



Data Radio Device for ETCS Purpose

EDOR-5E

RIU-ETCS – Funkwerk’s mobile solution for ETCS applications – in the standard version provides fully independent radio units EDOR-5E with state-of-the-art GSM-R mobile terminal MT5-E (8 watt) in combination with the integrated wide-range power supply covering the range of 24 to 110 V onboard voltage.

The EDOR-5E is compliant to latest specification for improved receiver parameters ETSI TS 102 933 V2.1.1.

The EDOR-5E modules can be equipped with or without a **data logger** (EDOR-5E or EDOR-5E/D-LOG). The data logger is designed for raw data collection of the trace data from the fixed MT5-E radio modules inside the RIU-ETCS.

One or up to four modules EDOR-5E are contained in a approved and certified 19" standard rack.

The GSM Bearer Services BS24, BS25 and BS26 (GSM 02.02) are accessible via the RS422 data interface on the front of each mobile termination. For this application transparent GSM data services are used. (GSM 04.22).

ETCS:

On an initiative of the EC, European Railways have introduced ETCS (European Train Control System) as the unified control system for train command and control for high speed traffic. This standard shall insure European interoperability with high reliable and safe operation, economic operation and increased speed and track capacity besides many other operational and technical benefits.

ETCS Level 1 is an overlay of the existing signalling systems with Eurobalises and track circuits. Levels 2 and 3 are supported via the GSM-R data communication.

The on-board equipment for level 2/3 requires in minimum two radio subsystems for GSM-R data calls independent to the GSM-R voice communication system.



Technical Data

| Power Supply | | Dimensions + Weight EDOR-5E | |
|---|--|--|-------------|
| Nominal battery voltage range | 24 V to 110 V | Height | 129 mm (3U) |
| Tolerances | 16.8 to 137.5 V | Width | 86 mm |
| Supply type | floating | Mounting depth | 185 mm |
| Stand-by power Idle Mode | 3.5 W | Weight | 1.5 kg |
| Maximum power GSM Mode | 10.3 W | | |
| GPRS Mode | 15.6 W | | |
| Connector | Phoenix PSC 1.5 / 5-M-PE protection class 1 | | |
| Environmental Conditions | | | |
| Operating temperature | -25 to +70°C (EN 50155) T3 | | |
| Storage temperature | -40 to +85°C | | |
| Radio Interface | | | |
| Frequency range | ER-GSM: TX 873-915 MHz RX 918-960 MHz ARFCN: 940-1023, 0-124 | | |
| Power transmission | 8 W GSM Class 2 | | |
| Reference sensitivity | -104 dBm typically | | |
| Antenna connector | TNC female, 50 Ω | | |
| Multi-slot class 10 | CS-1, CS-2, CS-3, CS-4, MCS5-MCS9 | | |
| Data Interfaces | | | |
| User (DATA) | V.24 / V.11 (RS422) | | |
| Service | V.24 / V.28 (RS232) | | |
| GSM Bearer Services | | | |
| According GSM 02.02 (ETS 300 501) | Transparent according to GSM 04.22 (ETS 300 053) | | |
| BS24 Asynchronous data 2.4 kbit/s | BS25 Asynchronous data 4.8 kbit/s | | |
| BS26 Asynchronous data 9.6 kbit/s | BS70 GPRS E-GPRS (EDGE) | | |
| Supplementary Services | | | |
| CLIP, CoLP, UUS1, eMLPP | | | |
| Others: OTDI, cOTDI, USSD, CLIR, CoLR, CFU, CFB, CFNRy, CFNRc, CW, HOLD, MPTY, CUG, AoCI, AoCC, BAOC, BOIC, BOIC-exHC, BAIC, BAIC-Roam | | | |
| additional Funkwerk specific functions, e.g. acceleration network search | | | |
| Datalogger Interfaces | | | |
| 3 x 5-pole M9 connector | GPS / Trace / ODO | | |
| 4-pole M12 connector | Ethernet connector | | |
| Miscellaneous | | | |
| Internal ARM based processor system | SW coded on Linux Ope- ration System | 2 GB internal data me- mory on datalogger | |

The diagram shows the front view of the EDOR-5E / DLOG device. It is a rectangular unit with a height of 128,4 mm (3 HE) and a width of 86,02 mm (17 TE). The top edge features several connectors and components: a TNC antenna connector (labeled Rx), a SIM card slot, a GPS In connector, a Trace 2 connector, an ODO connector, and an ETH connector. The bottom edge has a PS connector and a RS422 connector. The device is labeled 'EDOR-5E / DLOG' at the top center. The diagram also shows mounting holes and a warning symbol (a triangle with an exclamation mark) near the RS422 connector.

