

Installation and Operation Manual

QTrack™ Antenna System



Quasonix, Inc.
6025 Schumacher Park Dr.
West Chester, OH 45069
17 October 2024

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Specifications subject to change without notice.

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1 Introduction

1.1 Description

This document describes the installation and operation of the Quasonix QTrack™ Antenna System and is updated to match RDMS™ System Version 19.3. The QTrack™ antenna is enhanced by our industry-leading innovations, including our ultra-fast electronic scanning, enhanced system status graphics, and intuitive user interface. The standard QTrack Antenna System includes:

Dual Axis Pedestal Assembly

- Dual-axis positioner, slip ring, and two channel rotary joint assembly

SCM Antenna Assembly

- SCM antenna, with LHCP and RHCP outputs capable of operation at any or all of the following bands:
1435.5 MHz to 1534.5 MHz
1750.0 MHz to 1850.0 MHz
2200.5 MHz to 2394.5 MHz
4400.0 MHz to 5150.0 MHz
(Extended operating frequencies available)
- A two-by-two antenna array providing dual axis tracking capability
- An RF assembly integrated behind the antenna array containing:
 - Tracking hybrid assemblies
 - Band pass filters for each polarization
 - Low noise RF preamplifiers for each polarization

Rack Mounted 2U Control Unit

- Ethernet control and status
- HDMI video port for interfacing to HDMI monitor (available accessory bundle)
- Front and rear panel USB ports for connecting keyboard and mouse (available accessory bundle)

System Cable Set (Length to be specified by Customer)

- Two LMR-400 RF cables
- One Control umbilical cable

The QTrack™ Antenna System is manufactured by:

Quasonix, Inc.
6025 Schumacher Park Drive
West Chester, OH 45069
CAGE code: 3CJA9

1.2 Nomenclature

The QTrack™ Antenna System is available in a number of variations, depending on the options specified at the time of order. The features and modes installed in each unit are identified in the model number, as depicted in Figure 1.

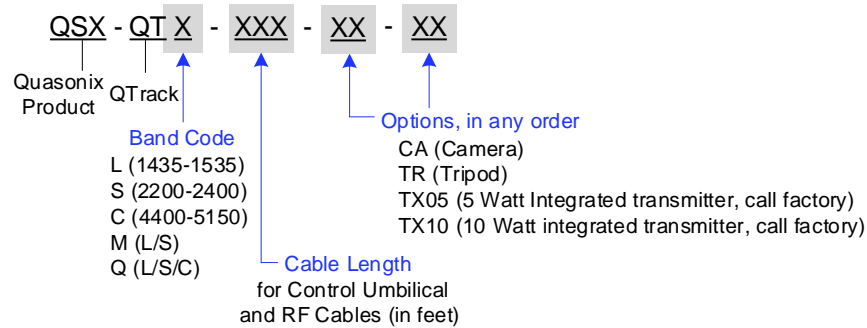


Figure 1: QTrack™ Antenna System Part Number Construction

For example, model number QSX-QTM-050-CA-TR defines a unit configured as shown in Table 1.

Table 1: Model Configuration Example

| Identifiers | Description |
|-------------|---|
| QSX | Quasonix product |
| QT | QTrack Antenna System |
| M | L and S bands |
| 050 | Cable length for control umbilical and RF cables, in feet |
| CA | Camera option |
| TR | Tripod option |

Specifications are subject to change. Contact Quasonix for questions regarding your specific system.

1.2.1 Options and Accessories

The available options and accessories include:

| | |
|----------------|--------------------------------|
| CA | Camera |
| TR | Tripod |
| TX05 | 5 Watt Integrated transmitter |
| TX10 | 10 Watt Integrated transmitter |
| QSX-AC-HWHEELS | Dual USB hand wheels |

1.2.2 Standard Package Contents

The contents of the shipment include the following:

- Round antenna
- Dual-Axis positioner
- 2U rack mount controller
- (2) 161005-xxx Coaxial cables
- QC-CBL005-XXX QTrack control umbilical cable

2 Specifications

| Antenna Specifications | |
|--|---|
| Operating Frequency | 1435.0 - 2500.0 MHz continuous 4400.0 - 5250.0 MHz continuous Actual operating band based on selected filters |
| Polarization | Receive: Simultaneous Right Hand and Left Hand Circular Transmit (with TXnn options): Left Hand or Right Hand Circular |
| Axial Ratio | 2.0 dB maximum |
| Antenna Type | Electronic Scanning |
| Array Size (Diameter) | 13.25 inches nominal |
| Weight | Feed: 44 lbs Camera (optional): 6.5 lbs |
| Antenna Gain (nominal, linear polarized receive, RHCP and LHCP outputs combined) | 1435.0 MHz +7.0 dB 2400.0 MHz +10.0 dB 4400.0 MHz +9.0 dB 5250.0 MHz +9.0 dB |
| Antenna Beamwidth | 40° (3 dB) (nominal) |
| Sidelobes | 10 dBp (nominal) |
| <i>Environmental</i> | |
| Temperature | Operating -30°C to +55°C Storage -40°C to +71°C |
| Relative Humidity | Up to 100%, including condensation (radome protected) |

Pedestal Specifications

| | |
|-----------------------------|--|
| Type | Elevation/Azimuth |
| Azimuth Travel | Continuous |
| Elevation Travel | -20° to +90° |
| RF Cabling Capability | Two RF channels supporting frequencies through C-band, VSWR 2.0:1 Maximum each RF channel |
| Weight | 32.5 lbs nominal |
| <i>Environmental</i> | |
| Operating Temperature | -30°C to +55°C |
| Storage Temperature | -40°C to +71°C |
| Relative Humidity | Up to 100%, including condensation |

3 Installation Instructions

3.1 Mechanical

3.1.1 System Configuration

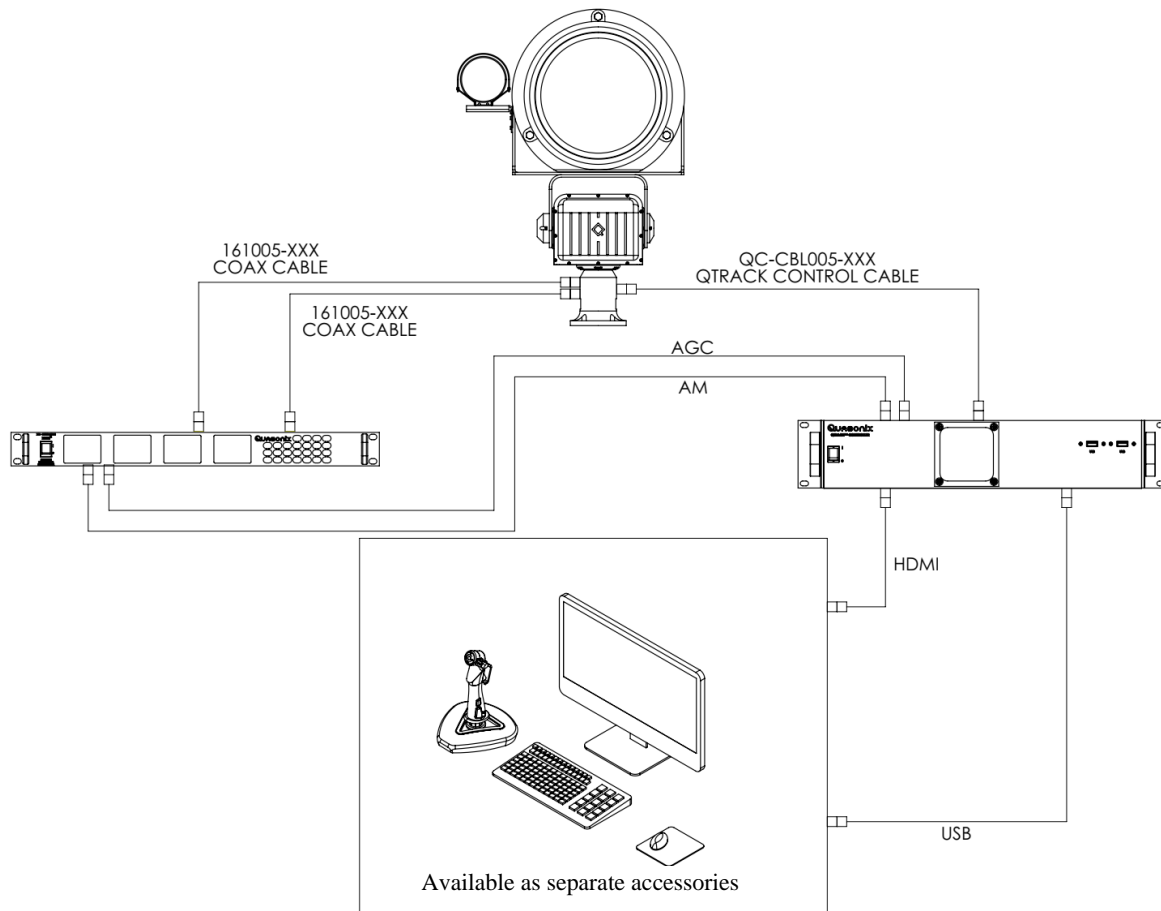


Figure 2: Typical System Configuration, Local Operation

3.1.2 2U Rack-Mount Controller

The 2U QTrack™ Antenna Controller enclosure fits in a standard 19" rack, occupying just 2U of rack space. Mechanical layouts are provided in Figure 3, Figure 4, and Figure 5.

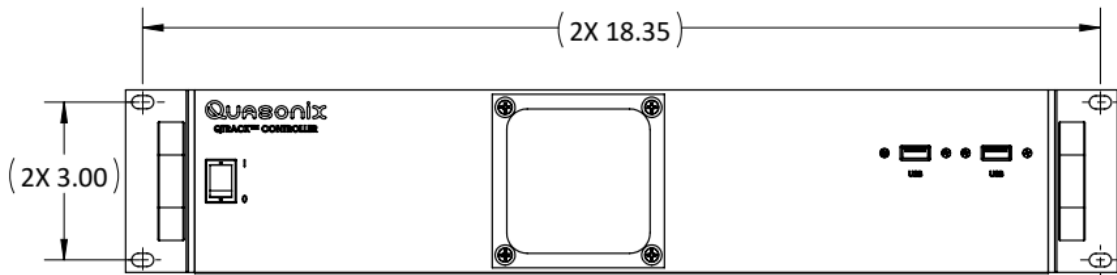


Figure 3: Mechanical Drawing – 2U Front View

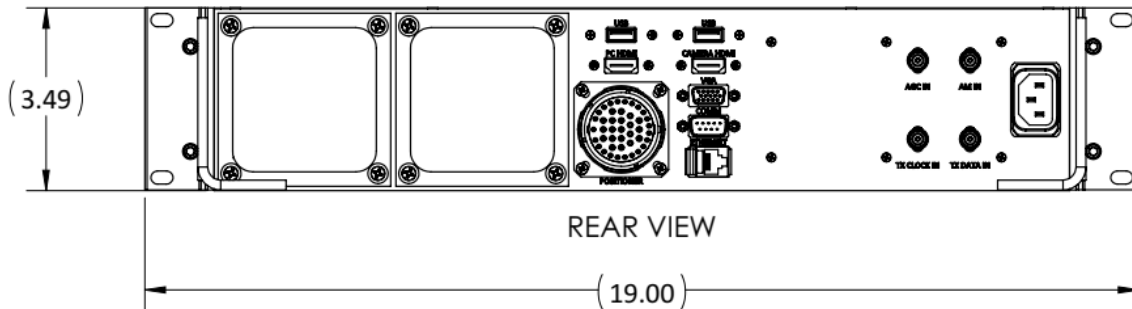


Figure 4: Mechanical Drawing – 2U Back View

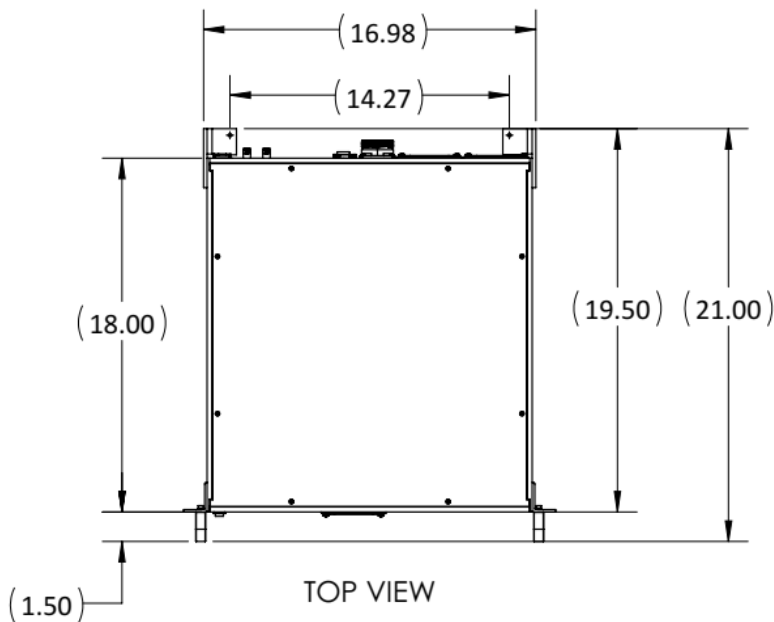


Figure 5: Mechanical Drawing – 2U Top View

3.2 Environmental

The storage temperature of the QTrack™ Antenna System is rated for -40°C to +71°C, while the operating temperature is rated for -30°C to +55°C. It is recommended that the unit be kept in a temperature controlled environment to minimize the risk of operating (or storing) outside the ranges specified.

The 2U Controller features cooling vents on the back of its aluminum chassis. These vents must be kept entirely unobstructed in order to allow for maximum airflow through the system. Whenever feasible, it is helpful to leave an open rack space above and below the 2U Controller for additional heat dissipation.

The QTrack™ supports an airline fitting for a supply of dehydrated air, and Quasonix recommends that this connection be used whenever the system is deployed outdoors for an extended period. Quasonix offers a dehydrator as an accessory for customers who do not have their own supply of dehydrated air. Contact sales@quasonix.com for details.

3.3 Electrical

Two USB ports are located on the front panel along with the power switch and a power indicator, as shown in Figure 6. All 2U Controller electrical connections are located on the rear panel, as shown in Figure 7.



Figure 6: 2U Front Panel

3.3.1 2U Controller Rear Panel Connections

Rear panel connectors are the same for all 2U Controllers. Connectors are present whether the feature is ordered or not. The electrical interface connectors are shown in Figure 7.



Figure 7: 2U Rear Panel

Functional descriptions and electrical characteristics for each connector located on the rear panel are described in Table 2.

Table 2: 2U Rear Panel Connectors

| Name | Description |
|------------------------|---|
| USB | USB-A 3.0 (blue connector) for local mouse and keyboard |
| PC HDMI | Local connection to monitor for GUI |
| Positioner | D38999/20WJ43SN multi-pin connector for control umbilical |
| USB | USB-A 2.0 (white connector) for local mouse and keyboard |
| Camera HDMI | Video connection for integrated camera (CA option) |
| VGA | Female HD-15, Standard VGA video |
| Ethernet | RJ-45, Enables network access |
| AGC In | 50 Ohm BNC, 1 kOhm, AGC feedback from receiver |
| AM In | 50 Ohm BNC, AM feedback from receiver |
| TX Clock In | BNC, 75 Ohm TTL, Clock input for optional integrated uplink transmitter |
| TX Data In | BNC, 75 Ohm TTL, Data input for optional integrated uplink transmitter |
| Power (far right side) | IEC-320-C14, Supplies AC power to the unit, 110 to 240 VAC, 50/60 Hz |

4 Operating Instructions

4.1 Local Antenna Control Unit (ACU) Operation

The QTrack™ Antenna System is operated via the PC Interface. With a keyboard, monitor, and mouse, users may connect to the ACU and run the QTrack™ client software which is located on the desktop.

4.1.1 Remote ACU Operation

The Local ACU and connected QTrack™ System can be controlled remotely by installing the client software on the remotest device and connecting to the ACU through an Ethernet connection. Figure 8 shows the connections necessary for remote access.

IP structure

- Internal
 - 10.1.1.10: QTrack controller
 - 10.1.1.20: Positioner
 - 10.1.1.30: (optional) RS232 serial comms for transmitter control
 - 10.1.1.40: Camera
 - 10.1.1.50: Decoder
- External
 - 172.16.0.10: QTrack controller
 - 172.16.0.40: Camera
 - 172.16.0.50: Decoder

4.1.1.1 Remote Access Set Up, LAN

1. Set remote PC IP address to 172.16.0.11/24.
2. Install client software on a remote PC.
3. Open QTrack ACU desktop icon on remote PC.

A small window displays while attempting to connect. If connection never occurs, click on the ACU Settings button, and ensure QTrack server IP is set to 172.16.0.10.

When connected, full access to ACU functionality should be available from the remote PC.

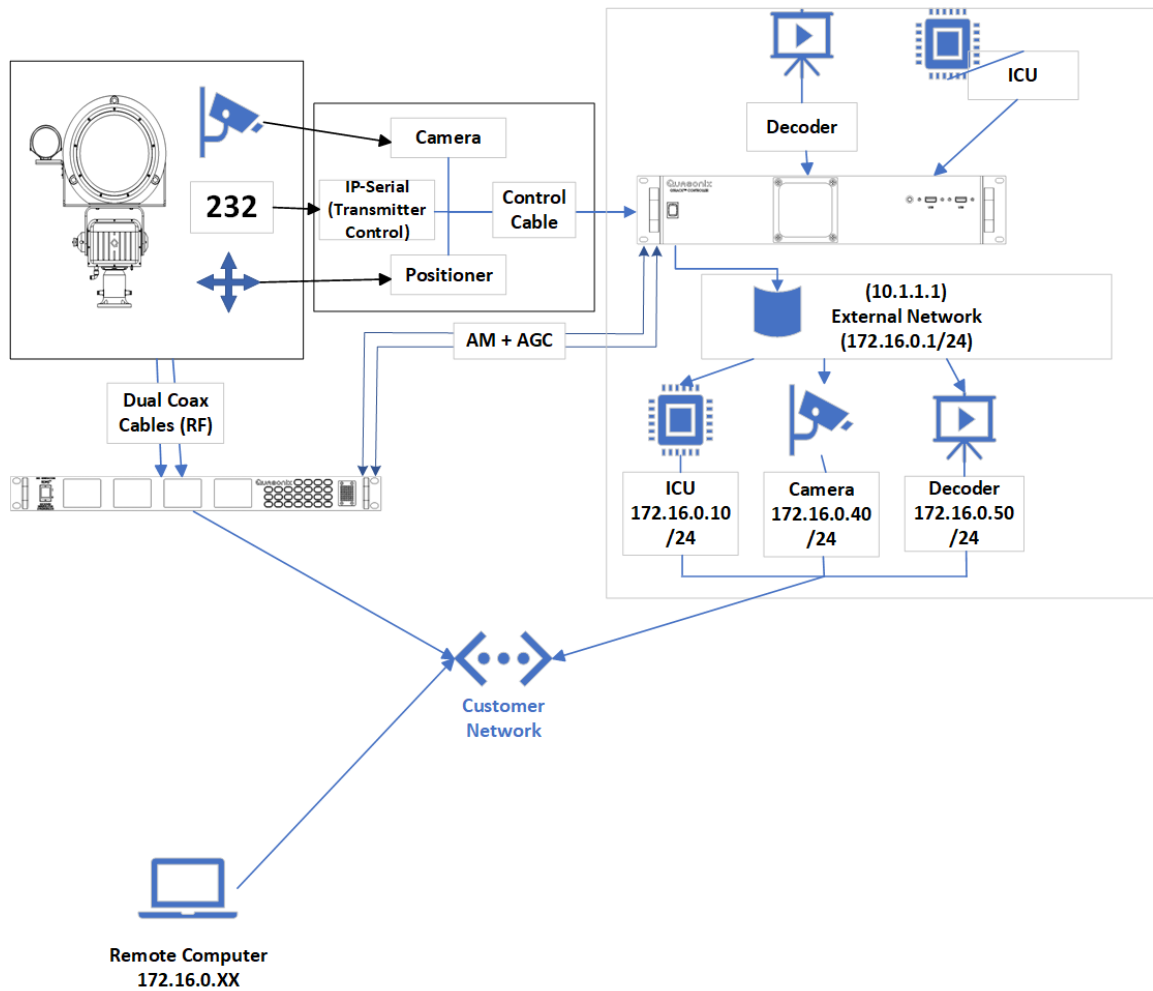


Figure 8: Typical System Configuration, Remote Operation—LAN Access

4.2 ACU Main Operations Indicators and Manual Control

This section covers the simple main system operations that are available from the front panel of the ACU Graphical User Interface (GUI). The front panel contains the operational selection buttons, as well as the display feedback readouts and indicators. The System Operation buttons are described in the next section.

Note: Be sure the receiver AM Bandwidth is set to 15,000, and the receiver AGC Scale (dB/V) is set to 20. Connect the Receiver combiner AGC and AM outputs to the respective ACU inputs.

1. Connect the ACU to the antenna pedestal, then turn the system on.
2. Click on the QTrack ACU desktop icon, as shown in Figure 9.

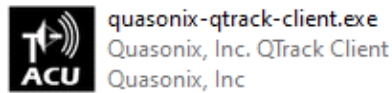


Figure 9: QTrack ACU Desktop Icon

The QTrack ACU Graphical User Interface (GUI) displays, as shown in Figure 10.

Note: This display is for a QTrack with the TX option.



Figure 10: QTrack ACU Graphical User Interface

4.2.1 ACU Menu Bar

The ACU Menu Bar consists of icons which provide access to functionality including Logging, Status, Settings, Tools, and Help.

4.2.1.1 Logging

The ACU is equipped with a logging feature which allows tracking status information such as AZ/EL position, tracking error, RSSI, and much more to be logged and saved to a local .txt file.

The Logging icon, shown in Figure 11, enables and disables the logging function. The icon illuminates green when logging is enabled, as shown in Figure 12.

Refer to section 4.5.1 for more detailed information about logging.



Figure 11: Menu Bar, Logging Icon



Figure 12: Menu Bar, Logging Enabled

4.2.1.2 Status

The Status icon, shown in Figure 13, opens a live status reporting window for the motion controller and user inputs, shown in Figure 14.



Figure 13: Menu Bar, Status Icon

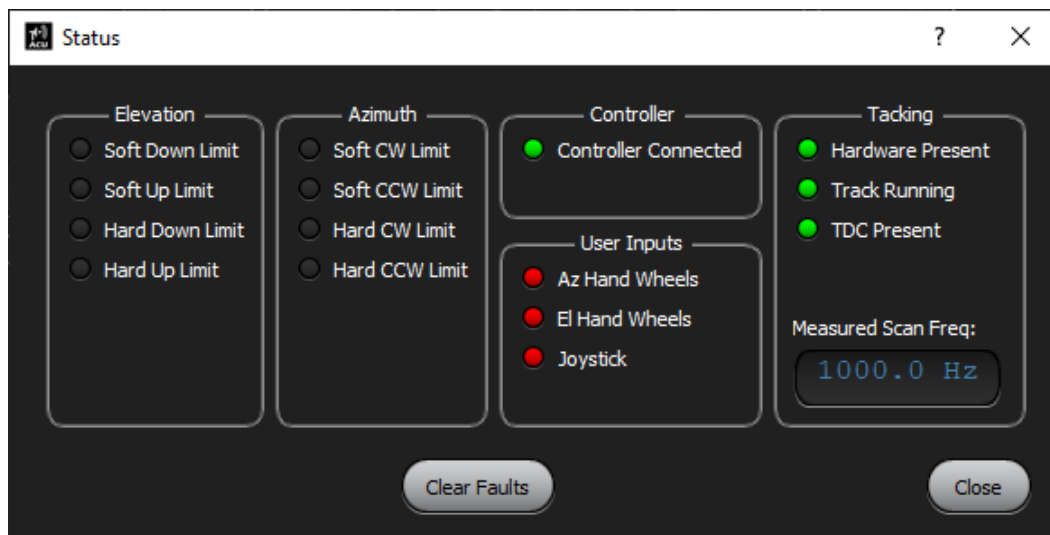


Figure 14: Status Window

4.2.1.3 Settings

The Settings icon, shown in Figure 15, opens the Settings window, shown in Figure 16. It is used to set or view parameters within the ACU.



Figure 15: Menu Bar, Settings Icon

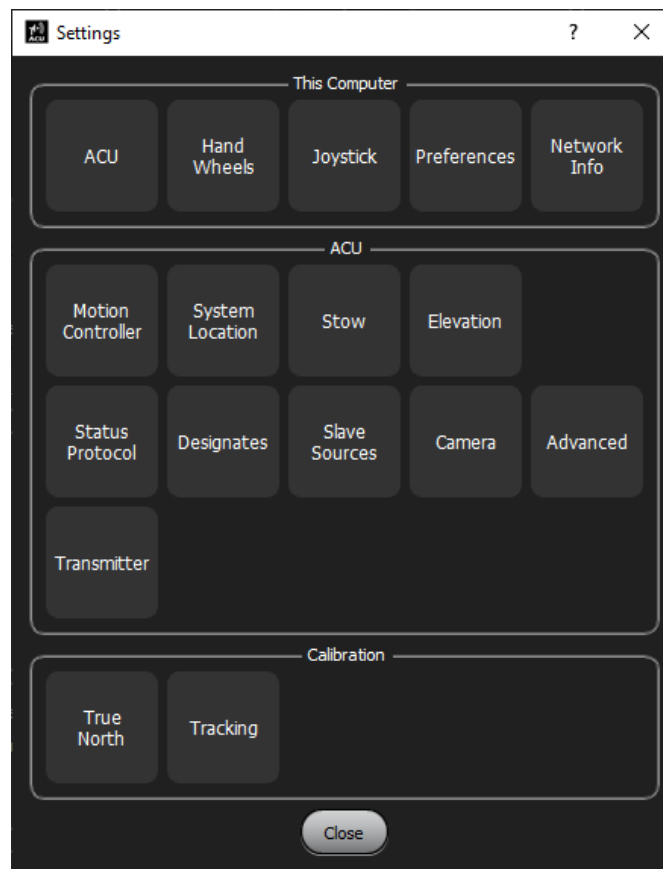


Figure 16: Settings Window

There are three main sections in the Settings window: This Computer, ACU, and Calibration.

4.2.1.3.1 This Computer

This Computer settings let the user Enable, Disable, and Modify user input controls such as hand wheels, joystick, and keyboard. The ACU selection shows the server IP address at 127.0.0.1. **Do not modify this address as it is critical for operation.**

4.2.1.3.2 ACU

The ACU section is used to set system location coordinates and user defined position designates. Refer to section 8 (Appendix A) for transmitter control information. Most other settings in this section should not be modified without Quasonix approval.

4.2.1.3.3 Calibration

Calibration is for True North Settings only. Refer to section 4.3.7 for True North Settings information. Do not modify Tracking settings as these are critical for operation. The QTrack™ system does not require a periodic calibration.

4.2.1.4 Tools

The Tools icon, shown in Figure 17, opens the Tools window, shown in Figure 18. It is used to set logging parameters, restart and shut down the server, and test joystick and hand wheel inputs. Refer to section 4.5 for more information about the Tools window.

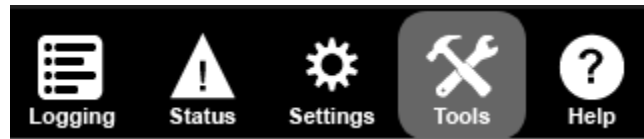


Figure 17: Menu Bar, Tools Icon

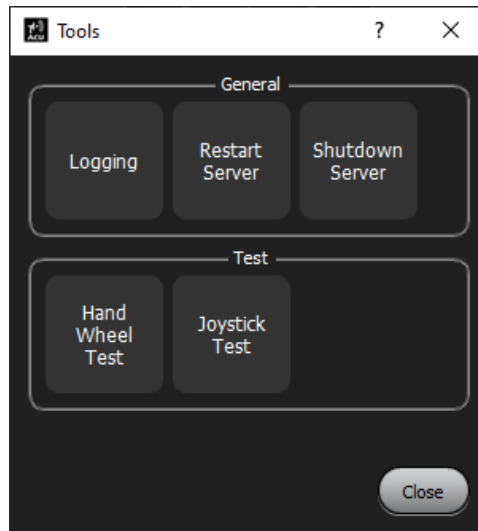


Figure 18: Tools Window

4.2.1.5 Help

The Help icon, shown in Figure 19, opens the Help window. The Help window contains contact information, client version, and server version for the unit.

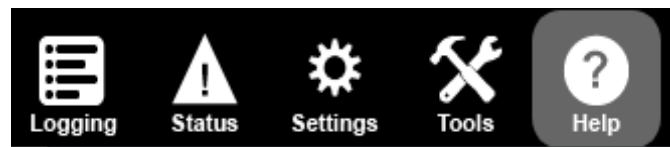


Figure 19: Menu Bar, Help Icon

4.2.2 Axis Control

The Axis Control section, shown in Figure 20, shows the available independent axis control modes, the servo On-Off button, and the (right hand side) Gear Icon (hot buttons) used for immediate display of the linked control and parameter input windows. When activated, those windows display directly to the right of Axis Control.

1. In the Axis Control window, select the red Servo power button, as shown in Figure 20.



Figure 20: Axis Control Window, Red Servo Button

The ACU Servo power button illuminates green, as shown in Figure 21.

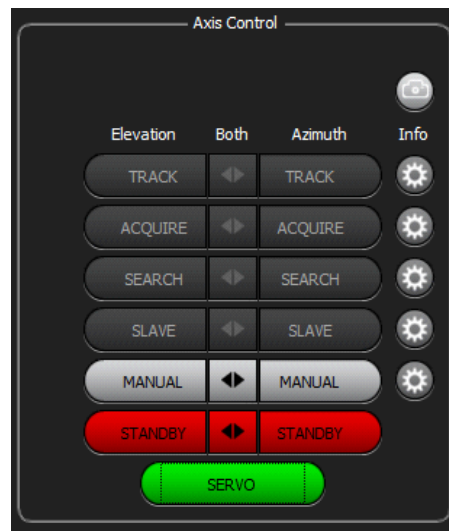


Figure 21: Axis Control Window, Servo Button Changed to Green

Note the Azimuth and Elevation indicators with resolution of 0.01° , indicating the pedestal pointing in El and AZ frame of reference.

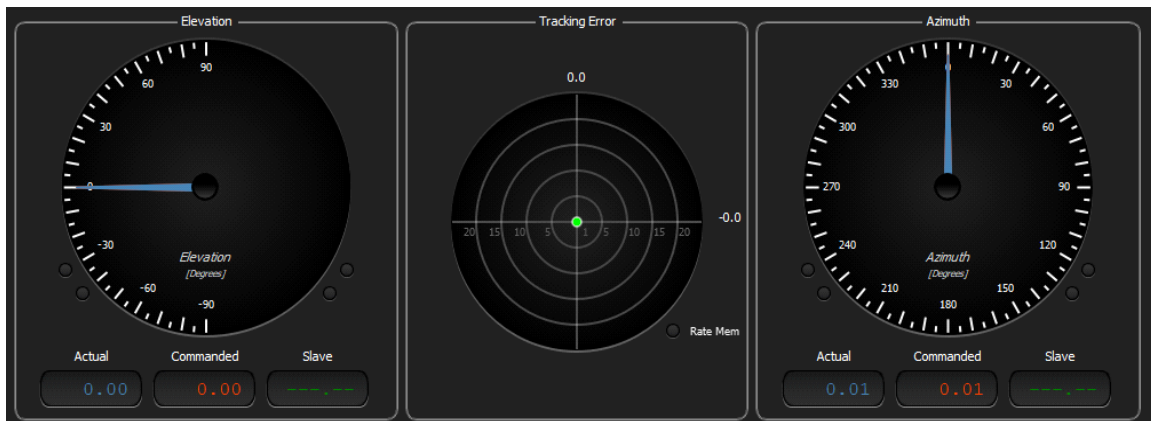


Figure 22: Elevation, Tracking Error, Azimuth Windows

2. On the Axis Control window, select Manual Mode, as shown in Figure 23, and verify that the Hand Wheel Position illuminates green for both Elevation and Azimuth Input Controls.

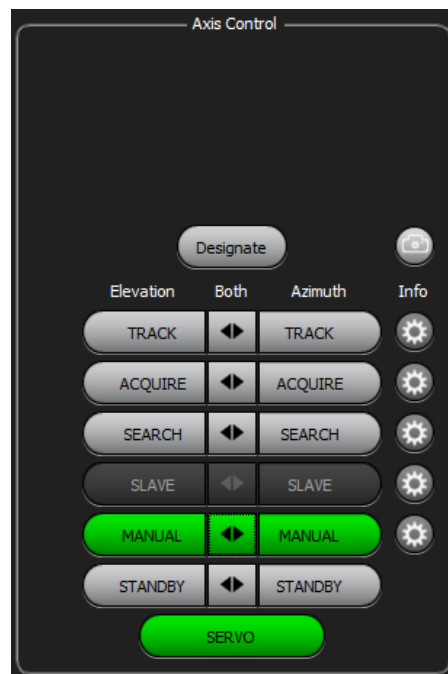


Figure 23: Axis Control Window, Manual Mode Buttons

3. Operate the ACU hand wheels, and verify the pedestal responds both Elevation and Azimuth commands. Alternatively, control the Elevation and Azimuth with the up/down and left/right arrows on the attached keyboard.

4.2.3 Camera Control

1. Click on the Camera button in the top right of the Axis Control pane. The camera control panel displays, as shown in Figure 24.



Figure 24: Camera Control Window

2. Select live video to view live video feed.
3. Control the camera's Zooming, Focus, and Exposer through this window.

4.3 System Tracking

This section describes the basic Azimuth and Elevation searching and tracking functions of the ACU and the attached QTrack System. Azimuth and elevation tracking cannot be independently enabled; only the “both” button is active.

Note: During these tests, the receiver and boresight transmitter are tuned for SOQPSK at 1 Mb/s, 2201 MHz (S band). Prior to performing any of the following tracking tests, turn off the boresight power, and zero the receiver AGC. Ensure that the ACU has the appropriate band (L, S, or C) selected for the frequency used. Select the band by clicking on the RX Band button until S band is selected.

4.3.1 Basic Tracking

Basic tracking operation uses the following steps.

1. From the ACU, slew the antenna to the boresight.
2. Turn on the Boresight RF.
3. Select Track. The antenna will slew to the tracking position.
4. Select Manual. Change the Azimuth and/or the Elevation by about 10°. Note that when track is engaged, the antenna will reacquire the boresight.

4.3.2 Target Dynamics

Target Dynamics controls the tracking speed of the antenna. It may be desirable to slow the tracking when noise or interference becomes evident.

1. On the Axis Control window, click on the gear button located to the right of the track button, and open the Track Settings window, as shown in Figure 25.

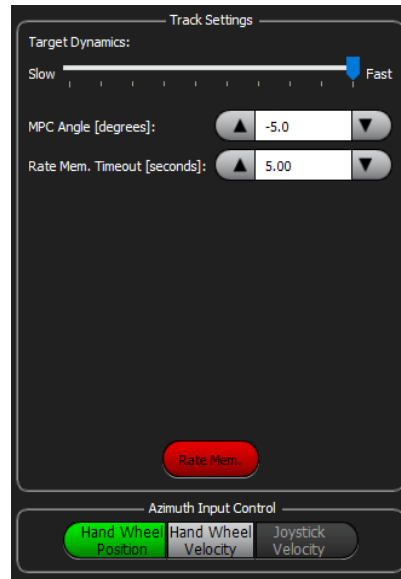


Figure 25: Track Settings Window

2. Move the antenna off by about 10° . Note the speed in which it tracks.
3. In the Track Setting window, set the Target Dynamics slider to about mid-scale. Note the slower tracking speed.
4. Set the Target Dynamics slider to about 1/10th scale. Note the slow tracking speed.
5. Place the slider back to 100%.

Quasonix recommends that the Target Dynamics slider be set high enough to follow the target, but not higher. Excessively fast tracking does not improve tracking and may degrade overall system performance.

4.3.3 Multipath Clipping Angle (MPC)

The Multipath Clipping Angle sets the minimum angle that the antenna can point downwards. When a larger signal is observed from a multipath reflection (primarily from the ground), this setting restricts the antenna's lower positioning.

1. Track to the center. Select the gear next to the Track button.
2. In Track settings, set the MPC Angle [degrees] to about 2 degrees larger than the Elevation tracking angle.
3. From the AGC window, select the MPC button. It will turn yellow, as shown in Figure 26, and the minimum elevation will be limited at the MPC Angle.

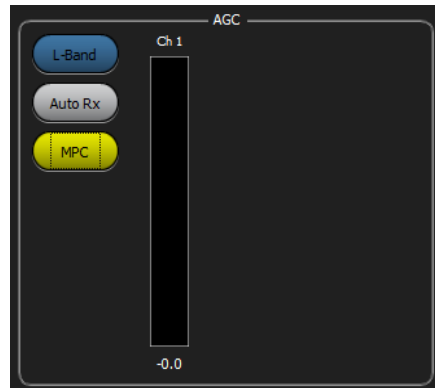


Figure 26: AGC Window

4. De-select MPC by clicking on the MPC button again. Note that the Elevation angle returns to the original position.

4.3.4 Acquire

Acquire allows the ACU to stop tracking when the received level gets below the Threshold minus the Hysteresis and to re-acquire when the signal level rises above the Threshold.

1. Click on the gear next to the Acquire button to display the Acquire Settings window.

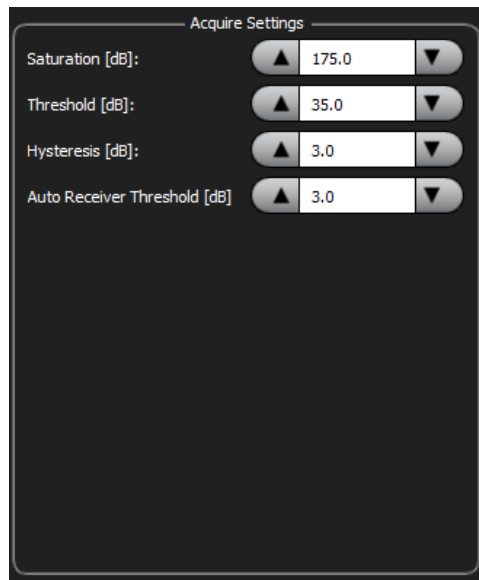


Figure 27: Acquire Settings Window

2. Note that the Saturation [dB] and Auto Receiver Threshold [dB] setting do nothing for the QTrack system. They should be set to 99 so they do not activate.
3. Set the Threshold to 10 dB and the Hysteresis to 3 dB. These will allow the tracking to continue until the received level reaches 10-3 or 7 dB above the RF Zeroed level.

4. Adjust the boresight transmitter power level for a received level of approximately 15 dB above AGC Zero. Select Acquire. Verify that the signal is tracking, the Acquire button is yellow, and the Track button is green.
5. Decrease the boresights power in 1 dB steps, and verify the Tracking continues until a receive level of less than 7 dB above zero is reached. The Track button turns grey and the position freezes at the last position.
6. Increase the signal level until the Track illuminates green indicating it is again tracking. Note that the receive level is greater than 10 dB above Zero.
7. De-select Acquire, and return to Manual.

4.3.5 Search

Search allows the ACU to go into search mode when the signal is lost. It uses the threshold and hysteresis values set in the Acquire Settings to activate/deactivate the search pattern.

1. Select the gear next to the Search button to display the Search Settings window.



Figure 28: Search Settings Window

2. From the drop down menu, either Box Spiral or Raster search can be selected. Select Box Spiral Search.
3. Enter a 10° range for both Elevation and Azimuth and a 5°/sec Rate for each.
4. Set the boresight power for about 40 dB above AGC Zero level.
5. On the ACU, select Acquire, then search. Note the system is tracking.
6. Remove the boresight power, and the system will enter the defined search pattern.
7. Turn the boresight power on, and the QTrack will lock on.
8. De-select Acquire, and return to Manual.

4.3.6 Designate Mode

While in manual mode, the user can select the DESIGNATE button (at the top of the Axis Control window, as shown in Figure 29) to enter an Azimuth or Elevation axis commanded angle by clicking on or touching the

Up/Down arrows, located just above the program designates list, as shown in Figure 30. The software keypad displays enabling the operator to enter the desired angle, which displays in the Elevation or Azimuth entry field. Selecting the GO button sends the axis to the desired (entered) position. There are two modes: Immediate Designate mode and Program Designate mode, as described in the next sections.



Figure 29: Axis Control Window, Designate Button

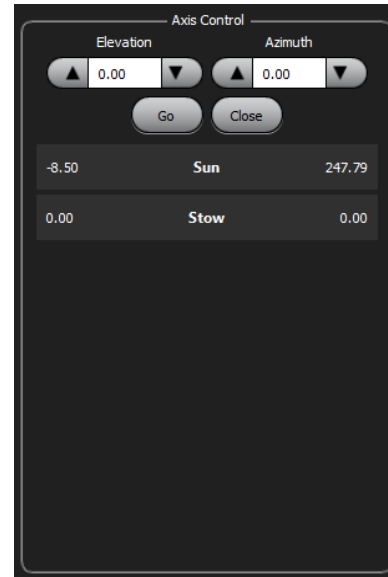


Figure 30: Axis Control Window

4.3.6.1 Immediate Designate Mode

1. Select Manual mode.
2. Select the Designate button in the manual mode area to reveal the Designates Selections.
3. In the AZ and EL command angle spin boxes, enter a legitimate coordinate set using the keypad in the dialog box.
4. Click on the GO button, and verify that the antenna slews to the designated position ($\pm 0.2^\circ$).
5. Select the CLOSE button.
6. Verify that the ACU reverts to the manual mode of operation upon completion of the antenna travel, and the Manual mode buttons are returned.

4.3.6.2 Program Designate Mode

1. Select Manual.
2. Select the Designate Button to reveal the Designates Selections.
3. Select a pre-Programmed coordinate set.
4. Click on the GO button.
5. Verify that the antenna slews to the selected position ($\pm 0.2^\circ$).
6. Select the CLOSE button.

7. Verify that the ACU reverts to the Manual mode of operation upon completion of the antenna travel.

4.3.7 True North Calibration

Verify that a True North Calibration capability is available to the operator.

Note: Prior to Setting the North Pointing Position, the Antenna's Earth Location, correct time, and altitude should be entered into the System Location area of the ACU.

1. Select the Settings – Calibration - True North button, as shown in Figure 31, to display the True North window, shown in Figure 32.

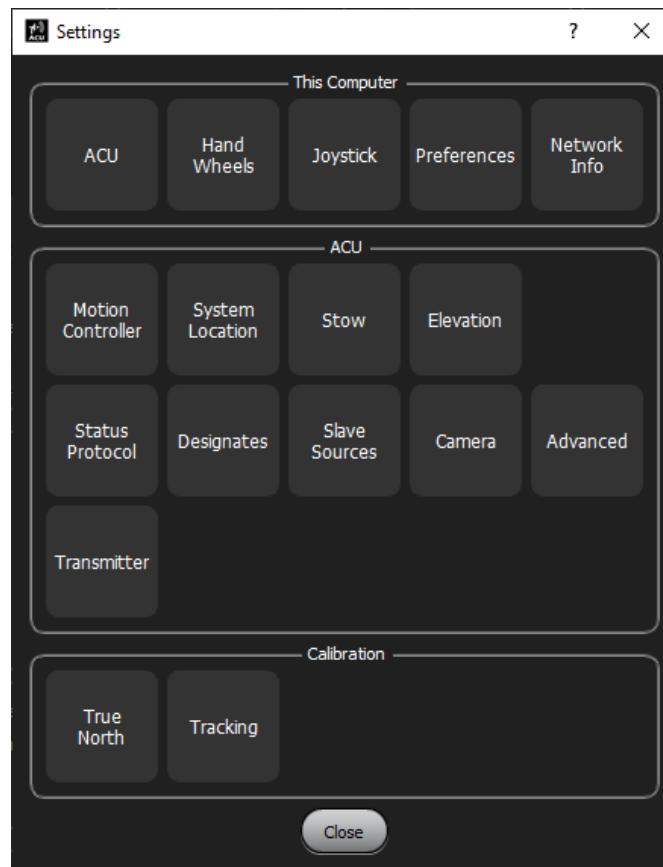


Figure 31: Settings Window

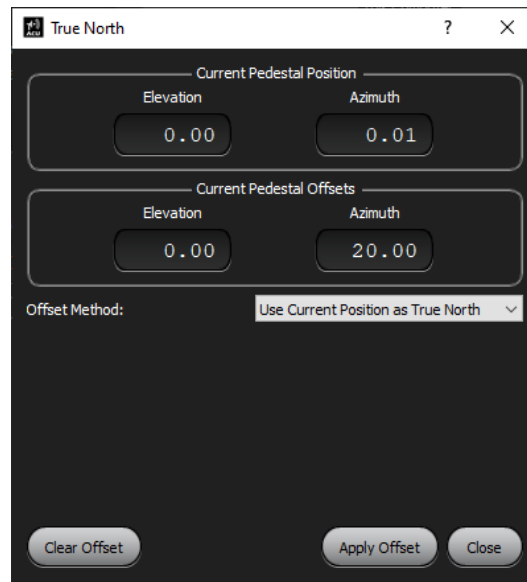


Figure 32: True North Window

2. Verify that values can be manually programmed for the Azimuth angle parameter for the operational modes present (manual and sun).
3. Verify that a Clear All Offsets button is present, and that when selected, all True North calibration data is discarded.
4. Aim the antenna at the sun.
5. Select Use Current Pedestal Position as True North in the north drop down menu.
6. Select Apply Offset. Ensure the new Azimuth North pointing angle is present.
7. Slew the antenna away from the sun, then select the Designate button in the Manual mode area.
8. Choose Sun from the menu, select the GO button, and the antenna should slew back to the sun position.

4.4 Slaving and Burn File Operation

The Customer provides pointing data via Ethernet. The ICD can be supplied, if required.

4.5 Basic GUI Tool Set Functions

The following Basic GUI (Tool) functions are described in this section. Select the Tools icon from the Tool bar, as shown in Figure 33. Three tool functions can be accessed here: Logging, Hand Wheel Test, and Joystick Test.

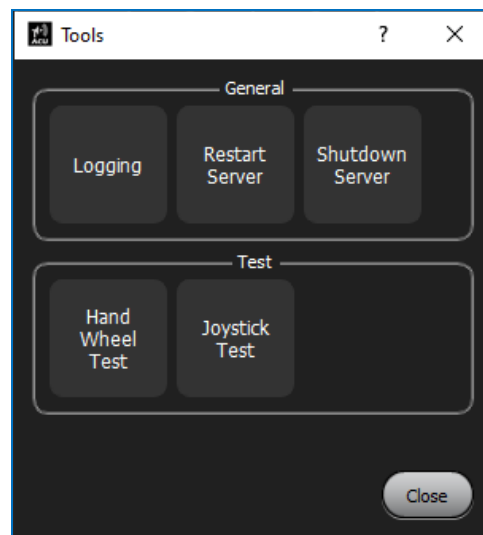


Figure 33: Tools Window

4.5.1 Logging

1. Select the Logging button to access the Logging window. The Options tab is shown in Figure 34.

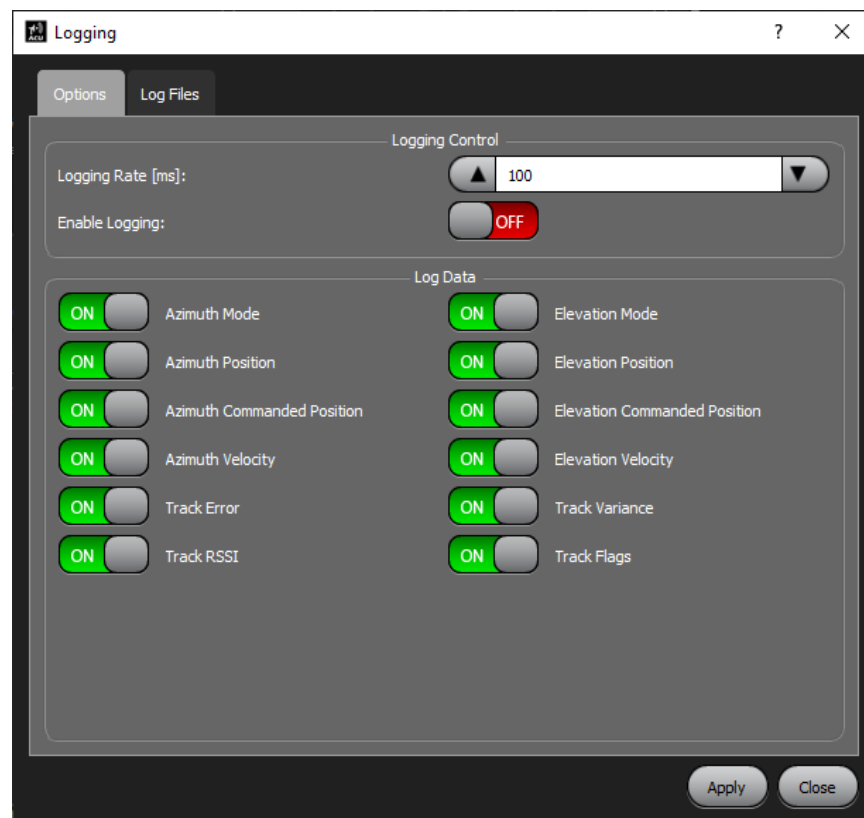


Figure 34: Logging Window

2. Turn on all available logging parameters for recording.
3. Close the Logging Window and the Settings Menu.
4. Select the Logger Icon from the Tool bar. It should turn green when selected (the Logger function is recording).
5. Turn the logging off by reselecting the Logger icon in the lower tool bar.
6. Return to the Logging window, Log Files tab, to ensure a log file has been created.
7. Click Download to save the file to desired location.

4.5.2 Hand Wheel Test (Optional)

1. Enable optional hand wheels by selecting the Settings button from the Tool bar.



Figure 35: Elevation and Azimuth Input Control Windows

2. Select the Hand Wheels button, then check the enable hand wheels box.
3. Click on Save and close the Settings window.
4. Select the Tools Icon from the Tool bar.
5. Select the Hand Wheel Test.

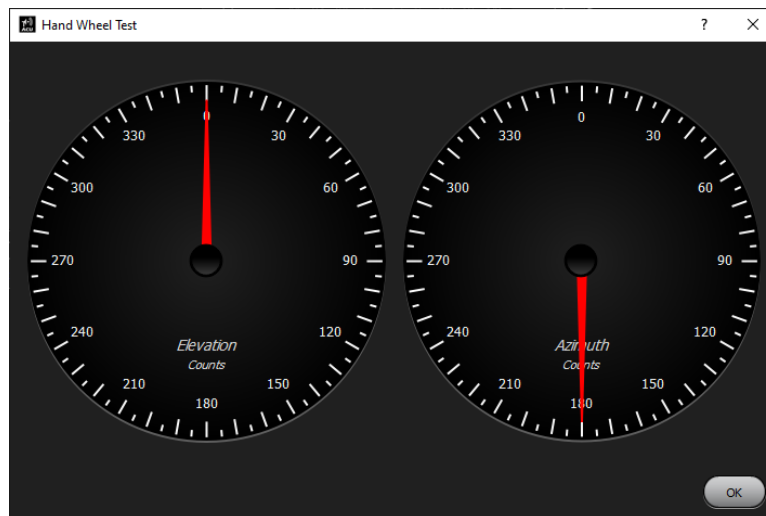


Figure 36: Hand Wheel Test Window

6. Rotate the Azimuth hand wheel. Ensure the Azimuth on-screen pointer rotates with the ACU hand wheel input.

7. Rotate the Elevation hand wheel. Ensure the on-screen Elevation pointer rotates with the EL hand wheel input.

4.5.3 Joystick Test (Optional)

1. Enable the optional Joystick by selecting the Settings button from the tool bar.
2. Select the Joystick button and check the Enable box.
3. Select desired joystick from drop down menu.
4. Click on Save and close the Settings window.
5. Select the Tools icon from the tool bar.
6. Select the Joystick button to launch the Joystick test window.

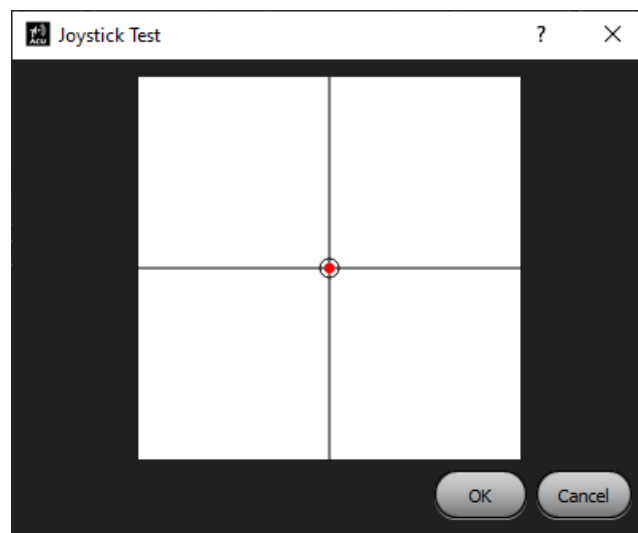


Figure 37: Joystick Test Window

7. Move the attached joystick in the Azimuth direction (side to side) and be sure the Joystick test follows the motion on the window.
8. Move the joystick in the Elevation direction (up and down), and ensure the test follows on the window.

5 Maintenance Instructions

The QTrack™ Antenna System requires no regular maintenance, but the battery in the 2U Rack Mount Controller may need to be replaced every 2-3 years.

5.1 Replace the Battery

1. Remove the top cover by unscrewing the eight (8) Philips head screws.
2. Locate the motherboard in the front right of the unit.
3. Replace the 2032 coin cell battery located next to the RAM, as shown in Figure 38.

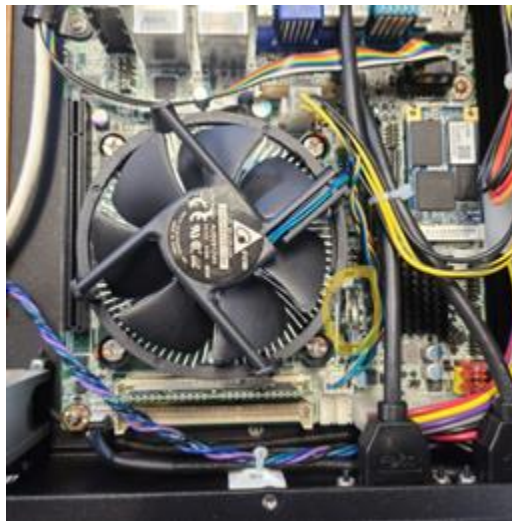


Figure 38: Location of Battery on Motherboard of Older Units

In newer units, the battery may be located in a slightly different location on the board, as shown in Figure 39. Newer units require a 2032 coin cell battery with a Molex connector.



Figure 39: Location of Battery on Newer Units

4. After installing the new battery, replace the cover and all eight Philips head screws.
5. Apply power to the 2U controller.
6. Ensure the computer system clock is accurate.

6 Product Warranty

The QTrack™ Antenna System carries a standard parts and labor warranty of one (1) year from the date of delivery.

7 Technical Support and RMA Requests

In the event of a product issue, customers should contact Quasonix via phone (1-513-942-1287) or e-mail (support@quasonix.com) to seek technical support. If the Quasonix representative determines that the product issue must be addressed at Quasonix, a returned materials authorization (RMA) number will be provided for return shipment.

Authorized return shipments must be addressed in the following manner:

**Quasonix, Inc.
ATTN: Repair, RMA #
6025 Schumacher Park Drive
West Chester, OH 45069**

To ensure that your shipment is processed most efficiently, please include the following information with your product return:

- Ship To – Company name, address, zip code, and internal mail-drop, if applicable
- Attention/Contact person – Name, Title, Department, Phone number, email address
- Purchase Order Number – If applicable
- RMA Number – provided by the Quasonix representative

Please note that Quasonix reserves the right to refuse shipments that arrive without RMA numbers.

8 Appendix A – Transmitter Control

A QTrack™ system with the TX(xx) option has an embedded uplink transmitter. These systems operate in both L and S bands, and must transmit and receive in separate bands.

The QTrack™ ACU GUI contains a Tx Control window, as shown in Figure 40, to facilitate transmitter operation.



Figure 40: QTrack ACU Graphical User Interface

The Tx Control window displays frequency and modulation (band) settings. Two LED indicators provide connectivity and RF status. The two buttons enable/disable transmitter and RF Output.

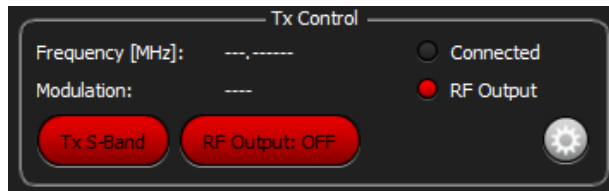


Figure 41: Tx Control Window

To set the transmit frequency and other parameters, select the settings (gear) button in the lower right corner for the Tx Control window. The Transmitter window, Tx Settings tab is shown in Figure 42.

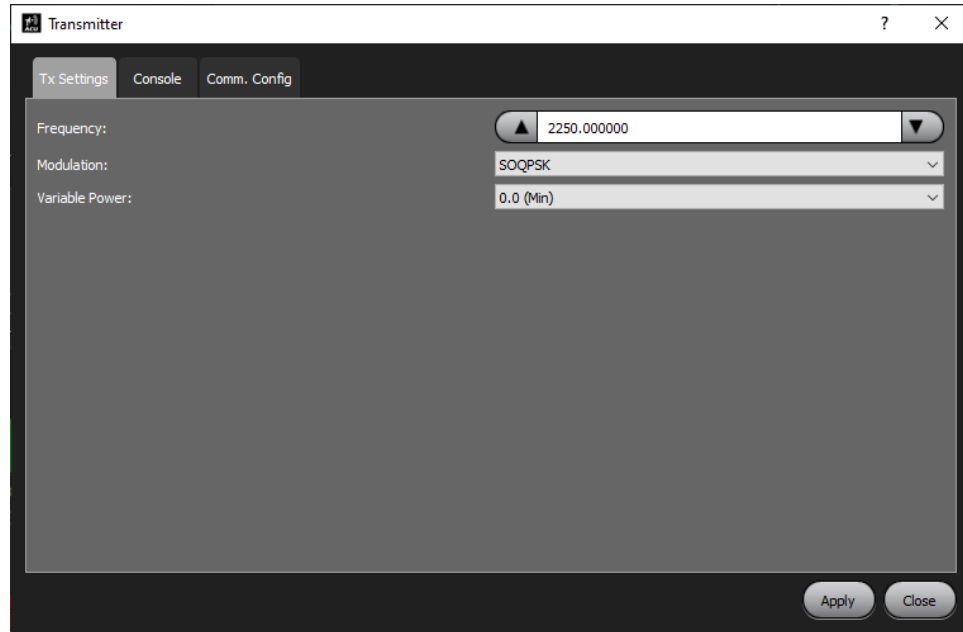


Figure 42: Transmitter Window, Tx Settings Tab

There are three tabs available on the Transmitter window: Tx Settings, Console, and Comm. Config.

- TX Settings – Contains typical transmitters settings for Frequency, Modulation, and Variable Power. Ensure the selected transmit frequency is in a different band than the desired receive band. The ACU will not enable RF if this set the same as the receive band.
- Console tab – Provides the serial interface to the transmitter
- Comm. Config – Contains IP address information for the transmitter serial interface. **Do not modify these parameters as they are critical for system operation.**

9 Appendix B – Acronym List

| Acronym | Description |
|---------|--|
| ACU | Antenna Control Unit |
| AGC | Automatic Gain Control |
| AM | Amplitude Modulation |
| AQPSK | Variant of Quadrature Phase Shift Keying |
| ARTM | Advanced Range Telemetry |
| AUQPSK | Variant of Quadrature Phase Shift Keying |
| AZ | Azimuth |
| BEP | Bit Error Probability |
| BER | Bit Error Rate |
| BNC | Bayonet Neill-Concelman Connector (RF Connector) |
| BPSK | Binary Phase Shift Keying |
| CCW | Counterclockwise |
| CD | Compact Disk |
| CPM | Continuous Phase Modulation |
| CW | Clockwise |
| CWM | Cable Wrap Meter |
| DACU | Digital Antenna Control Unit |
| DB-9 | D-subminiature 9 pin Serial Connector |
| DC | Diversity Combiner |
| DHCP | Dynamic Host Configuration Protocol |
| DPM | Digital Phase Modulation |
| DQE | Data Quality Encapsulation |
| DQM | Data Quality Metric |
| EL | Elevation |
| FPGA | Field Programmable Gate Array |
| G/T | Gain per Temperature |
| GPS | Global Positioning System |
| GUI | Graphical User Interface |

| Acronym | Description |
|---------|--|
| IF | Intermediate Frequency |
| IP | Internet Protocol |
| kbps | Kilobits per second |
| KHz | Kilohertz |
| LCD | Liquid Crystal Display |
| LDPC | Low Density Parity Check |
| LED | Light-emitting Diode |
| LHCP | Left Hand Circularly Polarized |
| LNA | Low Noise Amplifier |
| mbps | Megabits per second |
| MCX | Snap on subminiature connector |
| MHCPM | multi-h Continuous Phase Modulation |
| MHz | Megahertz |
| MPC | Multipath Clipping Control |
| N | (connector type) Threaded RF connector |
| OQPSK | Offset Quadrature Phase Shift Keying |
| PCB | Printed Circuit Board |
| PCMFM | Pulse Code Modulation/Frequency Modulation |
| PM | Phase Modulation |
| PSK | Phase Shift Keying |
| QPSK | Offset Quadrature Phase Shift Keying |
| RDMS | Receiver DeModulator Synchronizer |
| RF | Radio Frequency |
| RHCP | Right Hand Circularly Polarized |
| RJ-45 | Ethernet Connection Jack |
| RM | Rack-Mount |
| RS-232 | Recommended Standard 232 (Serial Communications) |
| SAW | Sawtooth Wave |
| SDI | System Degradation Indication |
| SNR | Signal to Noise Ratio |

| Acronym | Description |
|-----------|--|
| SOQPSK | Shaped Offset Quadrature Phase Shift Keying |
| SOQPSK-TG | Shaped Offset Quadrature Phase Shift Keying –Telemetry Group |
| STC | Space-Time Coding |
| TDC | Top Dead Center |
| TRL | Tracking Loop |
| TTL | Transistor Logic |
| UDP | User Datagram Protocol |
| UQPSK | Unbalanced Quadrature Phase Shift Keying |
| USB | Universal Serial Bus |
| VAC | Voltage Alternating Current |
| WAN | Wide Area Network |