



## S band TM/TC 2.4 m ANTENNA & ANTENNA CONTROL UNIT



### DESCRIPTION

This station is designed for signals Transmit & Receive in the standard SATCOM frequency bands (Others bands available upon request).

It is used for Low Earth Orbit Phase (LEOP) satellite TT&C.

The EIRP can be customized according to the User's request.

A friendly Man Machine Interface installed on a PC allows its remote Monitoring & Control via a RS232 serial or TCP/IP link.

**Receive** is made through a **2.4 m dish** equipped with GPS tracking & RF tracking feed in RHCP (or LHCP) including 0.7 dB NF LNA, and filters.

Tracking can be achieved through the three main modes: **GPS tracking, Manual (through Joystick) and Auto-tracking**

RF Auto Tracking can be performed through either AM/AGC signals delivered by the Telemetry Receiver or a dedicated 2 channels Tracking Receiver.

The pedestal is equipped with **Digital Servo Amplifiers, brushless servomotors, Digital Microcontroller boards** for Tracking Servo Loop and TCP/IP communication.

The station is mainly composed of the following parts:

- External two-axis auto-tracking antenna  
Electronic compass for automatic north reference. Electronic & spirit level for automatic set-up **in option** for mobile station.
- Control & servo power boards (integrated into the pedestal)
- Antenna Control Unit (PC under Windows)

### SPECIFICATIONS

#### Transmit

- Frequency band: 2025-2120 MHz
- EIRP: > 47 dBW (with 100 W HPA)
- Polarization: RHCP or LHCP (switchable)
- Axial Ratio: < 3 dB
- Side lobes: < 17 dB

#### Receive

- Frequency band: 2200—2300 MHz
- G/T > 7 dB/K @ 10° EI angle
- Polarization: RHCP and LHCP
- Axial Ratio: < 3 dB

#### Pedestal

- Type: Elevation over Azimuth
- Elevation range: -5° to +90° or -10° to +190° (**in option**)
- Azimuth range: unlimited (continuous rotation with rotary joint/slip ring assembly)
- Rotation speed max.: ≥ 25°/s on both axes (**35°/s in option**)
- Acceleration max.: ≥ 30°/s<sup>2</sup> typ. on both axes (**60°/s<sup>2</sup> in option**)
- Pointing accuracy: ± 0.04° (in manual mode)
- Optical encoders: 13 bits (**16 bits in option**)

#### Environmental

- Storage temperature: -35° to +70°C
- Operating temperature: -30 to +50°C (outdoor), extended range in option.
- Rain: up to 50 mm/hour
- Relative humidity: 0 to 100% (outdoor)
- Operating wind load: 90 km/h
- Survival wind load: 144 Km/h (**Up to 210 Km/h in option**)

#### Mechanical

- Antenna dimensions: 2.4 m
- Total weight (pedestal and dishes): < 290 kg
- Color (antenna and pedestal): RAL9003 (white) or other upon request.

#### Electrical

- Power supply: through Control & Servo Power Rack
- Pedestal peak consumption: 220 VAC, 50 Hz, 1.6 kVA

#### OPTIONS:

Video system installed at the back of the dish.  
Optical encoders: 16 bits  
Electronic compass & electronic spirit levels  
Zenith Pass

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## ANTENNA CONTROL UNIT (ACU)

The dedicated software, through the color display, provides a user friendly interface (see below non contractual example of ACU screen).

The software can easily be customized for user's needs.  
Touch screen with integrated PC in option

## MONITORING INFORMATION available through the PC Man-Machine Interface

- Elevation and Azimuth pedestal angles
- Selected operating mode
- Tracking signal level (when Auto-tracking mode is active)
- Tracking errors
- Transmit polarization in operation
- Alarms
- Logbook : events (El, Az, Time, antenna speed, received signal level, tracking errors, operating modes...) are recorded with 50ms step.



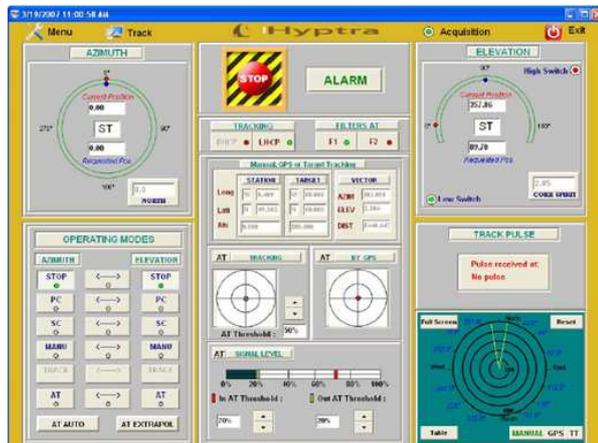
## OPERATING MODES available through the PC Man- Machine Interface

Elevation and Azimuth axes are independent :

- **STOP** : Stop on El. and Az. ; brakes are switched on
- **MANUAL** : El. and Az. axes reach the angular positions received through the PC (0 to 360° with 12 bits ; step = 0.0 8°)
- **SLEW** : El. and Az. axes speed adjustment(-20 to +20% with 8 bits ; step = 0.16°/s)
- **AUTO-TRACKING**: manual or automatic (with tracking error angle criteria or HF signal level criteria)
- **GPS** : The ACU elaborates El. and/or Az. angles through the target GPS information received by RS232 or TCP/IP link under **NMEA 0183 standard**. The target range is calculated by the ACU and displayed on the screen.
- **SLAVE (option)**: The ACU elaborates El. and/or Az. angles through the SLAVE information received by TCP/IP link.
- **MEMORY TRACK (with AT mode)**: as back up mode in case of auto-tracking lost. When auto-tracking is lost, the antenna continues traveling of Az and El with extrapolated speed.
- **SEARCH (option)**: searching around current antenna location (spiral scan)
- **PROGRAM TRACK (option)**: Tracking following a predicted trajectory download from computer.
- **ZENITH PASS (option)**: Automatic management of zenith-pass in Auto-Tracking mode.
- **PRESET** : Up to 10 El. and Az. angles can be stored
- **SURVIVAL** : El. 90°, brakes applied on El. and Az.
- **INITIALIZATION** : The ACU calculates the correction to be applied according to the electronic spirit level and compass information.
- **AUTOTRACKING SUPPORTED BY GPS (with AT mode)**: When GPS data from aircraft are available, the operator through the Man Machine Interface, can follow the aircraft and locates the aircraft into the 5 dB antenna pattern.

Starting in AutoTracking mode, if for any reason, the aircraft reaches this " 5 dB circle" then the antenna will automatically switch to GPS tracking mode.

Then when antenna will cross the 2 dB circle on its way back, the antenna will switch automatically in Auto-Tracking mode.



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