



RIU-ETCS with max. 4 EDOR5-E modules  
(2 x with and 2 x without data logger)

## Data Radio Device for ETCS Purpose

### RIU-ETCS 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 software of the radio module is based on the Release 04 GSM standard for operating in GPRS or EDGE mode.

### 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	132 mm (3U)
Tolerances	16.8 to 137.5 V	Width	483 mm
Supply type	floating	Mounting depth	190 mm
Stand-by power Idle Mode	3.5 W / set	Weight	7.5 kg (RIU-ETCS 5E - fully equipped)
Maximum power GSM Mode	10.3 W / set		
GPRS Mode	15.6 W / set		
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		Configuration	
Frequency range	ER-GSM: TX 873-915 MHz    RX 918-960 MHz ARFCN: 940-1023, 0-124	<b>with data logger(s):</b>	
Power transmission	8 W -2 / +2 dB                  GSM Class 2	RIU-ETCS 5E/1MT/1DLOG => 1 modul EDOR-5E/DLOG	
Reference sensitivity	-104 dBm typically	RIU-ETCS 5E/2MT/2DLOG => 2 module EDOR-5E/DLOG	
Antenna connector	TNC female, 50 Ω	RIU-ETCS 5E/3MT/3DLOG => 3 module EDOR-5E/DLOG	
Multi-slot class 10	CS-1, CS-2, CS-3, CS-4, MCS5-MCS9	RIU-ETCS 5E/4MT/4DLOG => 4 module EDOR-5E/DLOG	
Data Interfaces		<b>without data logger(s):</b>	
User (DATA)	V.24 / V.11 (RS422)	RIU-ETCS 5E/1MT => 1 modul EDOR-5E	
Service	V.24 / V.28 (RS232)	RIU-ETCS 5E/2MT => 2 module EDOR-5E	
		RIU-ETCS 5E/3MT => 3 module EDOR-5E	
		RIU-ETCS 5E/4MT => 4 module EDOR-5E	
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			
<b>Others:</b> 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 Operation System	2 GB internal data memory on datalogger	