Gimbal 30z Hardware Manual

Release 1.0

Embention

2024-03-13

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Veronte Gimbal 30z 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.

CHAPTER

ONE

INTRODUCTION

Fig. 1: **Veronte Gimbal 30z**

Veronte Gimbal 30z is a camera installed on a gyro-stabilized platform, whose sensors and servos allow an accurate aim.

30z is designed for aerial platforms (for example 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

CHAPTER

TWO

QUICK START

Veronte Gimbal 30z is moved and visualized using a **Veronte Autopilot 1x**. The **Autopilot 1x** that controls the aircraft can be configured to control and visualize **Gimbal 30z** cameras.

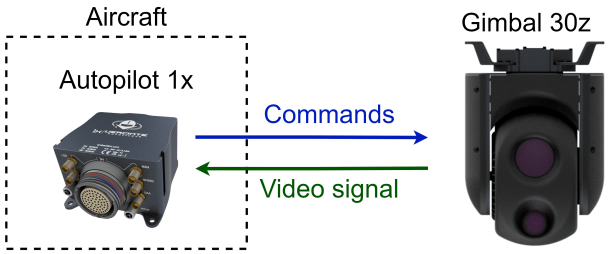


Fig. 1: **System Overview**

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 30z**.

2.1 Requirements

- A **Veronte Autopilot 1x** to command and visualize **30z**.
- Power supply of 24 V DC.
- **Veronte Gimbal 30z** 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.

CHAPTER

THREE

TECHNICAL

3.1 Features

- **IR camera** (only available for variant with this camera)
- **Visible HD camera** with 30x optical zoom
- **Video processing** with computer vision
- **Video Streaming** via ethernet
- **Long distance detection**
- **Auto Stabilization**

3.2 Variants

- **30z DC:** with visible light and IR camera.
- **30z 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
- **Video output**
  - Frame rate: 9 Hz
  - Resolution: 640 x 512
- Digital zoom: 8 x
- Thermal spectral range: longwave infrared (8 μm - 14 μm)
- Scene temperature range: to 140 °C (high gain) to 500 °C (low gain)
- Integral solar protection

3.3.2 Visible light camera

- **Sensor**
  - Type: 1/2.8-type 2M STARVISTM
  - 2.13 Megapixels
- **Zoom**
  - Optical zoom: 30 x
  - Digital zoom: 12 x (360 x combined with optical zoom)
  - Zoom movement time: 1.4 sec.
  - HFOV angle: 63.7º
- Resolution: 720p
- Defog: in adverse weather conditions, the image is retouched so that objects and people are identifiable.
- High light compensation: it compensates the brighter parts of pictures, preserving details that would otherwise be blown out.
- Wide dynamic range: it balances the light to produce clear images, capturing both the light and dark areas at the same time.
- Image stabilizer: it reduces blur caused by the camera movement.
- Auto IR-cut filter removal: shutter that blocks light in the IR spectrum to enable true color reproduction.
- Spherical privacy zone masking: configured image areas are excluded from monitoring.
- Noise reduction: image noise (unwanted random variation of brightness or colour information) is reduced with a minimal reduction of image quality.

3.4 Electrical and mechanical Specifications

Specification		Value
Power consumption		Average: 20 W. Maximum: 70 W
Humidity range		20 to 80 %
Temperature range		-5 to 55 ºC
Weight	With IR camera	1.6 kg
	Without IR camera	1.5 kg

3.5 Mating connector

Gimbal 30z 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.

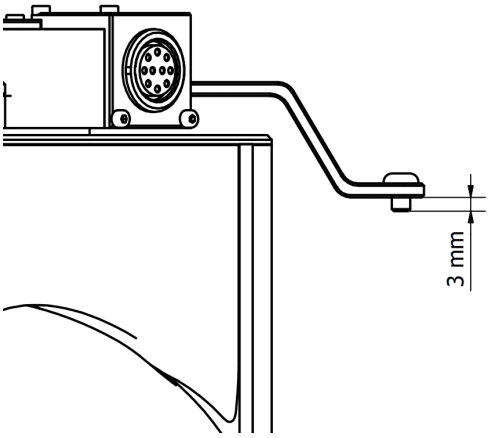
CHAPTER

FOUR

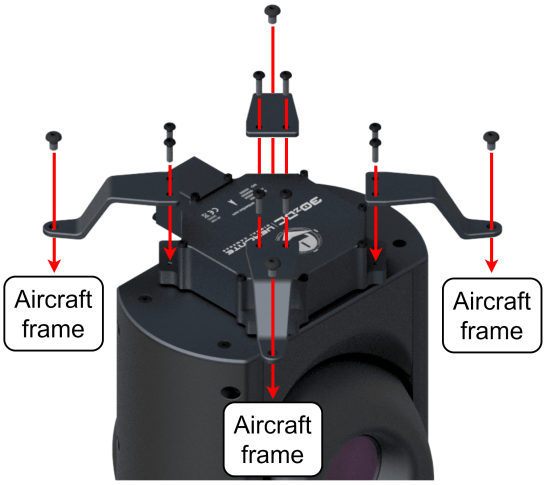
HARDWARE INSTALLATION

4.1 Mechanical Assembly

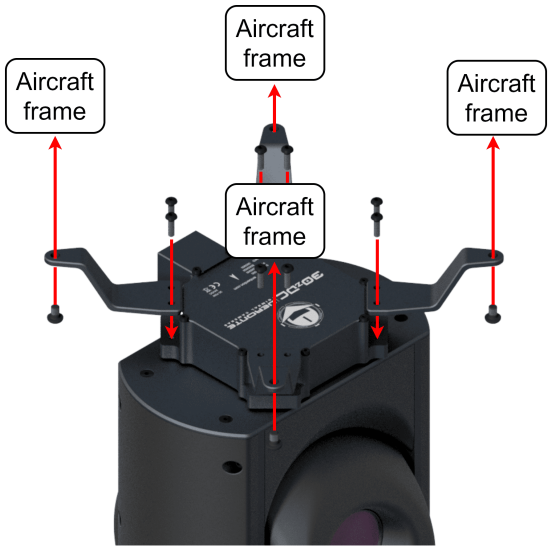
Veronte Gimbal 30z is fixed to the vehicle with four legs and included M4 screws. Each screw protrudes 3 mm from its leg, so the vehicle requires four screwed holes with 3 mm of minimum depth. Take a look to *dimensions* to know the distribution of holes and **30z** dimensions.



There are two ways to assembly **30z** to the vehicle according to the legs position.



Assembly position with legs downwards



Assembly position with legs upwards

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

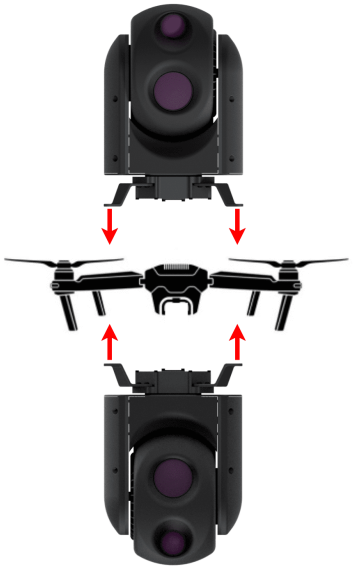


Fig. 1: **Assembly diagram**

4.1.1 Dimensions

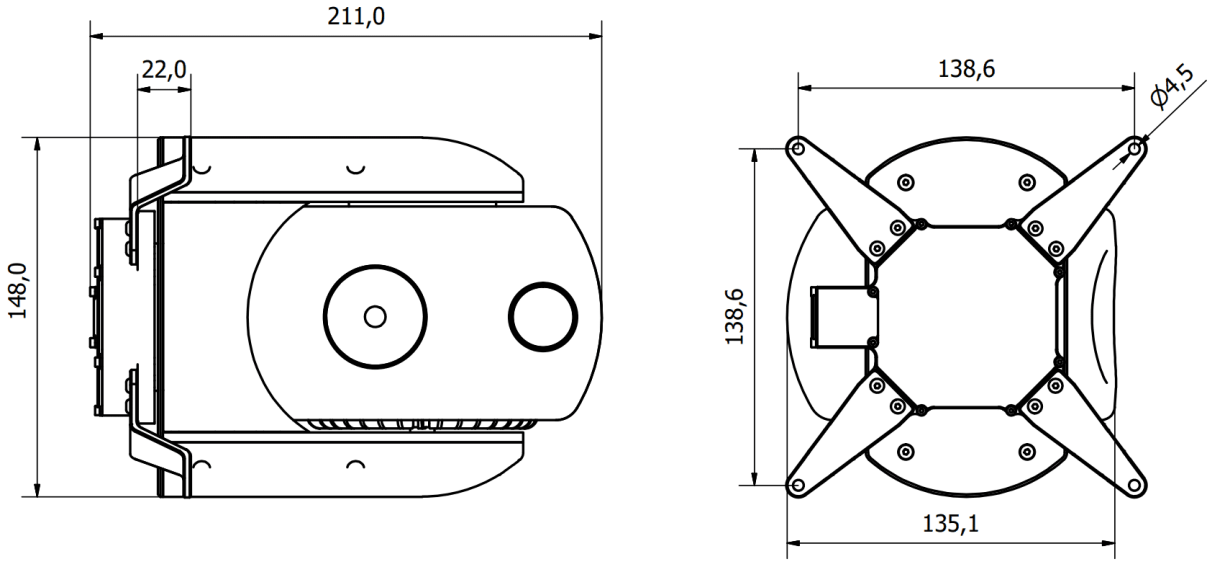


Fig. 2: **30z dimensions (mm)**

4.2 Electrical

4.2.1 Pinout

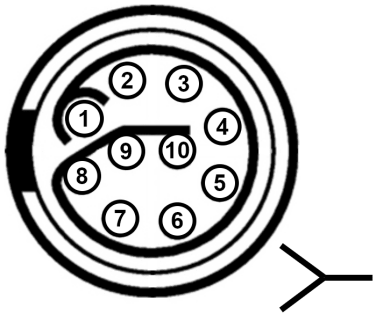


Fig. 3: **Gimbal 30z connector pinout - EGG.2B.310.CLL**

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 -	

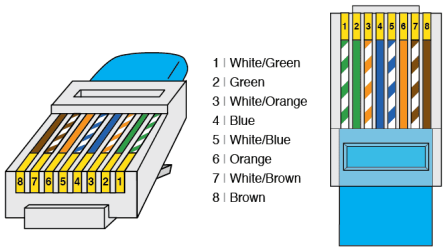


Fig. 4: **RJ45 T-568A pinout**

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 30z** does not include an internal resistor for CAN (120 Ω), then both resistors may be placed on cable or PCB.

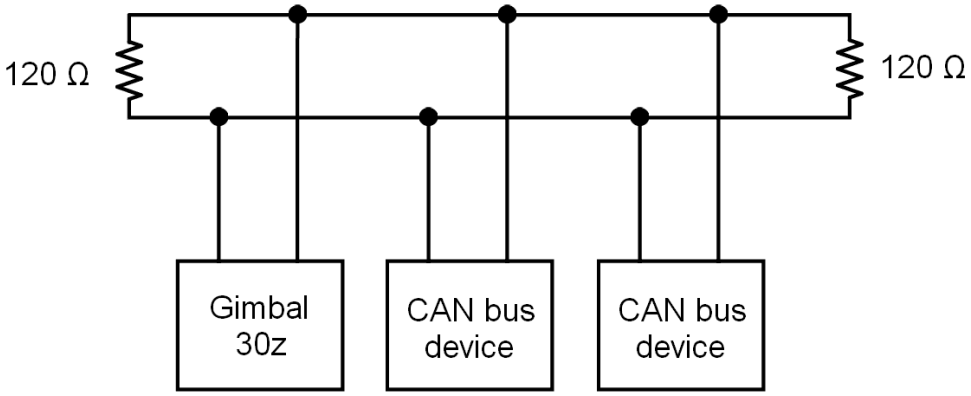


Fig. 5: **CAN assembly diagram example**

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

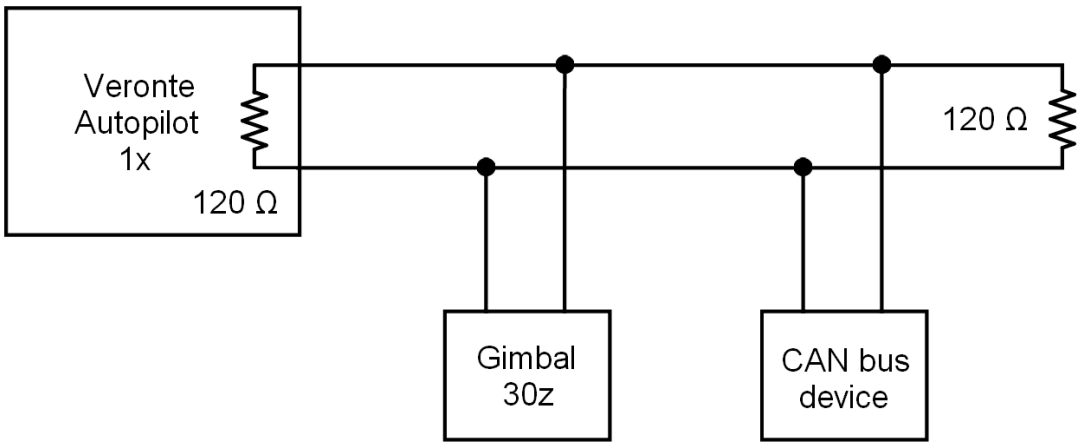


Fig. 6: **CAN assembly diagram example with 1x**

CHAPTER

FIVE

SOFTWARE INSTALLATION

Veronte Gimbal 30z 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.

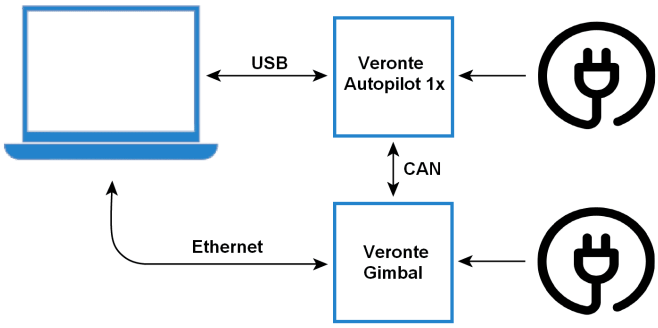


Fig. 1: **USB connection**

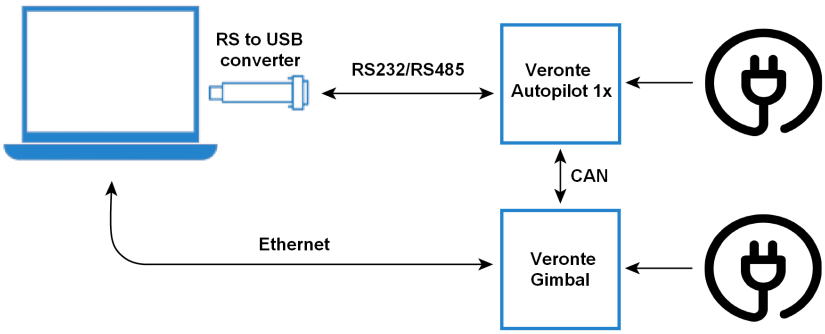


Fig. 2: **Serial connection**

To know which pins are employed for each connection, read the pinout of Autopilot 1x and the *pinout of Gimbal 30z*.

To install the required software and configure **Autopilot 1x** for **Gimbal 30z**, read the Gimbal Software Manual.

CHAPTER

SIX

MAINTENANCE

6.1 Preventive maintenance

Apart from cleaning, no extra maintenance is required to guarantee the correct operation of the **Veronte Gimbal 30z**.

In order to clean **Gimbal 30z** 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.

CHAPTER

SEVEN

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.

CHAPTER

EIGHT

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

CHAPTER

NINE

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).