



User and Installation Guide



1 WARNINGS / DISCLAIMERS

By using this product, you acknowledge and agree to follow all product instructions, safety warnings, privacy policies, and documentation referenced in this manual.

1.1 GENERAL WARNING

Failure to properly set up, use and maintain this product can increase the risk of serious injury, death, property damage, or damage to the product or accessories. Always be aware of your surroundings when using uAvionix products.

1. Casia G shall be used in accordance with all manufacturing instructions and limits.
2. Read all the documentation provided and keep it for future reference.
3. Follow all instructions and heed all warnings.
4. Properly install, use, and maintain all cables as per specifications.
5. Only use attachments and accessories specified and/or approved by uAvionix.
6. Casia G is designed to be serviced only by qualified service personnel.

1.2 SAFETY WARNING

Failure to take the following precautions can result in serious injury or death from electric shock, fire or damage to your camera or accessories:

1. Do not drop, crush, bend, puncture, disassemble, shred, or incinerate the camera or accessories.
2. Do not insert foreign objects into any openings.
3. Do not use the camera if damaged.
4. Do not dry with external heat sources.
5. Keep away from open flame sources.
6. Handle broken lens glass with care.
7. Keep out of reach of children.

1.3 Limitations

Setup and maintenance of Casia must be performed as per the Casia G User Guide to ensure that Casia performs optimally. Contact support@uavionix.com for assistance.

Incorrect installation can affect Casia performance:

- If the field of view of the camera is partially obscured - for example - by a building, tree, or any other object including bugs and water droplets, Casia will not detect as specified.

Pre-flight checks must always be performed as specified in the Casia User Guide.

uAvionix leverages artificial intelligence and machine learning to ensure Casia 'learns' to correctly interpret the environment. Casia has been trained to identify small, piloted aircraft and helicopters. The performance and limitations of the Casia system should be understood by the pilot in command before using Casia as part of a layered air risk mitigation approach.

- If Casia has not been 'trained' in an environment like yours, performance - including the frequency of false positives - may vary from that specified.
- Casia has been optimized for low-risk airspace, away from airports. If Casia 'sees' larger aircraft (e.g., Boeing 747) several miles away, it may report a smaller aircraft at a closer range.
- Casia was not trained to detect powered parachutes, balloons, large planes/jets, other crafts, or other objects. This should be considered by the operator when evaluating air risk.
- Casia may not detect every aircraft in all environments under all circumstances and may not detect all intruders early enough for an avoidance maneuver to be successfully formed. This must be considered during air risk assessment.
- The time taken for Casia to detect uncooperative piloted aircraft can vary due to environmental conditions, distance, aircraft size, clutter, smoke, and other factors.
- Depending on the performance (turn radius, cruising speed, ascent/descent rates, acceleration/deceleration rate) of your UAS, the time taken to avoid a detected intruder aircraft will vary. This must be considered during air risk assessment.
- The stated time between false detections excludes birds as the number of birds varies dramatically from environment to environment. If you are

operating in an area with an extremely high population of birds, you may see higher false positive rates.

Casia G has been trained and tuned to identify and classify small GA aircraft. The specified results are specific to the detection of small GA aircraft (small planes and helicopters). Casia will not perform to the above level when the intruder aircraft are small drones. This is the case even when aircraft scale is considered, as there are many factors involved in Casia G detecting crewed aircraft.

Following a heavy impact, your Casia system should be replaced or returned to uAvionix for evaluation and repair.

If you believe Casia may not be performing correctly, it should NOT be used and support@uavionix.com should be contacted for guidance.

For regulatory guidance, please contact support@uavionix.com.

2 Quality and Compliance

Designed in the USA. Assembled in the USA from domestic and imported components.

Compliant with FCC Part 15 (USA), Industry Canada. Please recycle all electronics.



3 COPYRIGHT

uAvionix Corporation

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<http://www.uavionix.com>

<http://www.uavionix.com/support>

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4 LIMITED WARRANTY

uAvionix products are warranted to be free from defects in material and workmanship for two years from the installation of Casia G. For the duration of the warranty period, uAvionix, at its sole option, will repair or replace any product which fails in normal use. Such repairs or replacement will be made at no charge to the customer for parts or labor, provided that the customer shall be responsible for any transportation cost.

4.1 Restrictions

This warranty does not apply to cosmetic damage, consumable parts, damage caused by accident, abuse, misuse, fire or flood, theft, hangar rash, damage caused by unauthorized servicing, or product that has been modified or altered.

4.2 Disclaimer of Warranty

IN NO EVENT, SHALL UAVIONIX BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM THE USE, MISUSE, OR INABILITY TO USE THE PRODUCT OR FROM DEFECTS IN THE PRODUCT. SOME STATES DO NOT ALLOW THE EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

4.3 Warranty Service

Warranty repair service shall be provided directly by uAvionix. Proof of purchase for the product from uAvionix or authorized reseller is required to obtain and better expedite warranty service. Please email or call uAvionix support with a description of the problem you are experiencing. Also, please provide the model, serial number, shipping address, and a daytime contact number. You will be promptly contacted with further troubleshooting steps or return instructions. It is recommended to use a shipping method with tracking and insurance.

5 Revision History

Revision	Date	Comments
1.0	11/05/2025	Initial Casia G 4.1 release

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9 Introduction

9.1 Purpose of Document

The purpose of this document is to provide clear and comprehensive instructions for installing the Casia G ground-based module and operating it once installation is complete. This User and Installation Guide explain how to mount, connect, and configure Casia G, and it offers plain-language descriptions of system functions and capabilities along with step-by-step operating instructions to ensure optimal performance.

9.2 System Description

Casia G is the ground-based node of the Casia Detect-and-Avoid (DAA) system. It hosts the detection software, manages multiple electro-optical cameras, and serves as the central surveillance point for BVLOS operations from a fixed location. Casia G interfaces with external systems—such as command-and-control applications, autopilots, UTM services, and situational awareness tools—over the network to provide timely traffic alerts that support safe BVLOS flight.

At the core of the module is an industrial compute system (e.g., NVIDIA Jetson Xavier AGX) integrated into uAvionix-engineered electronics and a rugged enclosure for reliable, permanent installation and straightforward integration with site infrastructure and camera arrays.

Software Version	4.1
Module	Casia G
Module Model	GACM-0100
Camera Type	12 MP GigE
Camera Model	HEOC-0013

10 Features

Detect & Alert	Senses non-cooperative aircraft using patented computer vision and AI system.
Integrated ADS-B	Integrated ADS-B for increased coverage with cooperative aircraft.
Visual & ADS-B Correlation	Electro-optical detections and ADS-B detections are correlated to providing a single intruder detection, and the most accurate data possible by combining the best from both sensors.
360 Degree Field of Regard	Six camera arrays within Casia G provides a 360-degree field of regard.
Day & Night Operation	Day or night, Casia G is watching the airspace to keep your operations safe no matter what time of the day.
Autopilot Compatible	Turn-key integration supported autopilot systems. Supports common commercially available autopilots.
Always On	Casia G is constantly surveilling the airspace, allowing you to fly at a moment's notice. It is always ready and waiting and does not require breaks.
Unlimited Coverage	Each Casia G module is small and easy to install and covers the area around it. Working together with additional nodes, Casia G can cover a greater combined area, providing more time to react to incoming aircraft.

Table 1: Casia G Features

11 What's in the Box?

Item	Description	Qty	Part Number
1	Casia G Module	1	UAV-1008011-001
2	Casia G Getting Started Guide	1	UAV-1005282-027
3	Power Supply in Weatherproof Enclosure	1	UAV-1008030-001
4	Pole Mount Brackets for Power Supply	1	UAV-1008445-001
5	RJ45 Ethernet cable with Weatherproof Bayonet Connector	1	UAV-1007999-001

Table 2: Casia G Module Box Contents

NOTICE

Refer to Section [14.3](#) for detailed mounting specifications and contact Sales at sales@uavionix.com to request the appropriate brackets for your installation.

12 Casia G Module

12.1 Overview

The Casia G Module houses an array of six cameras, a sensor package to automate installation configuration, and a graphical processing unit with uAvionix's proprietary software installed. This software is the heart of the Casia G ground based Detect and Alert system for detecting non cooperative air traffic.

The Casia G module also houses an ADS-B receiver to detect cooperative air traffic.

The anodized aluminum section of Casia G below the white molded plastic housing contains the graphical processing unit and provides a heatsink and fan to dissipate the heat produced by the device.

The airflow around the heatsink should not be impaired and foreign bodies (e.g., screw drivers) should not be allowed to interfere with the fan's ability to spin.

WARNING

Do not open or attempt to open the Casia G body. Doing so improperly may damage the device and will void your warranty.

12.2 Mechanical Specifications

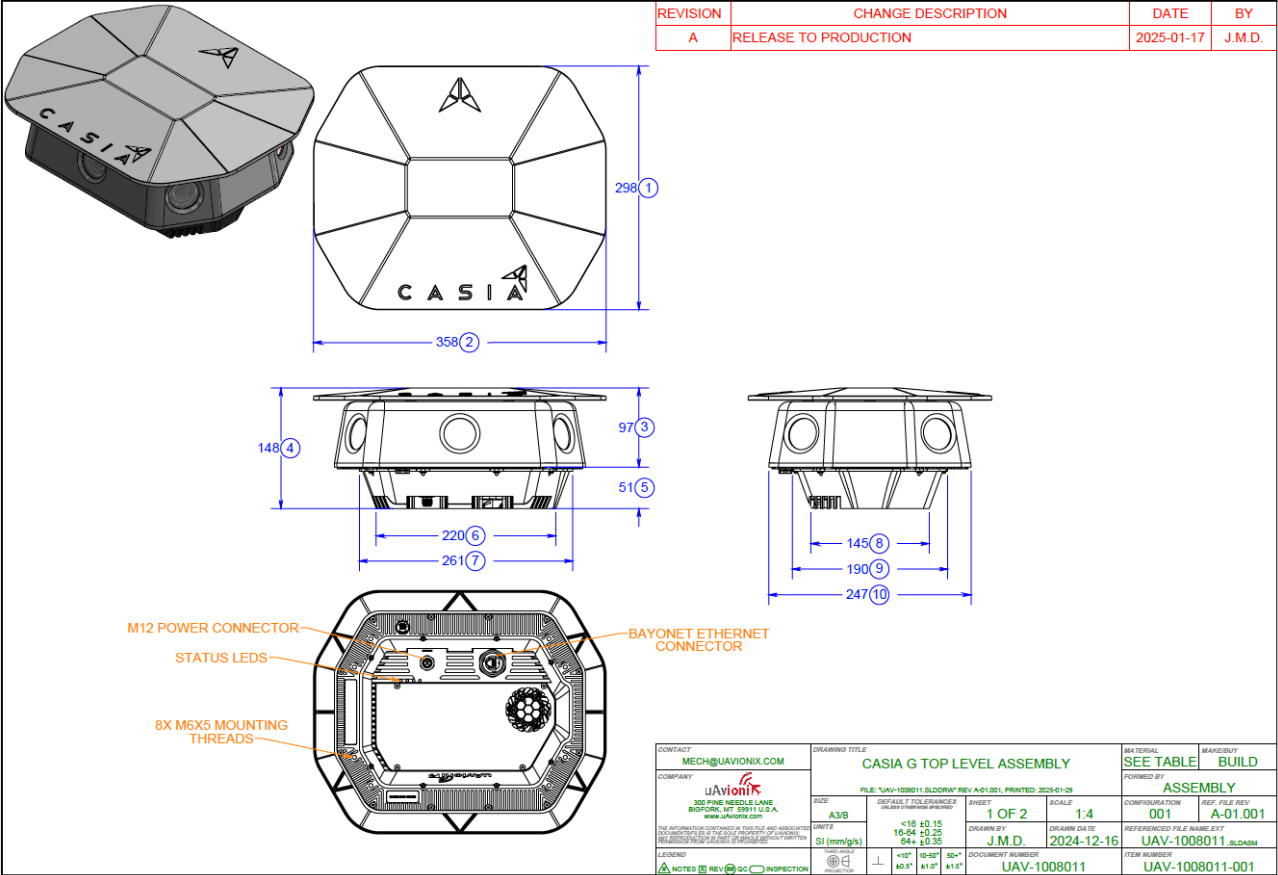


Figure 1: Casia G Top Level Assembly Mechanical Drawings

12.3 Operational Limits

Casia G must only be operated within the following limitations. In addition, pre-flight checks must be conducted before flight, as specified in the Pre-flight Checklist section.

Ambient Temperature *	-10°C to 50°C
Ambient Humidity *	85°C / 85% RH, 168 hours
Times of Day	All day except 45 mins before sunrise to sunrise All night except sunset to 45 mins after sunset
Precipitation	Nil
Cloud Coverage	Okta 0 to Okta 8
Visibility	Impacts performance, see below.

Table 3: Casia G Environmental Limitations

The table below reflects daytime performance as a function of visibility. Night operations are subject to additional degradation from reduced visibility; performance should be considered bound by the prevailing visibility conditions.

Visibility	Small Plane		Helicopter	
	Average Range	Detection Rate	Average Range	Detection Rate
>= 10 NM	2089 m	98.6%	1908 m	98.9%
5 NM	2030 m	98.6%	1854 m	98.9%
3 NM	1978 m	98.6%	1807 m	98.9%
1 NM	1693 m	98.6%	1547 m	98.9%

Table 4: Casia G Day Mode Performance Impact Specifications

NOTICE

To operate in the specified ambient temperature and humidity ranges airflow to the heatsink on Casia G must not be impeded (as is provided by the spacing of the standard Casia G mounts).

12.4 Performance Specifications

Casia uses different algorithms for day mode, in comparison to night mode. Performance data for each mode will differ. The following performance numbers were obtained by flying fixed wing and rotary GA at each of the 6 Casia G cameras at multiple altitudes, angles, and velocities. Declaration range varies based on the size of the intruder aircraft.

12.4.1 Day Mode

Specification	Value
Detection Rate	98.6%
Classification Precision	99%
Classification Recall	97.6%
Heading Accuracy	+/-46 degrees
Velocity Accuracy	+/-31%
Frame Processing Rate	6.1Hz
Average Between False Positives	1.4 hours
Elevation Accuracy	+/-0.5 degrees
Bearing Accuracy	+/-0.5 degrees
Range Estimation Accuracy	+/-17%

Table 5: Casia G Day Mode Performance Specifications

NOTICE

Detection rate was determined based on real encounters of general aviation aircraft with Casia G. Detailed performance reports are available for regulatory approval purposes. Performance improves as new software is released. uAvionix reserves the right to alter the above table without notice. Performance will reduce below that specified when visibility decreases.

Casia G has been trained and tuned to identify and classify small GA aircraft. The above results are specific to the detection of small GA aircraft. Casia G will classify intruders as one of the following: small single engine aircraft, single disk rotorcraft, birds, multirotors.

12.4.2 Night Mode

The following data reflects the results of performance testing of the night detection capability of the Casia G system.

The evaluation focused on the system's ability to detect and track small planes and helicopters during night operations.

12.4.2.1 Single-System Performance

At night, the system detects navigation and anti-collision lights. With a single system it is not possible to triangulate the position of detected aircraft. As such, it should be assumed that the detected aircraft is detected in the worst-case scenario (i.e., head on geometry). This results in shorter detection range for single versus multiple systems.

	Average Range	Max Range	Detection Rate
Small Plane	8242m	10620m	100%
Helicopter	10941m	13176m	100%

Table 6: Single-System Declaration Range Specifications for Night Mode

Specification	Value
Detection Rate	100%
Frame Processing Rate	10Hz
Elevation Accuracy	+/-0.5 degrees
Bearing Accuracy	+/-0.5 degrees
Range Estimation Accuracy	N/A

Table 7: Single-System Performance Specifications for Casia G Night Mode

12.4.2.2 Multi-System Performance

With multi-sensor configurations, at least one system will see the side of the intruder aircraft, as opposed to head-on. This provides a longer detection range than single sensor deployments.

	Average Range	Max Range	Detection Rate
Small Plane	11422m	16382m	100%
Helicopter	15260m	16749m	100%

Table 8: Multi-System Declaration Range Specifications for Night Mode

Specification	Value
Detection Rate	100%
Frame Processing Rate	10Hz
Elevation Accuracy	+/-0.5 degrees
Bearing Accuracy	+/-0.5 degrees
Range Estimation Accuracy	+/-3.97%

Table 9: Multi-System Performance Specifications for Casia G Night Mode

12.5 Input and Output Connectors

As shown in Figure 2, Casia G has two external connectors.

1. Gigabit ethernet RJ45 through a weatherproof bayonet connector
2. 24V DC power supply input through a weatherproof 4 pin type A M12 screw locking connector

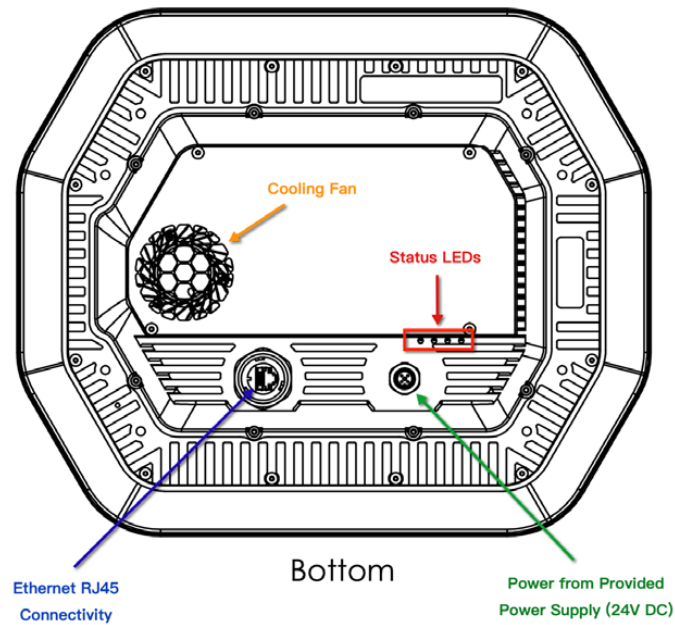


Figure 2: Casia G I/O Locations and Type

The ethernet connection is via an IP67 rated bayonet connector manufactured by TE Connectivity, the details of which can be found below. The supplied shielded outdoor rated CAT 6 cable is 5 meters long.

Connector	RJ45 Ethernet
Manufacturer	TE Connectivity
Part Number	2362760-2
Vendor Links	Mouser DigiKey

Table 10: Casia G Ethernet Connector Specifications

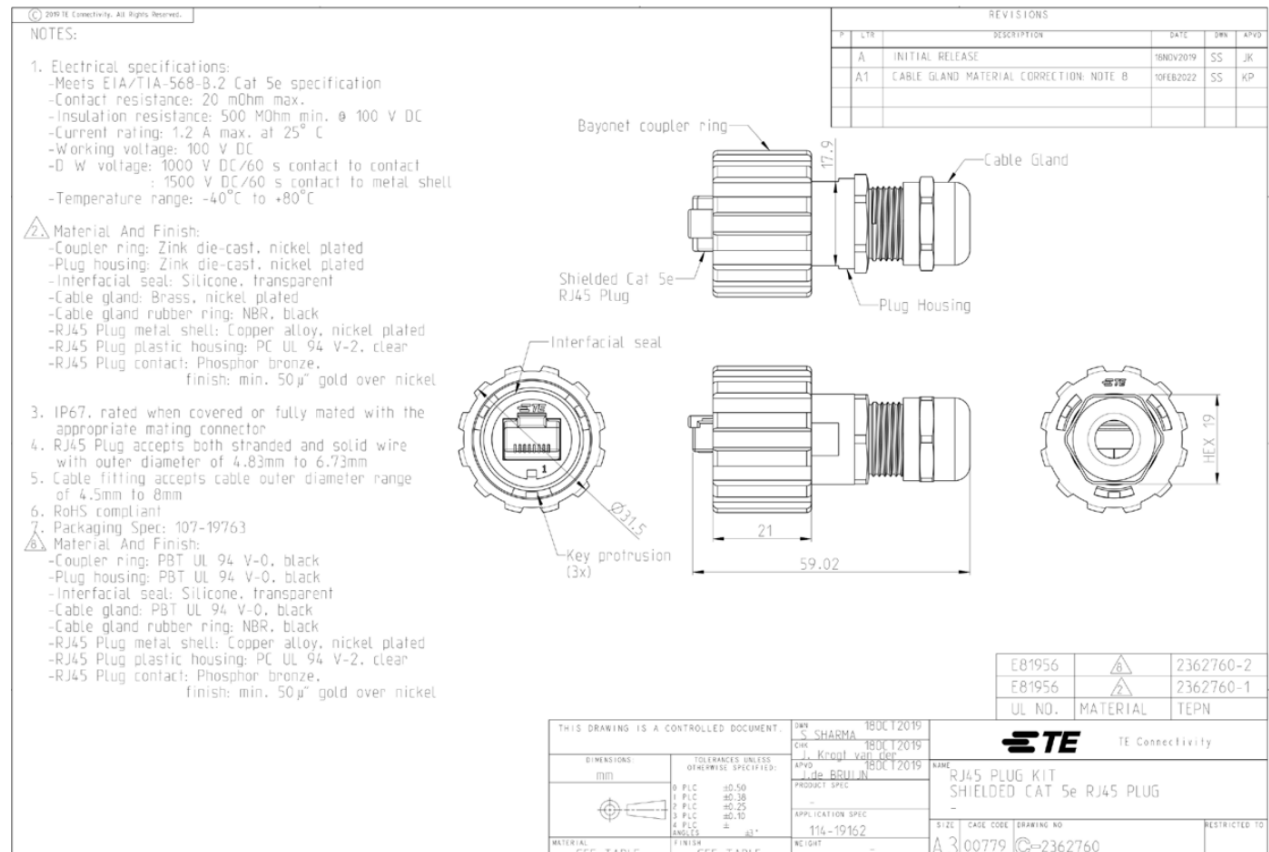


Figure 3: Casia G Ethernet Connector Dimensions

Connector	M12 Power
Manufacturer	TE Connectivity
Part Number	T4110001041-000
Vendor Links	Mouser DigiKey

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REVISIONS

P	NO.	DESCRIPTION	DATE	BY
A	1	INITIAL RELEASE	08/01/2015	AP XX
A1	1	ECR-15-018115 ADD 114 SPEC.	08/01/2015	AP XX
A2	1	ECR-29-012708 ADD PG9 MODEL	15/05/2008	S-C W
B	1	ECR-27-132011	08/01/2015	DP CM

VIEW A
DETAIL SEE TABLE 1

PG7

PG9

TABLE1

PIN ARRANGEMENT
A-CODE

T411000X02-000	T411000X03-000	T411000X04-000

T411000X05-000	T411000X08-000

TECHNICAL DATA

	T411000X02-000	T411000X03-000	T411000X04-000	T411000X05-000	T411000X08-000
RATED VOLTAGE	250V	250V	250V	60V	30V
RATED CURRENT	4A	4A	4A	2A	2A
POLLUTION DEGREE	3	3	3	3	3
OVERVOLTAGE CATEGORY	II	II	II	II	II
MATERIAL GROUP	1	1	1	1	1
CONTACT RESISTANCE	<10mΩ	<10mΩ	<10mΩ	<10mΩ	<10mΩ
INSULATION RESISTANCE	>100MΩ	>100MΩ	>100MΩ	>100MΩ	>100MΩ
DEGREE OF PROTECTION	IP67	IP67	IP67	IP67	IP67
OPERATION TEMPERATURE	-40~85°C	-40~85°C	-40~85°C	-40~85°C	-40~85°C

NOTE:

- MATERIAL:
 - ITEM NO. 1: NUT - ZINC DIE-CAST, NICKEL PLATED
 - ITEM NO. 2: HOUSING - PA
 - ITEM NO. 3: CONTACT - PHOSPHOR BRONZE
 - ITEM NO. 4: HOUSING BODY - PBT-GF
- CONTACT FINISH: GOLD OVER NICKEL OR SILVER OVER NICKEL
- CABLE WIRES:
 - FOR 2-5 PIN: 24AWG/0.25mm²...18AWG/0.75mm² (WITHOUT FERRULE) 24AWG/0.14mm²...20AWG/0.50mm² (WITH FERRULE)
 - FOR 6 PIN: 24AWG/0.25mm²...20AWG/0.50mm² (WITHOUT FERRULE) 24AWG/0.14mm²...22AWG/0.30mm² (WITH FERRULE)
- ALL DIMENSIONS ARE FOR NOMINAL REFERENCE ONLY UNLESS OTHERWISE STATED
- PACKAGE: 100 PCS IN A BAG
- PA INFORMATION

T411000XXXX-000

CONTACT FINISH:

- GOLD OVER NICKEL
- SILVER OVER NICKEL

NUMBERS OF PINS:

- 2: 2 PINS
- 3: 3 PINS
- 4: 4 PINS
- 5: 5 PINS
- 8: 8 PINS

CABLE OUTLET:

- PG13 CABLE FEED: 4-6mm
- PG16 CABLE FEED: 4-6mm

BRAND:

- W/ TIE LOGO

THIS DRAWING IS A CONTROLLED DOCUMENT

FIGURING: 1/1

DATE: 08/01/2015

BY: AP XX

APPROVED: AP XX

REVISIONS

NO.	DESCRIPTION	DATE	BY
1	INITIAL RELEASE	08/01/2015	AP XX

TECHNICAL DATA

	T411000X02-000	T411000X03-000	T411000X04-000	T411000X05-000	T411000X08-000
RATED VOLTAGE	250V	250V	250V	60V	30V
RATED CURRENT	4A	4A	4A	2A	2A
POLLUTION DEGREE	3	3	3	3	3
OVERVOLTAGE CATEGORY	II	II	II	II	II
MATERIAL GROUP	1	1	1	1	1
CONTACT RESISTANCE	<10mΩ	<10mΩ	<10mΩ	<10mΩ	<10mΩ
INSULATION RESISTANCE	>100MΩ	>100MΩ	>100MΩ	>100MΩ	>100MΩ
DEGREE OF PROTECTION	IP67	IP67	IP67	IP67	IP67
OPERATION TEMPERATURE	-40~85°C	-40~85°C	-40~85°C	-40~85°C	-40~85°C

NOTE:

- MATERIAL:
 - ITEM NO. 1: NUT - ZINC DIE-CAST, NICKEL PLATED
 - ITEM NO. 2: HOUSING - PA
 - ITEM NO. 3: CONTACT - PHOSPHOR BRONZE
 - ITEM NO. 4: HOUSING BODY - PBT-GF
- CONTACT FINISH: GOLD OVER NICKEL OR SILVER OVER NICKEL
- CABLE WIRES:
 - FOR 2-5 PIN: 24AWG/0.25mm²...18AWG/0.75mm² (WITHOUT FERRULE) 24AWG/0.14mm²...20AWG/0.50mm² (WITH FERRULE)
 - FOR 6 PIN: 24AWG/0.25mm²...20AWG/0.50mm² (WITHOUT FERRULE) 24AWG/0.14mm²...22AWG/0.30mm² (WITH FERRULE)
- ALL DIMENSIONS ARE FOR NOMINAL REFERENCE ONLY UNLESS OTHERWISE STATED
- PACKAGE: 100 PCS IN A BAG
- PA INFORMATION

T411000XXXX-000

CONTACT FINISH:

- GOLD OVER NICKEL
- SILVER OVER NICKEL

NUMBERS OF PINS:

- 2: 2 PINS
- 3: 3 PINS
- 4: 4 PINS
- 5: 5 PINS
- 8: 8 PINS

CABLE OUTLET:

- PG13 CABLE FEED: 4-6mm
- PG16 CABLE FEED: 4-6mm

BRAND:

- W/ TIE LOGO

24

13 Operational Area

The surveillance area provided by Casia G provides time for you to maneuver to avoid intruding cooperative aircraft (detected via ADS-B receiver in Casia G) and non-cooperative aircraft (detected by Casia G cameras).

Each operation / location may have different surveillance area requirements due to variables such as:

- Air space class.
- Desired area of operation.
- Performance envelope of UAVs (turn rate, descent rate, cruise speed).
- Avoidance maneuvers to be performed, including whether they are initiated automatically or via directive or suggestive pilot interactions.
- Typical speed and altitude of intruder aircraft.

uAvionix can provide guidance on how best to conduct safe operations with Casia G. If your UAV operations cover a large area, you may require multiple Casia G systems. To discuss your needs, email sales@uavionix.com.

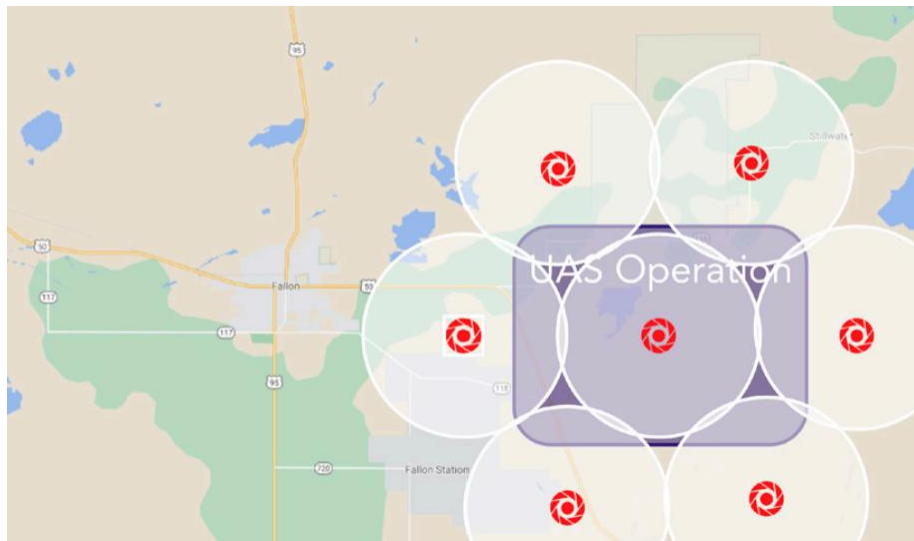


Figure 5: Casia G Merged Operational Area Overview

14 Installation

Casia G needs a clear, 360-degree view of the sky, or performance will be negatively impacted. It cannot see through buildings, trees, or other obstructions. As such, locate Casia G as far away as possible from any obstructions, or raise Casia G above obstructions.

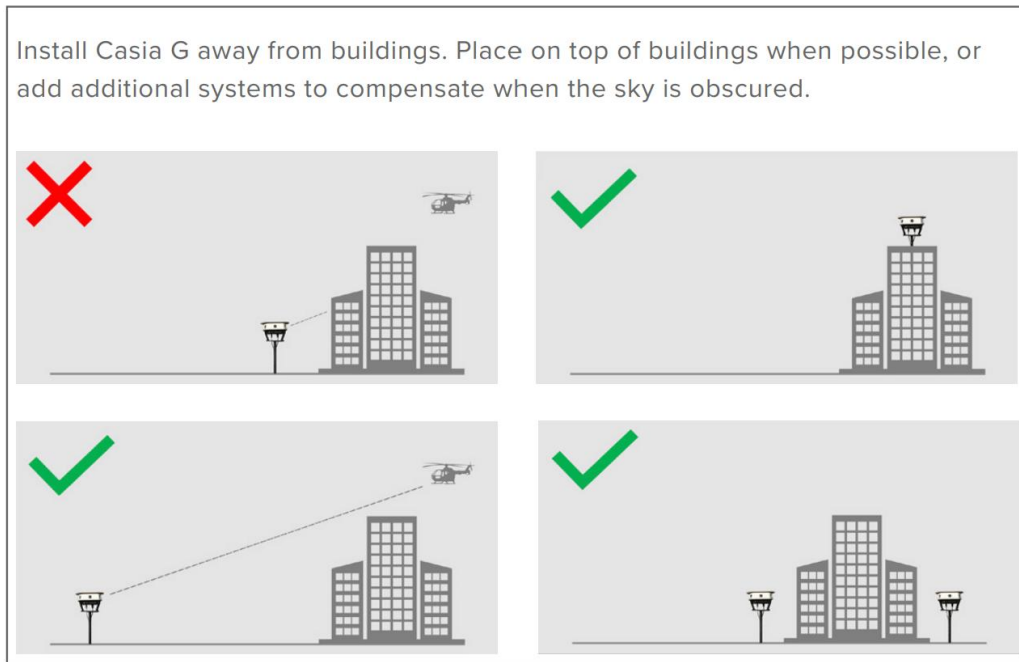


Figure 6: Casia G Building Installation Best Practices Diagram

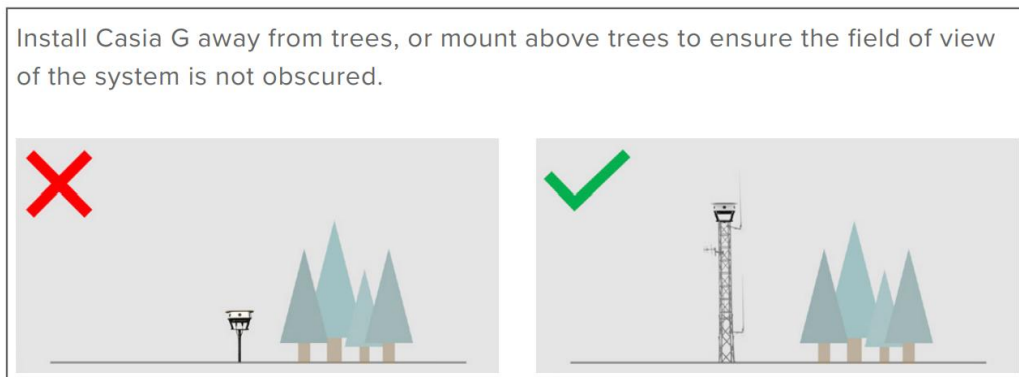


Figure 7: Casia G Near Tree Installation Best Practices Diagram

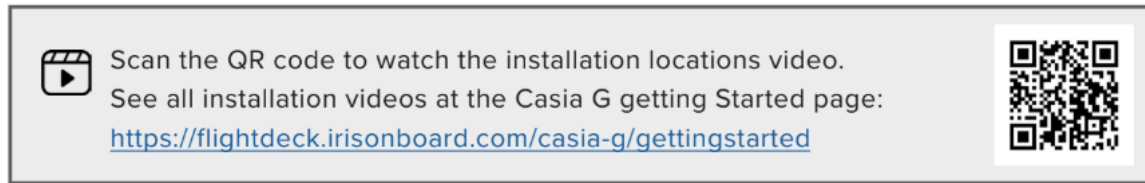


Figure 8: Installation Locations Video QR Code

Casia G should be installed at least four feet above the ground (e.g., on a tripod), and performs well on top of very high buildings, up to 800 feet AGL. If you wish to install at altitudes above 800 feet, for further assistance, submit a [Support Ticket](https://uavionix.com/support/support-ticket/) to: <https://uavionix.com/support/support-ticket/>.

Casia G is powered via a 24V power supply, which in turn consumes peak power of 70W (65W nominal). The 24V power supply required 110V AC. If the chosen location for Casia G does not have standard shore power, generators or solar panels can be leveraged. See the ‘Powering Casia G’ section of this document for more information.

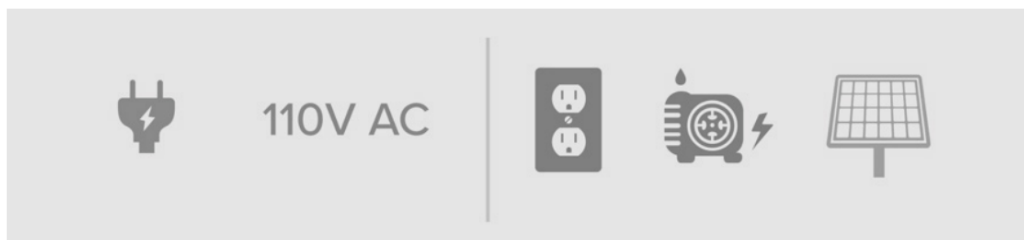


Figure 9: Casia G Power Supply Visual

Casia G needs to be connected to the internet to provide its output to your situational awareness tool. It can be connected to your internet router, or - if not available at your desired location - to an LTE device. See the ‘Casia G Connectivity’ section of this document for more information.



Figure 10: Casia G Connectivity Visual

14.1 Power

The Casia G power supply is contained in a weatherproof box. The power supply should be plugged into a standard 110V mains/shore power outlet. The power supply delivers 24V DC power to the Casia G module. The peak power consumption of Casia G is 70W, so at least this amount must be available. Casia G accepts a power input voltage of 11-36V. This power supply should be located within 100' of the Casia G.

If desired, Casia G can be powered from solar panels, however, consideration must be taken into whether power will be available for all the working hours of the system.

The EXTERNAL dimensions of the power supply box are 11.25 x 8.25 x 5.5 inches. The dimensions of the actual power supply inside the weatherized case are 3.75 x 7.5 x 1.5 inches.



Power Supply Box



Power Supply Pole Mount Option

Figure 11: Casia G Power Supply Enclosure and Pole Mount Option

The box containing the power supply has an LED light on the bottom which indicates if the power supply is producing power.



Figure 12: Casia G Power Supply LED Indicator

The power supply box can be screwed to a wall / post or mounted to a mast/pole using optional hardware. When used with a tripod mount, the mounting bracket is not required, and it can be left under the tripod, or somewhere that it is not a tripping hazard.

14.2 Connectivity

Casia G needs to be connected to the internet to provide its output to your situational awareness tool. It can be connected to your internet router, or to an LTE device using the supplied RJ45 ethernet cable.

The upload speed should be at least 10Mbps for standard operations.

Standard operations would be sending detection data, heartbeat, and status messages to your situational awareness tool.

Depending on the data collection parameters and the volume of air traffic in your location, each Casia G device can generate more than 1TB of video each day. Normally, videos will just be overwritten if not uploaded. This is as designed, as generally, video of the sky is not that interesting to look at.

If you do want to upload video from the device, for example, for regulatory purposes, you will need a suitable internet connection. A 1 Gbps upload speed would be appropriate to facilitate this.

NOTICE

Some internet providers may cap the volume of data that can be uploaded in each period. Casia G does not provide situational awareness while data is being uploaded.

14.3 Mounting (Mast, Tripod)

Casia G is typically mounted to a pole/mast (permanent locations) or to a tripod/telescopic pole (temporary locations). Other mounting configurations should be discussed with uAvionix. Please submit a Support Ticket at: <https://uavionix.com/support/support-ticket/>.

Casia G Mounts can be sourced from uAvionix. If mounting is to a pole/mast, the pole should be schedule 40 and 2-4" diameter. Casia G should be mounted at the top of the pole, otherwise the field of view will be partially obscured, reducing the effectiveness of the system.

The mast/pole should be within 3 degrees vertical. This can be determined using a bubble level, the 'Measure' app on iOS, or the 'Bubble Level' app on Android. If the mounting pole is not vertical, it can impact the ability to install Casia G level, which can impact the accuracy of intruder altitude estimates.

When mounting Casia G to the mast/ pole, Casia mounts allow finer adjustment to easily get Casia within 1 degree of level.

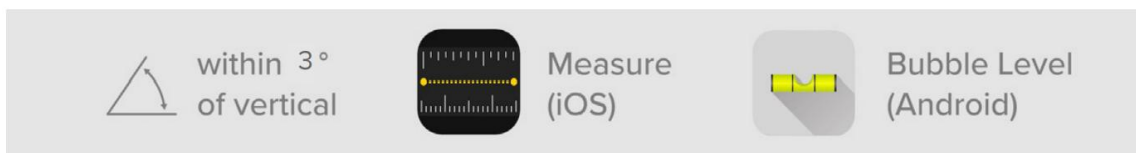


Figure 13: Casia G Leveling Guidance

If mounting Casia G to a telescopic mast on a trailer, the trailer should be leveled prior to extending the mast.



Scan the QR Code to watch instructional video the Casia G side mount and how to install Casia G perfectly level.

For all installation videos, go to:

<https://flightdeck.irisonboard.com/casia-g/gettingstarted>



Figure 14: Casia G Installation QR Code

14.3.1 Mast/Pole Side Mount Assembly

This mounting procedure is for a permanently mounted system, where the Casia will be positioned at an elevated point on a riser pole. In this setup, hardware provided by uAvionix can be utilized to fix the Casia hardware and the power supply to the pole with mounting brackets.

uAvionix will not provide the mast it has to be mounted on but has some requirements for that mast to optimize performance of the system.

Equipment Provided by uAvionix:

Equipment	Quantity
Mast Side Mounting Bracket	1
U-Bolt and Nuts	2

Table 12: Install Equipment Provided by uAvionix (Side Mount)

Equipment Provided by Customer:

Equipment	Quantity
2-4" Rigid Mast (Schedule 40)	1
110V AC Power Supply	1
Ethernet Access Point – Ideally Gigabit	1

Table 13: Install Equipment Provided by Customer (Side Mount)

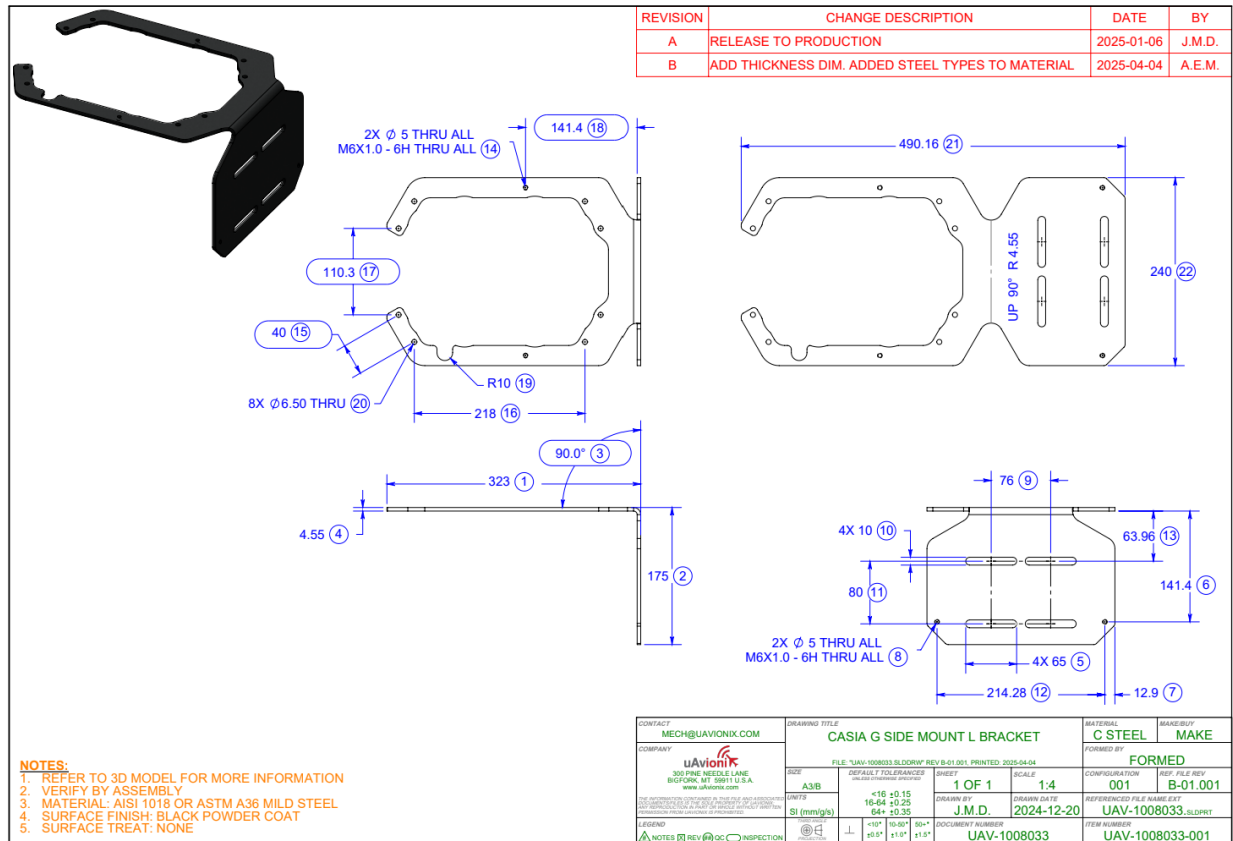


Figure 15: Casia G Side Mount Assembly Dimensions and Layout

Using M6x8 Button Head bolts, the mount is attached to Casia G in the manner shown below (see Figure 16). The mount should be attached to the pole using U-bolts sized for the pole in question.

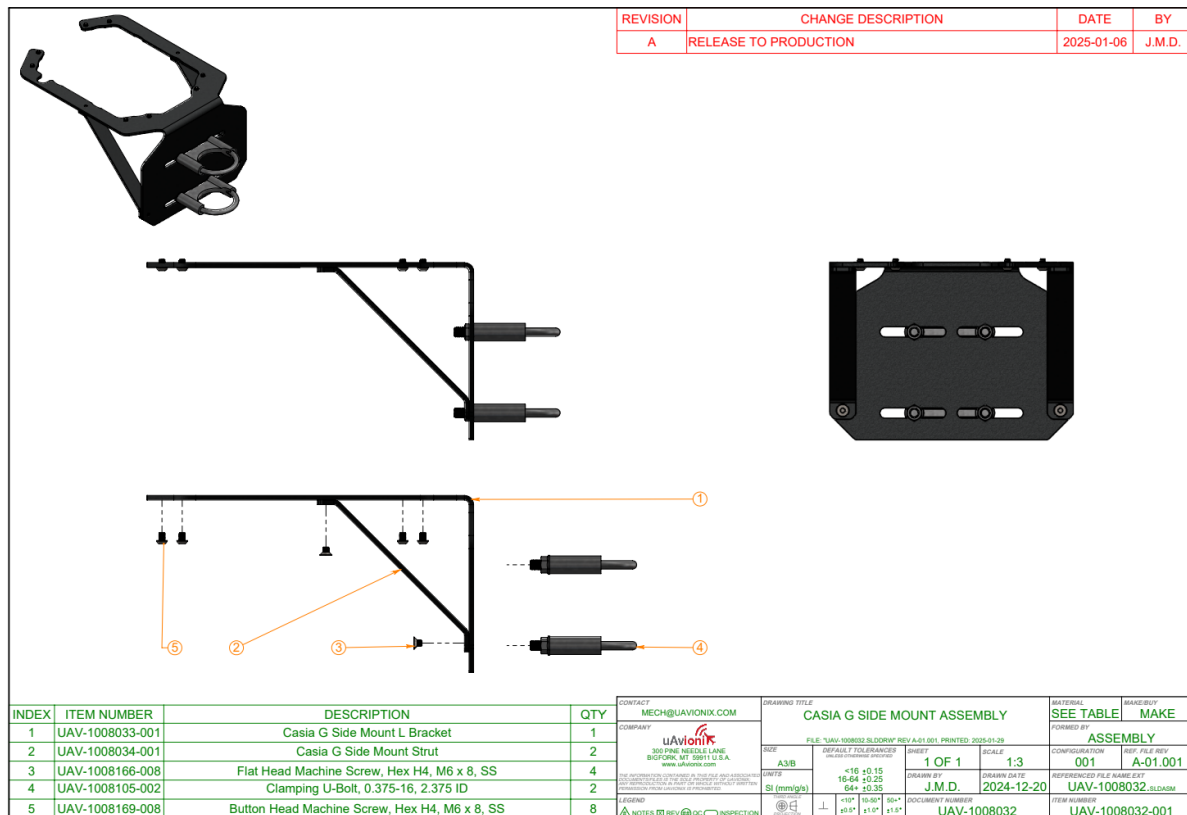


Figure 16: Casia G Side Mount Diagram

The mast being used to mount the Casia G must be rigidly fixed to ensure the best performance from the mounted system. Movement of the system while in operation will lead to decreased detection performance and accuracy of estimated intruder locations.

A shorter mast will ensure less movement of the system, but this must be counterbalanced with the need to provide a clear field of view for the system. Casia G should be mounted such that it has a clear field of view of the airspace to be monitored. Obstructions of the field of view by objects near the Casia G will prevent detections of aircraft in those areas. At an installation location with multiple other hardware systems in place, Casia G is ideally mounted at a higher elevation than all other systems.

A 2-4" diameter mast is required to accommodate the mounting bracket provided with the Casia G system. For most applications, it is recommended that a galvanized steel pipe be used to ensure rigidity and corrosion resistance. The mast must be securely anchored at its base and as far up the length of that mast as possible. The longer the length of unsupported mast, the more rigid the mast must be to prevent deflection at the top of that mast. Rigidity of the mast can be increased by either increasing the diameter of the mast or the thickness of the mast walls. For an unsupported length of 1-4', a 2" diameter SCH 40 pipe is sufficient.

The mast must be positioned as vertically as possible to provide a level mounting point for the Casia G system. The cameras internal to Casia G are rigidly affixed to the enclosure, which is in turn rigidly affixed to the mast, so a vertical mast is required to ensure a proper field of view of Casia G. The mast must be within 5 deg of vertical at a minimum and is ideally within 1 deg for best performance. It is recommended that the anchoring point for the mast be adjustable so that fine tuning of the mast can be performed.

Vibration of the Casia G will decrease the performance of the system. The mast must be rigid enough to ensure that it does not experience low frequency or high frequency oscillations when subjected to outside forces such as wind. Rigidity can be improved by increasing the thickness or diameter of the mast or by using guy wires to decrease the amount of unsupported mast. Guy wires can also be used as a means of fine adjustment of the position of the mast to ensure a level platform for Casia G.

14.3.2 Tripod Mount Assembly

The mount shown below (see Figure 17) is for temporary installations. The mount fastens onto the bottom of the Casia G using M6x8 Button Head bolts.

The mount then screws onto a 5/8"-11 bolt of a tripod or telescopic mount.

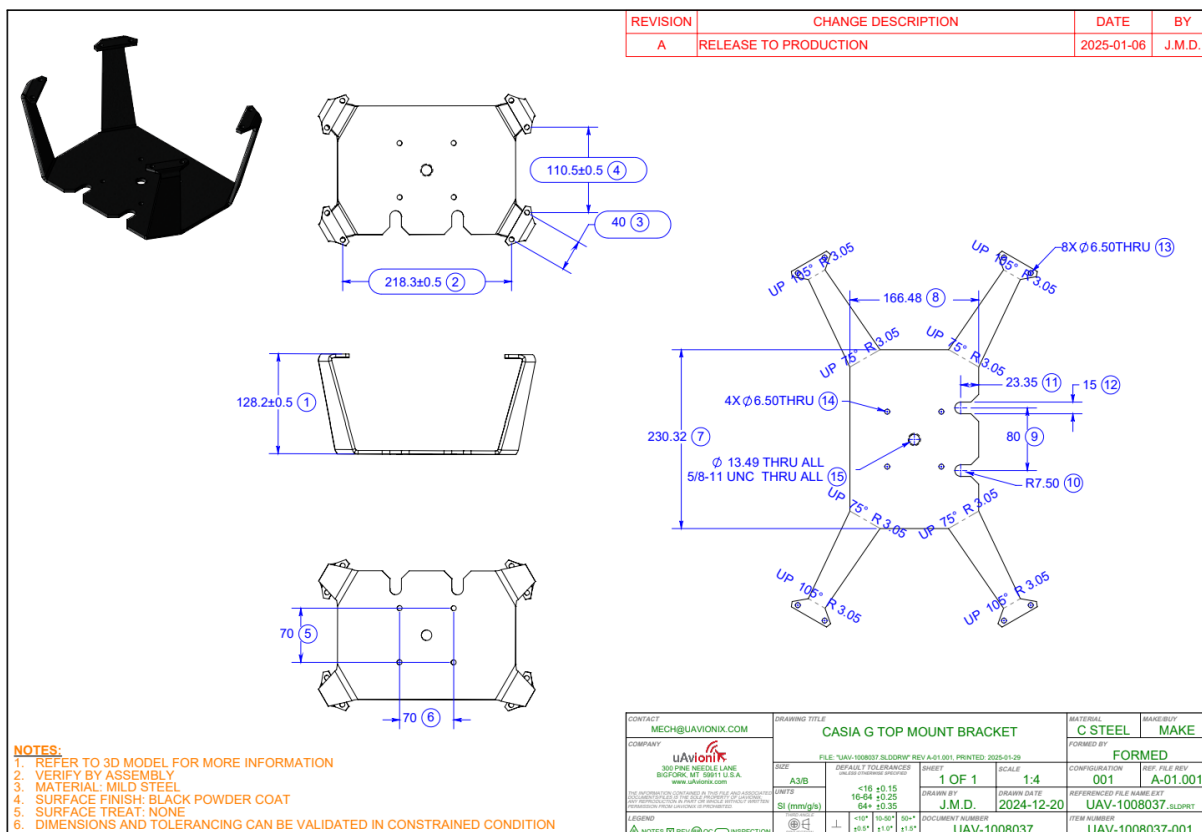


Figure 17: Casia G Tripod Mount Dimensions

Equipment Provided by uAvionix:

Equipment	Quantity
Tripod Mounting Bracket	1

Table 14: Install Equipment Provided by uAvionix (Tripod)

Equipment Provided by Customer:

Equipment	Quantity
Tripod	1
110V AC Power Supply	1
Ethernet Access Point – Ideally Gigabit	1

Table 15: Install Equipment Provided by Customer (Tripod)

14.3.3 Mast Top Mount Assembly

This mount is for permanently mounting Casia on top of a riser pole. It leverages the tripod mount with an additional bracket. In this setup, hardware provided by uAvionix can be used to fix the Casia hardware and power supply to the pole with premade mounting brackets.

A 2-4" diameter mast is required to accommodate the mounting bracket. For most applications, it is recommended that a galvanized schedule 40 steel pipe be used to ensure rigidity and corrosion resistance. The mast should be securely anchored at its base and as far up the length of that mast as possible.

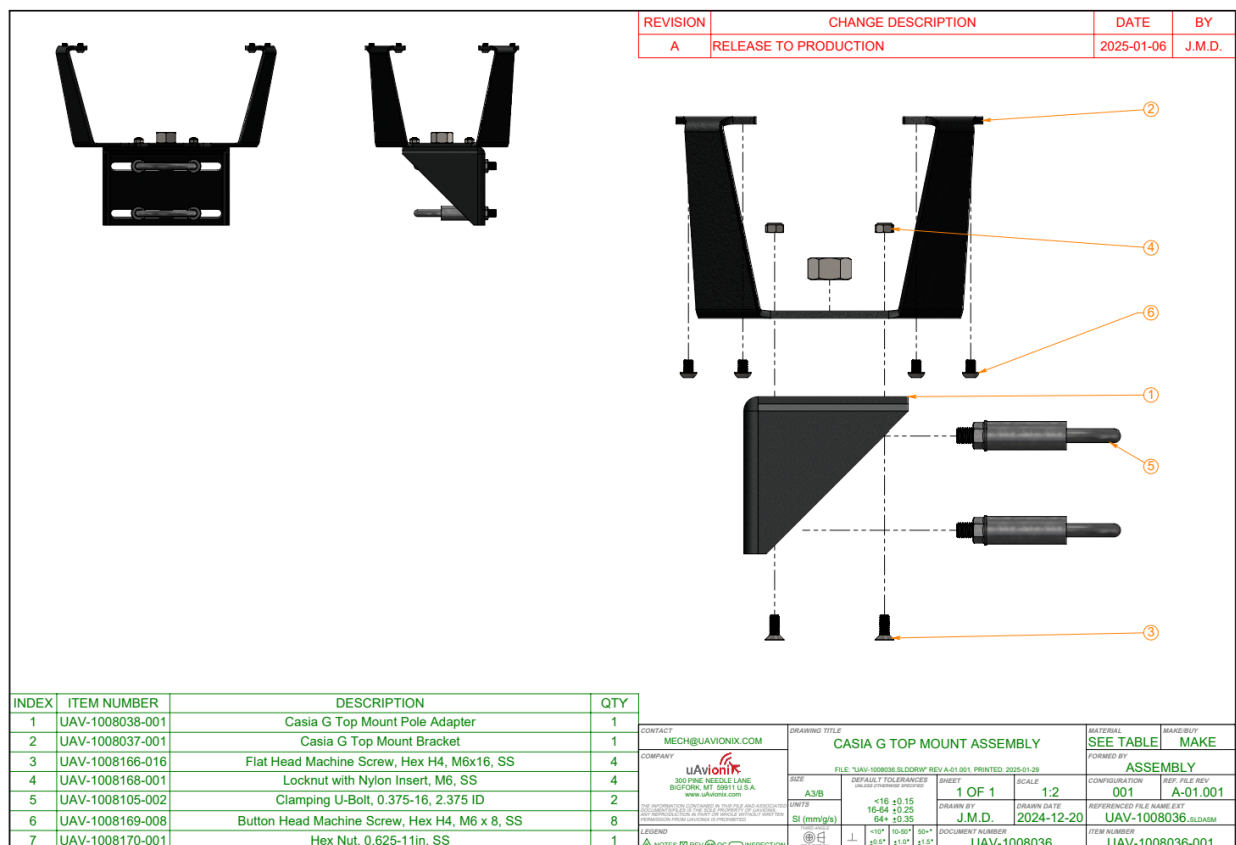


Figure 18: Casia G Top Mount Diagram

When assembled, the Casia G and mounting hardware weighs approximately 7 kg. The mounting bracket has a central thread that can accept a 5/8x11 thread, a common thread for construction or survey tripods. The mount also has a 4x M6 bolt pattern that can be used for a more custom solution.

The area directly below the Casia G body must be kept clear to allow for cable clearance and proper airflow to the heatsink. When installed, cables should be routed down the mast and then secured so that they are not free hanging.

14.4 Heading Alignment

Once Casia G is installed, it must be aligned correctly. For the azimuth of intruder aircraft to be precisely determined, alignment should be accurate to within 1° . This alignment will be fine-tuned during the setup process, but it is recommended to point the unit toward a prominent object in the distance (such as a tower, building, or mountain). This makes the later heading adjustment much easier.

If no prominent objects are available, the device should be aligned to True North. The simplest way to do this is to rotate Casia G on its mount until the arrow on top points to True North.

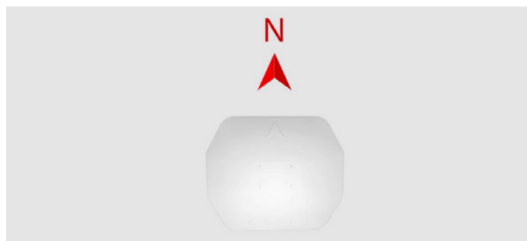


Figure 19: Casia G True North Alignment Diagram

To determine True North, you may use the Compass app on your smart phone but ensure to adjust the app settings to use True North as opposed to magnetic North.

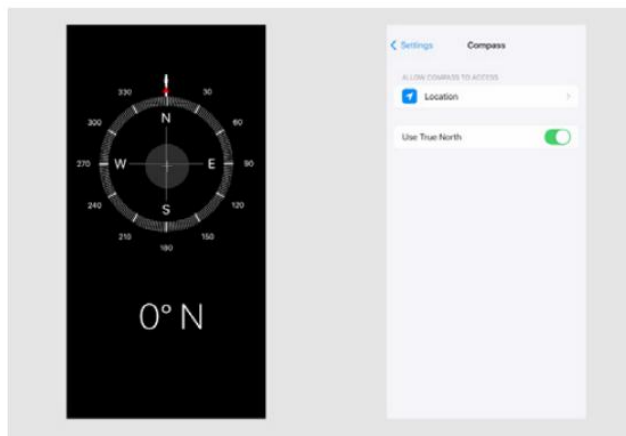


Figure 20: iOS Compass App Showing True North



Scan QR code for instructional video on alignment of Casia G, or visit the Getting Started page for all installation videos:

<https://flightdeck.irisonboard.com/casia-g/gettingstarted>



Figure 21: Casia Alignment Video QR Code

14.5 Ensure Casia G is Working

Now that Casia G is mounted, let's check everything is working properly.

1. Is Power Supply Receiving Power?
 - a. First, plug it in and check that the red LED on the bottom of the power supply box is illuminated.
2. System Status LEDs Nominal?
 - a. Next, check the status of the LEDs on the underside of the Casia G unit. The software watchdog, hardware watchdog, and power LEDs should all be solid red.
3. Most Casia G parameters such as position, altitude, roll angle and pitch angle are automatically determined by internal sensors or are assumed to be a specific value (e.g., alignment). See the Manual Configuration section (16 Remote Configuration (Remote)). If for some reason, you cannot use any of the automatically determined values.

15 Casia Management Interface

The Casia Management Interface is the primary tool for Casia device configuration, set up, and control. The Casia Management Interface provides a mobile-friendly on device web-UI, allowing smooth and accessible configuration of the device without internet connectivity.

Directions for the use of the interface and its included tools are detailed below. For any further assistance please submit a [Support Ticket](#) to uAvionix.

15.1 Preparation

To access the management interface, the Casia device must have been updated to Host Software V4.0.0 or later. Please refer to section [19.4](#) for more information on how to update your device.

Additionally, the device must be powered on and connected to a local network with an ethernet cable. Your computer or mobile device must also be connected to this same network to access the interface.

You will need to determine the IP address of the Casia device on this network, which can be achieved by checking your router's client address table or performing a network scan with tools such as nmap (possibly blocked on corporate or secure networks).

Alternatively, some networks support the use of the device's hostname for navigation. All Casia devices use their serial number as their hostname. To test if this is possible you can open a browser and attempt to navigate to **<serial number>.local**. For example, this would be **GACM-0100-000001.local** if the serial number of the device was **GACM-0100-000001**.

15.2 Sign in

Open a web browser on your computer or mobile device and navigate to the IP address or hostname of the Casia device (see the Preparation section on how to determine this).

You will be presented with the sign-in screen shown below (see Figure 22):

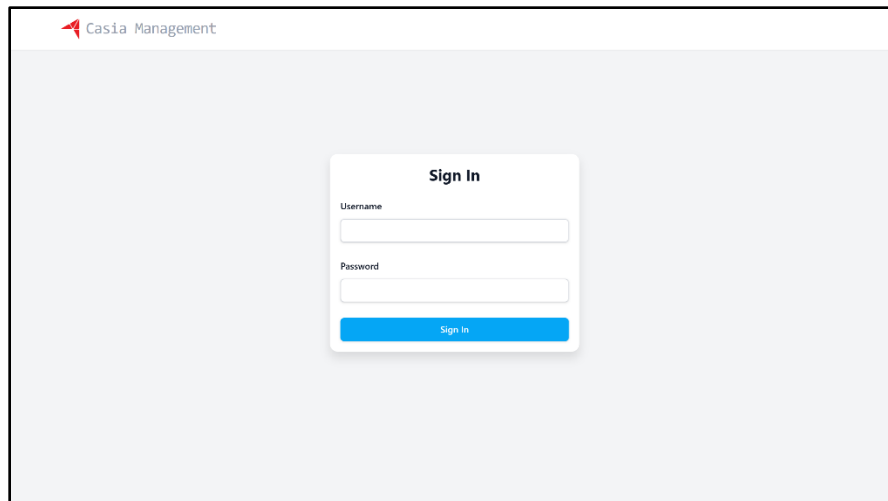


Figure 22: Casia Management Interface Sign-in Page

By default, the device credentials are as follows.

- **Username:** admin
- **Password:** <device serial number>

The device password is configurable in Administrative Settings (refer to Section [15.8](#)). Customers are advised to change the default password immediately upon deployment.

NOTICE

The password is case sensitive and Casia serial numbers all start with capital letters. If the password is changed from the default value but has been forgotten or lost and needs to be reset, you will need to submit a support ticket to uAvionix via: <https://uavionix.com/support/support-ticket/>.

Clicking the sign-in button will navigate you to the device dashboard, detailed in the next section of this document.

Signing in will authenticate you for 30 minutes, after which any interaction with the interface will automatically redirect you to the sign in page.

15.3 Dashboard and Navigation

The dashboard page provides a status overview of the primary components of the Casia device and software systems. Navigation to the rest of the interface can be done through the navigation menu bar shown at the top of every page.

The dashboard includes the following items:

- Device information
- Device location (shown on a map if internet is available to your browser)
- Current high level telemetry values
- Software status
- Communications status (for Casia G devices)
- Telemetry status
- ADS-B receiver status
- System status
- Storage status

Additionally, some tools are provided on this page for management of these system components including the following:

- System reboot
- System start/stop/restart
- Storage clear

The dashboard page will appear like the following image (see Figure 23):

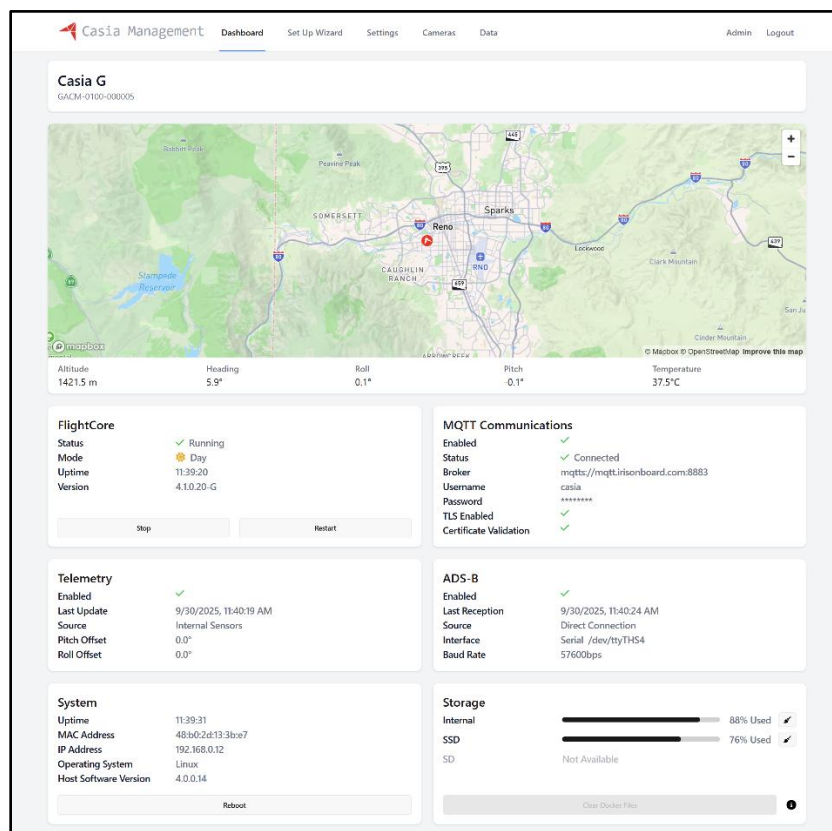


Figure 23: Casia Management Interface Dashboard

15.4 Function Details

15.4.1 System Reboot

As with all technology it may occasionally be required to restart the device. Clicking the “Reboot” button within the system dialogue will perform a full power off and power on of the device.

During this power cycle the device will not be available to interact with, and a timeout will be shown within the interface. Once the timeout has expired your browser will be navigated back to the sign in page.

15.4.2 System Start/Stop/Restart

It can be useful to disable or restart the detection capabilities of Casia which are executed within the device. Clicking the stop button will stop the software, the start button will start the software, and the restart button will restart software.

While the start, stop, or restart commands are executing the other buttons will become unavailable until the command has completed and software’s status has changed to the desired state.

NOTICE

The software will always automatically start after the system is powered on, including after the nightly reboot. Therefore, the maximum length of time software can be stopped while the device is powered 24 is hours.

15.4.3 Storage Clearing

Clearing the storage of the device can be useful when trying to isolate specific data, especially in test environments. Clicking the broomstick icon button next to a given storage device will delete any Casia data from that storage device and free up space.

Occasionally the internal storage of Casia can become full, especially after many updated cycles as temporary Docker files created during each update can be left on the device. To clear these files an additional “Clear Docker Files” button is provided, however it can only be accessed if the software is stopped. This will clean up any extraneous files, after which software can be started again.

NOTICE

Once data is deleted it cannot be recovered. None of these operations are destructive to Casia's functionality and can be done safely at any time.

15.5 Set-up Wizard

Casia device set-up, and configuration can be complicated, especially for non-standard installations. The set-up wizard provides a step-by-step guide for configuring the different sub-components of Casia for your installation. The wizard supports all Casia device types, and the steps and tools within the wizard are tailored for each device type.

For Casia G the set-up wizard will appear as follows (see Figure 24):

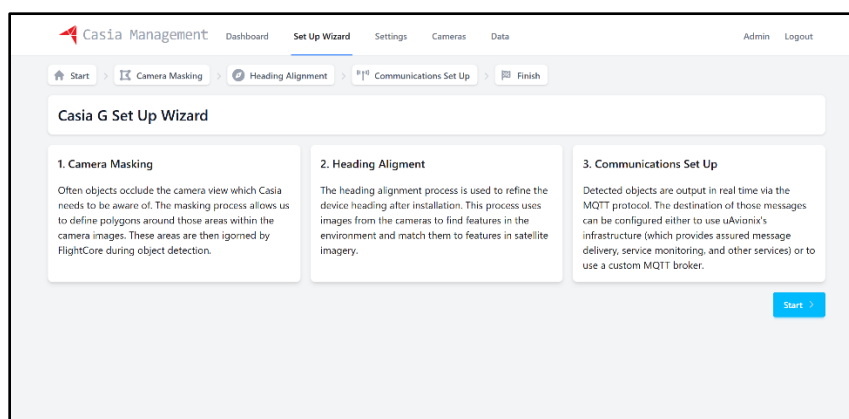


Figure 24: Casia Management Interface Set-up Wizard

The first page of the set-up wizard will show an overview of the steps ahead to configure your device type.

Clicking the “Start” button will navigate to the first step in the process. To continue from one step to the next, a “Next” button is available at the bottom of each page. You can navigate directly to any step in the process by clicking the button for that step in the breadcrumb navigation bar shown at the top of every page.

Instructions are built into each step of the wizard and therefore we will not cover any further details in this document. If you require further assistance with any of the steps in the set-up wizard, please reach out to [uAvionix Support](#).

15.6 Settings Editor

The settings page provides a means to directly edit each of the individual configuration parameters of the Casia device. Under the hood of the simpler interface, these are the parameters that the set-up wizard is modifying within each step. The settings editor will appear like the following image (see Figure 25):

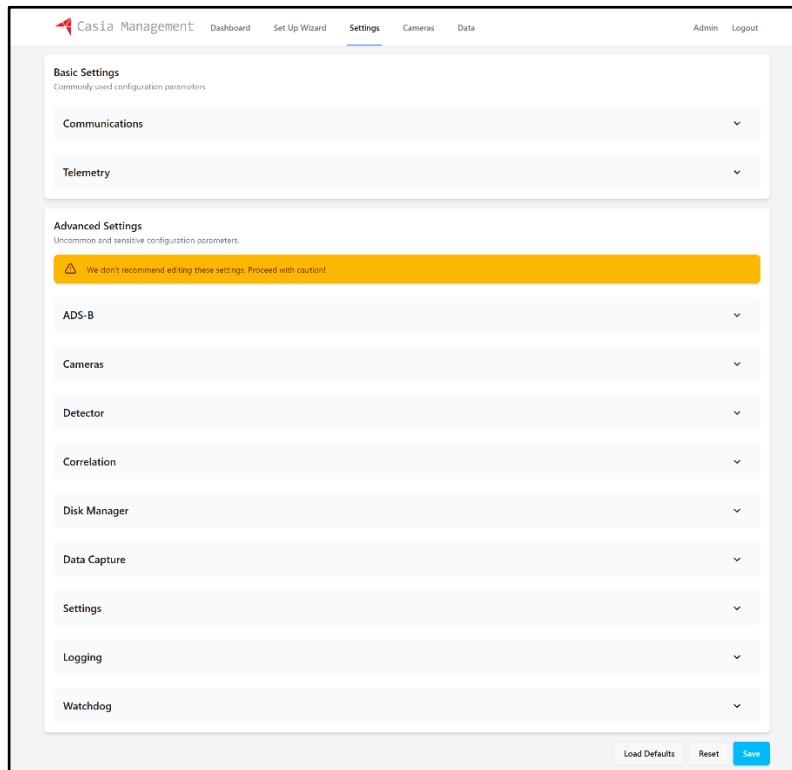


Figure 25: Casia Management Interface Settings Editor

The settings are broken down into two sections, basic settings, and advanced settings. How these settings are split is different for each device type as the use cases and applications differ.

The basic settings section contains parameters that are often changed or edited for that device type, and the advanced settings section contains parameters that are rarely changed (or more likely never changed) for that device type.

NOTICE

uAvionix highly recommends that you edit only the configuration parameters within the basic settings section and contact support before making any

advanced settings changes you wish to make to ensure the change will have the intended effects.

If you make a change you wish to undo, clicking the “Reset” button will refresh the settings to their current values.

If you wish to undo saved changes and restore the default configuration, clicking the “Load Defaults” button will refresh the settings to their default values.

Once your desired changes have been made clicking the “Save” button at the bottom of the page will save those changes to the device.

NOTICE

The device software will be automatically restarted every time the settings are saved to apply the changes.

The full list of configuration parameters and configuration values can be found in the release notes for the version of software installed on your device, they will not be listed in this document.

15.7 Camera Viewer and Masking Tool

The latest image from each of the cameras of the Casia device can be viewed with the camera viewer and their masks edited individually with the masking tool. Additionally, other information about each camera can be viewed, including its serial number and calibration information.

The camera selection page appears as follows. The images on this page will refresh every 60 seconds and display the latest image from each of the cameras.

NOTICE

The images are blurred in these screenshots to protect privacy but will not be blurred on your device.

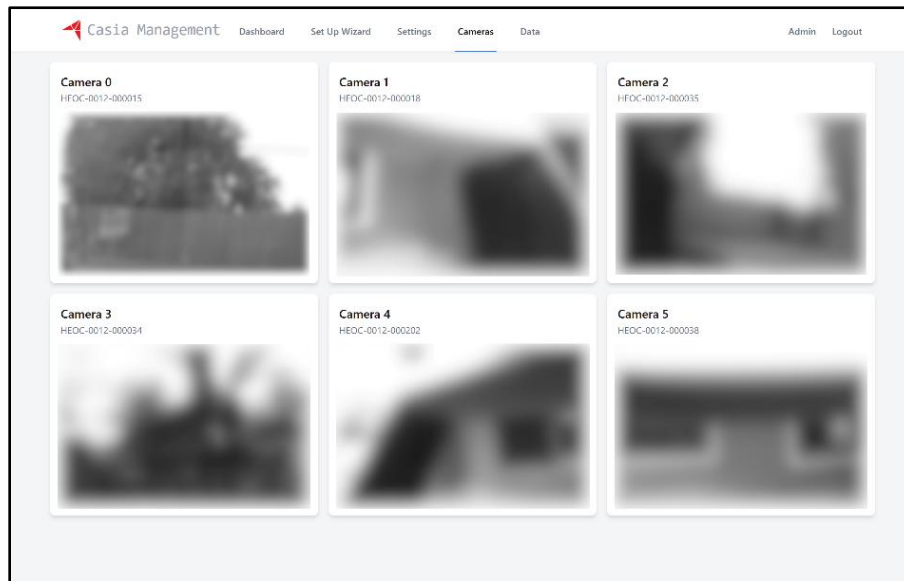


Figure 26: Casia Management Interface Camera Selection Page

15.7.1 Camera Viewer

To navigate to the viewer and masking tool for an individual camera click on the corresponding camera image. The individual camera viewer page will appear like the following screenshot (see Figure 27).

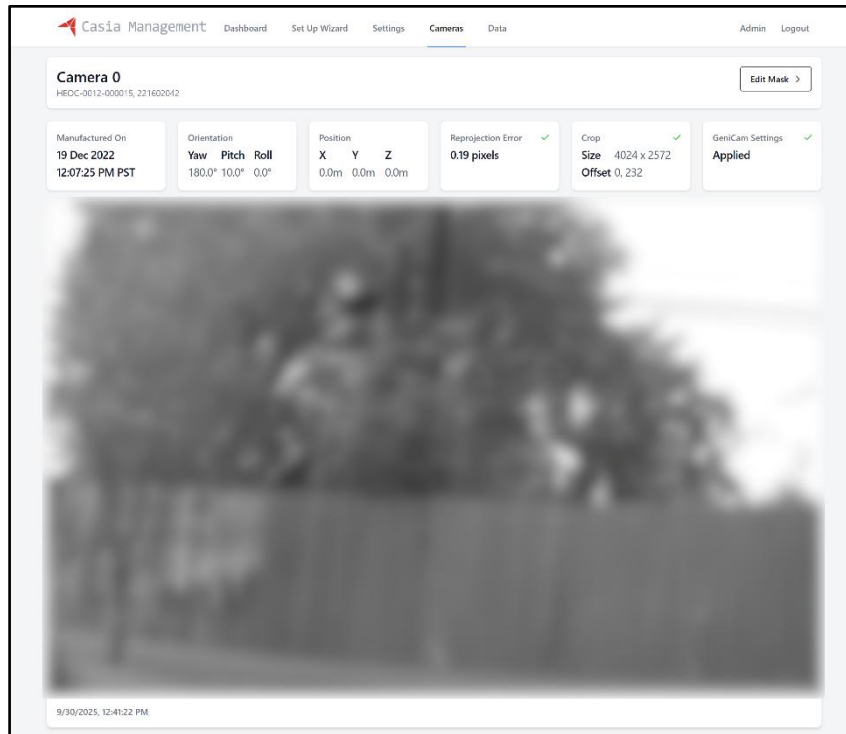


Figure 27: Casia Management Interface Camera Viewer

Camera information is displayed at the top of the page in each of the information dialogue boxes. The latest image from the camera is displayed in the main view dialogue box, and the timestamp of when that image was captured is displayed in the bottom left of the image viewer dialogue box.

NOTICE

The camera images are not real-time videos. Casia does not support streaming of the camera video and only provides a single output image every 60 seconds. This is the image viewed through this interface.

15.7.2 Masking Tool

To view and edit the mask for this camera, click on the “Edit Mask” button in the top right of the camera viewer page. The masking tool will appear like the following screenshot (see Figure 28).

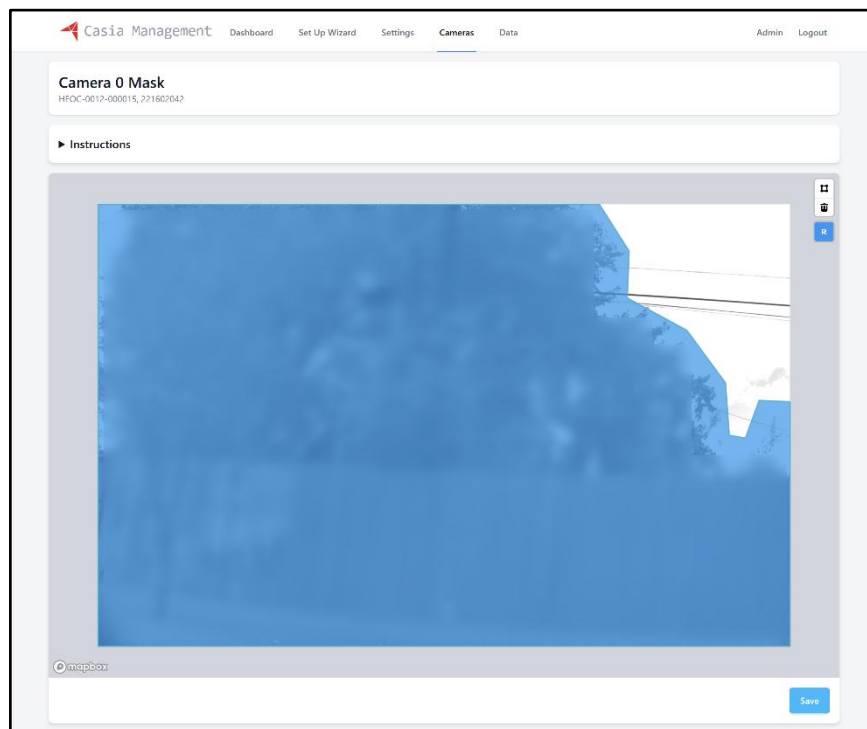


Figure 28: Casia Management Interface Masking Tool

Instructions on how to use the masking tool are provided within the tool and will not be detailed in this document.

Once the desired edits to the mask are made, click the “Save” button to save the mask to the device.

NOTICE

The device must be restarted after saving a camera mask for it to be applied. This is NOT performed automatically within the camera masking tool as it is assumed that multiple camera masks may need to be edited in succession and waiting for the device to reboot between each change will cause a long delay. Once all changes are made to all cameras, navigate to the dashboard page to restart the device manually.

15.8 Administrative Settings

On this page more sensitive device and interface settings can be edited including the password for the management interface and the network/IP address configuration for the device. The admin page will appear like the following screenshot (see Figure 29).

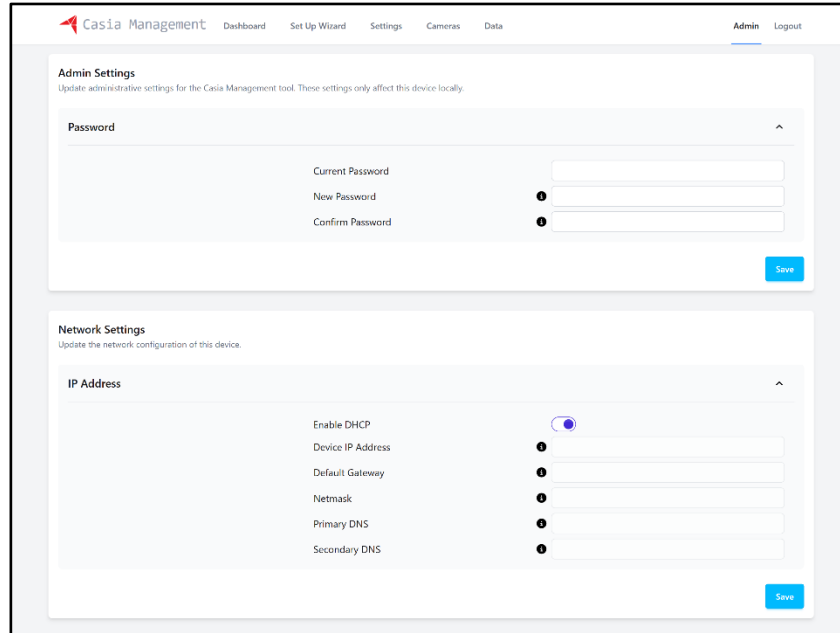


Figure 29: Casia Management Interface Administrative Settings Display

To change the password to the management interface first enter the current password, followed by the new password repeated twice. Once saved, the next time you sign in to the interface you will need to use the new password.

To alter the network configuration, enter in the details of the new desired configuration. To set a static IP address, DHCP will need to first be set to disabled to activate the other form fields. Click the “Save” button to save and apply the settings once you have entered your desired values.

NOTICE

Changing the IP address of the device can result in not being able to communicate with the device any longer. Please ensure you are certain of the changes you are making and their effects before applying them.

If a static IP address has been configured, the interface will redirect you to the new IP address automatically after the “Save” button has been clicked.

15.9 Data Browser

Data recorded and logged to the Casia device can be accessed directly from the data browser. The data browser is limited to showing only files and folders that are within the Casia log directory. The data will appear like the following screenshot and display each folder of log data available on the device (see Figure 30).

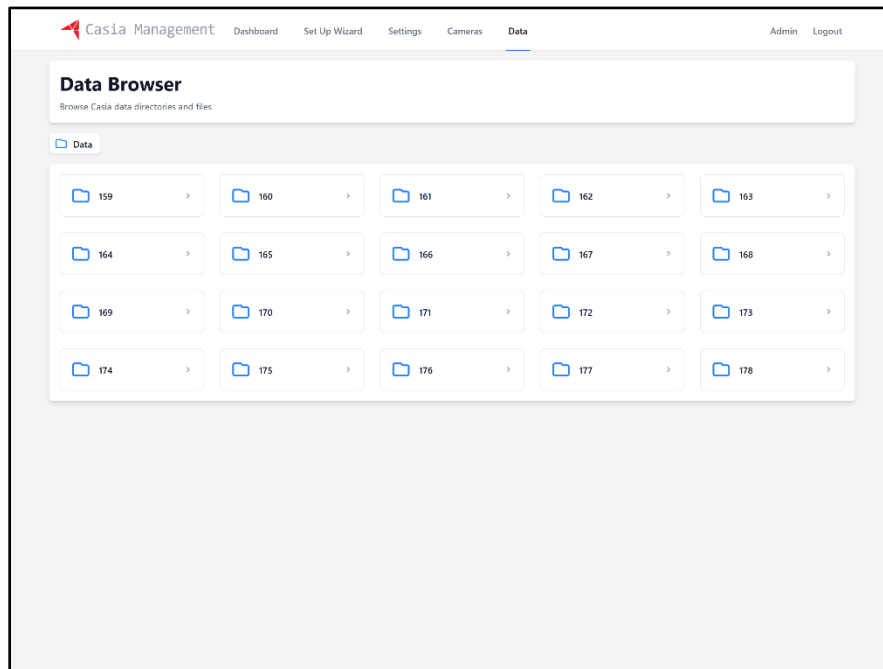


Figure 30: Casia Management Interface Flight Folder Display

Clicking on a folder will navigate within it and update the breadcrumb navigation at the top of the data browser, which allows you to navigate backwards along the file path you are now within. An individual folder of log data will look like the following screenshot (see Figure 31):

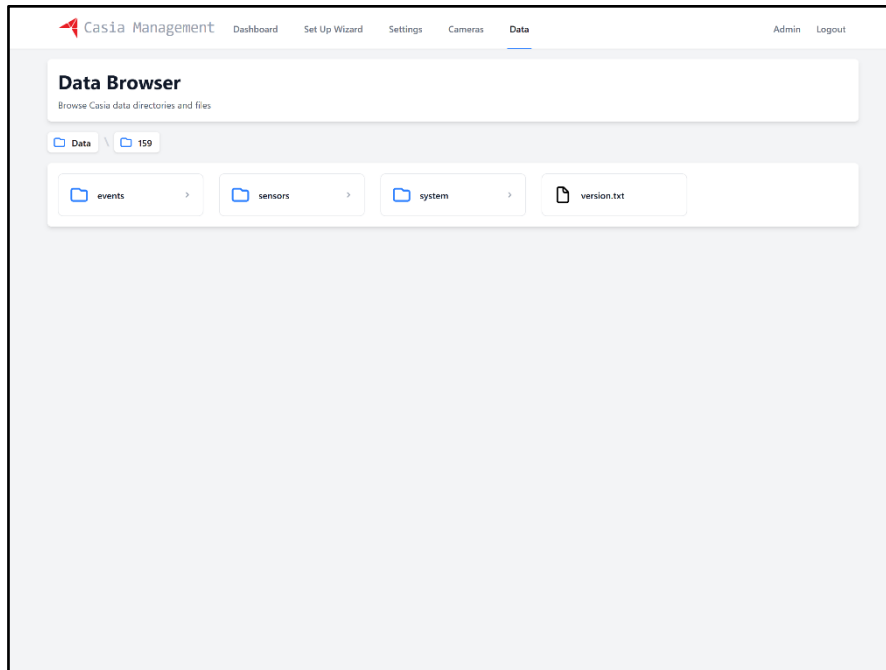


Figure 31: Casia Management Interface Individual Folder Display

Casia creates a new folder of log data each time the device is restarted. This means that at every power on event, or software restart event (such as the nightly reboot, day/night transition, or manual start/stop/restart) will create a new log folder.

Within each flight folder a directory structure organizes the recorded log data into similar sections. These folders are discussed in more detail below.

To download a file simply click on it within the data browser and the download will start. You may have to dismiss a warning about the security of the download depending on your web browser. The interface does not support downloading of folders and their entire contents currently.

15.10 Folder Structure

15.10.1 Events

The log files for each sub-system are contained within the events folder. This is the first place to look for clues when performing advanced debugging of a non-working Casia device.

15.10.2 Sensors

Each input sensor to the Casia will have its own folder within the sensors folder. Inside the folder for that device relevant information is logged, such as raw input from the sensor, calibration files, and other sub-system log information.

Casia supports the following sensor inputs:

- Cameras
- Autopilots (the name used for any telemetry input source, including the in-built sensors on Casia G)
- ADS-B Receivers

15.10.3 System

Sub-systems that are not related to receiving sensor data log their data into sub-folders of the system directory. This includes the following:

- Dynamic Tracker (our name for the visual object detector)
- Night Dynamic Tracker (the same sub-system, but the version for night operation)
- Collision Avoidance System (CAS)

15.10.4 Files of Interest

We often get requests for files from a Casia system from our customers. The following are the ones which we see the most requests for and therefore are likely to be files of interest for you if needed.

- Detected object log file - /system/cas/intruder.csv
- Detected object images -
/sensor/camera_x/intruder_images/intruder_x.png
- Raw video files - /sensor/camera_x/video_x.h264
- Camera image file - /sensor/camera_x/image.png

The contents and data structure of these files will not be discussed further in this document. Please see the Casia log file documentation for additional information or contact uAvionix support for details.

16 Remote Configuration (Remote)

WARNING

Remote configuration via FlightDeck can conflict with local configuration using the Casia Management Interface. FlightDeck is not aware of any local configuration and will therefore overwrite and changes when applied. Conversely the local Casia Management Interface will always display the current exact state of the device.

The preferred method for configuring Casia G is the Casia Management Interface, however the uAvionix web portal Flightdeck can still be used for configuration. If using Flightdeck, first power on your Casia G device and connect it to the internet. Find your device in FlightDeck (<https://flightdeck.irisonboard.com>) by selecting the 'Devices' menu option on the left. Select your device by clicking on it and scroll down to the 'Configuration' section. Click the pencil icon to edit device configuration. Expand the Autopilot section. For automated configuration using Casia Gs built in sensors, the autopilot__type should be set to 'GSPA-0100'. To set your own configuration values, select 'Ground.' Please contact [Customer Support](#) by submitting a Support Ticket to: <https://uavionix.com/support/support-ticket/> for further assistance.

1. Now expand the Static Deployment section. The question mark icons will give you details on the effect of each parameter.
2. Enter appropriate values for:
 - heading (enter value in radians. This value should be zero (0) if system is pointing to True North)
 - latitude (specify to 5 decimal places)
 - longitude (specify to 5 decimal places)
 - altitude in meters in the AMSL reference frame

Parameter		Default Value	Value	Rule
autopilot__ground_heading	?	0	0	Required
autopilot__ground_latitude	?	0	32.83274	Required
autopilot__ground_longitude	?	0	-97.31655	Required
autopilot__ground_altitude	?	0	174	Required

Figure 32: Casia G Manual Configuration Settings

3. Be sure to click Save & Push to make your configuration effective.
[Submit a ticket](#) to uAvionix for support for further assistance.

16.1 Advanced Configuration Parameters

If you require recorded video data for any of the following reasons, you can configure the parameters of your system to collect some / all data:

- Evaluate the performance of Casia G
- Gain regulatory approvals
- Understand traffic in your airspace (airspace categorization)

To do this, find your device by logging into [FlightDeck](#) (<https://www.irisonboard.com/>). Go to the 'Configuration' section. Click the pencil icon to edit device configuration. Expand the Data Capture Parameter section. The question mark icon will give you details on the effect of each parameter.

Select appropriate values for each parameter. [Submit a ticket](#) to uAvionix for support for further assistance.

16.2 Automated Daily Reboot Time

Casia should be rebooted every day. This is automatically enabled for your device to happen at 07:00 UTC.

Change Automated Reboot: Time To change to another time, find your device in FlightDeck (<https://flightdeck.irisonboard.com>). Go to the 'Configuration' section. Click the pencil icon to edit device configuration. Expand the Setting section. Change 'setting_reboot_time' to the desired time in UTC.



Figure 33: Casia G Reboot Time Setting in Flightdeck

Disable Automated Restart: The automated restart can interrupt data uploads which can occasionally be inconvenient. To eliminate this inconvenience, automated restarts can be disabled. To disable the automated restart, submit a ticket to: <https://uavionix.com/support/support-ticket/>.



Figure 34: Casia G Automated Restart Setting in Flightdeck

NOTICE

After changing this parameter, Casia must restart for the update to take effect.

WARNING

Disabling daily restart should only be done for data upload purposes as it can impair the performance of Casia.

16.3 Configuration Check

Whether the system was configured automatically or manually, you must confirm that the system is properly configured. The easiest way to do this is to check the position of your Casia G in your situational awareness tool.

Ensure your Casia G can be found in the expected location on the map in your tool.

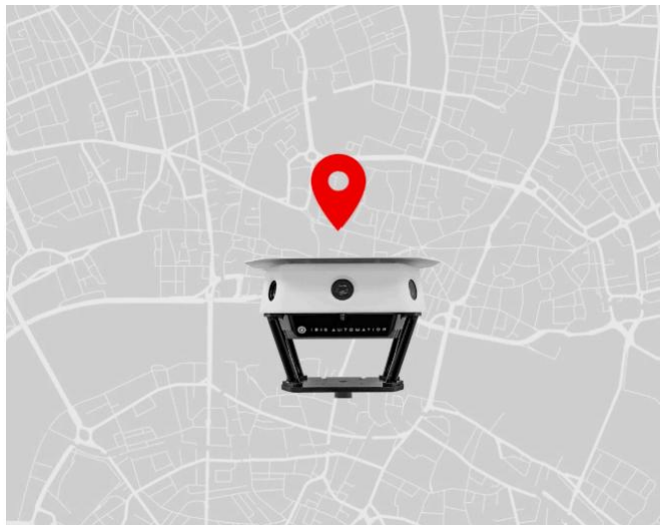


Figure 35: Casia G Location on Map

If you experience issues, repeat the configuration steps or submit a [Support Ticket](https://uavionix.com/support/support-ticket/) to <https://uavionix.com/support/support-ticket/>.

17 Situational Awareness

Casia G provides intruder aircraft location, altitude, velocity, classification, and other data to situational awareness tools. These tools will process the data and display it to RPIC, providing awareness to intruder aircraft. This allows decisions to be made on whether and how to keep the UAS operation safe.

Situational awareness can be provided via:

- Applications built by 3rd party organizations
- uAvionix Ground Station tool (provided only for demonstration, initial testing, and onboarding)

17.1 Third Party Situational Awareness Tools

There are many situational awareness tools available on the market, including Dronesense, Kongsberg, OneSky and others. These tools commonly provide map interfaces on which intruder aircraft - and often UAS - can be displayed for situational awareness. In many cases, they are also able to provide directive or suggestive avoidance instruction to the RPIC.

uAvionix offers a standard communications protocol for integration with 3rd party tools.

- Full documentation can be found [here](#).
- An emulator of Casia G output can be used to build an integration without a live Casia G device. The emulator can be downloaded [here](#).

Contact support by submitting a [Support Ticket](#) to <https://uavionix.com/support/support-ticket/> to better understand integration possibilities and paths.

17.2 uAvionix Ground Station

uAvionix's Ground Station tool provides situational awareness to intruder aircraft detected by the Casia G electro optical computer vision system, and the integrated ADS-B receiver. This includes audible and visual alerts to the RPIC, and intruder images.

For further reference, review the Casia G Ground Station Guide which can be downloaded at: <https://uavionix.com/support/casia-g/>.

17.3 Electro-Optical & ADS-B Correlation

ADS-B Correlation combines ADS-B reports with vision detections in real time to provide enhanced identification capabilities in real time. The algorithm works by using computer vision algorithms to predict a virtual image from ADS-B reports and computing a similarity metric based upon the real image points and the virtual image points. These correlations enhance the quality of the vision information by allowing it to perform in in challenging conditions such as rain, fog, and cloud cover.

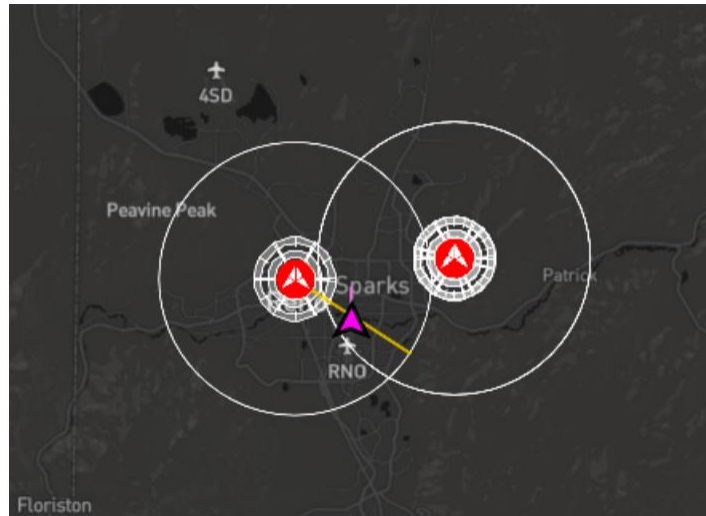


Figure 36: Correlated EO & ADS-B Track

The above (see Figure 36) shows a correlated EO/ADS-B track, which, in the uAvionix Ground Station application is represented by a purple icon.

18 Pre-Flight Checklist

18.1 Overview

The following checks must be performed before flights each day to ensure that Casia G is functioning correctly, and that operating conditions are suitable for Casia G to perform adequately. If any of these checks fail, the issue(s) must be corrected and the checklist started again, and/or flight delayed until our operating conditions improve sufficiently.

18.2 Lenses/Glass

- ☐ Inspect Casia G glass windows/ field of view for dust, particulates, liquids, fingerprints, or other blemishes. This can be done by physically inspecting the glass, by looking at images taken by the system (see section on Masking for how to refresh to see updated images from each camera).
- ☐ If glass is dirty, it should be cleaned using microfiber cloth and a glass cleaning fluid such as Windex.

18.3 Casia Status

- ☐ Situational awareness tool is receiving heartbeats from Casia G indicating it is functional.
- ☐ Ensure system is installed level and with the correct orientation as per the installation section of this document. If the system is permanently installed, daily checks will not be necessary.

18.4 Environmental/Operating Conditions

- ☐ Ensure Casia G is within operating limits, including visibility and temperature. See the Operational Limitations and Limitations & Disclaimers sections of this User Guide.

19 Preventative Maintenance

19.1 uAvionix

Casia G systems are easy to maintain, and we recommend you perform preventative maintenance yourself. However, if you contract uAvionix to provide preventative maintenance, uAvionix will perform regular maintenance on your Casia G systems. This includes cleaning and software upgrades. Should you incur issues between scheduled maintenance, submit a support ticket at: <https://uavionix.com/support/support-ticket/>.

Certain maintenance activities may necessitate your hardware be returned to uAvionix for tests or for maintenance to be performed.

WARNING

If subjected to heavy impact, Casia may incur damage that is not detectable via visual inspection. Casia devices that may have received impacts beyond standard operating conditions should no longer be used. [Contact uAvionix Support](#) for further advice.

uAvionix's FlightDeck web application enables management of Casia devices including:

- Software updates
- System configuration changes
- Data collection parameters

19.2 Owner

If you are performing preventative maintenance on your Casia G system (as opposed to via contract with uAvionix), preventative maintenance should be performed as described below to ensure reliable performance.

WARNING

If subjected to heavy impact, Casia may incur damage that is not detectable via visual inspection. Casia devices that may have received impacts beyond standard operating conditions should no longer be used. [Contact uAvionix Support](#) for further advice.

uAvionix has a portal (<https://flightdeck.irisonboard.com>) which enables fleet-wide management of Casia devices as well as a host of other features such as:

- Software updates
- System configuration changes
- Data collection parameters

19.3 Inspection and Maintenance

Until the optimal cadence can be established for your environment (level of rain, dust, etc.), your system should be visually inspected and checked for obvious issues every month. If necessary, the glass should be cleaned with a class cleaning solution (e.g., Windex) and a microfiber cloth.

19.4 Casia Software Updates

uAvionix is constantly improving the performance of the software, fixing issues and bugs, improving reliability, and adding important features and integrations.

You will receive notification about when new software is available. Also, if you log into FlightDeck (<https://flightdeck.irisonboard.com>) you will be able to see if a software upgrade is available for any of your Casia G devices.

Scan the QR code for videos about Upgrading Software Versions for the Casia G. Visit the Casia G getting Started page for all installation videos:
<https://flightdeck.irisonboard.com/casia-g/gettingstarted>



Figure 37: Casia G Upgrading Software Versions QR Code

20 Watchdog

Casia includes a Watchdog System that allows it to detect and recover from errors while in operation. There are multiple layers of watchdogs built into Casia to capture and recover from all potential internal failures of the system.

20.1 Software (SW) Watchdog

All elements of the Casia software report constantly to the Software Watchdog that they are still functional. If one of these elements stops reporting, the Software Watchdog will assume a failure and reset the entire software system allowing it to begin from nothing and recover from the error.

20.2 Hardware (HW) Watchdog

It is possible that an error encountered was outside the Casia software itself and is a result of an underlying operating system or hardware problem. Casia also has a Hardware Watchdog which will reboot the entire device when issues are detected, enabling it to start fresh and recover from any problems.

Resetting the entire device can take up to a couple of minutes.

21 Troubleshooting

If you encounter an issue with your device, follow these steps to diagnose and fix the problem. If you cannot resolve the issue, submit a [support ticket](#) to uAvionix for assistance.

Issue	Cause	Resolution	Resolution Details
Main Unit			
Not detecting intruder aircraft as expected	Device glass is dirty	Clean the Glass	Fingerprints, dirt, ice, snow, etc. may impact the performance of Casia. Review the maintenance section of this document to understand how to check the glass for clarity and how to clean it.
	Insufficient visibility		The performance of Casia is impacted by weather (rain, snow, etc.) and visibility (smoke, fog, etc.). See the performance specification of this user guide. Check visibility is appropriate for your operations.
	Airspace obstructed		Casia cannot see through buildings, trees, poles, or other objects that may prevent a clear view of the sky. Either remove any such obstructions or relocate Casia.
	Insufficient light		See operating limitations of Casia G in the user guide. Casia can only be used between 30 minutes after sunrise and 30 minutes before sunset.
	System not active	Ensure system is active	Check the system is shown as active by your situational awareness tool. If not, ensure it has power and is connected to the internet.

Power LED not illuminated (Underside of Casia G)	Not receiving power	check power supply box is receiving power	If the LED is not illuminated, the system may not be receiving power from the power supply. Check the power supply box LED is illuminated and that it is receiving at least 70W.
		Check power cables	Check that the cable from the power supply box to Casia G is plugged in, is undamaged, and is securely fastened.
HW LED Fast Flashing (Underside of Casia G)	Persistent error detected by the Casia hardware watchdog.,	Wait for 15 minutes	Casia G may be able to resolve the issue itself. Give it some time
		Ensure cables connected properly	Check that all cables are plugged in, undamaged, and securely fastened.
		Check external devices	Ensure external devices are powered on by checking their respective status indication LEDs.
		Reboot Casia	Power cycle the Casia device by disconnecting and reconnecting power.
SW LED Fast Flashing (Underside of Casia G)	Persistent error detected by the Casia software watchdog	Wait for 15 minutes	Casia G may be able to resolve the issue itself. Give it some time.
		Ensure cables connected properly	Check that all cables are plugged in, undamaged, and securely fastened.

		Reboot	Power cycle the Casia device by disconnecting and reconnecting power.
		Check cables	Check that all cables are plugged in, undamaged, and securely fastened.
Data uploads slow	Internet speed	Obtain faster internet	Consider getting internet connectivity with a faster upload speed. Gbit upload speed would be ideal.
Data uploads slow (continued)	Data volume	Record less data	See the Data Collection Parameters section of this document for further information.
Data uploads interrupted Daily	System daily reboot setting	Change configuration setting	Before uploading, disable the daily restart from the device Configurations page in FlightDeck. After uploading, this must be re-enabled.
Casia G reboots at the same time every day and disrupts operations	System daily reboot setting	Change configuration setting time	Change the daily restart from the device Configurations page in FlightDeck to a time that will not interrupt operations.
Power Supply Box			
LED not illuminated on bottom of power supply box	No power-to-power supply box.	Check power cables connected	Ensure the power supply is connected to 110 V AC supply and that the cables are securely fastened and not damaged.
Situational Awareness Tool			
Incorrect location shown for Casia G	Casia unable to obtain correct GPS location.	Manually enter GPS location in FlightDeck or relocate	Review the Configuration section of the user guide for instructions on manually entering GPS coordinates.

		away from interference	
Device Disconnected Message	No power-to-power supply box. LED on power supply box NOT illuminated.	Check power cables connected	Ensure the power supply is connected to 110 V AC supply and that the cables are not damaged
	No power to Casia G. Power LED on Casia G NOT illuminated.	Check power to device	Ensure that the power supply box is firmly connected to the Casia G unit and that the cables are not damaged.
	Insufficient power	Ensure supplied power is adequate	The available power must be more than 70W. Contact a qualified electrician for assistance.
	No internet Connection	Check cable connections	Ensure ethernet cable connections are firm and cables are not damaged.
		Check internet speed	Use speed test app to ensure upload speed is more than 10Mbps.
Frequent False Positives Disrupting Operation	Persistent detections on infrastructure, trees, etc.	Leverage masking tool in Flightdeck	Use the masking tool in FlightDeck to stop detections on those static objects. See the Persistent False Positives section of this document for further information.
Intruder aircraft appear in the wrong location	Poor alignment of Casia G	Repeat Alignment process	Casia G may not have been aligned correctly. Repeat the alignment process as outlined in this User Guide.
	Poor alignment of Casia G	Secure Casia to pole / mast and	Casia G may have rotated on its bracket if not sufficiently secured.

		repeat alignment	
	Poor alignment of Casia G	Incorrect setting in FlightDeck	The default settings for Casia assume it is pointing to True North. As such, the default value for alignment is zero (0) radians. This should be checked to ensure it agrees with the device.
	Poor leveling of Casia G	Repeat leveling process	Casia G may not have been installed sufficiently level. Check whether it is level and if not, repeat the leveling portion of the installation.
Detecting birds	Expected functionality	Filter out these detections	Casia G has been trained to detect and classify birds. If you do not want bird detection, they may be filtered by your situational awareness too. At times, Casia may think a bird is a plane as they can look very similar.
Intruders disappear when they are very close to Casia	Casia does not look up.	Expected functionality	Casia looks out to see aircraft coming from far away. Higher flying aircraft will not be detected as they fly over Casia G.
Cannot hear audible alerts	Volume too low / muted	Increase / un-mute volume	
	No intruder detected	Wait for intruder aircraft in field of view	No alert will be heard if no intruder was detected, ensure intruder aircraft are present and retry.
No intruder detections	No intruders present	Wait for intruder	No detections will be made if no intruders are present, ensure

		aircraft in field of view	intruder aircraft are present and retry.
	Casia not connected	Connect Casia to power and internet	Connect Casia to power and internet as described in the installation section of this document.

Table 16: Troubleshooting Guide

22 Device Registration

To register your device, complete the following form:

<https://uavionix.com/support/register-product/>

23 Support

For further assistance, please submit a [Support Ticket](https://uavionix.com/support/support-ticket/) to uAvionix at:
<https://uavionix.com/support/support-ticket/>

24 Appendix A: Casia G Top Assembly

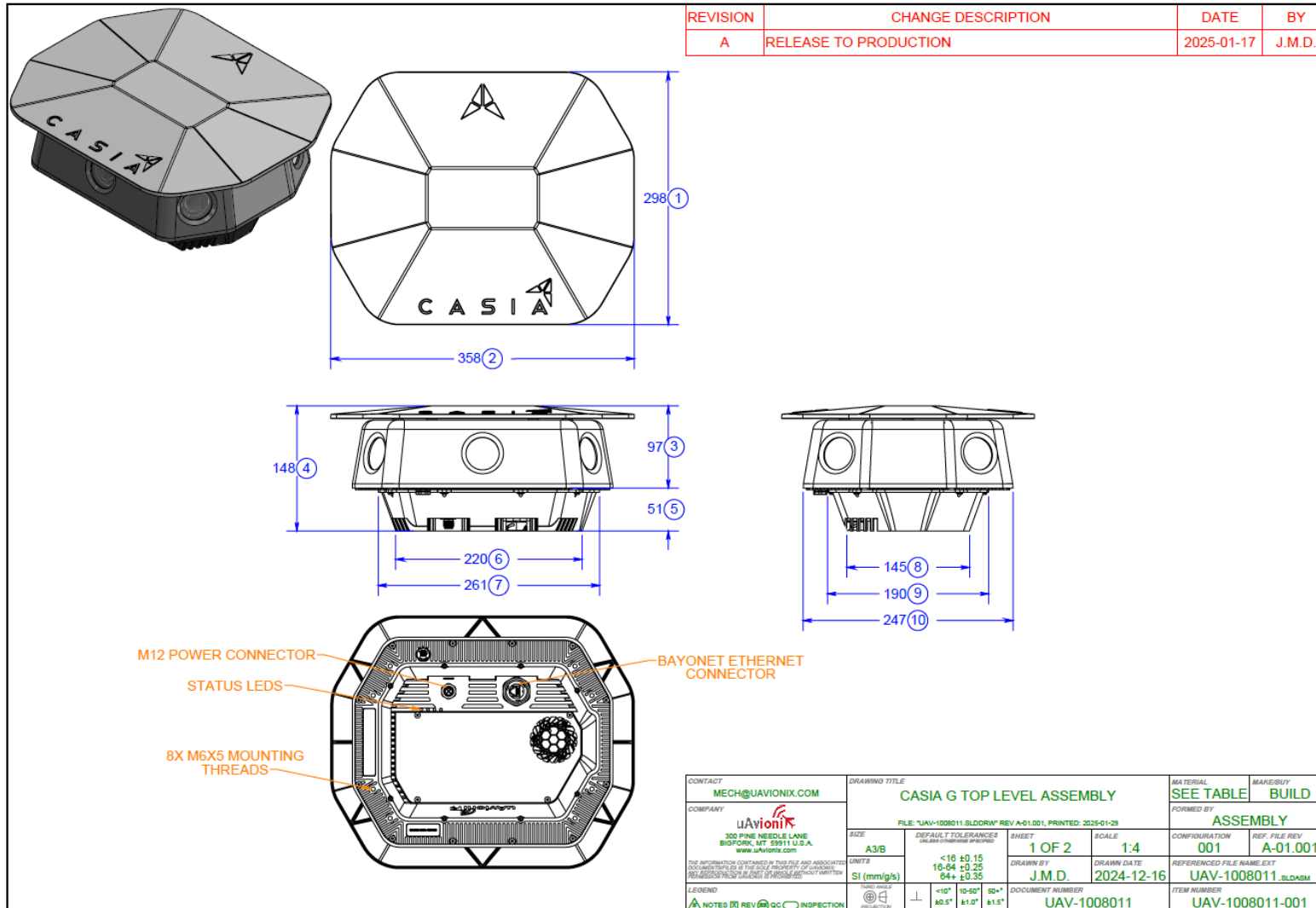


Figure 38: Casia G Top Level Assembly Mechanical Drawings

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