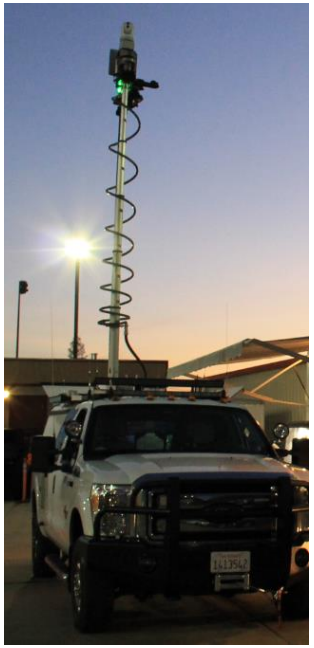
QPAR USA

Products overview

Auto Point Antenna Alignment Solutions

Typical Applications

- Emergency Management
  - Rapidly install microwave PtP, PtMP, and satellite communications
- Commercial COW or COLT Deployment
  - Rapid deployment of PtP backhaul transport layer
- Ship to Shore or Ship to Ship
  - Offshore maritime applications
  - Navy, Coast Guard, Commercial Ferry Routes, offshore oil production
- Border Security
  - Wideband communications to backhaul surveillance
- Oil & Gas
  - Offshore mobile exploration, drilling, and production communications
- News Gathering
  - Communications between live vehicles and news production



Benefits of LinkAlign

- Reduced Deployment Time
  - Self Aligning System
    - Press go and LinkAlign points and peaks
- Save Money
  - Immediate ROI
    - Cost savings normally seen during 1st deployment
    - Traditional methods have higher deployment costs
      - Removes recurring cost of tower crews and bucket trucks
- Increase Quality of Service
  - Final auto peak process results in higher QoS
    - Re-peak often with no tower climb to improve link performance
- Safety
  - All alignment operations are done from the ground
  - Human safety concerns removed
    - High wind, ice, rain, and snow alignments are done remotely

Key Features

- Power over Ethernet Operation
  - All products are powered and controlled over a single Ethernet cable
- Web Based User Interface
  - No special software to load or maintain. Use any computer, tablet, or smart phone with a web browser to access LinkAlign products
- Embedded GPS and Compass
  - All products self locate with GPS and self align with onboard compass
- Onboard Stored Locations Database
  - All products store target locations in an onboard database
  - All products allow upload from sight planning tools like Pathloss to populate on board database
- Closed Loop Radio Signal Strength Peaking
  - All products add closed loop peaking and tracking options

Adapt to any antenna or radio

Q-PAR Antennas offers ODU and antenna adapter bracket designs for most commercially available solutions making radio and antenna integration easy.

LinkAlign Positioner

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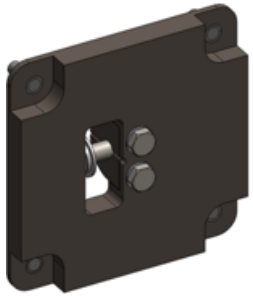

Adapter Bracket

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Customer Radio

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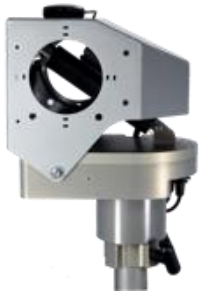
Easy radio integration

Current Products for Line of Sight

Automated Antenna Alignment Positioner Models

LinkAlign-360RPT



LinkAlign-360EER

LinkAlign-360FER

LinkAlign-360FERP

Pol Rotator

LinkAlign-360AZR

LinkAlign-60LPT

LinkAlign-360MPT

LinkAlign-60EBP

LinkAlign-ALTE

Product Comparison Table

PRODUCT COMPARISON TABLE

	Azimuth Capibility			Elevation Capibility			Feedback	Backlash	Typ Antenna	Max Payload	Positioner
Az/El Models	Travel	Drive Rate	Torque	Travel	Drive Rate	Torque	Resolution	Az/El	Size	Weight	Weight
QLA-60EBP	60° (+/-30°)	0.4°/sec	50 ft-lbs	60° (+/-30°)	0.4°/sec	50 ft-lbs	.01°	<0.1°	1 - 2 ft	100 lbs	40 lbs
QLA-60RPT	60° (+/-30°)	3°/sec	20 ft-lbs	15° (+/-7.5°)	1.5°/sec	40 ft-lbs	.1°	<2° / <1°	1- 2 ft	20 lbs	16.0 lbs
QLA-360AZR	440° (+/-220°)	4.5°/sec	20 ft-lbs	N/A	N/A	N/A	.1°	<0.25°	1 -3 ft	60 lbs	13.5 lbs
QLA-360EER	440° (+/-220°)	4.5°/sec	20 ft-lbs	40° (+/-20°)	4°/sec	20 ft-lbs	.1°	<0.25° / <2°	1 - 2 ft	45 lbs	17.6 lbs
QLA-360FER	440° (+/-220°)	4.5°/sec	20 ft-lbs	140° (+120°/-20°)	4.5°/sec	20 ft-lbs	.1°	<0.25°	1 - 2 ft	45 lbs	21.0 lbs
QLA-360MPT	440° (+/-220°)	2.6°/sec	8 ft-lbs	180° (+/-90°)	2.6°/sec	8 ft-lbs	.1°	<1°	1 ft	15 lbs	14.0 lbs
QLA-360RPT	440° (+/-220°)	4.5°/sec	20 ft-lbs	20° (+/-10°)	2°/sec	40 ft-lbs	.1°	<0.25° / <1°	1 - 2 ft	45 lbs	17.4 lbs
QLA-360AZR-HD	440° (+/-220°)	2.2°/sec	60 ft-lbs	N/A	N/A	N/A	.1°	<0.15°	2 - 4 ft	90 lbs	15.5 lbs
QLA-360EER-HD	440° (+/-220°)	2.2°/sec	60 ft-lbs	40° (+/-20°)	4°/sec	50 ft-lbs	.1°	<0.15° / <2°	2 - 3 ft	90 lbs	21.2 lbs
QLA-360FER-HD	440° (+/-220°)	2.2°/sec	60 ft-lbs	140° (+120°/-20°)	2.2°/sec	60 ft-lbs	.1°	<0.15°	2 - 3 ft	70 lbs	23.5 lbs
QLA-360RPT-HD	440° (+/-220°)	2.2°/sec	60 ft-lbs	20° (+/-10°)	2°/sec	100 ft-lbs	.1°	<0.15° / <1°	2 - 3 ft	90 lbs	21.0 lbs
QLA-15HD6	15° (+/-7.5°)	0.25°/sec	500 ft-lbs	15° (+/-7.5°)	.25°/sec	500 ft-lbs	.1°	<0.25°	4 - 8 ft	250 lbs	130 lbs

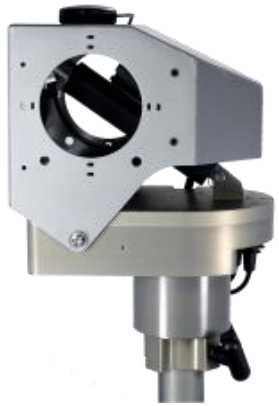
		Polarization Capability			Feedback	Backlash	Typ Antenna	Max Payload	Positioner
Pol Models	Azimuth and Elevation Capibility	Travel	Drive Rate	Torque	Resolution	Polarization	Size	Weight	Weight
QLA-360FERP-HD	Same as QLA-360FER-HD Model	440° (+/-220°)	6°/sec	5 ft-lbs	.1°	<2°	1 - 3 ft	65 lbs	28.0 lbs
QLA-360RPTP	Same as QLA-360RPT Model	440° (+/-220°)	6°/sec	5 ft-lbs	.1°	<2°	1 - 2 ft	40 lbs	23.6 lbs
QLA-360RPTP-HD	Same as QLA-360RPT-HD Model	440° (+/-220°)	6°/sec	5 ft-lbs	.1°	<2°	2 - 3 ft	85 lbs	26.0 lbs
QLA-360POL	Not applicable - Polarization only	440° (+/-220°)	4.5°/sec	20 ft-lbs	.1°	<0.25°	1 - 3 ft	80* lbs	7.7 lbs

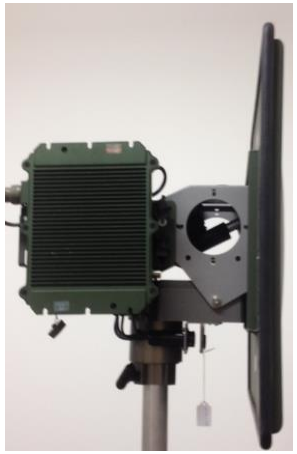
*QLA-360POL can be coupled with all models except QLA-15HD6. Max payload 80 lbs MAX or parent model payload less QLA-360POL weight

N500126 Rev B

LinkAlign-360RPT

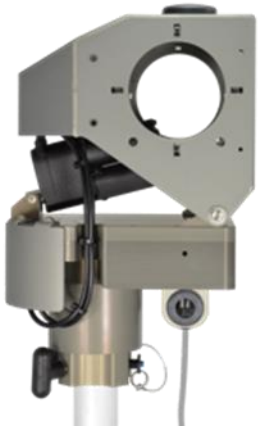
- Microwave Pan and Tilt Positioners
  - LinkAlign-360RPT
    - 440 degrees of azimuth motion (±220°)
    - 20 degrees of elevation motion (±10°)
- Product Highlights
  - Embedded Power over Ethernet (PoE) operation
  - Web based user interface
    - Automated pointing, tracking & peaking functions
  - Built in GPS and compass
    - Automatic link alignment and peaking
  - Tool-less installation
  - Adapts to any radio and antenna solution
  - Heavy duty model available





LinkAlign-360EER

- Microwave Pan and Tilt Positioners
  - LinkAlign-360EER
    - 440 degrees of azimuth motion (±220°)
    - 20 degrees of elevation motion (±20°)
- Product Highlights
  - Embedded Power over Ethernet (PoE) operation
  - Web based user interface
    - Automated pointing, tracking & peaking functions
  - Built in GPS and compass
    - Automatic link alignment
  - Tool-less installation
  - Adapts to any radio and antenna solution
  - Heavy duty model available



LinkAlign-360FER

- Microwave LOS or Satellite Applications
  - LinkAlign-360FER
    - 440 degrees of azimuth motion (±220°)
    - 170 degrees of elevation motion (+120° to -20°)
- Product Highlights
  - Embedded Power over Ethernet (PoE) operation
  - Web based user interface
    - Automated pointing, tracking & peaking functions
  - Built in GPS and compass
    - Automatic link alignment
  - Tool-less installation
  - Adapts to any radio and antenna solution
  - Heavy duty model available

LinkAlign-360FERP

- Microwave LOS or Satellite Applications
  - LinkAlign-360FERP
    - 440 degrees of azimuth motion (±220°)
    - 170 degrees of elevation motion (+120° to -20°)
    - 440 degrees of polarization motion (±220°)
- Product Highlights
  - Integrated polarization axis
  - Embedded Power over Ethernet (PoE) operation
  - Web based user interface
    - Automated pointing, tracking & peaking functions
  - Built in GPS and compass
    - Automatic link alignment
  - Tool-less installation
  - Adapts to any radio and antenna solution
  - Heavy duty model available

LinkAlign-360AZR

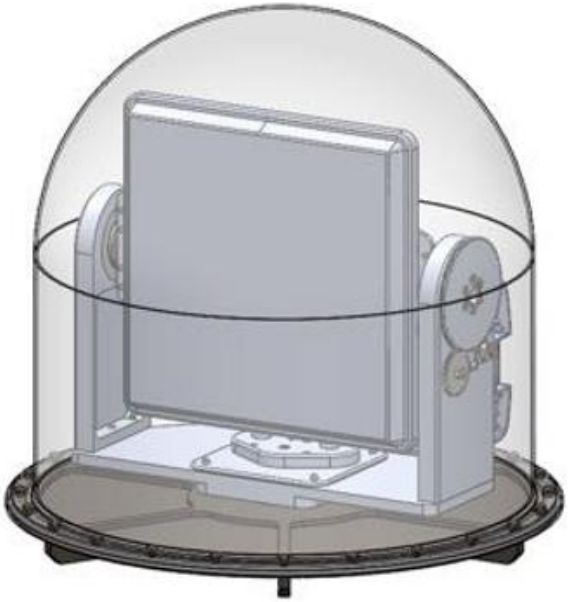
- Microwave Pan and Tilt Positioners
  - LinkAlign-360AZR
    - 440 degrees of azimuth motion (±220°)
- Product Highlights
  - Works with NATO Band III, Band III Plus, and Band IV
  - Embedded Power over Ethernet (PoE) operation
  - Web based user interface
    - Automated pointing, tracking & peaking functions
  - Built in GPS and compass
    - Automatic link alignment
  - Tool-less installation
  - Adapts to any radio and antenna solution
  - Heavy duty model available

LinkAlign-60LPT

- Microwave Pan and Tilt Positioner
  - LinkAlign-60LPT
    - 60 degrees azimuth travel (±30°)
    - 15 degrees elevation travel (±7.5°)
- Product Highlights
  - Embedded Power over Ethernet (PoE) operation
  - Web based user interface
    - Automated pointing, tracking & peaking functions
  - Tool-less installation
  - Adapts to any radio and antenna solution

Ship to Shore

- Active Tracking for Point to Point/Multipoint LOS
- Ship to Shore and Ship to Ship Solutions
- Works with any Commercial Radio Solution
- Scalable System Architecture
  - Active tracking on one or both ends of link
  - Multi-shore locations with auto hand over
  - Dual deck solutions to handle blockage



Ship to Shore User Interface

- System will Resume Operation on Power up
- User Interface Provides Monitoring Tool
  - Provides ship and shore side map views
  - Allows operator to start/stop operation
  - Map provides location and heading
  - Operating status window provides:
    - Current mode of operation
    - AIS target ID
    - AIS receiver status
    - GPS status
    - Antenna positioner status
    - Radio RSSI status

QLA-360MPT-10

- Antenna Positioner Designed for LEO Tracking
- Small Light Weight Low Power Design
  - LinkAlign-360MPT-10
    - 400 degrees azimuth travel (±200°)
    - 180 degrees Elevation travel (±90°)

- Product Highlights
  - Embedded Power over Ethernet (PoE) operation
  - Web based user interface
    - Automated pointing, tracking & peaking functions
    - Program and list track
  - Suitable for antenna payloads up to 15 pounds

LinkAlign-360MPT-40

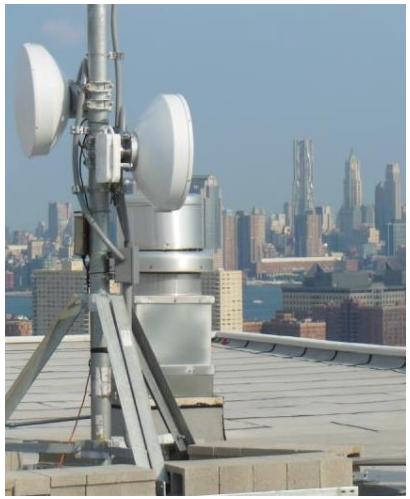
- Antenna positioner designed for LEO tracking
- Option for 3rd axis to remove keyhole
  - LinkAlign-360MPT
    - 360 degrees azimuth travel (±200°)
    - 180 degrees elevation travel (±90°)
    - Optional cross elevation to eliminate keyhole (±10°)
- Product Highlights
  - Embedded Power over Ethernet (PoE) operation
  - Web based user interface
    - Automated pointing, tracking & peaking functions
    - Program and list track
  - Suitable for up to 1.8 meter antenna

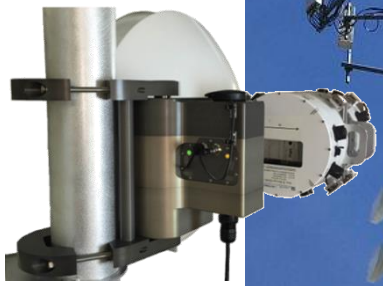
QLA-360MPT-50

- Antenna Positioner Designed for LEO Tracking
- Option for 3rd Axis to Remove Keyhole
  - LinkAlign-360MPT-50
    - 540 degrees azimuth travel (±270°)
    - 180 degrees elevation travel (±90°)
    - Optional cross elevation to eliminate keyhole (±10°)
- Product Highlights
  - Embedded controller and servo drives
  - Web based user interface
    - Automated pointing, tracking & peaking functions
    - Program and list track
  - Suitable for up to 2.4 meter antenna

LinkAlign-60EBP

- Positioner for 70/80GHz Radios and Antennas
  - Designed for antennas with wave guide mount ODU's
  - 1ft and 2ft antenna apertures
- Solves Industry-Known Issues with 70/80GHz Links
  - Difficult with alignment and peaking
  - Adjacent link interference
    - RF mapping tools help identify nearby adjacent links and provide data to make corrections
  - Environmental issues
    - NPRM will shift during the season due to seasonal temp changes resulting in multiple re-alignments during the year causing down time and expense to re-align
    - Monopole tower's bend during the day over temp causing mis-alignment and outages
- Q-PAR Antennas 70/80 GHz Solution
  - Works with any E band radio solution
  - Provides remote access and reduces setup time
  - Auto peaks link maintaining highest QoS
  - Maintains peak with triggered threshold re-peak tool





LinkAlign-15LPT

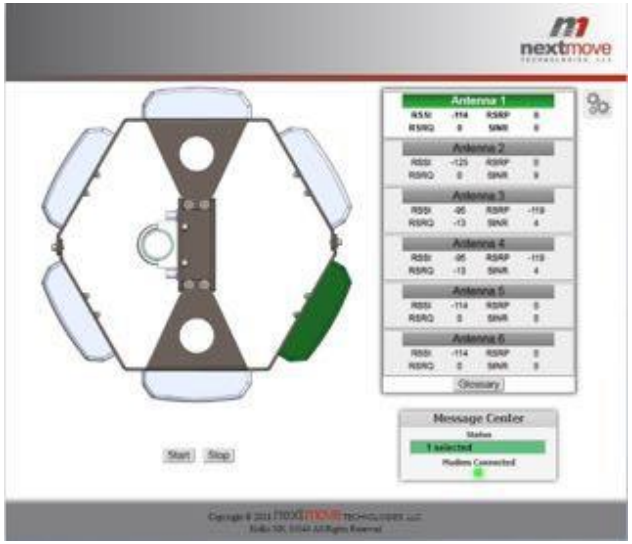
- Pan and Tilt for Large Aperture Antennas
  - Designed to fit 4 to 6 foot microwave antennas
  - Allows for remote control and maintenance of links
  - No tower crews for antenna alignment
  - Ideal for both fixed and mobile solutions

Installs on tower behind antenna

Solves alignment of microwave links on transportable systems

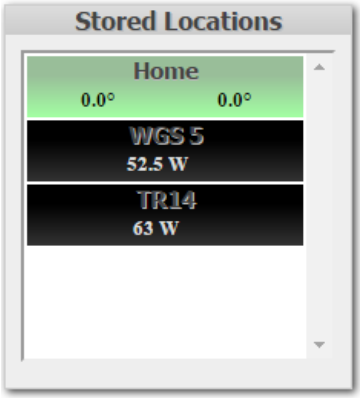
LinkAlign-ALTE

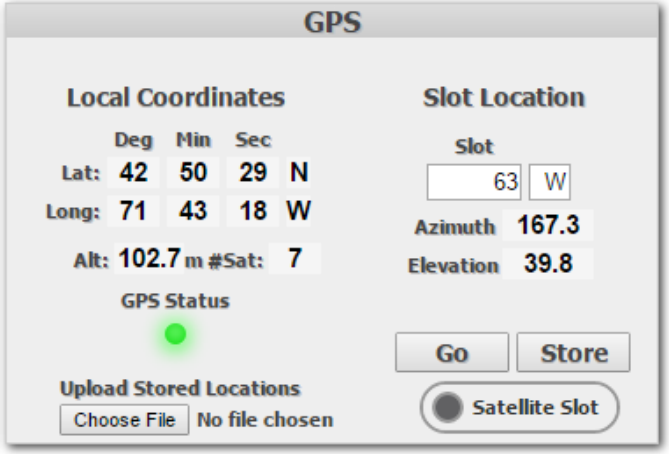
- Auto Range Extension for 3G/4G LTE Modems
- 698-2700 MHz
- Works with Cradle Point or Similar LTE Modems
- Searches 360 Degrees and IDs Best Connection
- Power over Ethernet Operation
- Web Based User Interface for Monitoring
- Operates on Power Up after Initial Configuration



Current Products for Satellite

- Auto Point and Track Solutions for VSAT
- Available with or without Antenna
- Onboard Stored Locations Satellite Database
- Embedded GPS and Compass
- iDirect modem interface
  - Closed loop tracking and peaking using modem SNR values
- All-in-one Solutions Available with Embedded iDirect Modem





LinkaSat 1 Meter Flyaway

- 1 Meter Auto Acquisition Satellite Terminal
- Ku Band (Ka and X band also available)
- Multiple Carbon Fiber Aperture sizes
  - 60cm
  - 80cm
  - 100cm
  - 120cm
- Auto Acquire using iDirect Modem
  - Ability to add additional modems on request
- Nextmove Positioner Provides Auto Acquire and Track Features
- Single button satellite acquisition and single button stow
- Packs away in two transit cases
  - Case 1: Antenna positioner with RF = 76lbs
  - Case 2: Tripod, antenna, and feed = 58lbs

Auto Acquire VSAT

- Pair with Any Commercial VSAT Antenna
- Nextmove can Provide Antenna Adapters for Most 1 and 1.2 meter Commercial VSAT
  - Prodelin
  - Skyware Global
  - Challenger/Patriot
- Fly Away with Folding Tripod or Roof Mount
- Onboard Stored Locations Satellite Database
- Embedded GPS and Compass
- iDirect Modem Interface
  - Closed loop tracking and peaking using modem SNR values

LinkAlign-360POL

- Polarization Rotator
  - Mounts to any LinkAlign positioner
    - 360 degrees of travel (±180°)
- Product Highlights
  - Allows third axis of rotation
  - Controlled through web based user interface
  - Tool-less installation
  - Adapts to any radio and antenna solution

GPS Heading Unit (GHU)

- Provides Greater Heading Accuracy
  - Nextmove has built in compass in most models
  - Built in magnetic compass provides ~ ±5°
  - GHU provides ~ ±0.5°
- Product Highlights
  - Plugs directly into LinkAlign products
  - Controlled through web based user interface
  - Tool-less installation
  - Provides greater GEO pointing accuracy

Tripods

- Light Weight Tripods for LinkAlign Products
- Various Sizes Based on Antenna Size and Weight
- Tool-less Setup and Breakdown
- Transportable Designs
- Transit Case Options Available

Quad Pod and Risers

- Quad Pod with Riser or Riser Only
- Designed to Work with Semi to Permanent Installations
- Product Highlights
  - Light weight aluminum construction
  - Multiple riser heights based on antenna size
  - Tool-less installation

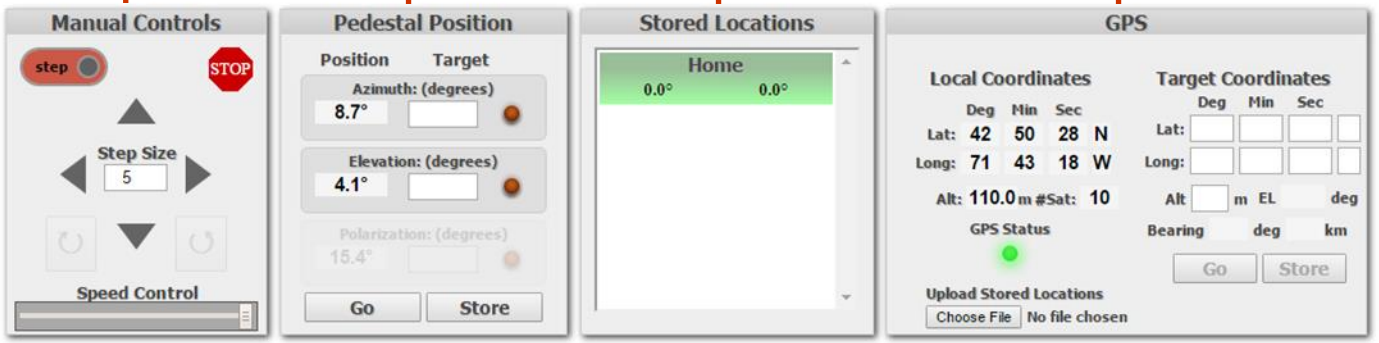
User Interface

Manual step and slew with settable step size and speed control

Az/El/ Pol position feedback and target entry option

Store Lat/Long or Az/El targets. Manually enter or import from Pathloss or CSV file

Displays positioner Lat, Long, and Altitude. Allows for entry of target Lat, Long, and Altitude to automatically position using onboard compass



Automatically seek and peak on target locations using RSL

Google maps displays current and target locations

Stored Locations and program track

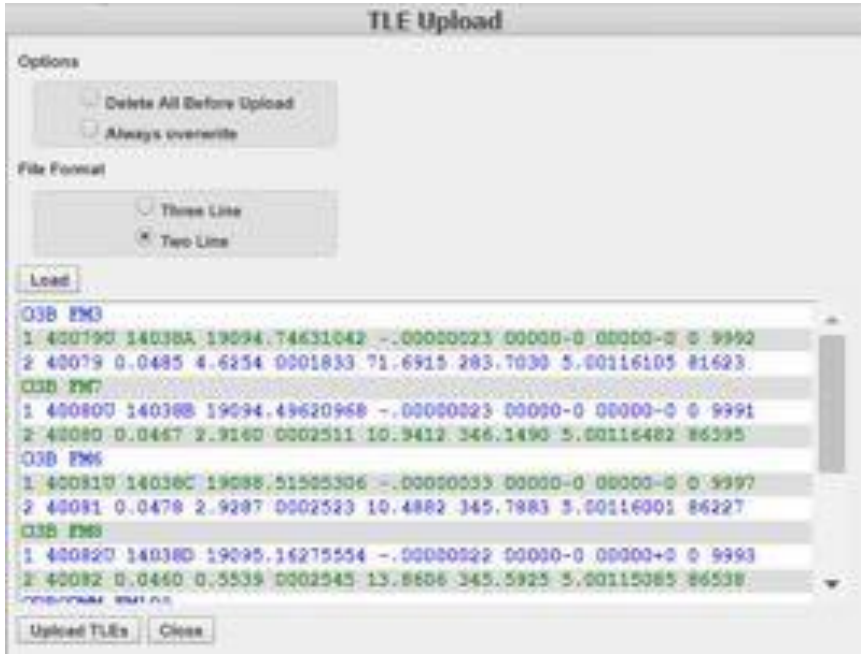
Store and recall Fixed Locations: Az/El Ped Position, Az/El GEO Position, Satellite Slot Location, Az/El GEO Location LAT/LONG/ALT

Download and upload stored locations

Store and recall NORAD Two Line Element Sets for Program Tracking Satellites

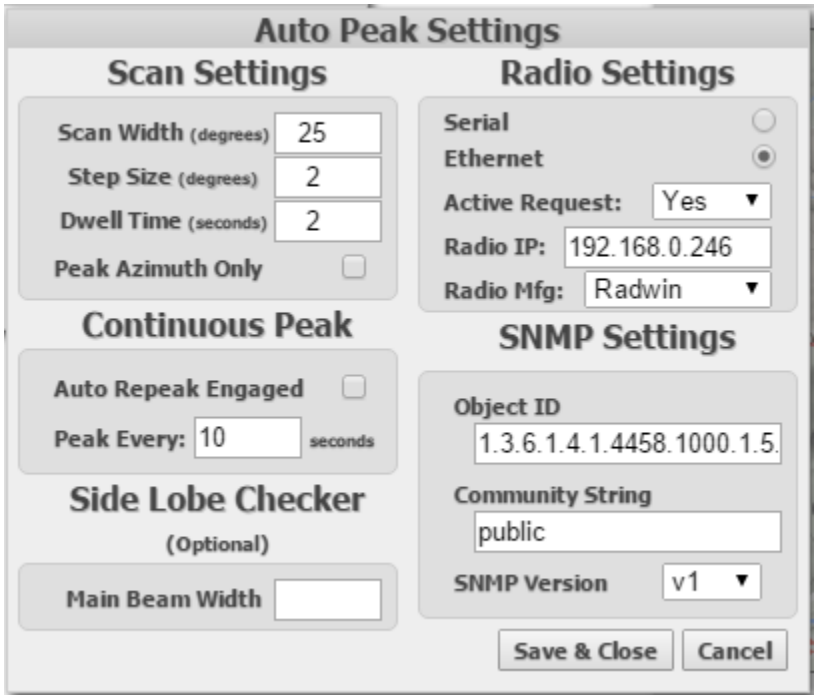
Upload recent TLE files for program track

Upload window for TLE Files allows tools to delete old files, select format, review, and upload.



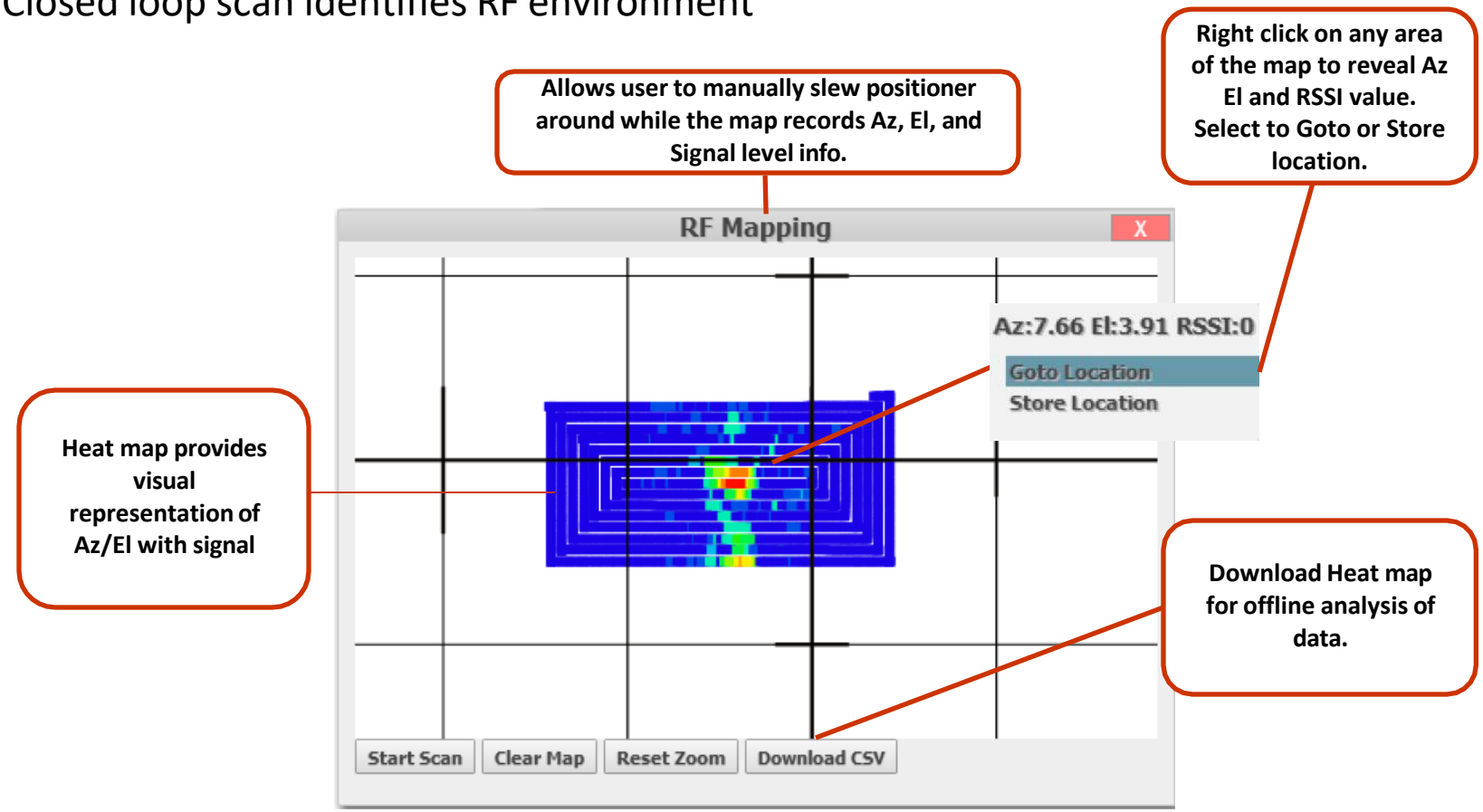
Closed Loop RF

- Auto Peak Function Allows Link Optimization
  - SNMP interface to radios and modems
  - Closed loop peaking using radio RSSI value
  - Add any radio with SNMP interface



RF Mapping

- RF Mapping Function
  - Cochlear scan function
  - Closed loop scan identifies RF environment



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