

## 2.4TSX1 S-X Band TT&C Antenna System

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

The 2.4TSX1 S-X Band Telemetry Tracking and Control Antenna System is a complete front end for connection to a satellite communications telemetry modem. This multi-band antenna transmits on S-Band, and receives on X-Band to enable reception of both control communications, and high-data rate satellite payload data. This system includes the antenna positioner, 2.4m dual-band antenna, tracking controller, upconverter, HPA and downconverter to cover the standard 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

- Antenna positioner with 2.4m solid aluminum reflector (2.4AEBP)
  - Antenna control unit with built-in GPS receiver (ACU-2)
  - Comprehensive maintenance tool kit
  - Dehydrator for system
- Concentric X and S-Band feed, RHCP only both bands
- Integrated X-Band block downconverter to IF of 1200 MHz
- Integrated S-Band tunable 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 at IF with a customer provided TT&C modem
- Outstanding RF performance with an X band G/T of approximately 24 dB/K and a typical S-Band EIRP of 42 dBw (P1dB) and 46 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) and the ACU-2 true Ethernet antenna controller that include a machine- and human-friendly control protocol based upon JSON file transfers
- 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. The HPA is managed automatically with the configurable transmit mask and numerous safety interlocks
- ACU-2 automatically tracks a satellite when provided with a TLE
- Track difficult first orbit passes using the built in time offset capability
- Control the transmit frequency and triggers the HPA activation sequence with simple commands
- 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
- Optional 3.7m to 1.8m variations are available
- RF customization is available



### Applications

- TT&C - Antenna front end through IF interface is used to transmit in S-Band and to receive in X-Band for satellite control and data collection

### Antenna and Feed

Feed ..... X band prime focus with on axis S band section  
 RX Sensitivity ..... X band G/T at 8000 MHz better than 24 dB/K  
 Axial Ratio ..... Better than 1.5 dB  
 Reflector ..... 2.4-meter spun aluminum, .360 f/D

### RF Downconverter

Frequency ..... Input 8000 to 8400 MHz; optional 7700 to 8400 MHz  
 IF Output ..... Block converted to 1200 MHz; optional 720 MHz, or tunable 70 MHz

### RF Upconverter

IF Input ..... 70 MHz, nominal -10 dBm, BW = 10 MHz  
 Frequency ..... Output tunable from 2025 to 2120 MHz in 25 kHz steps  
 Level ..... Integrated switchable 31 dB attenuator, switchable in 0.25 dB steps

### HPA

Type ..... Solid-state, instant-on, nominal 50W unit  
 System Power ..... Produces an EIRP of 42 dBw (P1dB) and 46 dBw (P<sub>sat</sub>)

### 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

