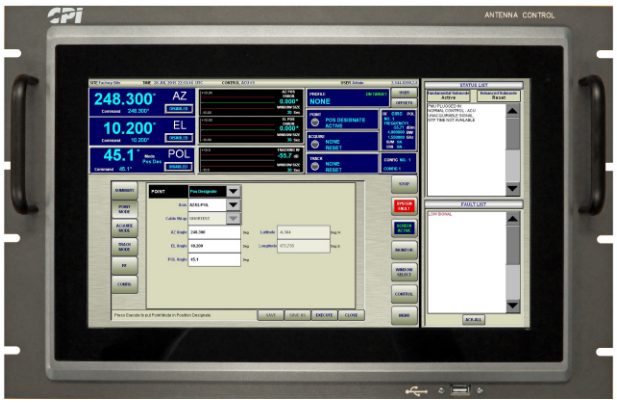
# Antenna Control System

Model 970

## Antenna Technologies




### System

The CPI Antenna Technologies' Model 970, offers excellent satellite tracking and control. It is ideally suited for almost any full motion antennas for precision satellite, spacecraft, or celestial tracking applications. The system is comprised of an Antenna Control Unit (ACU), Tracking Receiver Unit (TRU) and a Power Drive Unit (PDU) which are linked via dedicated ethernet connections. This configuration provides flexibility in locating the key system components, allows for variable separation distances, and provides immunity to electrical ground plane transients.

The Model 970 is Intelsat- Standard A compliant for great tracking performance, offers extensive modes for pointing, acquisition and tracking and its software is field-upgradable via a simple USB interface. In addition, the Model 970 is CE compliant for EU applications and features a touch-screen large viewing angle color display for modern user interfaces.

**Tracking Accuracy - Optrack** Normally better than 5% of the receive beamwidth in winds of 30 mph gusting to 45 mph, satellite inclination of up to 15° and signal scintillation of up to 2 dB.

**Monopulse Tracking**
For dynamic targets, normally better than 3% of the receive beamwidth for 30 mph gusting winds. Minimum scintillation sensitivity.

**Pointing Accuracy**
Normally better than 0.010° RMS in winds of 30 mph gusting to 45 mph as measured at the axis position transducer. The ACU bias correction model will significantly supress systematic errors affecting RF beam spatial accuracy.

### Overview

For over 50 years, CPI Antenna Technologies has been developing high-precision satellite tracking and control systems. As the world's leading manufacturer of satellite and ground-based products and services, our systems are designed using cutting edge technology by our experienced engineering team.

Our control systems can be used with almost any antenna and support a wide range of applications. The systems feature an easy-to-use, modern ethernet interface, and are software upgradeable to protect your investment. All control systems come with an end-to-end warranty and are supported 24/7/365 days a year by our technical customer support team.

**FEATURES:**

- Tracking, pointing, and acquisition modes
- Single drive per axis, multiple axes
- AZ/EL, X-Y, HA/Dec, and AZ/EL/Tilt pedestals
- Single or multi-speed operation

**BENEFITS:**

- Full motion, full featured linear drive control

**APPLICATIONS:**

- All bands and all orbits (GEO, MEO, LEO, HEO)
- Communications, data, broadcast, TT&C, RADAR, Celestial, Lunar, Cis-Lunar
- New antennas or upgrades and retrofits

**Operational Modes**

| Tracking | Pointing | Acquisition | Other |
|---|---|---|---|
| Optrack<br>Steptrack<br>Monopulse | Intelsat 11<br>Memtrack<br>Star Track<br>Preset<br>Designate<br>NORAD<br>Table Track | Box Scan<br>Spiral Scan<br>Geo Scan<br>Raster Scan | Maintenance<br>Manual<br>Stop<br>Computer<br>Simulator<br>Polarization<br>Test |

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## Antenna Control Unit

The Antenna Control Unit (ACU) is the primary control and monitor interface point for the entire system, featuring a friendly touch screen windowed interface.


*7RU ACU with 15 Inch Touch Screen*

### FEATURES:

- Detailed status with color enhancement
- Easy touch screen operation
- Informative display with full text color readouts
- Extensive diagnostic monitoring and test capabilities
- Antenna and satellite simulators

### ACU Options

- Dual/Remote ACU
- Fiber Optic Ethernet
- Tracking Receiver Display with Spectrum Analyzer
- Dual Ethernet


### Tracking Receiver

- 2RU TRU with 5.0" Touch Screen
- Beacon or Carrier
- Monopulse or Signal Strength for Optrack
- Digital Signal Processor (DSP) Based Receiver

## Portable Maintenance Unit

The Portable Maintenance Unit (PMU) provides manually commanded, bi-directional control of all axis.


It has the following features:

- Hand held ruggedized unit with a 10-ft pendant cable and 40-ft extension cable for convenient local operation at the antenna
- Backup means of moving antenna & is ACU independent
- Four line, 20 character display for axis positions, tracking signal strength, mode and scrolling status messages
- Modes include position jog, Hi/Lo speed
- Optional weather proof access junction boxes at convienient antenna locations
- Enable/disable per axis

## Manual Control Unit

The Manual Control Unit (MCU) provides manually commanded, bi-directional control of all axis.

- Slim, 1RU Chassis
- PMU Functionality

### System Options

- Fiber Optic ACU-PDU Link
- Redundancy
- Manual Control Unit
- Rack Mount Tracking Receivers
- Stainless Steel PDU for Salt Environment
- Extended Temperature Ranges
- Time Synchronization via NTP, IRIG-B or 1PPS
- High level EMI Suppression
- PDU configurable for various motor sizes and polarization controls
- Axis Stow Pin Control

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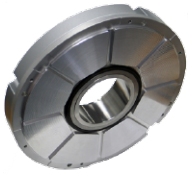
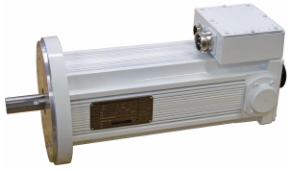
**Power Drive Unit (PDU)**
The Power Drive Unit (PDU) provides all digital control to the linear DC drive motors and contains the hardware/firmware logic to close the position and tracking loops with high resolution. It also provides controlled maximum acceleration and deceleration profile limit windows.

A lockable handle secures the access door while the system is operating. A lockout, tagout power disconnects are provided within the cabinet interior. Mounted in the enclosure is a panel assembly consisting of the Antenna Control Board (ACB), power supplies, motor controllers, and various ancillary devices. Status interlocks and position signals report to the ACB and, while in constant communication with the ACU, the ACB transmits information and receives commands to effect movement on any antenna axes. PDUs are FCC and CE compliant and are equipped with EMI/RFI protection.

FEATURES:

- The all digital ACB includes embedded processors for local position and rate loop closures
- Dedicated Ethernet link to ACU (fiber optic optional)
- Antenna interlock switches monitored by redundant hardware for processor independant safety shutdown





**Transducers**

- *High accuracy encoder*
- 0.00001° resolution, 0.0028° accuracy
- 25 bit optical design

*Optical Encoder (standard)*

- Absolute position
- Available with resolution up to 26 bit, and accuracy to 2 arc seconds

**DC Brushless Motor**

*The motor has the following features:*

- Outdoor rated (IP67)
- Optional handcrank access via extended rear shaft with personnel access safety interlock
- Motor resolver, DC Tach, and Incremental Encoder for motor rate feedback

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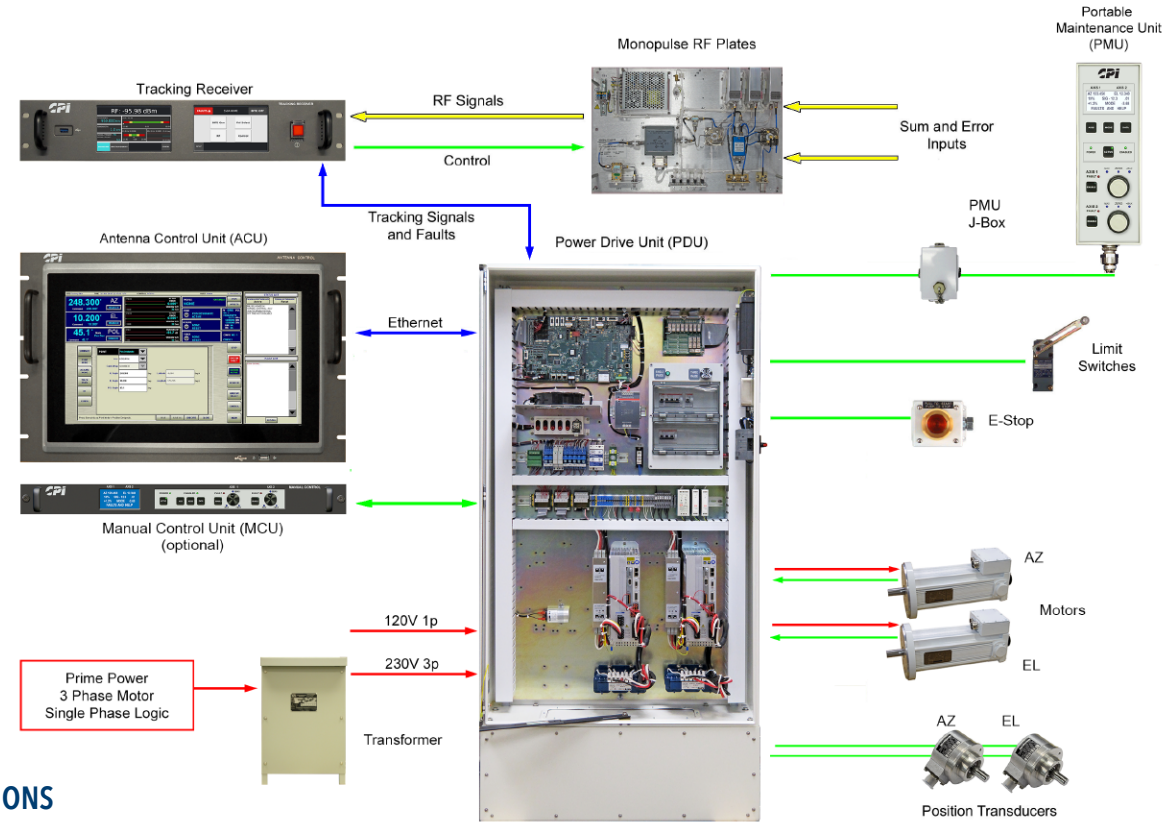


## SPECIFICATIONS

| UNIT | SIZE | WEIGHT | POWER |
|---|---|---|---|
| ACU- 7RU rack mount chassis | 12.25" H x 19" W x 3" D | 10 lbs | Single phase, 90-240 VAC~ 350 VA |
| PDU- DC/SCR/ Vector, 2 Drive Cabinet | 59" H x 36" W x 12" D | 500 lbs | Three phase 208/380/415 VAC~, KVA Motor Dependent |
| MCU- 1RU rack mount chassis | 1.75" H x 19" W x 8" D | 5 lbs | Single phase, 90-240 VAC~ 15 VA |
| TRU- 2RU rack mount chassis with slides | 3.50" H x 19" W x 20" D | 23.5 lbs | Single phase,90-240 VAC~ 200 VA |

| ENVIRONMENTAL | TEMPERTURE | HUMIDITY |
|---|---|---|
| Indoor Equipment | 0° to 50° C (Operating) | 95% Non-Condensing |
| Outdoor Equipment (optional) | -20° to 50° C (Operating) | 100% Condensing |

**Contact us at CustomerCareSAT@cpii.com or call us at +1 770-689-2040**

The data should be used for basic information only.
Formal, controlled specifications may be obtained from CPI for use in equipment design.


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