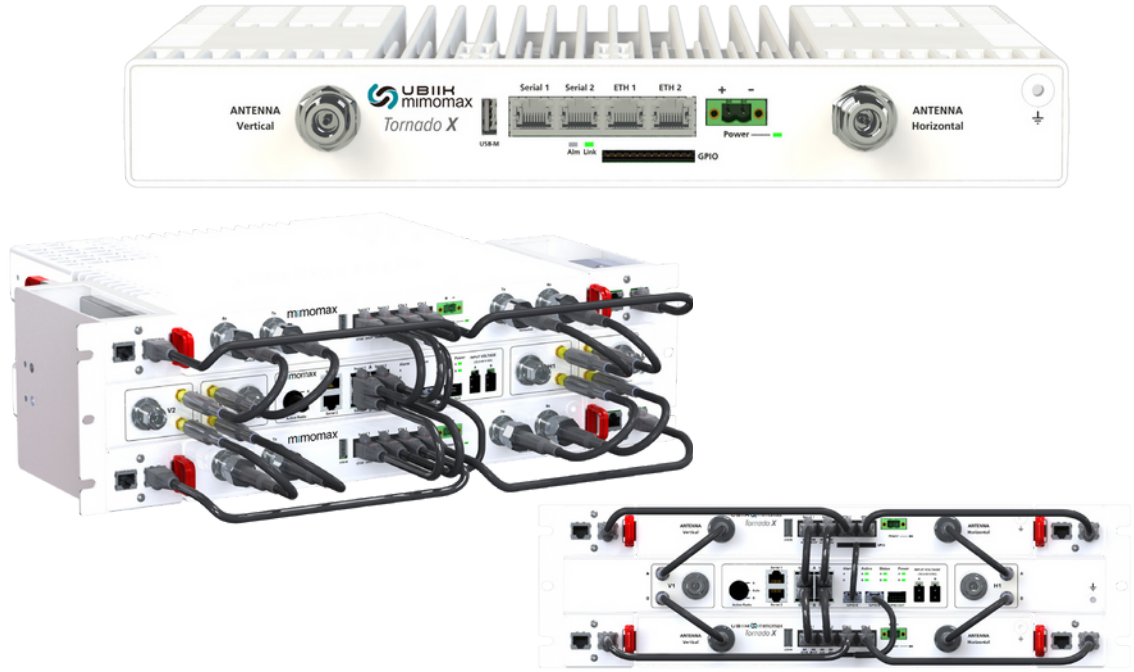
# UBIIK MIMOMAX TORNADO X 1+1 SYSTEM

Radio Spec Sheet




The Tornado X 1+1 is a full-duplex, software flexible, ultra spectrally-efficient, long range, point-to- multipoint and point-to-point radio with built-in intelligent network features for Critical Network Infrastructure. With scalable data rates and an efficient access protocol, it can provide near real-time access to a large number of remote sites with very high reliability and low latency. The Tornado X is fully compatible with all Tornado radios and provides economical SCADA and Telemetry solutions to remote sites in the Power, Gas and Water acquisition and distribution industries.

This 1+1 system provides automated support for both a warm and hot standby system where if one radio fails a second standby radio is automatically switched in to take over. The faulty radio can to be replaced without impacting the operating radio, enabling the system to operate without loss of data. The Tornado X 1+1 system offers multiple configurations with the ability to switch over Serial, GPIO, alarm and antenna ports. The design also provides the flexibility of an optional two-antenna solution, where each radio has its own antenna to provide a redundant antenna solution.

Operating in the licensed frequency bands between 896-960MHz and 700MHz Upper A-Block, the solution also has a wide temperature operating range. The Tornado X enables unrivalled performance while maintaining Ubiik Mimomax's renowned reputation for reliability and operational efficiency.

# UBIIK MIMOMAX TORNADO X 1+1 SYSTEM SPECIFICATIONS

1+1 available across Tornado X range. For the detailed specification of the radio units see the Tornado X radio unit specification sheet.

| Electrical Specification | | | |
|---|---|---|---|
| **Power Supply** | | | |
| Rated Input Voltage | Normal Operation | 13-50 | V |
| Extreme Input Voltage | Normal Operation | 10-60 | V |
| Total Power Consumption | Idle, Tx Off — Warm Standby | 16-20 | W |
| | Idle, Tx Off — Hot Standby | 16-20 | W |
| | Tx Active — Warm Standby | 80-110 | W |
| | Tx Active — Hot Standby | 144-204 | W |
| **Ethernet** | | | |
| Tx Peak Differential Voltage | 100Base-Tx, 100 Ohm termination | 1.00-1.05 | V |
| Tx Voltage Imbalance | 100Base-Tx, 100 Ohm termination | 2% | |
| Tx Rise/Fall Time | 100Base-Tx | 3-5 | ns |
| Tx Rise/Fall Imbalance | 100Base-Tx | 0-0.5 | ns |
| Tx Duty Cycle Distortion | 100Base-Tx | +/- 0.5 | ns |
| Tx Overshoot | 100Base-Tx | 5% | |
| Tx Output Jitter | 100Base-Tx, Peak to Peak | 0.7-1.4 | ns |
| Tx Peak Differential Voltage | 10Base-T, 100 Ohm termination | 2.4 | V |
| Tx Output Jitter | 10Base-T, Peak to Peak | 1.4-11 | ns |
| Rx Squelch Threshold | 10Base-T, 5MHz square wave | 400 | mV |
| **Serial** | | | |
| Output Voltage Swing | Loaded with 3kOhms to ground | +/- 5 to +/-5.4 | V |
| Output Short Circuit Current | | -60 to +60 | mA |
| Input Voltage | | -25 to +25 | V |
| Input Low Threshold | Temperature ambient = +25 | 0.8-1.5 | V |
| Input High Threshold | Temperature ambient = +25 | 1.8-2.4 | V |
| 5VDC Output Current | | 200 | mA |
| **GPIO** | | | |
| Input Voltage | Input | -0.3-60 | V |
| Current Sinking Capability | Output driving low | 100 | mA |
| Input Impedance | | 109 | kOhms |

| Electrical Specification | | |
|---|---|---|
| Alarm | Input Current (max) | 300 mA |
| | Switching Voltage (max) | 33 VDC |
| Reference Input | Level | -5 to +20 dBm |
| | Frequency | 10 MHz |
| Reference Output | Level | 0 dBm |
| | Frequency | 10 MHz |
| 1+1 Specific | | |
| Radio Switch Over Time | | < 1 S |
| IP Configuration Switch Over Time (1) | | 7 S |

| Physical Specification | |
|---|---|
| Dimensions (L x W x H) | 18.94 x 12.91 x 5.19 in (481 x 328 x 132 mm) 3U standard size 19 inch rack |
| Minimum Operating Temperature | -22ºF (-30ºC) |
| Maximum Operating Temperature | +140ºF (+60ºC) |
| Maximum Operating Humidity | 95%RH Non-Condensing |
| Minimum Storage Temperature | -40ºF (-40ºC) |
| Maximum Storage Temperature | +176ºF (+80ºC) |
| Maximum Storage Humidity | 95%RH Non-Condensing |

| Compliances | | |
|---|---|---|
| RF Bands | 757-758 and 787-788 MHz | 896-960 MHz |
| Radio Performance | FCC 47CFR part 27 | FCC 47CFR part 101 & part 24 |
| | | IC Canada (RSS-119) |
| EMC | FCC 47CFR part 15 | FCC 47CFR part 15 |
| | | AS/NZS/ CISPR22 |

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

(1) -40ºC for continuous operation.