

FullMAX: Broadband Wireless for Mission Critical Industries

FullMAX BS1000 Base Station

Supports all frequencies from 40 MHz to 958 MHz, tunable over the air

Software Definable Radio (SDR) supporting channel widths from 200 kHz to 10 MHz

High Tx Power: up to 4 Watts Effective Transmit Power (standard) with 10 Watts optional

Integrated GPS for automatic vehicle location

TDD Frame Synchronization

All industrial grade hardware

Ethernet and Serial Interfaces



Single Software Defined Radio (SDR) supports all frequencies from 40 MHz to 958 MHz

19" Rack Mount

10/100 Base RJ45 Ethernet Interface

FullMAX technology is based on the state-of-the-art **Mobile WiMAX** standard (802.16e-2005). We have enhanced the standard to meet the wide-area, IP data needs of mission critical industries. This includes adapting the WiMAX-e PHY and MAC layers to support VHF and UHF frequencies; the best frequencies for non-line of sight, long-range communication.

FullMAX establishes a wide-area, routable, mobile and fixed, broadband data network with operator controlled quality of service (QoS) for high reliability in dynamic field environments.

The FullMAX System is a turnkey, end-to-end solution which includes the FullMAX BS1000 base station, the FullMAX MS4000 mobile and fixed station radios and the NMS1000 network management system and configuration tool.

With FullMAX, the operator can establish mobile and fixed data coverage up to 20 miles from a base station tower site. We achieve this expanded coverage through a series of enhancements to the WiMAX-e standard including:

A Wide Range Software Definable Radio: At the heart of the FullMAX system is our specialized Software Definable Radio (SDR). The FullMAX SDR supports all frequencies from 40 MHz to 958 MHz. This opens up a multitude of VHF/UHF licensed spectrum opportunities - the best frequencies for long-range mobile coverage.

Narrow Channel Support: We have enhanced the WiMAX PHY to operate in narrower channel sizes (starting as narrow as 200 kHz in width). Narrow channels improve RF performance as well as unlock underutilized spectrum opportunities in the Sub 1 GHz bands.

High Tx Power. By using licensed frequencies, we can transmit at high power levels. The FullMAX Base Stations and Mobile Stations have adjustable power up to 4 watts of effective transmit power (standard) with an optional 10 watt version for increased coverage.

FullMAX BS1000 Specifications



OFDMA PHY Layer
for superior multipath
performance &
maximum frequency
reuse

Mobile Data
connectivity @ 75
Mph

Centralized Media
Access Control
(MAC) for high
reliability and QoS

Configurable
downlink and uplink
scheduling with
embedded
classification tools

MAC layer ARQ and
PHY layer HARQ for
improved BER
performance

EAP Authentication
AES128 Encryption
Security

WiMAX-e Features

Full Spectrum Enhanced Version of WiMAX-e	802.16e-2005 designed to support low range frequencies and narrow channels
Adaptive Modulation	64QAM, 16QAM, QPSK
Coding	Convolutional Coding Rates: 1/2, 2/3, 3/4 Convolutional Turbo Coding 1/2, 2/3, 3/4, 5/6
FFT Size (No. of Subcarriers)	128
End User Data Throughput	QPSK FEC 3/4 = 0.95 bits per hertz per second 16 QAM FEC 3/4 = 2.1 bits per hertz per second 64 QAM FEC 3/4 = 3.3 bits per hertz per second
Ranging Support	Initial Ranging, Periodic Ranging & Bandwidth Request
Synchronization Support	Preamble detection
Frequency Synchronization	PLL tracking
Rx Sensitivity	-110 dBm (QPSK), -101 dBm (16 QAM), -93 dBm (64 QAM)
Subchannelization	PUSC, FUSC and AMC 2x3

Mechanical / Electrical

User Interface	10/100 BaseT on RJ-45, RS232
Voltage	Subscriber Station (Mobile and Fixed): 9 to 36 VDC input
Dimensions (h-w-d) / mm	(BS): 19" x 1.75" x 17.7"
Weight (typical)	9.8 lbs
Temperature	-30°C to +60°C
Humidity	95% humidity for 96 hours, 55% average humidity

RF & PHY

RF PHY	OFDMA
Frequencies Supported	40 MHz to 958 MHz (5 kHz steps)
Channel Sizes	200 kHz up to 10 MHz (software configurable)
Duplex Method	TDD
Tx (effective transmit power)	4 Watt standard, optional higher power PA's available

Services & Provisioning

QoS Priorities	Up to 16 classifiers per Subscriber Station
QoS types, Classes of Service	BE, nrtps, rt-PS, UGS
Data Rate Control	Minimum data rate, Data Rate Limiting

Security

EAP, AES 128

Mgmt / Configuration

Management Protocol	SNMP, Telnet
Software upgrade	Yes, "over the air", "fail-safe" software upgradeable
NMS remote management & provisioning	SNMP