



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 40 dBm 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.

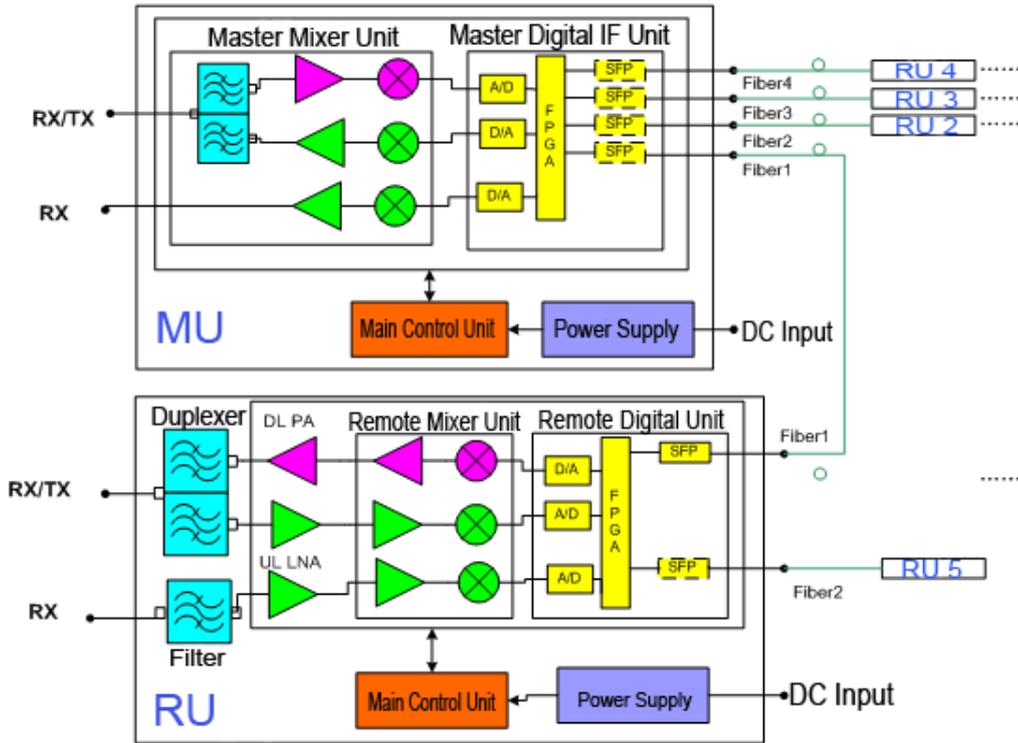
Working Principle

The master unit of TX/RX receives the downlink (DL) signal from BTS through the DL Amplifier and Input Power Detection. The RF signal converts to IF signal by using a mixer. IF signal transform into digital signal by digital module, which has included technologies of D/A conversion, digital down-conversion and digital filtering. The digital optical signal is transmitted via master optic unit and fiber to the remote unit, in which digital optical signal is converted back to (Digital filtering, digital Up-conversion and A/D conversion) RF signal via remote unit. RF signal is amplified in the DL-AMP 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 mobile terminal in the coverage area is entered by the port of the "To Service (TX)", which is filtered by duplexer and amplified by the ULNA (Uplink Low Noise Amplifier). Same as DL, using mixer to convert UL RF signal to IF signal, which convert to digital optical signal by using technologies of D/A conversion, digital down-conversion and digital filtering. The digital optical signal have been 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 being amplified , flittered by the UL AMP(Amplifier)and duplexer, after all processing, the signal are going to be transmitted at port of" RX Port." The main controlling panel (PCM) of master unit and remote unit will control their modules and communicate with each other via the data link of the optic modules. Parameters set 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.

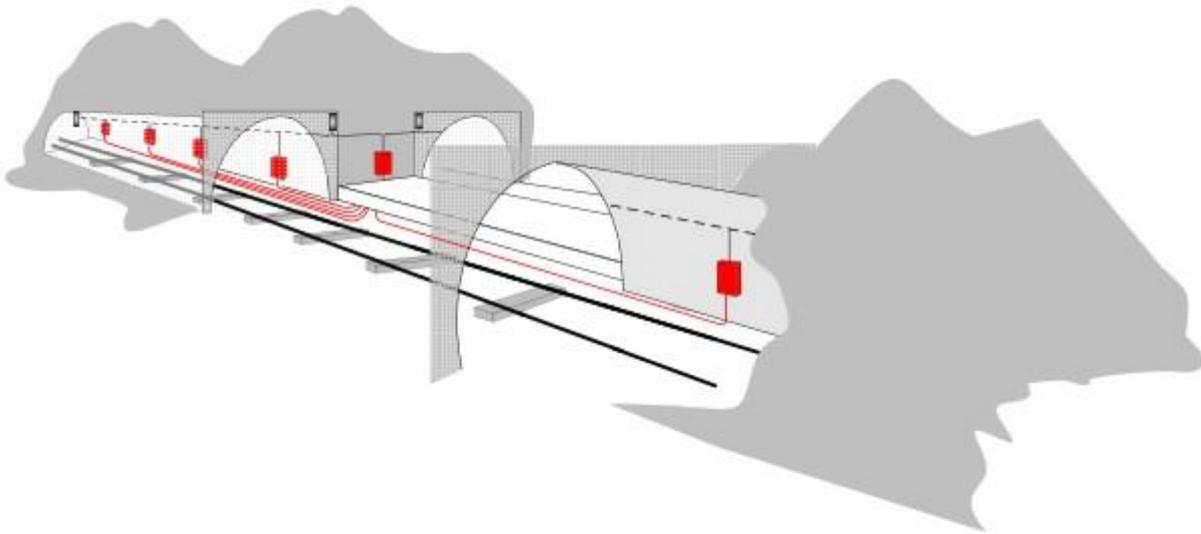
EMTS Telecom Services offers a comprehensive portfolio of enhanced coverage solutions for the Wireless Networks, Based on advanced technologies. **EMTS** proven, indoor and outdoor solutions solve a wide range of network challenges including interference and oscillation problems, challenging coverage 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.

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Note: All specifications subject to change without notice.



Electrical Specifications:

Item	Downlink	Uplink
Frequency Range Or any partial bandwidth	Type A: 918–925 MHz Type B: 930–934 MHz	Type A: 873–880 MHz Type B: 885–889 MHz
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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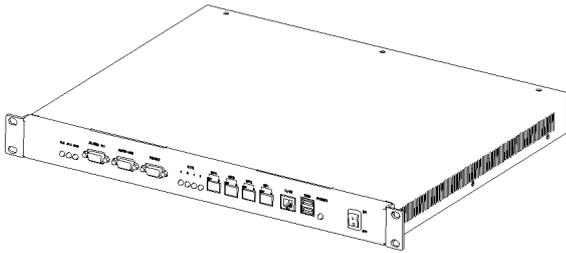
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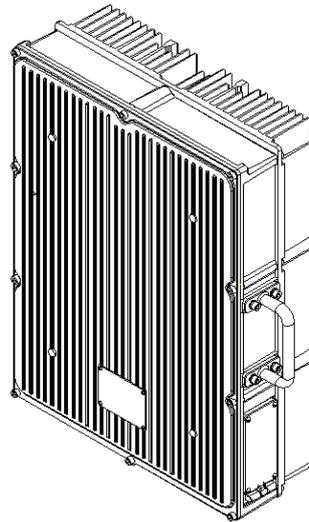
Mechanical Specifications

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

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