Research Concepts
RC4800 Servo Control System

The RC4800 Antenna Control System delivers precision, reliability, and flexibility for modern satellite ground stations. Designed for new builds or retrofits, it provides unmatched tracking accuracy and simplified control through a modular Ethernet-based architecture.

Flexible Configuration

The heart of the RC4800 Servo Control System is a highly flexible Antenna Interface Unit (AIU) designed to exact antenna specifications. A simple Ethernet connection provides the link between the AIU and the Antenna Control Unit (ACU).

The ACU supports an internal Beacon Tracking Receiver (BTR) or external monopulse tracking receiver for continuous link optimization. Additionally, it provides native control for existing serial and IP based BTR units, offering flexibility in system configuration.

Tracking Performance

All RC4800 systems come with the proven and tested reliability of RCI Enhanced Predictive Tracking (EPT). EPT provides measurable improvement in nominal tracking performance compared to classic step tracking modes.

For more challenging applications, all RC4800 systems can include optional single-channel monopulse tracking, which delivers real-time signal optimization for superior performance.

Nominal System Accuracy (RMS)		
	Angular	Signal
Pointing[1]	0.005°	
Step Tracking	10% HPBW	0.12 dB
EPT Tracking	5% HPBW	0.03 dB
Monopulse	3% HPBW	0.01 dB
1 – Not including structural deflection		

About Research Concepts

For almost four decades, Research Concepts has led the market in user-friendly and dependable antenna control systems. The RC4800 Servo Control System upholds this tradition of reliability while integrating the modern features operators demand.

Like all Research Concepts products, the RC4800 is supported by the industry's top technical team, comprised of the hardware and software design team. Throughout our company's history, we have never discontinued support for any product. We proudly stand by our commitment: "If it bears our name, our technical team is here to support the product."

Features

- Fully Digital 3-Axis Position Loop Servo
- Single or Multi-Drive per Axis
- AZ/EL, X-Y, HA/Dec Configurations
- Industry Standard RCI User Interface
- Ethernet Remote Interface
  - Enhanced Graphical User Interface
  - UDP Remote Protocol
  - SNMP (v2C, v3)
- Flexible Antenna Interface Units
  - Single or Multi-Drive per Axis
  - BLDC/AC Servo/Brush DC Motors
  - Multiple motor velocity feedback
- Multi-Orbit (LEO/MEO/GEO and HEO)
- Upgrades/Retrofits and New antennas

This datasheet provides preliminary information only. For comprehensive details, please contact RCI.

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Antenna Control Unit

The Antenna Control Unit (ACU) serves as the central user interface point, managing all control and monitoring functions by directly interfacing with the system's components over an Ethernet or fiber optic link.

RCI Standard 2RU Option

- Familiar RCI 4X40 LCD interface
- Tactile 4X4 keypad
- Simple text-based monitoring
  - Status and alarms
  - System configuration
- Ethernet or fiber AIU interface
- Available in-built BTR

7RU Touch Screen Option

- Intuitive touch screen operation
- Informative full color display
- Enhanced status information
  - Detailed satellite data
  - Tracking performance data
  - Easy alarm monitoring
- Ethernet or fiber AIU interface
- Available in-built BTR

Handheld Remote Front Panel

- Built in safety interlock
  - Disables other control points
- Full ACU function at antenna pad
  - No additional training required
- Up to 100 feet cable length
- IP65 Rated

Beacon Tracking Receivers

The RC4800 Antenna Control System can include an optional built-in Beacon Tracking Receiver (BTR) for tracking inclined orbit satellites. It supports analog signal strength and lock inputs and is optionally compatible with external BTR units from Novella, ASC, Avcom of Virginia, CPI, and many others.

Inbuilt BTR Specifications	
Input Frequency	945-2150 MHz
Tuning Step Size	10 kHz
Input Level	-90 to -30 dBm
Tracking Sensitivity	43 dB-Hz
Acquisition Bandwidth	200 kHz
Tracking Bandwidth	10 kHz

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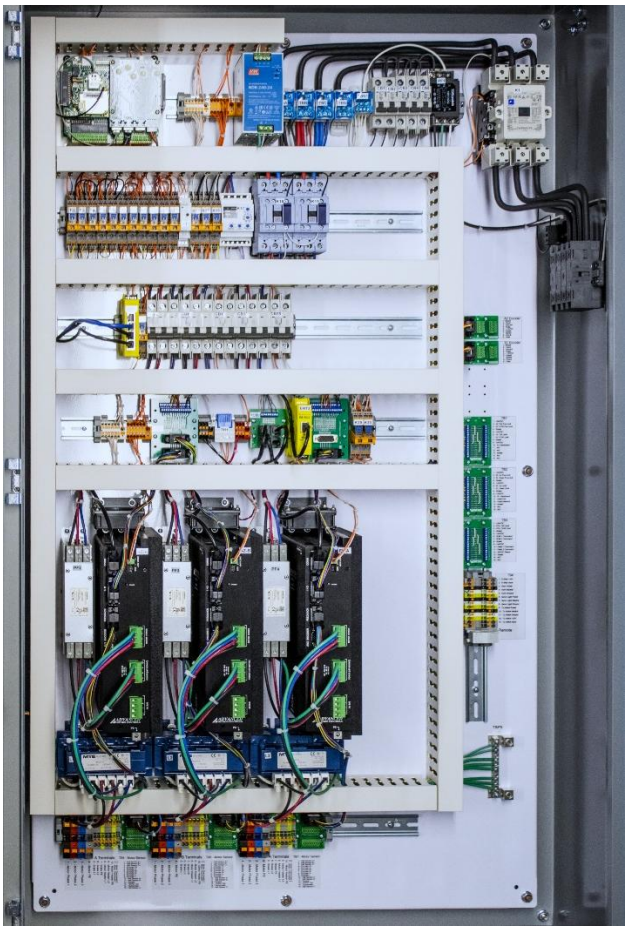
Servo Antenna Interface Unit

The Servo Antenna Interface Unit (AIU) delivers high-speed position and velocity servo control across various motorization setups. Multiple microprocessors oversee operations to guarantee dependable antenna motion control. Furthermore, several hardware interlock layers offer redundant, software-independent pathways for safety monitoring.

The AIU is housed in a NEMA 4X (IP66) rated electrical enclosure, ensuring durability in harsh conditions. Equipped with standard thermostat-controlled fans and a heater, it delivers reliable performance in extreme environments. A lockable main door secures access while the system is in operation. Additional disconnects and lockout features ensure safe maintenance operations.

Base EMI/RFI signal conditioning is part of the standard configuration, making the system ready for easy compliance testing in any region.

All features of the AIU are controlled over a single Ethernet or fiber optic link using the rack mounted ACU.



Position Sensors

The RC4800 Antenna Control System delivers exceptional flexibility in position sensing across its Azimuth, Elevation, and Polarization axes. Standard configurations include high-resolution 25-bit optical encoders, with optional configurations ranging from 23-bit to 29-bit to meet a wide range of precision requirements.

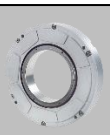
For seamless integration with existing infrastructure, the system also supports legacy size 11 resolvers and offers custom-engineered mounting solutions. Whether upgrading an existing installation or deploying a new system, the RC4800 provides reliable, high-accuracy position feedback for any antenna application.

Standard Encoder

- 0.00001° Resolution
- ±20 arc-second accuracy
- IP67 Housing, IP64 Shaft

Encoder Options

- Resolution <10^{-6} deg
- Accuracy to ±1 arc-second
- Small form factor options



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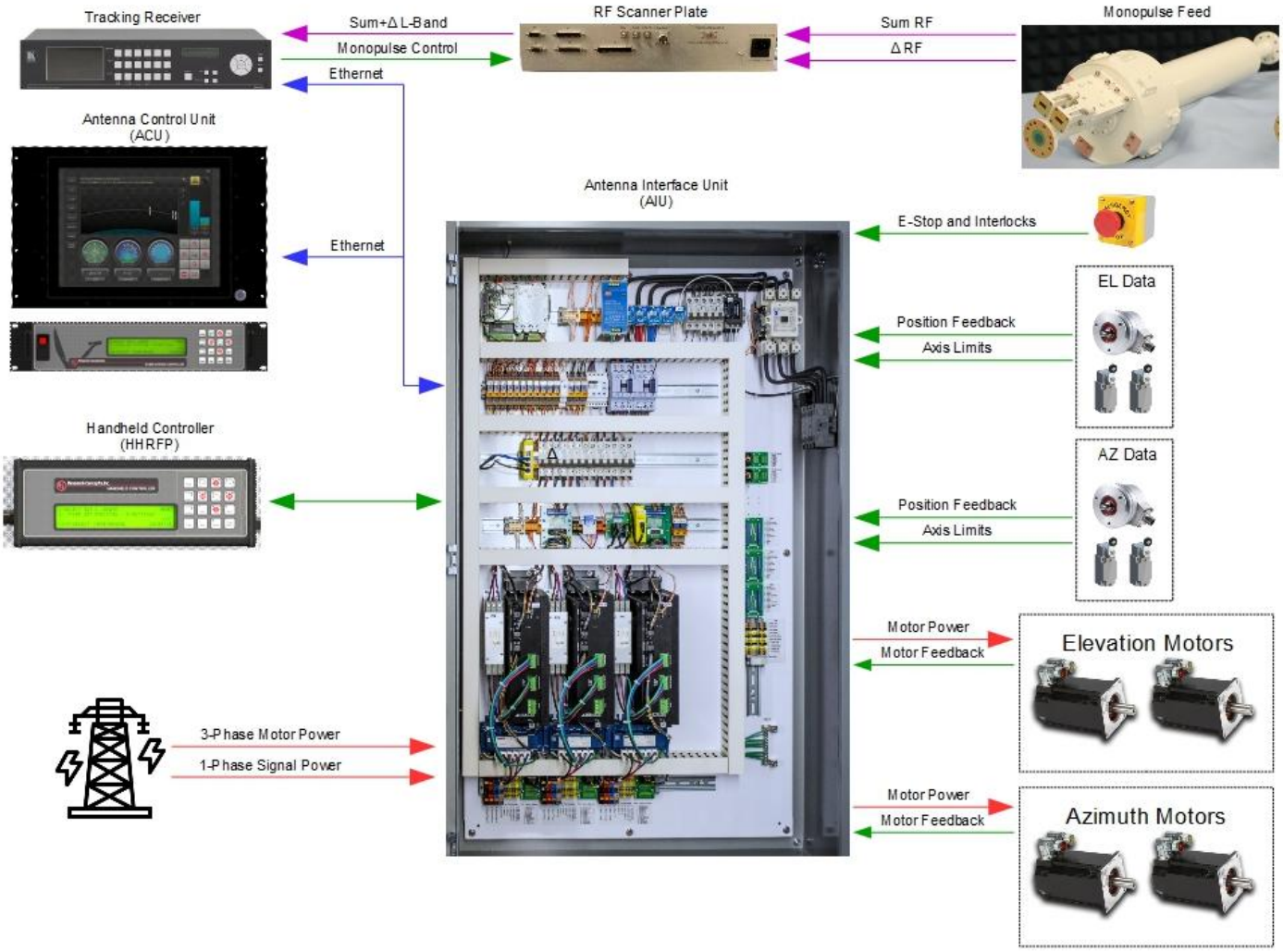

System Specifications			
System results are dependent on antenna mechanical functions Encoders recommended for beamwidths < 0.25°		RoHs, REACH, and WEEE Compliant	
Component	**Power Requirement**	**Size**	**Weight**
2RU ACU	85-265VAC, 50-60Hz, 125VA	3.5" H x 19" W x 8.5" D	3-7 pounds
7RU ACU	85-265VAC, 50-60Hz, 250VA	12.25" H x 19" W X 5" D	8-15 pounds
Servo AIU	200VAC ±10% - 3ø, WYE Up to 100 Amp Total Current Draw	60" H x 36" W x 12" D 72" H with optional stand	Configuration Dependent
	400VAC ±5% - 3ø, WYE Up to 100 Amp Total Current Draw		
Environmental	**Temperature**	**Humidity**	
Indoor Equipment	Storage: -40C to +85C Operational: -20C to +60C	95% Non-Condensing	
Outdoor Equipment	Storage: -40C to +75C Operational: -40C to +50C	100% Condensing	

Product specifications are subject to change without prior notice.

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