

## 2.4TSS3-3m S-Band TT&C Antenna System

Complete front end for interface with a customer provided satellite telemetry modem

The 2.4TSS3-3m S-Band Telemetry Tracking and Control antenna system is a complete front end for connection to a satellite communications telemetry modem. This antenna transmits and receives on S-Band enabling reception of both satellite control communications and high-data rate satellite payload data. System includes the 2.4m antenna positioner, 3.0m reflector, S-Band feed, tracking controller, HPA, and filters to cover the standard S-Band satellite uplink and downlink bands. The Orbital Systems antenna systems are designed and built to provide high reliability while withstanding severe environmental conditions. Superior engineering, precision manufacturing and strict quality control standards result in maintenance-free operation, making the system the optimal choice for service in remote locations and hostile climates.

### Antenna System Features

#### System Components

- 2.4AEBP antenna positioner with 3.0m solid aluminum reflector
  - Antenna control unit with built-in GPS receiver (ACU-2)
  - Comprehensive maintenance tool kit
  - Dehydrator for system pressurization
- S-Band feed, TX and RX polarity independently selectable
- Optional integrated downconverter, tunable or block available
- Optional integrated S-Band upconverter with IF input of 70 MHz
- Integrated 50W HPA for S-Band
- System cables cut to length and terminated, including coax and fiber cables
- Includes 3-day on-site installation and setup for prepared site

#### System Features

- Complete TT&C antenna front end for interface with a customer provided TT&C satellite modulator system
- Outstanding RF performance with an S-Band G/T of approximately 14 dB/K and a typical S-Band EIRP of 44 dBw (P1dB) and 47 dBw (Psat)
- Uses the proven high-reliability pressurization technology of Orbital Systems antenna systems to protect all electronics and mechanical systems with dehydrated air
- All components built into antenna system; eliminates need for indoor rack space
- Uses the powerful Orbital Data Bus (ODB) technology and the ACU-2 true Ethernet antenna controller that includes a machine- and human- friendly control protocol based upon JSON file transfers. JSON commands permit multi-function command files to rapidly set up the antenna system parameters; transmit frequency, output power level, satellite to track, while also requesting power output level, antenna pointing position, etc.
- Comprehensive web interface to facilitate status monitoring and human control of the antenna system
- ACU-2 integrates the antenna positioner tracking control with the HPA control for maximum safety and ease of control software development. The antenna system is also made safer through the implementation of a configurable transmit mask and numerous safety interlocks such as automatic shutdown when excess reflected power is sensed
- ACU-2 automatically calculates and tracks a satellites when provided with a TLE
- Track difficult first orbit passes using the built in time offset and variable dynamic elevation and azimuth tracking offset capabilities
- Optional up and down converters are built into the antenna and are seamlessly integrated into the control protocol
- Antenna system is CE marked and independently laboratory tested for compliance with CE Safety, Emissions, and Machinery Directives
- Quick delivery: typical time from purchase to shipment is 4 months



### Applications

- TT&C antenna and HPA front end used to transmit and receive in S-Band for satellite control and data collection

### Continuous Capable

Frequency ..... TX: 2025-2120 MHz, RX: 2200 - 2300 MHz  
 Feed ..... S-Band prime focus, dual circular polarization  
 RX G/T ..... S-Band G/T at 2250 MHz typical 14 dB/K at 25C, high elevation  
 Axial Ratio ..... Better than 2.0 dB  
 Reflector ..... 3.0 meter spun aluminum, 2 piece, .360 f/D  
 Emission Pattern ..... Compliant with ITU Recommendation: ITU-R S.580

### Optional RF Downconverter

Frequency ..... Input 2200 - 2300 MHz  
 IF Output ..... Tunable 70 MHz or block converted to lower IF frequencies

### Optional RF Upconverter

IF Input ..... 70 MHz, nominal -10 dBm, BW = 10 MHz  
 Frequency ..... Output tunable from 2025 to 2120 MHz in 25 KHz steps

### High Power Amplifier (HPA)

Type ..... Solid-state, class AB, nominal 20W P1dB, 50W Psat  
 Antenna Transmit Power ..... Produces an EIRP of 44 dBw (P1dB) and 47 dBw (Psat)

### Antenna Positioner and Integrated ACU-2

Type ..... Orbital 2.4AEBP elevation-over-azimuth bus-controlled positioner  
 Motors ..... Brushless servomotors  
 Corrosion Protection ..... Protected with pressurized dry air system, aluminum and stainless steel construction, powder coated  
 ACU ..... Orbital ACU-2 with internal GPS receiver, TLE tracking multi-mode fiber interface  
 Timing ..... GPS, or IEEE1588 and PTP  
 Protocols ..... Web, OACP, SNMP, legacy emulations available

### Power and Environmental

Mains ..... 208 to 240 VAC, 50/60 Hz, 16A maximum  
 Weight ..... 658 kg (1450 lbs)  
 Temperature ..... -40° C to +55° C; optional blanket kit available for extreme cold

## Electrical Cabinet and External Controls

The electrical cabinet is equipped with the following safety devices:

- Emergency stop switch
- Audible warning annunciator
- Visual warning indicator
- Padlocks to lock the left and right sides of the electrical cabinet

2.4AEBP antenna positioners are compliant with CE Machinery Directive IEC 60204-1

