

# DME signal analyzer: compact, fast, versatile and precise

Precise and reliable navigation and flight approach systems are vital to ensuring international aviation safety. The associated DME and TACAN systems must be continuously tested and maintained. Tailor-made for carrying out such tasks are “specialists” such as the compact R&S®EDS300 DME/pulse analyzer, which features extremely high sensitivity and measurement accuracy.

## Robust, compact and modular – for mobile and stationary applications

The R&S®EDS300 DME/pulse analyzer (FIG 1) is a digital test receiver featuring a robust and compact design. It was developed for stationary applications, but is especially suited for mobile measurements and installation into test vehicles and flight inspection systems. The modular structure provides a high degree of flexibility when adapting the analyzer to the task at hand. For instance, it can be enhanced with up to three additional receiver modules for flight inspection applications. Additional applications, such as TACAN analysis, are available after installation of a software option.

The R&S®EDS300 is a standalone, remote-controlled monitoring system that can be deployed for the continuous monitoring and recording of navigation signals. It features an external hard disk port for recording large volumes of data. Together with the R&S®EVS300 ILS/VOR analyzer, the R&S®EDS300 can analyze virtually the entire signal spectrum encountered in terrestrial flight navigation (FIG 2).

## Speed and accuracy are not mutually exclusive

Analyzing pulse amplitude, shape and position with maximum input sensitivity in multiple channels at the same time demands tremendous processing power. The R&S®EDS-K2 software option for DME pulse shape analysis provides intelligent algorithms that accelerate the processing of the measurement results, enabling the R&S®EDS300 to identify and accurately measure the levels of up to ten different DME stations within one second in multichannel operation (FIG 3).

## Complete TACAN signal measurements

The R&S®EDS-K1 software option for TACAN analysis expands the analyzer to include measurement functions for completely analyzing signals from TACAN stations, making it ideal for commissioning and service tasks. The analyzer measures the modulation depth and modulation frequency of the 15 Hz and 135 Hz signal components and derives the azimuth by detecting main and auxiliary reference bursts.

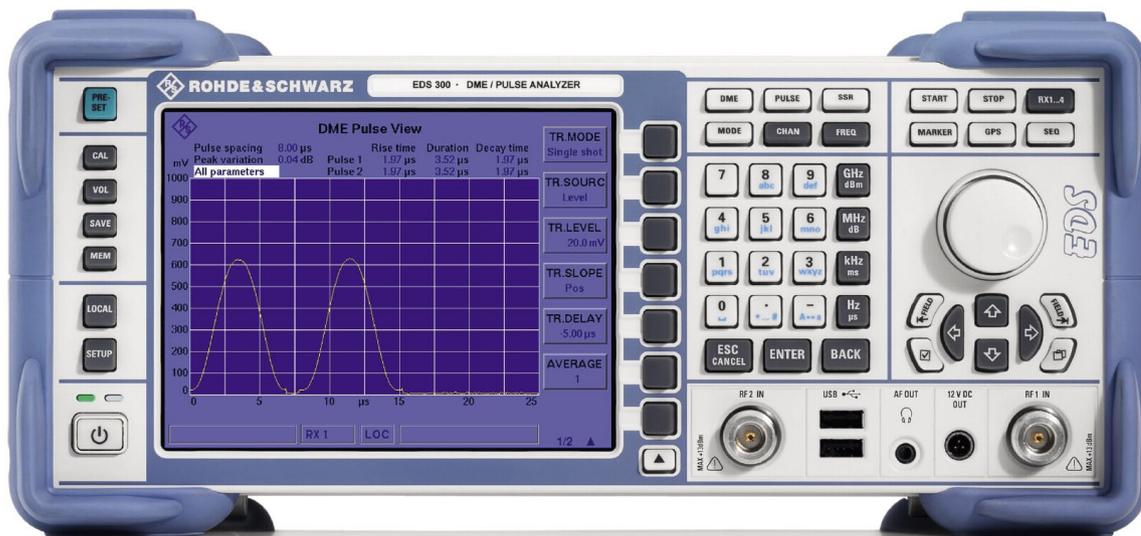


FIG 1 The compact R&S®EDS300 is also ideal for mobile measurements and for installation into test vehicles and flight inspection systems.

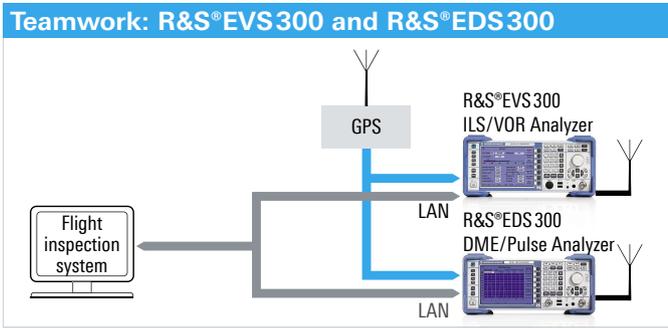


FIG 2 Integration of the R&S®EDS300 and the R&S®EVS300 into a flight inspection system.

### Integration into existing flight inspection systems

The R&S®EDS300 features trigger inputs for integration into existing flight inspection systems. Plus, it can synchronize to a time server connected to a flight inspection system. Use of the GPS time stamp (R&S®EDS-K3 option) ensures the precise linking of the measurement value and the recording position. The analyzer can be completely remote-controlled via the TCP/IP protocol. This allows the R&S®EDS300 to be individually adapted to any existing architecture and a variety of operating systems.

### Customer-specific requirements and enhancements

The R&S®EDS300 can be adapted to existing systems or expanded to meet individual customer requirements at any time, such as the integration of an interrogator for carrying out distance measurements. The Rohde&Schwarz Service Center in Cologne has a team of specialists available to help in these situations.

Gabriele Hanke

#### Condensed data of the R&S®EDS300

Frequency range 960 MHz to 1215 MHz  
 Dynamic range -90 dBm to -10 dBm

#### DME

Pulse shape (rise time, pulse duration, decay time)

Resolution 0.01  $\mu$ s  
 Deviation < 0.1  $\mu$ s

Pulse spacing

Resolution 0.01  $\mu$ s  
 Deviation < 0.05  $\mu$ s

#### TACAN (optional)

Bearing

Resolution 0.01°  
 Deviation < 0.2°

Modulation depth (0 % to 50 %)

Resolution 0.01 %  
 Deviation < 0.5 %

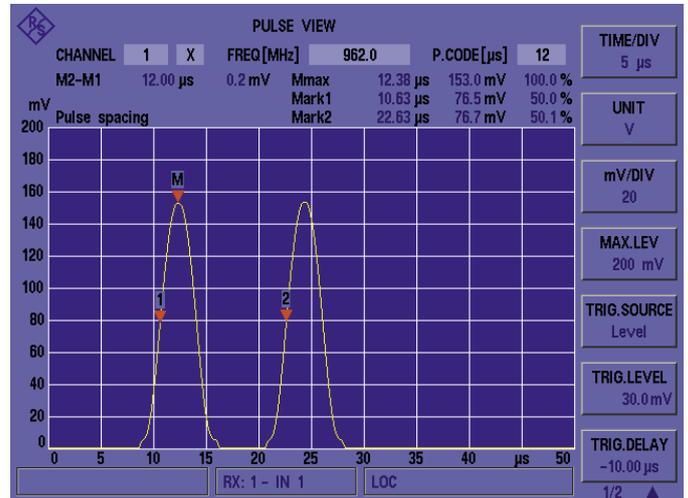


FIG 3 The R&S®EDS-K2 software option for DME pulse shape analysis.

#### Highlights of the R&S®EDS300

- Compliance with ICAO Doc. 8071, ICAO Annex 10
- High input sensitivity of -90 dBm
- Excellent immunity to interference (within and outside of the useful band)
- High-precision level measurements (up to ten DME channels per second)
- Measurement of DME/N and DME/P systems
- Analysis of stationary and mobile TACAN stations
- Diverse synchronization capabilities (GPS, trigger and remote control)
- LAN interface for remote control of all functions and for measurement data output
- Wide operating temperature range from +5 °C to +40 °C
- Low weight (< 7 kg); high degree of mechanical durability
- Analog output for additional analysis of received signals in the baseband
- Analysis of external baseband signals
- Built-in test (BITE)
- RS-232-C and USB ports for GPS receivers (NMEA)
- USB port for simple data export and software updates

#### Abbreviations

- DME Distance measurement equipment
- DME/N DME narrow spectrum characteristic standard (DME method used almost exclusively in civil aviation for distance measurement)
- DME/P DME precise (more precise DME method that is seldom used at present)
- ICAO International Civil Aviation Organization
- TACAN Tactical air navigation (military DME variant that also allows to the azimuth direction to be determined)
- VOR VHF omnidirectional radio range (navigation aid for determining the azimuth direction)