FRX-3E Long-Haul Microwave Radio System

This system transports Ethernet services for long-haul, high-capacity wireless backhaul applications.

Flexible, Robust and Scalable Wireless Backhaul

Ultra-High Capacity
Up to 4 Gbps of Ethernet/IP traffic throughput

Industry-Leading Density
Up to 16 channels in a single sub-rack

Flexibility
Wide variety of configurations and high-modularity design to meet virtually any requirement and allow easy system upgrades

The Fujitsu FRX-3E next-generation long-haul microwave radio system provides long reach and high throughput capabilities. It also scales for low capacity applications with an in-service growth path to higher density without having to purchase all of the capacity up front.

The FRX-3E is a reliable, robust and scalable solution for long haul, high-capacity wireless backhaul applications. Designed to meet the ever-growing demands placed on rapidly evolving mobile networks, particularly when those networks must migrate to IP-based transport with the advent of LTE, it features an innovative architecture that makes for very simple user operation. With the FRX-3E you can deploy microwave transmission networks quickly and easily, while providing a cost-effective route for managing both CAPEX and OPEX. Because it is made by Fujitsu, one of the great global names in the microwave radio industry—a name that for more than fifty years has stood for excellence in microwave technology—you can depend on its reliability and robustness in the field.
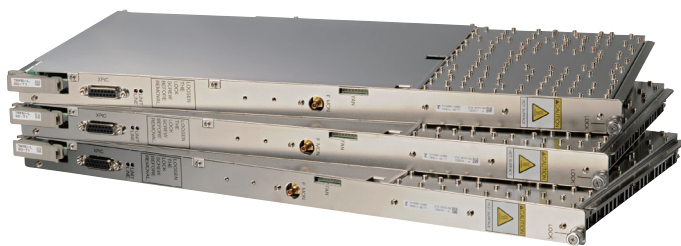
Why FRX-"3E"?

Ecology
Makes your network greener with the very latest environmental solutions

Ethernet
Supports your network migration toward 4G

Economy
Helps you efficiently manage your capital and operating expenditures

Features and Specifications

Input Voltage	–40.5 V to –57.0 V
Power Consumption	1650 W maximum configuration
Temperature	23 °F to 113 °F (–5 °C to +45 °C)
Humidity	5 to 95 % at 86 °F (30 °C)
EMC	FCC Part 15, ICES-003
Environmental Conditions	GR-63-Core equivalent EN 300 019 (Operation Class3.2, Storage Class 1.3, Transportation Class 2.3)
Safety	UL/CE 60950-1/CISPR 22, UL 60825
Radio Frequency	Refer to radio frequency specification table
Electrical	–48 VDC
EU Directives	RoHS, REACH, WEEE
Dimensions	84 x 25 x 10" (2133 x 635 x 254 mm) (7 ft network rack)
Weight	176 lb. (80 kg) in (1+1) configuration
EMS Interface	2 x 10/100Base-T Ethernet, SNMP/HTTP/FTP/TELNET protocols

Frequency Range [GHz]	4, 5, L6, U6, 7, 8, 11, 13 GHz Compliant with ITU-R recommendations
Capacity Range	Maximum 16 RF carriers in a single rack
Radio Frequency Arrangements	ACCP/ACAP/CCDP
Radio Protection Switching Configurations	16 + 0 for Ethernet Radio Protection
Modulation	QPSK/8, 16, 32, 64, 128, 256, 512 QAM with LDPC (Low-Density Parity Check) FEC
Power Control	20 dB by 1 dB step in manual or automatic TPC (Transmit Power Control) mode
Dispersive Fade Margin	50 dB or better (BER = 10^{-6})
XPIC	20 dB typical; 18 dB guaranteed
Diversity	Frequency diversity/RF band diversity/space diversity
Auxiliary Signals	Wayside channels 2.048 Mbps x 2 user channels 64 Kbps x 3 voice-order wire
Housekeeping	16 inputs and 8 outputs
Synchronization	Ethernet: Sync E/IEEE 1588v2
Line Interface	Gigabit Ethernet

Key Features of the FRX-3E

- Native Ethernet transport
- High scalability to accommodate up to 16 RF carriers in a single rack
- Flexible system configurations available to suit various network applications
- Variety of Radio Frequency channel arrangements with powerful XPIC performance
- Optimized Ethernet data speed through Radio Link Aggregation
- Carrier-Class Ethernet features (Link Aggregation, QoS, Ring Protection, Sync, OAM, etc.)
- High system gain (High power transmitter option available)
- Broad range of modulation schemes with LDPC Forward Error Correction
- 20 dB ATPC dynamic range with adjustable maximum Tx power setting
- Low power consumption (200 W in 1+1 system configuration)
- Simple design architecture for easy set-up and maintenance
- User-friendly web interface and SNMP for management connectivity
- NETSMART® 1500 management for alarms

Technical Specifications

System	4 GHz	U4 GHz	5 GHz	L6 GHz	U6 GHz	7 GHz	8 GHz	11 GHz	13 GHz
Frequency Range (MHz)	3,600 ~ 4,200	3,803.5 ~ 4,203.5	4,400 ~ 5,000	5,925 ~ 6,425	6,425 ~ 7,125	7,125 ~ 7,725	7,725 ~ 8,275	10,700 ~ 11,700	12,750 ~ 13,250
ITU-R Rec.	F.635-6	F.382-8	F.1099-4	F.383-8	F.384-10	F.385-9	F.386-8	F.387-10	F.497-7
T-R Spacing (MHz)	320	213	300	252.04	340	161 154	311.32	530 490	266
Channel Bandwidth (MHz)	40	29	40	29.65	40	28	29.65	40	28
Ethernet RPS Configurations [Alternated (ACCP/ACAP)]	Up to (7+0)	Up to (6+0)	Up to (7+0)	Up to (8+0)	Up to (8+0)	Up to (5+0)	Up to (8+0)	Up to (12+0)	Up to (8+0)
Ethernet RPS Configurations [Co-Channel (CCDP)]	Up to 2x(7+0)	Up to 2x(6+0)	Up to 2x(7+0)	Up to 2x(8+0)	Up to 2x(8+0)	Up to 2x(5+0)	Up to 2x(8+0)	Up to 2x(8+0)	Up to 2x(8+0)
Flange Type	UDR 40	UDR 40	UDR 48	UDR 70	UDR 70	UDR 70	UDR 84	UDR 100	UDR 120

Transmit Output Power (dBm) at TRMD RF Output Port

QAM	4 GHz to 8 GHz				11 GHz	13 GHz	Tolerance
	30 MHz		40 MHz		40 MHz	30MHz	
	STD	HP	STD	HP			
QPSK	+29	+32	+30	+33	+30	+27	
8QAM	+29	+32	+30	+33	+30	+27	
16QAM	+29	+32	+30	+33	+30	+27	
32QAM	+29	+32	+30	+33	+30	+27	
64QAM	+29	+32	+30	+33	+30	+27	+/−1 dB
128QAM	+29	+32	+29	+32	+29	+27	
256QAM	+28	+31	+28	+31	+28	+26	
512QAM	+27	+30	+27	+30	+27	+25	

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