uAvioni

George G3

User Guide

uAvionix Corporation
300 Pine Needle Lane
Bigfork, MT 59911

http://www.uavionix.com

support@uavionix.com

1 Revision History

Revision	Date	Comments
A	7/15/2021	Initial release
B	7/28/2021	New Ping200X section 6.6. Updated Pinout for Ping200X control. Removed power supply error.
C	9/2/2021	Updated for new firmware release. Changes to wiring diagram and SS2 sections 6.2, 6.4, and 6.5

2 Limited Warranty

uAvionix products are warranted to be free from defects in material and workmanship for one year from purchase. For the duration of the warranty period, uAvionix, at its sole option, will repair or replace any product which fails under 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.

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

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.

Warranty Service

Warranty repair service shall be provided directly by uAvionix.

3 Contents

4 Specification

4.1 George Autopilot Technology

George combines the flexibility and over a decade's worth of open-source innovation in UAS autopilots with the robustness of a certifiable DAL-C hardware and a DAL-C safety and sensor processor. George has the aircraft.

- Lightweight and low power consumption
- Skyline Cloud-Based C2 Compatible
- Available with truFYX, TSO-C145e Global Positioning System (GPS) Coordinated Universal Time (UTC)
- Detect and Avoid Ready
- Environmental RTCA/DO-160G and MIL-STD-810H
- Software RTCA/DO-178C Level C
- Complex Hardware RTCA/DO-254 Level C
- FCC 47 CFR Part 15.247 ID 2AFFTC2XISM

Specification	Value
Input Voltage/Power	14 or 28V 2.5W
Size	45x75x32mm
Weight	99 grams
Operating Temp	-10° to 55° C
Internal Peripherals	
Core	cubeOrange
Compass	3 axis RM3100
Airspeed	SDP33
External Interfaces	
Servo/ESC Outputs	12
RS232 Serial IO	2.5
UAVCAN IO	1
ADC Inputs	2
Options	
truFYX EXT TSO-C145e GPS Sensor	UAV-1004957-001
skyStation2	UAV-1005507-001
ADS-B antenna	UAV-1004675-002
microLink antenna	UAV-1004675-001

4.2 Regulatory Statements

4.2.1 FCC Statement

FCC ID: 2AFFTC2XISM

This device meets the FCC requirements for RF exposure in public or uncontrolled environments.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

4.2.2 Industry Canada Statement

IC ID: 25261-C2XISM

In order to comply with FCC / ISED RF Exposure requirements, this device must be installed to provide at least 20 cm separation from the human body at all times.

Afin de se conformer aux exigences d'exposition RF FCC / ISED, cet appareil doit être installé pour fournir au moins 20 cm de séparation du corps humain en tout temps.

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

(1) This device may not cause interference; and

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

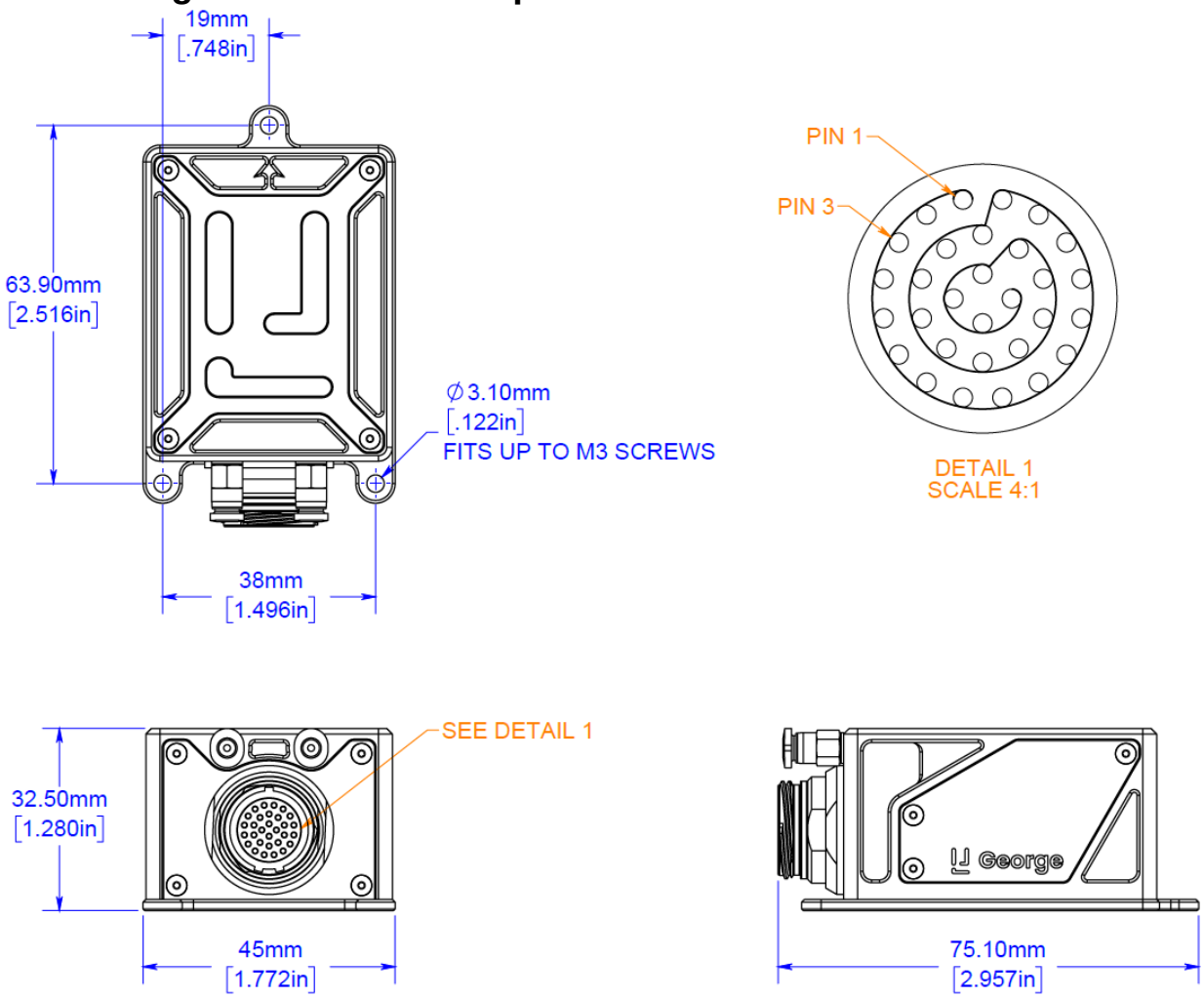
Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1) l'appareil ne doit pas produire de brouillage;

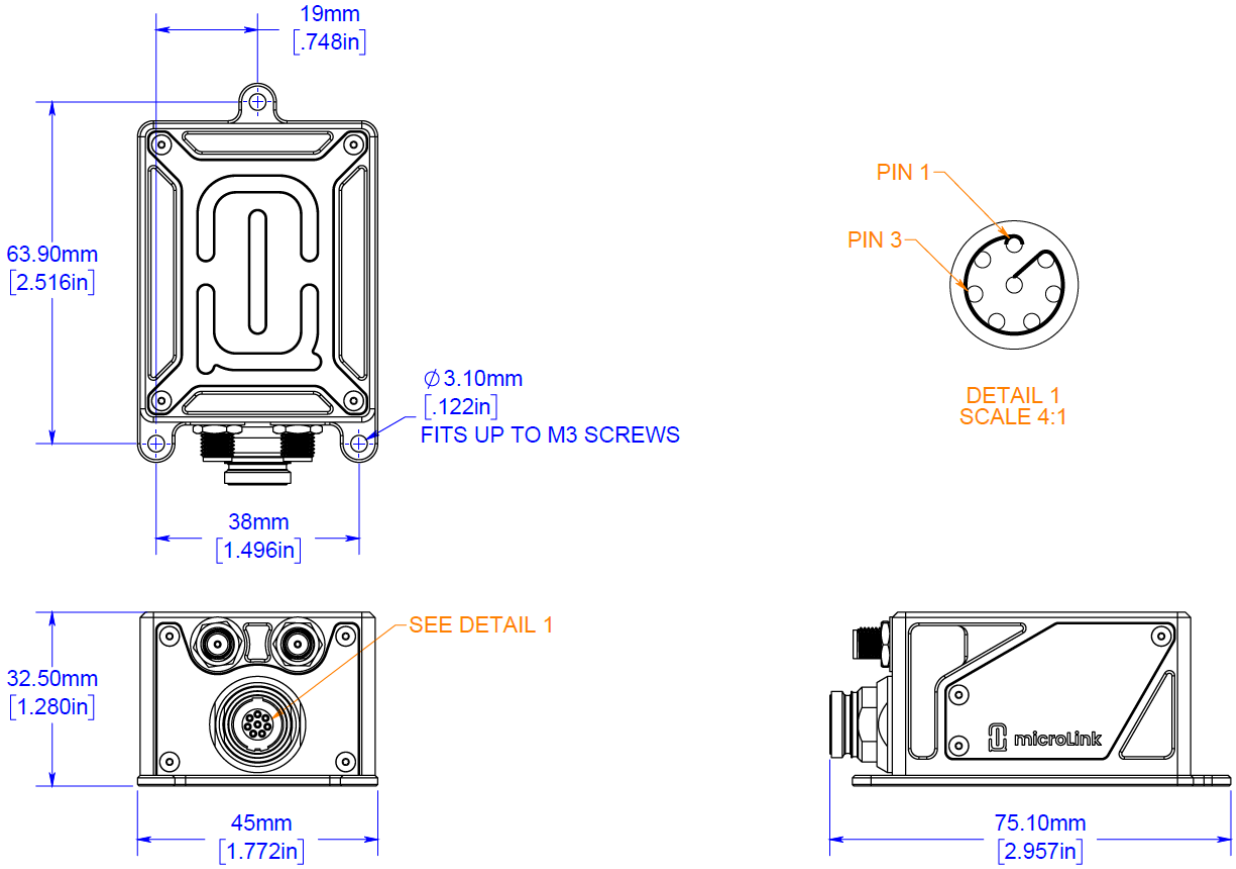
2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement."

4.3 Mechanical Specifications

4.3.1 George G3 Mechanical Specifications



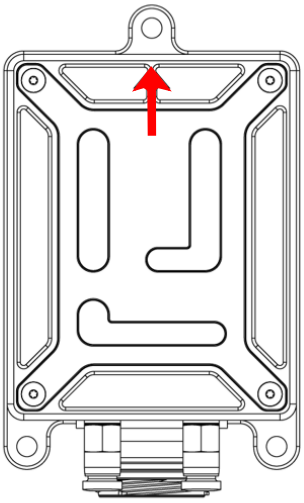
4.3.2 microLink Pro Mechanical Specifications



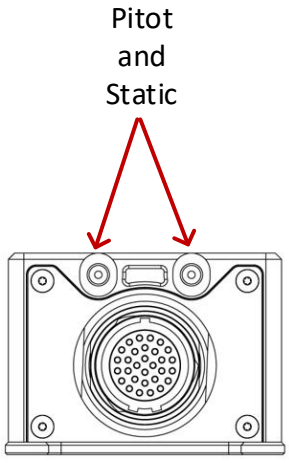
5 Installation

5.1 George Mechanical Installation

Mount the George AutoPilot on a flat solid surface near the Center of Gravity (CG) of the aircraft. Mount the George AutoPilot so that the arrow on top of the AutoPilot is pointed towards the nose of the aircraft. Use four M3 or #5 size screws to secure the George AutoPilot to the airframe at the four mounting locations.



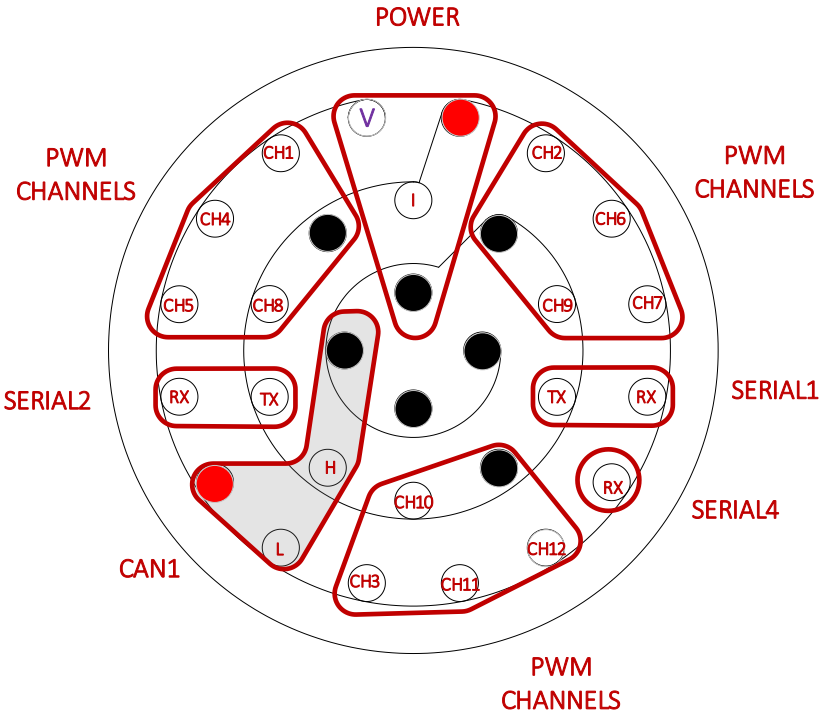
Connect aircraft pitot and static pressure lines to either of the 3mm push fit connectors. Pitot and static lines can connect to either port.

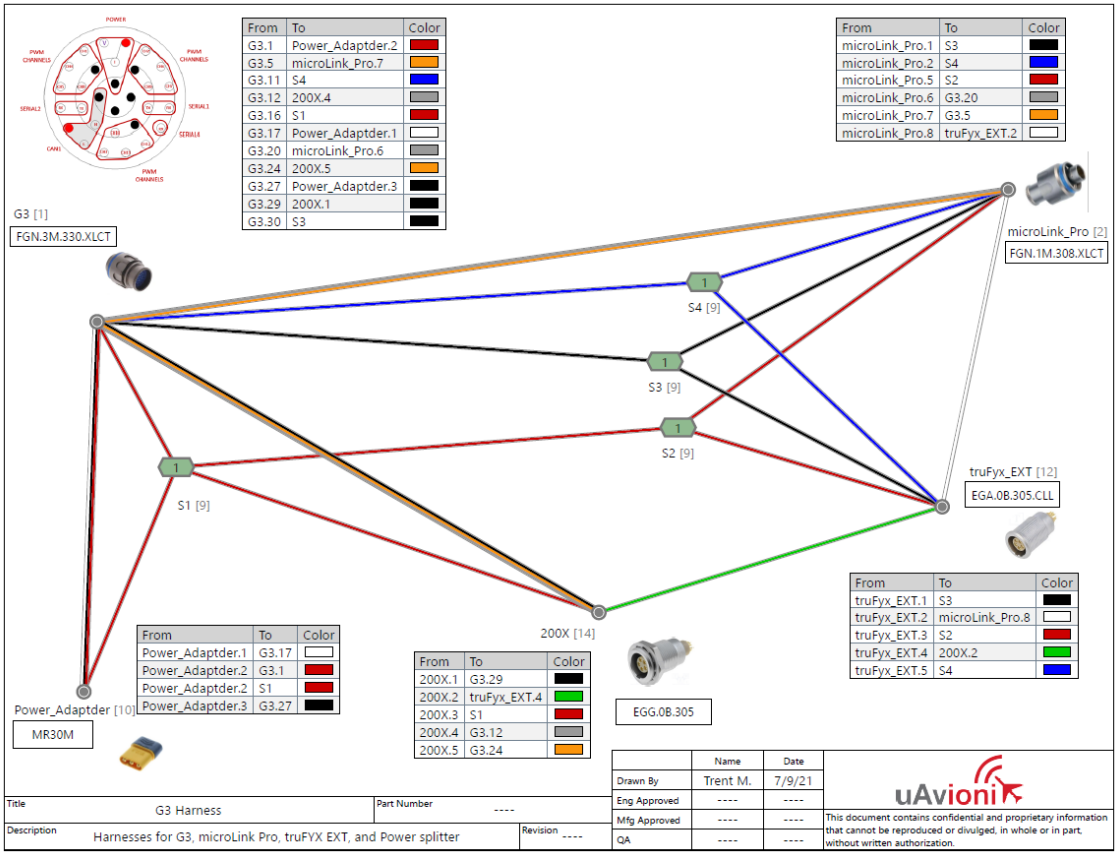


5.2 George Electrical Installation

Integrate the George AutoPilot to your platform. George offers 12 PWM channels, 3 external serial connections, and 1 CAN channel. The included harness allows for easy integration and quick connection to the microLink pro C2 radio and truFYX GPS source.

	LEMO P	Pin Name	Description	Resource	IO	Level
EXTERNAL CONNECTIONS	1	VOLTAGE	Main Voltage Sense		Input	12S
	2	IO_CH1	PWM_CH1	Servo / ESC	Output	3.3V
	3	IO_CH4	PWM_CH4	Servo / ESC	Output	3.3V
	4	IO_CH5	PWM_CH5	Servo / ESC	Output	3.3V
	5	SERIAL2_RX	TELEM 2 Rx	ZPX-B Mode 5 IFF	Input	EIA/TIA-232
	6	5V_CAN1			Power	5V
	7	CAN1_L	CanBus		IO	3.3V
	8	IO_CH3	PWM_CH3	Servo / ESC	Output	3.3V
	9	FMU_CH3	PWM_CH11	Servo / ESC	Output	3.3V
	10	FMU_CH4	PWM_CH12	Servo / ESC	Output	3.3V
	11	SERIAL4_RX	GPS PVT data		Input	EIA/TIA-232
	12	SERIAL1_RX	TELEM 1 Rx	SkyLink C-band C2	Input	EIA/TIA-232
	13	IO_CH7	PWM_CH7	Servo / ESC	Output	3.3V
	14	IO_CH6	PWM_CH6	Servo / ESC	Output	3.3V
	15	IO_CH2	PWM_CH2	Servo / ESC	Output	3.3V
	16	V_BUS	Aircraft Power		Power	2S-12S
	17	CURRENT	Main Current Sense		Input	3.3V
	18	GND	Aircraft Ground		Power	
	19	IO_CH8	PWM_CH8	Servo / ESC	Output	3.3V
	20	SERIAL2_TX	TELEM 2 Tx	ZPX-B Mode 5 IFF	Output	EIA/TIA-232
	21	CAN1_H	CanBus		IO	3.3V
	22	FMU_CH2	PWM_CH10	Servo / ESC	Output	3.3V
	23	GND	Aircraft Ground		Power	
	24	SERIAL1_TX	TELEM 1 Tx	SkyLink C-band C2	Output	EIA/TIA-232
	25	FMU_CH1	PWM_CH9	Servo / ESC	Output	3.3V
	26	GND	Aircraft Ground		Power	
	27	GND	Aircraft Ground		Power	
	28	GND	Aircraft Ground		Power	
	29	GND	Aircraft Ground		Power	
	30	GND	Aircraft Ground		Power	
INTERNAL CONNECTIONS			I2C1_SCL	RM3100 Compass	IO	3.3V
			I2C1_SDA		IO	3.3V
			I2C2_SCL	SDP33 Airspeed Sensor	IO	3.3V
			I2C2_SDA		IO	3.3V


POWER
PWM CHANNELS
PWM CHANNELS
SERIAL2
SERIAL1
SERIAL4
CAN1
PWM CHANNELS
V
I
H
L
CH1
CH2
CH3
CH4
CH5
CH6
CH7
CH8
CH9
CH10
CH11
CH12
RX
TX
TX
RX
RX


From To Color
G3.1 Power_Adaptder.2
G3.5 microLink_Pro.7
G3.11 S4
G3.12 200X.4
G3.16 S1
G3.17 Power_Adaptder.1
G3.20 microLink_Pro.6
G3.24 200X.5
G3.27 Power_Adaptder.3
G3.29 200X.1
G3.30 S3
From To Color
microLink_Pro.1 S3
microLink_Pro.2 S4
microLink_Pro.5 S2
microLink_Pro.6 G3.20
microLink_Pro.7 G3.5
microLink_Pro.8 truFyx_EXT.2
G3 [1]
FGN.3M.330.XLCT
microLink_Pro [2]
FGN.1M.308.XLCT
S4 [9]
S3 [9]
S2 [9]
S1 [9]
truFyx_EXT [12]
EGA.0B.305.CLL
200X [14]
EGG.0B.305
Power_Adaptder [10]
MR30M
From To Color
Power_Adaptder.1 G3.17
Power_Adaptder.2 G3.1
Power_Adaptder.2 S1
Power_Adaptder.3 G3.27
From To Color
200X.1 G3.29
200X.2 truFyx_EXT.4
200X.3 S1
200X.4 G3.12
200X.5 G3.24
From To Color
truFyx_EXT.1 S3
truFyx_EXT.2 microLink_Pro.8
truFyx_EXT.3 S2
truFyx_EXT.4 200X.2
truFyx_EXT.5 S4
Name Date
Drawn By Trent M. 7/9/21
Eng Approved ---- ----
Mfg Approved ---- ----
QA ---- ----
Title G3 Harness
Part Number ----
Description Harnesses for G3, microLink Pro, truFYX EXT, and Power splitter
Revision ----
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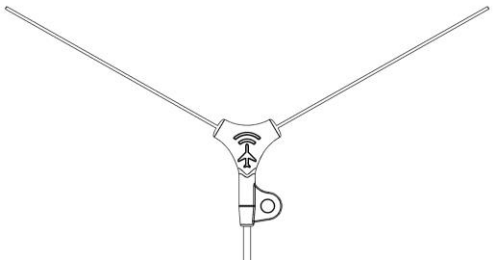
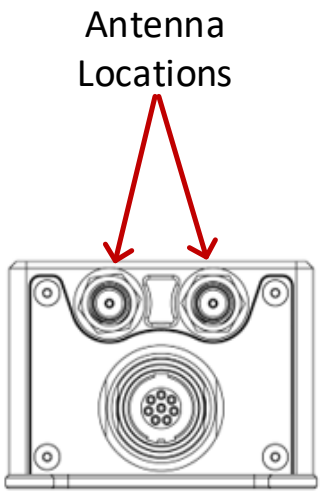
5.2.1 George RF Connections

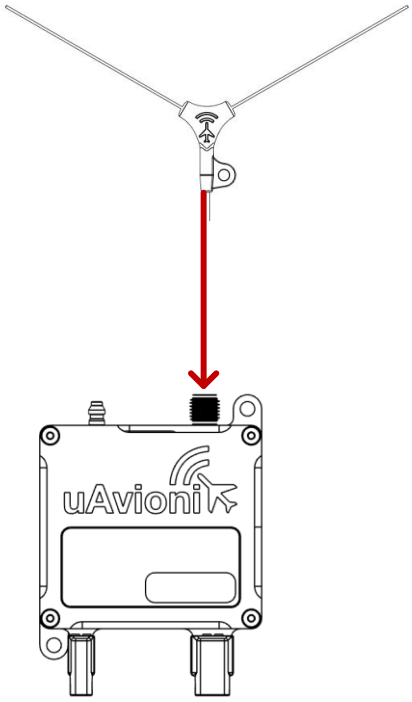
Two 915 MHz antennas are included when the George G3 is paired with a microLinkPro C2 radio. These antennas are installed on the SMA connection points of the back of the microLinkPro. Antenna orientation on the airframe should be vertical to the ground.



C2 Antenna



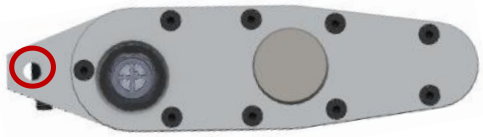
A 1090 MHz dipole antenna is included when a Ping200X is also included with the George G3. This antenna connects to the SMA port on the Ping200X and is installed in a vertical orientation on the airframe with respect to the ground. Install the transponder antenna at a maximum possible distance away from other antennas to avoid RF interference.



5.3 skyStation Mechanical Installation

5.3.1 Tripod Installation

Mount the skyStation to a conventional tripod using a standard ¼”-20 screw. Mounting location is on the bottom of the skyStation as shown below.



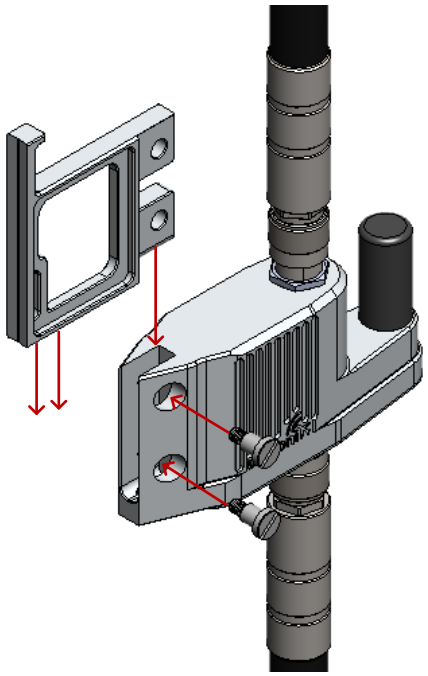
Place the skyStation at a vantage point to achieve adequate coverage and optimal line-of-sight to the autopilot.

Note!

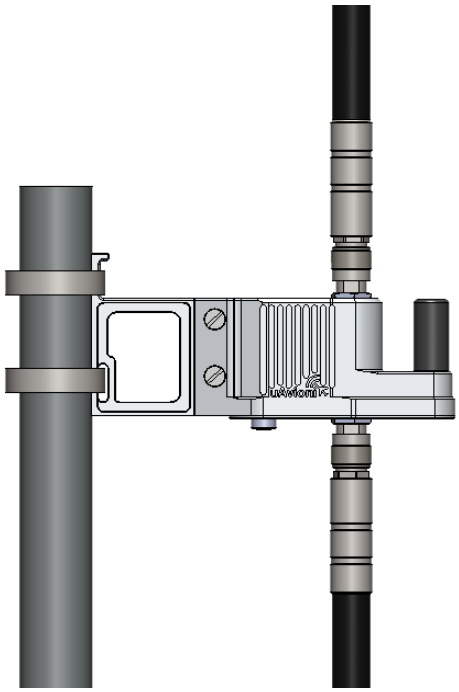
skyStation and George AutoPilot must be at least 20 feet apart to acquire a link.

5.3.2 Pole Installation

Attach the pole mounting bracket to the skyStation and secure using the two supplied M5 shoulder screws.



Use the supplied hose clamps to secure the skyStation to the mounting pole. Antenna orientation should be vertical.



5.4 skyStation Electrical

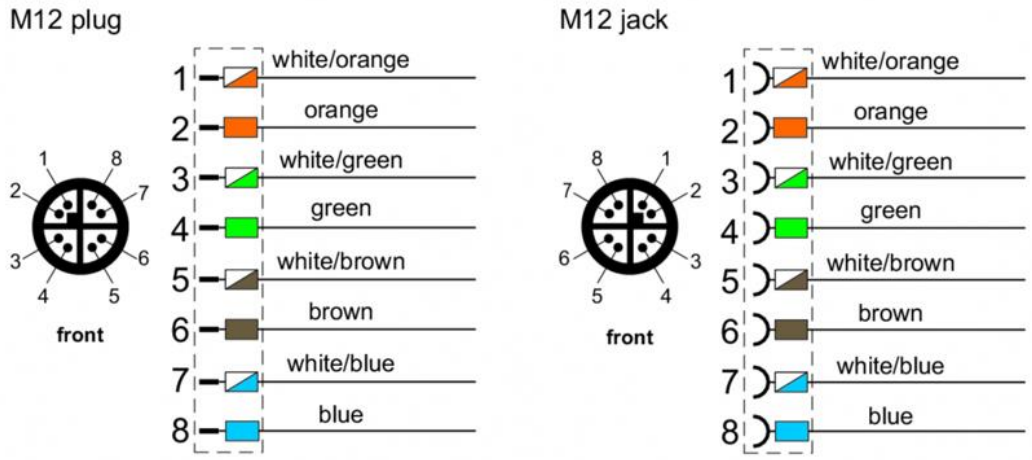
The skyStation connects to a network via POE using an M12 X-Coded connector.

Suggested cable part #: 142M2X15050

Suggested accessory: RJ45 Coupler

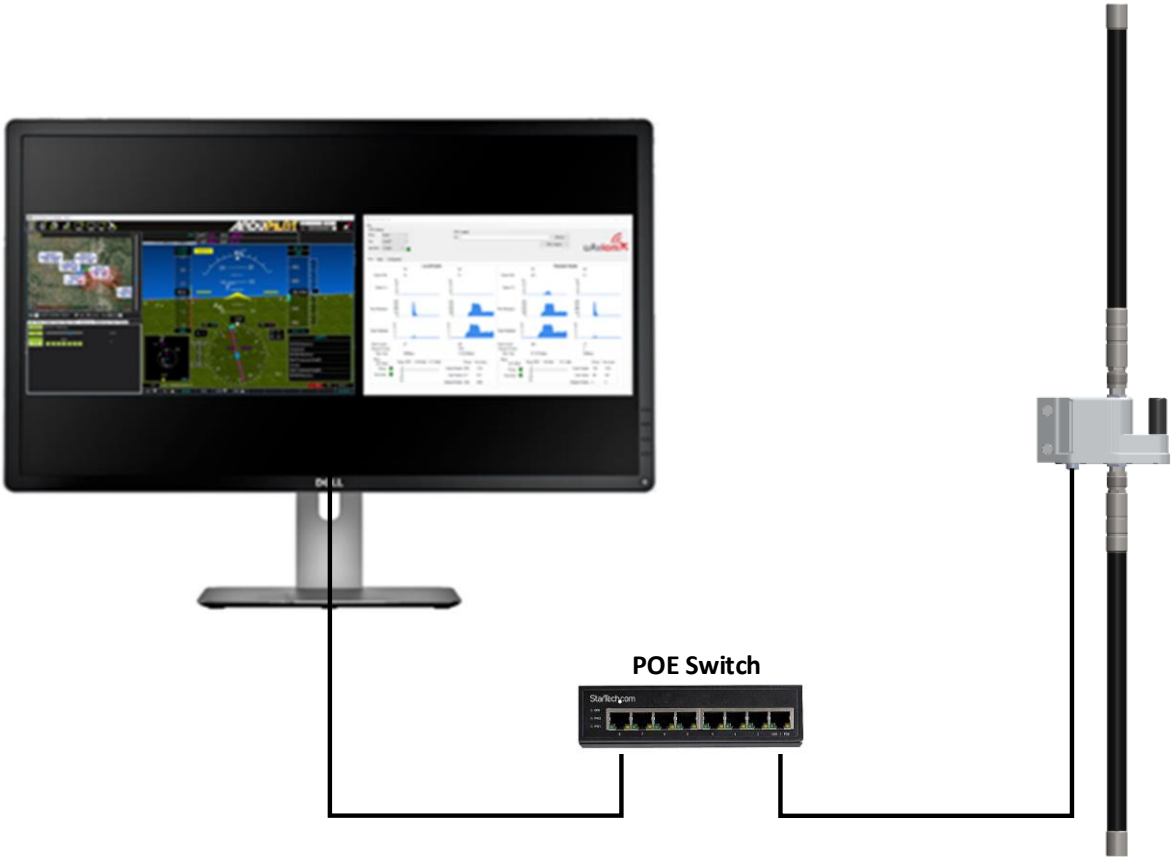
POE Specifications:

Parameter	Value
Standard	802.3af (802.3at Type1)
Maximum power	15.4W
Voltage Range	37 – 57V
Maximum Current	350mA
Maximum Cable Resistance	20Ω
Supported Cabling	Shielded Cat 3 and Shielded Cat 5
Supported Modes	Mode A (endspan), Mode B (midspan)
Power Management	Power Class 0
Maximum Cable Length	100 meters



Caution!

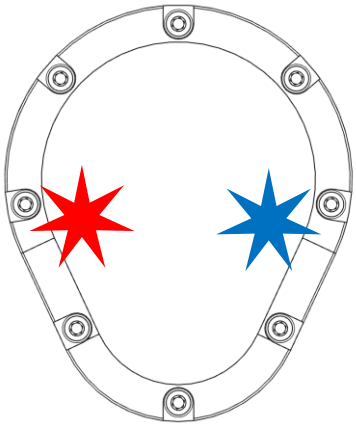
Absolute maximum DC voltage +57 V. A higher DC voltage value will permanently damage the equipment!



6 Configuration

6.1 George Start-up and Connection

Power on the George AutoPilot by connecting to the aircraft power system. Once George acquires a GPS lock, a C2 link can be made. LED indicators on the top of the tryFYX show GPS status.



Blinking Red: Waiting for GPS lock.
Solid Red: GPS lock acquired.
Blinking Blue: Differential lock acquired.

A C2 link can only be made when a skyStation is powered on within proximity. Link cannot be achieved unless both the skyStation and George Autopilot have a GPS lock and share the same Hop Table. See section 6.2 for skyStation configuration.

Note!
skyStation and George AutoPilot must be at least 20 feet apart to acquire a link.

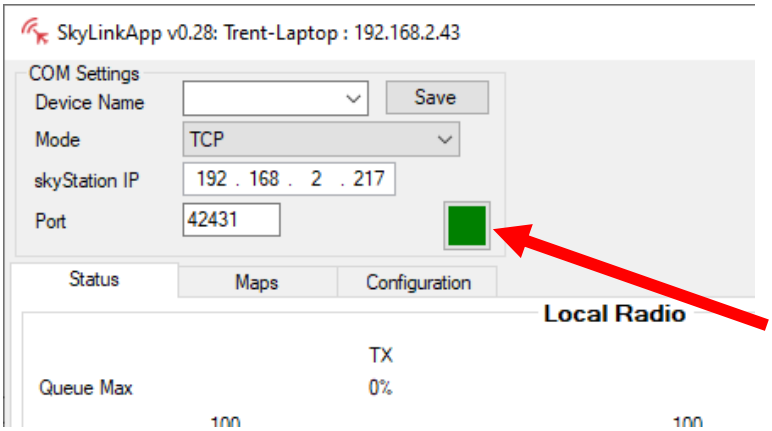
6.2 skyStation Start-up and Connection

Connect the skyStation to a POE capable network switch. At power-up an IP address will be assigned to the skyStation by the local DHCP server. By default, the skyStation will accept TCP connections for User channel information on TCP port 42430 and the Control channel information on port 42431. An IP Scan can be used to find the IP address of the skyStation. MAC addresses are printed on the skyStation label.

See section 6.5 for configuring the network settings on skyStation.

6.2.1 Run skyLinkApp.exe

In the skyLinkApp.exe, configure the Mode Settings to TCP, enter the IP address of the skyStation, and enter the default Control port 42431. The Status box in the upper left-hand corner will turn green indicating a successful connection to the skyStation.



NOTE: If you are not able to connect to the skyStation it is likely your firewall is blocking access on port 42431. Please setup your firewall to allow skyLinkApp.exe tpc access on port 42431.

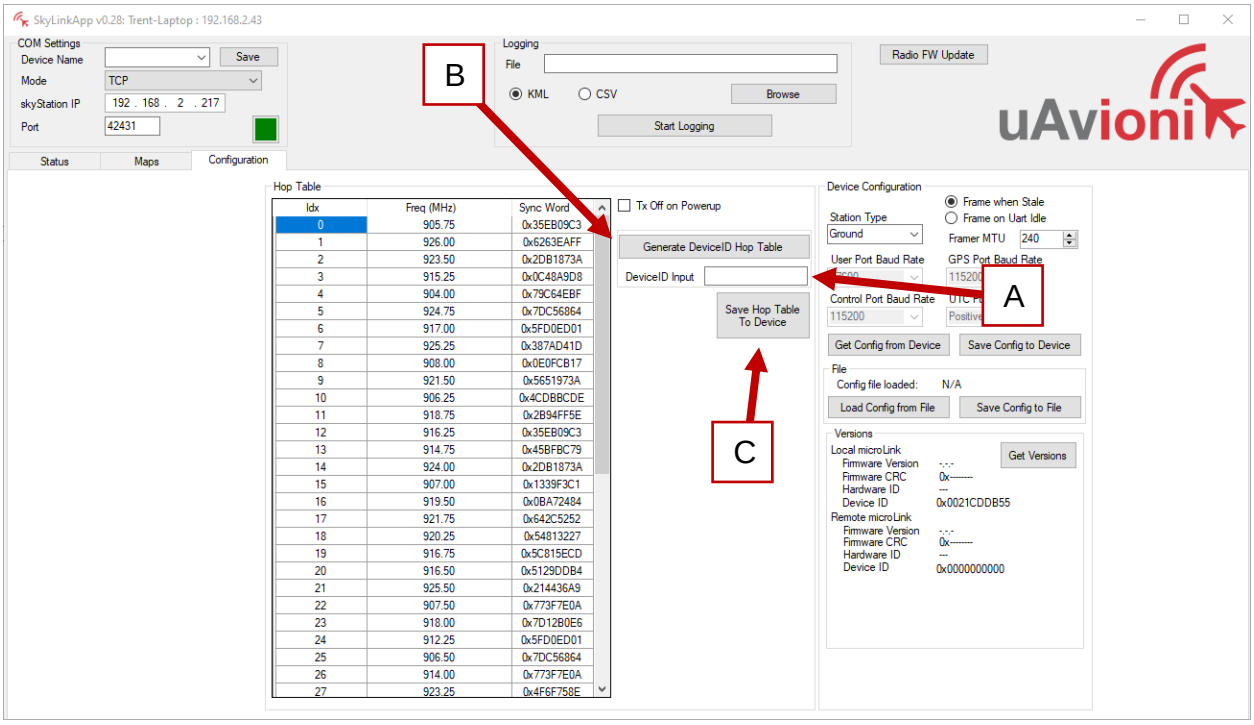
Please see section 6.5 to change or view the network configuration settings on the skyStation. See section 6.4 for more details on the skyLinkApp.

6.2.2 Configure Hop Table

Once connected via the skyLinkApp, go to the Configuration tab.

At first power up the user may need to configure the Hop Table to link with the microLink Pro. On the label on the back of the microLink Pro is a Radio ID.

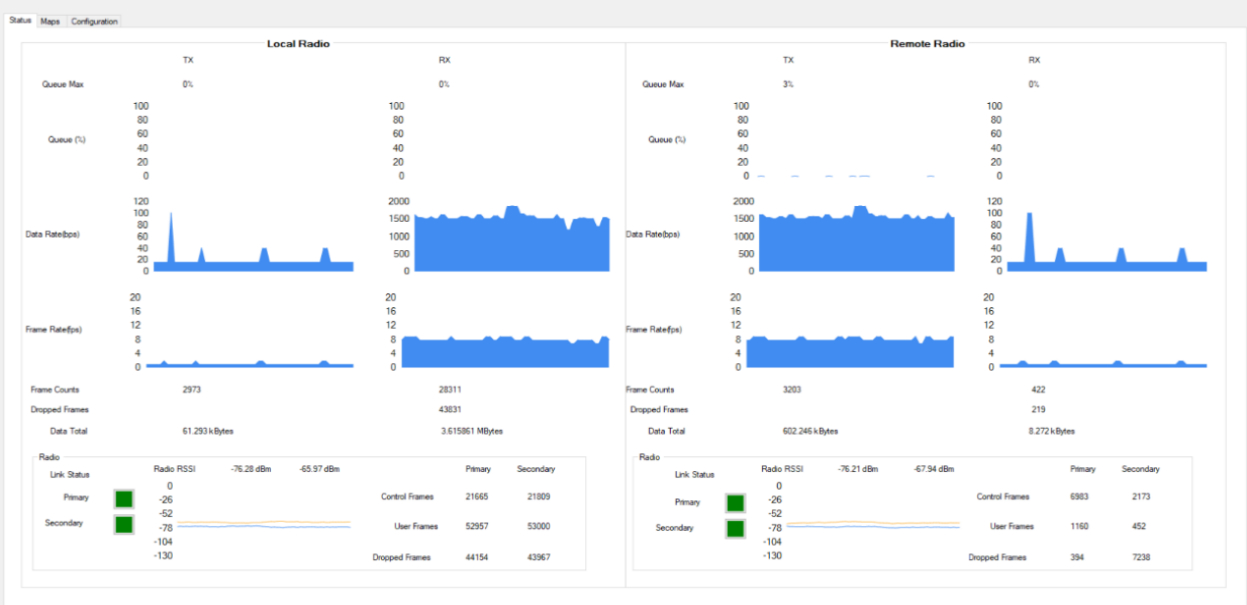
a. Enter the RadioID into the “RadioID Input” field on the skyLinkApp.
b. Press the “Generate RadioID Hop Table” button
c. Press “Save Hop Table To Device”



The skyStation and microLink Pro now share the same unique Hop Table.

6.2.3 Verify Link

To verify link go to the Status Tab of the skyLinkApp. When the data arrives, skyLinkApp will begin graphing the radio link statistics.



6.3 Connecting George to Mission Planner

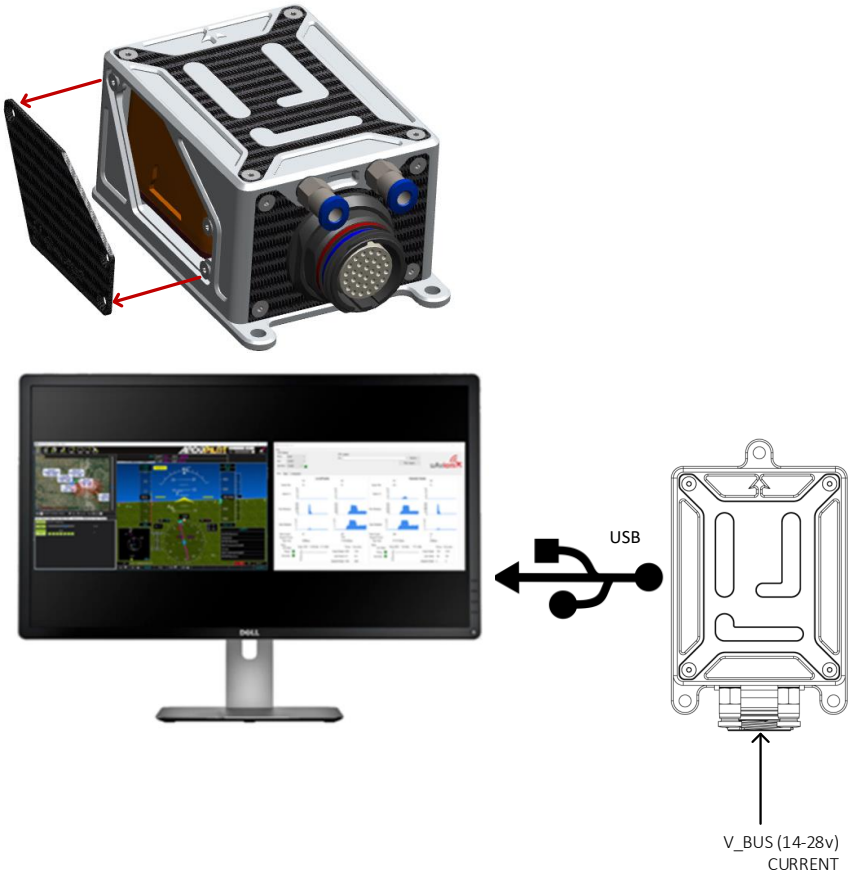
(If using a Ping200X please go to section 6.5.6 for AutoPilot configuration.) Download and install Mission Planner from:

http://firmware.ardupilot.org/Tools/MissionPlanner/

http://ardupilot.org/planner/docs/mission-planner-installation.html

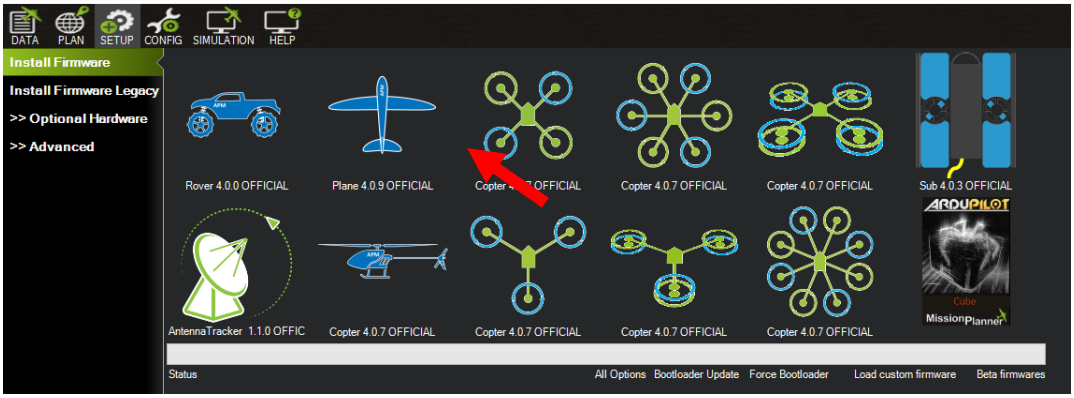
6.3.1 George Direct Connect

Connect the George AutoPilot directly to a PC using a micro-USB cable. The connection point on the George AutoPilot is on the left side of the Cube Orange. The cube Orange can be accessed by removing the carbon fiber side panels on the George by removing the three screws with a T5 driver. External power must be supplied to the George AutoPilot.

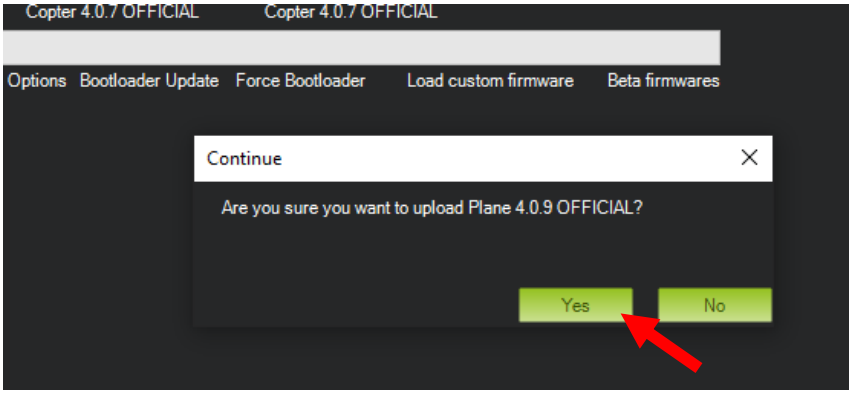


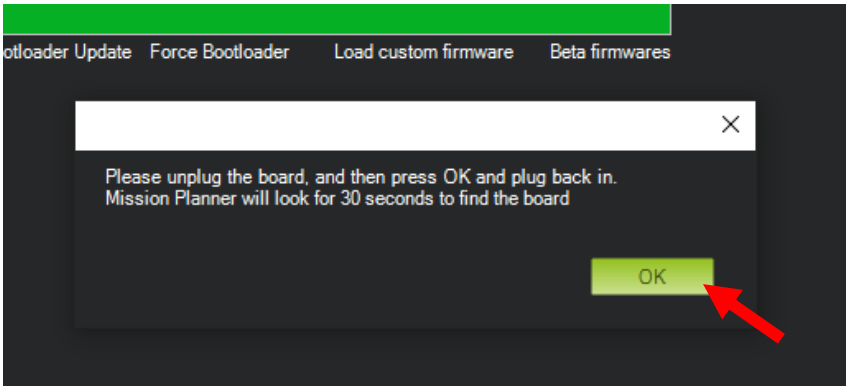
Open Mission Planner and in the upper right-hand corner select the corresponding MAVLINK COM port for the George Autopilot and hit CONNECT.

Note: On first power up, it may be required to setup the AutoPilot with Mission Planner. To do this, keep Mission Planner disconnected from the George AutoPilot. Go to the SETUP tab and the Install Firmware section. George AutoPilot comes default with an Airplane configuration. Select your platform style and follow the instructions on Mission Planner to setup the AutoPilot.



Note: It may be necessary to cycle the V_BUS power to activate the bootloader between these steps.





6.3.2 George Parameters

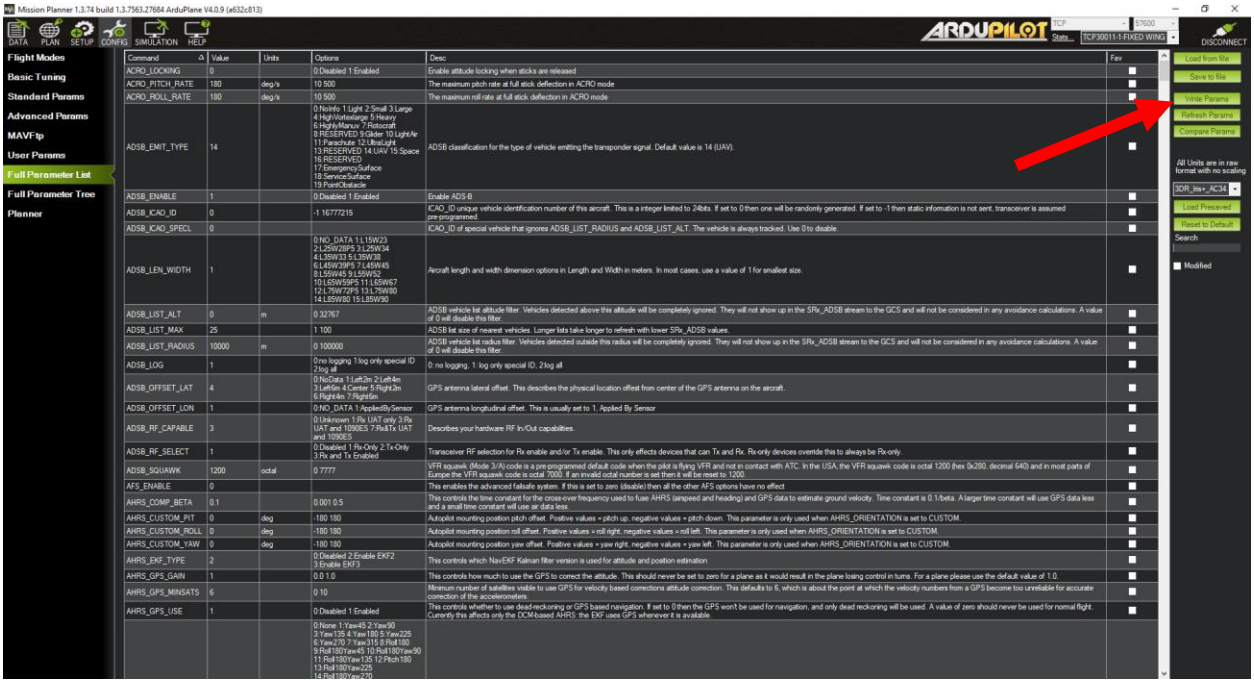
Once connected to the George AutoPilot through Mission Planner, change the following parameters in Mission Planner. (CONFIG>Full Parameter List)

Function	Parameter	Value	Description
GPS	GPS_AUTO_CONFIG	0	Disable GPS Auto Config
	GPS_AUTO_SWITCH	0	Use Primary GPS
	GPS_SAVE_CONFIG	0	Disable GPS Save Config
	GPS_TYPE	5	GPS = NMEA
	SERIAL4_BAUD	115	Baud Rate = 115200
	SERIAL4_PROTOCOL	5	Serial 4 = GPS
	BRD_SAFETYENABLE	0	Disable Safety Switch
Airspeed	ARSPD_TYPE	6	Airspeed Sensor = i2C – SDP3X
	ARSPD_USE	1	Enables Airspeed Sensor
	ARSPD_BUS	0	Internal i2C bus
	ARSPD_PIN	0	Disable Analog Airspeed Pin
	ARSPD_PRIMARY	0*	Enable First Sensor
	ARSPD_AUTOCAL	0*	Disable In-Flight Autocal
	ARSPD_TUBE_ORDER	2*	Either port can be used for Static/Pitot
	ARSPD_RATIO	2.0 *	Pitot tube Pressure/Velocity
	ARSPD_PSI_RANGE	1*	PSI Range for sensor
	ARSPD_SKIP_CAL	1	Startup offset calibration disable
C2	SERIAL2_BAUD	57	Baud Rate = 57600
	SERIAL2_PROTOCOL	1	MavLink 1 Protocol
****ADS-B**	SERIAL5_BAUD	57*	Baud Rate = 57600
	SERIAL5_PROTOCOL	1*	MavLink 1 Protocol
	SERIAL5_OPTIONS	1024	Don’t forward mavlink to/from
	ADSB_TYPE	1	Enable uAvionix ADSB
	ADSB_EMIT_TYPE	14*	Emitter Category = UAV
	ADSB_RF_CAPABLE	3	RX UAT and 1090ES
	ADSB_RF_SELECT	1*	RX Only
Battery	BATT_AMP_PERVLT	27.7347	Current Sensing Calibration
	BATT_CURR_PIN	15	Current Pin for Cube Orange
	BATT_MONITOR	4	Analog Voltage and Current
	BATT_VOLT_MULT	19.54	Voltage Sensing Calibration
	BATT_VOLT_PIN	14	Voltage Pin for Cube Orange

*Default Ardupilot value

**Configure ADS-B options if interfaced with a pingRX Pro. Not included in standard configuration.

Click “Write Params” when finished and cycle the power.



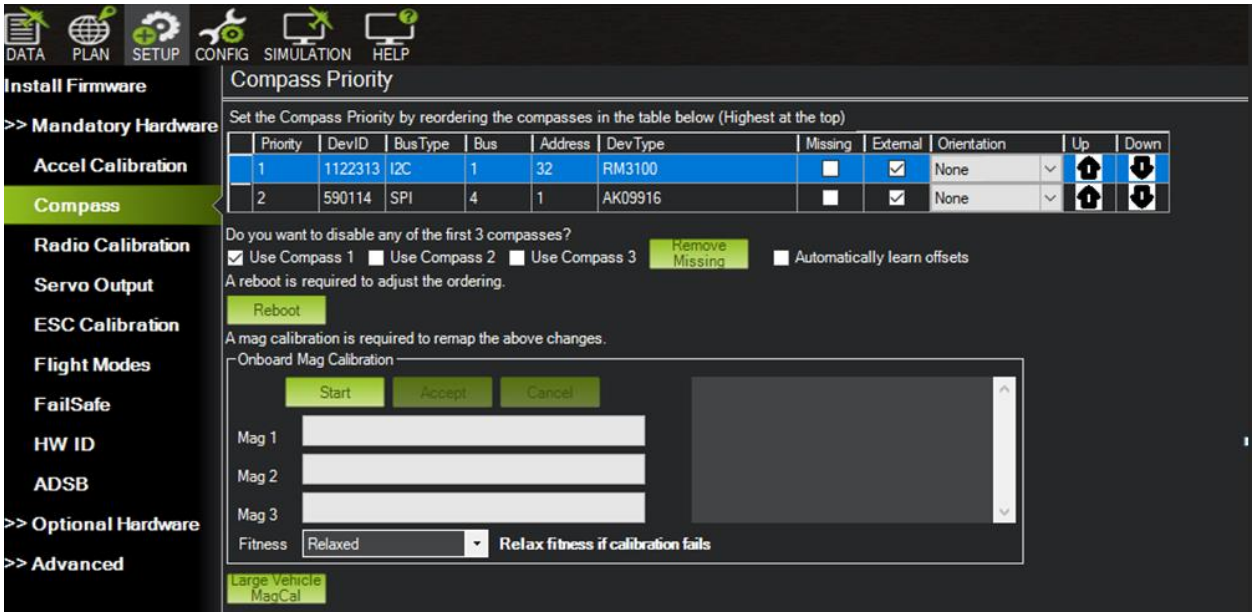
6.3.3 Compass Configuration

George contains an internal RM3100 compass for heading reference. The RM3100 delivers improved accuracy over the Cube integrated compass and is connected via the internal i2C bus. George will automatically detect the RM3100 and assign a DevID, no parameter changes are necessary for the RM3100 to be properly identified.

Configure the RM3100 as primary prior to calibration.

a. Under the “SETUP” tab in Mission Planner navigate to the “Compass” window.
b. Move the RM3100 to compass priority one position.
c. Uncheck the boxes for “Use Compass 2” and “Use Compass 3” located midway down the Compass dialog.
d. Reboot George via the “Reboot” button.

Compass orientation will be automatically set by default after calibration. Use the appropriate orientation for your George installation. In a standard installation the orientation would be set to None.



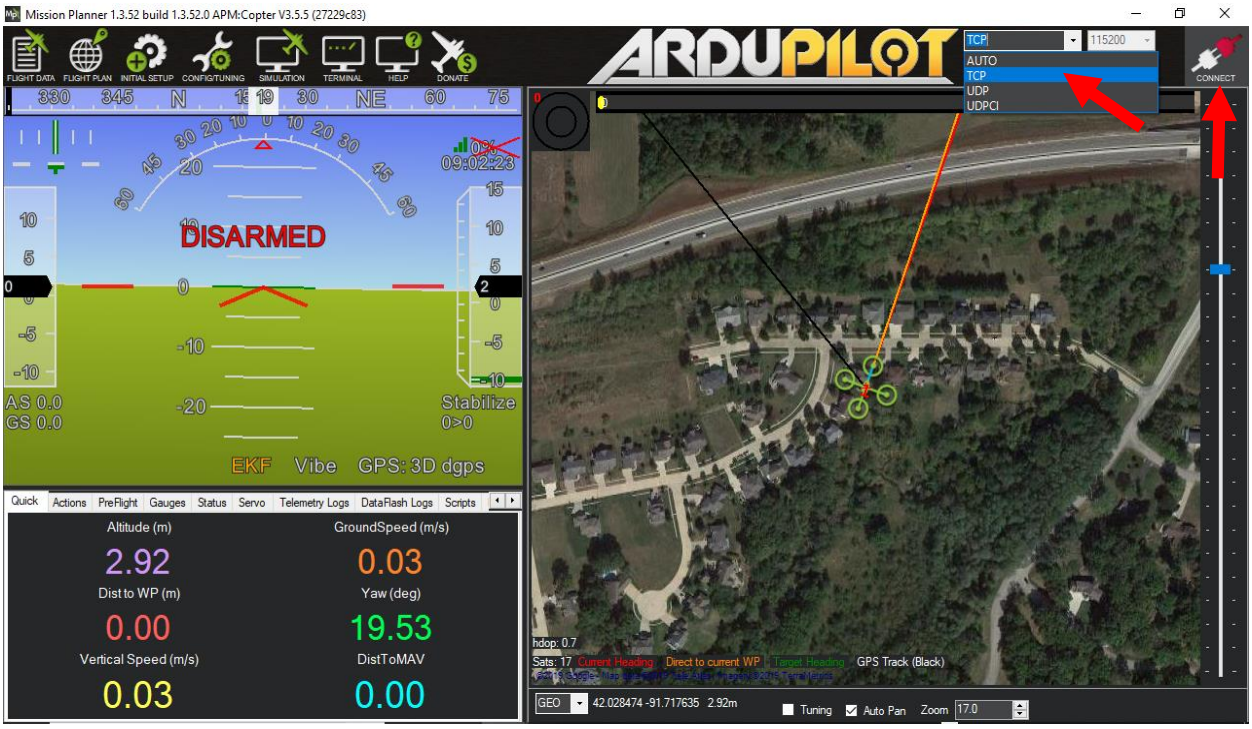
The RM3100 is now ready for calibration. Follow the Mission Planner compass calibration instructions via the link below.

https://ardupilot.org/copter/docs/common-compass-calibration-in-mission-planner.html

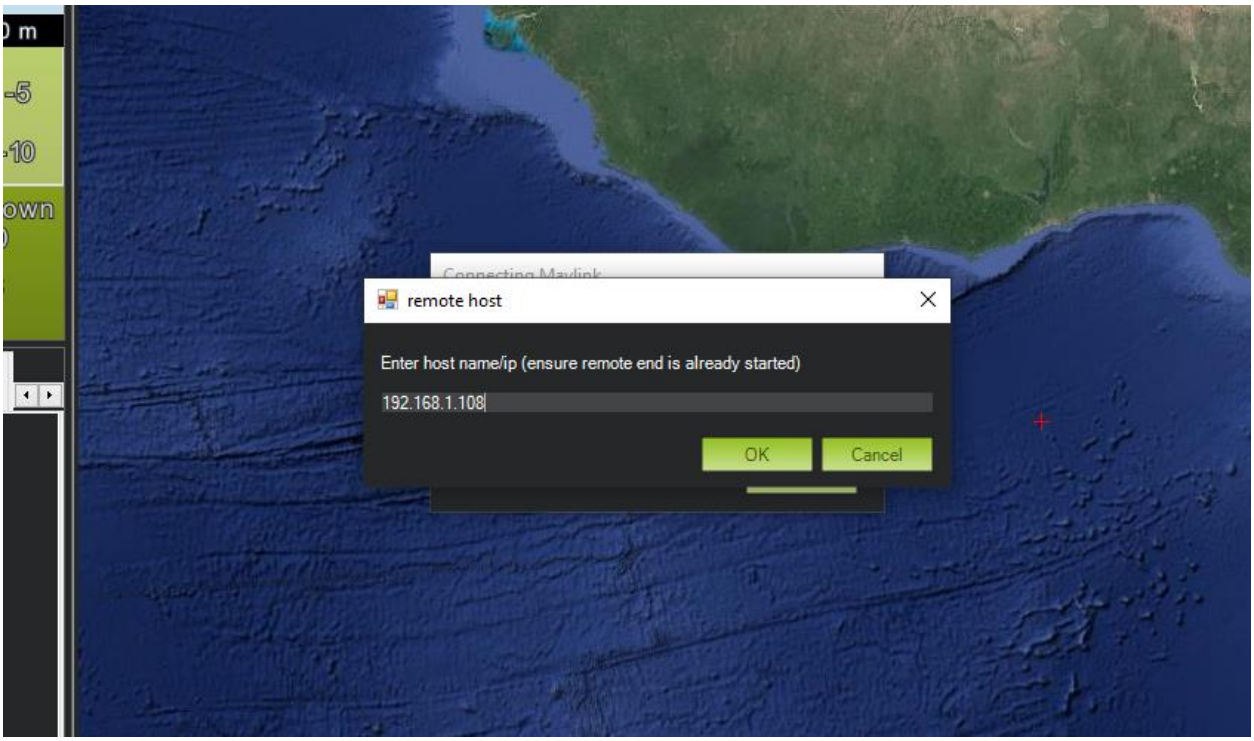
6.3.4 Remote Connection to George

Verify that the George AutoPilot and skyStation are powered, linked, and that skyLinkApp.exe is receiving data. Run Mission Planner and select the communications drop down menu.

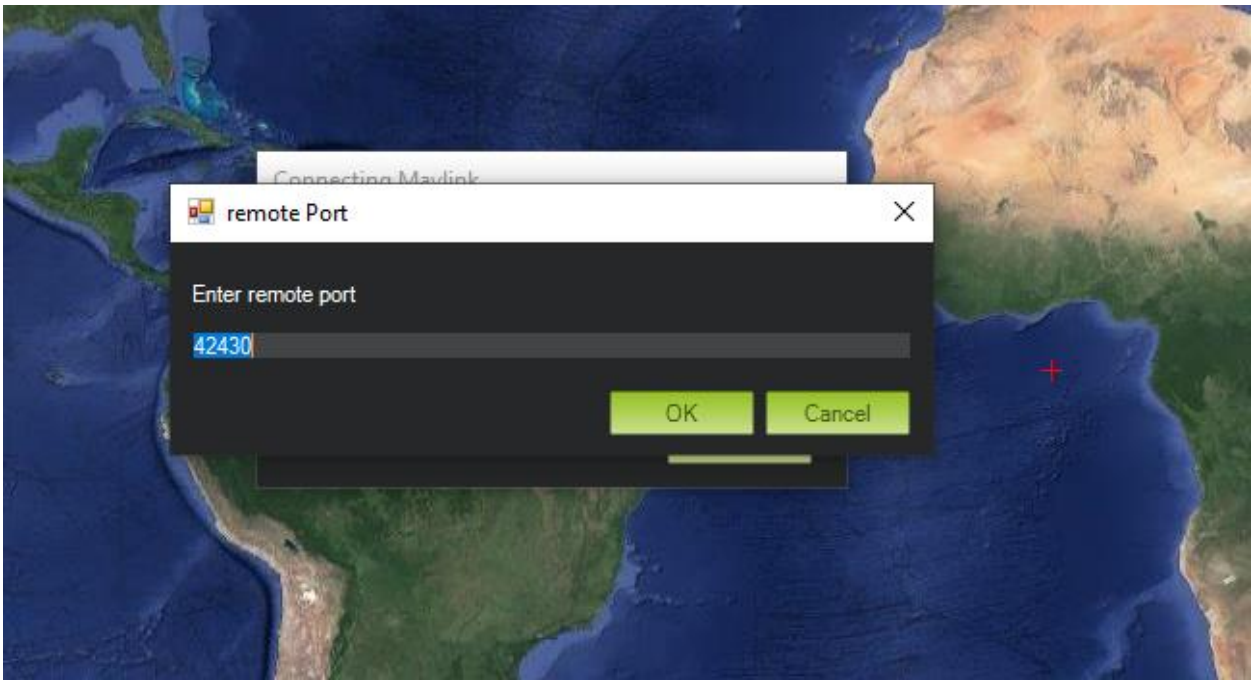
Select TCP as the communication mode and hit the Connect button on the upper right-hand corner.



Enter the skyStation IP address and click OK.



Enter the User TCP port number as shown on the skyStation configuration page (see section 6.5) and click OK. The default port number is 42430.

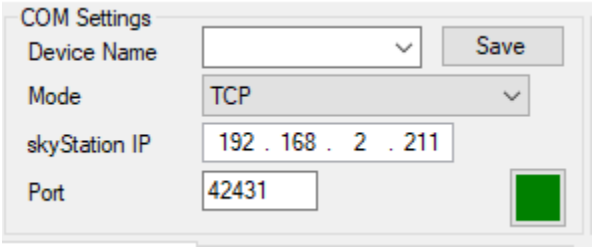


Mission Planner will begin retrieving parameters when a successful TCP connection has been made.

The user now has full remote access to the George AutoPilot.

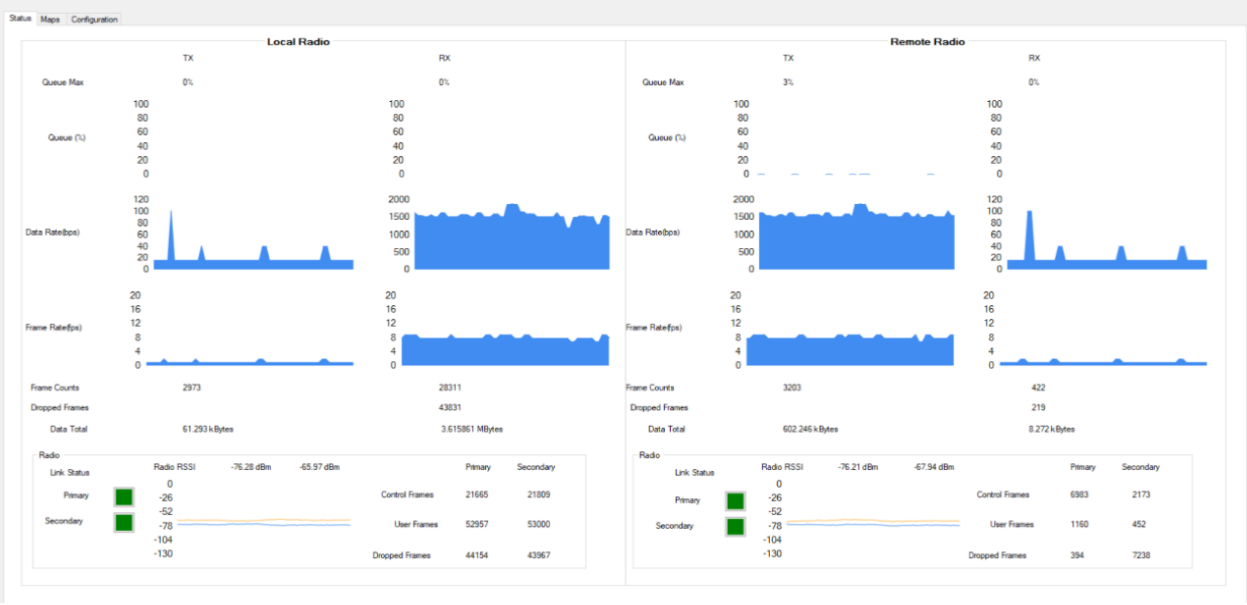
6.4 skyLinkApp.exe

skyLinkApp.exe is the uAvionix Control channel monitoring application used for showing Status, Maps, and Configuration information. It can be connected to the skyStation in TCP mode and the ports are configurable for network flexibility. The mode and port selection must match the skyStation Configuration page setup and the IP address is always the IP address of the skyStation. See section 6.5.

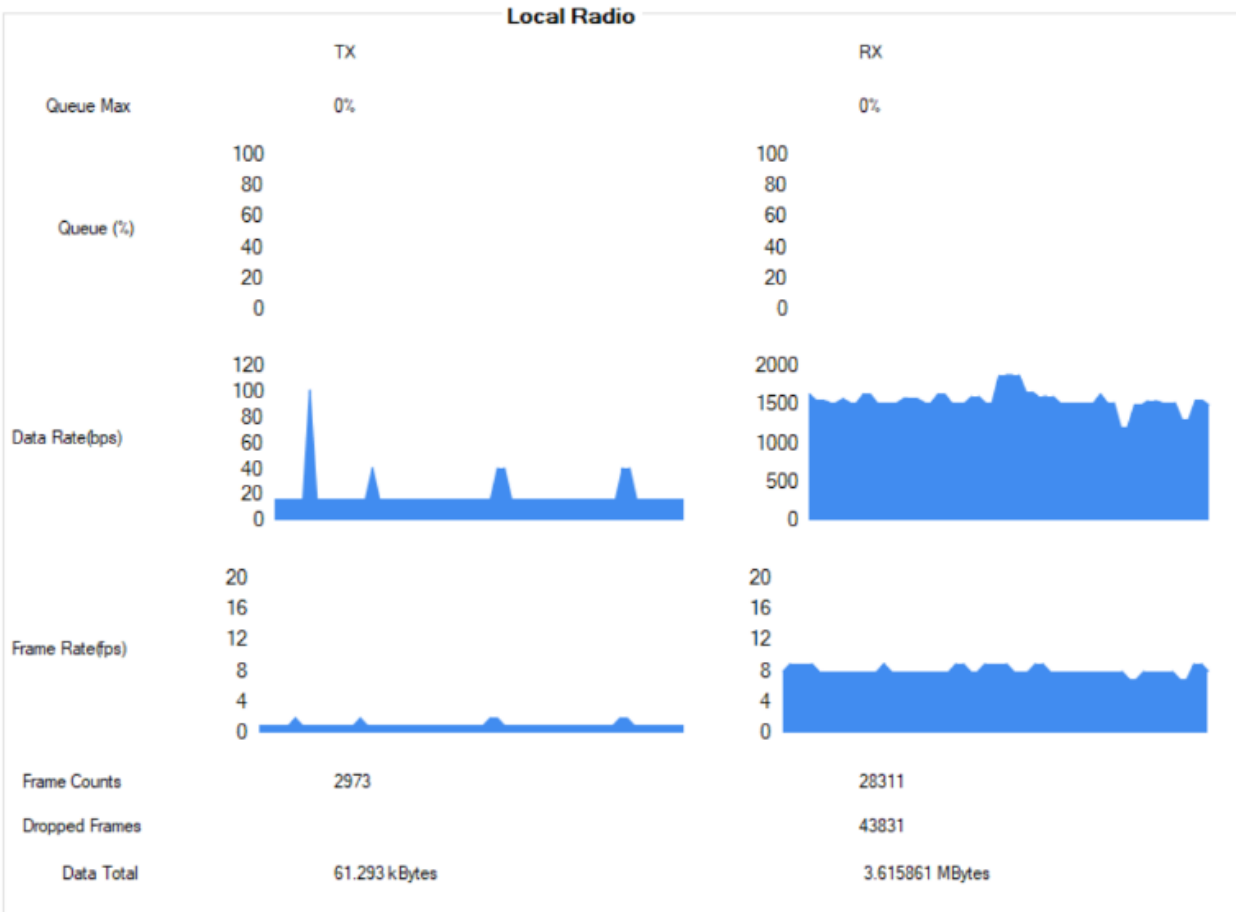


6.4.1 Status Tab

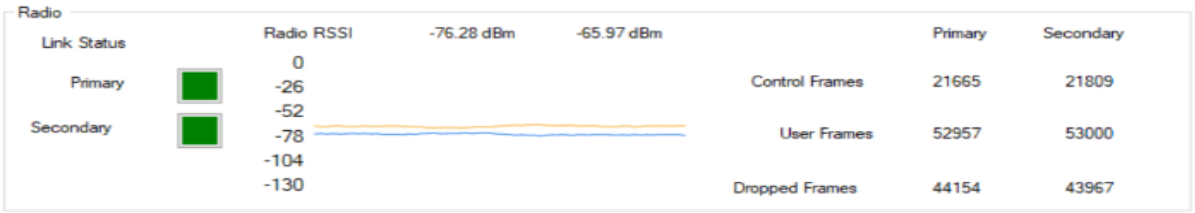
The status data is shown for both the local and the remote radios. It contains both transmit and receive information for the local and remote radios. This information includes memory queue depth information, transmit and receive data rates, frame rates, dropped frames and data totals. It also shows the RSSI's on the primary and secondary radios for both the local and remote radios giving the user comprehensive information on the state of the system.



Radio throughput and statistics detail shown below.

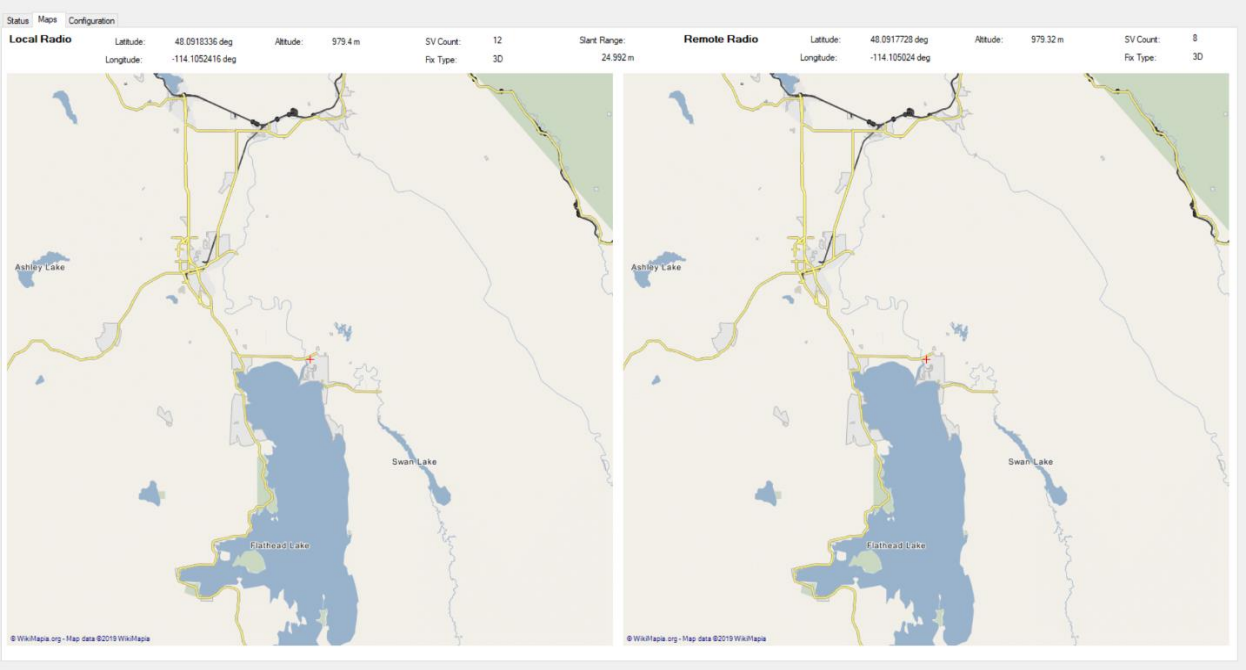


RSSI detail shown below.



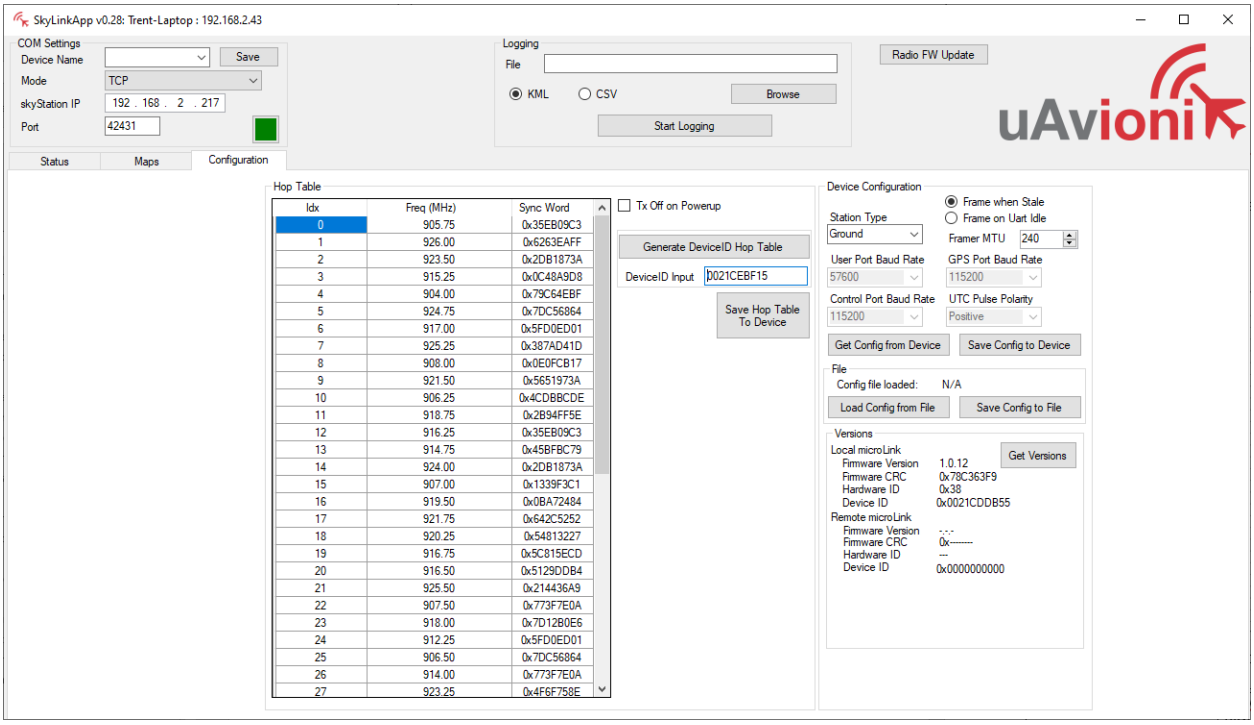
6.4.2 Maps Tab

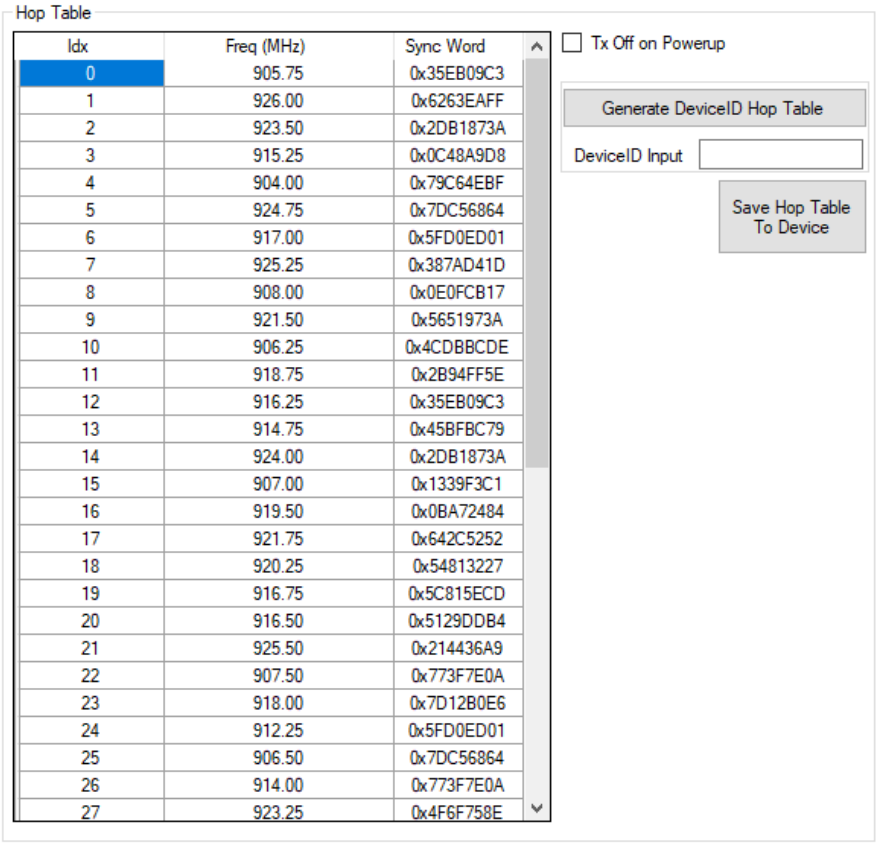
skyLinkApp.exe has a mapping tab for mapping the local radio skyStation radio as well as the remote aircraft radio. It includes latitude, longitude, altitude, GPS fix type, Slant Range and SV count.



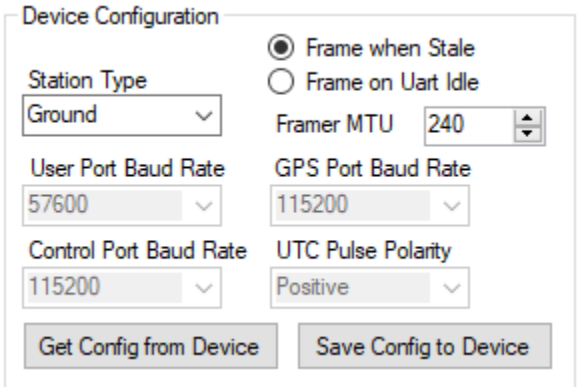
6.4.3 Configuration Tab

skyLinkApp.exe also contains a Configuration page. This page is used for device settings and setup as well as selecting the hop table scheme for the system.



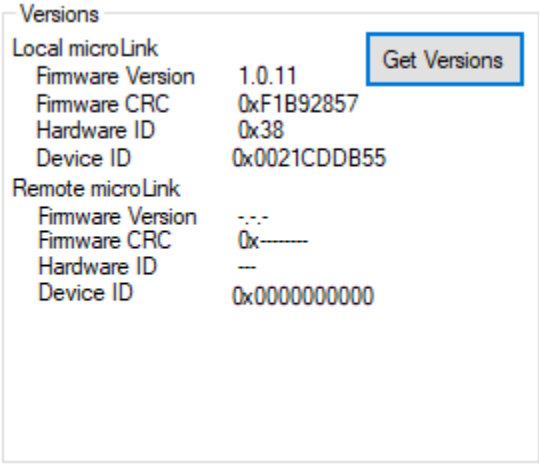


Generate DeviceID Hop Table	Generates the Hop Table per the DeviceID input
DeviceID Input 0021CEBF15	DeviceID input allows the user to enter the airborne radio ID to match Hop Tables.
Save Hop Table To Device	Saves the Hop Table currently displayed in the Hop Table window to the device.



Shows current device configuration. Clicking the Get Config from Device button will pull the configuration parameters currently stored on the device and display them in the window. Clicking the Save Config to Device button will push any new configuration parameters to the device.

The File window allows the user to save or load all the Configuration parameters to a PC.



The Versions window shows the microLink radio information for both the Local radio, and the Remote radio when a Link has been made.

6.5 skyStation Configuration and Health Webpage

The skyStation IP address can be determined by accessing the local DHCP server and reviewing the connected devices or by using industry accepted network scanning tools. Directions for each DHCP server, router, or network scanning tool differ. Refer to the instruction manual for these devices or tools to help determine the IP address assigned to the skyStation. The MAC address for each skyStation can be found on the device housing.

The following pages can be viewed in your web browser.

Note nnn.nnn.nnn.nnn is the IP address of the skyStation.

- skyStation base URL:

  http://nnn.nnn.nnn.nnn/

  Displays Health statistics, position and version information. Use to program the target TCP address and Port number.

- skyStation status URL:

  http://nnn.nnn.nnn.nnn/stats

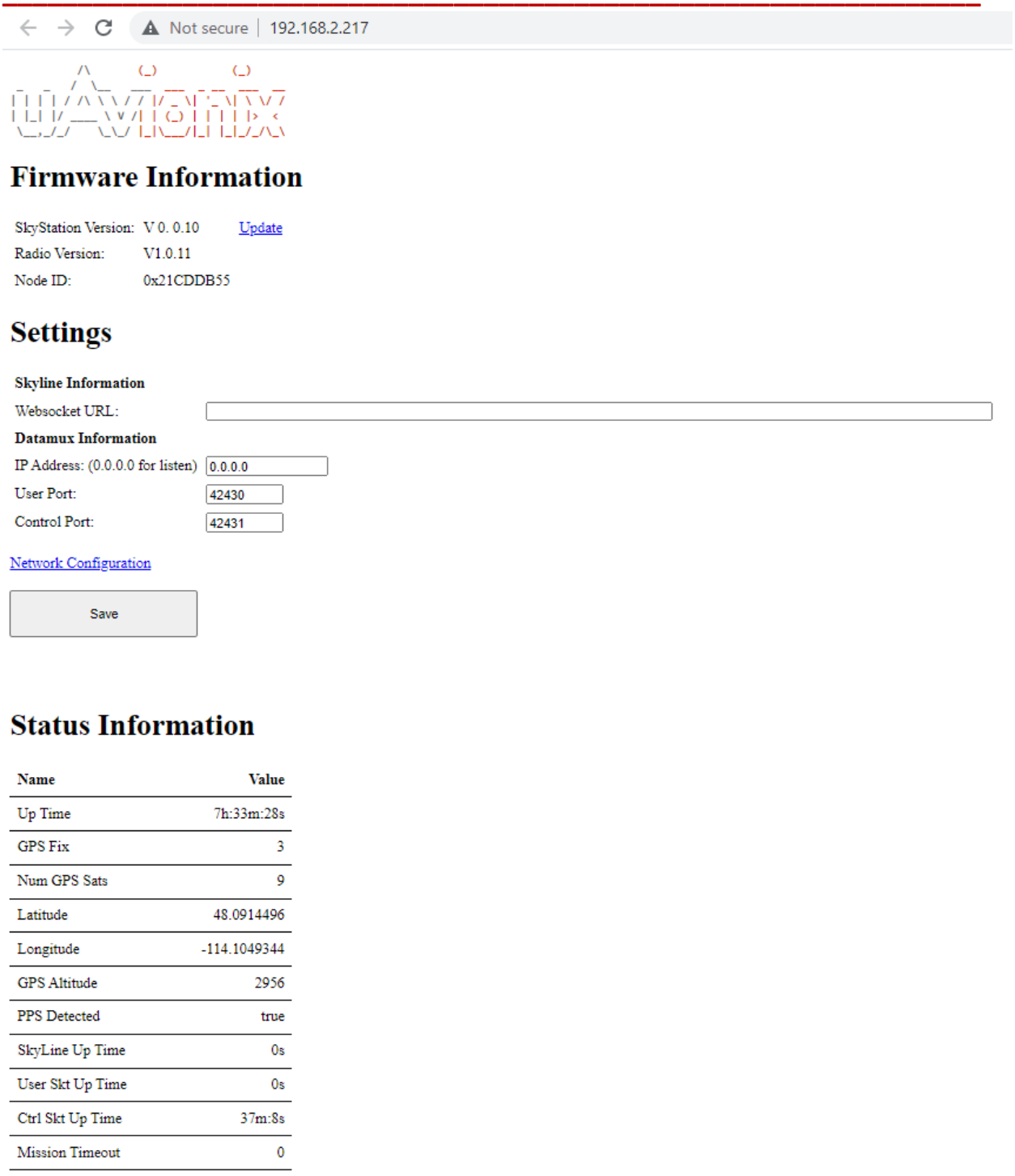
  Displays the status json sentence.

- skyStation update URL:

  http://nnn.nnn.nnn.nnn/update

  Provides ability to update skyStation firmware.

The base URL displays configuration items as well as dynamic skyStation health statistics. The defaults for the User and Control channel connections is shown. All parameters can also be modified to fit your network needs.


Not secure | 192.168.2.217
Firmware Information
SkyStation Version: V 0. 0.10 Update
Radio Version: V1.0.11
Node ID: 0x21CDDB55
Settings
Skyline Information
Websocket URL:
Datamux Information
IP Address: (0.0.0.0 for listen) 0.0.0.0
User Port: 42430
Control Port: 42431
Network Configuration
Save
Status Information
Name Value
Up Time 7h:33m:28s
GPS Fix 3
Num GPS Sats 9
Latitude 48.0914496
Longitude -114.1049344
GPS Altitude 2956
PPS Detected true
SkyLine Up Time 0s
User Skt Up Time 0s
Ctrl Skt Up Time 37m:8s
Mission Timeout 0

6.5.1 Firmware Information

The skyStation firmware version, microLink radio version and the microLink radio ID associated are displayed here. The user can update the skyStation through the webpage by clicking the “update” link and the microLink Radio through the skyLinkApp. see section 6.5.5 and 6.5.6.

6.5.2 Configuration Items

Configuration Item	Description
Skyline Websocket URL	When using Skyline or a websocket to manage missions, the mission data will be forwarded through to the URL address entered in this field.
Data Mux IP Address	When this parameter is 0.0.0.0, the skyStation will act as a TCP server and listen for incoming connections. Alternatively, if this address is a valid IP address, the skyStation will act as a TCP client and will attempt to connect to a TCP server listening on [User TCP IP Address : User TCP Port]. 0.0.0.0 is the default setting for this parameter.
Data Mux User Port	This is the port number used for the User connection. Typically, the ground control software uses the User connection to communicate with the aircraft. The skyStation listens on this port and forwards any received TCP datagrams from ethernet to the aircraft. Any User connection data coming from the aircraft will be sent as an ethernet TCP datagram to [User TCP IP Address : User TCP Port].
Data Mux Control Port	This is the port number used for the Control connection. The Control connection is used for device configuration and device monitoring. The skyStation will forward all internal data metrics through this port.

When you modify any configuration item, press the Save button to store the changes. These fields are non-volatile and persist through power cycles.

Example User port and Control port values are shown below.

6.5.3 Status

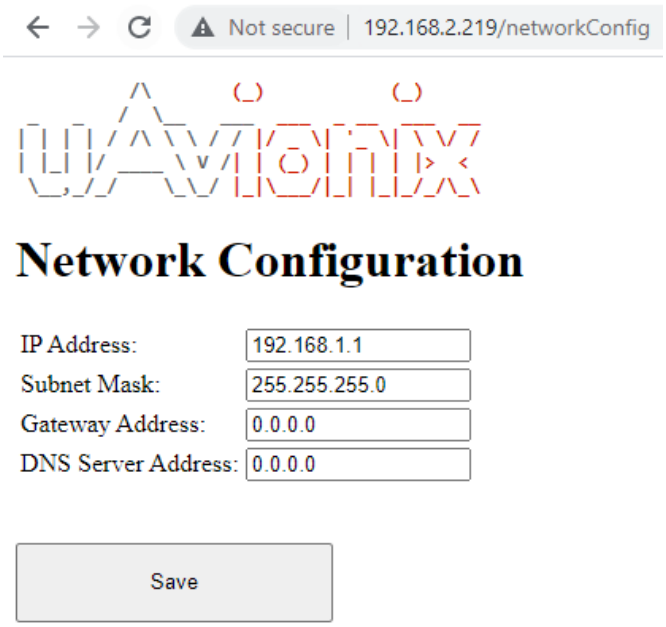
The Status Information section shows real time statistics updated once every second. It will show skyStation Up Time, GPS and PPS metrics. It will also show SkyLine metrics when connected through to the websocket.

Status Information

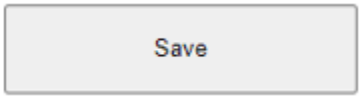
Name	Value
Up Time	7h:43m:57s
GPS Fix	3
Num GPS Sats	10
Latitude	48.0914496
Longitude	-114.1049344
GPS Altitude	2957
PPS Detected	true
SkyLine Up Time	0s
User Skt Up Time	0s
Ctrl Skt Up Time	47m:37s
Mission Timeout	0

6.5.4 Network Configuration

Clicking the Network Configuration link on the main landing page will forward you to the Network Configuration page where the user can adjust the network connectivity settings used by the skyStation when a DHCP server is not available.



Configuration Item	Description
IP Address	This is the IP address number of the skyStation which will be used when a DHCP server is not available. The network administrator should assign this number.
Subnet Mask	Mask used with the skyStation IP address to differentiate between local and remote subnet destinations.
Gateway IP Address	Address used to send packets out of the local network.
DNS Address	IP address of the Domain Name Service.



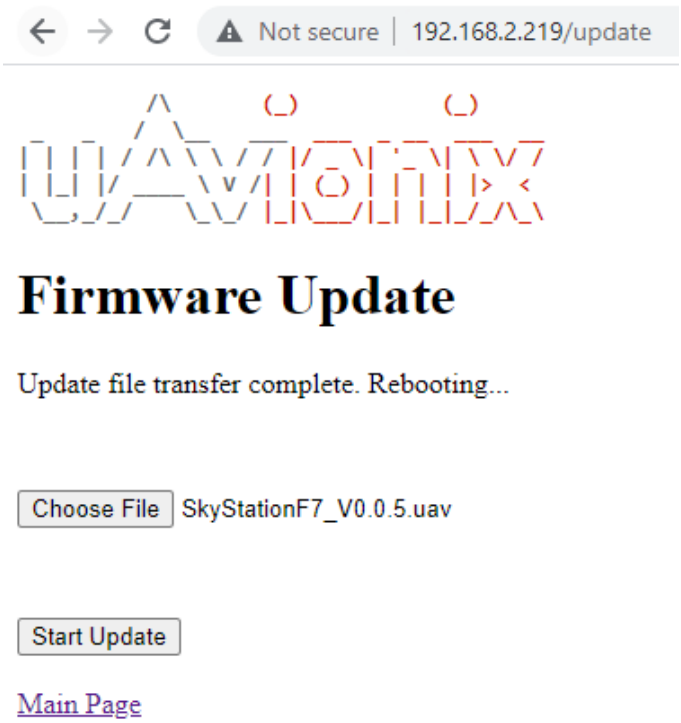
When you modify any configuration item, press the Save button to store the changes. These fields are non-volatile and persist through power cycles.

6.5.5 skyStation Update

The firmware on the skyStation can be updated through the skyStation Configuration Webpage by clicking the Update link next to the version number.

Choose the appropriate file to upload and click Start Update.

DO NOT power off the skyStation or close the web browser until the update is complete.



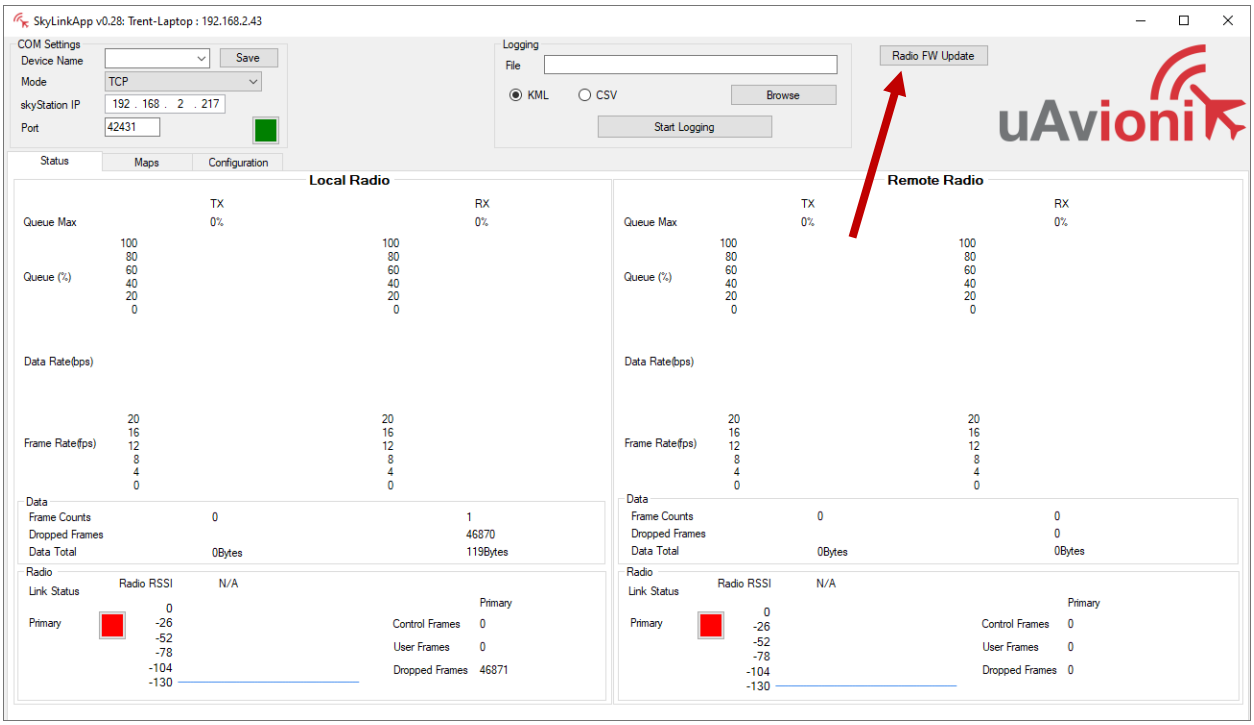
When the file transfer is complete, click the Main Page link to return to the skyStation Configuration Webpage*. The version number on the Configuration Webpage should reflect the firmware version uploaded.

* The reboot of the skystation could take up to 45s to complete

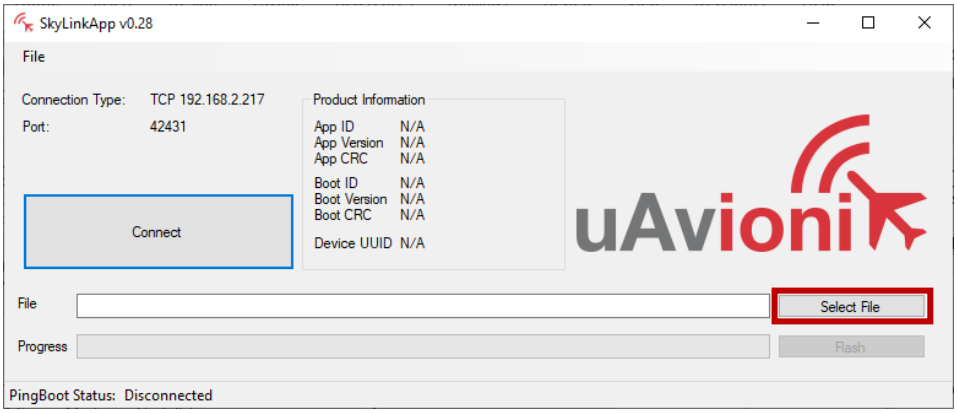
6.5.6 microLink Update

The microLink Radio on the skyStation can be updated using the skyLinkApp. First connect the skyLinkApp to the skyStation following the steps in section 6.2.

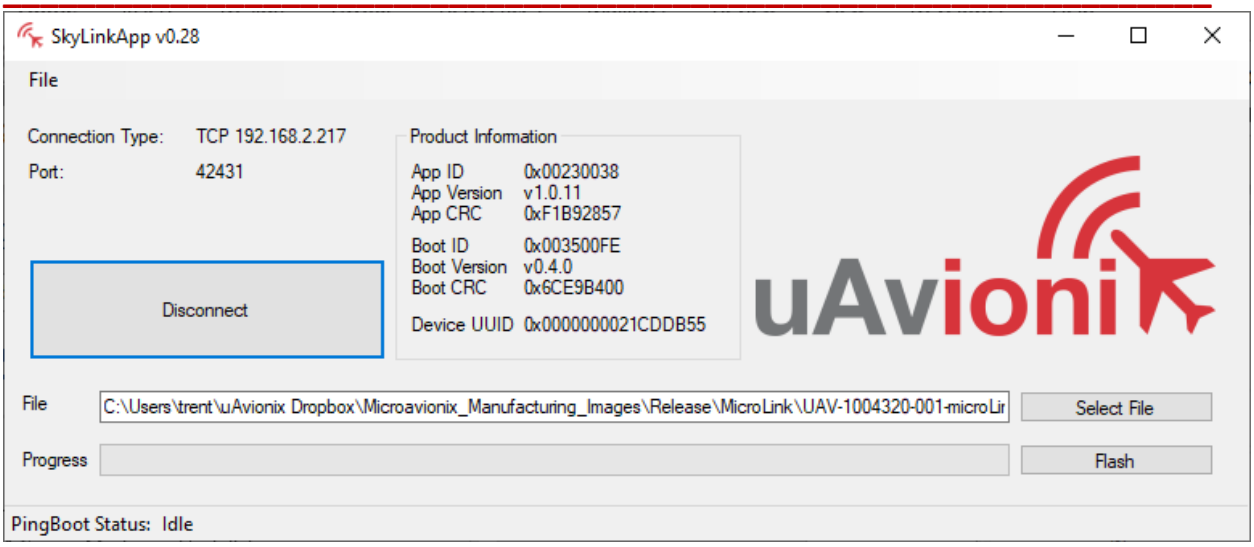
In the upper right-hand corner click the “Radio FW Update” button.



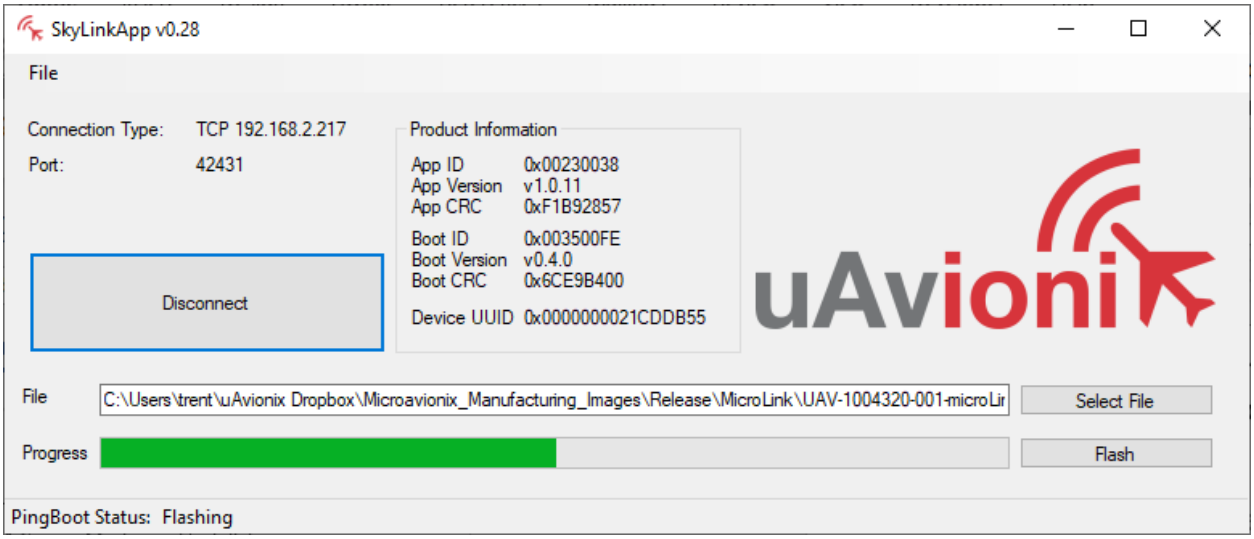
A new window will open. First click “Select File” and select the correct firmware file to upload.



Then click the “Connect” button. The Product Information window will populate with radio information when a connection is made, and the PingBoot Status in the bottom left will change to “Idle”



Click “Flash” DO NOT power off or disconnect the device until the flash is complete.

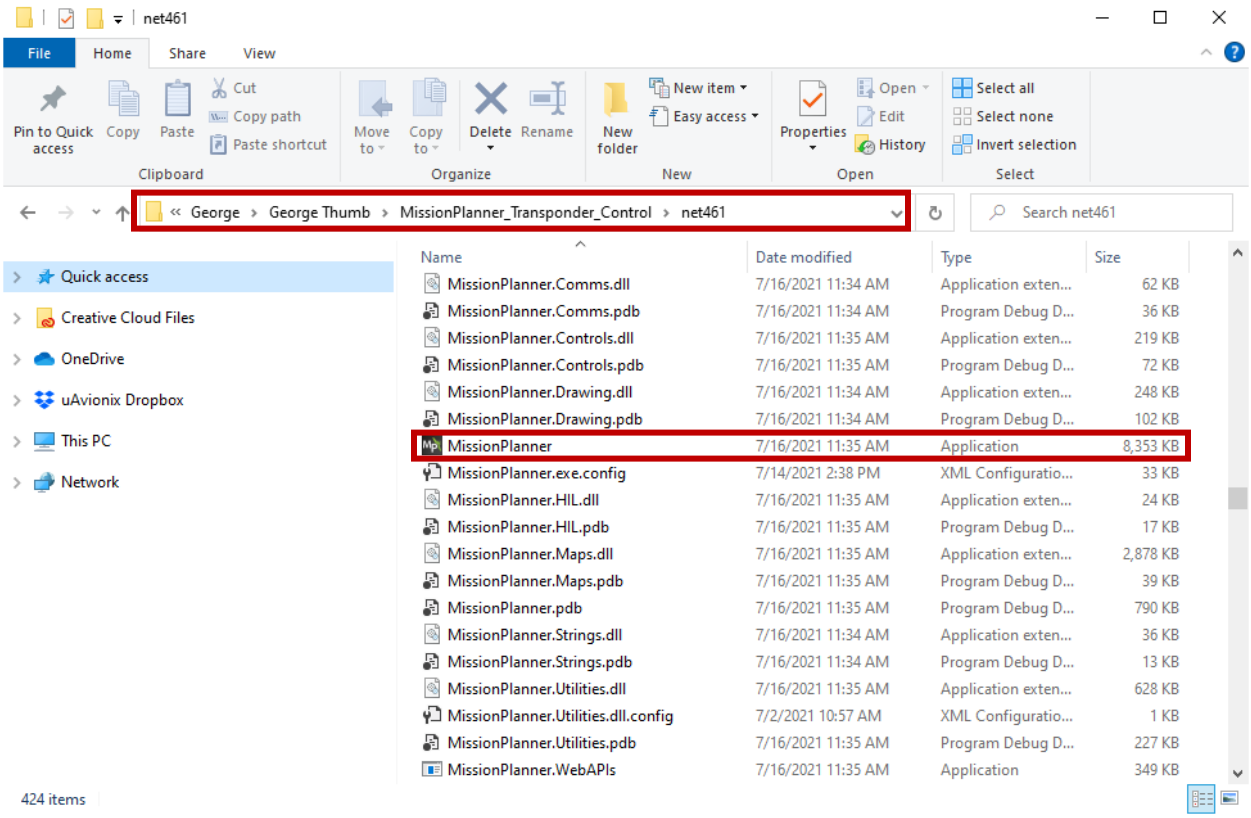


6.6 Ping200X Configuration

To use the Ping200X with the George G3 AutoPilot, an updated build of Mission Planner must be used and custom firmware has to be loaded onto the AutoPilot. Mission Planner and the firmware are included in the George thumb drive.

6.6.1 Mission Planner

Included in the George thumb drive is a folder that houses an updated Mission Planner application. Select the application to run the updated Mission Planner.



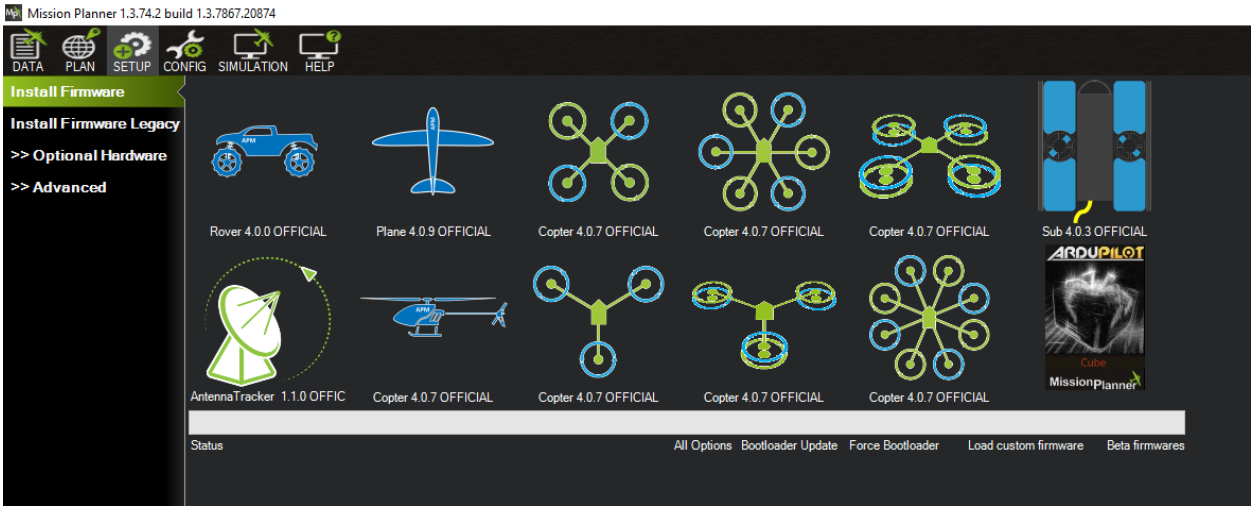
You will notice with the updated Mission Planner that a “Transponder” tab will be present on the data screen. See section 6.6.4 for more info on transponder control. If the “Transponder” tab is not visible, right click on the ribbon and select “Customize”, then enable the “tabTransponder”.

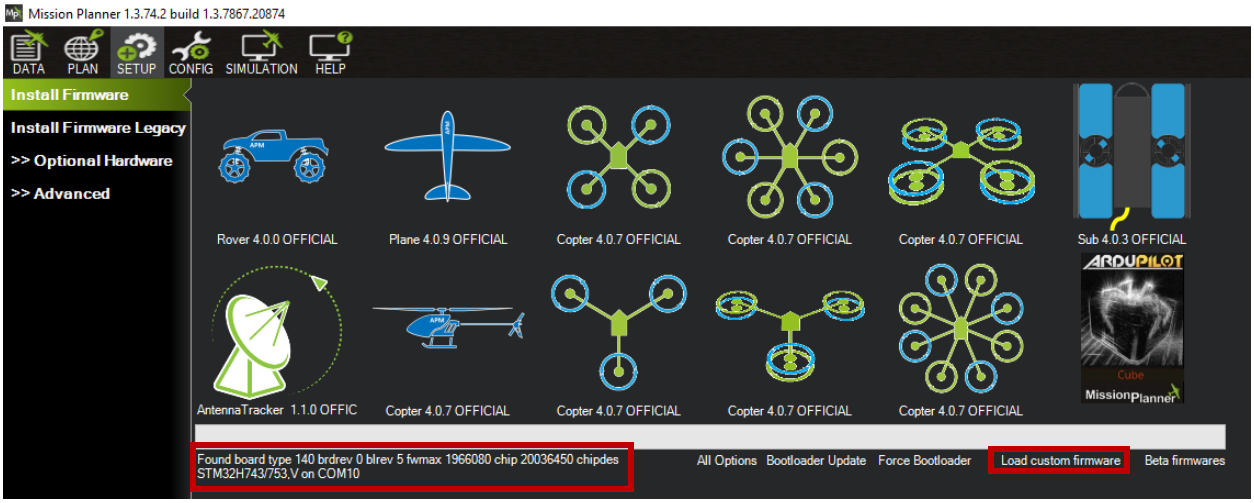

Mission Planner 1.3.74.2 build 1.3.7867.20874
DATA
PLAN
SETUP
CONFIG
SIMULATION
HELP
NW
330
345
NE
DISARMED
00:00:00
AS 0.0m/s
GS 0.0m/s
tabQuick
tabActions
tabPagemessages
tabActionsSimple
tabPagePreFlight
tabGauges
tabTransponder
tabStatus
tabServo
tabScripts
tabPayload
tabTLogs
tablogbrowse
Quick
Actions
Messages
PreFlight
STBY
ON
ALT
IDENT
FlightID
Squawk
1200
NIC
NACp
Maint. Req.
GPS Unavail.
GPS No Fix
TX Sys. Fail.
On Ground
Connect to Transponder


Mission Planner 1.3.74.2 build 1.3.7867.20874
DATA
PLAN
SETUP
CONFIG
SIMULATION
HELP
NW
330
345
NE
DISARMED
0m/s
0 m
AS 0.0m/s
GS 0.0m/s
Unknown
0m>0
EKF
Vibe
GPS: No GPS
Quick
Actions
Messages
PreFlight
Gauges
Transponder
Status
Servo/Relay
Scripts
STBY
ON
ALT
IDENT
FlightID
Squawk
1200
NIC
NACp
Maint. Req.
GPS Unavail.
GPS No Fix
TX Sys. Fail.
On Ground
Connect to Transponder

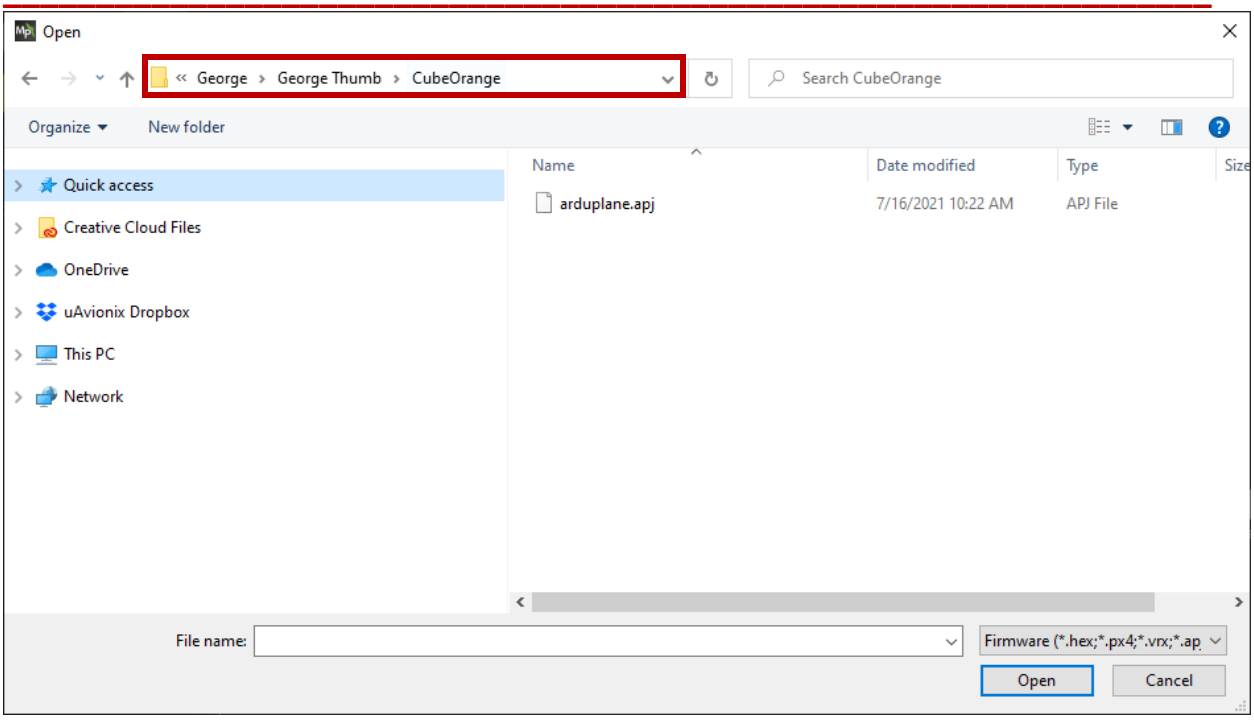
6.6.2 Updating George G3 Firmware

To update the George G3 firmware to support Ping200X control, connect the George G3 to a PC as specified in section 6.3.1. Open the new Mission Planner and go to the SETUP tab and the Install Firmware section. Power on the George G3, when Mission Planner recognizes the board, the status will change to “Found board type…”

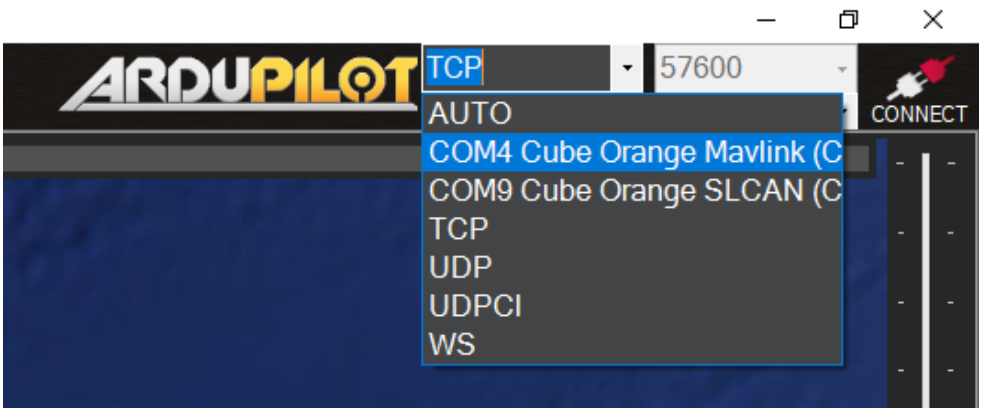




When the board is found, select “Load custom firmware.” Navigate to the CubeOrange folder in the George thumb drive and select the arduplane.apj firmware.



When the firmware is finished loading, the AutoPilot will restart then a Mavlink Com port will be available to select from the dropdown menu. Select it and press “CONNECT.”



6.6.3 George Parameters for 200X

Once connected to the George AutoPilot through Mission Planner, change the following parameters in Mission Planner. (CONFIG>Full Parameter List)

Function	Parameter	Value	Description
GPS	GPS_AUTO_CONFIG	0	Disable GPS Auto Config
	GPS_SAVE_CONFIG	0	Disable GPS Save Config
	GPS_TYPE	5	GPS = NMEA
	SERIAL4_BAUD	115	Baud Rate = 115200
	SERIAL4_PROTOCOL	5	Serial 4 = GPS
	BRD_SAFETYENABLE	0	Disable Safety Switch
Airspeed	ARSPD_TYPE	6	Airspeed Sensor = i2C – SDP3X
	ARSPD_USE	1	Enables Airspeed Sensor
	ARSPD_BUS	0	Internal i2C bus
	ARSPD_PIN	0	Disable Analog Airspeed Pin
	ARSPD_PRIMARY	0*	Enable First Sensor
	ARSPD_AUTOCAL	0*	Disable In-Flight Autocal
	ARSPD_TUBE_ORDER	2*	Either port can be used for Static/Pitot
	ARSPD_RATIO	1.9936*	Pitot tube Pressure/Velocity
	ARSPD_PSI_RANGE	1*	PSI Range for sensor
	ARSPD_SKIP_CAL	1	Startup offset calibration disable
C2	SERIAL2_BAUD	57	Baud Rate = 57600
	SERIAL2_PROTOCOL	1	MavLink 1 Protocol
****Ping200X**	SERIAL1_BAUD	57	Baud Rate = 57600
	SERIAL1_OPTIONS	0	
	SERIAL1_PROTOCOL	35	Serial ADS-B Receiver
	ADSB_TYPE	3	Enable ADSB Out
	ADSB_EMIT_TYPE	14*	Emitter Category = UAV
	ADSB_RF_CAPABLE	8	1090ES OUT
	ADSB_RF_SELECT	2	TX Only
Battery	BATT_AMP_PERVLT	27.7347	Current Sensing Calibration

Click “Write Params” and “Refresh Params” when finished and cycle the power.

6.6.4 Transponder Control

Connect the new Mission Planner to the George G3 AutoPilot via a C2 link or direct USB connection to the PC. On the Data screen under the “Transponder” tab click “Connect To Transponder.”

The status of the button will change to “Transponder Connected!” when a successful connection is made.

From this tab the user can control the mode of the transponder, “STBY”, “ON”, “ALT”, enable “IDENT”, input a FlightID, and modify the “Squawk” code.

Transponder status is displayed in the right-hand window and shows Transponder functionality status, GPS Status, and On Ground status. NIC and NACp metrics are also displayed under the “Squawk” code box.