S + C bands 2.4 m ANTENNA
&
ANTENNA CONTROL UNIT

Hyptra
An AA Group Company

Tracking Down Excellence

DESCRIPTION

This station is designed for signals Receive in the **S+C** frequency bands.

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 & LHCP including 0.7 dB NF LNA, and filters.

Target 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 S+C Tracking Receiver.

In option the feed can be equipped with one **Acquisition-Aid Antenna** mounted directly at the rear of the main antenna feed.

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.

- Antenna Drive Unit composed of three drawers: the microcontroller drawer, the power supply drawer and the servo power drawer.

- Antenna Control Unit (PC under Windows)

SPECIFICATIONS

TM antenna

- Type: 2.4 m dish with primary feed (Single Channels Monopulse)

- Frequency bands:2200-2400 MHz (S band)
                 : 5090– 5250 MHz (C band)

- G/T: 8.4 dB/K@ 2300 GHz and 15° Elevation angle and 23°C
     : 13.4 dB/K@ 5170 MHz and 15° Elevation angle and 23°C

- Polarization: RHCP and LHCP

- 3 dB beamwidth: 3.8°typ. @ 2.3 GHz

- 3 dB beamwidth: 1.6°typ. @ 5.17 GHz

- V.S.W.R < 1.5

- Side lobes: < 17 dB

Pedestal

- Type: Elevation over Azimuth

- Elevation range: -5°to +90°or –5°to +185°(in option)

- Azimuth range: unlimited (continuous rotation with rotary joint/slip ring assembly)

- Rotation speed max.: ≥ 25°/s on both axes

- Acceleration max.: ≥ 30°/s ^{2} typ. on both axes

- Pointing accuracy: ± 0.005°(in manual mode)

- Tracking accuracy: 0.15°at 25°/s

- Optical encoders: 16 bits

Environmental

- Storage temperature: -40°to +70°C

- Operating temperature: -30°C 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): < 650 kg

- Color (antenna and pedestal): RAL9003 (white) or other upon request.

Electrical

- Power supply: 220—230 VAC, 50—60 Hz

- Pedestal peak consumption: 1.5 KVA

OPTIONS:

- Omni directional antennas for far field or zenith pass operating
- Video/IR system installed at the back of the dish.
- Electronic compass & electronic spirit levels
- High antenna travel speed & acceleration
- Acquisition-Aid Antenna
- Dry air pressurization unit for pedestal and feed

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

<u>MONITORING INFORMATION available through the PC Man-Machine Interface</u>

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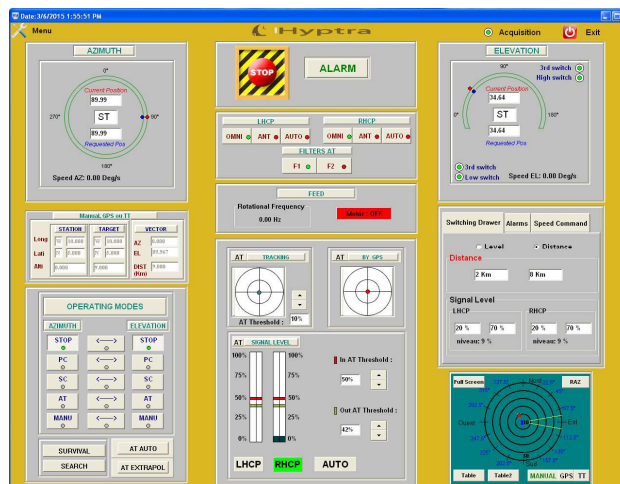

<u>OPERATING MODES available through the PC Man- Machine Interface</u>

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
- **SLEW** : El. and Az. axes speed adjustment(-25 to +25°/s 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.
- **Acquisition-Aid Antenna (option)**: manual or automatic selection between the main antenna and the Acuisition-Aid Antenna.
- **PRESET** : Up to 100 El. and Az. angles can be stored
- **SURVIVAL** *(STOW)*: 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.