XETAWAVE
CUSTOM RF SOLUTIONS

XETA24 DEBIAN

2.4 GHz Ethernet Radio

Industrial software defined radio · unlicensed 2.4 GHz



5.3Mbps
Max over-the-air rate

1W
RF output (+30 dBm)

24mi
Range

Mesh
Mobile ad-hoc networking

Xeta24 Debian Ethernet radios are highly capable, flexible industrial ISM Frequency Hopping Spread Spectrum (FHSS) and Digital Transmission System (DTS) software defined radios (SDR) supporting the unlicensed 2.4 GHz frequency band and running the Debian operating system, the **Xeta24 Debian** radios are part of XetaWave's latest generation of radios.

The **Xeta24** utilizes a XetaWave Dual Decode Digital Architecture which offers significant receiver performance. The radio supports multiple network types, modulation schemes, and many other features.

All **Xeta24** radios across the uTasker, Linux, Debian, XetaEdge, and XetaCell families are fully over-the-air compatible. For applications requiring simultaneous transmit and receive capability, the **Xeta24x24 Debian** radio supports full-duplex operation.

KEY FEATURES

High Speed
10 kbps to 5.3 Mbps over the air; higher throughput with payload compression and Enhanced MultiPoint.

Bands
2402–2478 MHz unlicensed ISM band.

Adjustable RF Output
Transmit output power from 10 mW (+10 dBm) up to 1 W (+30 dBm).

Network Types
Point-to-Point, Point-to-Multipoint, CSMA Peer-to-Peer, Enhanced MultiPoint, and Mesh.

Secure
Over-the-air payload and overhead encryption using 128-bit or 256-bit AES.

Selective Modulation
Multiple MSK, PSK, and QAM modulations.

MultiSpeed
Endpoints communicate at different RF data rates with the Access Point.

Diagnostics
Monitoring TX/RX statistics (noise, RSSI and more), voltage, and temperature over SNMP and Modbus.

Cellular
XetaCell24 models with LTE cellular and 2.4 GHz ISM capability are available.

Edge Computer
XetaEdge24 and XetaCell24 models with edge computing capability are available.

Dual Channel
Dual channel radios covering the same or different frequency bands are available.

GPS
Models with an integrated GPS are available.

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Hardware & Transmitter Specifications

PROCESSING

CPU	ARM Cortex-A8 @ 300 MHz
OS	Debian
RAM / Flash	256 MB / 4 GB

POWER @ +12 VDC

Transmit	235 mA
Receive	190 mA
Idle	176 mA

INTERFACES

Power	2-pin Phoenix · +10 to +32 Vdc
Ethernet	2× RJ45 · 10/100 Mbps Base-T
Serial	2× RJ45 · up to 1 Mbps · RS-232/422/485
Micro-USB	On-the-Go · +5 Vdc @ 500 mA
RF	TNC · 50 Ω
GPS	TNC (metal) · SMA (plastic) · 50 Ω
Standard I/O	1× MMS · 2× DI

ENVIRONMENTAL & MECHANICAL

Op. Temp.	-40 °C to +75 °C
Humidity	95% @ +40 °C, non-condensing
Dimensions	6.62 × 3.45 × 1.83 in (metal) 5.5 × 3.5 × 1.5 in (plastic)
Weight	700 g (metal) · 182 g (plastic)
Safety	UL Class I, Div 2

TRANSMITTER

	ISM FHSS & DTS
Frequency Range	2402 to 2478 MHz
Output Power	10 to 1000 mW (+10 to +30 dBm)
Modulation	MSK, BPSK, QPSK, 8PSK, 16PSK, 16QAM, 32QAM, 64QAM
Data Rate	57 to 5303 kbps
Channel Bandwidth	77, 154, 207, 310, 600, 1200 kHz
Frequency Stability	1.0 ppm
Range	24 miles

Receiver Specifications

ISM · 2402–2478 MHz

Modulation	Sensitivity	Data Rate
77 kHz channel		
MSK	-110 dBm	57 kbps
154 kHz channel		
MSK	-107 dBm	114 kbps
207 kHz channel		
MSK	-106 dBm	153 kbps
310 kHz channel		
MSK	-103 dBm	229 kbps
600 kHz channel		
BPSK	-98 dBm	530 kbps
QPSK	-99 dBm	1061 kbps
8PSK	-96 dBm	1591 kbps
16QAM	-91 dBm	2121 kbps
32QAM	-85 dBm	2651 kbps
64QAM	-80 dBm	3182 kbps

Modulation	Sensitivity	Data Rate
1200 kHz channel		
BPSK	-100 dBm	884 kbps
QPSK	-96 dBm	1768 kbps
8PSK	-90 dBm	2651 kbps
16PSK	-84 dBm	3535 kbps
16QAM	-85 dBm	3535 kbps
32QAM	-80 dBm	4419 kbps
64QAM	-77 dBm	5303 kbps

Sensitivity shown with FEC disabled. Enabling FEC can improve sensitivity by 3 dB.

Functionality

Networking	
Operating Modes	Point-to-Point, Point-to-MultiPoint, Enhanced MultiPoint, Peer-to-Peer, Full Duplex, Mesh
Roles	Access Point, Endpoint, Repeater (store-and-forward)
Networking	Static IP Routing, Net Filtering, Port Forwarding, Masquerading, Network Address Translation, Modbus Bridging, BATMAN Mobile Ad-hoc Networking
Protocols	IEEE 802.3, TCP, UDP, ARP, DHCP, NTP, STP, FTP, ICMP, HTTP, HTTPS, SSH, Telnet, Multicast, SNMP
Management	Web GUI, SNMP v1, v2a, v3
VLANs	802.1Q VLANs and Trunks, QoS
Quality of Service	Four levels of VLAN QoS
Serial Services	TCP/UDP Terminal Server, TCP Terminal Client, up to 5 simultaneous connections
Reliability & Security	
Error Handling	CRC, FEC, Retransmit on error
Error Correction	Golay, Reed-Solomon
Data/RF Encryption	128- & 256-bit AES, payload only or payload and RF
Hop Patterns	10 pseudo-random, 1 pseudo-random based on Network ID, and 1 secure
Secure Hop Pattern	128- & 256-bit AES hop-pattern determination
Compression	Low, High, Decompress Only
Network Performance & Diagnostics	
MultiMaster	Synchronization of collocated Access Points or multiple Access Points within a network
MultiSpeed	Up to 4 data rates within the same channel bandwidth
Diagnostics	Neighbor List, RF Ping, RF Throughput, RF Statistics, Spectrum Analyzer, IP Ping, Traceroute, IPERF, TCP Dump, DNS Lookup, Network / VPN / Serial / Modbus Bridging Statistics, statistics graphing and CSV download
Options	
Programmable I/O	8 programmable I/O signals (4 independently programmed analog inputs/outputs or digital inputs, and 4 independently programmed digital inputs/outputs)
Dual Radio	Dual radio with the same or different frequency bands
Integrated GPS	Integrated GPS receiver

Ordering Information

Part Number	Frequency	Enclosure	Eth / Serial	I/O	Band
Single-Channel Radios					
XETA24-11IMDFB	2.4 GHz	Metal	1 / 1	None	ISM
XETA24-22IMDFB	2.4 GHz	Metal	2 / 2	2 DI, 1 MMS	ISM
XETA24-22IMDFB-IO	2.4 GHz	Metal	2 / 2	8 I/O, 1 MMS	ISM
XETA24-11IPDFB	2.4 GHz	Plastic	1 / 1	None	ISM
XETA24-22IPDFB	2.4 GHz	Plastic	2 / 2	2 DI, 1 MMS	ISM
XETA24-22IPDFB-IO	2.4 GHz	Plastic	2 / 2	8 I/O, 1 MMS	ISM
Dual-Channel Radios					
XETA24X24-22IMDFB	2.4 GHz	Metal	2 / 2	2 DI, 1 MMS	ISM
XETA24X24-22IMDFB-IO	2.4 GHz	Metal	2 / 2	8 I/O, 1 MMS	ISM
Mixed-Band Dual-Channel Radios					
XETA9X24-22DMDFC	902–960 MHz + 2.4 GHz	Metal	2 / 2	2 DI, 1 MMS	ISM/MAS
XETA9X24-22DMDFC-IO	902–960 MHz + 2.4 GHz	Metal	2 / 2	8 I/O, 1 MMS	ISM/MAS
XETA9X24-22IMDFC	902–928 MHz + 2.4 GHz	Metal	2 / 2	2 DI, 1 MMS	ISM
XETA9X24-22IMDFC-IO	902–928 MHz + 2.4 GHz	Metal	2 / 2	8 I/O, 1 MMS	ISM
Radios with Integrated GPS					
XETA24XG-22IPDFB	2.4 GHz	Plastic	2 / 2	2 DI, 1 MMS	ISM
XETA24XG-22IPDFB-IO	2.4 GHz	Plastic	2 / 2	8 I/O, 1 MMS	ISM

Specifications subject to change without notice. **Rev. 11.2026**