ORUS-L

Specifications are subject to change. Product is currently in release phase.

Orus L – AI-Powered, Industrial Gimbal Payload for Long-Endurance UAV & Robotics Missions

Orus L is a next-generation 3-axis gimbal payload developed by **Gremsy**, designed for **industrial-grade performance**, **multi-sensor intelligence**, and **long-endurance deployment**. With an integrated **Jetson Orin onboard computer**, Orus L brings powerful AI capabilities directly to the edge, enabling autonomous decision-making and real-time analytics in the most demanding UAV and robotic missions.

Rugged Design, Endurance-Ready

- **Aerodynamic spherical form factor** engineered for **flight stability up to 100 km/h**, ideal for **fixed-wing and VTOL UAVs**.
- **Optimize lightweight, compact** construction ensures compatibility with endurance-focused platforms.

- **IP55-rated housing** protects against dust and rain—ready for harsh field conditions.

Jetson Orin Onboard for Edge AI Processing

- Built-in **NVIDIA Jetson Orin module**, delivering **AI compute performance up to 100 TOPS**
- Enables **real-time target detection**, tracking, sensor fusion, and deep learning inference on the fly
- Offloads heavy processing from the ground station or flight controller—ideal for **autonomous operations**
- Open for third-party software involvement.

High-Precision Multi-Sensor Payload

- **EO Camera**:
  - 30x **optical zoom**, 4K resolution
  - Night vision support for low-light operations
- **IR Thermal Camera**:
  - **Radiometric 640×512** resolution with Blue UAS version powered by Flir Thermal Sensor
  - Accurate thermal inspection for infrastructure, energy, and emergency response
- **LRF – Laser Range Finder**:
  - Long-range measurement up to **2400m**
  - Enables precise ranging, target cordinate terrain profiling, and geo-referenced targeting
- **Sensor Fusion**:
  - Real-time overlay of EO/IR/LRF data
  - Enables advanced perception, situational awareness, and tracking accuracy

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Integrated AI & Tracking Capabilities

- Developed by Gremsy, onboard algorithms include:
  - **Automatic object tracking and detection**
  - **Target lock & follow**
  - **Scene understanding & adaptive behavior**
- Works fully onboard without constant connection to GCS

Flexible Integration & Developer Support

- **Ethernet (UDP)** for real-time control
- **Ethernet RTSP** for live video streaming (EO + IR)
- **UART/MAVLink** for autopilot integration (PX4/ArduPilot)
- **Gremsy Payload SDK v3** for custom control, automation, and sensor coordination
- **Gremsy Payload Plus** for field setup and mobile operations

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Industrial & Tactical Applications

- Powerline, wind turbine, and pipeline inspection
- Public safety & ISR mission.
- Oil & gas and refinery monitoring
- Border patrol, search and rescue, and thermal surveillance
- UGVs and mobile robotics in infrastructure diagnostics

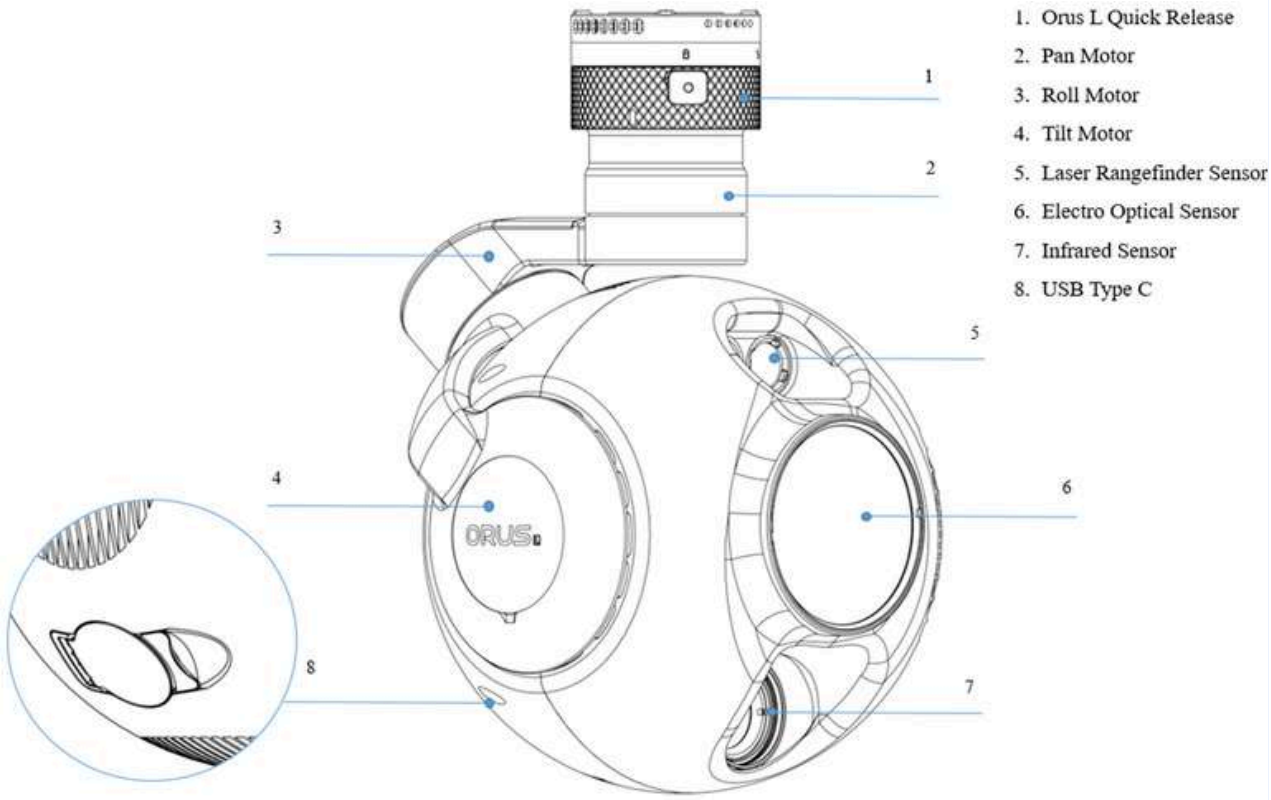
GENERAL

Specifications are subject to change. Product is currently in release phase.

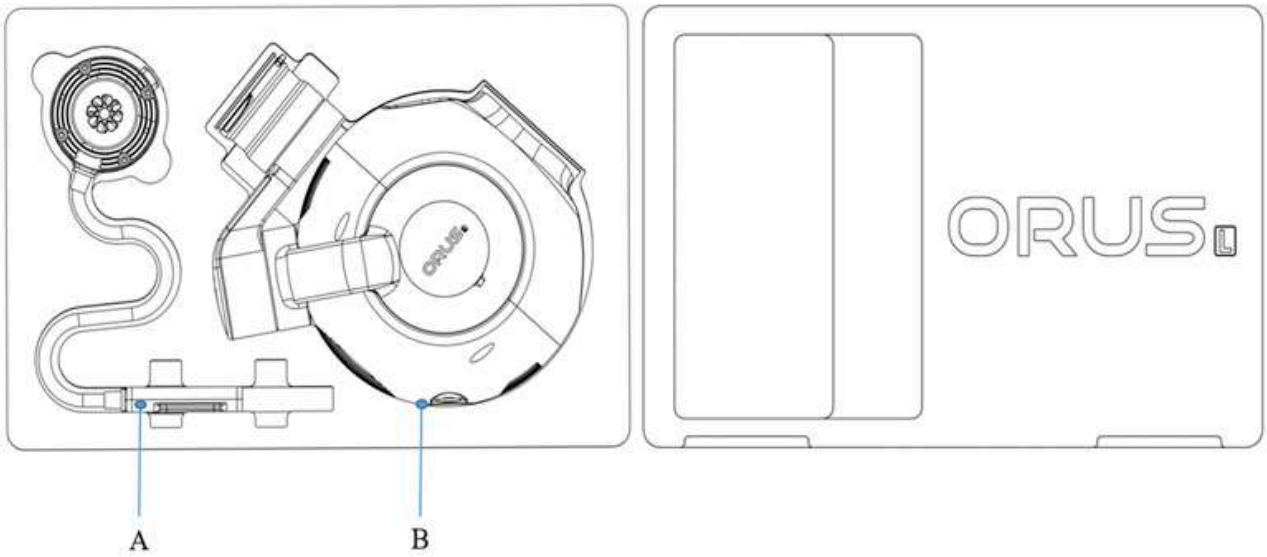
Overview

What is Orus-L?

Orus-L is a specialized payload developed by **Gremsy**, designed with a **spherical aerodynamic shape** and rated **IP55** for water and dust resistance. Built to endure harsh environments, including dust, humidity, and light rain, Orus-L remains stable even at speeds up to **100 km/h**. It's an ideal choice for **high-speed UAVs** and **demanding missions**.



What's in the box?



No.	Items	Quantity
	M-Port ip	1
	Orus-L	1
	Ethernet RJ45	1
	Ethernet Herelink	1
	MavLink Uart	1
	RC_SBUS Cable	1
	USB-C	1
	Power Supply Cable V2.0	1
	Allen Key 2.0 (mm)	1
	M3 × 8 - DIN 7991	4

ACCESSORIES

This accessory is not included in the box. If needed, please purchase it separately to ensure optimal use and a better overall experience.

SPECIFICATION

General Information

Items	ORUS-L	ORUS-L NDAA
Payload Weight (QR + Damping)	~1504g ± 15g	~1493g ± 15g
Payload Weight (QR only)	~1388g ± 10g	~1377g ± 10g
Dimensions (DxWxH)	165 × 140 × 248 mm	165 × 140 × 248 mm
Quick Release System	M-Port IP Version	M-Port IP Version
Damping Module	Orus L Damping	Orus L Damping
Protection Rating	IP55	IP55
Max Flight Speed	100 km/h	100 km/h
Input Voltage	19VDC ~ 52VDC	19VDC ~ 52VDC
Power Consumption	Avg: 30W, Max: 100W	Avg: 30W, Max: 100W
Operating Current	Static: 1A, Max: 3.3A @30V	Static: 1A, Max: 3.3A @30V
Operating Temperature	-20°C to 50°C	-20°C to 50°C
Storage Temperature	-20°C to 60°C	-20°C to 60°C

Video Stream	• HDMI 1080p60 Latency ~300ms
	• Ethernet:
	  ◦ 480p60
	  ◦ 720p60
	  ◦ 1080p60
		• HDMI 1080p60 Latency ~300ms
		• Ethernet:
		  ◦ 480p60
		  ◦ 720p60
		  ◦ 1080p60

	Video bit rate is adjustable Latency ~500ms* *Testing with Herelink v1.1	Video bit rate is adjustable Latency ~500ms* *Testing with Herelink v1.1
Payload Control Method	• UART | Mavlink • Ethernet UDP • SBUS	• UART | Mavlink • Ethernet UDP • SBUS
API/SDK	Gremsy Payload SDK	Gremsy Payload SDK

Platform Compatibility

- **Supported Autopilots**: Pixhawk, CubePilot, Skynode
- **Firmware Compatibility**: ArduPilot, PX4
- **Controller Compatibility**: Ground Station & Remote with:
  - QGroundControl
  - Gremsy Payload Assistant (Windows, Android)
- **SDK Support**: Gremsy Payload SDK (C++, MAVLink v2)

EO Camera Specifications

Feature	Specification
Sensor	1/1.8-type Starvis2 (IMX-678)
Effective Pixels	Approx. 8.51M Pixel
Lens	f = 6.5 mm (wide) to 162.5 mm (tele), F1.6 ~ 4.8
HFOV	59° to 2.8°

Optical Zoom	25x
Digital Zoom	12x
Stable Zoom	30x Enhanced Optical Zoom -Stable Zoom*2*3 *2Increases magnification by combining optical zoom and digital zoom. *3 For 1080p only
Resolution	4K@60fps / 1080@60fps / 720@60fps
Shutter Speed	1/1 to 1/10000s
Exposure Modes	-10.5 dB,to +10.5 dB, 15 steps
Electronic Image Stabilization (EIS)	Yes *3 • Super • Super+ *3 For 1080p, 1080i, and 720p only.
Defog Mode	Low / Mid / High
White Balance	Auto / Indoor / Outdoor
Noise Reduction	2D & 3D
IR Cut Filter	Auto / Manual
Wide Dynamic Range	Yes
Visibility Enhancer	Yes
Night Vision	Yes • **Minimum Illumination (50%, High Sensitivity Mode ON)**ICR-Off mode: 0.028 lx (Shutter Speed: 1/30 sec), 0.0039 lx (1/4 sec or 1/3 sec) ICR-On mode: 0.00016 lx (Shutter Speed: 1/30 sec), 0.0000098 lx (1/4 sec or 1/3 sec, 30%)

	• **Minimum Illumination (50%, High Sensitivity Mode OFF)**ICR-Off mode: 0.17 lx (Shutter Speed: 1/30 sec), 0.024 lx (1/4 sec or 1/3 sec) ICR-On mode: 0.0013 lx (Shutter Speed: 1/30 sec) • **Recommended Illumination**100 lx ∽ 100,000 lx
Flicker Reduction	Yes

IR Camera Specifications

Feature	ORUS-L	ORUS-L NDAA
Sensor Type	Uncooled VOx Microbolometer	Uncooled VOx Microbolometer
Sensor Model	COIN612	FLIR Boson 640R
Array Format	640 × 512	640 × 512
Frame Rate	30Hz	60Hz
Pixel Size	12 µm	12 µm
Thermal Range	-20°C to 550°C	Up to 500°C
Lens	Fixed, Athermal, 19 mm	Fixed, 14 mm, 32° HFOV
Digital Zoom	1x to 8x	1x to 8x
Photo Resolution	640 × 512	640 × 512
Video Output	640 × 512 @ 30Hz	640 × 512 @ 60Hz
Formats	JPEG / MP4	JPEG / TIFF / CSV / MP4 / SEQ (dev)
Thermal Sensitivity (NETD)	≤50 mK	≤50 mK
Radiometry	Yes, overlay on runtime video	Yes, overlay on runtime video

Laser Rangefinder

Feature	Specification
Max Range	• Min: 5m • Max: 1200m (10Hz) | 2400m (1Hz) • Availability: 700m (10Hz) | 1500m (1Hz)
Performance Continuous measure mode (Default)	10Hz, • 1200m* *Target size 2.3 × 2,3 m, visibility 25 km, target reflectivity 30 %, detection probability 90%
Accuracy	• 0.5m • Depending on distance and object reflectivity
Safety Classification	Class 1M (IEC 60825-1:2014)

Gimbal Specifications

Feature	Specification
Mount Type	Bottom Mount
Angular Vibration	±0.01°
Modes	Off, Lock, Follow
Controllable Range	Tilt: +40° to -120° / Pan: ±320° / Roll: ±40°
Mechanical Range	Tilt: +45° to -140° / Pan: ±326° / Roll: ±50°
Max Speed	100°/s (All Axes)

Additional Features

- **AI Object Detection**: Human, Vehicle (expandable)
- **Object Tracking**: Basic & Smart Tracking (with auto zoom)
- **Camera Sync**: EO/IR Side-by-Side Synchronization
- **Geotagging**: Based on MAVLink (autopilot or external GPS input)
- **Pinpoint Targeting**: Target coordinates overlay + SDK export
- **Video Output**: HDMI (recommend cable <50cm), RTSP
- **Ethernet File Server**: Accessible via HTTP server
- **Web Configuration Interface**: Yes

LED STATUS INDICATOR

Quick Release LED Status Indicators

No.	LED Status	Description
1	Blink	Low Power
2	Solid	System Error (Motor or IMU)
3	Blink	Calibrating
4	Solid	Initialize
5	Blink	System Ready
6	Blink	Lock Mode without Control
7	Solid	Follow Mode without Control
8	Blink	Lock Mode with Gimbal Controllable
9	Solid	Gimbal Control with Gimbal Controllable

10	Blink & Blink	Auto-tuning in process
11	Blink (Pink or Purple)	Lock Mode with Payload Controllable
12	Solid (Pink or Purple)	Follow Mode with Payload Controllable

Camera LED Status Indicators

No.	LED Status	Description
1		Payload Error
2		Payload Power on
3		Payload is ready to work
4		Recording video

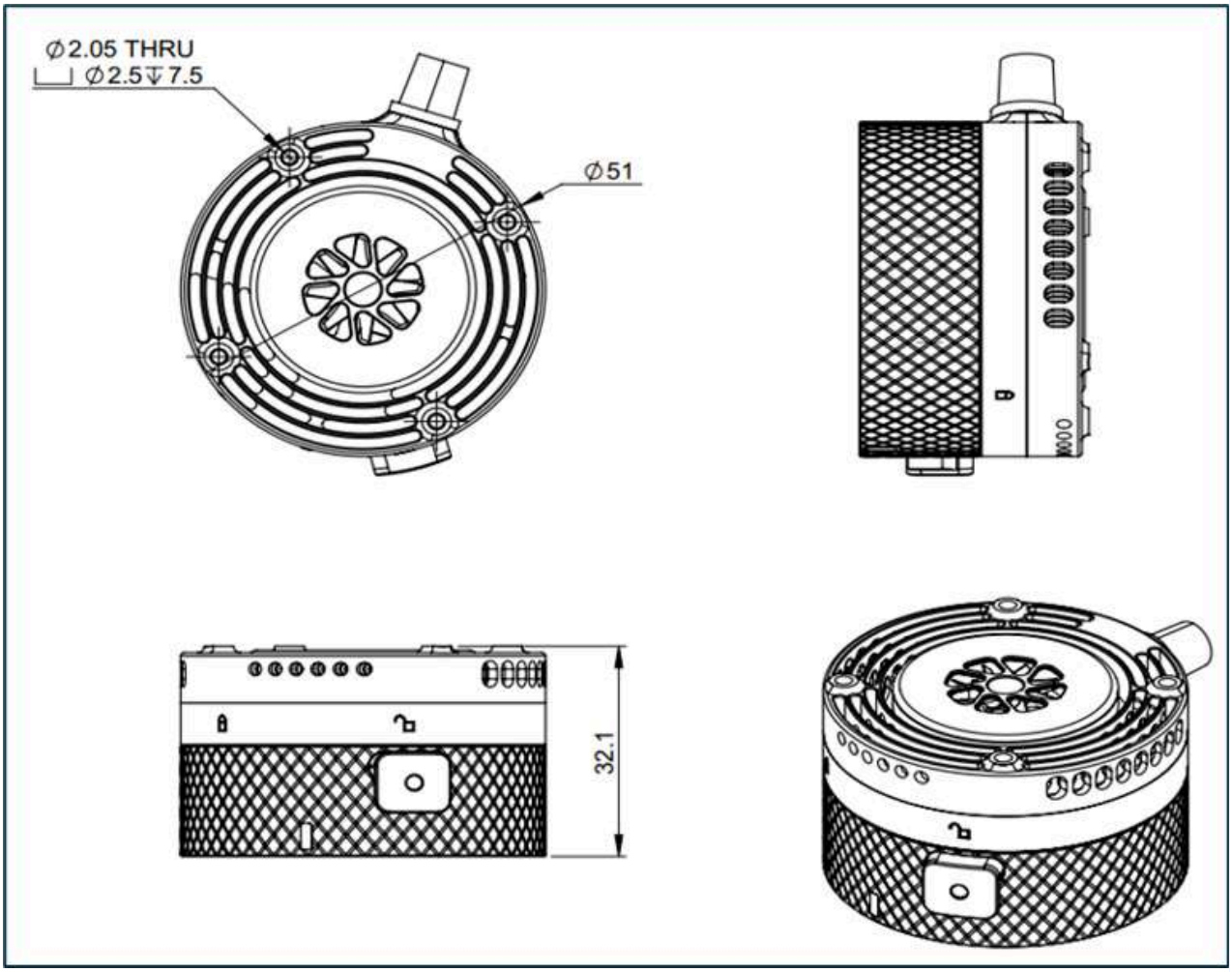
Contact to support@gremsy.com to get more information

HARDWARE CONFIGURATION

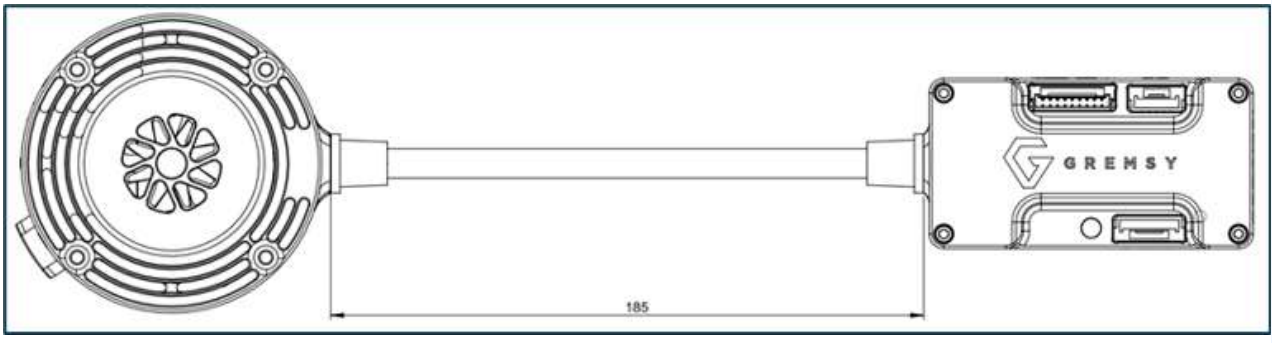
Specifications are subject to change. Product is currently in release phase.

MOUNTING

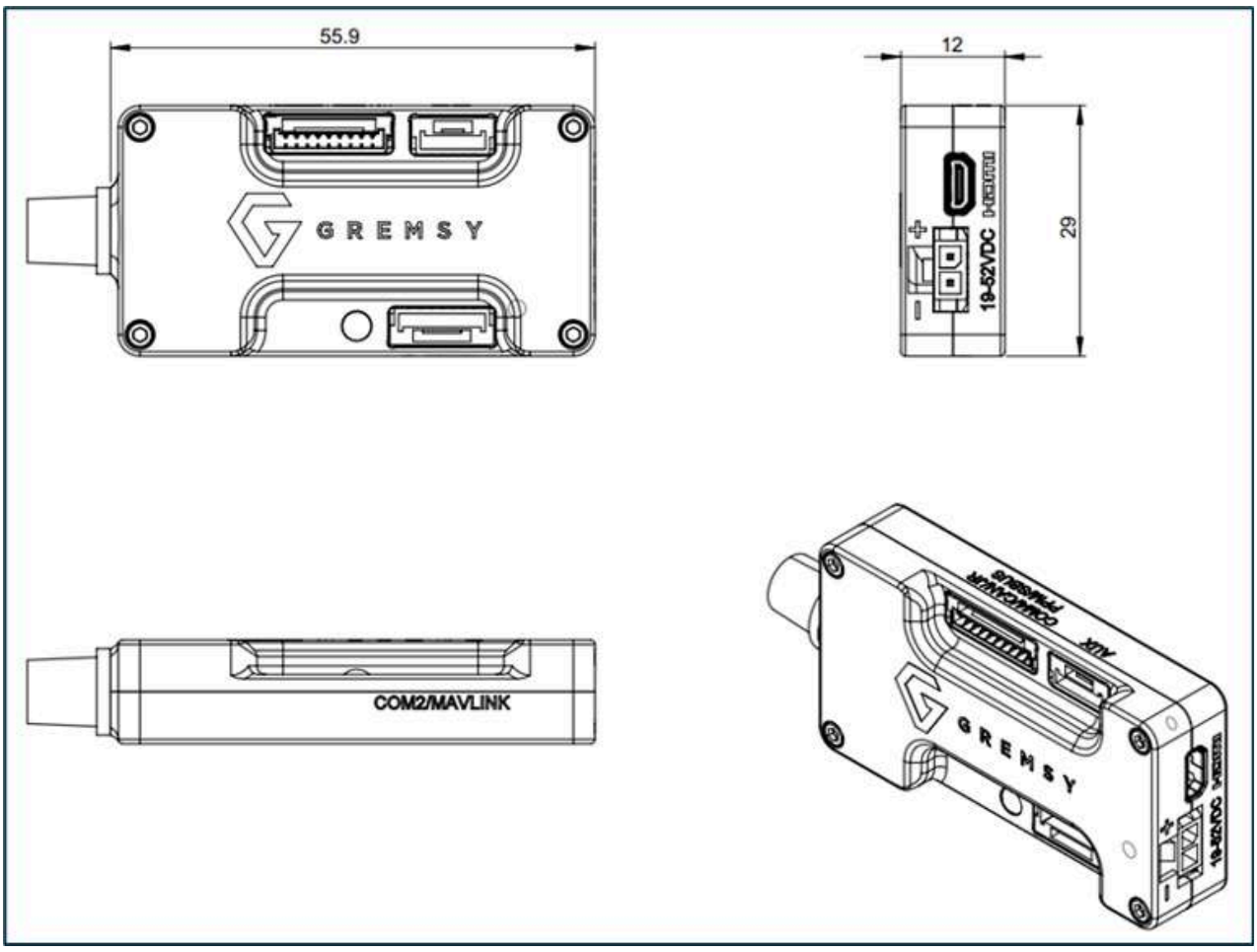
M-PORT QUICK RELEASE (IP VERSION) MOUNTING DIMENSION



M-Port IP version



CONNECTION HUB MOUNTING DIMENSION



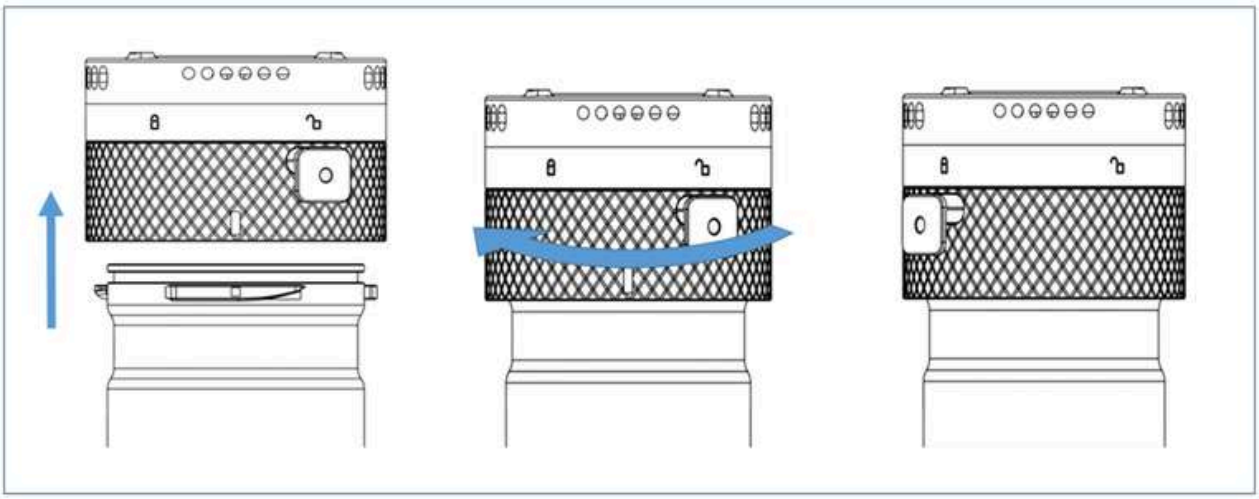
QUICK RELEASE INSTALLATION

CONNECT QUICK RELEASE

STEP 1: The marks on the top part and bottom part must be aligned. The button on the ring should be aligned with the unlocked icon as shown in the first picture.

STEP 2: Keep everything aligned and attach the bottom part to the top part.

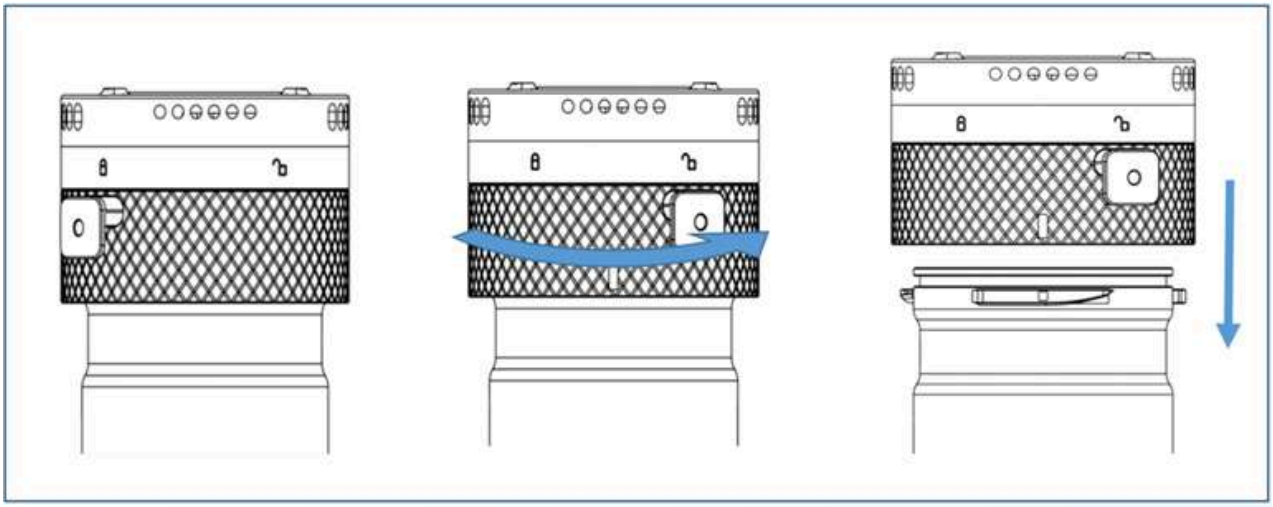
STEP 3: Rotate the ring clockwise until the button on the ring aligns with the locked icon.



DISCONNECT QUICK RELEASE

STEP 1: Press and hold the button, and rotate the ring counterclockwise.

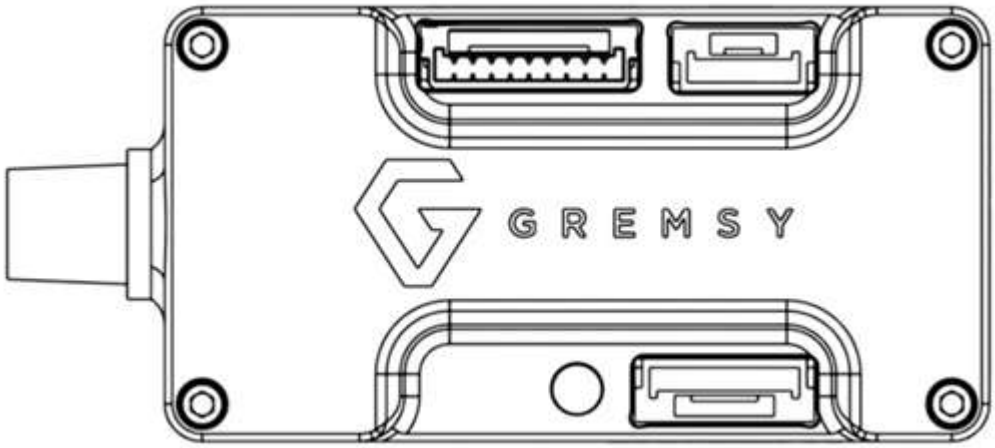
STEP 2: When the button on the ring is aligned with the unlock icon, the ORUS L can be detached from the top part of the Quick Release.



I/O CONNECTION

Specifications are subject to change. Product currently in release phase.

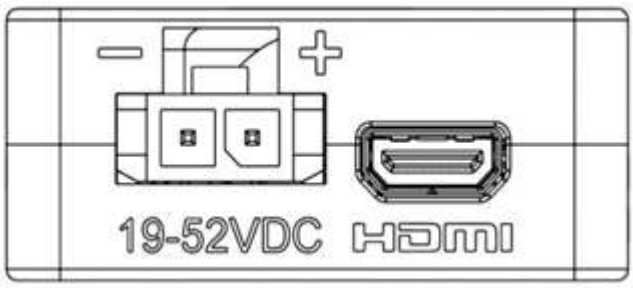
ORUS L CONNECTION HUB CONNECTORS AND PINOUTS



1. POWER

Input range: **19-52 VDC**

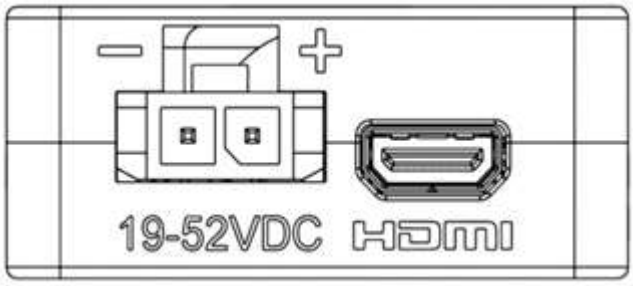
Connector type: **JST SM02B-SFKH-TF**



2. HDMI

Use to output video from the camera

Connector type: HDMI micro



3. MULTIPLEX PORT

> For wiring interfaces such as **Pixhawk COM2**, **Pixhawk COM4**, **RC_CAN**, and **RC_JR**, the corresponding cables are **not included** in the standard (Basic) package.

ETH

Connector Type: BM05B-GHS-TBT

Pinout:

- LAN_TX_P
- LAN_TX_N
- LAN_RX_P
- LAN_RX_N
- GND

COM4/CAN/JR/PPM/SBUS

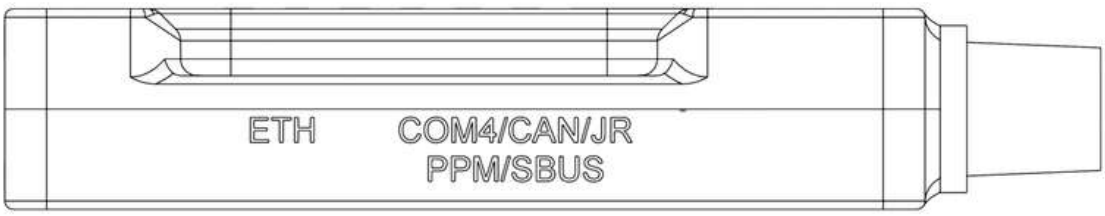
Connector Type: BM09B-GHS-TBT

Pinout:

- 5V

- SBUS/PPM
- GND
- SPEK (JR)
- 3V3
- CAN_L
- CAN_H
- GIMBAL_TX4
- GIMBAL_RX4

⚠ Supported cable not include on the package

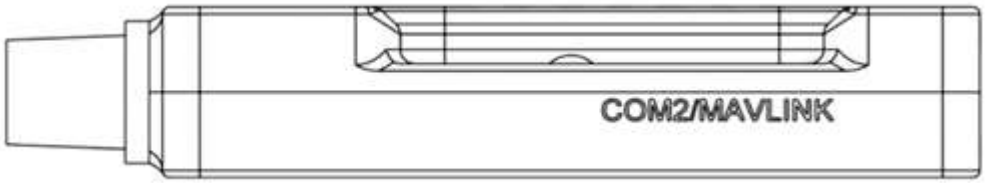


MAVLINK

Connector Type: BM07B-GHS-TBT

Pinout:

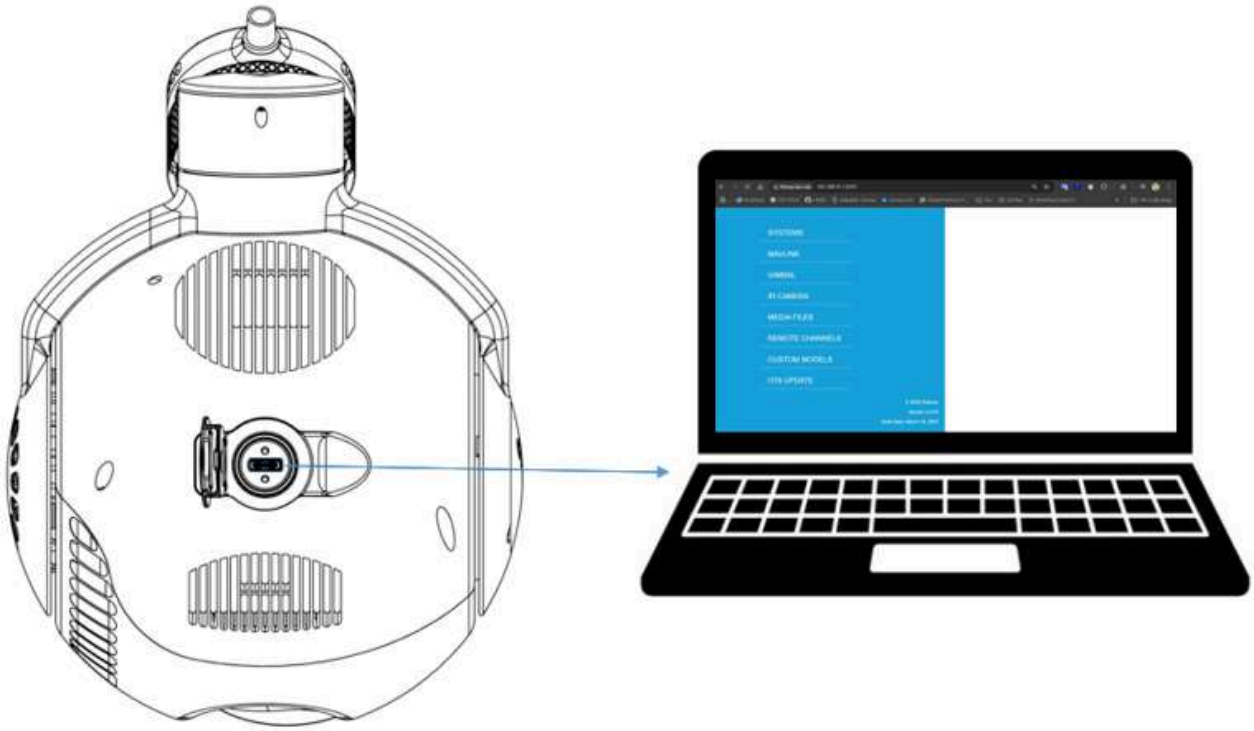
- RESERVE
- RESERVE
- MAVLINK_RX
- MAVLINK_TX
- GND
- RESERVE
- RESERVE



PAYLOAD CONNECTOR

1. USB-C

USB Ethernet to configure the ORUS L settings via web app and upgrade software



2. Reset Button

To reset the computer processor inside ORUS L

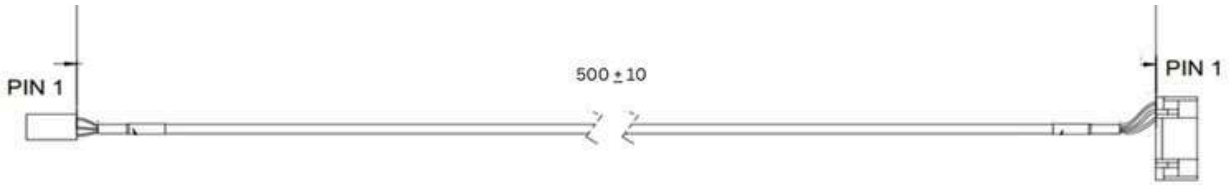
> Contact Support@gremsy.com before using this function

ORUS L CONTROL CABLE

RC_SBUS_PPM Cable

Connector type 1: Housing 3 2.54mm

Connector type 2: GHR-09V-S



ORUS-L CONTROL CABLE

No.3: RC_SBUS_PPM CABLE

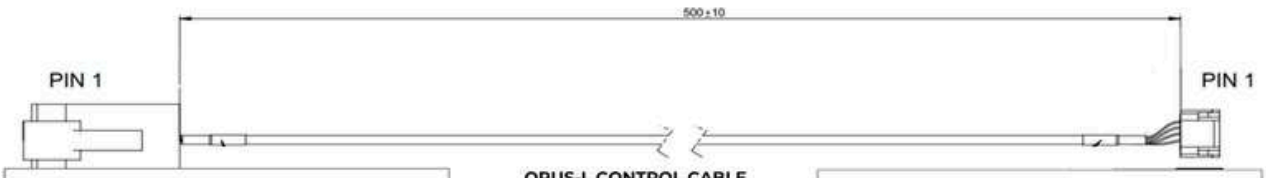
Connector Type: **Housing 3 2.54mm**		
Wire Color	**Pin Number**	**Pin Name**
	#1	SBUS / PPM
	#2	5V
	#3	GND

Connector Type: **GHR-09V-S**		
Wire Color	**Pin Number**	**Pin Name**
	#1	5V
	#2	SBUS / PPM
	#3	GND
NC	#4	
NC	#5	
NC	#6	
NC	#7	
NC	#8	
NC	#9	

Ethernet RJ45

Connector type 1: GHR-05V-S

Connector type 2: RJ45



ORUS-L CONTROL CABLE

No.4: ETHERNET RJ45 CABLE

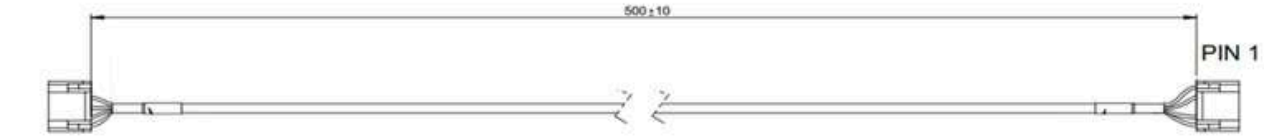
Connector Type: **RJ45**		
Wire Color	**Pin Number**	**Pin Name**
	#1	S1
	#2	S2
	#3	S3
	#4	X
	#5	X
	#6	S4
	#7	X
	#8	X

Connector Type: **GHR-05V-S**		
Wire Color	**Pin Number**	**Pin Name**
	#1	S1
	#2	S2
	#3	S3
	#4	S4
	#5	X

Ethernet HereLink

Connector type 1: GHR-05V-S

Connector type 2: GHR-05V-S



ORUS-L CONTROL CABLE

No.5: ETHERNET HERELINK CABLE

Connector Type: **GHR-05V-S**		
Wire Color	**Pin Number**	**Pin Name**
	#1	S1
	#2	S2
	#3	S3
	#4	S4
	#5	

Connector Type: **GHR-05V-S**		
Wire Color	**Pin Number**	**Pin Name**
	#1	S1
	#2	S2
	#3	
	#4	S3
	#5	S4

MavLink UART

Connector type 1: GHR-07V-S

Connector type 2: GHR-06V-S

ORUS-L CONTROL CABLE

No.6: MavLink Drone CABLE

Connector Type: **GHR-07V-S**		
Wire Color	**Pin Number**	**Pin Name**
NC	#1	NC
NC	#2	NC
■	**#3**	**GND**
■	#4	TX2
■	#5	RX2
NC	#6	NC
NC	#7	NC

Connector Type: **GHR-06V-S**		
Wire Color	**Pin Number**	**Pin Name**
NC	#1	NC
■	**#2**	**TX_DRONE**
■	#3	RX_DRONE
NC	#4	NC
NC	#5	NC
■	**#6**	**GND**

If you require these specific connection options, please contact **contact@gremsy.com** for further information regarding availability, compatibility, and purchasing of the appropriate accessories.

SOFTWARE CONFIGURATION

Orus L support connect with PC or similar device running Windows/Mac/Unbutu over USB-ETH connection in order to initial setup, settings param and troubleshooting

It will require for some configuration to have the stable connection over the USB-ETH connection

Why Set a Static IP?

While you connect to your computer as default IP, it may change and affect to the connection, leading to loss and instability

This article will show you how to change the IP address of computer for stable connection with ORUS-L via USB connection

1 🔌 **Step 1: Connect the Device**

Plug the device into your PC using a USB-C cable.

Your PC will automatically display a notification:
L4T-README (E:)
💡 *This confirms that the device is recognized.*

2 🌐 **Step 2: Access Network Settings**

Go to: **Settings > Network & Internet > Advanced network settings**

Locate the Ethernet adapter labeled as:
Unidentified network | Remote NDIS Compatible Device #2 (or similar)

This is the virtual network interface created for the USB-C connection.

3 🖥️ **Step 3: Edit the PC's IP Address**

You now need to assign a static IP address to this adapter.

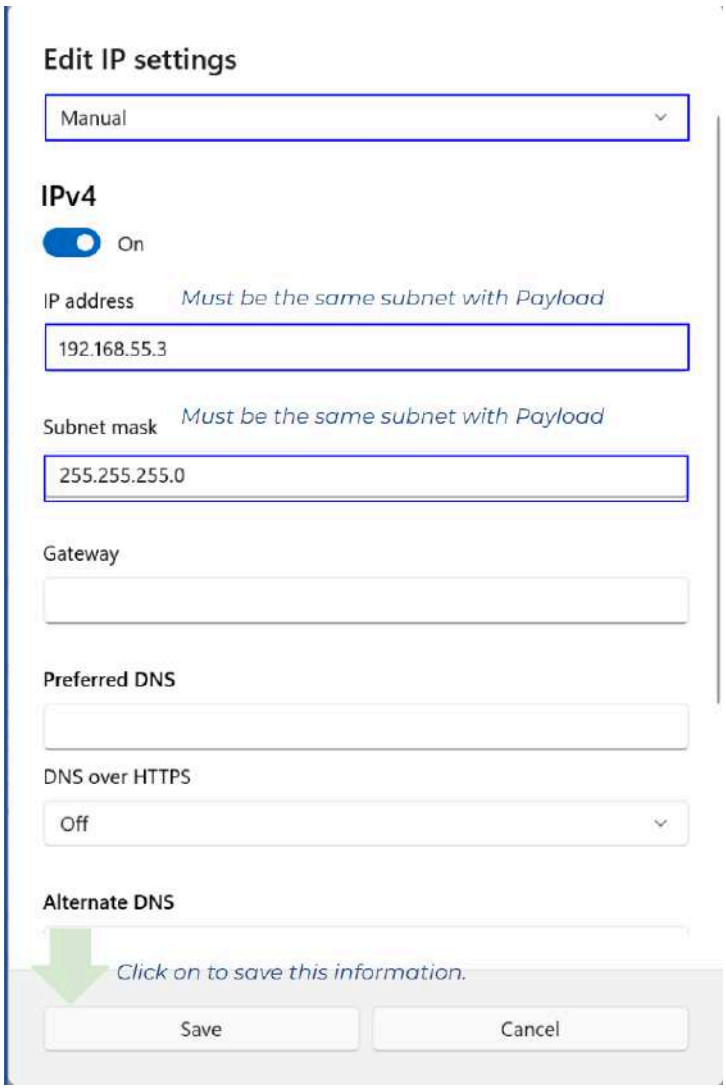
1. Click on the Ethernet adapter *(Ethernet 5 or similar).*
2. Choose **Edit IP settings.**
3. Select **Manual**, turn on **IPv4.**
4. Enter the following:
    a. **IP address:** *192.168.55.3*
    b. **Subnet mask:** *255.255.255.0*
5. Leave other fields blank unless specified by your device documentation.
6. Click **Save.**

4 ✅ **Completed**

Your PC is now on the same subnet as the connected device (typically 192.168.55.x). You can now:

- Access a web interface, link: `192.168.55.1:8000`

5 ***For Example***


Edit IP settings
Manual
IPv4
On
IP address
Must be the same subnet with Payload
192.168.55.3
Subnet mask
Must be the same subnet with Payload
255.255.255.0
Gateway
Preferred DNS
DNS over HTTPS
Off
Alternate DNS
Click on to save this information.
Save
Cancel

WEB SETTING APP

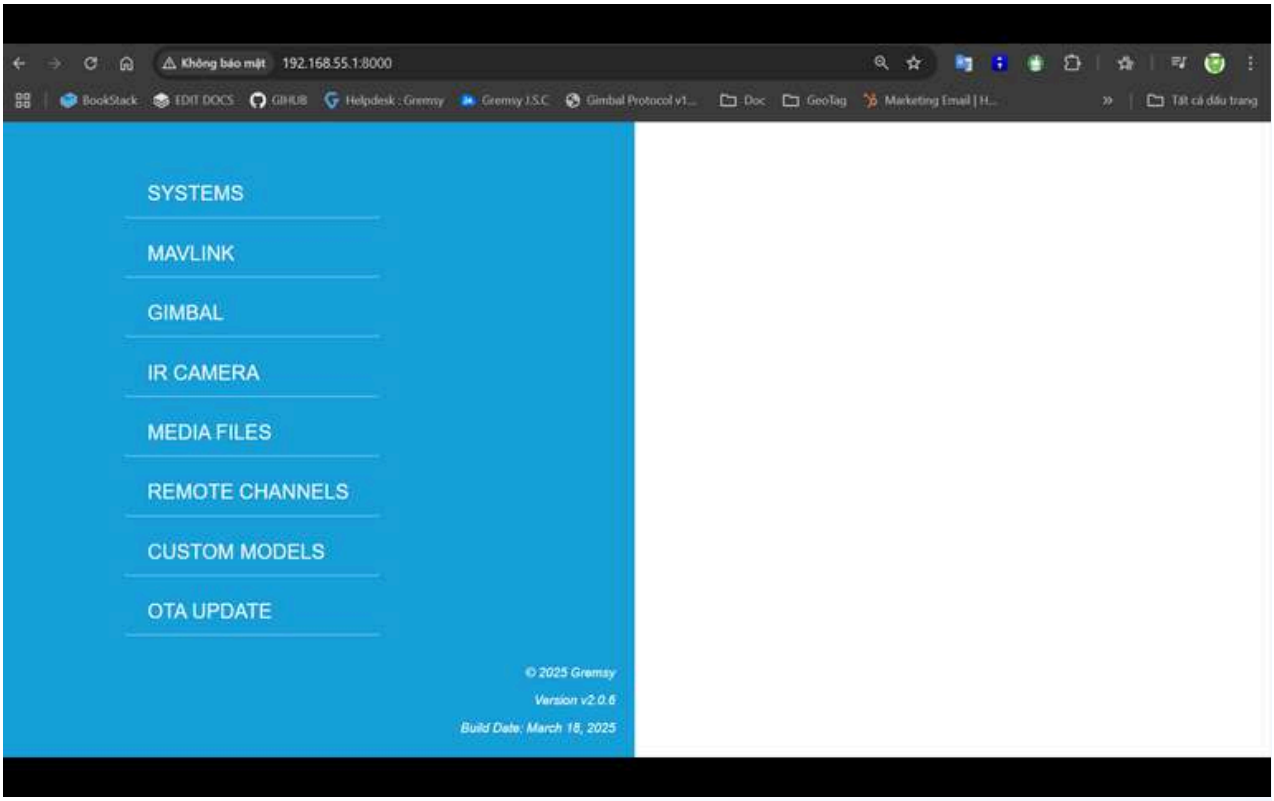
Use USB-C *(bottom of ORUS-L)* to connect the Payload Web Setting.

To check the Firmware version and Software version, also configure the parameter of Payloads

1. **How to Connect?**

- LINK: `192.168.55.1:8000`
- When connect successfully, The computer will pop up a message

> Your PC will automatically display a notification:
>
> **L4T-README (E:)**
>
> 💡 *This confirms that the device is recognized.*
>
> 
>


Không bảo mật
192.168.55.1:8000
BookStack
EDIT DOCS
GITHUB
Helpdesk : Gremsy
Gremsy J.S.C
Gimbal Protocol v1...
Doc
GeoTag
Marketing Email | H...
Tất cả dấu trang
SYSTEMS
MAVLINK
GIMBAL
IR CAMERA
MEDIA FILES
REMOTE CHANNELS
CUSTOM MODELS
OTA UPDATE
© 2025 Gremsy
Version v2.0.6
Build Date: March 18, 2025

SYSTEM

No.	Function
1	IP Address
2	Storage
3	General Setting
4	Video Streaming
5	PiP Configuration
6	Localization
*	*Factory Reset*
*	*Restart Payload*
*	*Reboot System*
*	*Export Setting*
*	*Import Setting*

IP ADDRESS

Default IP Address of ORUS-L Payload

Payload Address: 192.168.12.249

Netmask: 255.255.255.0

Gateway: 192.168.12.1

Click on **“APPLY”** to save the information.

Set up an IP Address via USB Connection

1. Connect the USB Type-C port (located at the bottom of the **Orus-L**) to your computer using a USB cable.
2. The host computer will detect a new network adapter.
3. **Orus-L** will assign a DHCP IP address in the 192.168.55.x range to the host computer. Typically, the computer will receive the IP address **192.168.55.100**.
4. Verify the connection by opening a terminal or command prompt and executing:

```
ping 192.168.55.1
```

5. Open a web browser and navigate to the Orus-L settings interface:

```
http://192.168.55.1:8000
```

6. Go to the **IP Address** tab, then enter your desired static IP address.
7. Click **Apply and Reboot** to restart the **Orus-L** and apply the new static IP

settings.

Change IP Address via Ethernet Connection

If you have already changed the IP address and connected the **Orus-L** to your system using an Ethernet cable, follow the steps below to access and reconfigure the device.

1. **Connect Orus-L via Ethernet**

   Plug an Ethernet cable into the Orus-L Ethernet port and connect it to your computer or network switch.

2. **Access the Web Interface**

   In your browser, enter the updated IP address assigned to Orus-L using the following format:

   ```
   http://<orus_ip>:8000
   ```

3. **Navigate to Static IP Settings**

   Once connected to the web interface:

   - Go to the **IP Address** tab.
   - Enter a new static IP address if needed.

4. **Apply the Changes**

   Click **Apply and Reboot** to save the new configuration. The Orus-L will restart with the updated IP settings.

✅ **Tip:** Make sure your computer is in the same subnet (e.g., 192.168.55.x) to maintain connectivity.

STORAGE

This section describes how to configure the storage and recording options for the Orus-L system.

IR Image Type

Select the format in which infrared images will be saved:

- **JPEG** – Standard image format
- **JPEG & CSV** – Saves both the image and raw thermal data in CSV format

> ✅ *Use "JPEG & CSV" if thermal analysis is required in post-processing.*

Video Format

Choose the video file format for recorded footage:

- **MP4** – Widely supported and efficient for general use
- **MKV** – Supports more advanced features and metadata

Record Format

Select the video encoding standard:

- **H.265 (HEVC)** – Higher compression, smaller file sizes, ideal for longer recordings
- **H.264 (AVC)** – Greater compatibility with legacy systems

> 📌 *H.265 is recommended for modern workflows and efficient storage.*

Record Bitrate Settings

Electro-Optical (EO) Camera:

Choose the desired video quality based on your storage and performance needs:

- `20 Mbps (highest quality)`
- `14 Mbps`
- `8 Mbps`
- `4 Mbps`
- `2 Mbps`
- `1 Mbps (lowest quality)`

Infrared (IR) Camera:

Select from the following bitrate options:

- `4 Mbps`
- `2 Mbps`
- `1 Mbps`

> ⚠️ *Higher bitrates offer better image quality but use more storage.*

Saving Your Settings

Once all desired options are selected, click the **“APPLY”** button to save changes. The new configuration will take effect immediately or after a system restart, depending on the setting.

GENERAL SETTING

This section covers general configuration options to tailor Orus-L’s behavior and measurement units to your operational needs.

LRF Unit (Laser Range Finder)

Select the preferred unit of measurement for distance readings:

- `Meters`
- `Yards`
- `Feet`
- `Miles`
- `Kilometers (km)`

GPS Unit Format

Choose the format for displaying GPS coordinates:

- **Decimal Degrees (DD)** – e.g., 41.40338, 2.17403
- **Degrees, Minutes, Seconds (DMS)** – e.g., 41°24'12.2"N 2°10'26.5"E
- **Degrees Decimal Minutes (DDM)** – e.g., 41°24.2028', 2°10.4418'

Tracking Autozoom

Enable or disable automatic zoom during object tracking:

- **Enable** – Zooms automatically to keep the target centered and sized
- **Disable** – Zoom level remains fixed regardless of target movement

---

Camera Definition Location

Specify where the camera configuration is sourced from:

- **Offline** – Uses onboard definitions without requiring internet access
- **Online** – Loads updated definitions from the cloud when connected

---

Saving Your Settings

After configuring the above options, click **“APPLY”** to save the settings. Changes will be applied immediately or after a system restart, depending on the option.

VIDEO STREAMING

This section allows you to configure video streaming parameters for optimal performance based on your network conditions and operational requirements.

Auto Connect

Determines whether the stream starts automatically when the system powers on:

- **Enable** – Automatically initiates video streaming
- **Disable** – Requires manual start.

Bitrate

Sets the data rate for video transmission. Higher bitrates offer better quality but require more bandwidth:

- **512 Kbps**
- **1 Mbps**
- **2 Mbps**
- **4 Mbps**
- **8 Mbps**

Mount Point

Defines the stream endpoint name used by RTSP clients (e.g., VLC, Payload Assitant App/Desktop):

- **Default:** `payload`
- You can change this value as needed for your streaming setup.

Port

Specifies the port number used for RTSP streaming:

- **Default:** `8554`

> 📌 Ensure this port is open and not blocked by firewalls on your network.

Resolution

Select the desired output resolution:

- **1920 × 1080 (Full HD)**
- **1280 × 720 (HD)**
- **640 × 360 (Low Bandwidth Mode)**

Encoder

Choose the video compression format:

- **H.264 (AVC)** – Standard and widely supported
- **H.265 (HEVC)** – Higher efficiency, reduced bandwidth usage

---

Frame Rate

Set the number of video frames per second (FPS):

- **Range:** 1 to 30 FPS

> Lower frame rates reduce bandwidth and power consumption.

Individual IR Stream

Enable or disable a separate infrared video stream:

- **Enable** – Streams IR video independently from EO
- **Disable** – IR is not streamed or is embedded with EO feed

Saving Your Settings

Click **“APPLY”** to save and apply your selected streaming configuration.
Streaming changes may take effect immediately or require a system reboot.

PiP Configuration

Parameter	Description	Valid Range
Position X	Horizontal coordinate of the PiP window’s top-left corner	0 to 1280 pixels
Position Y	Vertical coordinate of the PiP window’s top-left corner	0 to 568 pixels
Width	Width of the PiP window	1 to 640 pixels
Height	Height of the PiP window	1 to 512 pixels

Position X:

- Enter a value between **0** and **1280**.
- This sets the horizontal position of the PiP window's top-left corner relative to the left edge of the screen.

Position Y:

- Enter a value between **0** and **568**.
- This sets the vertical position of the PiP window's top-left corner relative to the top edge of the screen.
- **Width:**
  - Enter a value between **1** and **640**.
  - This defines the width of the PiP window in pixels.
- **Height:**
  - Enter a value between **1** and **512**.
  - This defines the height of the PiP window in pixels.

LOCALIZATION

Select Timezone

- Locate the **Select Timezone** option.
- Timezone options correspond to standard global time zones (e.g., UTC±offset).

Apply and Save Configuration

- After selecting the correct timezone, click the **“APPLY”** button to confirm and save your settings.
- The system clock will automatically update to reflect the chosen timezone.

Important Considerations

- Correct timezone configuration is critical for:
  - Accurate flight logging and mission timestamping
  - Compliance with regulatory reporting requirements
  - Synchronization with ground control and data servers
- For operations spanning multiple regions or time zones, ensure the system timezone is updated accordingly prior to deployment.

MAVLINK

Available Camera Component IDs

Camera Name	MAVLink Component ID
Camera 1	100
Camera 2	101
Camera 3	102
Camera 4	103
Camera 5	104
Camera 6	105

Available Baudrate Options

Baudrate:

- 1200
- 2400
- 4800
- 9600
- 19200
- 38400
- 57600
- 111100
- 115200
- 230400
- 256000
- 460800

- 500000
- 921600
- 1500000

GIMBAL

Gimbal Device – Firmware Update

Update the gimbal firmware using a `.hex` file provided by the manufacturer.

Steps to Update Firmware:

1. Click **“Choose File”** and select the appropriate `.hex` firmware file from your computer.
2. Click **“UPDATE”** to begin the upgrade process.

> ⚠️ **Do not power off or disconnect the device during the update.**

Gimbal Control – Autospeed

Enable or disable the automatic speed adjustment feature for gimbal movements.

- **Enable** – Gimbal movement speed adjusts dynamically based on input
- **Disable** – Gimbal speed remains constant, as defined by user input settings

---

Saving and Applying Changes

Firmware updates take effect after the update process completes.
Changes to **Gimbal Control** settings apply immediately after clicking **“UPDATE”**.

IR CAMERA

Environmental Factors

Environmental Factors – Orus-L

This section allows you to configure environmental parameters to improve the accuracy of thermal measurements based on real-world conditions.

Atmospheric Temperature (K)

- **Range:** 100 to 500 Kelvin
  Set the ambient air temperature for thermal compensation.

Distance (m)

- **Range:** 0 to 255 meters
  Enter the distance between the Orus-L and the target object to enhance thermal accuracy.

Emissivity Target (%)

- **Range:** 0% to 100%
  Defines the emissivity of the target surface.

> ⚠️ Default for most organic materials is around **95%**.

Humidity (%)

- **Range:** 0% to 100%
  Input the relative humidity of the environment, which may affect thermal

readings.

ModifyB / ModifyK

- **Range:** 0 to 255 (each)
  Advanced calibration parameters used for fine-tuning thermal correction models.

> Only modify if you have specific calibration requirements or guidance.

Window Reflect Temperature (K)

- **Range:** 100 to 500 Kelvin
  Temperature of the window or lens surface through which the sensor observes the target.

Temperature Unit

Choose your preferred unit for displaying temperature:

- **Celsius (°C)**
- **Fahrenheit (°F)**
- **Kelvin (K)**

Saving Your Settings

Click **“APPLY”** to save and activate the new environmental configuration.
Settings will be used to refine thermal imaging calculations in real time.

Isotherms Regions

Isotherms Regions – Orus-L

The Isotherms function highlights temperature ranges within the thermal image to enhance visibility of specific heat zones.

Mode

Select the desired isotherm display mode:

- **Disable** – Turns off isotherm overlays
- **Upper & Lower** – Highlights areas above and below defined temperature thresholds
- **Medium** – Highlights areas within a specified temperature range

---

Lower Temperature (℃)

- Enter the **lower threshold** for isotherm display (°C)

Upper Temperature (℃)

- Enter the **upper threshold** for isotherm display (°C)

> 💡 Use precise values to isolate thermal anomalies or regions of interest.

Measurement Range

Choose the appropriate thermal measurement range for your application:

- **-20℃ ~ 150℃** – Standard range for general thermal tasks
- **-20℃ ~ 550℃** – Extended range for high-temperature environments

---

Saving Your Settings

Click **“APPLY”** to confirm and apply your isotherm configuration.
The thermal display will immediately reflect the new settings.

IR Camera Settings

IR Camera Settings – Orus-L

This section provides configuration options to optimize the infrared (IR) camera's display, measurement accuracy, and Flat-Field Correction (FFC) behavior.

Scale

Adjust how the IR image is displayed on screen:

- **Original** – Maintains the sensor’s native aspect ratio
- **Full Screen** – Scales the image to fill the display

Overlay ROI (Region of Interest)

Enable or disable visual overlays for measurement regions:

- **Enable** – Displays measurement boxes on the IR image
- **Disable** – Hides all ROI overlays

ROI Measurement

Select the size of the temperature measurement region:

- **Small**
- **Medium**
- **Large**
- **Full Screen**

> 📌 Choose a smaller ROI for precise spot measurements or larger regions for broader thermal averaging.

FFC Mode (Flat-Field Correction)

Control how thermal noise and image uniformity are corrected:

- **Auto** – Automatic calibration based on internal logic
- **Manual** – User-triggered calibration
- **External** – Triggered by external signal
- **External with Auto Table Switch** – Uses external trigger and auto compensation table selection

---

FFC Period (Seconds)

Set how frequently FFC is triggered in **Auto** mode.

> Example: Enter `60` to run FFC every 60 seconds.

FFC Temp Delta (°C)

Set the minimum change in temperature that triggers an automatic FFC operation.

FFC Integration Period

Select the number of frames used to integrate the image during FFC:

- **2 Frames**
- **4 Frames**

- **8 Frames**
- **16 Frames**

> Higher values improve uniformity but may slightly delay frame refresh.

Saving Your Settings

Click **“APPLY”** to confirm and apply your IR camera configuration.
Settings will be used immediately or after the next FFC trigger.

MEDIA FILES

Download Image and Video – Orus-L

This section allows users to manage stored media files directly from the Orus-L interface.

IMAGE Management

Options to manage captured infrared and electro-optical images:

- **Download All** – Download all stored images to the host computer
- **Delete All** – Permanently remove all stored images from internal storage

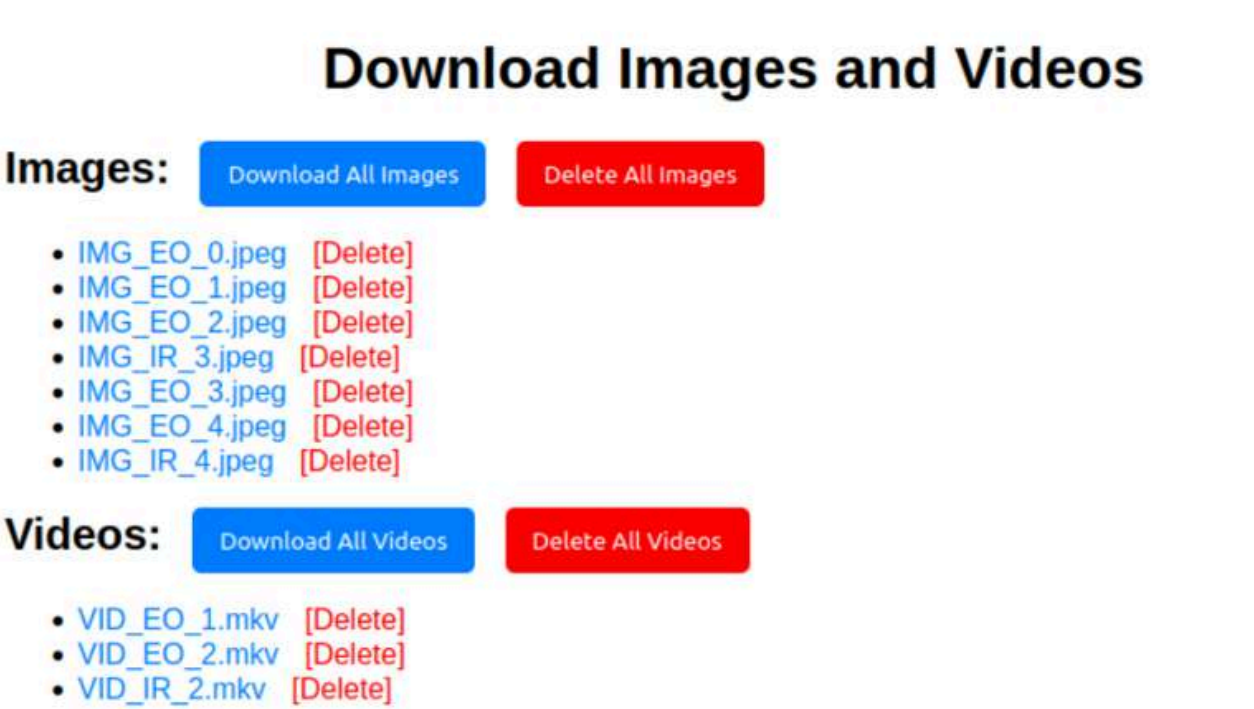
---

VIDEO Management

Options to manage recorded video files:

- **Download All** – Download all recorded videos
- **Delete All** – Permanently delete all stored video files

> ⚠️ **Caution:** Deleting media is irreversible. Ensure backups are made before selecting "Delete All."


Download Images and Videos
Images:
Download All Images
Delete All Images
IMG_EO_0.jpeg [Delete]
IMG_EO_1.jpeg [Delete]
IMG_EO_2.jpeg [Delete]
IMG_IR_3.jpeg [Delete]
IMG_EO_3.jpeg [Delete]
IMG_EO_4.jpeg [Delete]
IMG_IR_4.jpeg [Delete]
Videos:
Download All Videos
Delete All Videos
VID_EO_1.mkv [Delete]
VID_EO_2.mkv [Delete]
VID_IR_2.mkv [Delete]

REMOTE CHANELS

SETTING REMOTE CONTROL MODE | GREMSY PRODUCT SUPPORT

ASSISTANCE SOFTWARE

Payload Plus App

Orus L Fully compatible with the **Gremsy Payload Plus** Android application, offering advanced control and configuration capabilities over **Ethernet (UDP + RTSP)**.

Key Highlights

- **Seamless Integration with Payload Plus**: Orus L works natively with the **Gremsy Payload Plus** app, enabling intuitive setup, real-time gimbal control, and live video preview directly from an Android device.
- **Ethernet Connectivity**: Utilizes high-speed Ethernet interface to ensure stable and low-latency communication for both control (UDP) and video streaming (RTSP).
- **Precise Gimbal Control**: Control Pan, Tilt, and Roll angles smoothly using the app interface. Adjust movement speed, mode switching, and gimbal behavior on the fly.
- **Live Video Streaming via RTSP**: Stream real-time video feed from the integrated camera to the Payload Plus app using **RTSP**, ensuring immediate visual feedback for target framing and mission planning.
- **Advanced Configuration**: Access full payload settings including object tracking, AI detection, camera indeep settings—all within the Payload Plus app.

For the detailed installation and connect with the Payload Plus, refer to the link below:

PAYLOAD PLUS

Payload Assistant Desktop

Orus L Fully compatible with the **Gremsy Assistance Desktop** offering advanced control and configuration capabilities over USB-Ethernet for settings and testing the payload.

Video Stream and Control via Payload Assistant Desktop

Use the USB-C port to stream and control the Orus-L payload using the **Payload Assistant Desktop** application.

1 ✅ **Step 1: Launch the Application**

Open Payload Assistant Desktop v2.0.0.1 or later on your computer.

> Release Payloads_Assistant_Desktop v2.0.0.1 · Gremsy/Payload-Assistant-Desktop
> GitHub

2 ✅ **Step 2: Configure RTSP Video Stream**

URL RTSP: rtsp://192.168.55.1:8554/payload

Port 8554 is used for RTSP (Real-Time Streaming Protocol).

3 ✅ **Step 3: Set Communication Settings**

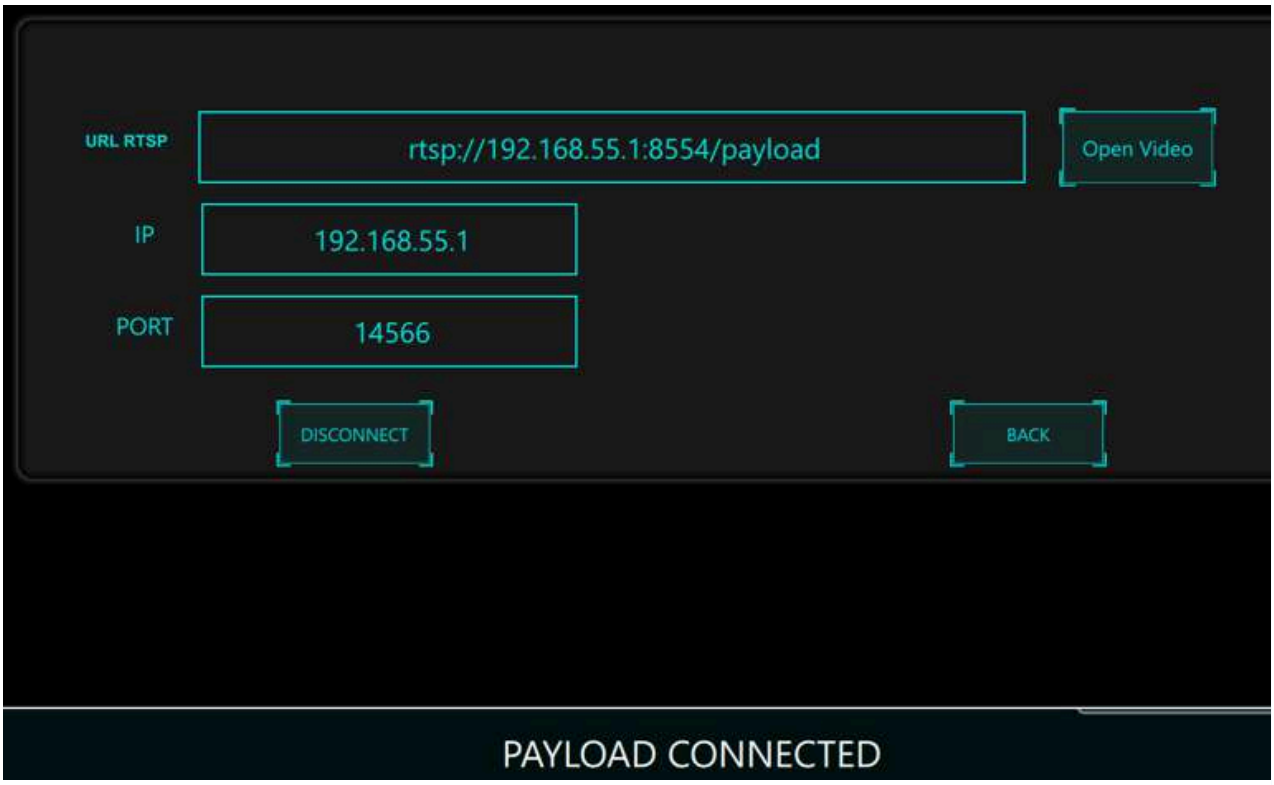
- IP: 192.168.55.1
- PORT: 14566

Port 14566 is used for MAVLink telemetry communication.

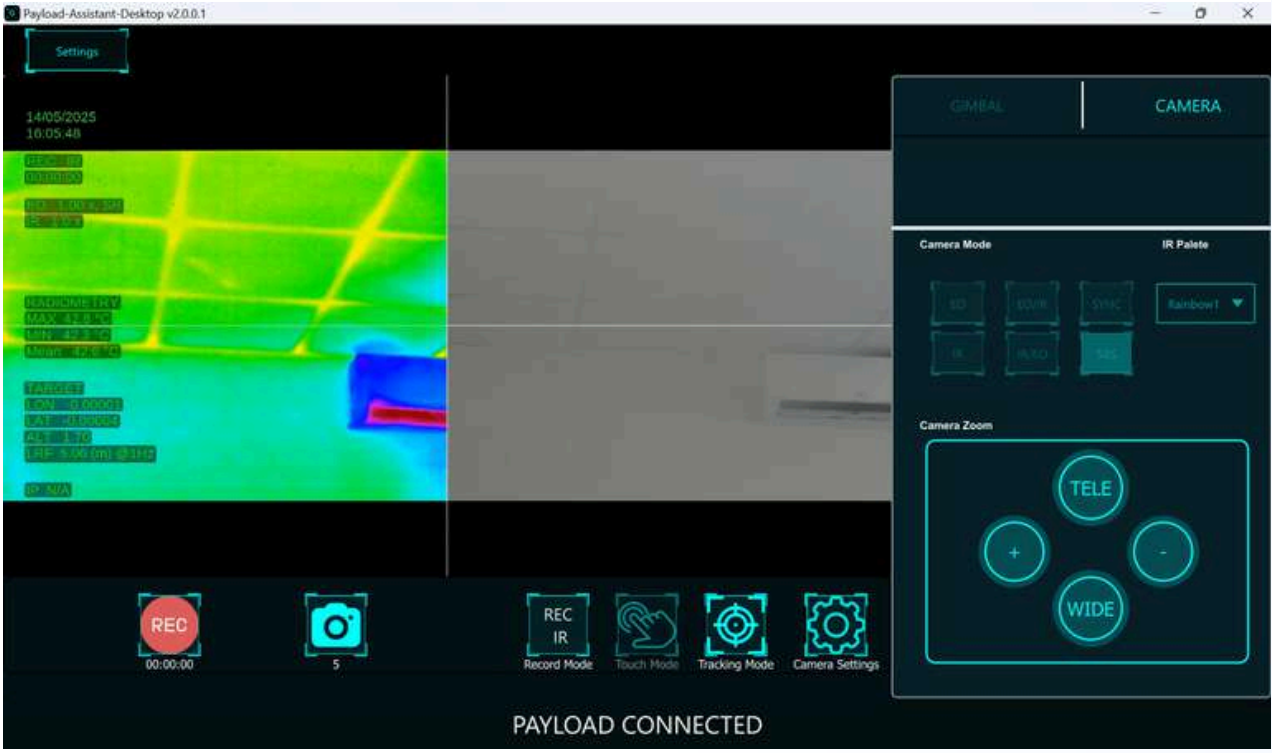
4 ✅ **Step 4: Connect**

1. Status will show: "PAYLOAD CONNECTED" if successful.

2. Click "Open Video" to start the RTSP stream (video feed).
3. Click "Connect" to establish the MAVLink link via port 14566.




Payload-Assistant-Desktop v2.0.0.1
Settings
Camera Settings
Tracking Mode
Object Detection
RC Mode
Object Tracking
Setting Target
Object Detection
Gimbal Mode
LOCK
GIMBAL
CAMERA
ATTITUDE
ENCODER
Mode Gimbal
Lock
Follow
POWER ON
Mapping
Home
Move Gimbal
SPEED TILT
20
SPEED PAN
50
47.72%
REC
00:00:00
6
REC
EO
Record Mode
Touch Mode
Tracking Mode
Camera Settings
PAYLOAD CONNECTED


Payload-Assistant-Desktop v2.0.0.1
Settings
14/05/2025
16:05:48
GIMBAL
CAMERA
Camera Mode
IR Palete
Rainbow1
Camera Zoom
TELE
WIDE
REC
00:00:00
5
REC
IR
Record Mode
Touch Mode
Tracking Mode
Camera Settings
PAYLOAD CONNECTED

THIRD PARTIES INTEGRATION

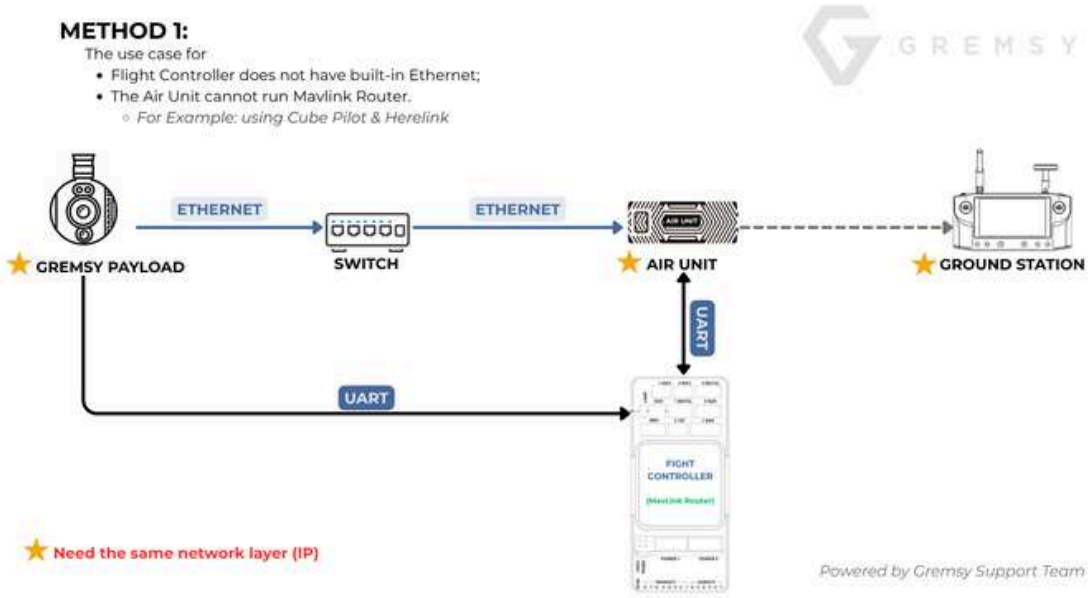
Orus L is designed to be highly flexible, allowing it to integrate into a wide range of UAVs and robotics platforms. With support for **UART**, **Ethernet (UDP & RTSP)**, **MAVLink**, and the **Gremsy Payload SDK**, users can easily adapt Orus L to fit their specific system architecture—whether it's a flight controller-based drone, an onboard computer, or a mobile robot.

Below are four common integration setups that demonstrate how Orus L can be deployed in real-world applications:

1. Mavlink Autopilot Integration (UART + Ethernet)

Ideal for traditional drones using PX4 or ArduPilot firmware.

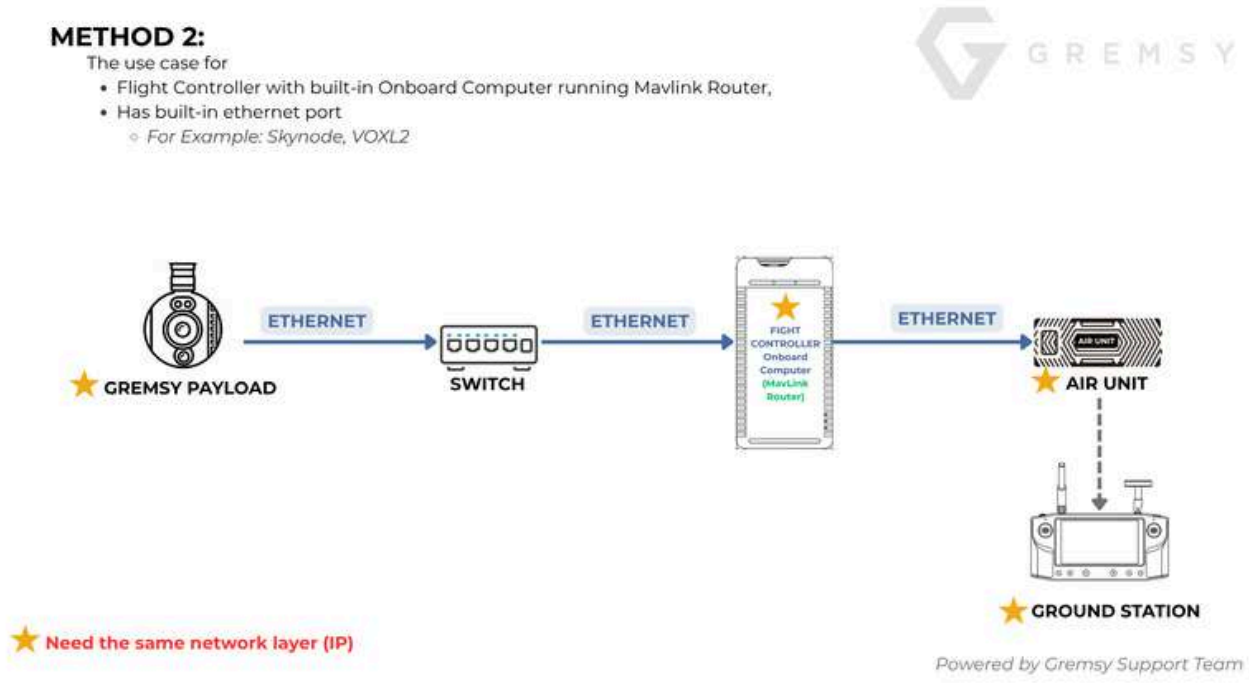
- Connect via UART
- Controlled via Mission Planner or QGroundControl
- Gimbal responds to waypoint missions and ROI commands



2. Advance Mavlink Autopilot with Companion Computer (Ethernet + SDK)

Ideally for Flight controller with onboard computing buit-in such as Skynode, VOXL2 (Jetson, RPi, NUC).

- Use Ethernet for control (UDP) and video (RTSP)
- Integrate using Gremsy Payload SDK for custom logic (optional)
- Optional MAVLink passthrough to flight controller

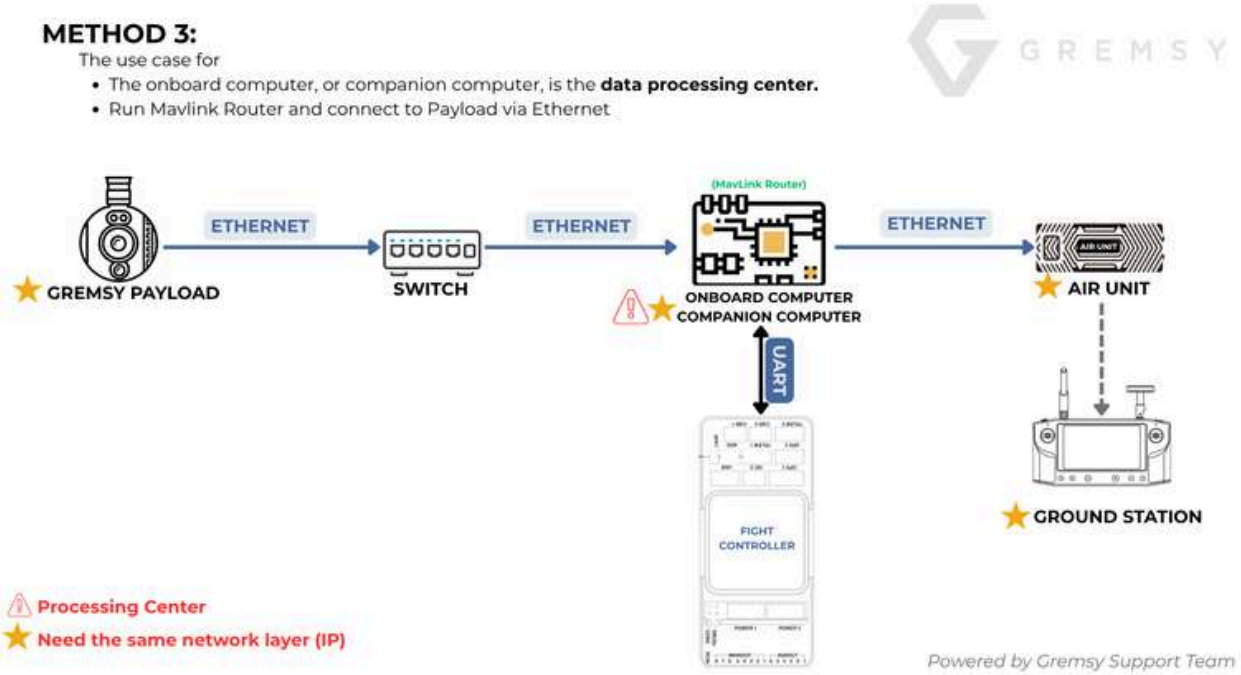


3. Companion Computer Integration (Ethernet/UART + SDK)

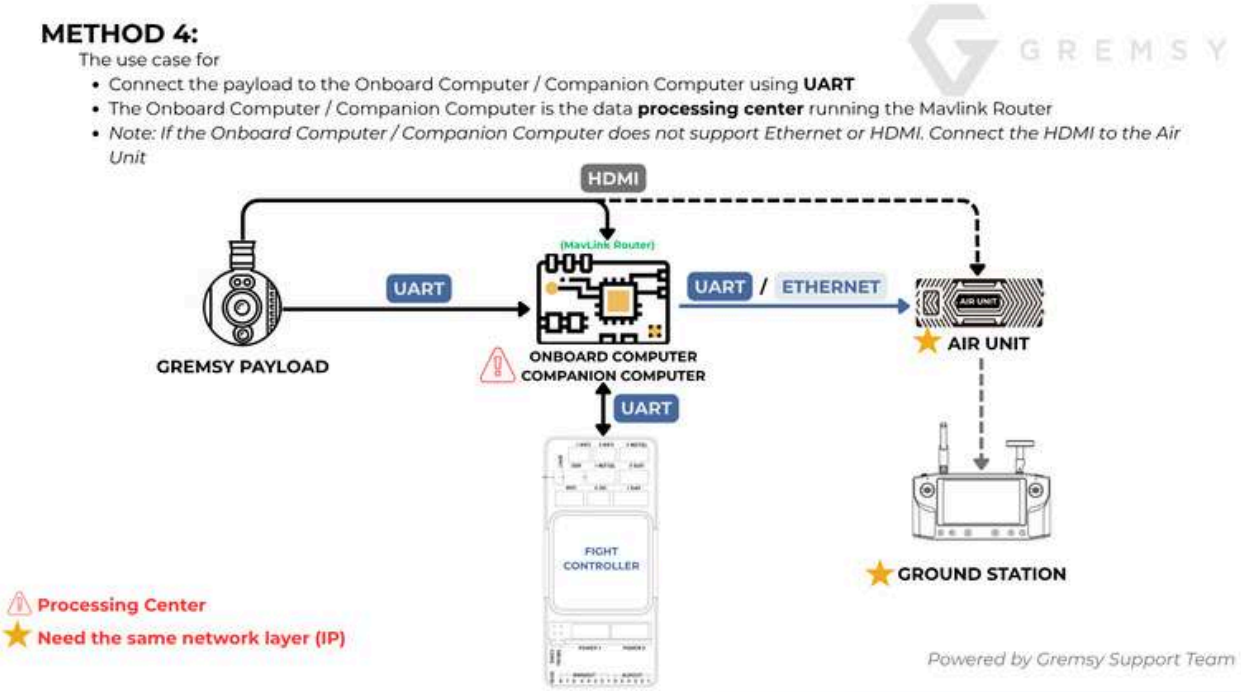
Used in ground robots or special payload systems with/without flight controller.

- Full control and video via Ethernet
- Custom logic handled by onboard PC using Gremsy SDK

3.1 Using Ethernet Connection



3.2 Using UART Connection



MAVLINK AUTOPILOT

Gremsy Payload Integration with Mavlink-based Autopilot Systems

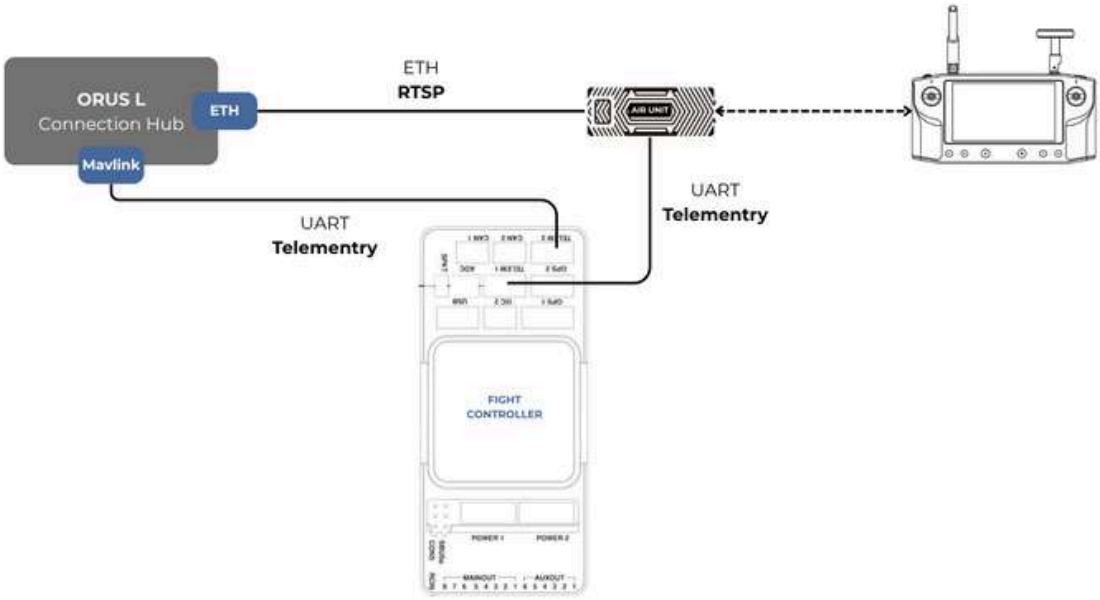
Integration Capabilities

Gremsy payloads support standard communication protocols to interface smoothly with Pixhawk systems, including:

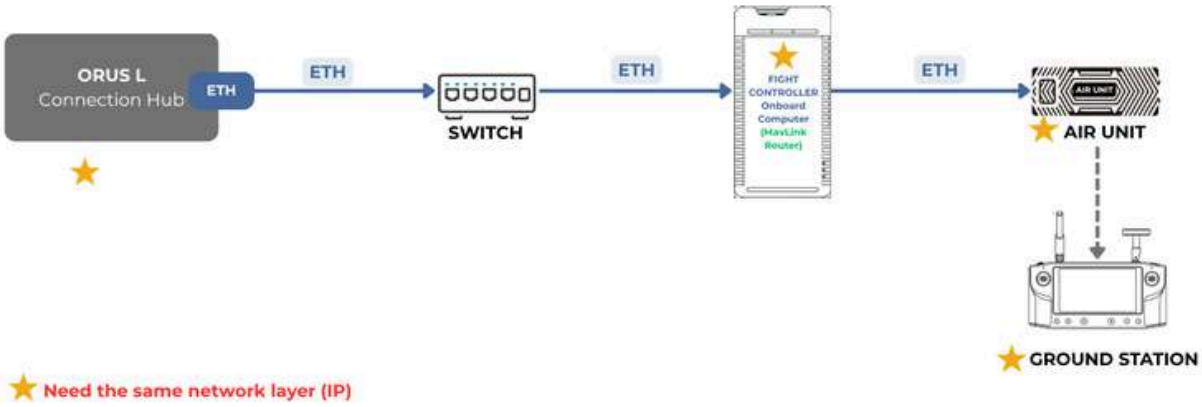
- **MAVLink v2 Protocol**: Compatible with popular firmware such as PX4 and ArduPilot. The payload can receive and respond to gimbal control commands from the autopilot, including angle control, ROI (Region of Interest) tracking, and camera navigation along waypoints.
- **UART/Serial Communication**: Gremsy gimbals offer UART ports for direct communication with the flight controller. Baud rate and protocol settings can be configured to match the specific autopilot setup.
- **Ethernet Interface**: Enables high-speed, low-latency communication for advanced use cases:
    - **UDP Protocol** for real-time gimbal and camera control commands from onboard computers or ground stations.
    - **RTSP (Real-Time Streaming Protocol)** for live video streaming from the payload camera to ground control software or network video recorders.

General Hardware Connection

1. **Flight Stack without onboard computer**
   E.g: Cube Pilot, Pixhawk series with Herelink v1.1 remote



2. **Flight Stack with onboard computer built-in**
   E.g: Skynode, VOXL2 with Herelink v1.1



SETUP WITH ARDUPILOT

Payload Telemetry & Gimbal Mount Settings

Ardupilot 4.3 or higher

Category	Parameter	Value	Description
Telemetry Setup	`SERIAL2_PROTOCOL`	`2`	Use MAVLink2 protocol
Telemetry Setup	`SERIAL2_BAUD`	`115`	Set baud rate to 115200
RC Channel Options	`RCx_OPTION`	`214`	x is desired channel match with remote/ground station button (joystick) • Standard mode: PAN control • Gremsy mode:PAN/TILT move (speed-based control)
RC Channel Options	`RCy_OPTION`	`212`	y is desired channel match with remote/ground station button (joystick) • Standard mode: Roll control • Gremsy mode: not applicable
			z is desired channel match with remote/ground

RC Channel Options	`RCz_OPTION`	`213`	station button (joystick) • Standard mode: TILT control • Gremsy mode: Select axis: PAN or TILT
Mount Settings	`MNT1_TYPE`	`6`	MAVLink Gimbal Type
Mount Settings	`MNT1_DEFLT_MODE`	`3`	Default to RC Targeting mode
Mount Settings	`MNT1_RC_RATE`	`240`	Speed control rate for gimbal
Camera Settings	`CAM_TYPE`	`6`	MAVLink Camera integration

Ardupilot lower 4.3 (limited support from Ardupilot)

Category	Parameter	Value	Description
Telemetry Setup	`SERIAL2_PROTOCOL`	`2`	Use MAVLink v2 protocol on Telemetry 2
Telemetry Setup	`SERIAL2_BAUD`	`115` (`115200`)	Set telemetry baud rate to 115200
RC Channel Options	`RC6_OPTION`	`0`	Disabled
RC Channel Options	`RC7_OPTION`	`0`	Disabled
RC Channel Options	`RC8_OPTION`	`0`	Disabled

Mount RC Mapping	`MNT_RC_IN_PAN`	`6`	PAN/TILT move (assigned to RC channel 6)
Mount RC Mapping	`MNT_RC_IN_ROLL`	`7`	Zoom control (High = Zoom In, Neutral = Stop, Low = Zoom Out)
Mount RC Mapping	`MNT_RC_IN_TILT`	`8`	Axis select (assigned to RC channel 8)
Mount Settings	`MNT_TYPE`	`4` (`SToRM32 MAVLINK`)	Set gimbal mount type to SToRM32 MAVLink

Data Stream Rate Settings (Telemetry 2)

To receive essential positioning and status information:

- `SR2_POSITION` = `10` → **GPS Position**
- `SR2_EXT_STAT` = `2` → **GPS Lock Status**

GPS Configuration via CAN

If using a UAVCAN GPS unit:

CAN Port Driver Enable

- `CAN_P1_DRIVER` = `1` → **Enable CAN1**
- `CAN_P2_DRIVER` = `1` → **Enable CAN2**

GPS Type Selection

- `GPS_TYPE` = `9` → **UAVCAN GPS**

Notification LED Settings

- `NTF_LED_TYPES` = `231` → **Enable Standard Notification LEDs**

SETUP WITH PX4

Parameter Setup

- Version: update to the latest version.
- Support Mavlink v2 protocol

Parameter	Value	Description
Firmware Version	Latest	Required for MAVLink v2 support and gimbal features
MAV_1_CONFIG	TELEM2	Assign MAVLink instance 1 to telemetry port 2 (TELEM2)
SER_TEL2_BAUD	115200 8N1	Set TELEM2 baud rate to 115200, 8 data bits, no parity, 1 stop bit
MAV_1_FORWARD	1	Enable forwarding of MAVLink messages
MNT_MODE_IN	RC	Mount input mode: manual control via RC channels
MNT_MODE_OUT	2	Mount output mode (specific to hardware/protocol)
MNT_RC_IN_MODE	1	RC input mode: angular control
MNT_MAN_PITCH	AUX3	Manual control for pitch (tilt) assigned to AUX3
MNT_MAN_ROLL	AUX2	Manual control for roll (zoom) assigned to AUX2
MNT_MAN_YAW	AUX1	Manual control for yaw (pan) assigned to AUX1
RC_MAP_AUX1	Channel 6	Maps RC channel 6 to AUX1 (yaw control)

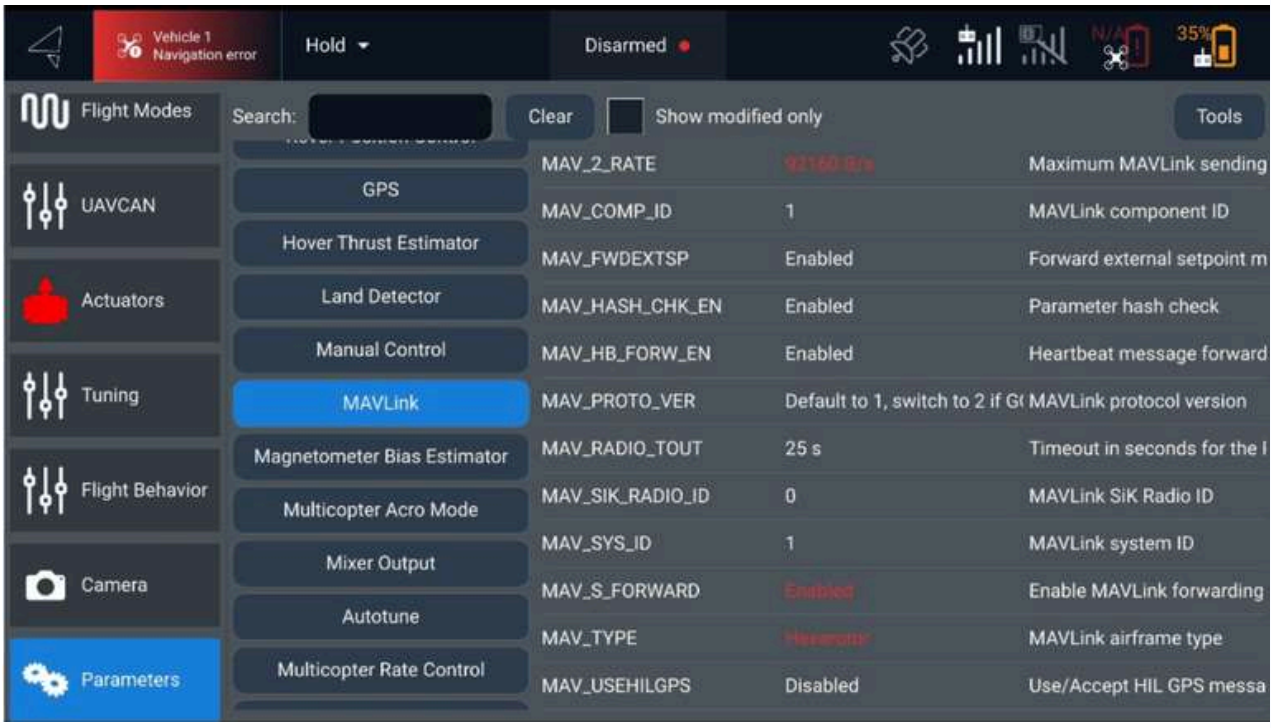
RC_MAP_AUX2	Channel 7	Maps RC channel 7 to AUX2 (zoom control)
RC_MAP_AUX3	Channel 8	Maps RC channel 8 to AUX3 (pitch control)
COM_RC_IN_MODE	3	RC input mode blending (e.g., RC + MAVLink)

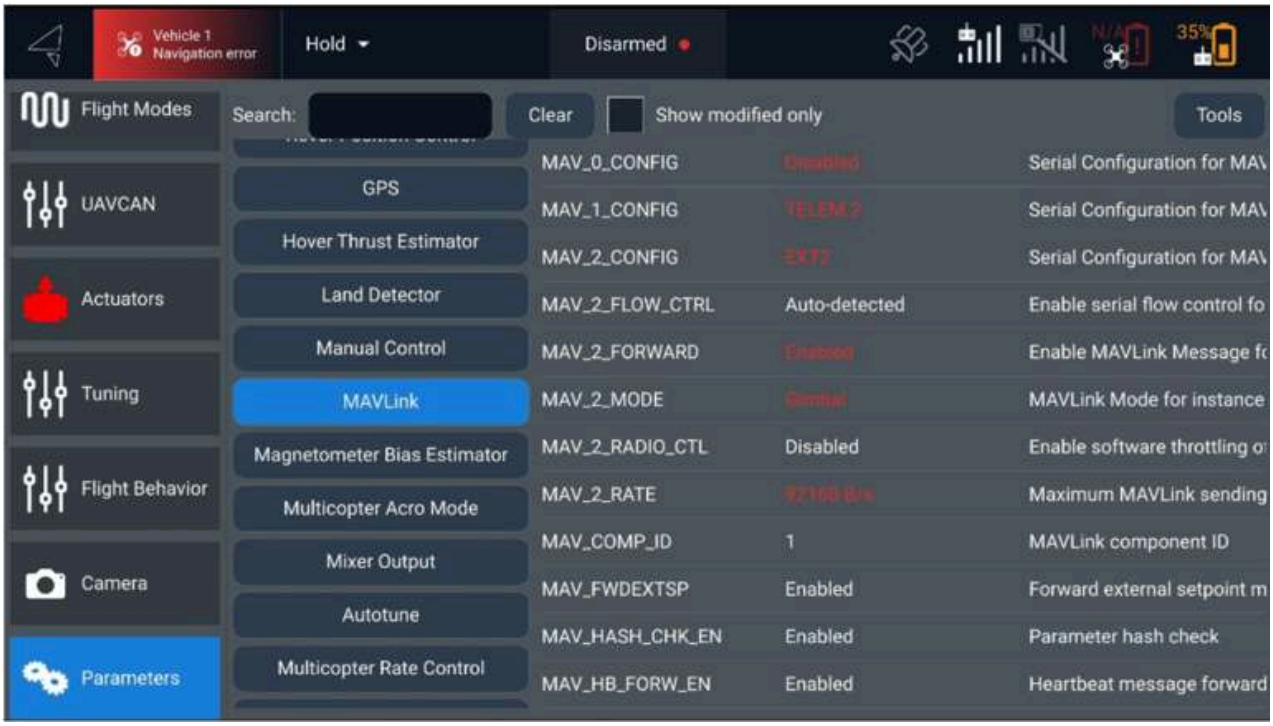
SETUP WITH SKYNODE

Parameter Settings

In the **Advanced** menu, adjust the **MAVLink** settings as needed.

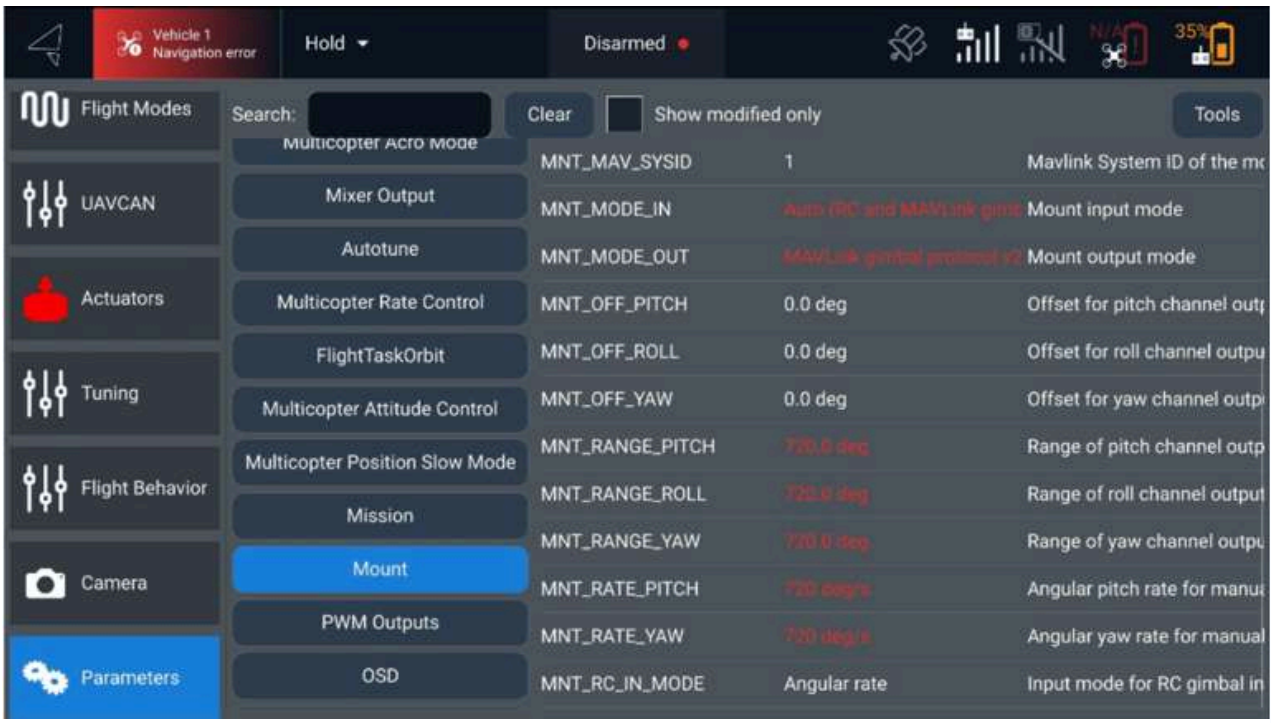
No.	Parameters	Settings
1	MAV_0_CONFIG	Disabled
2	MAV_1_CONFIG	TELEM 2
3	MAV_2_CONFIG	EXT2
4	MAV_2_FORWARD	Enabled
5	MAV_2_MODE	Gimbal
6	MAV_2_RATE	92160 B/s
7	MAV_S_FORWARD	Enabled
8	MAV_TYPE	Hexarotor

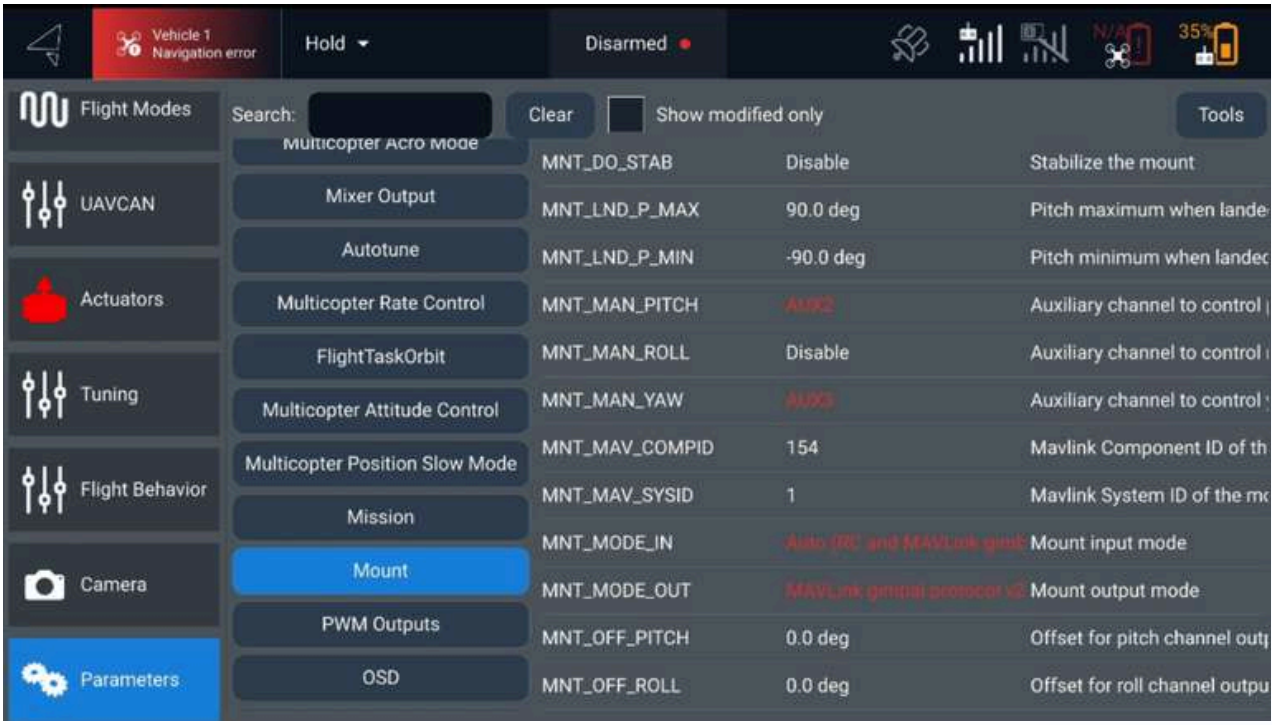




Switch to the **Mount** section to continue configuring other parameters.

No.	Parameters	Settings
1	MNT_MODE_IN	Auto (RC and MAVLink gimbal Protocol V2)
2	MNT_MODE_OUT	MAVLink gimbal protocol V2
3	MNT_RANGE_PITCH	720.0 deg
4	MNT_RANGE_ROLL	720.0 deg
5	MNT_RANGE_YAW	720.0 deg
6	MNT_RATE_PITCH	720.0 deg
7	MNT_RATE_YAW	720.0 deg
8	MNT_MAN_PITCH	AUX2
9	MNT_MAN_YAW	AUX3
10	MNT_MODE_IN	Auto (RC and MAVLink gimbal Protocol V2)
11	MNT_MODE_OUT	MAVLink gimbal protocol V2


Vehicle 1
Navigation error
Hold
Disarmed
35%
Flight Modes
UAVCAN
Actuators
Tuning
Flight Behavior
Camera
Parameters
Search:
Clear
Show modified only
Tools
Multicopter Acro Mode
Mixer Output
Autotune
Multicopter Rate Control
FlightTaskOrbit
Multicopter Attitude Control
Multicopter Position Slow Mode
Mission
Mount
PWM Outputs
OSD
MNT_MAV_SYSID 1 Mavlink System ID of the mo
MNT_MODE_IN Mount input mode
MNT_MODE_OUT Mount output mode
MNT_OFF_PITCH 0.0 deg Offset for pitch channel outp
MNT_OFF_ROLL 0.0 deg Offset for roll channel outpu
MNT_OFF_YAW 0.0 deg Offset for yaw channel outp
MNT_RANGE_PITCH Range of pitch channel outp
MNT_RANGE_ROLL Range of roll channel output
MNT_RANGE_YAW Range of yaw channel outpu
MNT_RATE_PITCH Angular pitch rate for manu
MNT_RATE_YAW Angular yaw rate for manual
MNT_RC_IN_MODE Angular rate Input mode for RC gimbal in


Vehicle 1
Navigation error
Hold
Disarmed
35%
Flight Modes
UAVCAN
Actuators
Tuning
Flight Behavior
Camera
Parameters
Search:
Clear
Show modified only
Tools
Multicopter Acro Mode
Mixer Output
Autotune
Multicopter Rate Control
FlightTaskOrbit
Multicopter Attitude Control
Multicopter Position Slow Mode
Mission
Mount
PWM Outputs
OSD
MNT_DO_STAB Disable Stabilize the mount
MNT_LND_P_MAX 90.0 deg Pitch maximum when lande
MNT_LND_P_MIN -90.0 deg Pitch minimum when landec
MNT_MAN_PITCH Auxiliary channel to control
MNT_MAN_ROLL Disable Auxiliary channel to control
MNT_MAN_YAW Auxiliary channel to control
MNT_MAV_COMPID 154 Mavlink Component ID of th
MNT_MAV_SYSID 1 Mavlink System ID of the mo
MNT_MODE_IN Mount input mode
MNT_MODE_OUT Mount output mode
MNT_OFF_PITCH 0.0 deg Offset for pitch channel outp
MNT_OFF_ROLL 0.0 deg Offset for roll channel outpu

PAYLOAD SETTING

ORUS L and other gremsy payload compliance with the Mavlink protocol v2 and support for the payload settings over Mavlink telementry.

It could be integrate/embedded to the autopilot software such as Qground Control easily by manual or auto (with internet access in the first time connect).

Note: If you're running the customize software, you may need to customize the payload menu settings UI by using Payload SDK for call the API.

Payload Definition File Download

1. Manual

Download the suitable with your sofware version here:
https://github.com/Gremsy/Orus-L-Camera-Definition/releases ↗

Install to the Software Camera Settings folder

E.g: Qground control

2. Auto

Connect the Ground Station/Remote which is running the software to the internet.

Enable the Camera defination to "Auto"

Then the payload settings will be auto download and install to your device

Payload Settings Menu

ORUS-L NDDA

Parameter	Options	Default
Camera Mode	Photo, Video	Video
Tracking Mode	Object Tracking, Object Detection	Object Tracking
OSD Mode	Disable, Debug, Status	Disable
RC Mode	Gremsy, Standard	Gremsy
Setting Target	Camera Device, Gimbal Device	Camera Device
Video View Source	EO/IR, Only EO, Only IR, IR/EO, SYNC	EO/IR
Video Record Source	Both EO/IR, Only EO, Only IR, Only OSD	Both EO/IR
IR Palette	WhiteHot, BlackHot, Rainbow, RainbowHC, Ironbow, Lava, Arctic, Globow, Gradedfire, Hottest	WhiteHot
IR Zoom	1x to 8x	1x
EO Zoom Mode	Combine, Super Resolution	Combine
EO Combine Zoom	1x, 10x, 20x, 40x, 80x, 120x, 240x	1x
EO Super Resolution Zoom	1x to 30x	1x
EO Flip	OFF, ON	OFF
EO Defog Mode	OFF, ON	OFF
EO Defog Level	Lowest, Low, Mid, High	Lowest

EO Auto Exposure Mode	Full Auto, Manual, Shutter Priority, Iris Priority, Bright	Full Auto
EO Shutter Value	1/10 to 1/2000	1/10
EO Aperture Value	F2.0 to F11	F2.0
EO Brightness Value	0 to 41	0
EO WB Mode	Auto, Indoor, Outdoor, One Push WB, ATW, Manual	Auto
EO Focus Mode	Manual, Auto Zoom Trigger, Auto Focus Near, Auto Focus Far	Manual
EO Focus Value	0 to 61440	0
EO AutoICR Mode	Auto, Manual	Auto
EO ICR Mode	On, Off	On
EO ICR Threshold	0 to 255	0
EO Image Stabilizer Level	Super, Super+	Super
EO Image Stabilizer	Hold, On, Off	On
EO High Sensitivity	On, Off	On
Gimbal Mode	OFF, LOCK, FOLLOW, MAPPING, RETURN HOME	OFF
LRF Mode	OFF, 1 Hz, 4 Hz, 10 Hz	OFF

ORUS-L STANDARD

Description	Options	Default
Camera Mode	Photo, Video	Video
Tracking Mode	Object Tracking, Object Detection	Object Tracking

OSD Mode	Disable, Debug, Status	Disable
RC Mode	Gremsy, Standard	Gremsy
Setting Target	Camera Device, Gimbal Device	Camera Device
Video View Source	EO/IR, Only EO, Only IR, IR/EO, SYNC	EO/IR
Video Record Source	Both EO/IR, Only EO, Only IR, Only OSD	Both EO/IR
IR Palette	WhiteHot, Fulgurite, IronRed, HotIron, Medical, Arctic, Rainbow1, Rainbow2, Tint, BlackHot	WhiteHot
IR Zoom	1x, 2x, 3x, 4x, 5x, 6x, 7x, 8x	1x
EO Zoom Mode	Combine, Super Resolution	Combine
EO Combine Zoom	1x, 10x, 20x, 40x, 80x, 120x, 240x	1x
EO Super Resolution Zoom	1x to 30x (various steps)	1x
EO Flip	OFF, ON	OFF
EO Defog Mode	OFF, ON	OFF
EO Defog Level	Lowest, Low, Mid, High	Lowest
EO Auto Exposure Mode	Full Auto, Manual, Shutter Priority, Iris Priority, Bright	Full Auto
EO Shutter Value	1/10 to 1/2000 (various values)	1/10
EO Aperture Value	F2.0 to F11 (various steps)	F2.0
EO Bright Value	Adjustable (0 to max)	0
EO White Balance Mode	Auto, Indoor, Outdoor, One Push WB, ATW, Manual	Auto
EO Focus Mode	Manual, Auto Zoom Trigger, Auto Focus Near, Auto	Manual

	Focus Far	
EO Focus Value	Adjustable focus value	Default
EO AutoICR Mode	Auto, Manual	Manual
EO ICR Mode	On, Off	Off
EO ICR Threshold	Adjustable (0 to max)	Default
EO Image Stabilizer Level	Super, Super+	Super
EO Image Stabilizer	Hold, On, Off	Off
EO High Sensitivity	On, Off	Off
Gimbal Mode	OFF, LOCK, FOLLOW, MAPPING, RETURN HOME	OFF
LRF Mode	OFF, 1 Hz, 4 Hz, 10 Hz	OFF

COMPANION COMPUTER FOR UAV & ROBOTICS PLATFORM

1. System Overview Diagram

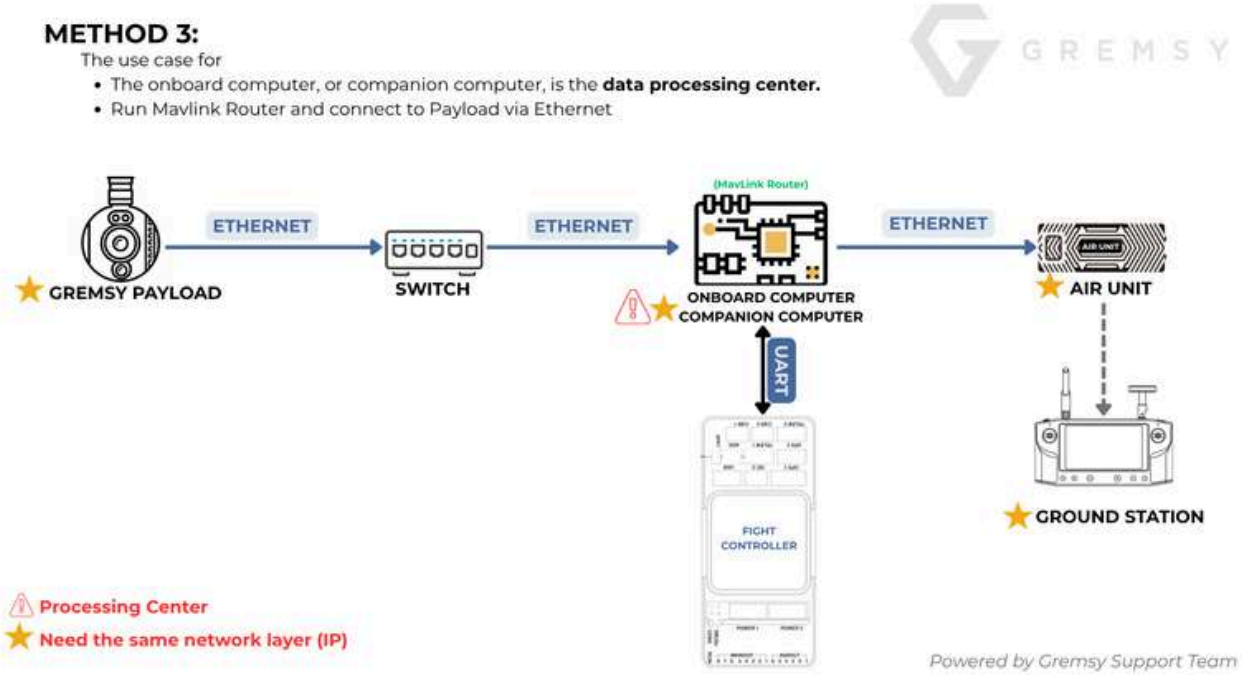
```
Companion / Onboard Computer (Jetson / RPi / NUC)
     ├── [UDP via Ethernet or UART] → Orus L Control (Payload SDK)
     ├── [RTSP Stream] ← Orus L Camera Output
     └── [Optional] → Flight Controller (MAVLink)
```

---

2. Hardware Connection

Option A: Ethernet (Recommended)

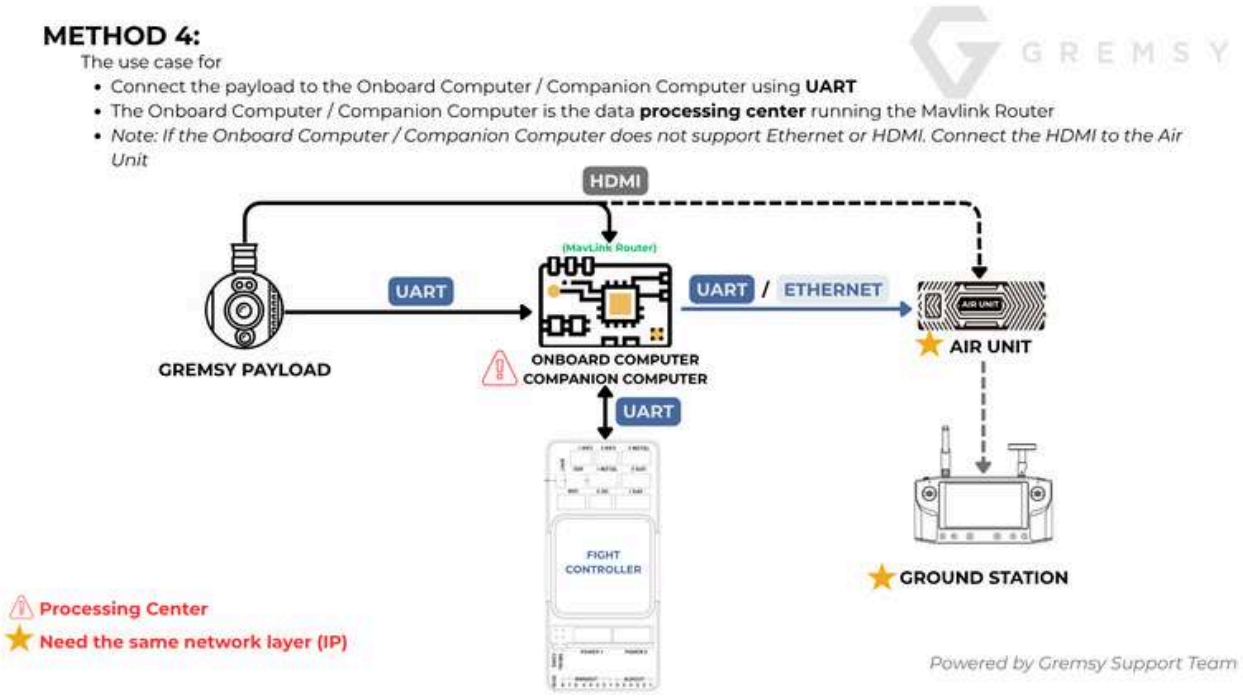
- Connect Orus L's Ethernet port to the onboard computer's Ethernet port (or via USB-C to Ethernet adapter)



Option B: UART (Alternative)

- Connect UART TX/RX lines from Orus L to onboard serial port

- Ensure proper logic level (3.3V TTL)



Optional:

- Connect Flight Controller (Pixhawk) via separate UART for MAVLink passthrough if needed

---

3. Software Setup: Gremsy Payload SDK (v3)

A. Install SDK (Python version)

```
# Clone the SDK
git clone -b payloadsdk_v3 https://github.com/Gremsy/PayloadSdk.git
cd PayloadSdk/python

# Install dependencies
pip install -r requirements.txt
```

B. Initialize SDK and Connect

```
from payloadsdk import GremsySDK

# Create SDK instance and connect via Ethernet (UDP)
sdk = GremsySDK(protocol='udp', target_ip='192.168.12.249',
target_port=14566)

# Or connect via UART
# sdk = GremsySDK(protocol='serial', serial_port='/dev/ttyUSB0',
baudrate=115200)

sdk.connect()
```

C. Send Basic Commands

```
# Move gimbal to specific angles
sdk.gimbal_control.set_angle(pitch=0.0, roll=0.0, yaw=90.0)

# Start/Stop video recording
sdk.camera_control.set_recording(True)

# Set gimbal mode
sdk.gimbal_control.set_mode('lock')
```

---

4. RTSP Video Streaming

- Use VLC or OpenCV to access the video stream:

```
rtsp://192.168.12.249:8554/payload
```

- Example with OpenCV:

```
import cv2
cap = cv2.VideoCapture('rtsp://192.168.12.249:8554/payload')

while True:
    ret, frame = cap.read()
    if ret:
        cv2.imshow("Orus L Stream", frame)
    if cv2.waitKey(1) == 27:
        break
cap.release()
cv2.destroyAllWindows()
```

---

5. Optional: Integration with MAVLink and Flight Controller

- If a flight controller is present, you can:
  - Forward MAVLink commands from Pixhawk to Orus L (mount_control)
  - Synchronize gimbal with autopilot commands
- Requires proper UART bridge and time sync if needed

---

6. Use Cases

- Onboard AI/ML target detection and autonomous gimbal pointing
- GPS-denied or tethered drone operations
- Ground robot (UGV) with 3-axis PTZ camera functionality
- Inspection and defect detection robots with onboard processing

DETAILED PAYLOAD SDK

GREMSY PAYLOAD SDK ›