO_DATA2	2	SDIO_DATA3																						
3	SDIO_CMD	4	SDIO_VCC																						
5	SDIO_CLK	6	GND																						
7	SDIO_DATA0	8	SDIO_DATA1																						
9	GND	10	SDIO_CD																						



4.4 RJ45 Ethernet Connector [P9]

Function	RJ45 Ethernet connector			
Identification	P9			
Type/Model	RJ45 Ethernet Socket, RA, Female			
Pound definition	Pin	Signal	Pin	Signal
	1	TP0+	2	TP0-
	3	TP1+	4	TP2+
	5	TP2-	6	TP1-
	7	TP3+	8	TP3-
The network port supports 10/100/1000Mbps adaptive switching.				



4.5 USB3.0 Connector [P3]

Function	The USB3.0 Connector			
Identification	P3			
Type/Model	Type-A Standard USB3.0 Interface			
Pound definition	Pin	Signal	Pin	Signal
	1	VBUS	2	USB_D -
	3	USB_D +	4	GND
	5	SSRX -	6	SSRX +
	7	GND	8	SSTX -
	9	SSTX +		



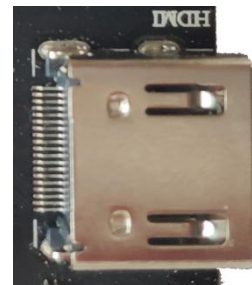
4.6 Micro-USB2.0 [P4]

Function	USB 2.0 Connector			
Identification	P4			
Type/Model	Type-B standard Micro USB 2.0 interface (for burning operating system)			
Pound definition	Pin	Signal	Pin	Signal
	1	VBUS	2	USB2.0DB
	3	USB2.0D+	4	USB ID
	5	GND		
<p>When USB-OTG is in host mode, the USB ID pin must float.</p> <p>When USB-OTG is in slave mode, the USB ID pin must be grounded.</p>				



4.7 HDMI Connector [P1]

Function	The HDMI Display Connector			
Identification	P1			
Type/Model	Type A Standard HDMI Connectors			
Pound definition	Pin	Signal	Pin	Signal
	1	TMDS	2	TMDS
	3	TMDS	4	TMDS
	5	TMDS	6	TMDS
	7	TMDS	8	TMDS
	9	TMDS	10	TMDS
	11	TMDS	12	TMDS
	13	CEC	14	No Connect
	15	DDC clock	16	DDC data
	17	DDC GND	18	+5V Power
	19	Hot Plug		

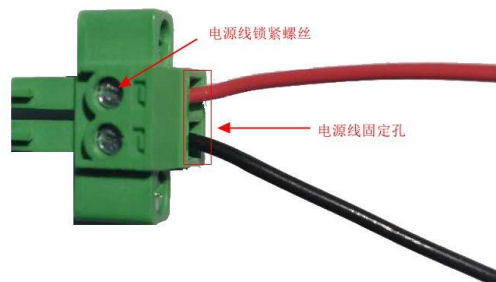


4.8 Power Jack [P8]

Function	Power supply input terminal								
Identification	P8								
Type/Model	The 3.5mm power supply terminals								
Pin definition	<table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>VCC (+)</td> <td>2</td> <td>GND (-)</td> </tr> </tbody> </table>	Pin	Signal	Pin	Signal	1	VCC (+)	2	GND (-)
	Pin	Signal	Pin	Signal					
1	VCC (+)	2	GND (-)						
<p>Pin 1 position: marked in the red box on the right picture.</p> <p>Input voltage range: + 9V to + 24V.</p>									

Power cord connection step:

1. Release the power cord lock screw for the power terminal (male) in the accessory bag
2. Insert the cable into the power cord fixing hole of the power supply terminal (male)
3. Tightening of power wire locking screw for power supply terminal (male) (note power line polarity)
4. Insert the male power terminal into the master power terminal on the card
5. Tighten the power supply terminal connector retaining screw



4.9 30-pin Extension Header [P10]

Function	Multi-function signal extension interface			
Identification	P10			
Type/Model	30-pin (2x15, 2.00mm pitch)			
Pin definition	Pin	Signal	Pin	Signal
	1	3.3V	2	3.3V
	3	UART0_RX	4	UART0_TX
	5	UART1_RX	6	UART1_TX
	7	UART2_RX	8	UART2_TX
	9	UART3_TX	10	UART3_RX
	11	GPIO0	12	GPIO1
	13	GPIO2	14	GPIO3
	15	GND	16	GND
	17	I2C_DAT	18	I2C_CLK
	19	CAN1_L	20	CAN1_H
	21	CAN0_L	22	CAN0_H
	23	GND	24	GND
	25	POWER_BUTTON	26	GND
	27	RESET_BUTTON	28	RECOVERY_BUTTON
29	RTC_BAT_IN	30	5V	

The four serial ports, UART0~UART3, are all 3.3V TTL logic level. The mapping files in the Linux system are ttyS0, ttyTHS2, ttyTHS1, and ttyTHS3 in the /dev directory. **The TX1 module does not support UART3.**

UART0 is the kernel debugging serial port by default, which is used to output C-BOOT, U-Boot, and Linux kernel information. After the Linux kernel is started, it is used as the serial port of the display control terminal. The default serial port setting of TX1/TX2 is: 115200bps, 8N1

The sysfs mapping numbers of the derived GPIO0~GPIO3 in the TX1 system are: 187, 186, 89, 202. The sysfs mapping numbers in the TX2 system are: 388, 298, 480, 486. GPIO high level voltage is 3.3V.

The derived I2C bus corresponds to the IIC-0 bus in the Linux system.

RTC_BAT_IN is the RTC clock power supply (+3V) input



4.10 High-speed signal expansion connector [P7]

Function	150Pin high-speed signal expansion connector
Identification	P7
Type/Model	Pinlink-20202204150
Pound definition	<p>Signals that can be drawn from this connector:</p> <ul style="list-style-type: none"> Second DP display signal PCIe x 2 + PCIe x1 signal or PCIe x1+ PCIe x1+USB3.0x1 signal 6Lane MIPI CSI signal SATA signal Multiple I2C, I2S, SPI signals <p>Please contact sales for a detailed documentation of this interface!</p>



Chapter 5. Product size diagram

