



AL-4100

Outdoor Antenna Control Unit (ACU)

Typical Applications



Aeronautical
Test
Telemetry



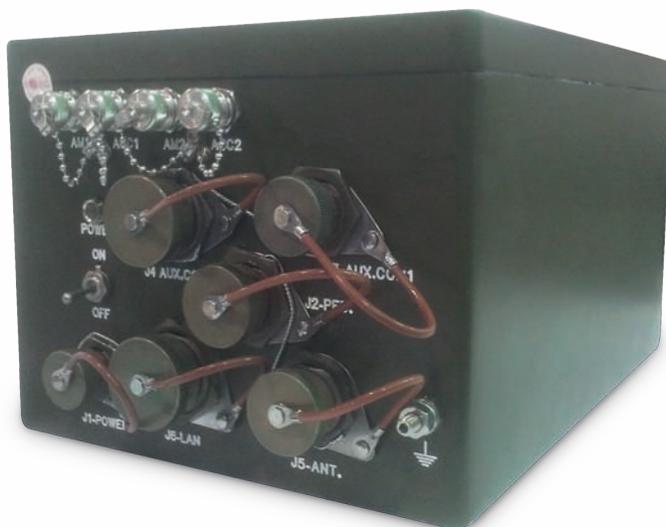
Missile
Launch
Tracking



UAV C&C



Weather
Radar



Features

- ✓ Highly modular hardware design provides the reliability and maintainability required in critical applications
- ✓ Fully electronic non-volatile memory eliminates need for mechanical disk drives for maximum reliability
- ✓ Digital algorithms for high-bandwidth closed-loop control
- ✓ Variety of tracking modes for GEO, MEO, LEO satellites and fast-moving targets
- ✓ Stabilized system control using direct interface with gyrocompass and motion reference sensors
- ✓ Direct GPS interface capability

The AL-4100 is ORBIT's advanced outdoor Antenna Control Unit (ACU), designed to facilitate monitoring and control of tracking systems in remote locations.

It incorporates built-in features for a wide range of telemetry and satellite tracking applications.

A wide variety of operation modes allows for automatic tracking, slave tracking and remote control operation via a host computer.

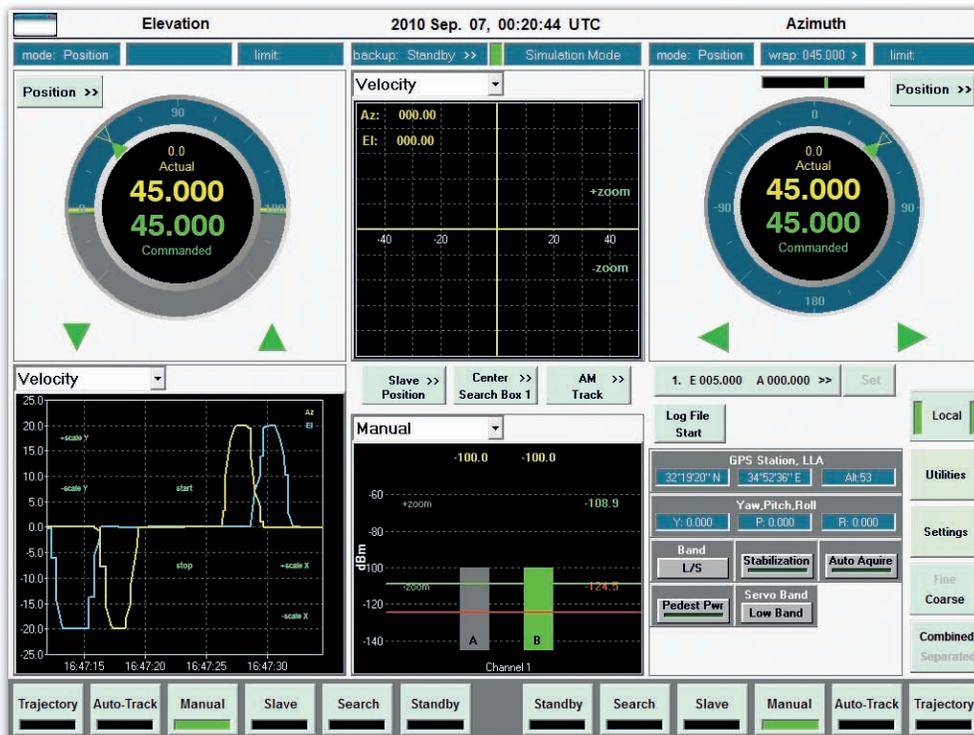
The AL-4100 is designed to withstand extreme environmental conditions in outdoor applications. It is a rigid and hermetically sealed case equipped with a powerful CPU engine capable of performing complex tracking algorithms.

The connection with the AL-4100 can be established through the host computer via either an Ethernet or RS-422 communication link. By connecting the host computer to the AL-4100, the operator can control and monitor the tracking system.

AL-4100 Mode of Operation

Remote Operation

Using ORBIT's microsoft Windows-based GUI console, the operator can remotely monitor and control the ACU. A standard PC connected to the ACU via LAN interface provides the operator with full control of the system using keyboard and mouse.



AL-4100 Outdoor Controller GUI Console

Search

The pointing angle of the antenna is scanned for target acquisition.

Raster scan: Synchronized movement of azimuth scans and elevation steps.

Zig-zag scan: Unsynchronized movement of azimuth and elevation scans.

Sinusoidal scan: Sinusoidal pattern movement of azimuth and elevation.

Target Acquisition and Auto-Track

The ACU supports Conical Scan, Monopulse or Electronic Scan feeds and provides auxiliary functions to overcome momentary auto-track disruptions.

Multiple receivers tracking: Manually or automatically selects the highest signal strength received from up to 8 tracking receivers' AGC levels.

Dual antenna tracking: Manually or automatically selects between two antennas for optimal target acquisition and tracking performance as well as

side-lobe locking prevention.

Backup: If the target is lost, the ACU reverts to programmable backup mode.

Position memory: Brings the antenna back to the point where the target was initially acquired.

Rate memory: Upon loss of track, continues movement of both azimuth and elevation with extrapolated velocities.

Launch acquisition: Enables better accuracy by preventing the elevation axis from moving downwards for a predefined amount of time after launch.

Zenith pass: Moves the antenna to the point where the target is estimated to exit the Zenith cone, re-acquires it and renews Auto-Track.

Adaptive threshold: Allows the auto-track acquisition level to follow slow changes in the AGC signals.

Multi-Path Clipping: Prevents locking on a reflected signal when tracking targets at low elevation angles. The tracking will be enabled only above a predefined elevation angle.

Step-Tracking

Periodic jogging of the antenna Up/Down and CW/CCW for repositioning to the point of maximum reception level.

Program-Track

Tracking according to preloaded trajectory or a script file.

Orbit Tracking: Predefined trajectory files.

Satellite: Set of ephemeris data of specific LEO/MEO satellite (NORAD TLE format).

Solar: Sun tracking for accurate “northing” and system calibration.

Scheduler: Enables switching between different tracking options according to specific time slots. In addition, the scheduler enables positioning according to predefined trajectory.

Slave-Track

The ACU can act in slave mode for different resources such as:

Host Computer via Communication Link: Using standard RS-422 or Ethernet interface.

GPS: Receiver attached to the tracked target transmitting its accurate position.

Shipboard Stabilization: The ACU is capable of receiving yaw, pitch and roll angles from IMU or GPS-compass devices and keeping the AZ/EL positioner axes stabilized on a predefined constant angle in space when operating on a moving platform (e.g., ship).

3rd party control software: The AL-4100 supports 3rd party control software using Ethernet or RS-422 communication link. ORBIT supplies all necessary documentation to support the communication protocols.

Physical Specifications

Dimensions	W: 9.05” (230 mm) D: 14.5”(368.5mm) H: 7.13”(181 mm)
Weight	14 lbs (6.5 kg)
Power Requirements	Max 100 W (115V/60Hz or 230V/50Hz)
Operating Temperature	-40°F (-40°C) to 140°F (60°C)
Storage Temperature	-40°F (-40°C) to 185°F (85°C)

COMMUNICATION WITHOUT BOUNDARIES



www.orbit-cs.com