



Avionics

WDL-45/X - WBDL LOS WIDE BAND DATA LINK LINE - OF - SIGHT IN KU BAND

The WBDL LOS is an avionics wireless communication system for downlink streaming of broadband ISR data (Intelligence, Surveillance, Reconnaissance e.g. Synthetic Aperture Radar, high resolution digital video, analog video) and two-way transmission of Ethernet TCP/IP data, sensor control, mission control and ATC voice.

INTRODUCTION

Operational applications of the WBDL LOS span through a wide range of manned and unmanned platforms, including tactical UAVs, High and Medium Altitude - Long Endurance UAVs (HALE / MALE), Helicopters and other ISR platforms.

The WBDL LOS product operates in the Ku radio band (15 GHz). However its modular design supports customizations to other radio bands, e.g. the C band (5 GHz).

The WBDL System is composed of an Airborne Data Terminal (ADT) and one or more Ground Data Terminals (GDT), and operates in line-of-sight conditions at very long ranges by means of two-axis directional antennas automatically tracking the aircraft motion.

KEY POINTS

The WDL-45/x product family includes two versions. The WDL-45/S version complies with NATO STANAG 7085 Edition 3; the non-NATO version (WDL/45E) operates a Selex ES proprietary radio protocol for non-NATO customers.

All versions rely on robust and secure digital waveforms, with data rates up to 45 Mb/s in downlink and 2 Mb/s in uplink. Strong FEC techniques, configurable data rates and Spread Spectrum waveforms improve the operational ranges and robustness of communication services.

High-gain directional antennas on board and on ground are automatically controlled, tracking aircraft route and attitude changes. The ADT processes in real time the aircraft Navigation data, the GDT also implements monopulse tracking technique, ensuring fast link setup and dynamic antenna control.

The Ground Data Terminal includes a remote Interface Unit, which may be installed up to 1.5 km away from the tracking antenna (via optic fiber cable) for additional protection of the operators and the control station.

TECHNICAL SPECIFICATIONS

Modes

- Point-to-Point
- Broadcast (with omnidirectional antenna at the aircraft)
- Multi-user: advanced Uplink waveform with multiple GDTs
- Relay mode: provision, implemented on request.

Range (including fade margin)

- Standard configuration
 - 200km in point-to-point mode @ 44.73Mb/s
 - 50km in broadcast mode @ 10.71Mb/s
- Optional High-end configuration (with additional airborne RF amplifier and larger ground antenna):
 - 300km in point-to-point mode @ 44.73Mb/s
 - 200km in broadcast mode @ 44.73Mb/s

Operational Frequency Bands

- Downlink 14.40 - 14.83GHz
- Uplink 15.15 - 15.35GHz

Bit Rates

- Downlink from 10.71Mb/s to 44.73Mb/s
- Uplink from 200kb/s to 2Mb/s
- Uplink 100kb/s in Multi User mode

Standards

- WDL-45/S: STANAG 7085 Ed. 3
- WDL-45/E: Selex ES proprietary non-NATO waveform

TRANSEC & COMSEC

- DSSS Direct Sequence Spread-spectrum (uplink)
- Directional antenna beams
- AES-256 embedded encryption

Antenna Tracking

- Automatic, based on aircraft Navigation data and monopulse techniques

Interfaces

- 3 Gbit Ethernet
- 2 Serial I/O interfaces for low latency C2 reserved data.
- 1 Air Traffic Control analog audio and PTT relay, two ways
- 1 Analog video input PAL / NTSC with H.264 compression
- 3 Serial Aircraft Navigation data inputs at the ADT
 - MIL-STD-1553B
 - ARINC 429 option
 - RS-422 (Navigation or GPS)



ADT Dimensions

- ADT Transceiver: 3/8 ATR Short i.a.w. ARINC 404A
- Omni antenna: 55mm x 135mm x 80mm (WxDxH)
- Directional Antenna: 210mm x 210mm (Ø x Height)
- Other antenna options are available.

GDT Dimensions

- Remote Interface Unit: 300mm, 460mm, 120mm (WxDxH).
- Antenna with Tripod: 2.30m x 2.35m (Ø x Height).
- Antenna dish Standard Ø 1.2m, High End Ø 2.0m.

ADT Weight

- ADT Transceiver: 6kg
- High Gain steerable Antenna Unit: 6kg

GDT Weight

- Remote Interface Unit: 10kg
- Antenna: 130kg

Power

- ADT: 200W, 28VDC
- GDT: 1kW peak, 100W at remote Interface Unit. 220VAC

Environmental

- ADT i.a.w. RTCA DO-160F, MIL-STD-461F
- GDT i.a.w. MIL-STD 810F, MIL-STD-461F
- Wind: max 80km/h speed at GDT

Safety

- RTCA DO-178C, level "D"