RuggedMAX™ WiN7200

WiMAX Base Station

RuggedMAX™ WiN7200 is a long range, secure, IEEE 802.16e-2005 mobile WiMAX broadband wireless platform delivered in a compact form factor. The WiN7200 is a single sector lightweight base station that can be easily installed by a single person on poles, street lamps or walls, and provides connectivity to fixed or mobile end points.

Connected via a single Power over Ethernet (PoE) connection and easily provisioned, the WiN7200 reduces operational cost and complexity. The WiN 7200 system is powered by OFDMA radio technology, which is robust in adverse channel conditions and enables Non-Line-Of-Sight (NLOS) operation. Leveraging link adaptation algorithms, modulation and coding are continuously adapted to prevailing link conditions, ensuring an optimal balance between robustness and efficiency.

The use of MIMO radio technology enables peak link performance by maintaining maximum bandwidth and service coverage.

Key Features and Benefits:

Long Range: Transmit and receive diversity for improved reach and Non-Line of Sight Performance

High Bandwidth: RuggedMAX has two built-in radios operating on the same frequency simultaneously (MIMO) to increase bandwidth (up to 40Mbps) and spectral efficiency.

Lowest Frequency Use: Leverages OFDMA and built in GPS to enable users to deploy an entire network on a single frequency channel.

Usage models: Designed to support long range connections to fixed, portable and mobile end points, supporting vehicular speed seamless mobility, and backhaul mode.

Quality of Service: RuggedMAX gives the user the ability to separate traffic types over the air, and guarantee latency, minimum bandwidth and jitter according to application needs.

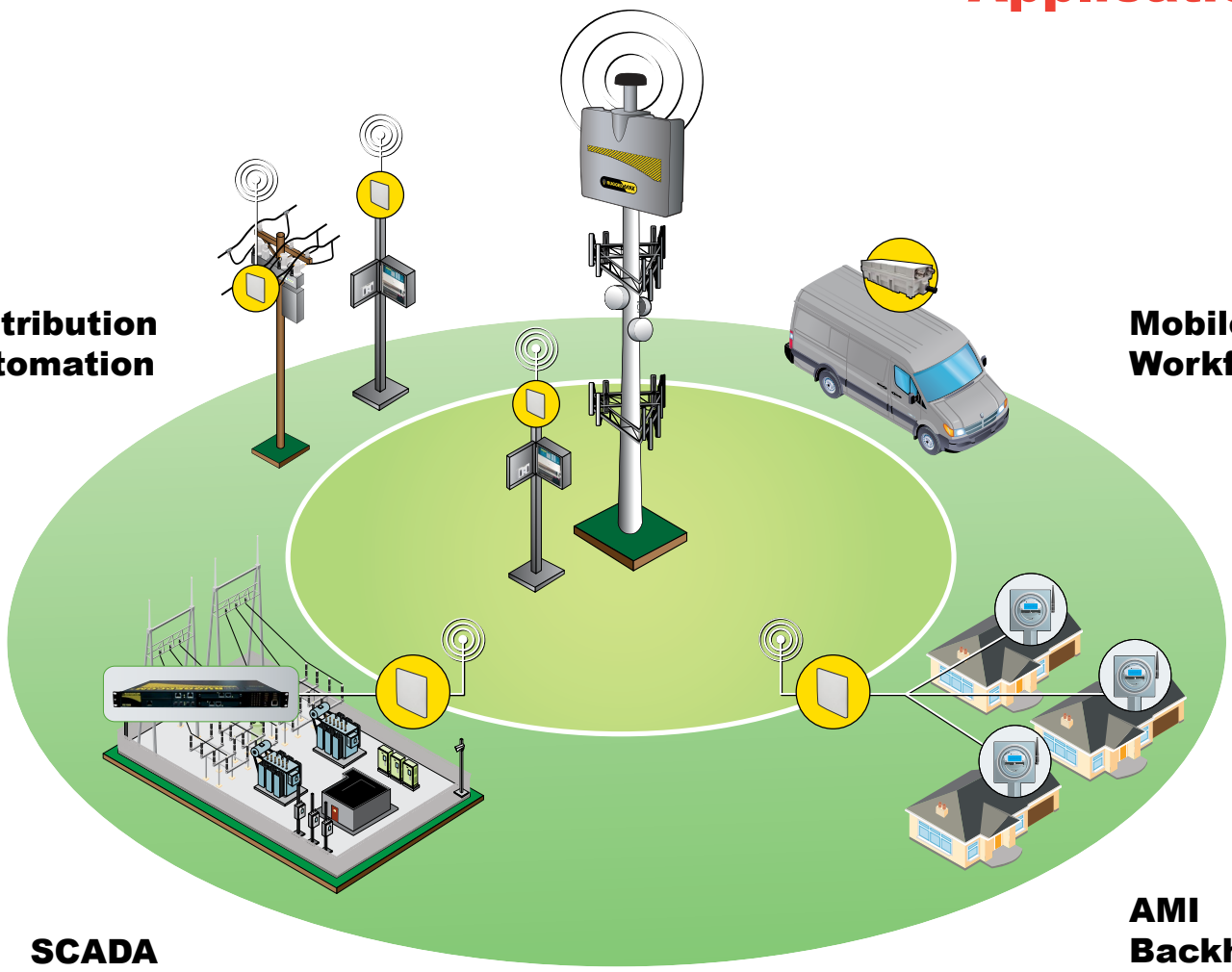
Rugged Form factor: RuggedMAX is an all outdoor utility grade form factor enabling flexible deployment options. RuggedCom products are designed for use in harsh environments such as those found in electrical power substations, oil refineries, military applications, roadside traffic control cabinets and metals and minerals processing.

Standalone Architecture: Commercial WiMAX equipment requires an entire network infrastructure to be in place including a specialized mobile router called an ASN gateway, which acts as a central point for all network traffic. This infrastructure can be very costly and complex to implement. RuggedCom has developed a mode which does require this heavy infrastructure but maintains the interoperability and technology advances of WiMAX.

Secure: RuggedMAX has many built-in features to ensure NERC CIP compliance such as two factor mutual authentication, AES encryption and message integrity protection using CMAC.

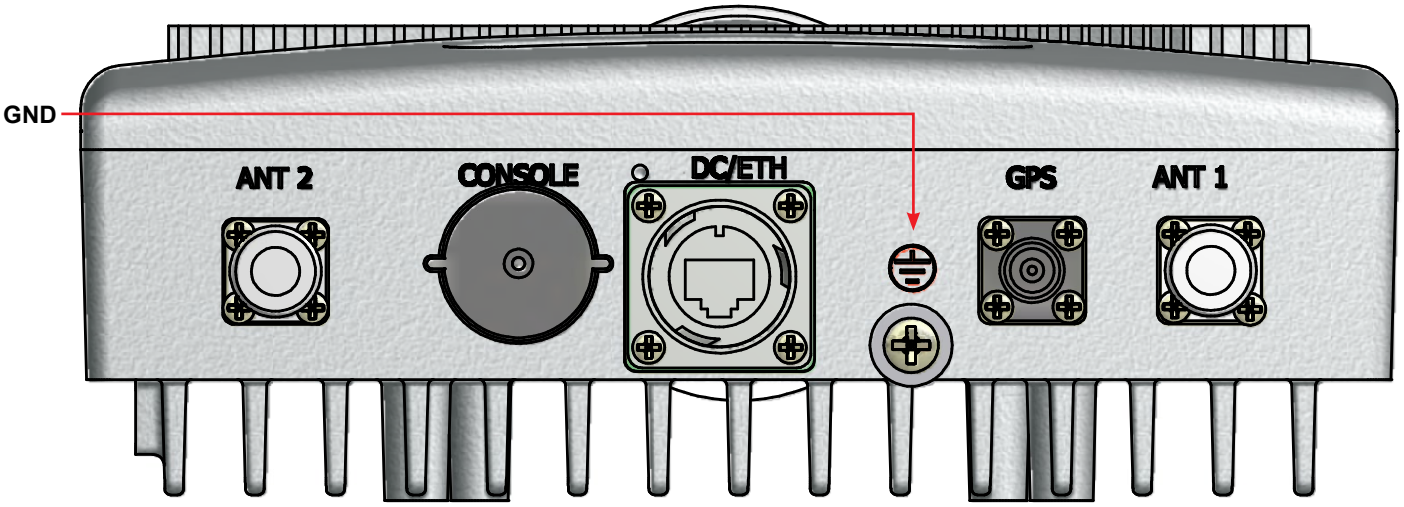
RUGGEDCOM ISO 9001 REGISTERED

Applications



Interfaces

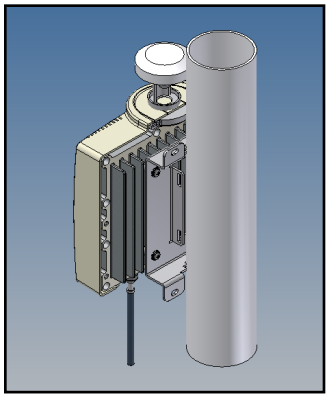
The interface panel supports the atenna, power and Ethernet connectors.



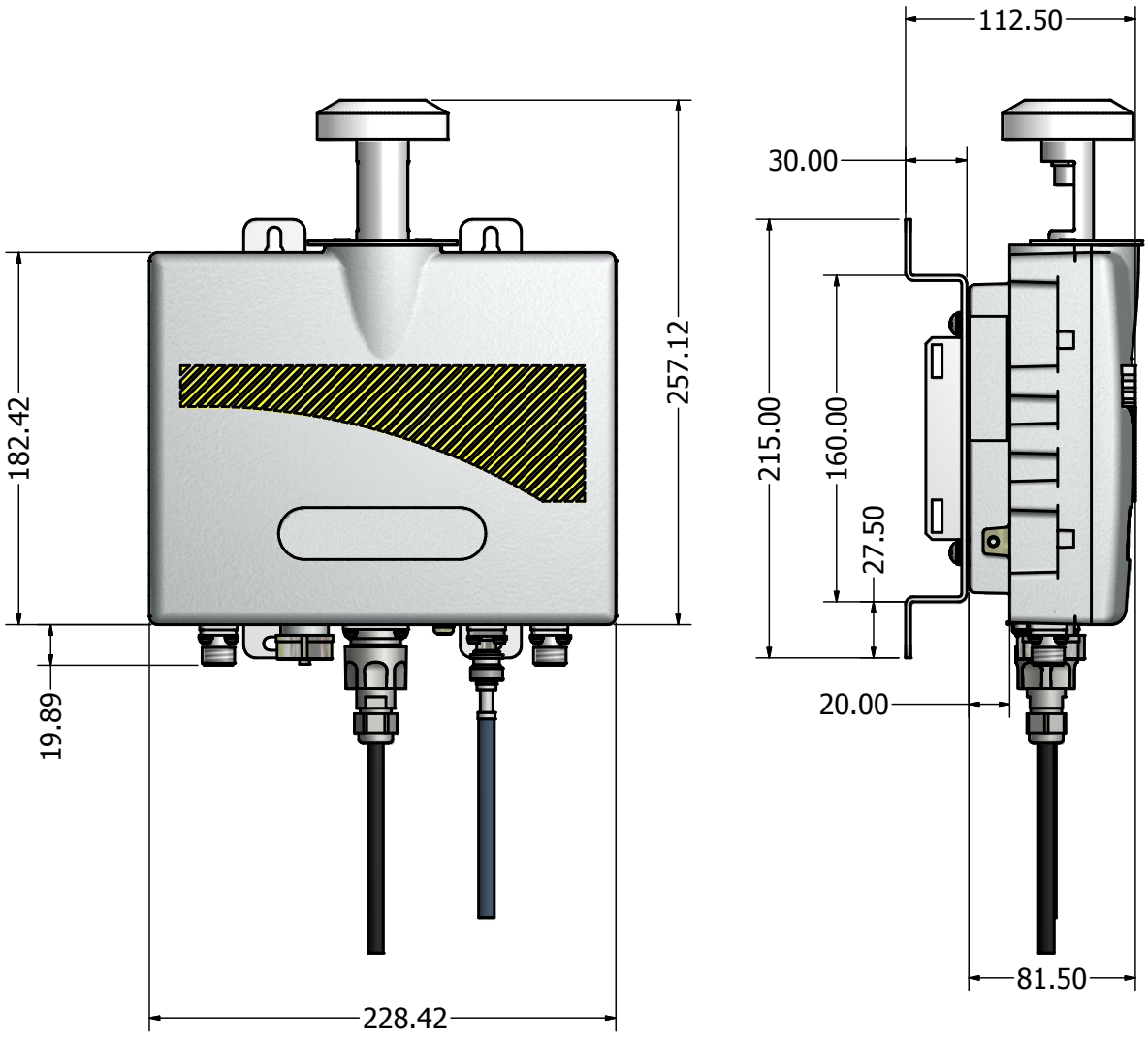
The following table provides a description of the Pico BST bottom panel connectors and ports.

No.	Connector Name	Connector Type	Cable Type	Description	Connected to
1	ANTI	N type Female	RG 214/U	RF antenna connection	external antenna or Screwed-on omni-directional antenna
2	Console	RJ45	Cat5 ETH	Low level CLI for RuggedCom technical personnel. RS-232	Computer
3	DC + ETH	RJ45	Cat5 ETH	DC 1.5A + Ethernet Cat5	PoE data adaptor
4	GND	1 screw ETSI	#10 AWG bare copper wire	Grounding lug. #10 AWG bare copper wire	Central earth ground, Tower or pole chassis
5	GPS (optional)	TNC Female	RG-59	Base Station Synchronization	Optional External GPS antenna
6	ANT2	N type Female	RG 214/U	RF antenna connection	external antenna or Screwed-on omni-directional antenna

Mechanical Details and Mounting Arrangement:



Dimensions


112.50
30.00
257.12
182.42
215.00
160.00
27.50
19.89
20.00
228.42
81.50

EMI and Environmental Type Tests

IEC 61850-3 EMI TYPE TESTS				
Climatic Environmental Conditions				
TEST	Description	Criteria	Test Levels	Result
IEC 60068-2-1 IEC 61850-3 (5.2)	Low Temperature (Operational)	A	-40°C 16 hour dwell	Pass
IEC 60068-2-2 IEC 61850-3 (5.2)	High Temperature (Operational)	A	65°C 16 hour dwell	Pass
IEC 60068-2-1 IEC 61850-3 (5.2)	Low Temperature (Storage)	A	-40°C 16 hour dwell	Pass
IEC 60068-2-2 IEC 61850-3 (5.2)	High Temperature (Storage)	A	85°C 16 hour dwell	Pass
IEC 60068-2-30 IEC 61850-3 (5.2)	Humidity (Operational)	A	95% at 55°C for 96 hours	Pass
IEC 60068-2-30 IEC 61850-3 (5.2)	Humidity (Storage)	A	95% at 55°C for 96 hours	Pass
Mechanical Environmental Conditions				
IEC 60068-2-27 IEC 61850-3 (5.5)	Shock	A	30g	Pass
IEC 60068-2-6 IEC 61850-3 (5.5)	Vibration	A	2g, 10-150Hz per axis	Pass
EMC				
IEC 61000-4-6 IEC 61850-3 (5.7.1.1)	Conducted Immunity	B	10Vrms	Pass
IEC 61000-4-5 IEC 61850-3 (5.7.1.2)	Surges Immunity	B	4kV L-G	Pass
IEC 61000-4-12 IEC 61850-3 (5.7.1.3)	Oscillatory Surge	A	2.5kV	Pass
IEC 61000-4-4 IEC 61850-3 (5.7.1.4)	Electrical Fast Transients Immunity	A	4kV	Pass
IEC 61000-4-3 IEC 61850-3 (5.7.2)	Radiated Susceptibility Immunity	A	20V/m	Pass
IEC 61000-4-16 IEC 61850-3 (5.7.3)	Low Frequency Conducted Susceptibility	B	30V, 300V Continues 3V, 30V 15Hz-150Khz	Pass
IEC 61000-4-8 IEC 61850-3 (5.7.3)	Magnetic Immunity	B	100A/m 1000A/m (1 sec)	Pass
CISPR 22 IEC 61850-3 (5.8)	Radiated Emission	Class A	30MHz to 8GHz	Pass
EN55022 IEC 61850-3 (5.8)	Conducted Emission	Class B	150kHz - 30MHz	Pass

EMI and Environmental Type Tests (Continued)

IEEE 1613 (C37.90.x) EMI IMMUNITY TYPE TESTS				
Climatic Environmental Conditions				
Standard/Method	Description	Criteria	Level	Result
IEC 60068-2-1 IEEE 1613 (4.1.1)	Low Temperature (Operational)	A	-40°C 16 hour dwell	Pass
IEC 60068-2-2 IEEE 1613 (4.1.1)	High Temperature (Operational)	A	65°C 16 hour dwell	Pass
IEC 60068-2-1 IEEE 1613 (4.1.2)	Low Temperature (Storage)	A	-40°C 16 hour dwell	Pass
IEC 60068-2-2 IEEE 1613 (4.1.2)	High Temperature (Storage)	A	85°C 16 hour dwell	Pass
IEC 60068-2-30 IEEE 1613 (4.1.3)	Humidity (Storage)	A	95% at 55°C for 96 hours	Pass
Mechanical Environmental Conditions				
IEEE 1613 (10)	Shock (Drop)	A	1m, 1 falls per axis	Pass
IEC 60068-2-6 IEEE 1613 (10)	Vibration	A	2g, 10-150Hz per axis	Pass
Power Input				
IEC 61000-4-11 IEEE 1613 (5.1)	Voltage Variations	B	38.4-56V	Pass
EMC				
IEC 61000-4-12 IEEE 1613 (7.3.1) IEEE C37.90.1	Oscillatory SWC	A	2.5kV	Pass
IEC 61000-4-4 IEEE 1613 (7.3.2) IEEE C37.90.1	Fast Transient SWC	A	4kV	Pass
IEC 61000-4-3 IEEE 1613 (8) IEEE C37.90.2	Radiated Susceptibility Immunity	A	80MHz-1GHz 20V/m (un modulated) 35V/m (modulated)	Pass
IEC 61000-4-2 IEEE 1613 (9) IEEE C37.90.3	ESD	A	8kV Contact 15kV Air	Pass
Insulation				
IEC 60255-5 (6.1.3) IEEE 1613 (6.3)	HV Impulse	C	5kV	Pass
IEC 60255-5 (6.1.4) IEEE 1613 (6.2)	Dielectric	C		Pass

Specifications

Radio and Modem:
- Frequency:
  - WiN7225 – 2483 MHz to 2690 MHz
  - WiN7233 – 3300 MHz to 3400 MHz
  - WiN7235 – 3400 MHz to 3600 MHz
  - WiN7237 – 3600 MHz to 3720 MHz
  - WiN7249 – 4900 MHz to 5000 MHz
  - WiN7258 – 5725 MHz to 5850 MHz
- IEEE802.16-2005 (16e OFDMA)
- WiMAX Forum Wave 2 Profile
- Time Division Duplex (TDD)
- Channel Bandwidth (MHz) 3.5, 5, 7, 10
- Frequency Resolution 0.25 MHz
- Diversity Support 2x2, STC/MIMO-SM
- FEC Convolution Code and Turbo Code
- Transmit Power Control
- Output Power (average) 2 x 27 dBm
  2 x 24 dBm — 4.9-5.0 GHz
  2 x 21 dBm — 5.725-5.850 GHz
- Modulation 512/1024 FFT points; QPSK, 16QAM, 64QAM

Radio Interfaces:
- Number of Antennas 2
- Antennas Connectors 2x N-Type, 50 ohm, lightning protected
- Integrated or External Sector or Omni Antenna
- Built-in GPS included

Network Interfaces:
- 10/100BaseT Half / full Duplex IEEE 802.3 CSMA/CD
- ASN GW Compatibility WiMAX Forum R6, Profile C

Configuration and Management:
- Web GUI: HTTPS
- SNMP Agent SNMP ver 2 client/ SNMP v3
- Software Upgrade SFTP
- Remote Configuration SFTP

Mechanical:
- Dimensions [HxWxD] 228mm x 257mm x 112mm
- Weight <4Kg

Power Interface:
- Power supply Input 85 -265 VAC (WiN 1010)
  10–60 VDC or 88–300VDC and
  85–264VAC (RP 100/110)
- Power Consumption 25 Watt max (average power)

Standards Compliance

Environmental:
- Operating Temperature: -40°C to +70°C
- Operating Humidity: 5%-95% non condensing
- Weather protected: IP67
- IEC 61850-3 section 5.2, 5.3, 5.5
- IEC 870-2-2 section 3
- Designed to meet and exceed AREMA C&S Manual part 11.5.1 as applicable
- Hazardous Locations: Class 1 Div 2 (UL 1604, CSA 22.2 No213- M1987)
  ATEX Zone 2 (EN60079-0, EN60079-15)
- Corrosion: MIL-STD-810F 509.4 - salt fog

Safety:
- EN60950-22
- TUV 60950-1
- IEC 60950-1
- 1613 Section 5, 6.2
- IEC 60255-5 section 6.14

Radio:
- EN 302 544-2 -1
- EN302 326-1, EN302 326-2, EN302 326-3
- FCC CFR 47 Part 27
- FCC CFR 47 Part 90
- FCC Part 15

EMC:
- FCC part 15, subpart B, class A
- ETSI EN 301 489-1 V1.8.1
- ETSI EN 301 489-4 V1.3.1
- 1613 section 6.3, 7, 8, 9 Class 1
- IEC 61850-3 section 5.7, 5.8
- EN55022

Ordering Information:
- Part Number: WiN72XX-5 - Small form factor base station
  - XX – Frequency range (See frequency table for details)
  - -5 Standard 5 year warranty

- Comes equipped with:
  - GPS antenna
  - AC power supply
  - 2X RF cables 1.6 m for connection to antenna
  - Pole / wall mount kit

Antenna Options:
- ANTN0029 - 90° X-Pol Sector 3.3-3.8GHz 17dBi
- ANTN0027 - 65° X-Pol Sector 3.3-3.8GHz 17dBi
- ANTN0040 - Omni 3.4-3.7GHz 360° 8.5dBi
- ANTN0048 - 90° X-Pol Sector 2300-2700MHz 16dBi
- ANTN0050 - Omni BST 2.3-2.7GHz 9dBi
- ANTN0043 360° Low gain Omni Antenna 3.4-3.6GHz 6dBi
- ANTN0057 360° Low gain Omni Antenna 3.6-3.8GHz 6dBi
- ANTN0051 360° Low gain Omni Antenna 2.5-2.7GHz 5.5dBi
- ANTN0074 - 90° X-Pol Sector 4.9–5.95 GHz 16dBi

Data cable must be ordered separately:
- CBWR0014-XX- CAT5e double jacket data cable (outdoor rated)
  Where XX can be 2, 15, 30, 45, 60, 75, 90 meters in length

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