AC4100 is an antenna control unit designed for high dynamic systems tracking LEO, MEO, and GEO satellites. The control system performs digital signal processing of servo loop closures for highly accurate position, tracking, rate and torque bias loops required for large aperture antennas operating at Ka-band and beyond. The system also monitors and controls brakes, interlocks, and feed status.

**MODES OF OPERATION AND TRACKING**
The ACU's operational modes follow a hierarchical format with the highest mode enabled. The modes include:

- **Standby** Axes are disabled, brakes engaged
- **Manual** Discrete position commands including position designates and tracking
- **Slave** Digital slave positioning at a 10 Hz rate
- **Rate** Velocity commands

There are several tracking modes to ensure accurate antenna positioning. They can be used alone or combined to improve positioning robustness.

- **Autotrack** Tracking mode follows an RF signal from the satellite; requires a tracking feed and receiver
- **Adaptrack** Models the inclined orbit of a GEO satellite using beacon receiver signal strength
- **Program Track** Follows the propagated ephemeris of the satellite
- **Steptrack** Tracking augmentation that peaks the received RF signal strength in lieu of Autotrack
- **Scan** Tracking augmentation to assist in initial satellite acquisition

**ANTENNA CONTROL UNIT (ACU)**
The panel mounted ACU is located in the Servo Control Unit with control, troubleshooting, maintenance, and configuration managed through a remote GUI. Features include:

- 32 digital inputs and 14 digital outputs for RF switch control, additional warnings, etc
- Autotrack interface
- GPS receiver and NTP time server for flexible time system
- Programmable transmit inhibit and tracking masks
- Time tagged data output
- All software and firmware remotely upgradable

**ORBIT DETERMINATION**

- Ephemeris updates from GUI or M&C system
- Track satellites via TLE, Intelsat 11, STDM, Time Tagged Angles, ECI, IIRV, and several other formats
- Track celestial bodies including the sun, moon and stars
- Receipt of new ephemeris files does not interrupt current tracking

**AC4100 AT-A-GLANCE**

- LEO/MEO/GEO including TT&C applications
- Highly accurate position readout suitable for TT&C applications (0.0001° standard)
- Ethernet-based monitor and control through Windows-based GUI or other M&C system
- Integrated into drive controls, no rack space required
- Standard built-in GPS/1PPS interface
- All setup & operational parameters stored in flash memory (no battery required)
AC4100 Antenna Control Unit

SPECIFICATIONS

OPERATOR CONTROLS AND INDICATORS
- Remote Control: 10/100 Base-TX Ethernet, Windows-based graphical interface, ASCII-based M&C command set
- Local Control: Optional walkbox unit
- LEDs: Power, summary fault, mode of operation, network link/activity
- Buttons: Reset power, reset IP address

ENVIRONMENTAL
- Temperature Range: Operational -40º to +55º C, Humidity 0 to 100% non-condensing

ELECTRICAL
- Input Voltage: 24 VDC (-20%/+10%)
- Power Consumption: 8.5 W typical

MECHANICAL
- Weight: 1.8 kg; 4 lb
- Dimensions (W x H x D): 76 x 318 x 228 mm; 3.0 x 12.5 x 9.0 in.
- Finish: Aluminum, chemical conversion per MIL-DTL-5541 Class 1A (Clear)

DIGITAL I/O
- Fully fault-protected I/O (ESD, surge, shorts, opens, and reverse bias)
- 14 spare 24 V sourcing outputs
- 32 spare contact closure sensing inputs

ANALOG I/O
- Fully fault-protected I/O (ESD, surge, shorts, opens, and reverse bias)
- 4 tracking or beacon receiver inputs (16-bit, +/10 V)

TIME SYNCHRONIZATION
- Built-in GPS receiver
- NTP for network time sync
- 1PPS input/output for enhanced accuracy

DATA STORAGE AND LOGGING
- 4 GB removable compact flash
- Auto-rotating log files
- Streaming telemetry information for remote logging

REGULATORY APPROVALS
- CE mark
- Machinery Safety Directive (MSD) 2006/42/EC
- Low Voltage Directive (LVD) 2006/95/EC
- Electromagnetic Compatibility Directive (EMC) 2004/108/EC

CONTACT
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