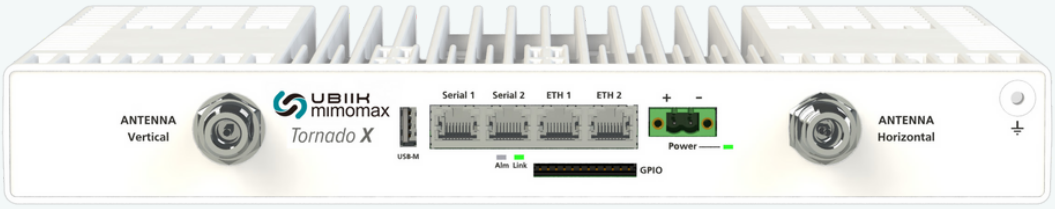
UBIIK MIMOMAX TORNADO X

900MHz Radio Spec Sheet



Tornado X is a high Tx power addition to our full duplex, MIMO product range. Offering a Tx power which remains stable across all modulations, full compatibility with the Tornado radio allows for a mix of radios in the network to suit terrain or meet network requirements.

Software flexible, ultra-spectrally efficient and offering extremely low latency to provide near real-time communications and visibility across critical infrastructure.

Tornado X is ideally suited as:

- a base radio for coverage limited multipoint systems or networks where traffic is uplink predominant
- a point-to-point linking radio for longer links and obstructed paths.

Available in 900MHz and in 12.5kHz, 25kHz, 50kHz, 75kHz, 100kHz, 150kHz or 200kHz channel sizes.

KEY FEATURES

- *Point-to-Point, Point-to-Multipoint*
- *Linux Applications Engine*
- *Ultra Spectrally Efficient*
- *Scalable Data Throughput Rates*
- *SCADA, Telemetry & Data Solutions*
- *Software Flexible & Intelligent*
- *Very Low Latency*
- *Very Low Power Consumption*
- *Full-duplex*
- *Capacity to Simultaneously Operate in Poll and Interrupt Modes*
- *900MHz Licensed Spectrum*
- *Ethernet, Serial & USB Interface*
- *IP Data Encryption & Firewall Security*
- *Advance Software Features*
- *User Settable Frequency*
- *User Programmable Power*
- *Indoor & Outdoor Mountable*

900MHz UBIIK MIMOMAX TORNADO X SPECIFICATIONS

General

Gross Aggregate Data Rates	200 kHz	1333/2667/4000/5333kbps *Full-duplex* 9
	150 kHz	85/1969/2954/3938kbps *Full-duplex*
	100 kHz	655/1309/1964/2618kbps *Full-duplex*
	75 kHz	480/960/1440/1920kbps *Full-duplex*
	50 kHz	320/640/960/1280kbps *Full-duplex*
	25 kHz	160/320/480/640kbps *Full-duplex*
	12.5 kHz (FCC Part 101 and ISED RSS-119)	80/160/240/320kbps *Full-duplex*
	12.5 kHz (FCC Part 24)	71/143/214/286kbps *Full-duplex*
Configuration		2 x 2 Full Duplex MIMO 10.5v DC
Supply Voltage		to 60V DC
Maximum Power Consumption (100% duty cycle)		73.5W (at 13.8V) 67.5W typical
Standby Power Consumption		<7.75W typical
Ambient Temperature Range		-30°C (-40ºC)[1] to +60°C (+70ºC) [2]
Mounting		1U High Rack Mount
Dimensions (L x W x H)		330 x 480 x 45mm
Weight		6 kg *radio unit only, excl. mounts*

Receiver

Modulation		QPSK/16/64/256QAM
Number of MIMO receivers		2
Symbol Rate		2x166.667k symbols/sec (200 kHz) 2x123.077k symbols/sec (150 kHz) 2x81.818k symbols/sec (100 kHz) 2x60k symbols/sec (75 kHz) 2x40k symbols/sec (50 kHz) 2x18.576k symbols/sec (25kHz) 2x10k symbols/sec (12.5kHz)(FCC Part 101 and ISED RSS-199) 2x8.929k symbols/sec (12.5kHz)(FCC Part 24)
Modulation[3] Sensitivity[4] for 10^{-4} BER	200 kHz	<-105/-97/-91/-85dBm
	150 kHz	<-106/-99/-92/-86dBm
	100 kHz	<-107/-100/-93/-88dBm
	75 kHz	<-107/-102/-94/-89dBm
	50 kHz	<-109.5/-103/-97/-91dBm
	25 kHz	<-112.5/-106/-100/-93.5dBm
	12.5 kHz	<-115.5/-109/-103/-96dBm
Modulation[3] Sensitivity[4] for 10^{-6} BER	200 kHz	<-103/-96/-90/-83dBm
	150 kHz	<-105/-97/-91/-84dBm
	100 kHz	<-106/-99/-92/-86dBm
	75 kHz	<-107/-100/-93/-87dBm
	50 kHz	<-108.5/-102/-96/-89.5dBm
	25 kHz	<-111.5/-105/-99/-92dBm
	12.5 kHz	<-114.5/-108/-102/-94.5dBm
	Measurements via duplexer at antenna port	
Frequency Range		896-960 MHz other frequencies available on request
Frequency Step Size		5 kHz & 6.25 kHz selectable
Frequency Accuracy and Stability		better than +/- 1ppm

Compliances

Radio Performance	US: FCC 47CFR part 101 (pending) and part 24 Canada: IC RSS-119 pending
EMC	US: FCC 47CFR part 15 Canada: IC RSS-GEN
Safety	IEC 62368-1: 2014 + A11: 2017

Transmitter

Number of MIMO transmitters	2
Modulation	QPSK/16/64/256QAM
Symbol Rate	2x166.667k symbols/sec (200 kHz) 2x123.077k symbols/sec (150 kHz) 2x81.818k symbols/sec (100 kHz) 2x60k symbols/sec (75 kHz) 2x40k symbols/sec (50 kHz) 2x18.576k symbols/sec (25kHz) 2x10k symbols/sec (12.5kHz) (FCC Part 101 and ISED RSS-119) 2x8.929k symbols/sec (12.5kHz)(FCC Part 24)
RF Power Output[5]	Avg. before duplexer 2x36dBm Avg. after duplexer 2x34dBm Peak before duplexer 2x44dBm Peak after duplexer 2x42dBm
RF Power Control Range	>20 dB
Frequency Range	896-960 MHz
Frequency Step Size	5 kHz & 6.25 kHz selectable
Frequency Accuracy and Stability	better than +/- 1ppm

Duplexer (Internal)

Type	Bandpass
Tx / Rx Split	9 MHz
Frequency Range	896-960 MHz other frequencies available on request
Stop Band Attenuation	>70 dB
Pass Band Bandwidth[6]	1 MHz

Duplexer (External)

Type	Bandpass
Tx / Rx Split	3.6 MHz minimum
Frequency Range	806 to 960 MHz
Insertion Loss	<1.5 dB
Stop Band Attenuation	>70 dB
Pass Band Bandwidth[6]	2 MHz
Mounting	To be confirmed

Interfaces (Digital & Analogue)

ETHERNET	Dual 10BaseT/100BaseT
Connectors	2 x RJ45
ASYNCHRONOUS SERIAL	(Other data interfaces available via external media converters [7])
Format	Dual RS232
Connectors	2 x RJ45
Baud Rate	300 - 115,200 baud
USB	High speed USB 2.0
Connectors	Type A
ALARM	1 set of volt-free change over contacts
GPIO *Analogue/Digital*	4 x s/w configurable I/O ports
FREQUENCY REFERENCE *Input/ Output*	isolated differential pair

***Important**: Specifications are subject to change without prior notice*

(1) -40ºC for continuous operation.
(2) +70ºC for RRU-T with 25% duty cycle.
(3) Systems employing modulation swapping will automatically reduce the modulation order at a signal level higher than the specified sensitivity level.
(4) Sensitivity as specified includes forward error correction and internal duplexer loss.
(5) Tornado RF output remains constant at all modulations.
(6) The maximum acceptable frequency shift without retuning the duplexer is also subject to the stop band performance.
(7) Available via external media converter.