

Model 950 Antenna Control System

Full featured inverter drive control

The Model 950 Control Systems can be used with almost any limited motion antenna for precision satellite tracking applications.

- Tracking, Pointing, and Acquisition modes
- Ideal for single AC motor (per axis) antennas
- Single, Dual, or Multi-speed antenna motor drives
- Stable or inclined GEO targets
- Flexible receiver options
- Designed to minimize site cabling



System

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 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.

Pointing Accuracy

Normally better than 0.05° RMS in winds of 30 mph gusting to 45 mph. This includes all drive train errors, but excludes structural errors between the position transducers and RF beam.

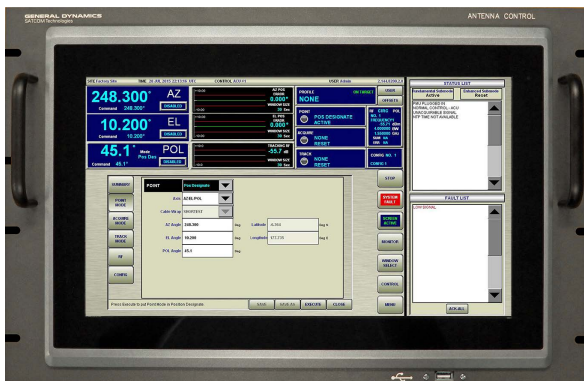
Operational Modes			
Tracking	Pointing	Acquisition	Other
Optrack Steptrack	Intelsat 11 Memtrack Preset Designate NORAD TableTrack Star Track Sun Track Moon Track.	Box Scan Geo Scan	Maintenance Manual Stop Computer Simulator Polarization Stow

Control units

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 of the ACU are:

- Optrack, which provides high performance tracking of stable or inclined orbit satellites with an adaptive, self-learning ephemeris modeling mode
- 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

Receiver Options

- Model 500 series of Tracking Receivers in Analog, or Digital with Spectrum Display.
- 2 RU Digital Model 550 with dual 5 inch displays
- 2 RU Analog Model 520 with dual 5 inch displays
- Model 520 or 550 Receiver module mounted behind ACU for zero additional rack space requirements.
- Receivers also available with internal block down converters for common frequency bands

Portable Maintenance Unit

The Portable Maintenance Unit (PMU) provides manually commanded, bi-directional control of all axes. 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 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
- Optional 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. It has the following features:

- Slim, 1RU chassis
- PMU functionality

System Options

- Fiber Optic ACU-PDU Link
- Time Synchronization via NTP
- Manual Control Unit
- Rack mount Tracking Receiver
- Extended low temperature operation
- Extended Warranty
- PDU configurable for various motor sizes and polarization controls.
- E-Stops in panel mount or J-Box

Power drive components

Multi-Speed Inverter PDU

The Power Drive Unit (PDU) provides all digital control to the AC drive motors and contains the hardware/firmware logic to close the position and tracking loops with high resolution. It also provides controlled acceleration and deceleration profile & speed regulation range of up to 15:1 with conventional inverter rated AC motor (antenna system dependant).

The inverter PDU's are free-standing, housed in an NEMA 4 (IP66 equivalent) aluminum enclosure and contains the electrical/mechanical components necessary to move the antenna. The PDU contains an internal fan for ambient air circulation and "hot spot" avoidance and an optional thermostat controlled, internal heater for cold weather operations. Single speed contactor configurations are also supported.

A lockable handle secures the access door while the system is operating. A Lockout, Tagout power disconnect is provided on the cabinet exterior. Mounted in the enclosure is a panel assembly consisting of the Antenna Control Board (ACB) logic, power supply, inverter drives, 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 control movement of any antenna axes.

Communication within the system via Ethernet between ACU, TRU, and PDU by a dedicated controller. A second Ethernet controller and port provides independent connection to M&C or customer WAN.

System design minimizes cable installation cost and complexity, and allows for flexible site layout.



Transducers

1:1 Resolver (standard)

- 0.0055° Resolution, 0.05° Accuracy
- Standard 16 bit



Position Encoder (option)

- 0.00001° Resolution, 0.0055° Accuracy
- 25-bit Optical

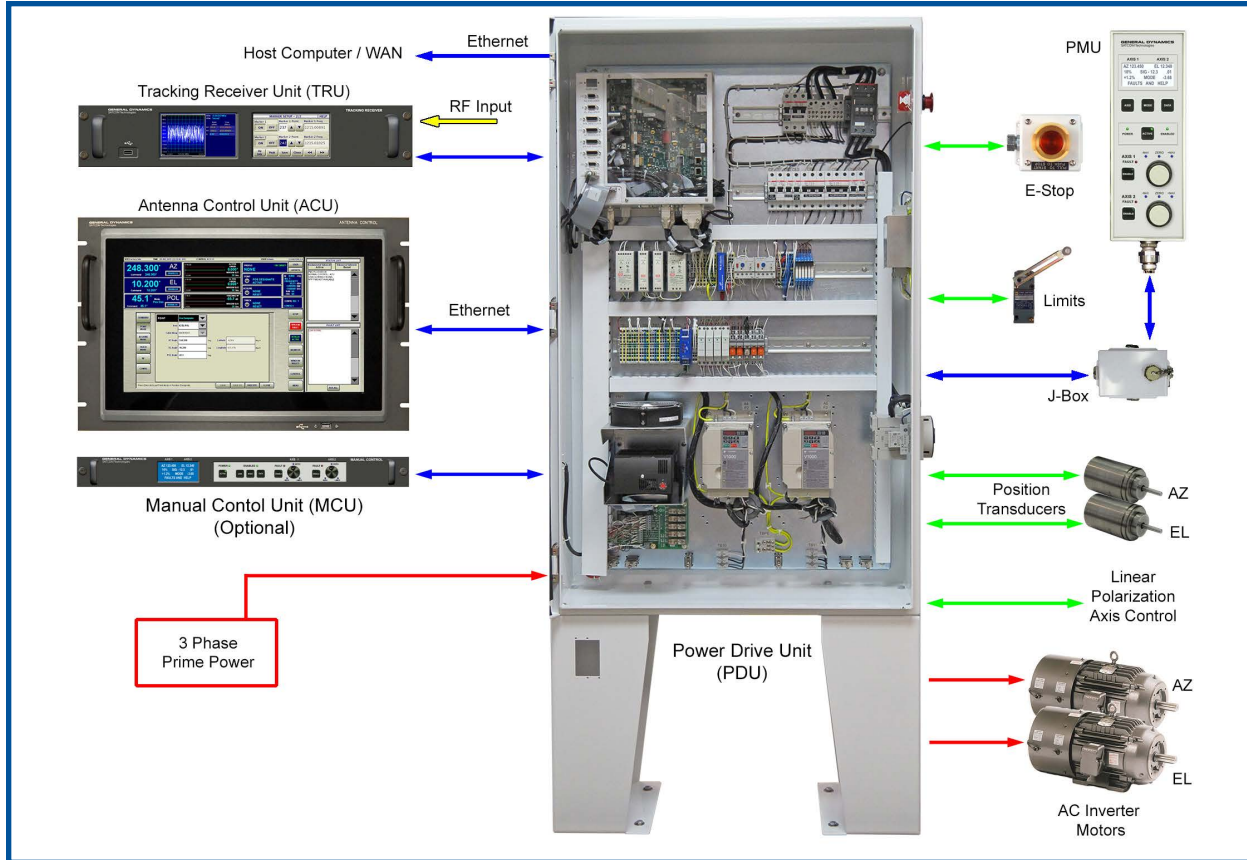


AC Motor Support

- Single or multiple inverter duty windings.
- Optional Handcrank interlock.
- 208-480v 3 phase voltage windings available.
- Overtemp interlock.
- Up to 5 HP standard, larger upon request.



Typical Model 950 System Diagram



SPECIFICATIONS

- Tracking accuracy $\leq 5\%$ of Beamwidth
- Pointing accuracy $\leq 0.05^\circ$ RMS
- Total system results are antenna (mechanically) dependent
- CE, FCC Class A compliant

ACU	Size	Weight	Power
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			
AC Inverter or Single speed contactor.	66.5" H x 30" W x 11.25" D (Including for Floor Stand)	230 lbs	Single Phase Electronics, 100-250 VAC 500 VA 208/380/415 VAC, 3 ϕ , KVA motor dependent Three Phase 200-240 Vac, 7.5 HP max Three Phase 380-480 Vac, 10 HP max Single speed 5HP max, 208/380/415 3 phase
MCU			
1RU rack mount chassis with slides	1.75" H x 19" W x 8" D	5 lbs	Powered by PDU
Environmental	Temperature	Humidity	
Operating-Indoor	0° to 50° C	95% Non-Condensing	
Operating-Outdoor	-20° to 50° C	100% Condensing	
Operating-Outdoor (optional extended)	-40° to 40° C	100% Condensing	
Storage	-10° to 70° C	100% Condensing	

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