FUNKWERK FRMCS GATEWAY - FGW-2

HIGHLIGHTS AND TECHNICAL INFORMATION

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The next generation of cab radios will be based on FRMCS technology and, as a first step, will use a data transmission system that has an extremely high bandwidth and remarkably low latency. In addition, the Security and reliability will be improved through the use of private and commercial 5G networks. Based on its many years of expertise in GSM-R, analogue train radio and LTE-based radio modules, Funkwerk has developed a 5G gateway with a processor unit for the next generation of train communication.

In the gateway concept, the mobile radio interfaces are implemented using integrated modem modules that comply with common industry standards for form factors and interfaces. This ensures not only the already existing support of various mobile radio systems and frequency bands, but also outstanding future viability and flexibility. For example, this ensures that the **FGW** can also meet future requirements in global use and can easily integrate certified FRMCS modems as soon as they are available. Radio module variant **FGW-2**: 3x 5G (optional 2x 5G, 1x 2G/3G/4G)

HIGHLIGHTS

- Supports a multitude of 5G and LTE bands
- Wide range power supply from 24 to 110 VDC
- High-performance Quad-Core Arm® Cortex® CPU
- Patchable embedded operating system based on Linux
- Container-based application framework, open for thirdparty applications
- Integrated FRMCS clients for the connection of vehicle systems to the FRMCS network
- Support of various vehicle interfaces and protocols
- Standardised modems exchangeable (FRMCS)

TECHNICAL DATA

DIMENSIONS & WEIGHT

CONSTRUCTION	enclosed housing
HEIGHT	150 mm
WIDTH	142 mm
DEPTH	207 mm
WEIGHT	max. 2.5 kg

POWER SUPPLY

INPUT VOLTAGE	24 V bis 110 V DC (tolerances according to EN 50155)
INTERRUPTION	S1 (no interruption) according to EN 50155
TOLERANCES	according to DIN EN 50155
MAXIMAL POWER CONSUMPTION	2 A an 24 - 110 V
TYPICAL POWER CONSUMPTION	< 20 W

FIRE PROTECTION PROPERTIES

EN 45545-2	HL3
EN 45545-5	OC1 to OC4

ENVIRONMENTAL CONDITIONS

PROTECTION CLASS	IP20 according to EN 60529
VIBRATION AND SHOCKS	according to 50155
EMC	according to EN 50121-3-2 and EN 50155

CLIMATIC CONDITIONS

OPERATING TEMPERATURE RANGE	-25 °C to +55 °C
STORAGE TEMPERATURE RANGE	-40 °C to +70 °C
MAXIMAL GRADIENT	± 1 °C/min of ambient temperature
MAXIMAL HUMIDITY	75 % in annual average
RELATIVE HUMIDITY	95 % on max. 30 days per year
ALTITUDE AND PRESSURE FLUCTUATION	- 100 m to 1.800 m above sea level

INTERFACES

POWER SUPPLY	Multi-purpose digital I/O
DUAL-SIM (STANDARD/ESIM)	11 x antenna (3G/4G/5G + GPS)
SD EXTENDED CAPACITY (SDXC™)	2x Gigabit Ethernet (Standard IEEE 802.3 from 1000BASE-Tx)
GPS, GLONASS, BEIDOU, GALILEO	

FREQUENCY BANDS

5G	5G NR: 3GPP Release 15 NSA/SA operation, Sub-6 GHz 5G NR NSA: n38/n41/n77/n78/n79 5G NR SA: n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48*/n66/n71/n77/n78/n79 MIMO:DL: 4 × 4 MIMO on n1/n2/n3/n7/n25/n38/n40/n41/n48/n66/n77/n78/n79 UL: 2 × 2 MIMO on n41/n77/n78/n79
LTE	LTE Category: DL Cat 16/ UL Cat 18 LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29/B30/B32/B66/B71 LTE-TDD: B34/B38/B39/B40/B41/B42/B43/B48 LAA: B46 DL 4 × 4 MIMO: B1/B2/B3/B4/B7/B25/B30/B32/B34/B38/B39/B40/B41/B42/B43/B48/B66
UMTS	WCDMA: B1/B2/B3/B4/B5/B8/B19
GNSS	GPS/GLONASS/BeiDou (Compass)/Galileo

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