Neousys Technology Inc.

FLYC-300 Series

Quick Installation Guide

Revision 1.0

Table of Contents

1   Introduction

2   Setting Up Your FLYC-300

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Contact Information

Headquarters **(Taipei, Taiwan)**	**Neousys Technology Inc.** 15F, No.868-3, Zhongzheng Rd., Zhonghe Dist., New Taipei City, 23586, Taiwan Tel: +886-2-2223-6182 Fax: +886-2-2223-6183 Email, Website
Americas **(Illinois, USA)**	**Neousys Technology America Inc.** 3384 Commercial Avenue, Northbrook, IL 60062, USA Tel: +1-847-656-3298 Email, Website
China	**Neousys Technology (China) Ltd.** Room 612, Building 32, Guiping Road 680, Shanghai Tel: +86-2161155366 Email, Website

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Safety Precautions

Read these instructions carefully before you install, operate, or transport the system.

- Install the system or DIN rail associated with, at a sturdy location
- Install the power socket outlet near the system where it is easily accessible
- Secure each system module(s) using its retaining screws
- Place power cords and other connection cables away from foot traffic.
- Do not place items over power cords and make sure they do not rest against data cables
- Shutdown, disconnect all cables from the system and ground yourself before touching internal modules
- Ensure that the correct power range is being used before powering the device
- Should a module fail, arrange for a replacement as soon as possible to minimize down-time
- If the system is not going to be used for a long time, disconnect it from mains (power socket) to avoid transient over-voltage

Service and Maintenance

- ONLY qualified personnel should service the system
- Shutdown the system, disconnect the power cord and all other connections before servicing the system
- When replacing/ installing additional components (expansion card, memory module, etc.), insert them as gently as possible while assuring proper connector engagement

ESD Precautions

- Handle add-on module, motherboard by their retention screws or the module's frame/ heat sink.
- Avoid touching the PCB circuit board or add-on module connector pins
- Use a grounded wrist strap and an anti-static work pad to discharge static electricity when installing or maintaining the system
- Avoid dust, debris, carpets, plastic, vinyl and styrofoam in your work area.
- Do not remove any module or component from its anti-static bag before installation

About This Quick Installation Guide

This quick installation guide introduces the basic input/ output connections of Neousys Technology's FLYC-300 series, an ultra-light and compact drone computer.

Revision History

Version	Date	Description
1.0	Apr. 2024	Initial release

1   Introduction

Neousys FLYC-300 is an NVIDIA Jetson Orin NX based mission computer tailor-made for drone and UAV applications. Designed to coincide and collaborate with the flight controller that is responsible for stabilizing and controlling drone's flight, FLYC-300 fuels compelling 100 TOPS AI performance combining versatile sensors to empower true autonomy of drone and advance applications such as autonomous navigation, obstacle avoidance, object detection and tracking.

With enclosure	**Without enclosure**

Catering to the diverse needs of cameras and sensors like RGB, hyperspectral, infrared, LiDAR, and 3D cameras, FLYC-300 boasts a versatile array of connectivity options, including two Ethernet, two USB3.2, and two GMSL2 ports. Making it ideal for real-time video analytics applications such as drone imagery collection, surveillance, infrastructure monitoring. To command the flight of drone, FLYC-300 can communicate seamlessly with the flight controller through configurable UART, Ethernet, and CAN ports. It also accommodates a wide voltage input range from 4S to 14S battery packs via the XT30 DC-IN connector. The system is compatible and supports installation of 5G/ 4G modules for real-time transmission of images, videos, and data.

FLYC-300 can elevate unmanned systems to another level by combining vision devices with a powerful NVIDIA Jetson-based AI platform. Intelligent autonomous UAV systems can deliver enhanced operational effectiveness, risk reduction, and real-time information, making them a valuable repertoire. With its 297 grams ultra-lightweight design, versatile connectivity, FLYC-300 is ready for integration and deployment into real-world applications.

1.1 FLYC-300 Specification

| System Core	
Processor	NVIDIA® Jetson Orin™ NX system-on-module (SOM), comprising NVIDIA® Ampere GPU and ARM Cortex CPU
Memory	8GB/ 16GB LPDDR5 @ 3200 MHz on SOM
External I/O Interface	
GMSL2	2x GMSL2 FAKRA Z connector, supporting 2x 1920x1080 @ 60 FPS or 1x 2880x1860 @ 30 FPS camera input
Ethernet	1x Gb Ethernet port by NVIDIA 1x 2.5Gb Ethernet port by Intel® I225-IT
USB	1x Type A USB 3.2 Gen2 (10 Gbps) ports 1x Type A USB 3.2 Gen1 (5 Gbps) ports 1x Type C port reserved for original manufacturing purposes
SD Card	1x microSD card slot
Video Port	1x DisplayPort
Internal I/O Interface	
USB	1x USB 2.0
CAN Bus	1x CAN bus 2.0
I2C	I2C
GPIO	Isolated 2x DI, 4x DO
UART	1x UART
Storage Interface	
M.2	1x M.2 2230 M key socket NVMe interface (Gen4 x4)
Expansion Bus	
M.2	1x M.2 3042/3052 B key with internal micro SIM socket
Power Supply	
DC Input	XT-30 for 12V to 60V DC input, supports 4S-14S battery packs
Mechanical	
Dimension	124mm x 123mm x 30.5mm (Including enclosure)
Weight	297g (Excluding enclosure) 345g (Including enclosure)
Mounting	Wall mount
Fan	Optional external-accessible 65mm x 65mm fan for system heat dissipation
Environmental	
Operating Temperature	<table><tr><td>Temperature*</td><td>Heat Spreader Attachment</td><td>Compatible Battery Pack</td></tr><tr><td>-25°C to 40°C</td><td>Not required</td><td>4S-14S</td></tr><tr><td>-25°C to 60°C</td><td>Required**</td><td>4S-14S</td></tr><tr><td>-25°C to 70°C</td><td>Required**</td><td>4S-6S</td></tr></table> * For sub-zero operating temperature, a wide temperature SSD is required. ** Conduction must be utilized by securing the FLYC's heat spreader to a metallic

	surface.
Storage Temperature	-40°C to 85°C
Humidity	10%~90%, non-condensing
Vibration	Operating, MIL-STD-810H, Method 514.6, Category 4
Shock	Operating, MIL-STD-810H, Method 516.6, Procedure I, Table 516.6-II
EMC	CE/FCC Class A, according to EN 55032 & EN 55035

* For sub-zero operating temperature, a wide temperature NVMe is required.

1.2 Dimensions of FLYC-300 Series
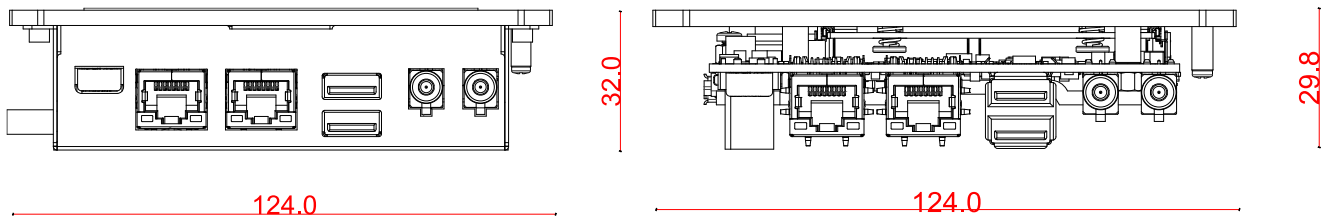
NOTE

All measurements are in millimeters (mm).

1.2.1 Bottom View

123.0

124.0

With enclosure

123.0

124.0
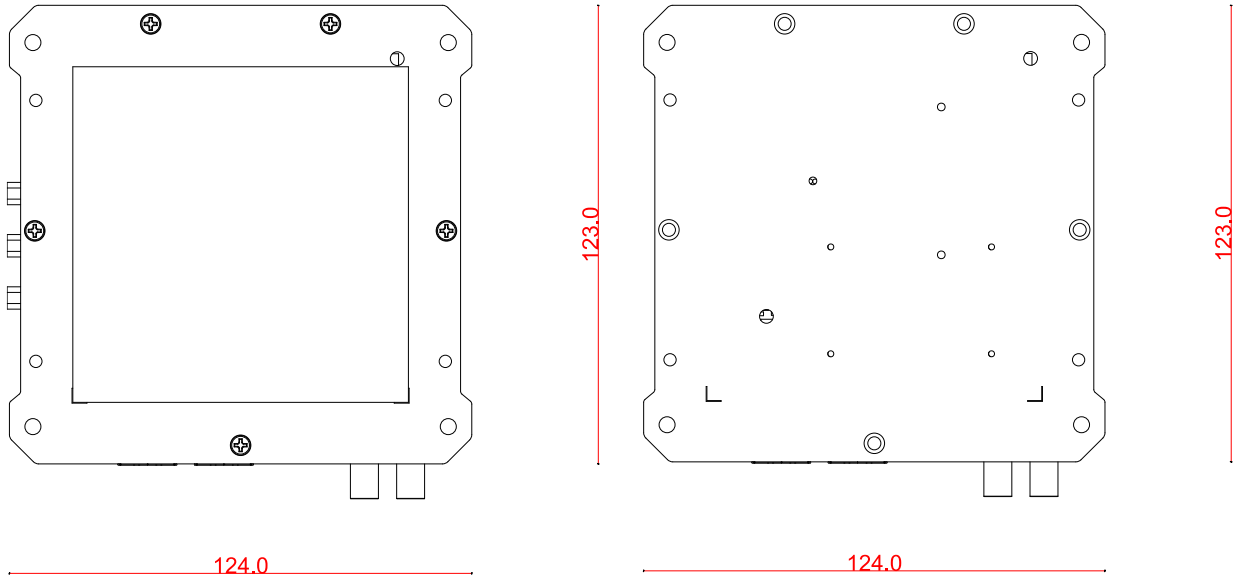
Without enclosure

1.2.2 I/O Panel View

NOTE

All measurements are in millimeters (mm).

The 32.0mm height (with enclosure) does not include the thickness of the thermal pad.

32.0

124.0

With enclosure

29.8

124.0

Without enclosure

2   Setting Up Your FLYC-300

2.1   Unpacking Your FLYC-300 system

Upon receiving the FLYC-300 system, please check immediately if the package contains all the items listed in the following table. If any item is missing or damaged, please contact your local dealer or Neousys Technology.

Item	Description	Qty
1	FLYC-300 system	1
2	Screw pack	1

2.2 I/O Panel
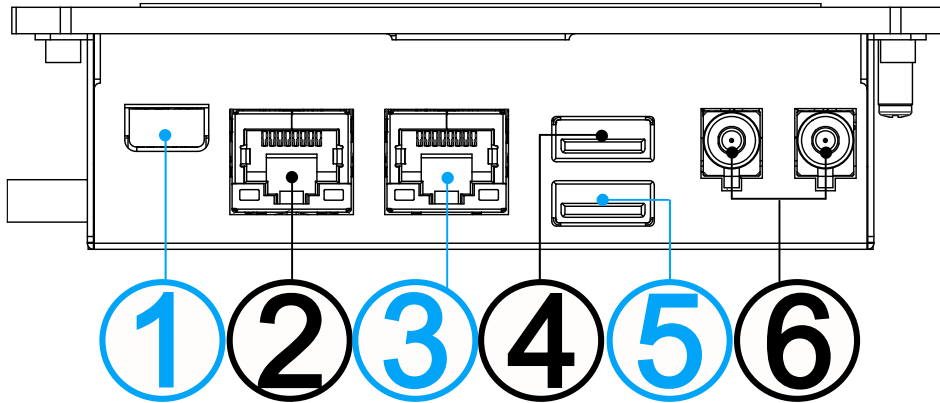
No.	Item	Description
1.	XT-30 DC input	A compact and high-power efficient transfer connection often applicable in drone electronics.
2.	Gigabit Ethernet	The Gigabit Ethernet port is provided by the NVIDIA SoM.
3.	2.5Gb Ethernet	The 2.5Gb Ethernet port by is provided by Intel® I225-IT.
4.	USB 3.2 Gen 1 ports	USB 3.2 Gen 1 offers up to 5Gbps of data-throughput performance. They are backward compatible with USB2.0.
5.	USB 3.2 Gen 2 ports	USB 3.2 Gen 2 port (SuperSpeed+) offers up to 10Gbps, twice the bandwidth over existing SuperSpeed USB3.1 Gen. 1 connection. They are backward compatible with USB3.2 Gen1 and USB2.0.
6.	FAKRA Z connectors	There are two FAKRA Z connectors to connect to GMSL2 cameras.

2.2.1 XC-30 DC Input
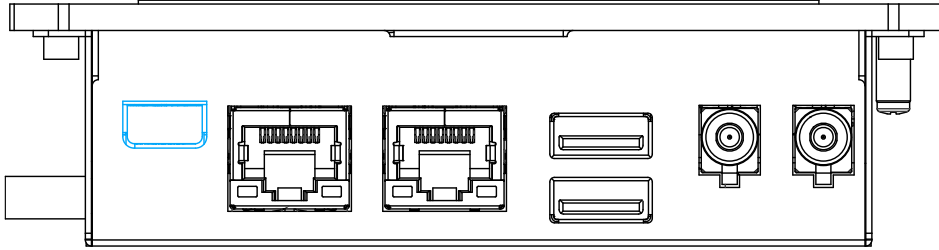
The XT-30 DC input connector supports 12V to 60V and is compatible with a 4S – 14S battery pack. The XT-30 is a popular and common choice in the realm of drone electronics and remote-controlled vehicles for its compact size and efficient power transfer capabilities. Designed for high-current applications, it features a plug and socket configuration, with the male plug featuring protruding pins that fit snugly into the female socket. This design ensures a secure connection while minimizing the risk of accidental disconnection during operation.

The XT-30 connector is capable of handling significant power loads, making it ideal for use in drones, RC cars, boats, and other electronic devices requiring reliable power delivery. Additionally, the XT-30 connector is designed with user convenience in mind, featuring easy-to-use connectors that can be quickly plugged and unplugged without the need for specialized tools. This makes it particularly popular among hobbyists who often need to swap out batteries or components during their projects.

2.2.2　Gigabit Ethernet Port
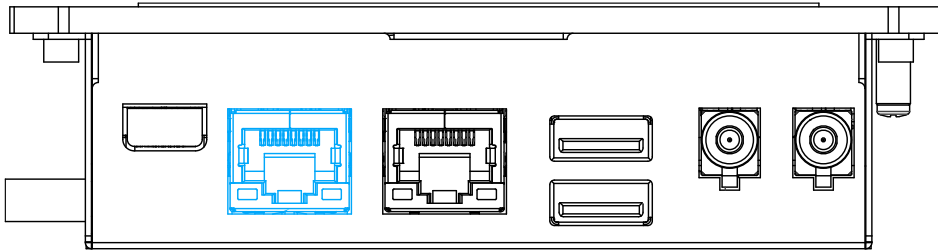
The system offers a Gigabit Ethernet port on its I/O panel. When an Ethernet connection is established, the LED indicators on the RJ45 connector represents the following connection statuses:

Active/Link LED (Right)

LED Color	Status	Description
Off or Yellow	Off	Ethernet port is disconnected
	On	Ethernet port is connected and no data transmission
	Flashing	Ethernet port is connected and data is transmitting/receiving

Speed LED (Left)

LED Color	Status	Description
Off, Yellow, Green or Orange	Off	10 Mbps
	Green	100 Mbps
	Orange	1000 Mbps

2.2.3   2.5Gb Ethernet
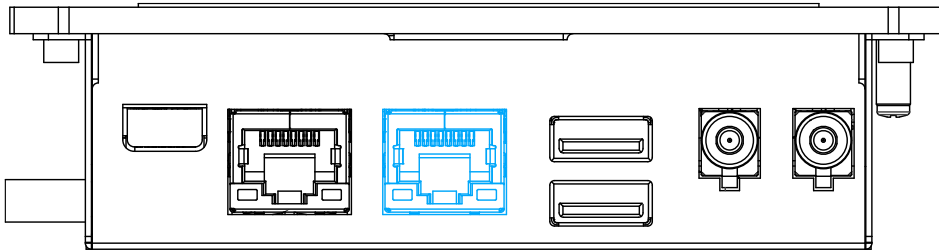
The system offers two 2.5Gb Ethernet ports using Intel® I225-IT controller. When plugged in and connected via the Ethernet cable, the LEDs on the RJ45 connector indicate connection status and speed.

Active/Link LED (Right)

LED Color	Status	Description
Off or Yellow	Off	Ethernet port is disconnected
	On	Ethernet port is connected and no data transmission
	Flashing	Ethernet port is connected and data is transmitting/receiving

Speed LED (Left)

LED Color	Status	Description
Off, Green or Orange	Off	10 Mbps
	Green	100 Mbps
	Orange	1000/ 2500 Mbps

2.2.4 USB 3.2 Gen 1 Port
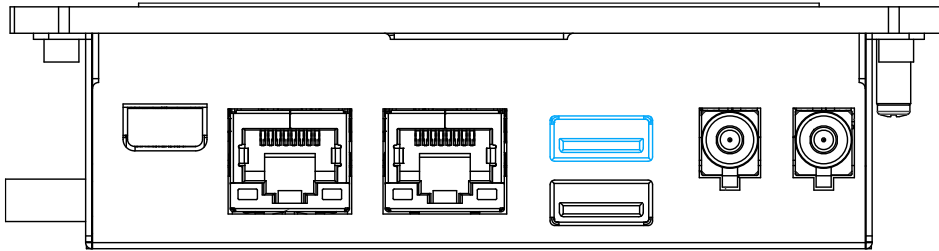
The system's USB 3.2 Gen1x1 port (5Gbps) is backward compatible with USB 2.0, USB 1.1 and USB 1.0 devices.

2.2.5 USB 3.2 Gen 2 Port
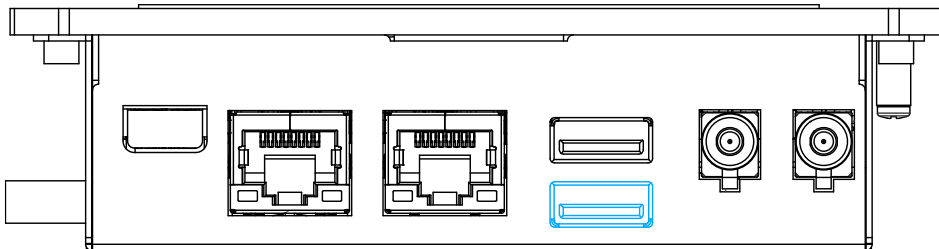
The system's USB 3.2 Gen2x1 port (10Gbps) is backward compatible with USB3.2 Gen1, USB 2.0, USB 1.1 and USB 1.0 devices.

2.2.6 **FAKRA Z Connector**
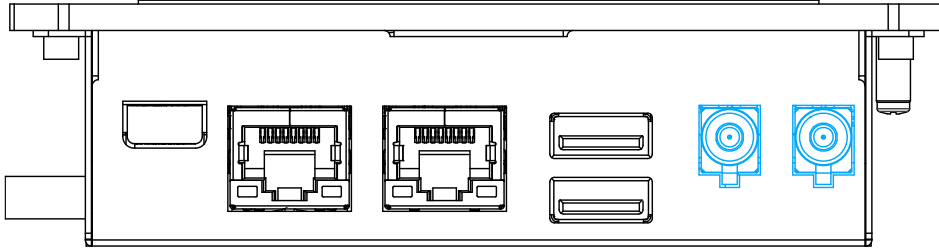
Fachkreis Automobil (FAKRA) connector is a German standard for SubMiniature version B based automotive-grade connectors. There are two FAKRA Z connectors on the front side of FLYC-300 to connect to automotive GMSL2 cameras.

Due to their advanced features such as IP67 waterproof, high dynamic range (120dB HDR), auto white balance (AWB), and LED flicker mitigation (LFM), automotive GMSL2 cameras are ideal for autonomous vehicle applications. due to their advanced features, such as IP67 waterproof, high dynamic range (120dB HDR), auto white balance (AWB), and LED flicker mitigation (LFM).

Another FAKRA Z connectivity is for the 3D camera. The benefit of using a drone with a 3D camera is its ability to capture depth perception, enabling accurate 3D mapping and modeling. It is ideal for applications such as surveying, inspection, and navigation in complex environments.

2.2.7 DisplayPort
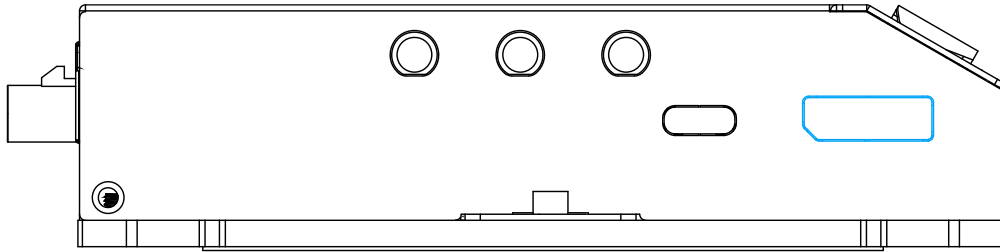
The system has a DisplayPort (DP) output which is a digital display interface that mainly connect video source and carry audio to a display device. It can deliver up to 3840 x 2160 in resolution and is designed to support **active** DP adapter/ cable. You can connect to display devices using DP-to-HDMI cable or DP-to-DVI cable.

DP-to-HDMI   **DP-to-DVI**
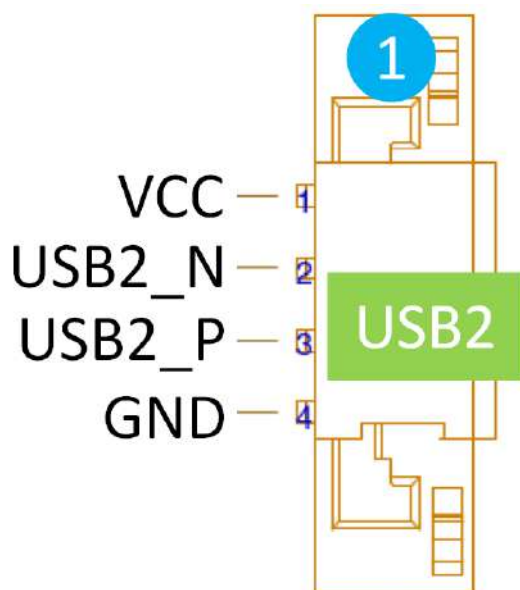
2.2.8 microSD Card Slot
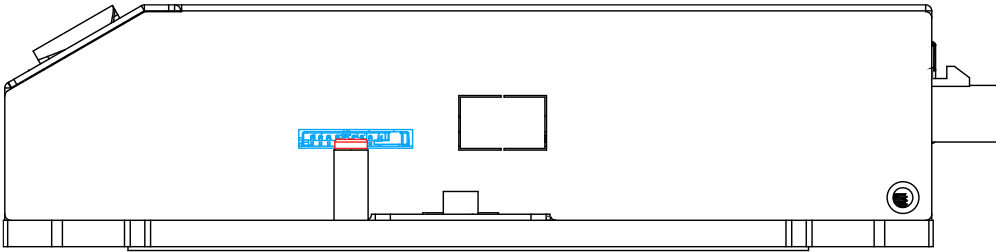
The microSD card slot (indicated in **blue**) is located on the side. To insert or remove the microSD card, you will have to remove the screw (indicated in **red**) to gain access.

2.3   Onboard I/O
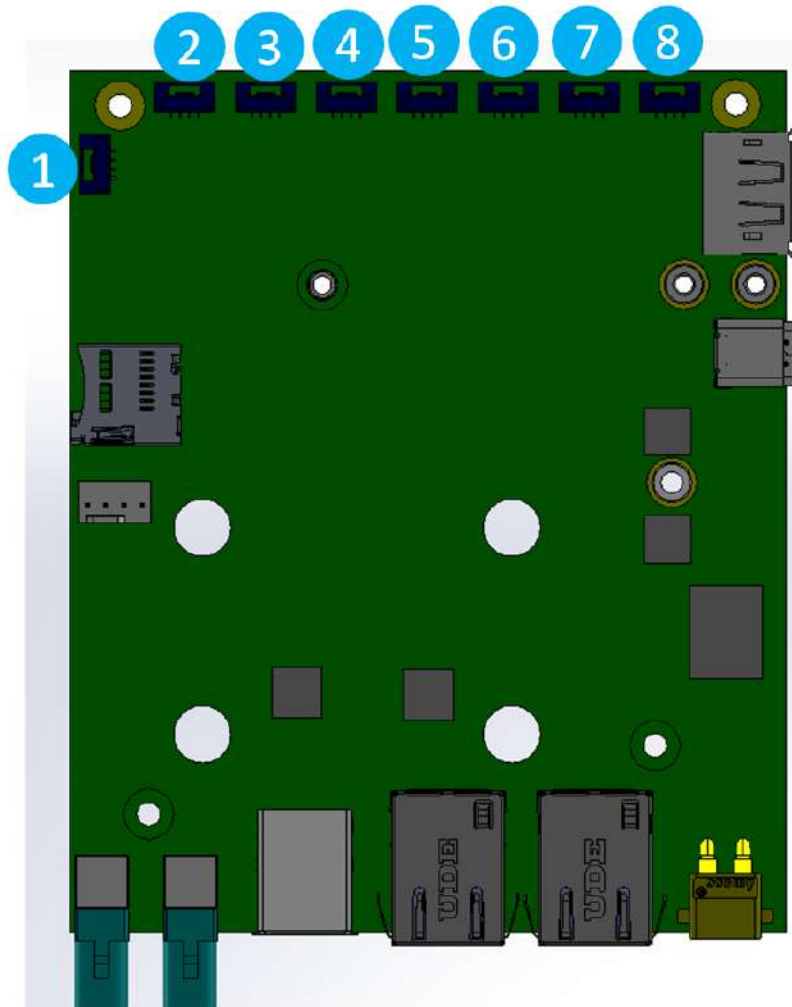
No.	Connection type
1.	1x USB2.0
2	I2C
3	1x CAN bus 2.0
4	1x UART
5	2x DI
6	2x DO
7	2x DO
8	Power Switch + Power LED

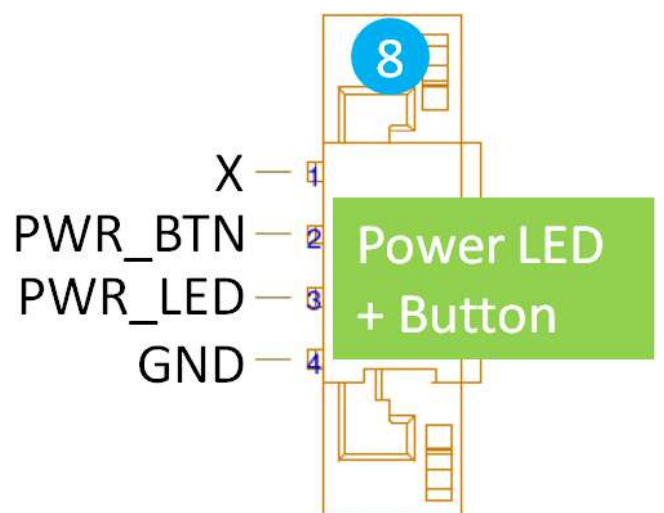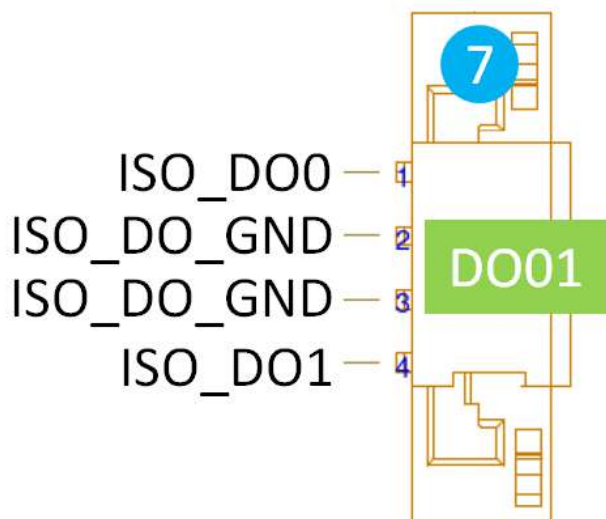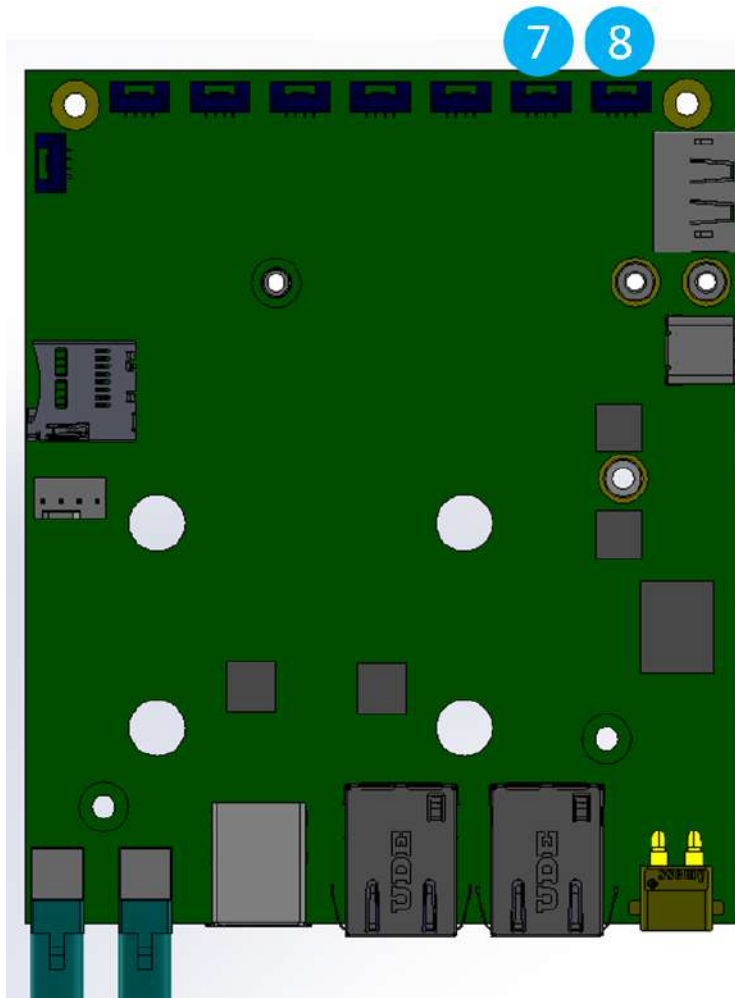## 2.3.1 Onboard I/O Connectors 1 & 2 Pin Definition
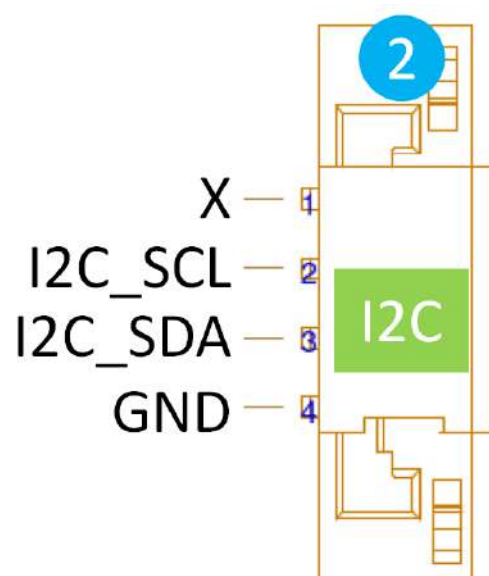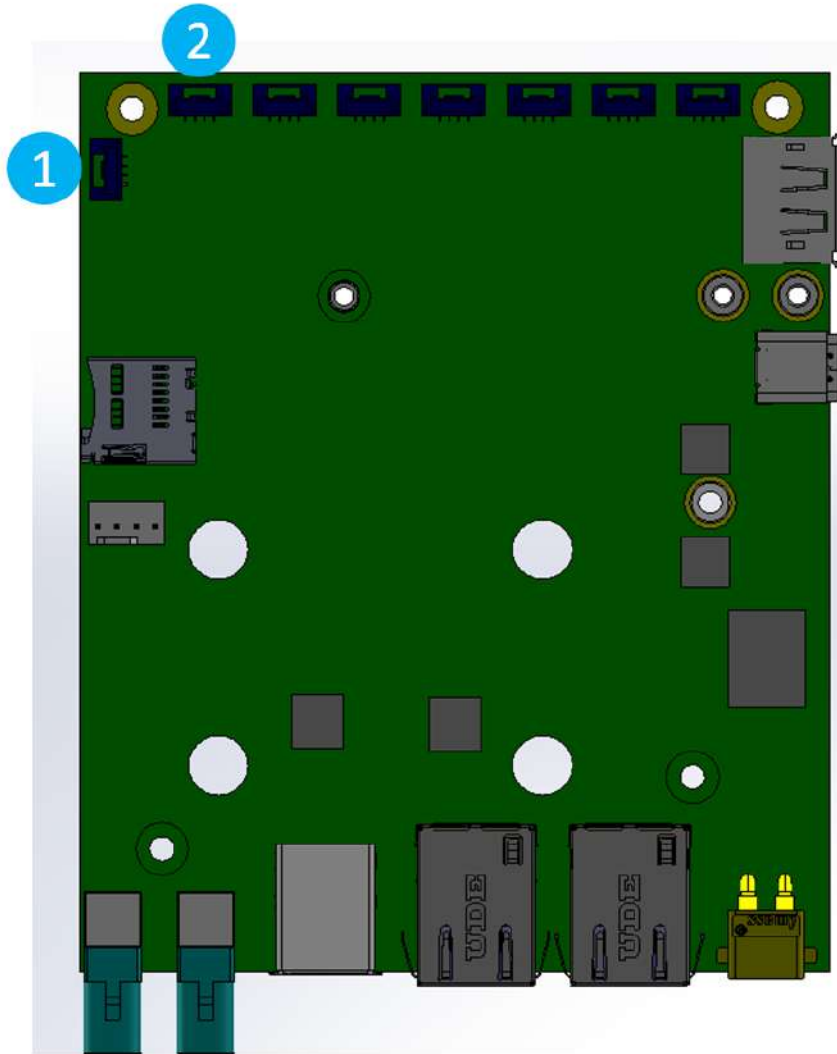
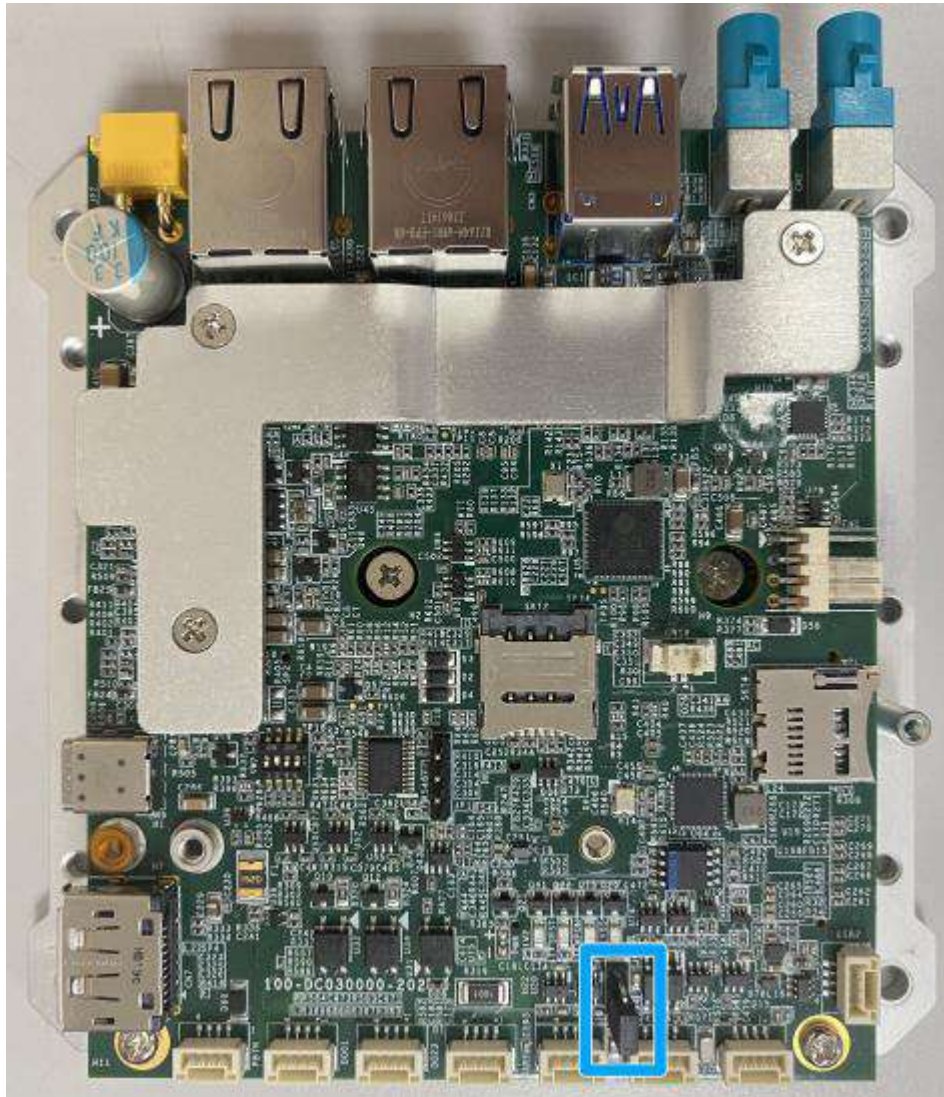## 2.3.2 Onboard I/O Connectors 3 & 4 Pin Definition
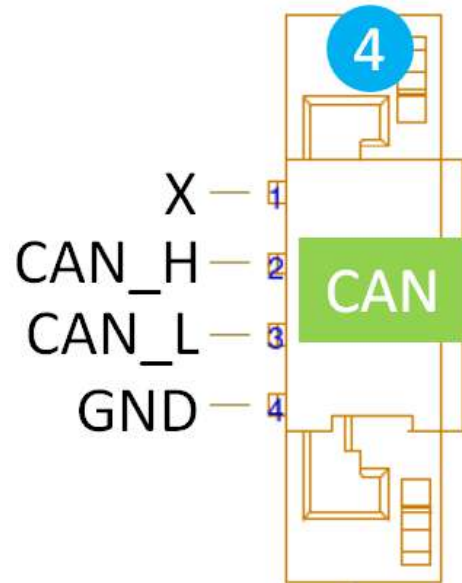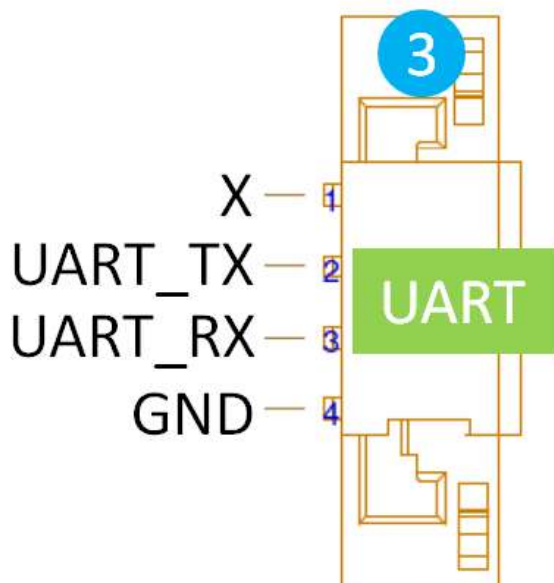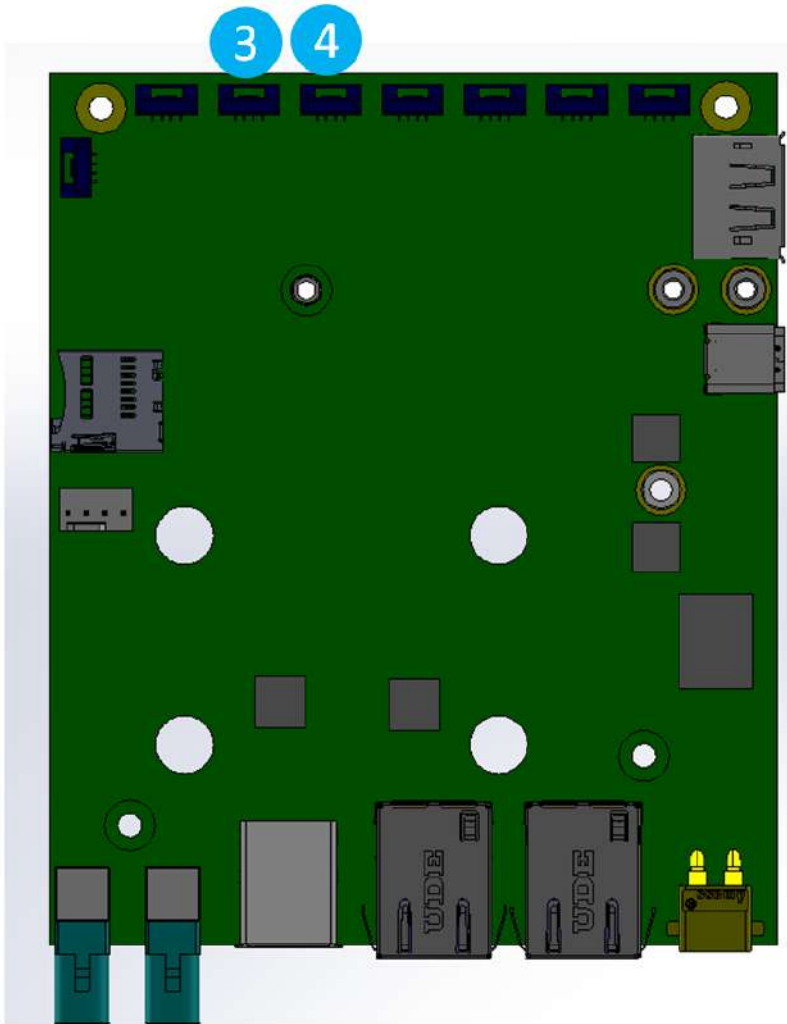
2.3.3 Onboard I/O Connectors 5 & 6 Pin Definition
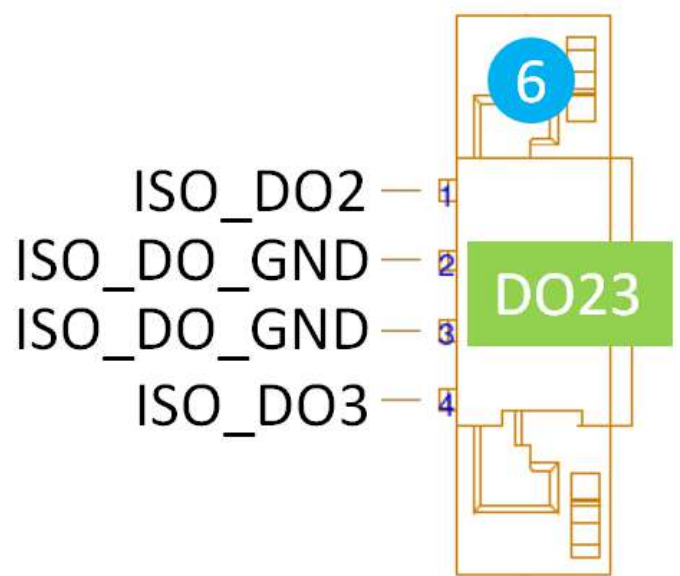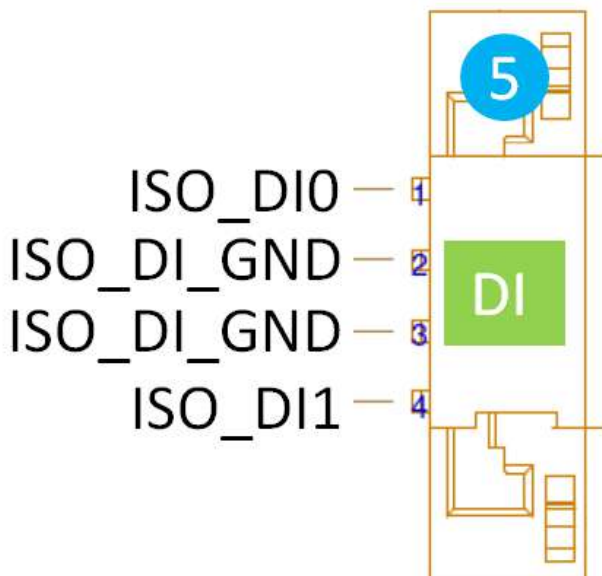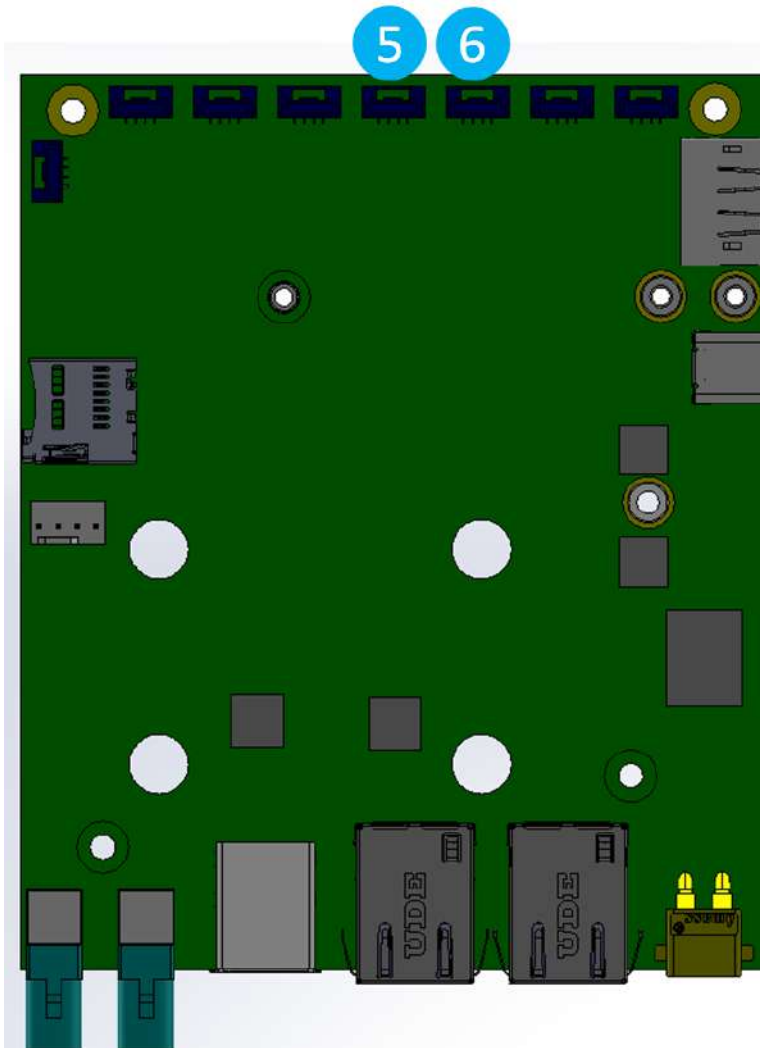
2.3.4 Onboard I/O Connectors 7 & 8 Pin Definition

2.4 CAN Termination

CAN Termination ON　　　　**CAN Termination OFF (Default)**

2.5 DIP Switch

Switch / Mode	1	2	3	4
Auto power on (default)	OFF	OFF	OFF	OFF
Power button	ON	OFF	OFF	OFF
Auto power on + recovery mode (for reflashing Orin NX)	OFF	ON	OFF	OFF
Power button + recovery mode (for reflashing Orin NX)	ON	ON	OFF	OFF