Applanix AVX210 Configuration

For PAS1000 and PAS190

Version 16

27 June 2019

PHASEONE INDUSTRIAL

Contents

1. Before you start

- Configure the screens
- Configure the screen touch (par instructions om page33)

2. Introduction

Follow the instructions to configure the unit for PAS100/150 and PAS190. The difference between the PAS systems is in the following areas:

- IMU lever arm
- Length of the wires in the “Octopus” harness

3. Configuring the Wires

Five wires exit from the D-Type that connects to the AVX210:

- **Power**:
  Connects to one of the iX Controller power ports.
- **Com1:**
  Connects to the iX Controller Com port. This wire is used for:
  - Commanding the SOMAG stabilizer by iX Flight
    (no connection to the AVX210, just uses the harness).
  - Transfer of stabilizer angles to the AVX210 (GIM01 message).
- **Com2:**
  Connects to the camera for tagging the image with GPS data.
- **Ethernet:**
  - Connects to the iX Controller right Ethernet port.
  - Supplies data to the flight management system.
    (The right port is supposed to be configured as part of the computer image. At the end of this manual, there are instructions in case of trouble).
- **SOMAG connector:**
  Transmits flight management commands to the stabilizer.
  Transmits gimbal angles to the IMU for inclusion in the T04 data.

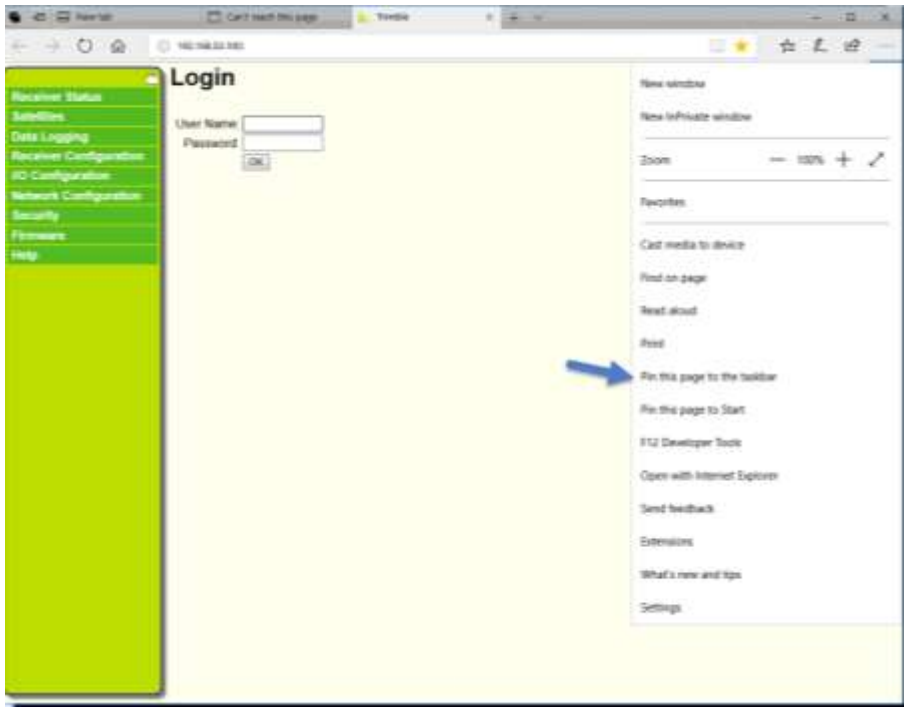
To configure the wires:

1. Connect all five wires.
2. Connect a GPS antenna.
3. Power up the system.

4. Opening Applanix Setup Application

To open the Applanix setup application:

1. To get to the Applanix setup application, on the address bar of your browser, enter the IP address: `http://192.168.53.100`.



2. Pin the page to the taskbar for fast future entries
3. The default credentials are:
    - User Name: `admin`
    - Password: `password`

After connecting, a splash screen opens on the screen, showing: the product, system name, serial number, and firmware version.

The receiver type for the POS AVX210 product appears as APX-15v2 AV indicating the system has been set up for Airborne Vehicle applications and the hardware version of this unit is 2.

Firmware version in this example screenshot is 5.14.

5. Updating Firmware Version

Current firmware version is **5.50**.
Make sure you have the correct files:

- **APX-15v2_V550-A_RC3.timg**– for hardware version 2
- **APX-15v3_V550-A_RC3.timg**– for hardware version 3

To update the firmware

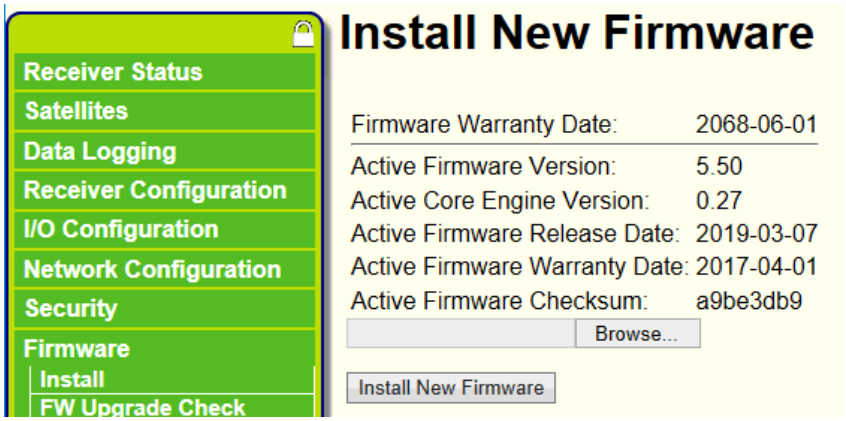
1. Open Firmware page
2. Select Install page
3. Use “Choose File” button to point to firmware image
4. Use “Install New Firmware” button to initiate transfer and installation.
5. Click OK on browser message to start the process.
6. At the end of the installation the receiver will reboot (it will show reaching 100% three times for three processes done in a raw before completing).

Keep browser opened during image transfer from your local drive to AVX210. Closing the browser during image transfer might result in corruption of the image itself.

Keep browser opened all the time until firmware is 100% installed.

At the end of the installation the following message appears:

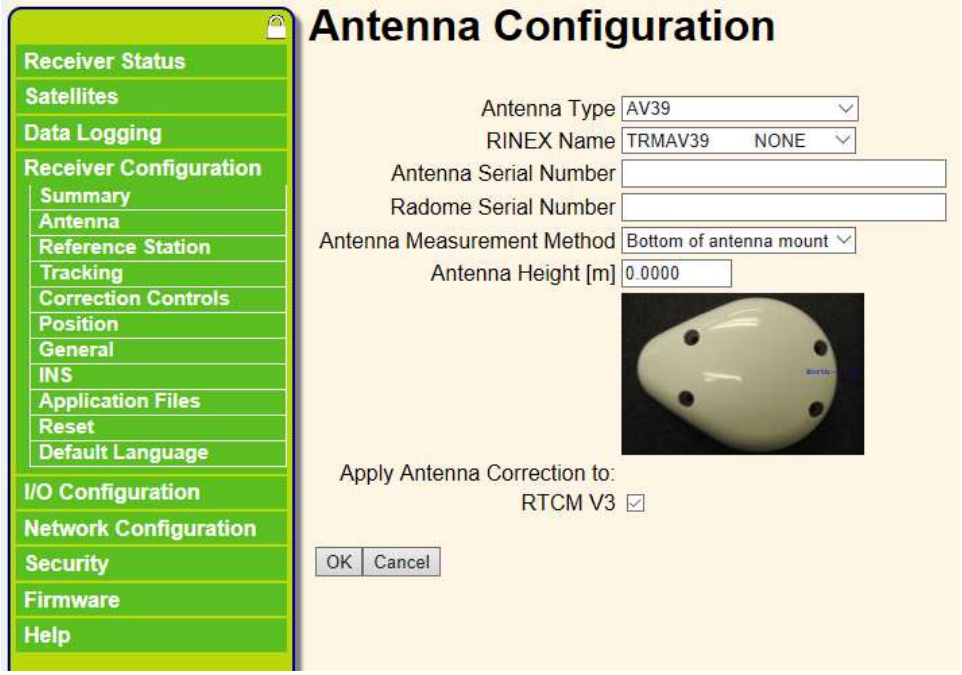
Go back to Firmware page / Install New Firmware and verify the correct version is installed:



6. Setting the Antenna

To set the antenna for internal testing:

1. From the **Receiver Configuration** menu, for internal testing select **Antenna** > **Unknown External>** click **OK**
2. After testing, change to the parameters shown in the following screenshot:



3. Customers using a different antenna should enter the correct antenna type.

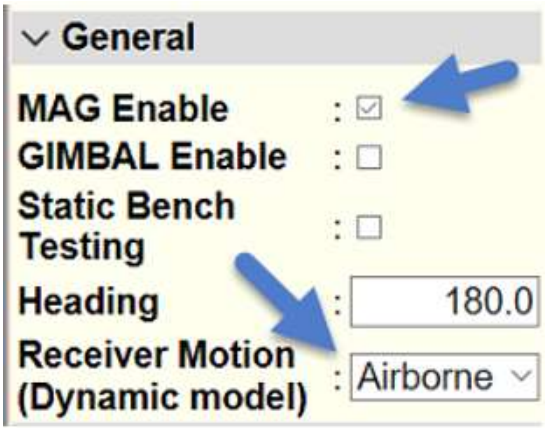
7. Event Setting

1. Go to Receiver configuration - General
2. Verify that the configuration is the same as that shown in the following screenshot:

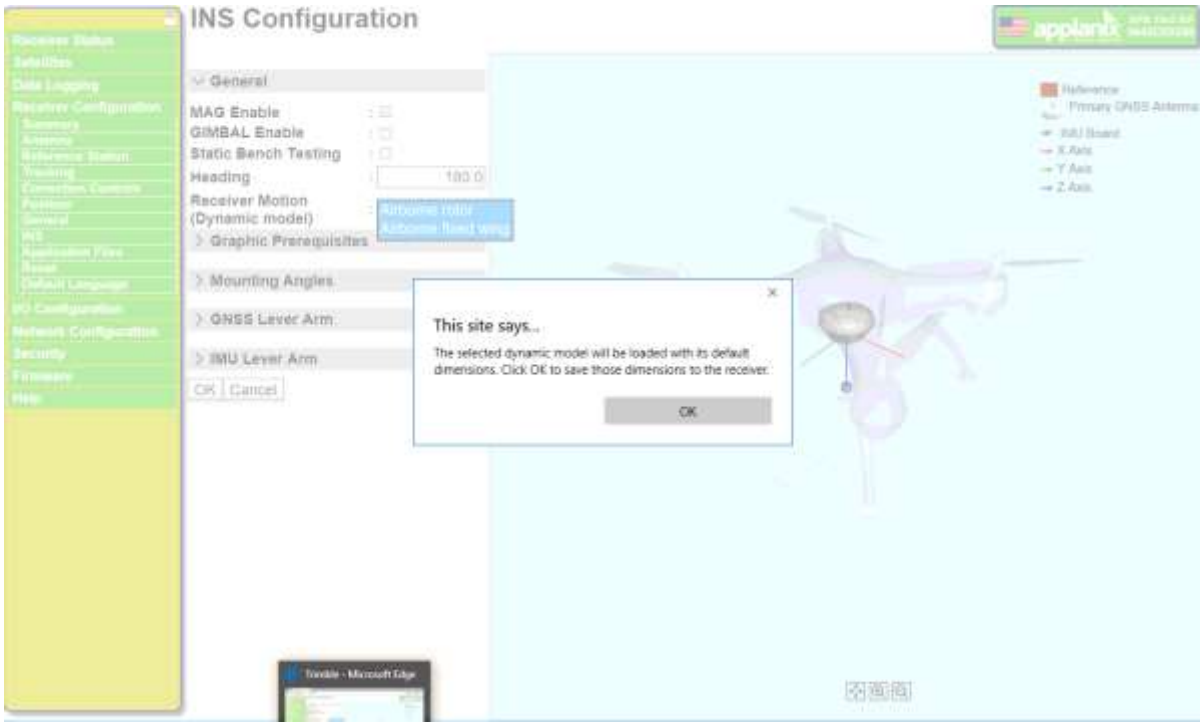
8. Setting the Magnetic Calibration

To set the magnetic calibration:

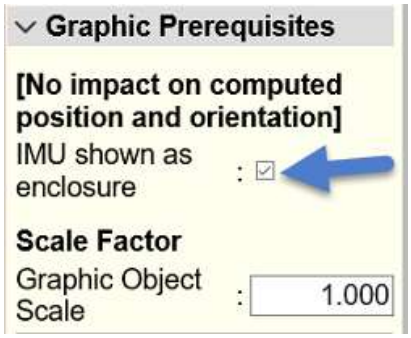
1. In **Receiver Configuration / INS / General**, select the **MAG Enable** checkbox.
2. Set **Receiver Motion** to **Airborne Fixed Wing**.

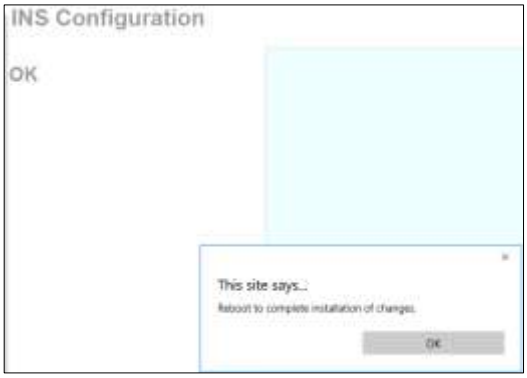


3. Click **OK** on the following message

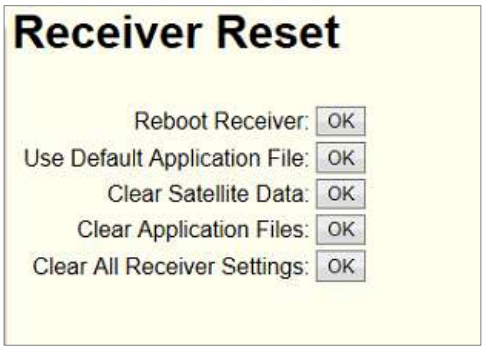


1. Click OK and reboot.
2. In the **Receiver Configuration / INS / Graphic Prerequisites** dialog, select the "**IMU shown as enclosure"** checkbox.
3. Click "ok"
4. From the Receiver Configuration menu, select **INS** > **Mounting Angles**.
5. Go to **Reference to IMU Mounting Angles [Deg.]** and set **X [ROLL]** to `180`.
6. Click **OK**.
   A reboot message displays.

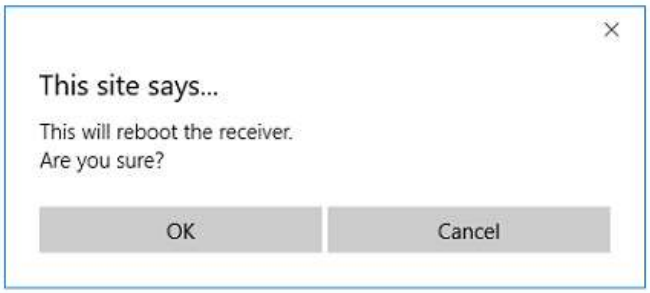




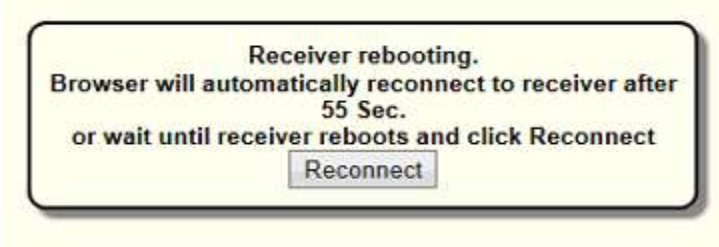
7. When the reboot message displays, click **OK** to reboot.
8. On **Reboot Receiver**, click **OK**.



A verification message displays.



9. Click **OK** and wait until the reboot completes.



10. **Make sure that APX is tracking GNSS**.
    This is because gyro measurements are not available until after the receiver's clock has been synchronized with GPS time.

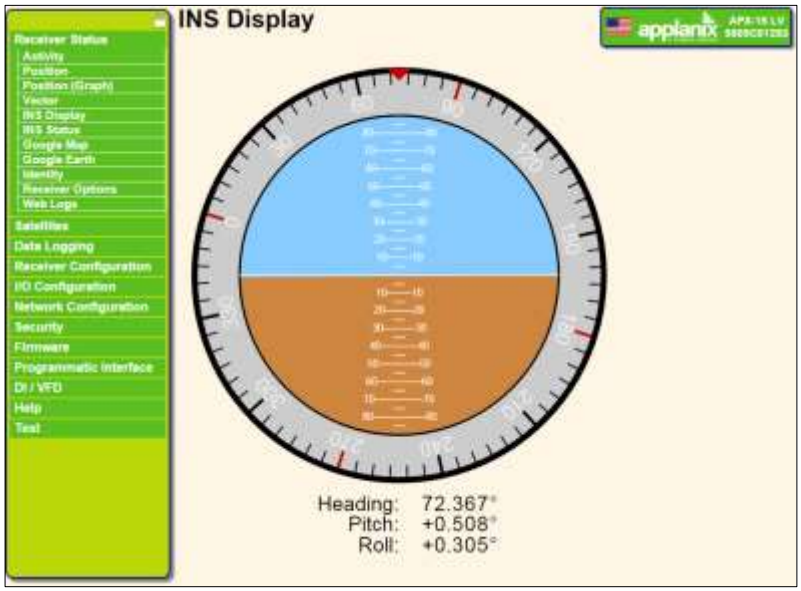
    Raw gyro measurements are used to determine when to start and stop collecting magnetometer measurements for the calibration.
11. Before starting the calibration – make sure the platform is fully static for the first minute after the power is applied:
12. Hold the unit away from screens and metal plates.
13. Rotate the unit slowly at least two times clockwise around the Z-axis.

The maximum angular rate cannot exceed 40-degrees per second. It should, therefore, take at least nine seconds to complete a full 360-degree rotation about one axis.
The calibration algorithm initiates automatically when the receiver is rotated about the Z-axis at a minimum of 0.6-degrees per second.

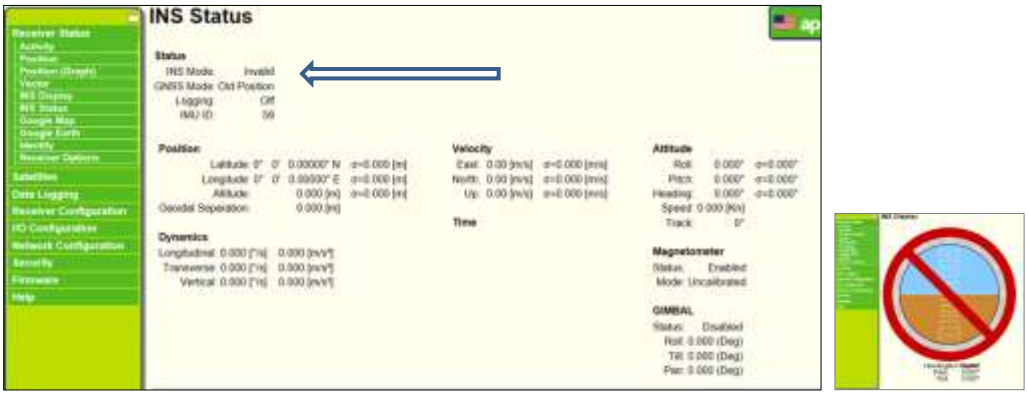
9. Checking Magnetometer Calibration

To check the magnetometer:

1. Power cycle the system.
2. After the unit reboots, go to the Receiver Status menu, select **INS Display**.



- If the calibration was successful, the **INS Mode** reads **Degraded.** The heading should now initialize when static.
- If the heading is unable to initialize – the calibration was not successful. The INS mode shows INVALID and the INS display shows a “forbidden” icon.
  Repeat the procedure.



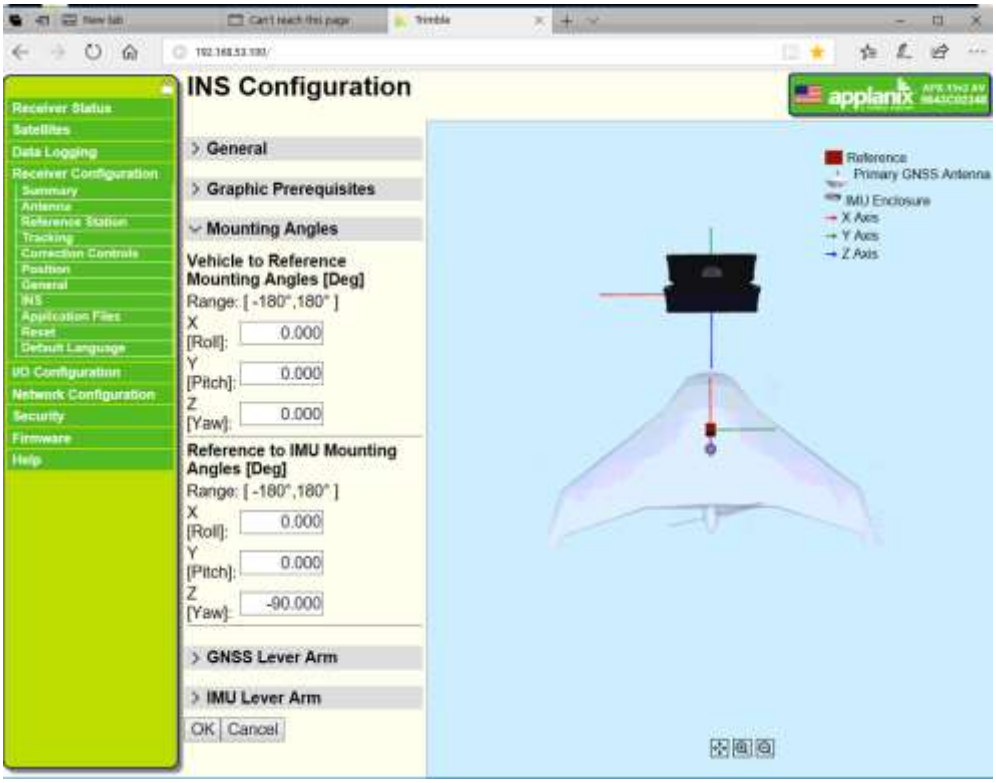
Note:

- *If the magnetometer calibration was successful, the calibration times out and the system does not allow another calibration to be completed for 10 minutes (turning the system on and off does not change this).*
- *If the calibration was unsuccessful, redo the process. If you fail multiple times – power down the system and wait 10 minutes before redoing.*

10. Settings the Lever Arms

To set the lever arms:

1. From the Receiver Configuration menu, select **INS/Mounting Angles**.
2. Verify that the Vehicle to reference mounting angles are all set to zero.
3. In the **Reference to IMU Mounting Angle** pane, set **Z** to **--90.000**. (Minus (!) 90.
4. Verify that roll and pitch are 0.00



5. From the INS configuration menu, select **Reference to IMU lever Arm** and set the values below as shown.

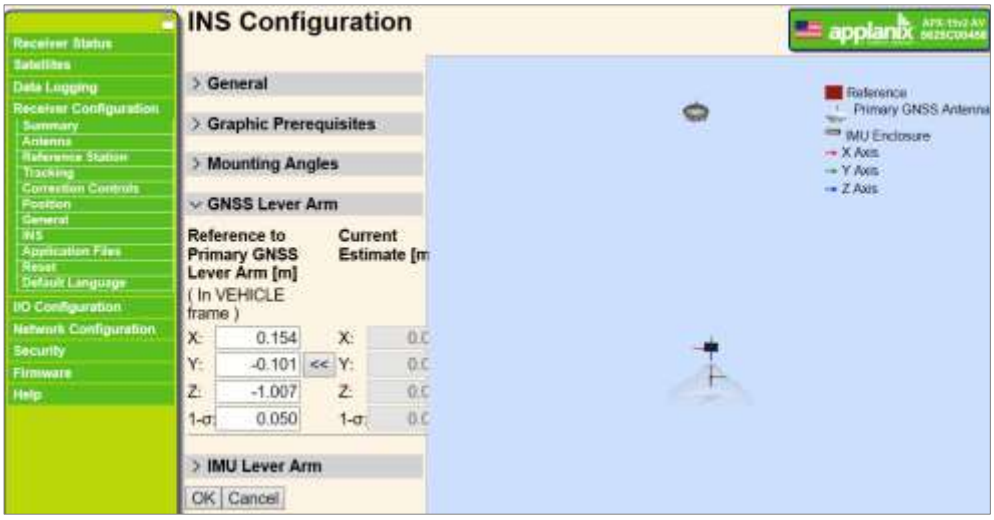
6. For:
   - PAS 1000 (ixu)– set:
     - X = `0.0022`
     - Y = `0.013`

Lens	32 mm	40 mm	50 mm	70 mm	90 mm	110 mm	150 mm
• Z (m)	-0.2023	-0.1932	-0.1964	-0.1866	-0.2272	-0.1731	-0.1654

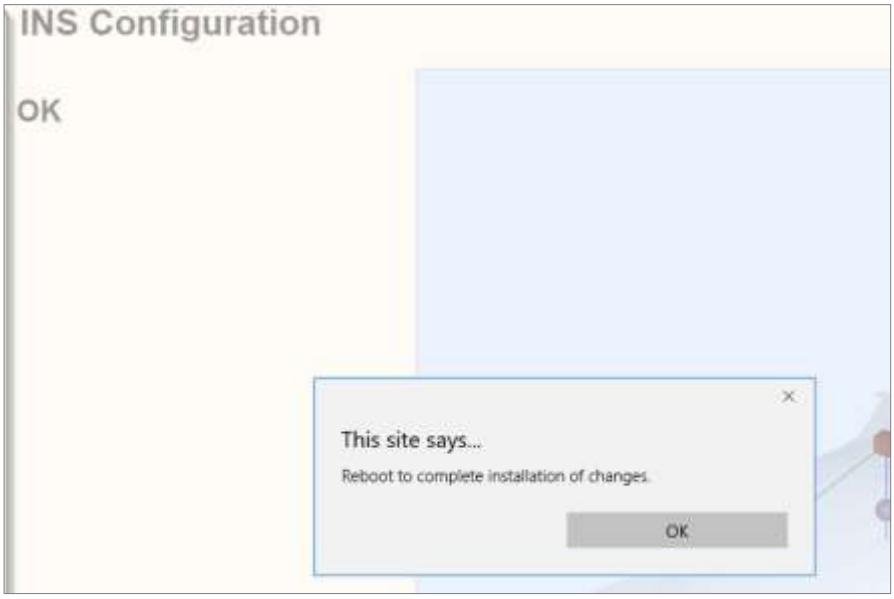
   -
   - PAS 190 – set:
     - X = `0.02025`
     - Y = **-** `0.0405 (minus!)`
     - Z = **-**`0.3627 (minus!)`

7. Make sure the graphic representation of the location and orientation to the unit, with respect to the camera, seems to be “OK”.

8. Enter the following GNSS (antenna) lever arm and review the graphic presentation. End users need to change these values according to their aircraft. However, these initial values help in a sanity check.



9. Verify in the picture that the IMU is above the camera (reference system) and that the antenna is above and to the left of the camera. Zoom out if you do not see the antenna.



10. Click **OK**.
11. **Reboot**.

11. Setting the I/O

This configures the data to be sent by the ports.

- **TCP/IP** data is used by **iX Flight**.
- **Com1** connects to the **Somag Stabilizer**.
- **Com2** connects to the **camera**. It is used for tagging the images.

To set the I/O:

1. Select **I/O Configuration**.

The following screen opens:

10.1. Setting TCP/IP configuration

The TCP/IP communication data is used by iX Flight.

1. Click on **TCP/IP** Port 5018. A screen opens.

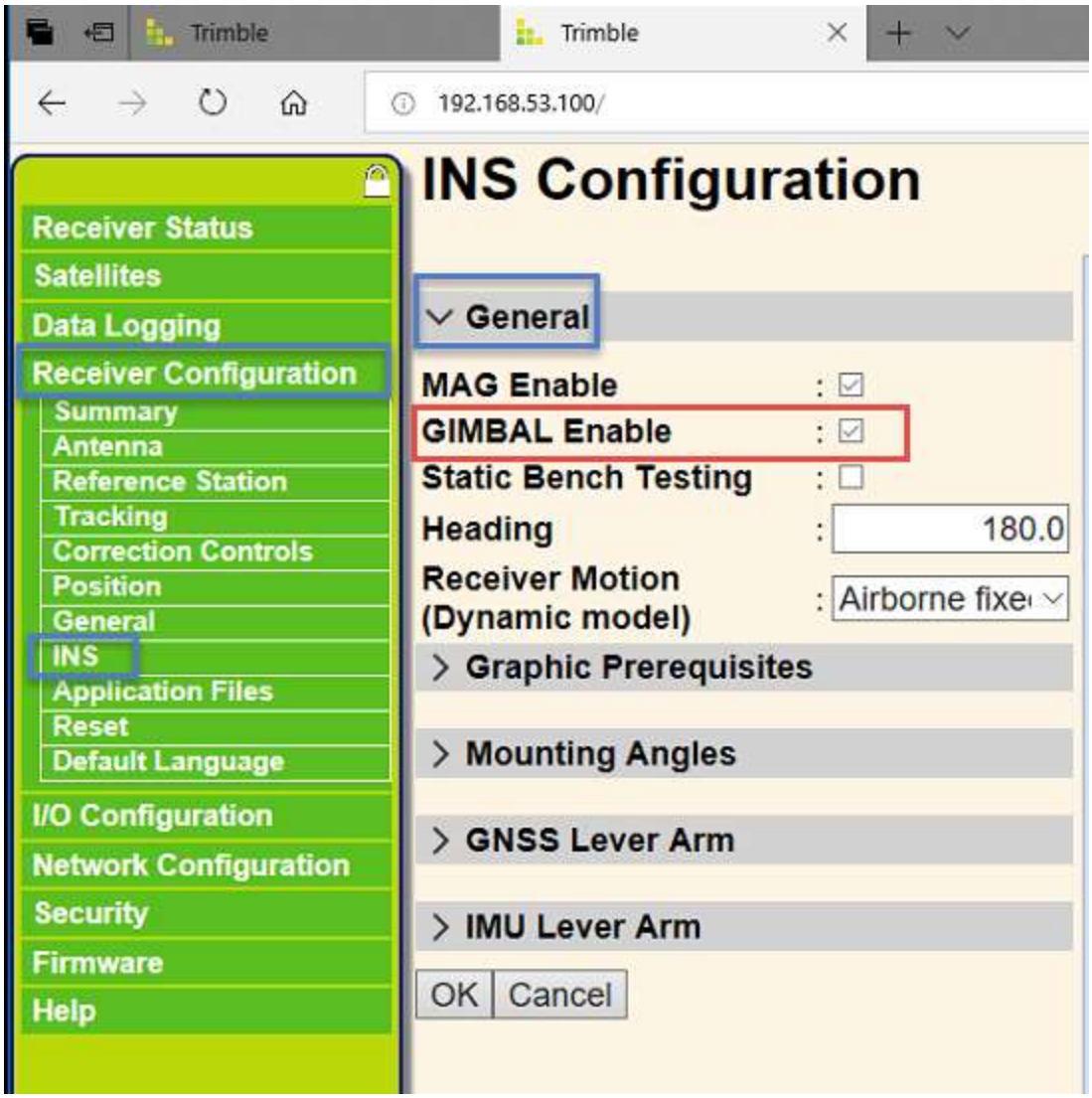
2. Verify TCP/IP 5018, NMEA
3. Verify server TCP 192.168.53.100, port 5018.
   To changing the server address, go to “Network Configuration” (see the section described in “12Changing Network Configuration”, on page 23).
4. In the dialog that opens, select:
   - **GGA (20 Hz)**
   - **GSA (20 Hz)**
   - **VTG (20 Hz)**
   - **PASHR (20 Hz)**
   - **EN1 (ON)**
5. Verify Standard – NMEA Legacy is checked.
6. **Click “ok”**

7.

10.2. Setting Com1 configuration

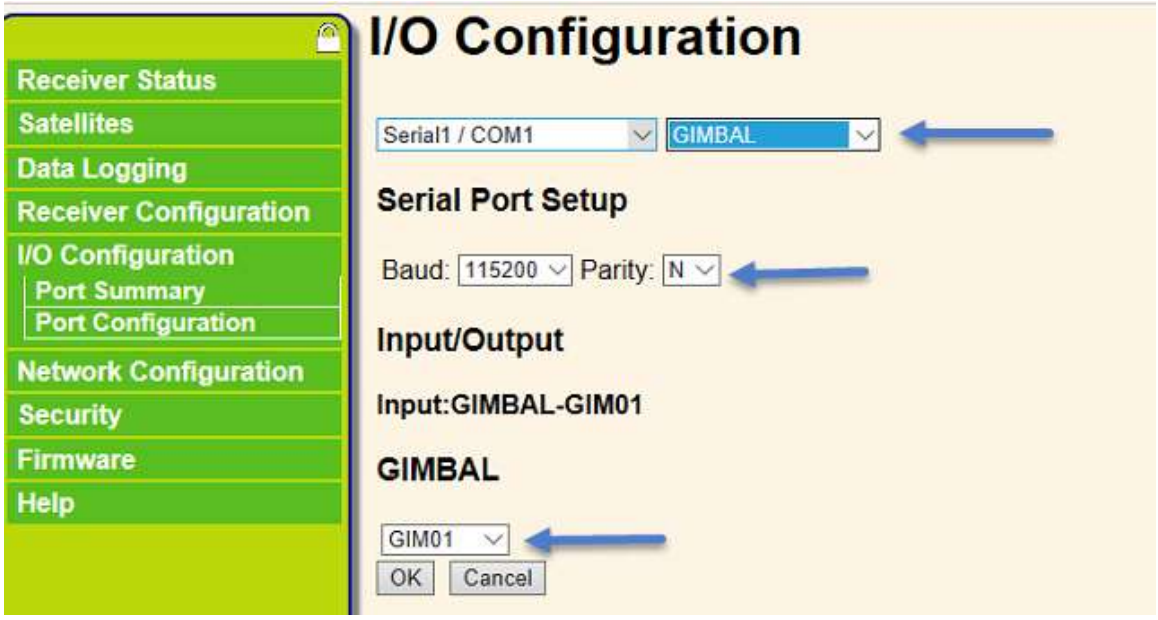
Com1 communication is used for communication with the Somag stabilizer.

1. Enable gimbal angles. In Receiver configuration/INS/General put a check mark in the Gimbal Enable check box.



2. Click OK and reboot the system for this setting to be saved.

3. In I/O Configuration select serial Com1
4. On the first line- select GIMBAL (see Following screen shot)
5. On the second line – select Baud 115200 and Parity N
6. In GIMBAL – select GIM01

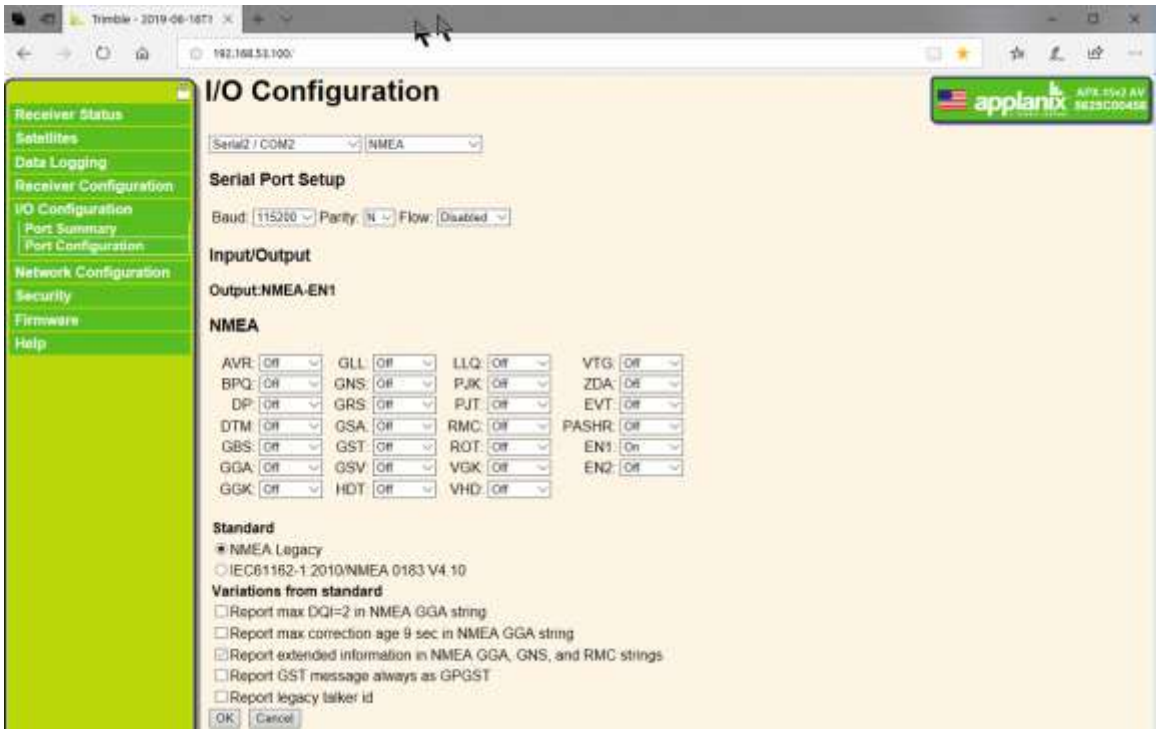


7. Click OK

10.3. Setting Com2 configuration

Com2 communication data is used by the camera

1. In I/O Configuration – click on Serial Com2.
2. Select the following values:
    - **Baud 115200**
    - **EN1-ON**

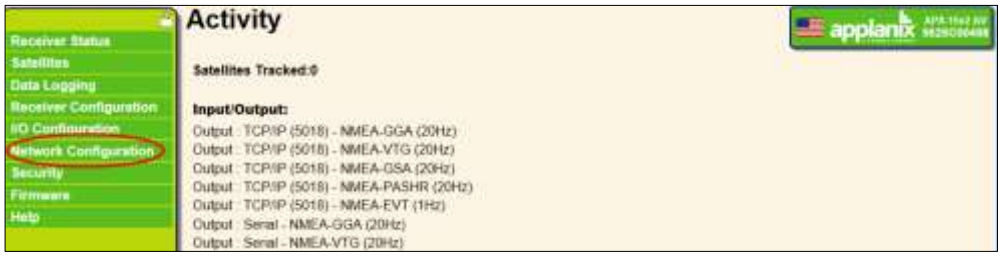


3. Verify Standard – NMEA Legacy is checked.
4. Click OK.

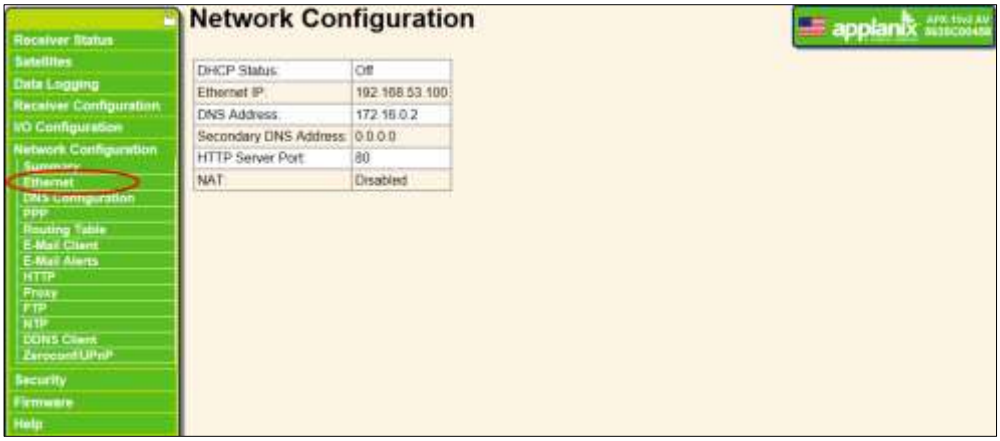
12. Changing Network Configuration

This is needed only in cases where you need to change communication with the system.

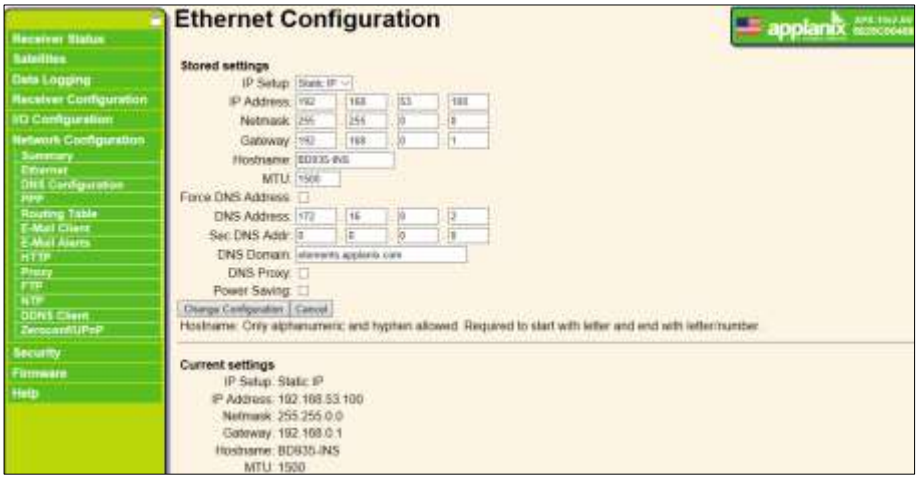
1. Select “Network Configuration



2. Select Ethernet



3. Verify the settings are as shown. You may change the numbers to conform to the numbers shown.



13. Changing Security Configuration

When security is not needed, and quick access to the GPS pages in flight is needed, you may bypass the need for user and password by changing the security configuration.

1. Click on “Security”.
2. Click on “Configuration”
3. In Security - select “Disabled”

Click “OK”.

14. Testing the System

The test shows the connectivity between the camera, iX Capture, iX Flight, and the GPS.

To test the iX Capture system:

1. Activate iX Capture.
2. Verify a camera is connected.
3. Go to **Settings**/camera page

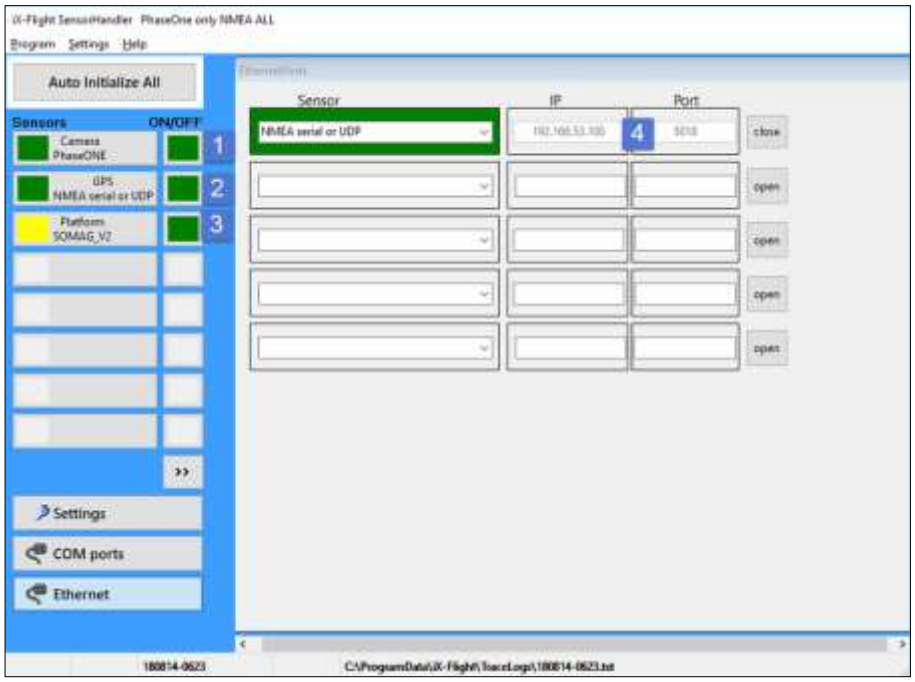
4. Serial link/left terminal/type – set **GPS**
5. Baud rate set 115200
6. In GPS/GPS Receiver - Select **Applanix**.
7. Trigger a picture.
8. Verify a picture is taken.
9. Verify the GPS information is shown.

To test the iX Flight system:

1. Activate iX Flight.
2. In settings, select **Display windows**.
1. Select **Separate pilot window**.
2. Move the pilot window to the pilot display.
3. Click **Save display positions**.

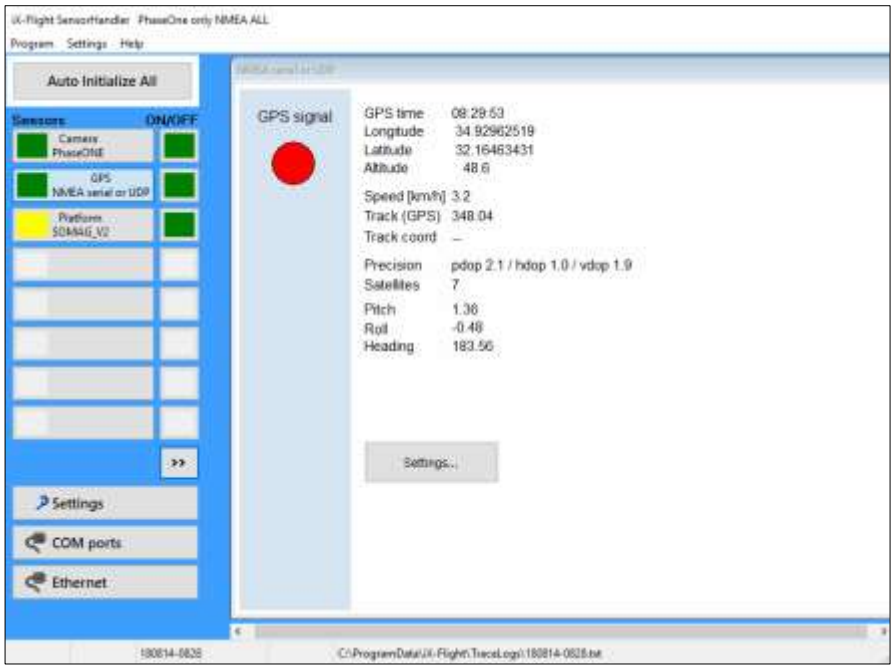
To test the Sensor handler:

Configure the sensor handler (using its manual)

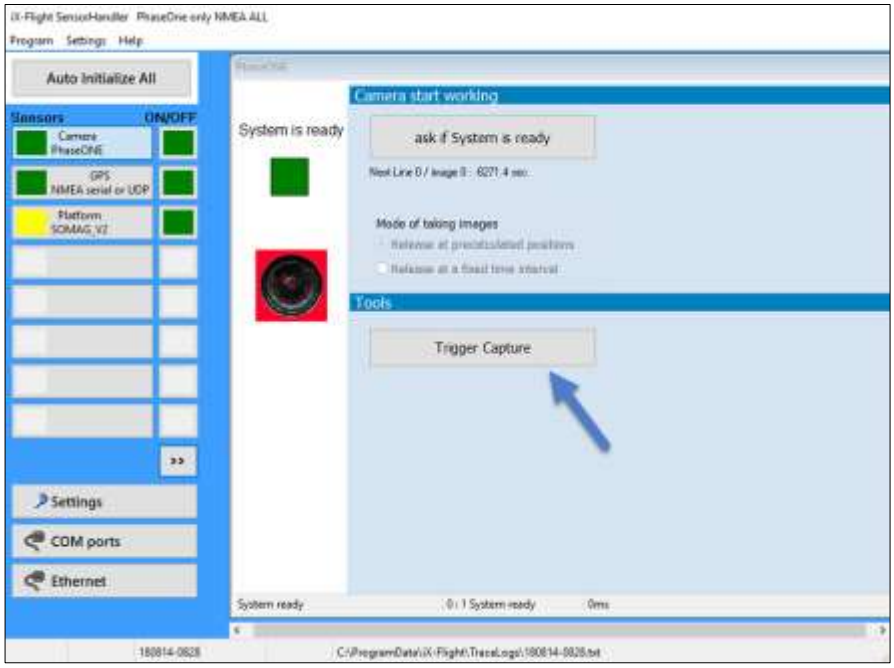


1. Click on the camera (1), GPS (2), and platform (3).
2. Verify GPS and Camera green, stabilizer – yellow.
3. If the GPS is not green – verify the port (4) is 5018. You may edit it by clicking on it and putting the correct data in its place.
4. Click **GPS**

5. Verify the GPS data is correct.

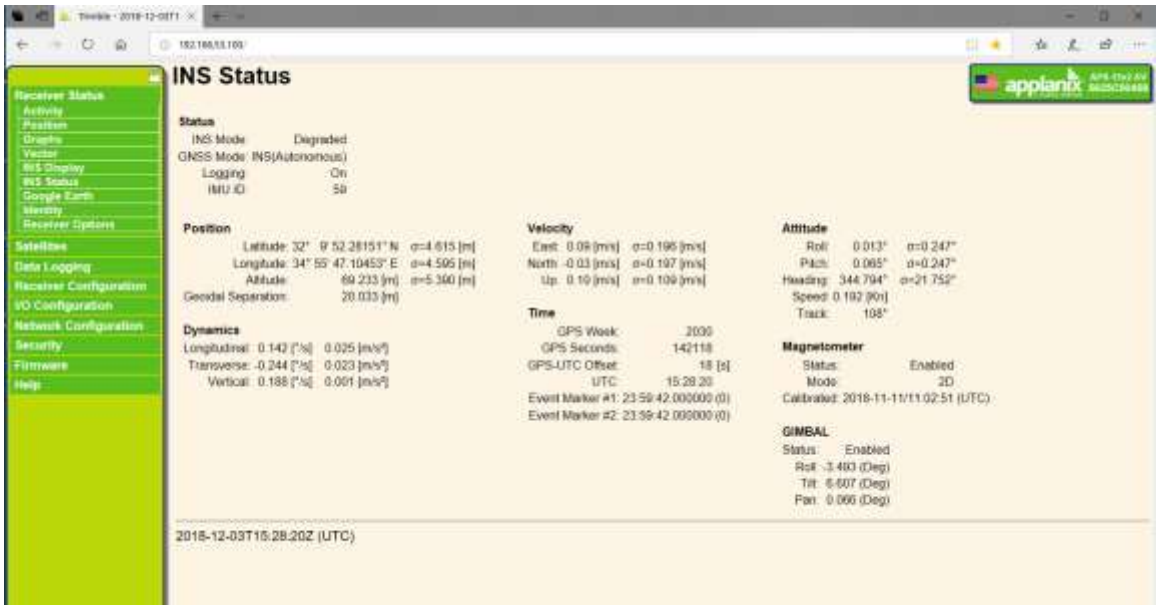


6. Click on **Camera**.
7. Click **Trigger capture**.
8. Verify an image is taken and the GPS data is present.



9. Verify that the gimbal angles are correctly sent to the AXV210.

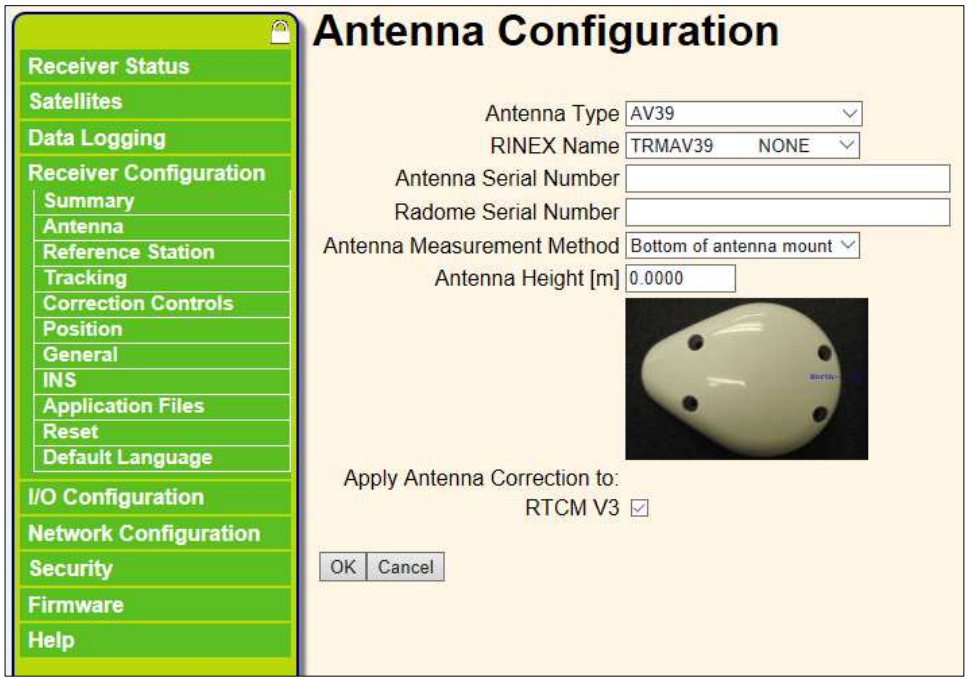
   In page INS Status see “Gimbal”. Move the stabilizer and verify that the angles update.



15. After-Testing the Antenna Setting

To post-test the antenna setting:

1. From the Receiver Configuration menu, select **Antenna**.
2. From the **Antenna Type** list, select **AV39**.



16. Setting Up the iX Controller Port

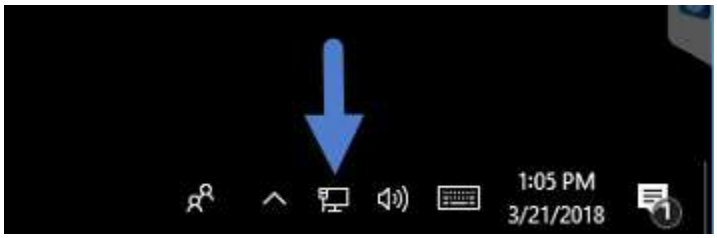
This procedure is usually not required b because the iX Controller should be preset for this configuration.

However, If the iX Controller is not preset to PAS configuration-**this procedure should be done before connecting to the Applanix unit**.

The Applanix unit is pre-configured for:

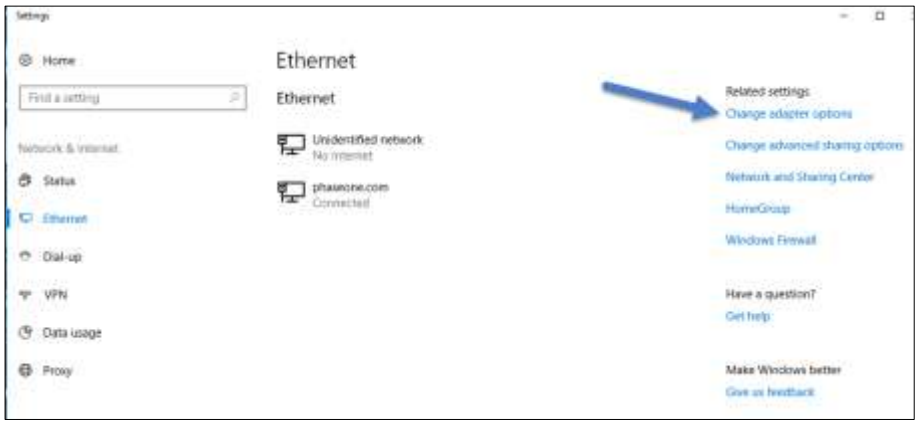
- **Static IP address**: 192.168.53.100
- **Subnet mask**: 255.255.255.0

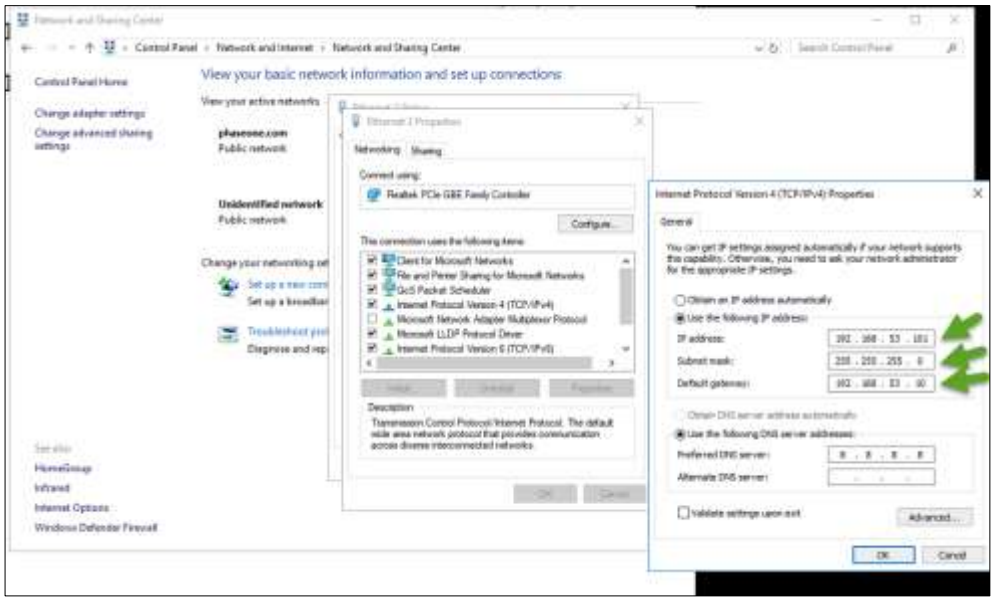
1. Change the right port of the iX Controller to communicate with the Applanix AVX210.



To change the iX Controller Ethernet port configuration:

1. On the lower right corner of the iX Controller main screen, right click on the network icon.
2. Open **Network and Internet Settings**.
3. Click **Ethernet**.
4. Change the adapter options.





To set the iX Controller port IP address and subnet mask:

1. Click on **Internet Protocol Version 4 (TCP/IPv4) properties**.
2. Enter:
   - IP 192.168.53.101
   - Subnet mask 255.255.255.0
3. Click **OK**.

Setting touch screen configuration

a. Go to Control Panel

b. Choose Hardware and Sound

c. Choose Tablet

d. Choose Setup

e. Tap 15” display and press enter

f. Tap 7” display

g. Close all relevant windows

2. It should be kept like that. Any change is caused by OS and there’s nothing we can do about it.