



TURNING TECHNOLOGY INTO SOLUTIONS

GSM-R 900MHz Digital Fiber Optic Repeater System

Feature Model No: DFBDA-GSM-R-900-40W55



Features

- Supports GSM-R with 40dBm downlink composite power at each remote unit
- Comply with Railway Telecommunications (RT); ER-GSM frequencies; Part 1: ER-GSM additional radio aspects, ETSI TS 102 281 V3.0.0 (2016-02)
- Digital fiber optic technology enduring stable performance
- Energy-efficient design, power saving, user friendly GUI & plug and play installation



Introduction

The GSM-R Fiber Optic Repeater is the equipment for the network optimization in the mobile network that can enlarge the BTS coverage. It is widely used in the shaded area, high traffic load area and the pilot pollution area, etc.

Working Principle

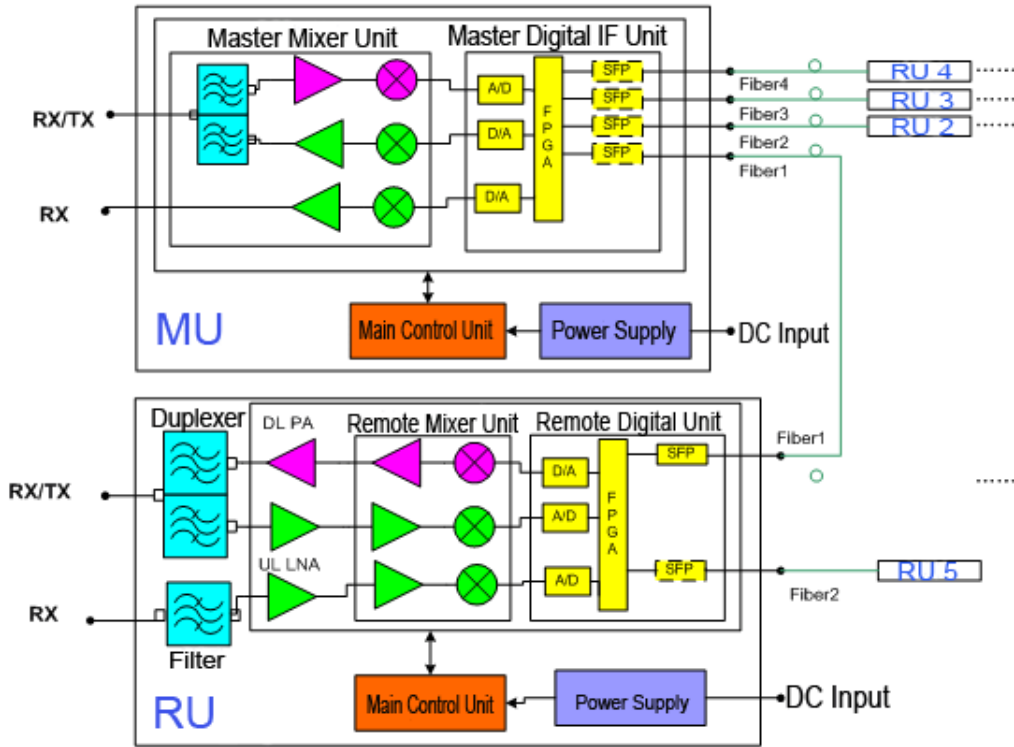
The master unit of TX/RX receives the downlink (DL) signal from BTS through the DL Amplifier and Input Power Detection. The RF signal is converted to IF signal by using a mixer. The IF signal is transformed into digital signal by digital module, which uses special technology of D/A conversion, digital down-conversion and digital filtering. The digital optical signal is transmitted via Master optic unit and its fiber to the Remote unit, in which digital optical signal is converted back (Digital filtering, digital Up-conversion and A/D conversion) to RF signal via remote unit. The RF signal is then amplified in the DL-AMP (Amplifier) and PA (Power Amplifier) to meet a required output power level and then to remote DL filter and transmit at port of "To Service (TX) port". The Uplink RF signal of the mobile terminals in the coverage area is connected via an antenna port and is filtered by duplexer and amplified by the ULNA (Uplink Low Noise Amplifier). Same as in the Downlink path, using a mixer to convert the UL RF signal to IF signal, which is converted to digital optical signal by using technologies of D/A conversion, digital down-conversion and digital filtering. The digital optical signal is then transmitted via master optic unit and fiber to remote unit, in which optic signal converted back to RF(Digital filtering , digital Up-conversion and A/D conversion) signal then amplified , flittered by the UL AMP (Amplifier) and duplexer, after all processing stages, the signal are to be transmitted at via the donor/ Rx Port.

The main controlling panel (PCM) of the master and remote units is controlling their modules and communicate with each other via the data link of the optic modules. User can inquire and set the parameters by LOC (local monitoring) interface on the master/remote unit. and user also can do in the OMC (Operation and Maintenance Center) by IP network. Power supply unit - supplies power to all the active modules and in charge of charging battery.

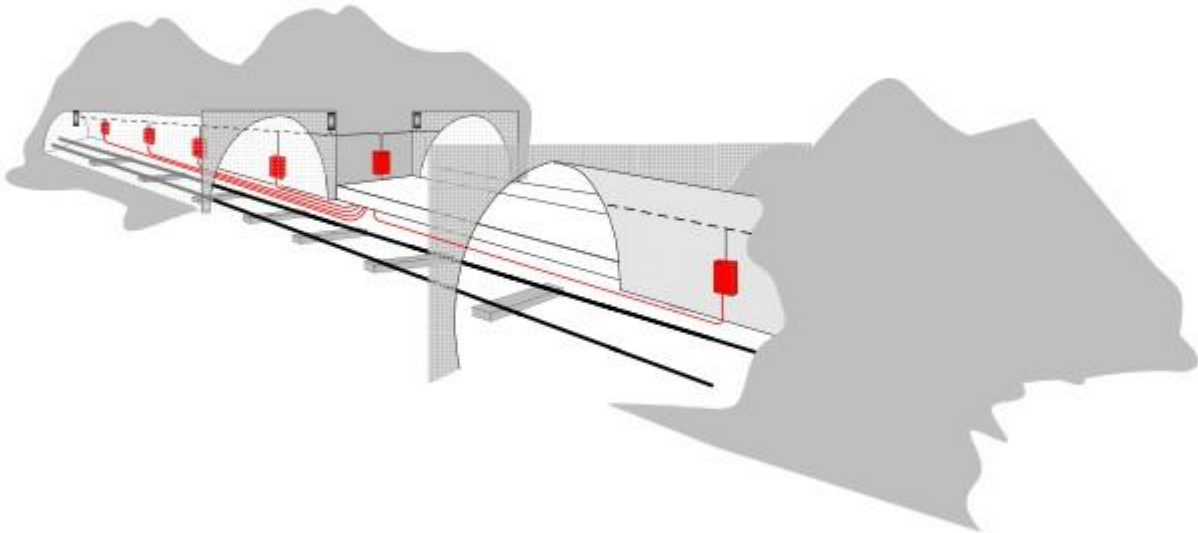
EMTS Telecom Services offers a comprehensive portfolio of enhanced coverage solutions for the Wireless Networks, Based on advanced technologies. **EMTS** proven, indoor and outdoor solutions solve a wide range of network challenges including interference and oscillation problems, challenging coverage holes, rapid response deployment and inadequate in-building coverage. Regardless of the technology or frequency, **EMTS** can provide customized coverage solutions that address any combination of unique and complex network needs for the Wireless Networks.



System Diagram:



System Applications



About EMTS Telecom Services Ltd.:

EMTS is a leading supplier of high-quality RF coverage solutions designed to maximize wireless network coverage in difficult RF environments and complex settings. The company specializes in extending RF radio coverage to rural areas, office buildings, subways, tunnels and shadowed areas. The EMTS coverage solution supports all major mobile technologies and standards of wireless Networks.



Electrical Specifications:

| Item | Downlink | Uplink |
|---|---|--|
| Frequency Range Or any partial bandwidth | Type A: 918–925MHz Type B: 930–934MHz | Type A: 873–880MHz Type B: 885–889MHz |
| Gain (Max.) | 55±3dB | 50±3dB |
| Output Power (Max.) | 40dBm±1dB (10W) | 0dBm±1dB |
| Gain adjustable range/step | ≥30dB/1dB | |
| Gain Adjustable Error | Gain adjustable range is 0-20dB, error≤±1dB; ≥21dB, error≤±1.5dB | |
| ALC | When adding ≤10dB at max. output level, output variation ≤±2dB, when adding >10dB, output variation ≤±2dB or turnoff. | |
| VSWR | ≤1.5 | |
| Ripple in Band | ≤3.0dB | |
| Group delay | Repeater delay: ≤18μs(One with one, Fiber optical pigtail 1m); System delay: ≤25μs(One with six, Fiber optical pigtail 1m); Delay compensation range: ≥100μs automatic or manually compensation; Delay calibration step: ≤1μs; | |
| ALC | When adding ≤10dB at max. output level, output variation ≤±2dB, when adding >10dB, output variation ≤±2dB or be off. | |
| Noise Figure | <5dB (only for uplink) | |
| Out-band gain | ≥400kHz | ≥56dB |
| | ≥600kHz | ≥60dB |
| | ≥1MHz | ≥60dB |
| | ≥5MHz | ≥65dB |
| IMD | In-Band | ≤-45dBc |
| | Out-Band | 9kHz-1GHz≤-36dBm/100kHz |
| | | 1GHz-12.75GHz≤-30dBm/1MHz |
| Spurious emission | 9kHz-1GHz≤-36dBm/100kHz | |
| | 1GHz-12.75GHz≤-30dBm/1MHz | |
| Blocking | F1 -20MHz-F1-2.5MHz: -40dBm/ GSM signal | |
| | F2 +2.5MHz-F2+20MHz: -40dBm/ GSM signal | |
| | 100kHz-F1-20MHz: 0dBm/ CW signal | |
| | F2+20MHz-12.75GHz: 0dBm/ CW signal | |
| | 1805MHz-1880MHz (Except1800MHz Downlink) | |
| | 1880MHz-1920MHz / 2010MHz-2025MHz / 2110MHz-2170MHz / 2300MHz-2400MHz / 2400MHz-2483.5MHz / 2500MHz-2690MHz / 3300MHz-3600MHz / 806MHz-835MHz: 0dBm/ CW signal | |
| | 1880MHz -1920MHz/1920MHz-1980MHz: 0dBm/ CW signal | |

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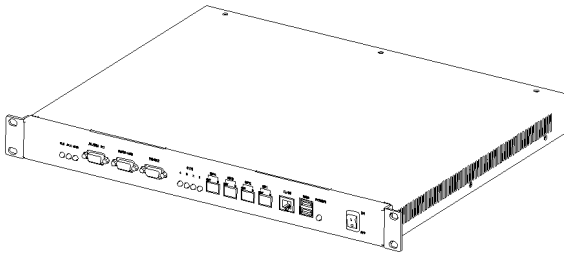
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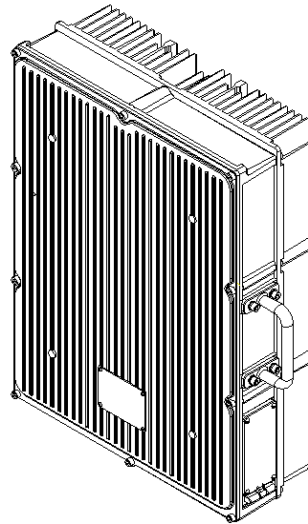
Mechanical Specifications

| | | |
|------------------------|--|---------------------------|
| Power Supply | Master unit: DC -48V±9.6V or AC: 90-270V Remote unit: AC 110V/220V, 45~60Hz or DC -48V±9.6V | |
| Dimension and Weight | Master Unit: 482.6*43.6*365mm, ≤10kg Remote Unit: 520*380*151mm, ≤20kg | |
| Max. Power Consumption | Master Unit: ≤90W | Remote Unit: ≤120W |
| Operating Temperature | Master Unit: 0 to +45°C | Remote Unit: -25 to +55°C |
| Operating Humidity | Master Unit: ≤85% | Remote Unit: ≤95% |
| Environmental Class | Master Unit: IP30 | Remote Unit: IP65 |
| RF Connector | N-Female, 50ohm | |
| MTBF | ≥50000 hours | |
| Monitor Interface | Local Monitor: TCP/IP or RS232, Remote Monitor: TCP/IP or Modem SMS | |

Products outlook:



Master Unit
P/N: FBB-800-L-I



Remote Unit
P/N: FBR-800-40W40-L-I

Note: All specifications subject to change without notice.

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