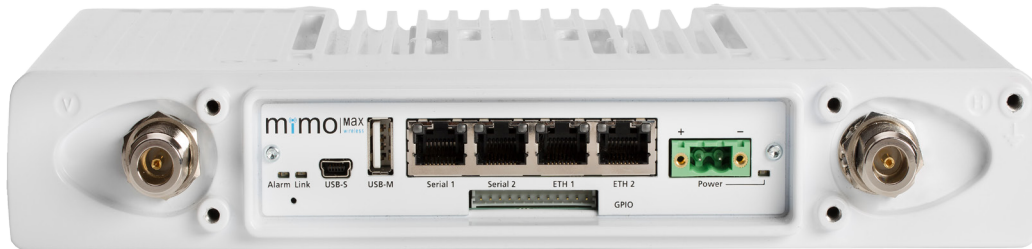


TORNADO RADIO



MiMO + Full Duplex + QAM 256 = 1.28Mb/s

Our award-winning Mimomax Tornado radio is pushing the boundaries of what can be achieved in narrowband channels.



Utilizing MIMO technology, full-duplex communications and high order modulation (QAM256), the Tornado radio can achieve higher rates of data throughput than standard narrowband radios. The result is a better **return on investment** in the spectrum and the ability to run more voice channels over the same link.

Operating in the licensed frequency bands between 400-470MHz, 757-788MHz & 806-960MHz, the Tornado has a wide temperature operating range and optional waterproof outdoor mount. The Tornado enables unrivalled performance while maintaining Mimomax's renowned reputation for reliability and operational efficiency.

Key Benefits

- » Aggregate data rates of up to 1280kbps in a 50kHz channel
- » Latency as low as 3ms in 50 kHz channels (using the Optimized Protection Variant for Teleprotection) and sub 10ms in a standard point-to-point configuration
- » Resilient communications over links as long as 60 miles
- » Built-in duplexers and band-pass filters to minimize interference
- » In a 50kHz channel, run as many as 25 x P25 voice channels or 30 x DMR channels at 256QAM.
- » Support a combination of ethernet and RS232 interfaces for ease of integration with legacy systems
- » Isolated Power Supply with low power consumption
- » Remote over-the-air radio configuration
- » Optional SNMP and DNP3 support and a very efficient random access protocol

Available for 400MHz, 700MHz, 800MHz, & 900MHz Frequency Bands (others available on request)

We offer a package of software that comes with the kit, including MSEC, SNMP, MDAP, CCMS, & CLI
For more features, visit our website at mimomax.com/products_category/software or contact your regional sales manager.

TORNADO RADIO SPECIFICATIONS				
		400MHz	700MHz	900MHz
Gross Data Rates	50kHz 25kHz 12.5kHz	160/320/480/640kb/s Uplink and/or downlink 320/640/960/1280kb/s Full-duplex 80/160/240/320kb/s Uplink and/or downlink 160/320/480/640kb/s Full-duplex 40/80/120/160kb/s Uplink and/or downlink 80/160/240/320kb/s Full-duplex		
Configuration	2 x 2 Full Duplex MIMO			
Supply Voltage	+/- 10.5v DC to +/- 60V DC			
Maximum Power Consumption	26W (at 13.8V) 20W typical			
Standby Power Consumption	<6W typical			
Ambient Temperature Range	-30°C (-40°C) to +60°C (+70°C)			
Mounting	1U High Rack Mount Pole Mount Wall Mount DIN Rail Mount			
Dimensions (L x W x H)	180 x 270 x 44mm			
Weight	2 kg radio unit only, excl. mounts			
RECEIVER				
Modulation	QPSK/16/64/256QAM			
Number of MIMO receivers	2			
Symbol Rate	50kHz 25kHz 12.5kHz	2x40k symbols/sec 2x20k symbols/sec 2x10k symbols/sec	2x40k symbols/sec 2x20k symbols/sec 2x10k symbols/sec	2x40k symbols/sec 2x20k symbols/sec 2x10k symbols/sec
Modulation Sensitivity for 10 ⁻⁴ BER	50kHz 25kHz 12.5kHz	<-111/-104/-98/-91dBm <-114/-107/-101/-94dBm <-117/-110/-104/-97dBm	<-111/-104/-98/-92dBm <-114/-107/-101/-94dBm <-117/-110/-104/-97dBm	<-111/-103/-97/-91dBm <-113/-106/-100/-94dBm <-116/-109/-102/-96dBm
Modulation Sensitivity for 10 ⁻⁷ BER	50kHz 25kHz 12.5kHz	<-109/-102/-96/-89dBm <-112/-105/-99/-92dBm <-116/-108/-102/-96dBm	<-109/-102/-96/-89dBm <-112/-105/-99/-92dBm <-116/-108/-102/-96dBm	<-109/-102/-96/-89dBm <-112/-105/-99/-92dBm <-116/-108/-102/-96dBm
Frequency Range	400 to 470 MHz		757-758 & 787-788 MHz	806 to 960 MHz
Frequency Step Size	5 kHz & 6.25 kHz selectable			
Frequency Accuracy and Stability	better than +/- 1ppm			
Nominal Channel Bandwidth	12.5 kHz, 25 kHz, 50kHz		12.5 kHz, 25 kHz, 50kHz	12.5 kHz, 25 kHz, 50kHz
TRANSMITTER				
RF Power Output	Avg. before duplexer 2 x 27dBm Avg. after duplexer 2 x 24dBm Peak before duplexer 2 x 35dBm		Avg. before duplexer 2x26dBm Avg. after duplexer 2x24dBm Peak before duplexer 2x34dBm Peak after duplexer 2x32dBm	Avg. before duplexer 2 x 26dBm Avg. after duplexer 2 x 24dBm Peak before duplexer 2 x 34dBm Peak after duplexer 2 x 32dBm
RF Power Control Range	>20 dB			
Other Details	Modulation, Number of MIMO receivers, Symbol Rates, Frequency Range, Frequency Step Size, Frequency Accuracy and Stability are similar with Receiver			
DUPLEXER (INTERNAL)				
Type	Bandpass			
Tx / Rx Split	5 MHz minimum	30 MHz	9 MHz minimum	
Frequency Range	400 to 470 MHz	757-758 & 787-788 MHz	806 to 960 MHz	
Duplexer Sub Bands	400-430 MHz 440-450 MHz 450-470 MHz	757-758 to 787-788 MHz	806-869 MHz 852-933 MHz 896-960 MHz	
Stop Band Attenuation	>60 dB @ >5 MHz from centre	>75 dB	>60 dB @ >9 MHz from centre	
Pass Band Bandwidth	2 MHz (-0.5dB)	3 MHz (-0.5dB)	4 MHz (-0.5dB)	
DUPLEXER (EXTERNAL)				
Type	Bandpass		Bandpass	
Tx / Rx Split	4.5 MHz		6 MHz minimum	
Frequency Range	400 to 470 MHz		806 to 960 MHz	
Insertion Loss	<1.75 dB		<1.5 dB	
Stop Band Attenuation	>70 dB		>70 dB	
Pass Band Bandwidth	1 MHz min		tunable, 1 MHz min	
Mounting	2U High Rack Mount		1U High Rack Mount	
	Available on request			
INTERFACE (DIGITAL & ANALOG)				
ETHERNET	Dual 10BaseT/100BaseT Connector: 2 x RJ45			
ASYNCHRONOUS SERIAL	Format: Dual RS232 Connector: 2 x RJ45 Baud Rate: 300 - 115,200 baud			
USB	High speed USB 2.0 Connector: Type A and mini B			
ALARM	1 set of volt-free change over contacts			
GPIO Analog/Digital	4 x s/w configurable I/O ports			
FREQUENCY REFERENCE Input/Output	isolated differential pair			