



## AL-4100

### Outdoor Antenna Control Unit (ACU)

#### Typical Applications



Aeronautical  
Test  
Telemetry



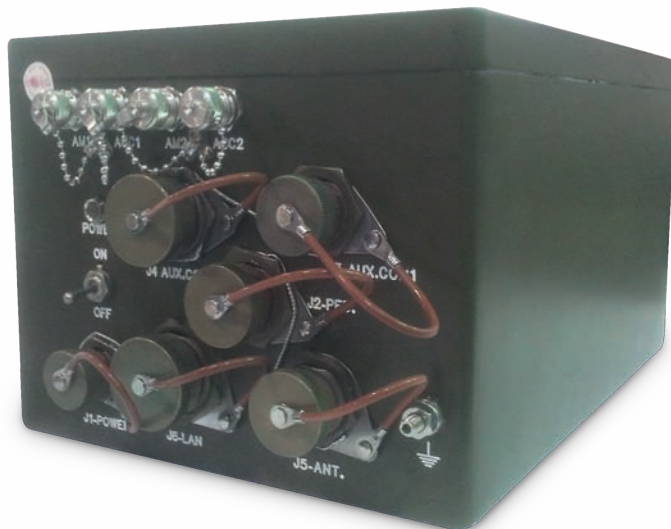
Missile  
Launch  
Tracking



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.

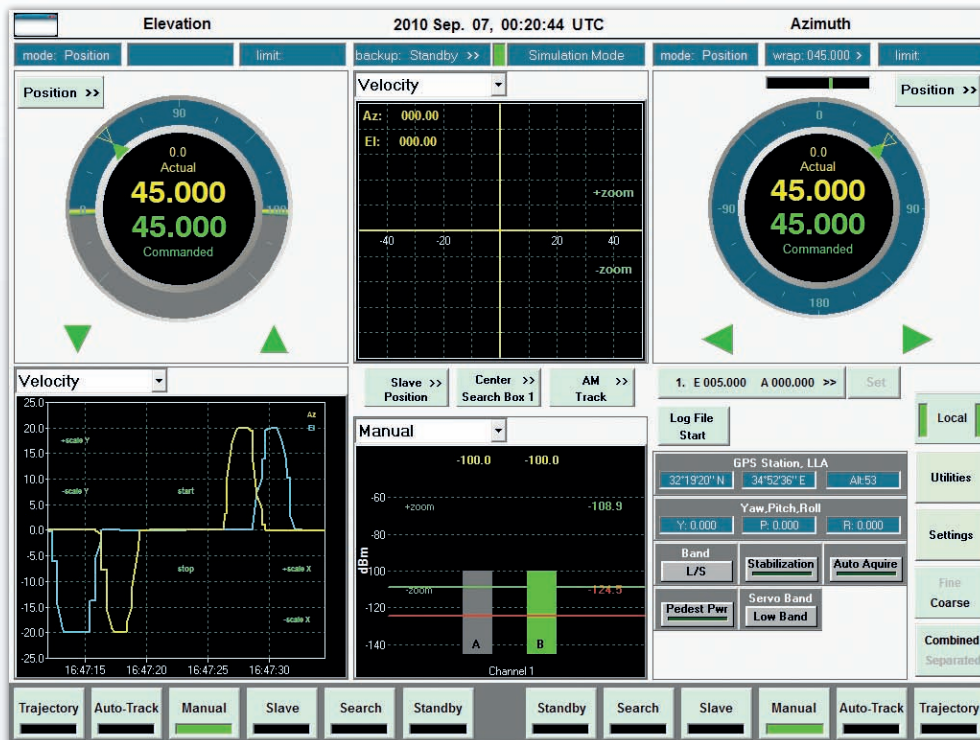
The AL-4100 is designed to withstand extreme environmental conditions in outdoor applications. It is a rigid and hermetically sealed case equipped with a powerful CPU engine capable of performing complex tracking algorithms.

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).

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

## Physical Specifications

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

