
Gimbal 10z Hardware Manual

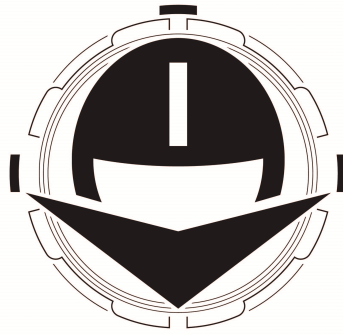
Release 2.0

Embention

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10z | **VERONTE**
GIMBAL CAMERAS

Veronte Gimbal 10z is an articulated camera to capture visible and infrared images from moving vehicles.

Warning: Select your version before reading any user manual. The following image shows where to select a version from any Embention user manual.

The screenshot shows the Embention user manual website. The top navigation bar includes links for Home, Version-4.8, Languages-EN, and Download. A dropdown menu is open under 'Version-4.8', showing options for 4.5 and 4.8. A red arrow points from the dropdown menu to the Veronte logo on the page. The page content includes the title '1x Hardware Manual', the Veronte logo, and the text 'Veronte Autopilot 1x is a miniaturized high reliability avionics system for advanced control of unmanned systems.' Below this, the version and date are listed: 'Version: UM.305.4.8' and 'Date: 2023-11-24'.

INTRODUCTION



Fig. 1: Veronte Gimbal 10z

Veronte Gimbal 10z is a camera installed on a gyro-stabilized platform, whose sensors and servos allow an accurate aim.

10z is designed for aerial platforms (i.e. helicopters or quadcopters), however, it can be installed in other types of vehicle like ships.

Applications:

- Border control
- Law enforcement
- Surveillance
- Defence
- Agriculture
- Wildlife control

QUICK START

Veronte Gimbal 10z is moved and visualized using a **Veronte Autopilot 1x**. The **Autopilot 1x** that controls the aircraft can be configured to control and visualize **Gimbal 10z** cameras.

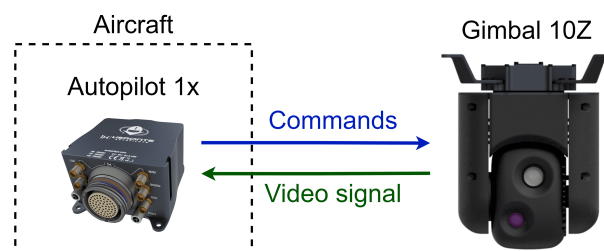


Fig. 1: System Overview

First of all, configure the **Autopilot 1x** according to the *Software installation section* , then the *Hardware installation section* provides instructions on how to physically install the **Gimbal 10z**.

2.1 Requirements

- A **Veronte Autopilot 1x** to command and visualize **10z**.
- Power supply of 24 V DC.
- **Veronte Gimbal 10z** has not an internal resistor for CAN bus, in case that the **Gimbal** is at the end of the bus, please place a 120 Ω resistor externally
- A device with ethernet port to receive video signals.
- A frame with four screwed holes for M4 screws, read *Mechanical Assembly* for more information.

3.1 Features

- **IR camera** (only available for variant with this camera)
- **Visible HD camera** with 10x optical zoom
- **Video processing** with computer vision
- **Video Streaming** via ethernet
- **Auto Stabilization**

3.2 Variants

- **10z DC:** with visible light and IR camera.
- **10z SC:** only with visible light camera.

3.3 Camera Specifications

3.3.1 IR camera

- **Sensor**
 - Thermal imaging detector: Uncooled VOx microbolometer
 - Pixel size: 12 μm
 - NEDT: <50mk
 - Thermal spectral range: longwave infrared (7.5 μm - 13.5 μm)
 - Scene temperature range: to 140 °C (high gain) to 500 °C (low gain)
- **Video output**
 - Frame rate: 9 Hz
 - Resolution: 320 X 256
- Digital zoom: 8 x
- Integral solar protection

- HFOV: 16°
- Focal length: 13.8 mm

3.3.2 Visible light camera

- **Sensor**
 - Type: 1/3-type CMOS (Progressive Scan)
 - Effective number of pixels: aprox. 4,080,000
- **Zoom**
 - Optical zoom: 10 x
 - Zoom movement speed: 1.4 sec.
 - Horizontal viewing angle: 58.2 to 6.9 °
 - Minimum object distance: 100 to 800 mm
- Resolution: 720p
- Vibration compensation: clear images are obtained even with vibration, this feature is more appreciable at long range.
- Defog: in adverse weather conditions, the image is retouched so that objects and people are identifiable.
- Noise reduction: image noise (unwanted random variation of brightness or colour information) is reduced with a minimal reduction of image quality.
- Privacy zone masking: configured image areas are excluded from monitoring.
- Picture freeze.
- Electronic flip: if a target moves underneath the camera the image will be upside. In this case, The Electronic flip detects the position of the camera and automatically flips the image to the correct orientation so that it will always appear the right-side-up.
- Title display.
- Wide dynamic range: it balances the light to produce clear images, capturing both the light and dark areas at the same time.

3.4 Electrical and mechanical Specifications

Specification	Value	
Power consumption	Average: 15 W. Maximum: 60 W	
Humidity range	20 to 80 %	
Temperature range	-5 to 55 °C	
Weight	With IR camera	1 kg
	Without IR camera	0.9 kg

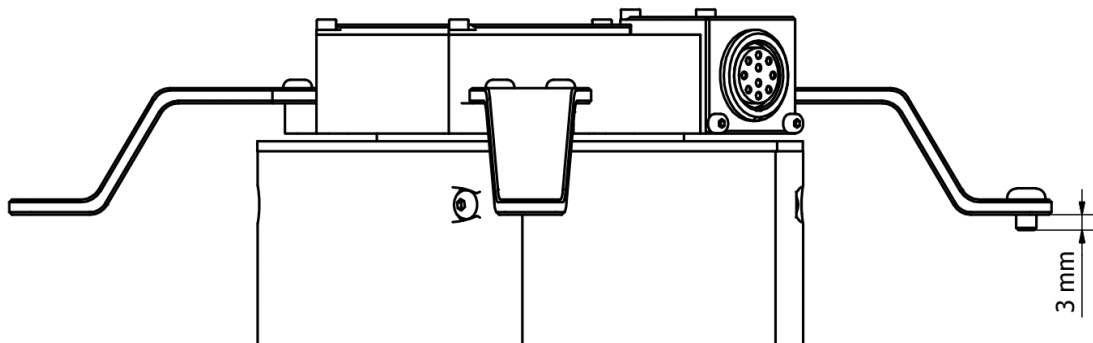
3.5 Mating connector

Gimbal 10z has an electrical connector for all wires. This connector is a female **EGG.2B.310.CLL** from Lemo. A matching male connector is required, we recommend **FGG.2B.310.CLAD62Z** from Lemo.

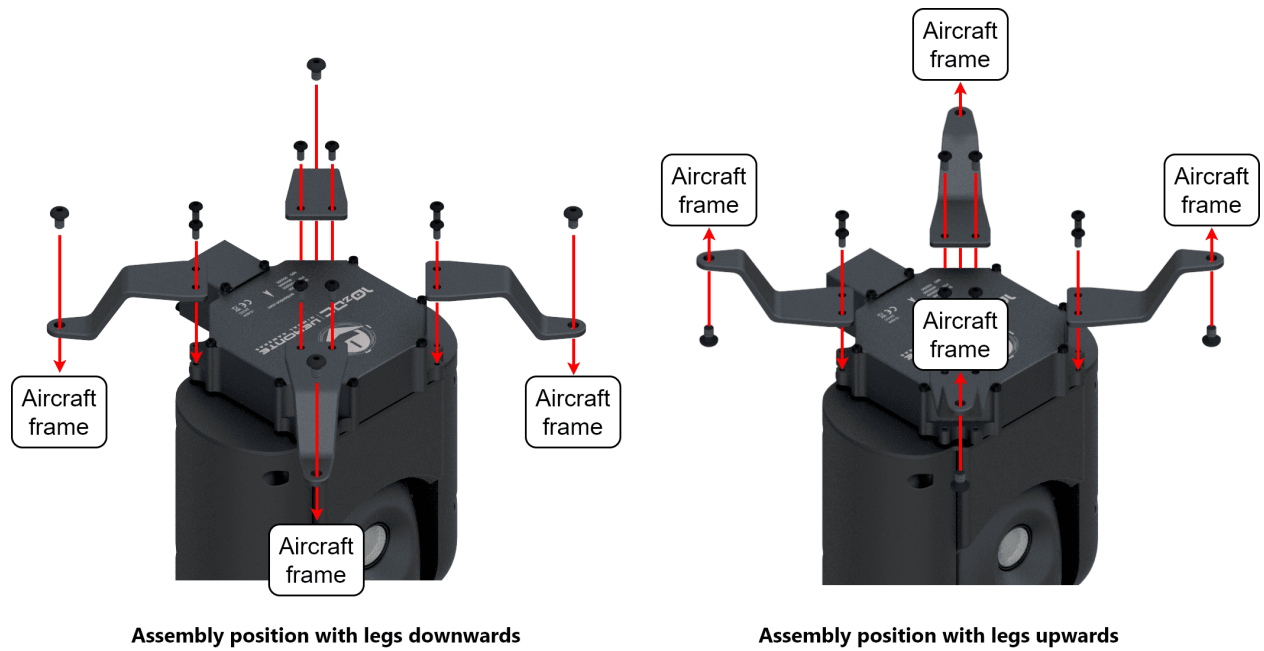
HARDWARE INSTALLATION

4.1 Mechanical Assembly

Veronte Gimbal 10z is fixed to the vehicle with four legs and included M4 screws. Each screw protrudes 3 mm from its leg, so the vehicle requires four screwed holes with 3 mm of minimum depth. Take a look to *dimensions* to know the distribution of holes and **10z** dimensions.



There are two ways to assembly **10z** to the vehicle according to the legs position.



In addition, it can be mounted under or over the vehicle.

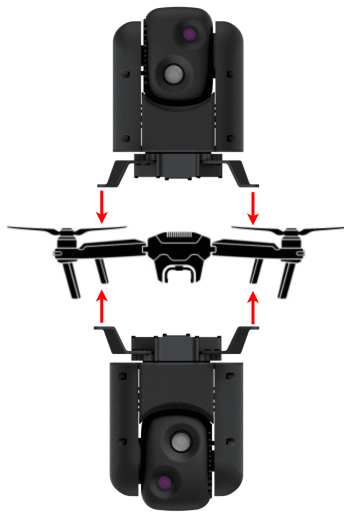


Fig. 1: Assembly diagram

4.1.1 Dimensions

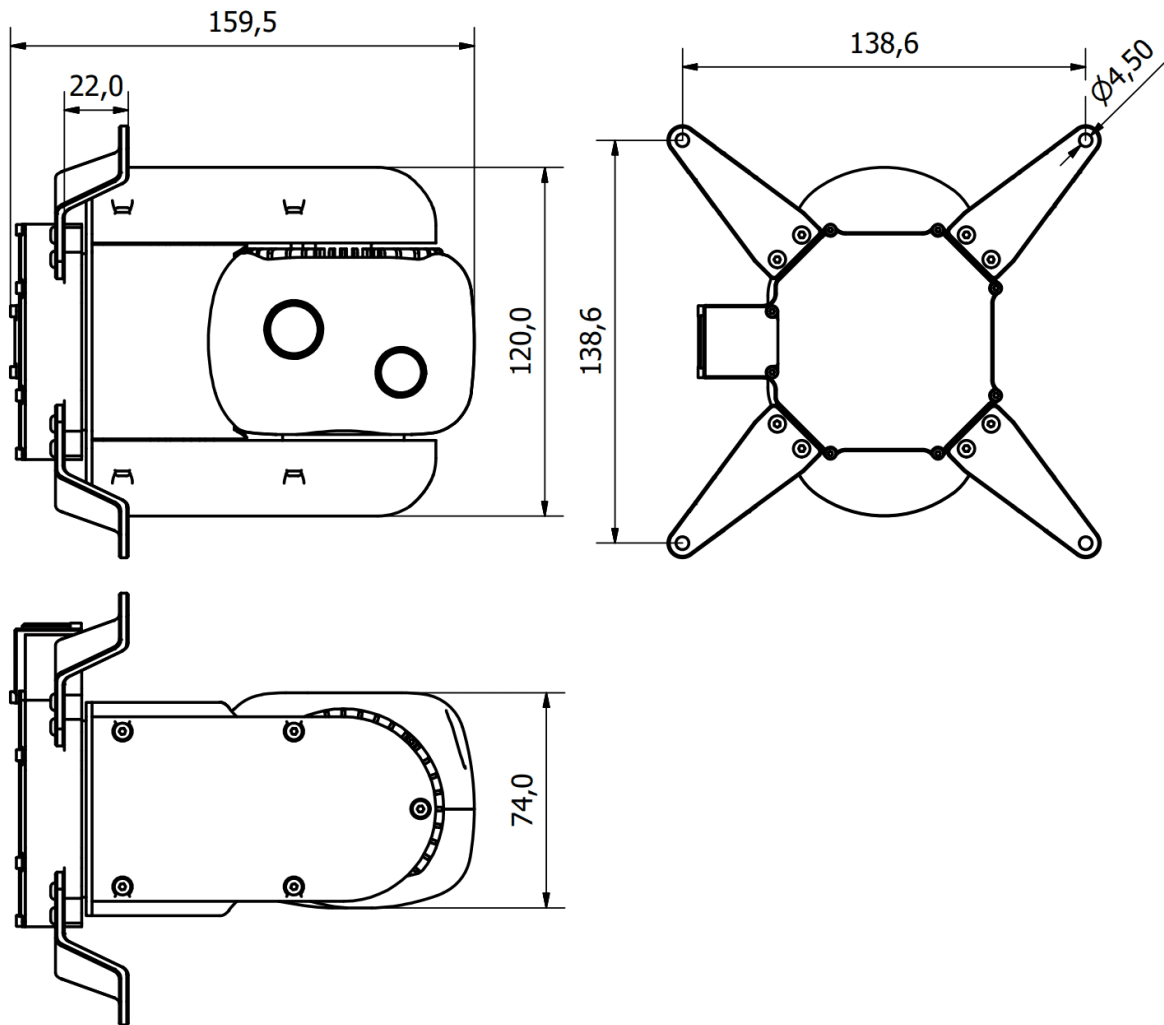


Fig. 2: 10z dimensions (mm)

4.2 Electrical

4.2.1 Pinout

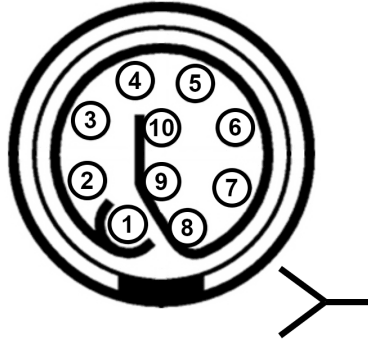


Fig. 3: Gimbal 10z connector pinout - EGG.2B.310.CLL

Pin	Abbreviation	Name	Function
1	24 V	24 volts input	Input power supply (24 V DC)
2	GND	Ground	Ground
3	CAN H	CAN high	CAN communications to control cameras
4	CAN L	CAN low	
5	NO CONNECT		
6			
7	TDX+	Transmit data +	Ethernet connection for video signals
8	TDX-	Transmit data -	
9	RDX+	Receive data +	
10	RDX-	Receive data -	

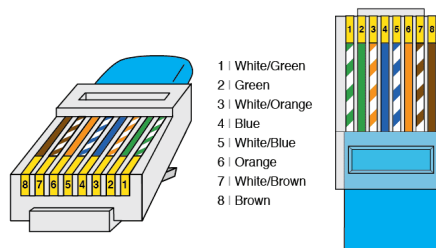


Fig. 4: RJ45 T-568A pinout

Pin	Colour	Function
1	White/Green	Transmit data +
2	Green	Transmit data -
3	White/Orange	Receive data +
6	Orange	Receive data -

4.2.2 CAN bus assembly

A resistor is required at each end of the CAN line. Nonetheless, **Gimbal 10z** does not include an internal resistor for CAN ($120\ \Omega$), then both resistors may be placed on cable or PCB.

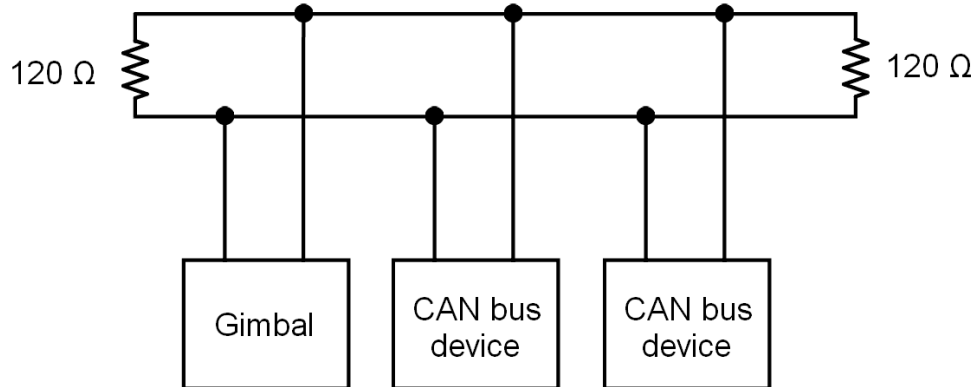


Fig. 5: CAN assembly diagram example

Veronte Autopilot 1x includes a CAN resistor, so it is only required one more to build a CAN line.

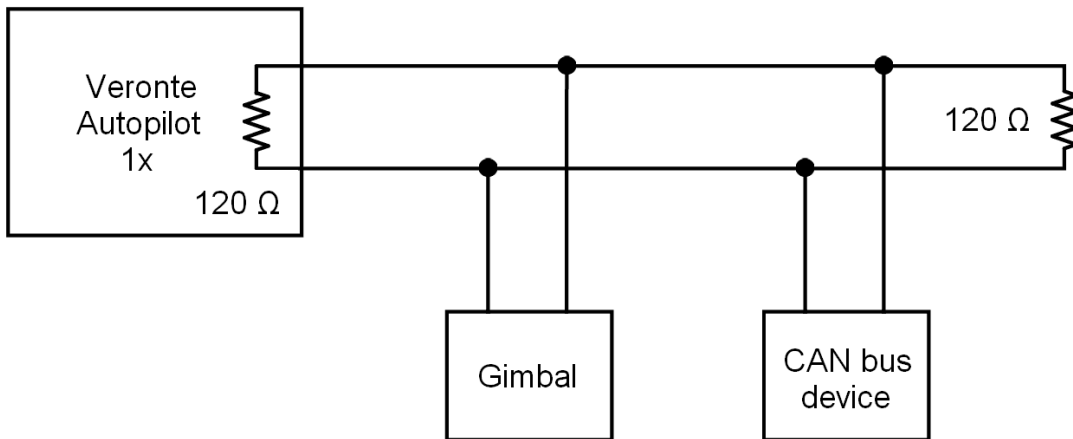


Fig. 6: CAN assembly diagram example with 1x

SOFTWARE INSTALLATION

Veronte Gimbal 10z is moved and visualized using a **Veronte Autopilot 1x**. Hence, the configuration is done in the **Autopilot 1x**

To configure the **Autopilot 1x**, it is required a connection with a computer. There are two ways to make the connection between a computer and **Veronte Autopilot 1x**: via USB or RS (232 or 485) with a converter RS-USB.

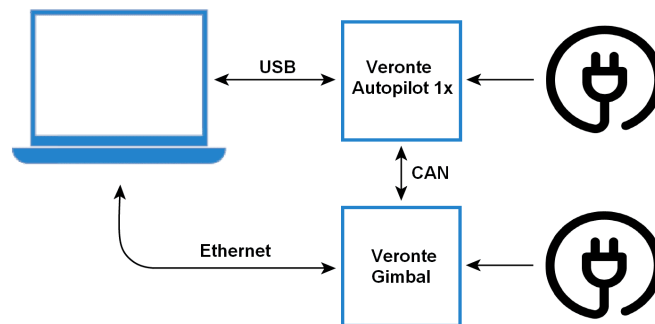


Fig. 1: USB connection

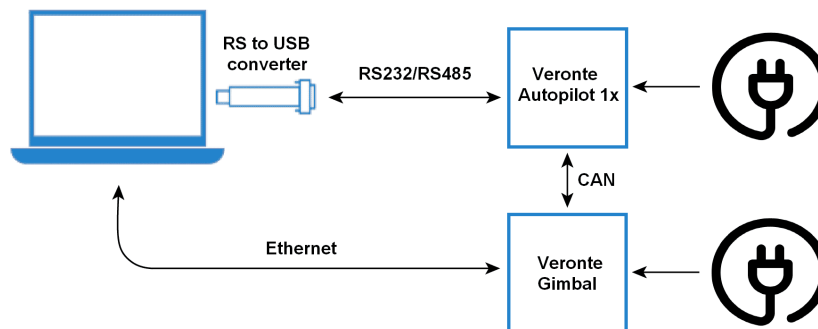


Fig. 2: Serial connection

To know which pins are employed for each connection, read the [pinout of Autopilot 1x](#) and the [pinout of Gimbal 10z](#).

To install the required software and configure **Autopilot 1x** for **Gimbal 10z**, read the [Gimbal Software Manual](#).

MAINTENANCE

6.1 Preventive maintenance

Apart from cleaning, no extra maintenance is required to guarantee the correct operation of the **Veronte Gimbal 10z**.

In order to clean **Gimbal 10z** properly follow the next recommendations:

- Turn off the device before cleaning.
- Use a clean, soft, damp cloth to clean the unit.
- Do not immerse the unit in water to clean it.

TROUBLESHOOTING

7.1 Optical zoom is not configured correctly

In this case, the user should contact the support team to remotely configure the zoom.

Note: To contact the support team for any question, create a ticket in the customer's **Joint Collaboration Framework**. For more information, see [Tickets section](#) of the JCF manual.

ACRONYMS AND DEFINITIONS

CMOS	Complementary Metal Oxide Semiconductor
DC	Dual Camera
HD	High definition
HFOV	Horizontal Field Of View
IR	InfraRed
NEDT	Noise Equivalent Differential Temperature
PCB	Printed Circuit Board
SC	Single Camera
V DC	Voltage Direct Current
VOx	Vanadium Oxide

CONTACT DATA

You can contact Embention if you need further help and support.

Embention contact data is as follows:

Email: support@embention.com

Telephone: (+34) 965 421 115

Address: [Polígono Industrial Las Atalayas, C/ Chelín, Nº 16, CP 03114, Alicante \(España\).](#)