

Model 970 Antenna Control System

Full Featured Linear Drive Control



Overview

For over 50 years General Dynamics SATCOM 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.

System

Can be used with almost any full motion antenna for precision satellite, spacecraft, or celestial tracking applications. The system comprises an Antenna Control Unit (ACU), Tracking Receiver Unit (TRU) and a Power Drive Unit (PDU) which are linked via dedicated Ethernet connections. This provides flexibility in locating the key system components, allows for variable separation distances and provides immunity to electrical ground plane transients.

Tracking, Pointing, and Acquisition modes

Single drive per axis, multiple axes

AZ/EL, X-Y, HA/Dec, and AZ/EL/Tilt pedestals

GEO, LEO, TT&C, RADAR, or Celestial applications

Single or Multi-Band operation

Tracking Accuracy - Optrack

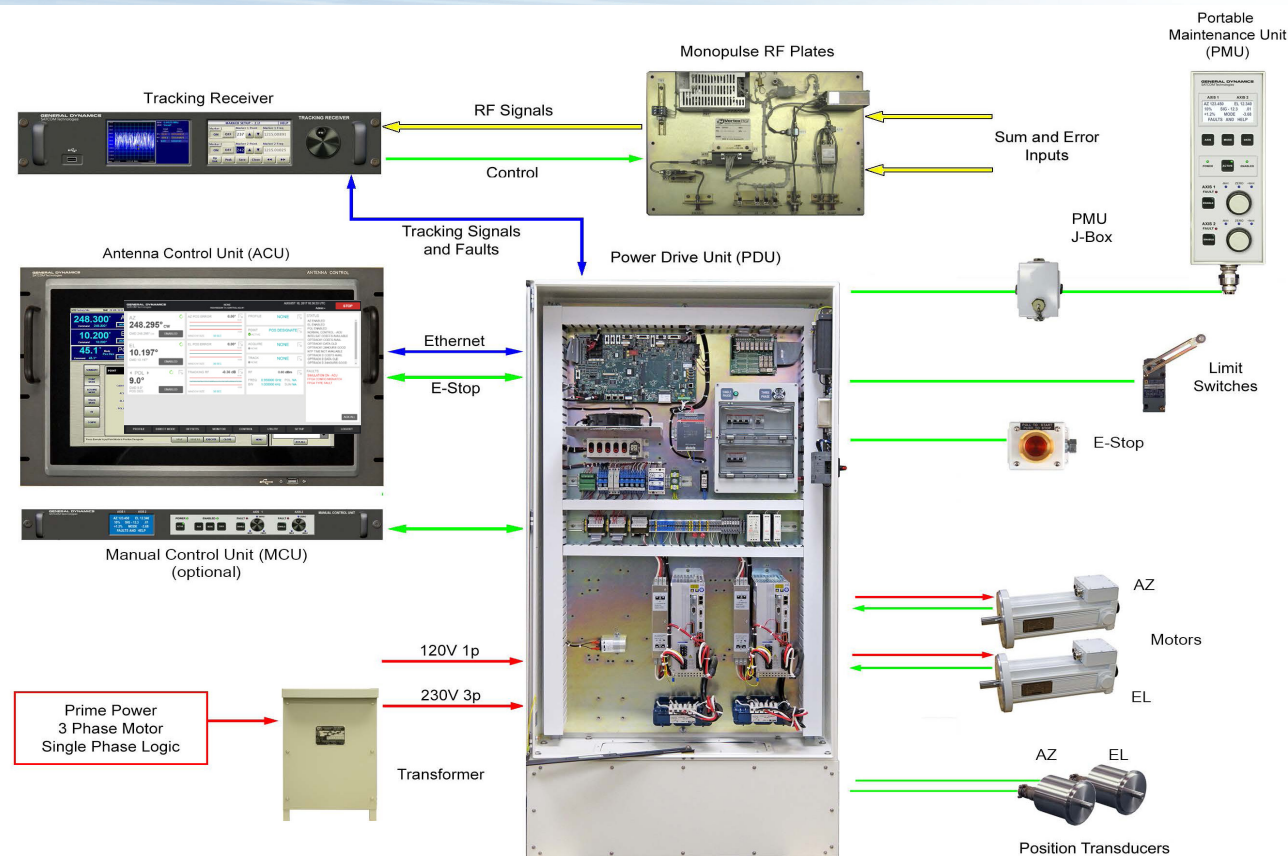
Optrack - Normally better than 5% of the receive beamwidth in winds of 30 mph gusting to 45 mph, satellite inclination of up to 15° and signal scintillation of up to 2 dB.

Monopulse - For dynamic targets, normally better than 3% of the receive beamwidth for 30mph 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 suppress systematic errors affecting RF beam spatial accuracy.

| Operational Modes | | | |
|-------------------|-------------|-------------|--------------|
| Tracking | Pointing | Acquisition | Other |
| Optrack | Intelsat 11 | Box Scan | Maintenance |
| Steptrack | Memtrack | Spiral Scan | Manual |
| Monopulse | StarTrack | Geo Scan | Stop |
| | Preset | Raster Scan | Computer |
| | Designate | | Simulator |
| | NORAD | | Polarization |
| | TableTrack | | Test |



| ACU | Size | Weight | Power |
|--|---------------------------|--------------------|--|
| 2RU rack mount chassis with slides | 3.50" H x 19" W x 19.5" D | 16 lbs | Single phase, 110-240 VAC 350 VA |
| 7RU rack mount chassis with slides | 12.25" H x 19" W x 3" D | 10 lbs | Single phase, 110-240 VAC 350 VA |
| PDU | | | |
| Brushless DC/SCR/Vector, 2 Motor Cabinet | 59" H x 36" W x 12" D | 500 lbs | 208/380/415 VAC, 3ø, KVA motor dependent |
| MCU | | | |
| 1RU rack mount chassis with slides | 1.75" H x 19" W x 8" D | 5 lbs | Powered by PDU |
| TRU | | | |
| 2RU rack mount chassis with slides | 3.50" H x 19" W x 19.5" D | 23.5 lbs | 90-264 VAC, 47-63 Hz, 200VA |
| Environmental | Temperature | Humidity | |
| Operating-Indoor | 0° to 50° C | 95% Non-Condensing | |
| Outdoor Specs | -20° to 50° C | 95% Non-Condensing | |

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.

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
- Supervisory Control Link
- (Ethernet; TCP/IP or RS-232/422).
- Fully software field upgradable



ACU Options

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



Tracking Receiver

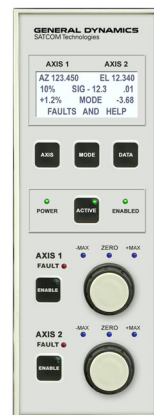
- 2RU TRU with 4.3" touch screen
- Beacon or Carrier
- Monopulse or Signal Strength for Optrack
- Digital Signal Processor (DSP) Based Receiver

Portable Maintenance Unit

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

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 and is ACU independent
- Four line, 20 character display for axis positions, tracking signal strength, and scrolling status messages
- Modes include position jog and Hi/Lo speed
- Weather proof access junction boxes at convenient antenna locations
- Enable/Disable per axis



Manual Control Unit

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

Features:

- Slim, 1RU chassis
- PMU functionality



System Options

- CE Certified
- Fiber Optic ACU-PDU Link
- SNMP Monitor and Control
- 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

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 doors while the system is operating. 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) logic, power supply, 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 of any antenna axes. PDUs can be optionally equipped with EMI/RFI protection, and/or CE certification.

- The all digital ACB includes 3 embedded microprocessors for local position and rate loop closures
- Dedicated Ethernet link to ACU (fiber optic optional)
- Antenna interlock switches monitored by redundant hardware for microprocessor independent safety shutdown
- Outdoor rated NEMA cabinet
- Available in Brushless DC, SCR, or Vector motor controller configurations

Transducers

- High Accuracy Resolver
 - 0.0003° Resolution,
 - 0.003° RMS Accuracy
 - 20 bit, 16:1 multispeed electrical design
- Position Encoders
 - Absolute Position
 - Available with resolution up to 26 bit, and accuracy to sub arc seconds



DC Brushless Motor



- Outdoor rated (IP67)
- Optional handcrank access via extended rear shaft with personnel access safety interlock.
- DC tach for motor rate feedback