A201（Nano）User Guide

JETSON NANO/ AGX XAVIER NX / TX2 NX

A201 User Guide Leetop@leetop.top

LEETOP | CHINA

DOCUMENT CHANGE HISTORY

Version	Date	Description of Change
V1.1	2020-07	
V1.2	2020-08	
V3.1	2021-01	

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Preface

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Leetop Tech assumes no liability for any damages incurred directly or indirectly from any technical or typographical errors or omissions contained herein or for discrepancies between the product and the user's guide.

Customer Support Overview

If you experience difficulties after reading the manual and/or using the product, contact the Leetop Tech which you purchased the product. In most cases the reseller can help you with product installation and difficulties.

Contact Information

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1. Overview

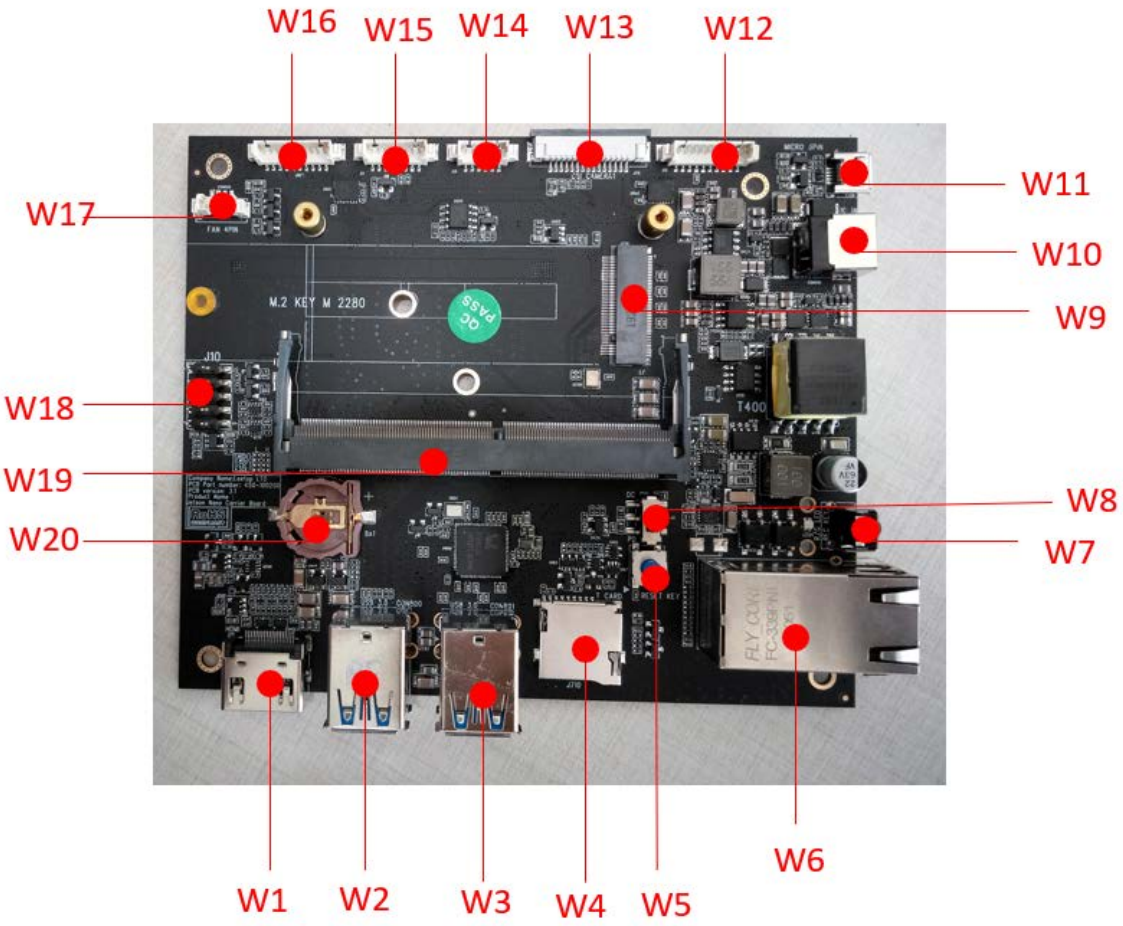
1.1 Introduction

A201 is a high-performance, rich interface NVIDIA® Jetson carrier board. Support Nano/ AGX Xavier NX/ TX2 NX. A201 carrier board provides Gigabit Ethernet, USB3.0, USB 2.0 (W/OTG function), USB WIFI MODE, M.2 WIFI/BT, M.2 KEY E PCIE Solid state drive, CSI CAMERA, SATA, Mini-PCIe/mSATA, RS232, SIM Card, GPIO, I2C, I2S, fan and other rich peripheral interfaces.

1.2 Product interface specifications

Feature	A201 Carrier for NVIDIA ® Jetson™ Nano/ Xavier NX /TX2 NX
Module Compatibility	NVIDIA ® Jetson™ Nano
PCB Size / Overall Size	125mm x 105mm (4.92” x 4.13”)
Display	1x HDMI
Ethernet	1x Gigabit Ethernet (10/100/1000M)
USB	4x USB 3.0 Type A (Integrated USB 2.0) 1x USB 2.0 Type A/1x USB 2.0 OTG Micro-AB
CSI CAERAA	1x CSI CAMERA
USB WIFI MODEL	1X USB2.0 WIFI
M.2 KEY M PCIE	1X PCIE 2280 SIZE
I2S	2x I2S(3.3V Level)_
SPI	1x SPI(3.3V Level)_
I2C	1x I2C(3.3V Level)_
Misc.	1x UART (+3.3V I/O) 2x GPIO
Power Requirements	+12V~19V DC Input @ 3A POE class 4
Operating Temperature	-25° to +65°
Weight	
Accessories	Cables
Warranty and Support	1 Year Warranty and Free Support

1.3 Carrier board Interface location



2. Interface

2.1 A201 Interface list

Table 2-1：A201 Connector Summary

Designator	Connector	Description
W1	HDMI Port	HDMI Right Angle Vertical Connector
W2/W3	USB 3.0 Type A	USB 3.0 Link 1 Type A Connector
W4	SD Card	1x microSD Card Slot
W5	RESET	RESET BUTTOM
W6	NVIDIA Gigabit Ethernet	Gigabit Ethernet Connector (10/100/1000) support POE class 4
W7	RECOVERY	RECOVERY BUTTOM
W8	DC OR POE POWER SWITCH	DC OR POE POWER SELECT SWITCH
W9	M.2 KEY M Disk	Disk size 2240&2280 Share
W10	DC Power CONNECT	DC POWER INPUT CONNECTOR
W11	USB 2.0 OTG	USB 2.0 Link 0 OTG Micro-AB Connector
W12	I2S2 CONNECT	10 PIN I2S 3.3V CONNECTOR
W13	CSI CAMERA0 CONNECT	15 PIN CAMERA CSI CONNECTOR
W14	SPI CONNECT	6 PIN SPI CONNECTOR
W15	I2C CONNECT	8 PIN I2C CONNECTOR
W16	I2S1 CONNECT	10 PIN I2S 3.3V CONNECTOR
W17	FAN CONNECT	4 PIN 5V FAN CONNECTOR
W18	10 PIN CONNECT	POWER/UART/IO CONNECTOR
W19	NVIDIA Jetson Nano	Nano 266 PIN Connector
W20	3V LITHIUM BATTERY	3V Backup Battery
W21	USB 2.0	6PIN WIFI USB 2.0

2.2 A201 Detailed description of external interface

2.2.1 HDMI （ W1）

Table 2-2：W1 HDMI Connector

Pin	Pin Descriptions	Pin	Pin Descriptions
1	TMDS Data2+	2	TMDS Data2 GND
3	TMDS Data2-	4	TMDS Data1+
5	TMDS Data1 GND	6	TMDS Data1-
7	TMDS Data0+	8	TMDS Data0 GND
9	TMDS Data0-	10	TMDS Clock+
11	TMDS Clock GND	12	TMDS Clock-
13	CEC	14	NC
15	DDC clock	16	DDC data
17	DDC GND	18	+5V
19	Hot Plug Detect		

2.2.2 USB3.0 （W2/W3 ）

Table 2-3：W2/W3 USB3.0 Interface

Pin	Pin Descriptions	Pin	Pin Descriptions
1	VBUS	2	USB 2.0 D-
3	USB 2.0 D+	4	GND
5	SSRX-	6	SSRX+
7	GND	8	SSTX-
9	SSTX+	10	VBUS
11	USB 2.0 D-	12	USB 2.0 D+
13	GND	14	SSRX-
15	SSRX+	16	GND
17	SSTX-	18	SSTX+

2.2.3 Micro SD （W4 ）

Table 2-4：Micro SD Interface

Pin	Pin Descriptions	Pin	Pin Descriptions
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

2.2.4 USB-OTG （W11 ）

Table 2-5：W5 USB-OTG Interface

Pin	Pin Descriptions	Pin	Pin Descriptions
1	VBUS	2	USB 2.0 D-
3	USB 2.0 D+	4	USB ID
5	GND		

2.2.5 POE Ethernet Jack （W6）

Table 2-6：W6Ethernet Jack Interface

Pin	Pin Descriptions	Pin	Pin Descriptions
1	TP0+	2	TP0-
3	TP1+	4	TP2+
5	TP2-	6	TP1-
7	TP3+	8	TP3-

2.2.6 M.2 KEY M Disk（W9 ）

Table 2-7：W9 M.2Interface

Pin	Pin Descriptions	Pin	Pin Descriptions
1	GND	2	+3.3V
3	GND	4	+3.3V
5	PCIE0_RX3_N	6	NC
7	PCIE0_RX3_P	8	NC
9	GND	10	NC
11	PCIE0_TX3_N	12	+3.3V
13	PCIE0_TX3_P	14	+3.3V
15	GND	16	+3.3V
17	PCIE0_RX2_N	18	+3.3V
19	PCIE0_RX2_P	20	NC
21	GND	22	NC
23	PCIE0_TX2_N	24	NC
25	PCIE0_TX2_P	26	NC
27	GND	28	NC
29	PCIE0_RX1_N	30	NC
31	PCIE0_RX1_P	32	NC
33	GND	34	NC
35	PCIE0_TX1_N	36	NC
37	PCIE0_TX1_P	38	NC
39	GND	40	I2C_CLK
41	PCIE0_RX0_N	42	I2C_DATA
43	PCIE0_RX0_P	44	M2_E_ALERT
45	GND	46	NC
47	PCIE0_TX0 _N	48	NC
49	PCIE0_TX0 _P	50	PCIE0_RST
51	GND	52	PCIE0_CLKREQ
53	PCIE0_CLK_N	54	PCIE_WAKE
55	PCIE0_CLK_P	56	NC
57	GND	58	NC
59	NC	60	32KH
61	NC	62	+3.3V

63	GND	64	+3.3V
65	GND	66	+3.3V
67	GND		

2.2.7 Power Interface（W10 ）

Table 2-8：W7 DC Interface

Pin	Pin Descriptions	Pin	Pin Descriptions
1	PowerDC Interface		
Input voltage range：+12~19V			

2.2.8 I2S0 Interface （W12 ）

Table 2-9：W12 I2S0 Interface

Pin	Pin Descriptions	Pin	Pin Descriptions
1	GPIO09_AUD_MCLK	2	I2S0_LRCK_3V3
3	I2S0_SDOUT_3V3	4	I2S0_SDIN_3V3
5	I2S0_SCLK_3V3	6	GND
7	VDD_3V3_SYS	8	GND
9	GND	10	GND

2.2.9 I2S1Interface （W16 ）

Table 2-10：W8 I2S1Interface

Pin	Pin Descriptions	Pin	Pin Descriptions
1	GPIO09_AUD_MCLK	2	I2S1_LRCK_3V3
3	I2S1_SDOUT_3V3	4	I2S1_SDIN_3V3
5	I2S1_SCLK_3V3	6	GND
7	VDD_3V3_SYS	8	GND
9	GND	10	GND

2.2.10 CAMERA CSI InterfaceW13

Table 2-11: CSI CAMERA0 Interface

Pin	Pin Descriptions	Pin	Pin Descriptions
1	GND	2	CSI_A_D0_N
3	CSI_A_D0_P	4	GND
5	CSI_A_1_N	6	CSI_A_D1_P
7	GND	8	CSI_A_CLK_P
9	CSI_A_CLK_N	10	GND
11	CAM1_PWDN	12	CAM1_MCLK
13	CAM_I2C_SCL	14	CAM_I2C_SDA
15	+3.3V	16	

2.2.11 SPI Interface （W14）

Table 2-2：W14 SPI Interface

Pin	Pin Descriptions	Pin	Pin Descriptions
1	GND	2	SPI1_CS0_3V3
3	SPI1_MOSI_3V3	4	SPI1_MISO_3V3
5	SPI_SCK_3V3	6	VDD_3V3_SYS

2.2.12 I2C Interface （W15 ）

Table 2-13：W15 I2C Interface

Pin	Pin Descriptions	Pin	Pin Descriptions
1	GND	2	VDD_3V3_SYS
3	I2C_SDA_3V3	4	I2C_SCL_3V3
5	GPIO01 _3V3	6	NC
7	NC	8	NC

2.2.13 Fan Interface （W17 ）

Table 2-14：W17 FANInterface

Pin	Pin Descriptions	Pin	Pin Descriptions

1	GND	2	+5V
3	FAN_TACH	4	FAN_PWM

2.2.14 10 PIN Interface （W18 ）

Table 2-15：W18 10 PIN Interface

Pin	Pin Descriptions	Pin	Pin Descriptions
1	GND	2	+3V3
3	UART1_TXD_DEBUG	4	UART1_RXD_DEBUG
5	+5V	6	GND
7	UART2_RXD_3V3	8	UART2_TXD_3V3
9	GPIO03_3V3	10	GPIO13_3V3

2.2.15 USB2.0 WIFIInterface （W21 ）

Table 2-15：W21 1USB2.0WIFI Interface

Pin	Pin Descriptions	Pin	Pin Descriptions
1	NC	2	GND
3	USB D+	4	USB D-
5	+5V	6	NC

2.2.16 module Interface W19;

2.2.17 Reset Key（W5 ）

2.2.18 RECOVERY Key （W7 ）

2.2.19 RTC battery （W20 ）

2.2.20 M.2 KEY M SSD.Interface

This is a standard M.2 KEY MInterface, which can be connected to standard 2240 size, PCIEInterface solid state hard drives and other standard M.2 KEY M devices.

The operation steps are as follows:

Step1.

```
lspci          Check whether the recognition is successful
root@xavier-gmsl:~/x# lspci
0000:00:00.0 PCI bridge: NVIDIA Corporation Device 1ad0 (rev a1)
0000:01:00.0 Non-Volatile memory controller: Silicon Motion, Inc. Device 2263 (rev 03)
0001:00:00.0 PCI bridge: NVIDIA Corporation Device 1ad2 (rev a1)
0001:01:00.0 SATA controller: Marvell Technology Group Ltd. Device 9171 (rev 13)
```

Step2、

```
fdisk (sudo su)                  Create partition
root@xavier-gmsl:~/x# fdisk /dev/nvme0n1
Disk /dev/nvme0n1: 111.8 GiB, 120034123776 bytes, 234441648 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0xed2c7c21
Create a new primary partition in turn
'n' ->'p' ->'default' ->'w'
```

Step3、

```
mkfs.ext4    /dev/nvme0n1p1    （mkfs    file system type）
```

Step4、

```
mount -t ext4 /dev/nvme0n1p1    nvme/    （mount folder）
Auto mount (you can mount it automatically when you start it next time, otherwise you have to
mount it manually every time you start it)
echo /dev/nvme0n1p1 /mnt ext4 defaults 0 0 >> /etc/fstab
```

3. Software /BSP

3.1 Software configuration

NVIDIA Jetson NanoSoftware resources：

https://devtalk.nvidia.com/default/topic/1048642/jetson-nano/links-to-jetson-nano-resources-amp-wiki/

NVIDIA Jetson Nano Jetpackdescription：

Jetson Nano currently supports Jetpack 4.2.2 (R32.2.1) and JetPack 4.2.1 (R32.2.0). Nano installation of JetPack needs to be done through SDKManager. The interface is as shown in the figure:

Installation Environment：Ubuntu18.04 x64

Download link: https://developer.nvidia.com/nvidia-sdk-manager

Description: Jetpack includes various tools on the host and target, including OS image files, middleware, sample programs, documents, etc.

Note: When entering the USB Recovery mode, the system will not start, and there will be no debugging information output from the serial port.