

# 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
- Single or Multi-Band operation



## 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			*Optional
Tracking	Pointing	Acquisition	Other
Optrack	Intelsat 11	Box Scan	Maintenance
Steptrack	Memtrack	Spiral Scan	Manual
	StarTrack	Geo Scan	Stop
	Preset	Raster Scan	Computer
	Designate		Simulator
	NORAD		Polarization*
	TableTrack		



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## Control units

### Antenna Control Unit

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

#### 6RU ACU with 15 Inch Touch Screen



#### 2RU ACU with 4.3 Inch Touch Screens



#### 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)

#### ACU Options

- Time Synchronization via optional NTP, IRIG-B or 1PPS
- Internal Tracking Receiver (Analog, Digital) with Spectrum Analyzer
- Optional 6RU ACU with 15inch touchscreen

### 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 50-ft pendant 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

- 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
- Extended Warranty
- High level EMI Suppression
- PDU configurable for various motor sizes and polarization controls

## 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 20:1 with conventional inverter rated AC motor.

The inverter PDU's are free-standing, housed in an aluminium enclosure and contain the electrical/ mechanical interface necessary to move the antenna. For those units installed in harsh environments, an optional stainless steel enclosure and/or heat exchanger is also available.

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 effect movement of any antenna axes. The PDU also contains an optional thermostat controlled, internal heater for cold weather operations and an internal fan for ambient air circulation and "hot spot" avoidance.



### Transducers

#### 1:1 Resolver (standard)

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



#### Position Encoder (option)

- 0.0014° Resolution, 0.0042° Peak Accuracy
- 18-bit Optical



#### High Accuracy Resolver (option)

- 0.0003° Resolution, 0.003° RMS Accuracy
- 20 bit, 16:1 design



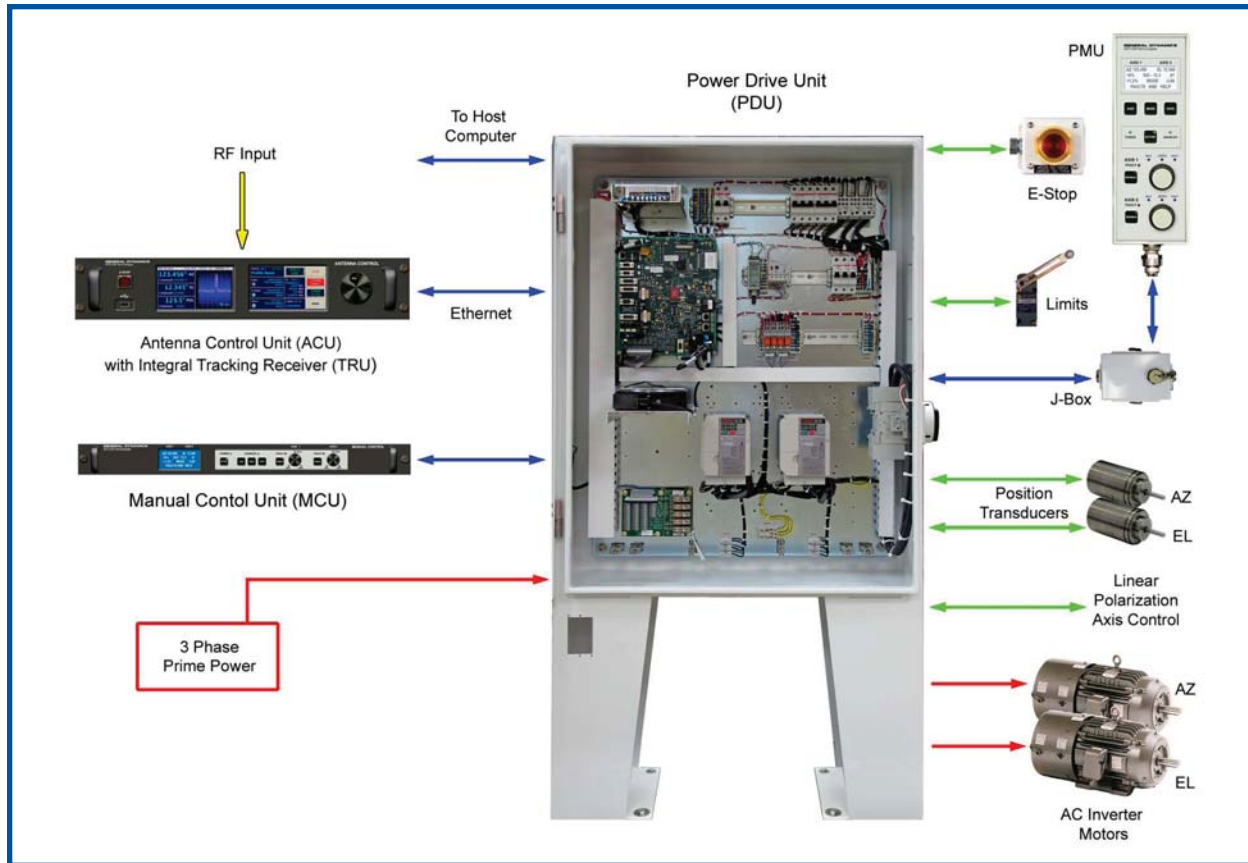
### AC Motor

The AC Motor has the following features:

- Single or multiple inverter duty windings.
- Optional Handcrank access via extended rear shaft.
- High and low voltage windings available.



## Typical Model 950 System Diagram



### SPECIFICATIONS

- Tracking accuracy  $\leq 5\%$  of Beamwidth
- Pointing accuracy  $\leq 0.05^\circ$  RMS

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
6RU rack mount chassis with slides	10.50" H x 19" W x 19.5" D	30 lbs	Single phase, 110-240 VAC 350 VA
PDU			
AC Inverter	38" H x 30" W x 11.25" D (Add 18" to H for Floor Stand)	230 lbs	208/380/415 VAC, 3 $\phi$ , KVA motor dependent Single Phase 200-240 Vac, 3 HP max Three Phase 200-240 Vac, 10 HP max Three Phase 380-480 Vac, 15 HP max
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	95% Non-Condensing	
Operating-Outdoor (optional extended)	-30° to 60° C	95% Non-Condensing	
Storage	-40° to 70° C	95% Non-Condensing	