DLAP-411-Orin

Edge Inference System

User's Manual



Manual Rev.: 0.6

Revision Date: November 22, 2023

Part No: 50M-45108-1000

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Leading EDGE COMPUTING

Revision History

Revision	Release Date	Description of Change(s)
0.1	2023-07-19	Preliminary release
0.2	2023-08-15	Updated dimensions and panel I/O
0.3	2023-10-05	Updated Chapter 3
0.4	2023-10-31	Updated installation images and add 3.6 LED Indicators
0.5	2023-11-20	Added Side Panel I/O and Sections 1.5.8, 1.5.9, 3.7 Multi I/O Control
0.6	2023-11-20	Added exterior antenna illustrations for installing Wi-Fi, 5G module added

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Preface

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Conventions

Take note of the following conventions used throughout this manual to make sure that users perform certain tasks and instructions properly.


NOTE:

Additional information, aids, and tips that help users perform tasks.


CAUTION:

Information to prevent ***minor*** physical injury, component damage, data loss, and/or program corruption when trying to complete a task.

Informations destinées à prévenir les blessures corporelles mineures, les dommages aux composants, la perte de données et/ou la corruption de programme lors de l'exécution d'une tâche.


WARNING:

Information to prevent ***serious*** physical injury, component damage, data loss, and/or program corruption when trying to complete a specific task.

Informations destinées à prévenir les blessures corporelles graves, les dommages aux composants, la perte de données et/ou la corruption de programme lors de l'exécution d'une tâche spécifique.

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Table of Contents

Revision History iii

Preface v

List of Tables ix

List of Figures xi

1 Introduction 1

1.1 Features 1
1.2 Specifications 2
1.3 Mechanical Dimensions 4
1.4 External Layout 5
1.5 Pin Definitions 8
1.5.1 Ethernet GbE Connectors 8
1.5.2 USB 3.2 Gen2 Connectors 8
1.5.3 24 Volt DC Connector 9
1.5.4 CAN (Controller Area Network) Bus 9
1.5.5 COM Port (Serial Port) 10
1.5.6 HDMI Connector 11
1.5.7 USB 3.2 Gen2 OTG Connector 12
1.5.8 Multi I/O 13
1.5.9 Micro SD Card Slot 15
1.6 DIP Switch Configurations 16
1.6.1 AT Power Mode Switch 16

2 Getting Started 17

2.1 Unpacking Checklist 17
2.2 Removing the Chassis Cover 17
2.3 Installing an M.2 SSD Module 19
2.4 Installing a Wi-Fi Module 20

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2.5 Installing a 5G/LTE Module 22
2.6 Connecting DC Power 24
2.7 Mounting (Optional) 25

3 Using the System 27
3.1 Software Configuration 27
3.2 System Recovery 27
3.3 Multi IO Configuration 28
3.4 COM Port Configuration 31
3.5 CAN Bus Configuration 31
3.6 LED Indicators 32
3.7 Multi I/O Control 34
3.7.1 GPIO Map 34
3.7.2 SPI I2C 36
3.8 Temperature Sensor (LM73) 36

Important Safety Instructions 37

Getting Service 39

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List of Tables

Table 1-1: Specifications 3
Table 1-2: Front Panel I/O Connectors & Controls 5
Table 1-3: Rear Panel I/O Connectors 6
Table 1-4: Rear Panel I/O Connectors 7
Table 1-5: USB 3.2 Gen2 Pin Definition 8
Table 1-6: 24 Volt DC Connector Pin Definition 9
Table 1-7: CAN Bus Pin Definition 9
Table 1-8: RS-232/422/485 Connector Pin Definition 10
Table 1-9: HDMI Connector Pin Definition 11
Table 1-10: USB 3.2 Gen2 OTG Connector Pin Information 12
Table 1-11: Multi IO 1 Connector Pin Information 13
Table 1-12: Multi IO 2 Connector Pin Information 14
Table 1-13: AT Power Mode Switch 16

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List of Figures

Figure 1-1: Front View Dimensions 4
Figure 1-2: Rear View Dimensions 4
Figure 1-3: Front Panel I/O Connectors & Controls 5
Figure 1-4: Rear Panel I/O Connectors 6
Figure 1-5: Side Panel I/O Connectors 7
Figure 2-1: M.2 Slot 19
Figure 2-2: Mini PCIe Wi-Fi Slot 20
Figure 2-3: M.2 Key Slot 22
Figure 2-4: Wall Mount 25

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1 Introduction

ADLINK's DLAP-Orin Edge Inference System harnesses the power of NVIDIA® Jetson™ AGX Orin modules to realize industry-leading smart automation across a wide range of applications, enabling tasks such as automatic obstacle identifying, collision avoiding, safety navigation, detour adjustments, and automatic adjustments to a number of environmental factors.

DLAP-411-Orin features intelligent, flexible, and robust computing power to automate intralogistic workflows in both industrial and commerical environments alike.

Boasting comprehensive industrial I/O and visual inferencing capabilities all in a compact system, DLAP-411-Orin supports 1x HDMI display, 4x GbE PSE ports (optional), 4x USB 3.2 Gen 2 ports (plus a USB 3.2 Gen 2 Type-C OTG port for BSP flashing), 1x isolated CAN bus, 1x COM (RS-232/422/485), 1x M.2 M key NVME (for additional storage options), 1x M.2 2230 E key slot to support Wi-Fi communications, and 1x 3042/3052 B key for 4/5G communications.

1.1 Features

- Deep learning acceleration with NVIDIA® Jetson™ AGX Orin
- 4x USB 3.2 Gen 2, 4x GbE PSE ports (optional), 1x Type-C USB 3.2 Gen 2
- Internal function expansions by M.2 E key 2230, 3042/3052 B key
- Compact system: 175(W) x 145(D) x 85(H) mm
- 24V DC input
- Additional storage by M.2 key 2242/2280

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1.2 Specifications

Item	Description
System Core	
Module	NVIDIA® Jetson™ AGX Orin
Memory	32/64GB LPDDR5 (on module)
Storage	64GB eMMC 5.1 (on module)
Front Panel I/O Interface	
USB 3.2 Gen 2	4x Type-A
Ethernet	4x GbE PSE ports (optional)
Pushbuttons	1x Power button 1x Reset button 1x Recovery button
Side Panel I/O Interface	
CAN Bus	1x CAN bus (DB-9 male)
USB 3.2 Gen 2	1x Type-C
HDMI	1x HDMI 2.0a Type A
COM	1x RS-232/422/485 (DB9 male D-sub connector)
Internal I/O Interface	
M.2 E Key	1x (2230)
M.2 B Key	1x (2242 / 3042)
M.2 M Key	1x (2242 / 2280)
USIM	1x USIM
Power	
DC Input	24V
AC Input	Optional 160W (up to 220W) AC-DC adapter
Fail Reset	Reset and recovery buttons
Buttons	Power button w/ LED indicator
Mechanical	
Antenna Holes	6x SMA
Dimensions	175(W) x 145(D) x 85(H) mm
Weight	2.2kg

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Environmental	
Operating Temperature	**32G:** -20°C to 60°C with 0.6m/s airflow, at 40W (not including Wi-Fi module, M.2 SSD) -20°C to 55°C with 0.6m/s airflow, at max power, MAXN (not including Wi-Fi module, M.2 SSD)
	64G: -20°C to 55°C with 0.6m/s airflow, at 50W (not including Wi-Fi module, M.2 SSD) -20°C to 40°C with 0.6m/s airflow, at max power, MAXN (not including Wi-Fi module, M.2 SSD)
Operating Humidity	93% RH @40°C (non-condensing)
Storage Temperature	-20°C to 80°C (-4°F to 176°F)
Altitude	Operating: < 2000 m
Vibration	Operating: 5 to 500 Hz, 1 G acceleration (IEC 60068-2-6)
Shock	Operating: 15G, half sine 11 ms (IEC 60068-2-6)
EMC	CE & FCC class B, (EN61000-6-4/-6-2/-3-3/-3-2)
Safety	IEC/CE standard
Substance Regulations	WEEE/ROHS/REACH compliant
Operating System Support	
Linux	Ubuntu for Tegra

Table 1-1: Specifications

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1.3 Mechanical Dimensions

All dimensions shown in millimeters (mm).

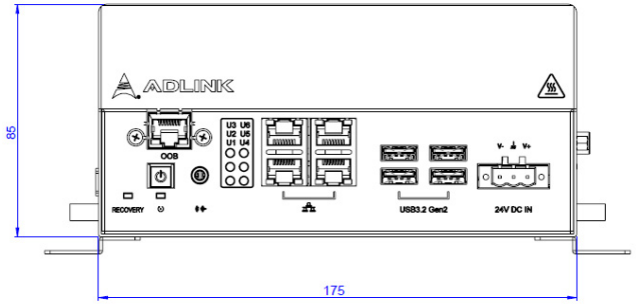


Figure 1-1: Front View Dimensions

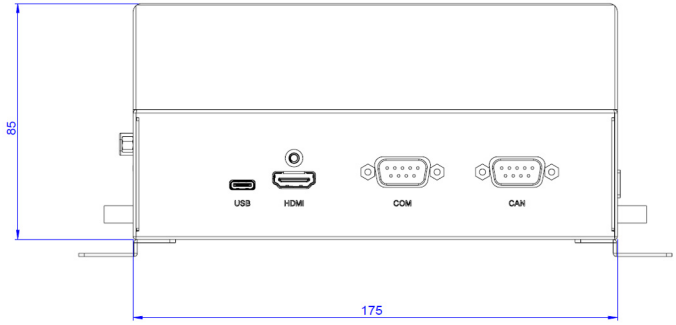


Figure 1-2: Rear View Dimensions

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1.4 External Layout

Front Panel

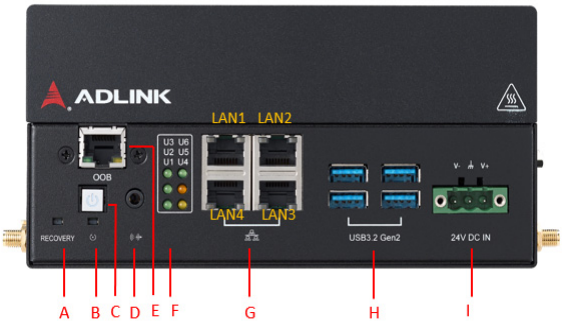


Figure 1-3: Front Panel I/O Connectors & Controls

Item	Name	Description
A	Recovery button	Press this button to force the system into recovery mode. See **Section 3.2 System Recovery**.
B	Reset button	The reset button executes a hard reset on the system.
C	Power button	The power button is a non-latched push button with a green LED power indicator. If the system is powered off when the button is pressed, the system powers up and the blue LED lights up. If the system hangs, pressing and holding the button continuously for 5 seconds performs a hard shutdown on the system.
D	Audio connector	Mic-in (mono). Line-out (stereo)
E	Out-of-Band (OOB) module.	OOB is a hardware-based technology that helps service providers manage devices remotely with monitoring and management features.
F	User-define LEDs x6	See **Section 3.6 LED Indicators**.
G	GbE connector	See **Section 1.5.1 Ethernet GbE Connectors**.
H	USB 3.2 Gen2 x4	See **Section 1.5.2 USB 3.2 Gen2 Connectors**.
I	24V DC connector	24V DC screw-type connector. See **Section 1.5.3 24 Volt DC Connector**.

Table 1-2: Front Panel I/O Connectors & Controls

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Rear Panel

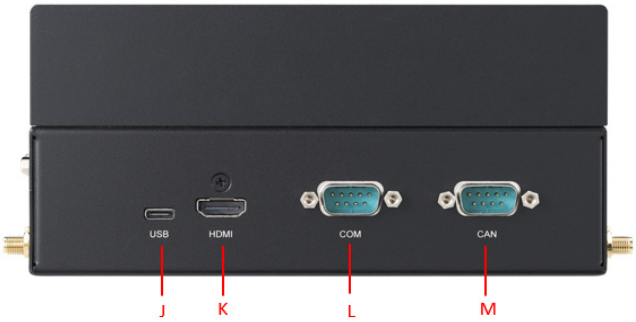


Figure 1-4: Rear Panel I/O Connectors

Item	Name	Description
J	USB 3.2 Gen2 OTG Type-C	See **Section 1.5.7 USB 3.2 Gen2 OTG Connector**.
K	HDMI port	HDMI 2.0
L	Serial port	COM port (DB9 male D-sub connector) RS-232/422/485 (software programmable)
M	CAN bus	CAN 2.0B (only supported with Jetson AGX Orin, backward compatible with 2.0A)

Table 1-3: Rear Panel I/O Connectors

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Side Panels

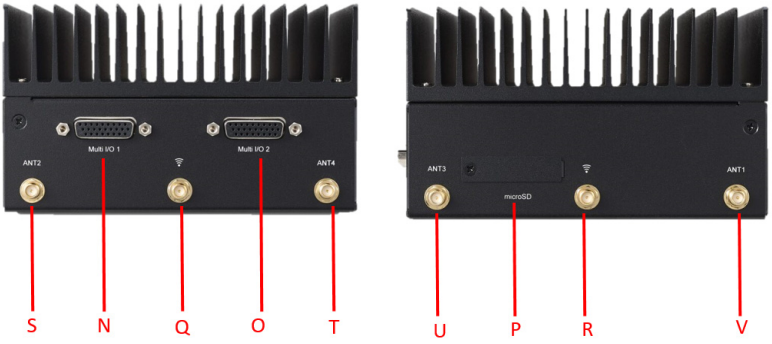


Figure 1-5: Side Panel I/O Connectors

Item	Name	Description
N	Multi IO 1	See **Section 1.5.8 Multi I/O**.
O	Multi IO 2	
P	micro SD card slot	See **Section 1.5.9 Micro SD Card Slot**.
Q	Wi-Fi antenna connectors	See **Section 2.4 Installing a Wi-Fi Module**.
R		
S	5G/LTE antenna connectors	See **Section 2.5 Installing a 5G/LTE Module**.
T		
U		
V		

Table 1-4: Rear Panel I/O Connectors

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1.5 Pin Definitions

1.5.1 Ethernet GbE Connectors

The DLAP-411-Orin comes with four RJ-45 connectors. When these Ethernet connectors support PoE, you will get an output of 48V DC, 0.3125A, and 15W from each.

- Intel® I210 (LAN1-3)
- NVIDIA® Jetson™ AGX Orin (LAN 4)

LAN LED connection speed color indicators:

Rate	Speed (left) LED	Active & Link (right) LED
10Mbps	N/A	Blinks yellow
100Mbps	Lights green	
1Gbps	Lights orange	

1.5.2 USB 3.2 Gen2 Connectors

The USB 3.2 Gen2 ports support a USB Type-A connection, compatible with SuperSpeed, Hi-Speed, full-speed, and low-speed USB peripherals including USB cameras..

Pin #	Signal Name
1	USB3.0_P5VA
2	USB2_CMAN
3	USB2_CMAP
4	GND
5	USB3A_CMRXN
6	USB3A_CMRXP
7	GND
8	USB3A_CMTXN
9	USB3A_CMTXP

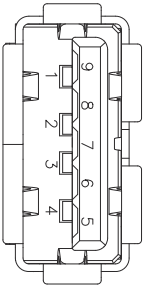
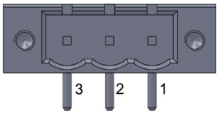


Table 1-5: USB 3.2 Gen2 Pin Definition

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1.5.3 24 Volt DC Connector

The system requires a DC power source via a Eurostyle terminal block.



Pin	Signal
1	DC in P
2	DGND
3	DC in N

Table 1-6: 24 Volt DC Connector Pin Definition

1.5.4 CAN (Controller Area Network) Bus

The Controller Area Network (CAN) enables communication among devices. The table below provides CAN bus pin information.

Pin	Signal	Description
1	NC	(Not connected)
2	CAN_Low	Differential CAN signal negative level
3	GND	CAN interface ground
4	NC	(Not connected)
5	NC	(Not connected)
6	NC	CAN interface ground
7	CAN_High	Differential CAN signal positive level
8	NC	(Not connected)
9	NC	(Not connected)

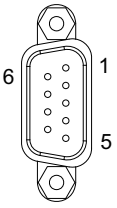


Table 1-7: CAN Bus Pin Definition

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1.5.5 COM Port (Serial Port)

RS-232/422/485 are supported by jumper selection.

Pin	RS-232	RS-422	RS-485
1	NC (not connected)	COM_TXD_N	COM_D-
2	COM_RXD	COM_TXD_P	COM_D+
3	COM_TXD	COM_RXD_P	NC
4	NC	COM_RXD_N	NC
5	COM_GND	NC	NC
6	NC	NC	NC
7	COM_RTS#	NC	NC
8	COM_CTS#	NC	NC
9	NC	NC	NC

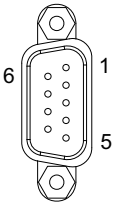
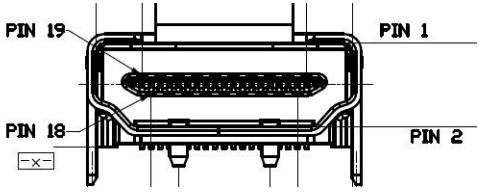


Table 1-8: RS-232/422/485 Connector Pin Definition

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1.5.6 HDMI Connector

The side panel supports HDMI 2.0.



Pin #	Signal	Pin #	Signal
1	HDMI_TX2_P	2	GND
3	HDMI_TX2_N	4	HDMI_TX1_P
5	GND	6	HDMI_TX1_N
7	HDMI_TX0_P	8	GND
9	HDMI_TX0_N	10	HDMI_CLK_P
11	GND	12	HDMI_CLK_N
13	CEC	14	NC
15	HDMI_SCL	16	HDMI_SDA
17	GND	18	+5 V Power
19	Hot Plug Detect	20	GND
21	GND	22	GND
23	GND		

Table 1-9: HDMI Connector Pin Definition

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1.5.7 USB 3.2 Gen2 OTG Connector

The DLAP-411-Orin supports a USB 3.2 Gen2 OTG Type-C connection for system recovery. The pin definition is as follows.



Pin #	Signal	Pin #	Signal
A1	GND	A2	SSTXp1
A3	SSTXn1	A4	VBUS
A5	CC1	A6	Dp1
A7	Dn1	A8	NC
A9	VBUS	A10	SSRXn2
A11	SSRXp2	A12	GND
B1	GND	B2	SSTXp2
B3	SSTXn2	B4	VBUS
B5	CC2	B6	Dp2
B7	Dn2	B8	SBU2
B9	VBUS	B10	SSRXn1
B11	SSRXp1	B12	GND

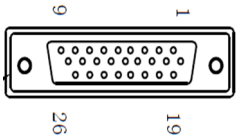
Table 1-10: USB 3.2 Gen2 OTG Connector Pin Information

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1.5.8 Multi I/O

The DLAP-411-Orin supports 2 Multi I/O ports. The pin definitions are as follows.

Multi IO 1

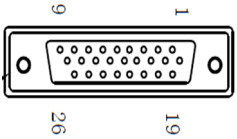


Pin #	Signal	Pin #	Signal
1	GPIO0	14	GPIO13
2	GPIO1	15	GPIO14
3	GPIO2	16	GPIO15
4	GPIO3	17	GPIO16
5	GPIO4	18	GPIO17
6	GPIO5	19	NC
7	GPIO6	20	NC
8	GPIO7	21	NC
9	GPIO8	22	NC
10	GPIO9	23	NC
11	GPIO10	24	+3V3
12	GPIO11	25	GND
13	GPIO12	26	GND

Table 1-11: Multi IO 1 Connector Pin Information

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Multi IO 2



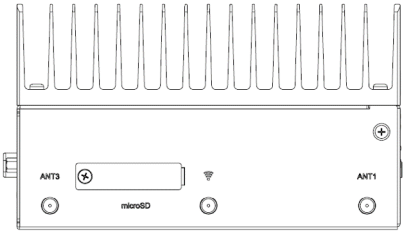
Pin #	Signal	Pin #	Signal
1	NC	14	SPI_MOSI
2	NC	15	NC
3	NC	16	NC
4	NC	17	+3V3
5	NC	18	GND
6	NC	19	I2C_CLK_1
7	NC	20	I2C_DAT_1
8	+3V3	21	I2C_DAT_3
9	GND	22	I2C_CLK_3
10	SPI_CS0	23	NC
11	SPI_CLK	24	NC
12	SPI_CS1	25	+3V3
13	SPI_MISO	26	GND

Table 1-12: Multi IO 2 Connector Pin Information

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1.5.9 Micro SD Card Slot

For additional storage, users can insert a micro SD card into the DLAP-411-Orin from its right side panel.



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1.6 DIP Switch Configurations

The DLAP-411-Orin provides a DIP switch:

- AT power mode DIP switch

1.6.1 AT Power Mode Switch

SW1	
Disable auto power on (default)	1-2
Enable auto power on	2-3

Table 1-13: AT Power Mode Switch

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2 Getting Started

2.1 Unpacking Checklist

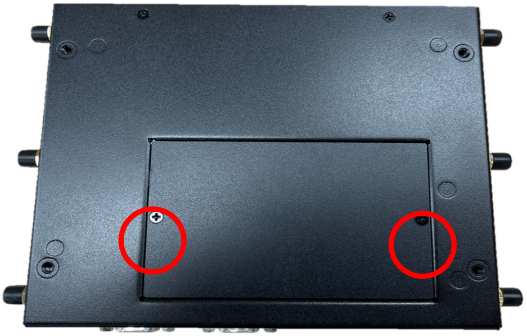
Before unpacking, check the shipping carton for any damage. If the shipping carton and/or contents are damaged, inform your dealer immediately. Retain the shipping carton and packing materials for inspection. Obtain authorization from your dealer before returning any product to ADLINK. Ensure that the following items are included in the package.

- DLAP-411-Orin unit
- (Optional) AC-DC adapter 160W 24V, 6.67A or DC power source. (if PSE SKU, AC-DC adapter 220W 24V, 9.2A or DC power source)
- Operating temperature shall be under 55°C.

2.2 Removing the Chassis Cover

Remove the underside of the chassis as follows.

1. On the underside of the device, remove the two screws indicated by the red circles in the figure below.



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2. Slide the cover in the direction indicated by the red arrow to the position shown below.



Reverse the steps above to replace the bottom cover.

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2.3 Installing an M.2 SSD Module

Use the following steps to install an M.2 SSD module.

1. Install the M3,H5,Ni standoff (provided).



Figure 2-1: M.2 Slot

2. Insert the M.2 2242/2280 M key module into the indicated slot at an angle. Press down on the M.2 module until it is seated, and secure it with one M3, I-head, L4 screw (provided).



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3. Replace the bottom cover of the chassis.

CAUTION:

Take care not to remove or damage any wires while installing the module.
Veillez à ne pas retirer ou endommager les fils lors de l'installation du module.

2.4 Installing a Wi-Fi Module

Use the following steps to install an M.2 E key (2230) Wi-Fi module.

1. Install the M3,H5,Ni standoff (provided).
2. Insert the Wi-Fi module into the indicated slot at an angle.



Figure 2-2: Mini PCIe Wi-Fi Slot

3. Press down on the module until it is seated, then secure it to the board using one M3-I-head-L4 screw (provided).
4. Attach the wires and antennas that came with your Wi-Fi module.
5. Replace the bottom cover of the chassis.

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6. Install the exterior antennas according to its labels to finish.



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2.5 Installing a 5G/LTE Module

Use the following steps to install a M.2 B key (3042 and 3052) 5G/LTE module.

1. Install the M3,H5,Ni standoff (provided).



2. Insert the SIM card and 5G/LTE module into the indicated slot at an angle.



Figure 2-3: M.2 Key Slot

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3. Press down on the module until it is seated, then secure it to the board using one M3-I-head-L4 screw (provided).
4. Attach the wires and antennas that came with your 5G/ LTE module according to its labels.
5. Replace the bottom cover of the chassis.
6. Install the exterior antennas according to its labels. to finish.



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2.6 Connecting DC Power



Before providing DC power to the DLAP-411-Orin, ensure the voltage and polarity provided are compatible with the DC input. Improper input voltage and/or polarity can be responsible for system damage.

Avant de connecter le PC DLAP-411-Orin à une source de courant continu, veuillez vous assurer de la polarité de la tension conformément à l'entrée CC du PC. Une tension et/ou une polarité incorrectes peuvent causer des dommages irréversibles sur le système.

DC power sources must comply with ES1 circuits as well as the following:

- IEC 62368-1 + UL 62368-1
- Output voltage: 24 VDC
- Output current: 6.67A or 9.2A minimum
- TMA: 55°C minimum

The DLAP-411-Orin DC power input connector uses V+, V-, and chassis ground pins and accepts input voltage as shown previously.

Customers may optionally order a DC power adapter from ADLINK.



Make sure the power adapter is connected to a socket outlet that is grounded.

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2.7 Mounting (Optional)

Optional Mounting Kit (91-95221-0000) for DLAP-411-Orin provides the following:

- Wall Mount BKT A3a170042B*2 (34-34255-1000-B0)
- Screw M4, P-head, L6, Toothed Washer Nylok*4 (33-04202-0060

)

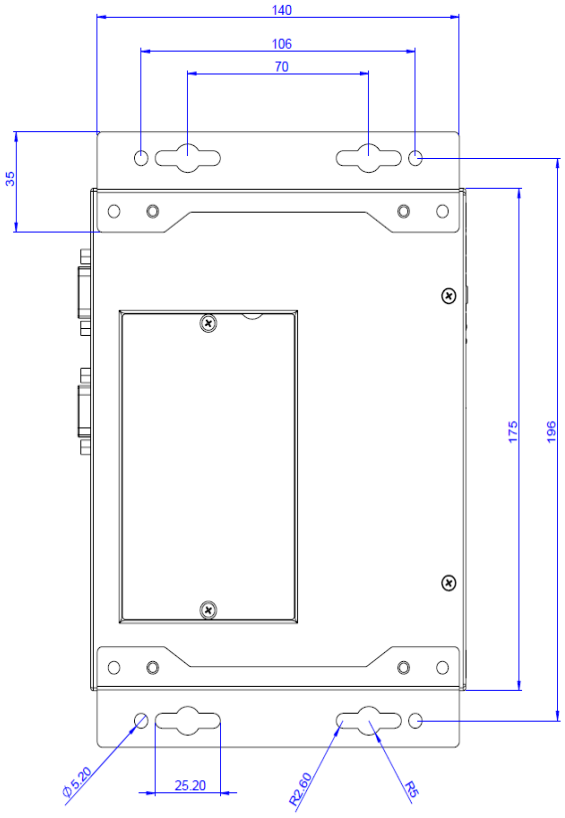


Figure 2-4: Wall Mount

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3 Using the System

3.1 Software Configuration

The DLAP-411-Orin ships with a customized NVIDIA Linux for Tegra (L4T) image pre-installed. The latest version of this custom L4T image and other relevant files are available on the ADLINK website:

https://www.adlinktech.com/Products/Deep_Learning_Accelerator_Platform_and_Server/Inference_Platform/DLAP-411-Orin?lang=en

3.2 System Recovery

You will need a host PC in order to flash your client device with a new system image.

Host PC:

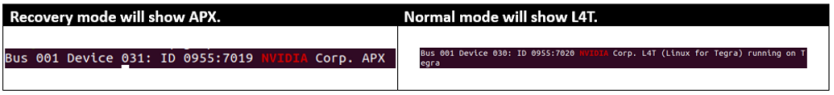
Before flashing the image, you should prepare an OTG cable (USB Type-C) for connecting to DLAP-411-Orin, and a host PC running Ubuntu 18.14 or 20.04 with the following dependencies:

```
$ sudo apt install libxml2-utils simg2img network-manager abootimg sshpass device-tree-compiler
```

1. Connect the host PC to the DLAP-411-Orin with the OTG cable.
2. Open a terminal on the host PC and run this command:

   ```
   $ lsusb | grep NVIDIA
   ```

3. Make sure the Client PC is in Recovery mode before flashing the image.



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If the Client PC is not in Recovery mode, double-check the OTG cable connection and perform troubleshooting as needed.

4. Download, unzip, and navigate to and flash mfi file image on the Host PC by running the following commands:

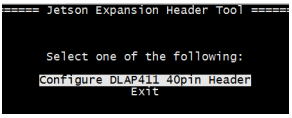
```
$ mfi_jetson-<jetson_type>-<jetson_module_name>-
     <jetson_version>-<bsp_verson>.tbz2
$ sudo tar -jxf mfi_jetson-<jetson_type>-
     <jetson_module_name>-<jetson_version>-
     <bsp_verson>.tbz2
$ cd mfi_jetson-<jetson_type>-
     <jetson_module_name>-<jetson_version>-
     <bsp_verson>.tbz2
$ sudo ./tools/kernel_flash/l4t_initrd_flash.sh -
     -flash-only
```

5. Allow the update to complete.

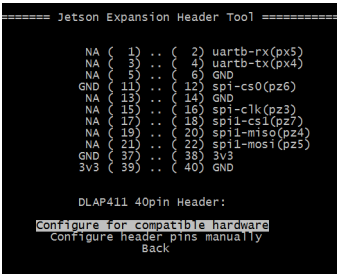
3.3 Multi IO Configuration

By default, the pins that can be set by are all functional (note gpio). Note that sudo permissions are required and that commands need to be executed in the full path /opt/nvidia/jetson-io/jetson-io.py

```
$ sudo /opt/nvidia/jetson-io/jetson-io.py
```

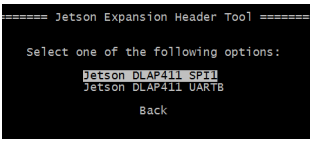


Jetson-IO can be configured through hardware or pins



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Jetson-IO Configuration by Hardware:

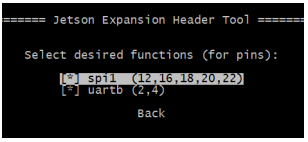


Selecting configure by hardware will set the pinmux function of the relevant pins and disable the corresponding hardware bus function.

After disabling the bus function, it can no longer be configured by hardware rollback through jetsion-io.

To remove the function bus disable setting by function, please modify the /boot/extlinux/extlinux.conf file with sudo permissions and change DEFAULT from DEFAULT JetsonIO to DEFAULT primary.

Jetson-IO Configuration by Pins:

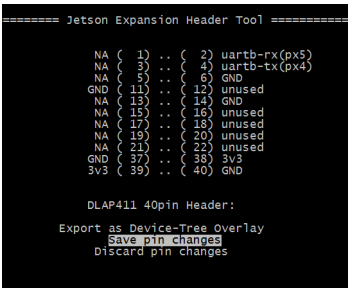


Selecting configure by pins will only set the pinmux pins (group).

```
[ * ] spi1 (12,16,18,20,22) > spi function
[   ] spi1 (12,16,18,20,22) > gpio function
```

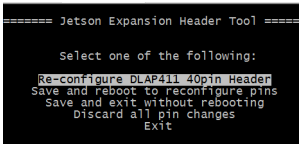
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When the pin function is changed, it takes effect immediately after leaving the by function or by pin menu.



Select Save pin changes > Save and reboot to reconfigure pins

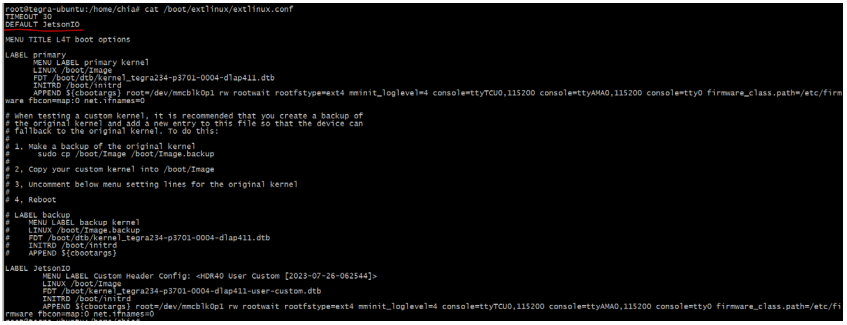
When finished, the system will be rebooted automatically.



After setting, Jetson-IO will generate a new dtbo file in the /boot directory.

Add a new set of JetsonIO in the /boot/extlinux/extlinux.conf file

JetsonIO will be set as the Default boot option.



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NOTE:

If you use /sys/class/gpio/ as the test method, take SPI MISO pin as an example, $echo 482 > /sys/class/gpio/export
The direction under the gpio node must be set once by the user before it can be used.
When using the default direction after export, the behavior will not be as expected.

3.4 COM Port Configuration

By default, the DLAP-411-Orin is configured to support the RS-232 protocol. COM Port Name: ttyTHS4

Switching between RS-232/422/485:

```
$ echo rs232 > /sys/class/sp339_mode_ctl/uartMode
$ echo rs422 > /sys/class/sp339_mode_ctl/uartMode
$ echo rs485 > /sys/class/sp339_mode_ctl/uartMode
```

Checking current serial port mode:

```
cat /sys/class/sp339_mode_ctl/uartMode
```

3.5 CAN Bus Configuration

By default, the DLAP-411-Orin is configured to support the CAN bus protocol.

The loopback test commands are as follows:

```
# ifconfig can0 down
# ip link set can0 type can bitrate 500000 dbitrate
  20000000 berr-reporting on fd on
# ip link set up can0
# cansend can0 123#0101020300050607   //send data
# candump can0 > recv.txt &           //recv data
# cat recv.txt
```

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3.6 LED Indicators

Six user-defined LEDs are provided on the front panel.

LED	Color
U1	Green
U2	Green
U3	Green
U4	Amber
U5	Red
U6	Green

The LED commands are as follows:

Turn On:

U1

```
# echo 1 > /sys/class/leds/LED4/brightness
```

U2

```
# echo 1 > /sys/class/leds/LED5/brightness
```

U3

```
# echo 1 > /sys/class/leds/LED6/brightness
```

U4

```
# echo 1 > /sys/class/leds/LED1/brightness
```

U5

```
# echo 1 > /sys/class/leds/LED2/brightness
```

U6

```
# echo 1 > /sys/class/leds/LED3/brightness
```

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Turn Off:

U1

```
# echo 0 > /sys/class/leds/LED4/brightness
```

U2

```
# echo 0 > /sys/class/leds/LED5/brightness
```

U3

```
# echo 0 > /sys/class/leds/LED6/brightness
```

U4

```
# echo 0 > /sys/class/leds/LED1/brightness
```

U5

```
# echo 0 > /sys/class/leds/LED2/brightness
```

U6

```
# echo 0 > /sys/class/leds/LED3/brightness
```

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3.7 Multi I/O Control

3.7.1 GPIO Map

Multi I/O 1

Pin	Signal	Number
1	GPIO 0	300
2	GPIO 1	301
3	GPIO 2	302
4	GPIO 3	303
5	GPIO 4	304
6	GPIO 5	305
7	GPIO 6	306
8	GPIO 7	307
9	GPIO 8	308
10	GPIO 9	309
11	GPIO 10	310
12	GPIO 11	311
13	GPIO 12	312
14	GPIO 13	313
15	GPIO 14	314
16	GPIO 15	315
17	GPIO 16	284
18	GPIO 17	285

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Multi I/O 2

Pin	Signal	Number
10	CS0	484
11	CLK	481
12	CS1	485
13	MOSI	483
14	MISO	482

Usage:

```
$sudo -s
#export IO
$echo 300 > /sys/class/gpio/export
#setting direction
#GPO
$echo out > /sys/class/gpio/gpio300/direction
#GPI
$echo in > /sys/class/gpio/gpio300/direction
#GPO set low command:
$ echo 0 > /sys/class/gpio300/value
#GPO set high command:
$ echo 1 > /sys/class/gpio300/value
#GPI get value command:
$cat /sys/class/gpio/gpio300/value
```

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3.7.2 SPI I2C

SPI I2C Map

I2C	SPI
CN12 - pin 30/ 32:i2c-2	/dev/spidev0.0 / dev/spidev0.1
CN12 - pin 24/ 26:i2c-0	

3.8 Temperature Sensor (LM73)

You can use the following command to get the temperature of the DLAP-411-Orin:

```
$ cat /sys/class/hwmon/hwmon5/temp1_input
```

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Important Safety Instructions

For user safety, please read and follow all instructions, Warnings, Cautions, and Notes marked in this manual and on the associated device before handling/operating the device, to avoid injury or damage.

S'il vous plaît prêter attention stricte à tous les avertissements et mises en garde figurant sur l'appareil , pour éviter des blessures ou des dommages.

- Read these safety instructions carefully.
- Keep the User's Manual for future reference.
- Read the Specifications section of this manual for detailed information on the recommended operating environment.
- The device can be operated at an ambient temperature of 55ºC.
- When installing/mounting or uninstalling/removing device, or when removal of a chassis cover is required for user servicing:
  - Turn off power and unplug any power cords/cables.
  - Reinstall all chassis covers before restoring power.
- To avoid electrical shock and/or damage to device:
  - Keep device away from water or liquid sources.
  - Keep device away from high heat or humidity.
  - Keep device properly ventilated (do not block or cover ventilation openings).
  - Always use recommended voltage and power source settings.
  - Always install and operate device near an easily accessible electrical outlet.
  - Secure the power cord (do not place any object on/over the power cord).
  - Only install/attach and operate device on stable surfaces and/or recommended mountings.
- If the device will not be used for long periods of time, turn off and unplug it from its power source
- Never attempt to repair the device, which should only be serviced by qualified technical personnel using suitable tools

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- A Lithium-type battery may be provided for uninterrupted backup or emergency power.



Risk of explosion if battery is replaced with one of an incorrect type; please dispose of used batteries appropriately.
Risque d'explosion si la pile est remplacée par une autre de type incorrect. Veuillez jeter les piles usagées de façon appropriée.

- The device must be serviced by authorized technicians when:
  - The power cord or plug is damaged.
  - Liquid has entered the device interior.
  - The device has been exposed to high humidity and/or moisture.
  - The device is not functioning or does not function according to the User's Manual.
  - The device has been dropped and/or damaged and/or shows obvious signs of breakage.
- Disconnect the power supply cord before loosening the thumbscrews and always fasten the thumbscrews with a screwdriver before starting the system up.
- It is recommended that the device be installed only in a server room or computer room where access is:
  - Restricted to qualified service personnel or users familiar with restrictions applied to the location, reasons therefor, and any precautions required.
  - Only afforded by the use of a tool or lock and key, or other means of security, and controlled by the authority responsible for the location.

	**BURN HAZARD** Touching this surface could result in bodily injury. To reduce risk, allow the surface to cool before touching. ***RISQUE DE BRÛLURES*** *Ne touchez pas cette surface, cela pourrait entraîner des blessures.* *Pour éviter tout danger, laissez la surface refroidir avant de la toucher.*

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