RuggedMAX™ WiN5100

WiMAX Vehicular Subscriber Unit Profile (MIMO)

The WiN5100 is a member of the RuggedMAX™ family, a line of mobile WiMAX broadband wireless access systems based on the 802.16e mobile WiMAX standard. WiN5100 is a high-performance subscriber unit designed for indoor or outdoor use that provides complete 802.16e mobile WiMAX broadband wireless access functionality.

The self-learning subscriber device automatically detects the base station on the best signal available allowing for plug and play installation and maintenance free operation. The automatic switching and monitoring features guarantee “always-on” connectivity in changing conditions which results in low maintenance and considerable savings in OPEX.

The WiN5100 is compliant to the IEEE 802.16e standards to effectively meet the unique requirements of the wireless Metropolitan Area Network (MAN) environment and to deliver broadband access services to a wide range of customers. Specifically designed for point-to-multipoint broadband wireless access applications, the WiN5100 provides efficient use of the wireless spectrum, supporting a range of user environments.

Key Features and Benefits:

Long Range

The WiN5100 has multiple built-in receivers to improve range and NLOS performance. The system has ability to leverage sub-channelization technology to balance links with high power base stations. The WiN5100 has external antenna ports for connection to higher gain omni antennas for long range mobile applications or directional antennas for nomadic applications.

Investment Protection

The WiN5100 is built from the ground up by RuggedCom with complete supply chain control and backed by the industry’s leading five year warranty.

Robust Design

The RuggedMAX™ WiN5100 series of subscriber units are designed for mission critical applications in harsh environments with very high Mean Time Before Failure. The unit is designed to operate in harsh environments with extended temperature range and IP67 ingress protection.

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.

Direct DC Power Supply

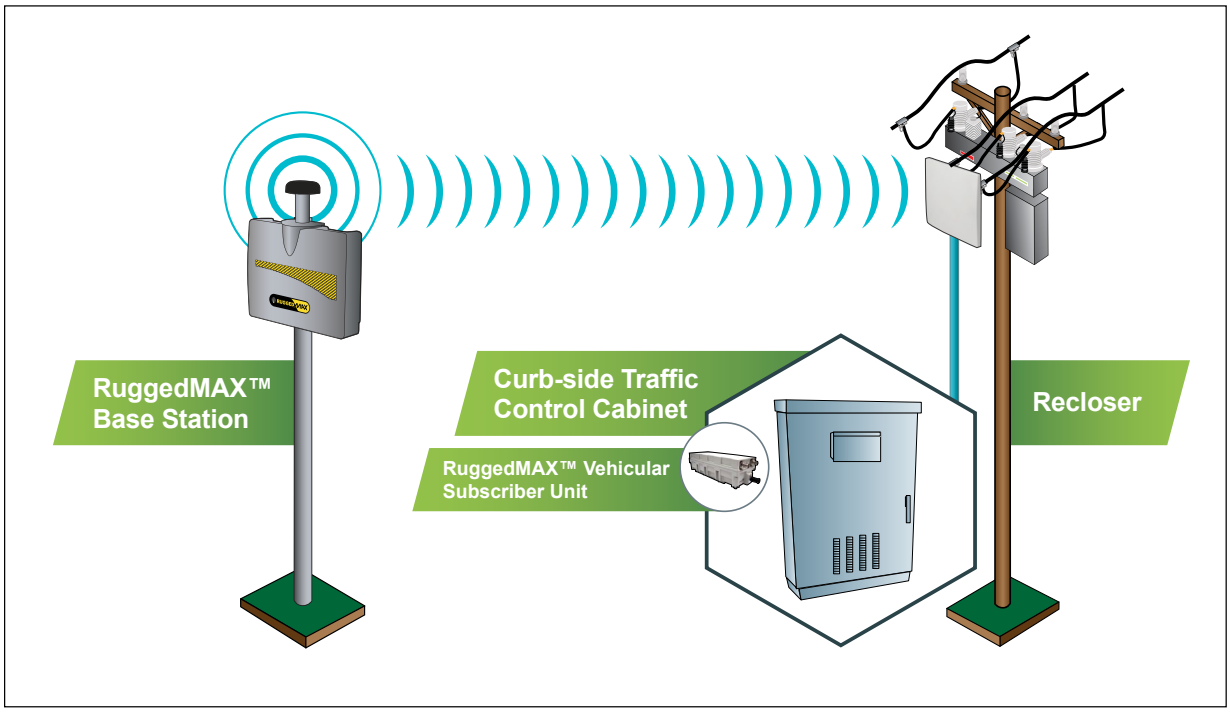
The WiN5100 can be fed directly with 10-30 Volts DC, enabling the unit to be powered from any number of vehicles. The AC version can be powered by an approved power injector, supporting a wide range of power inputs.

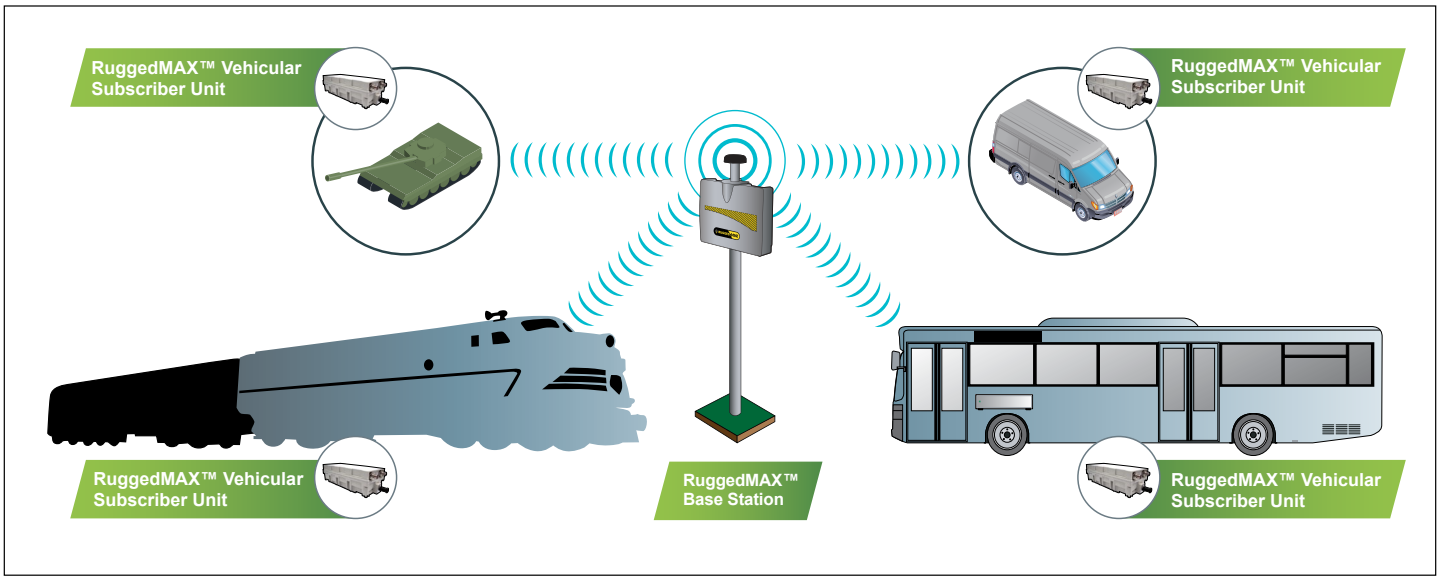
Flexibility

The WiN5100 supports both IP convergence sublayer for wireless internet service providers or Ethernet Convergence Sublayer, ideal for mission critical private networks. The WiN5100 can be used in either vehicular installs (powering directly from a car DC outlet) or for indoor installs with RF cables running to an external antenna.

RUGGEDCOM ISO 9001 REGISTERED

Applications





AC Version

DC Version

Power/Data Interface (AC)

The AC version of the 5100 CPE is using the following connectors:

- An RJ-45 connector for the Ethernet traffic and power
- Ground connection
- 2 RF ports for external antenna connection

Power/Data Interface (DC)

The DC version of the 5100 CPE is using the following connectors:

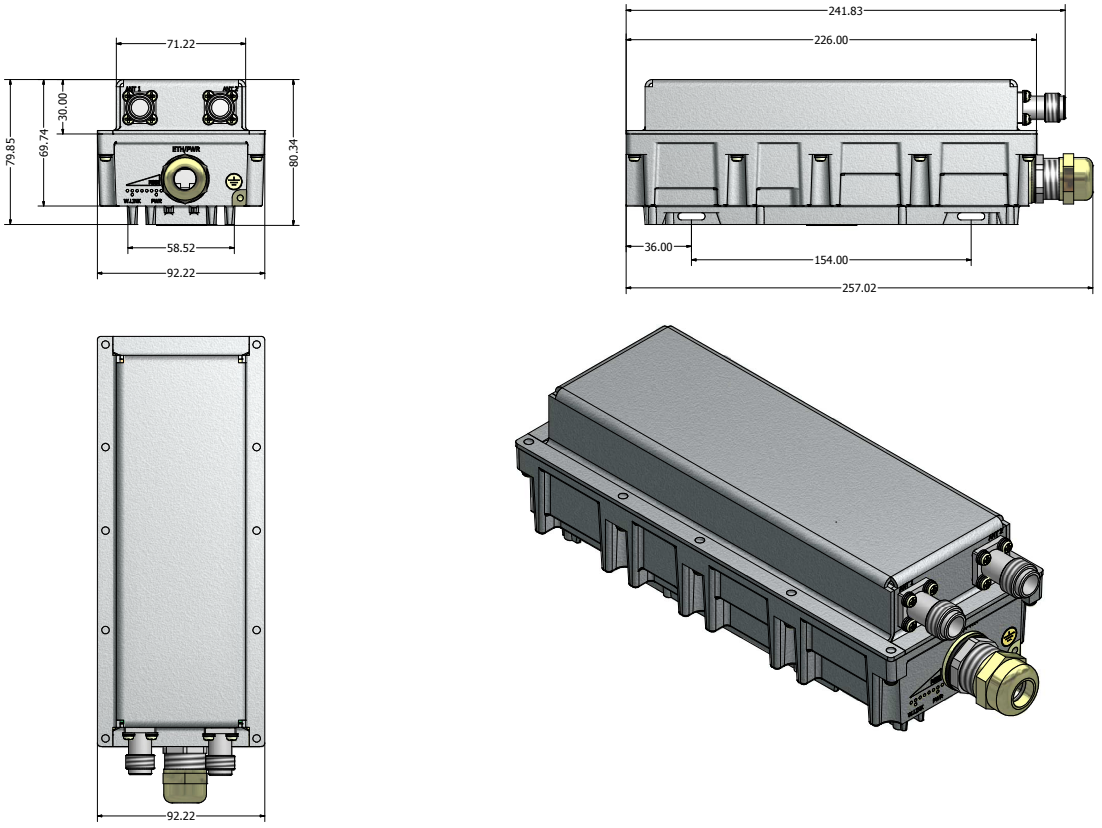
- An RJ-45 connector for the Ethernet traffic ONLY
- Ground connection
- 2 RF ports for external antenna connection
- DC port for connection to 10-30 VDC source

Pin	Description
1	Ethernet RX_POSITIVE Signal
2	Ethernet RX_NEGATIVE Signal
3	Ethernet TX_POSITIVE Signal
4	Power 48V_POSITIVE_IN
5	Power 48V_POSITIVE_IN
6	Ethernet TX_NEGATIVE Signal
7	Power 48V_NEGATIVE_IN
8	Power 48V_NEGATIVE_IN

The Ethernet and Power connector pin out in detail.

LED	Color	Description
WLNK is ON	Green	CPE is connected with and receives services from the base station; network entry is complete.
WLNK is BLINKING	Green	Link between CPE and base station is down.
PWR is ON	Green	CPE power is good
RSSI: one LED is ON (least significant)	Green	5dB <= SNR < 10dB
RSSI: two LEDs are ON	Green	10dB <= SNR < 15dB
RSSI: three LEDs are ON	Green	15dB <= SNR < 20dB
RSSI: four LEDs are ON	Green	20dB <= SNR < 24dB
RSSI: five LEDs are ON	Green	SNR => 24dB and RSSI < -75dBm
RSSI: six LEDs are ON	Green	SNR => 24dB and RSSI => -75dBm
RSSI: seven LEDs are ON	Green	SNR => 24dB and RSSI => -70dBm
RSSI: eight LEDs are ON	Green	-70dbm < RSSI < -61dbm
RSSI: eight LEDs are ON	LEDs 1-7: Green LED 8: Red	-61dbm <= RSSI < -35dbm
RSSI: only the last LED is ON (most significant)	Red	RSSI => -35dBm (saturation)

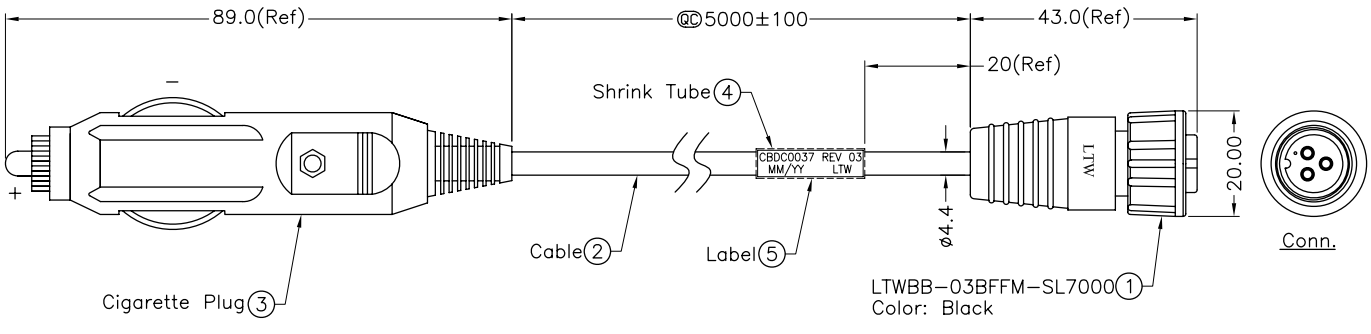
Table 2.4. CPE LED Indicators



Outdoor unit (without antenna)

- Height: 226mm
- Width: 92mm
- Depth: 89mm
- Weight: 1.5Kg

Cable Diagram



Specifications

Radio and Modem:

Frequency	WiN5114: 1350 MHz to 1525 MHz WiN5118: 1800 MHz to 1830 MHz WiN5123: 2300MHz to 2400MHz WiN5125: 2496MHz to 2690MHz WiN5135: 3300 MHz to 3600 MHz WiN5137: 3600 MHz to 3800 MHz WiN5149: 4900 MHz to 5000 MHz WiN5258: 5725 MHz to 5850 MHz
Radio Access Method	IEEE802.16-2005 (16e OFDMA)
Operation Mode	TDD
Compatibility	Wave 2 Profile (MIMO)
Channel Bandwidth	3.5 MHz, 5 MHz, 7MHz, 10 MHz
Frequency Resolution	0.25 MHz
Antenna Support	External RF ports
Antenna Diversity Support	STC/MRC/MIMO
Output Power (average)	+27 dBm +/-1dB +24 dBm (4.9-5.0 GHz) +21 dBm (5.725-5.850 GHz)
TPC	54dB
FFT/Modulation	1024/512 FFT points; QPSK, 16QAM, 64QAM
FEC	Convolutional Turbo Code
Dynamic range	RX: -100dBm:-20 dBm TX: -30dBm: +24 dBm

Data Communication (Through indoor unit):

Ethernet Standard Compliance	IEEE 802.3 CSMA/CD
Ethernet Port	10/100 Mbps, Half/Full Duplex with Auto Negotiation
Traffic Classification:	DSCP/IP TOS field IP Protocol/Next Header field IP masked Source Address IP Destination Address Protocol source port range Protocol destination port range Source MAC address (SA mode) Destination MAC address (SA mode) VLAN ID (SA mode) Ethertype (SA mode)
Max User Throughput	DL: 20Mbps, UL: 10Mbps

Supported Power Supplies (AC version):

WiN1010	Data Adapter
RP100	RuggedPower Injector supporting 10–60 or 88–300VDC or 85–264VAC
RP110	Supporting embedded serial protocols (refer to RP1XX datasheet for more details)

Power Supply (DC version): 10-30VDC

Configuration and Management:

Local Management	• Web Browser-HTTPS • SSHv2 • RADIUS based authentication
SNMPv3 Client	
Authentication	EAP-TTLS, EAP-TLS (4.2.1):
Device:	X509 digital certificate
User:	MS-CHAP
Software Upgrade	SFTP

Mechanical, Electrical and Environmental:

Dimensions	226 x 92 x 89 mm
Weight	1.5 kg
Power Consumption	8W typical
Operating Temperature	-40°C to +75°C
Operating Humidity	5%-95% non condensing

Standards Compliance:

EMC	FCC part 15, subpart B, class B ETSI EN 301489-1/4
Safety	TUV-UL 60950-1 EN 60950-1 CSA C22
Radio	FCC Part 27 FCC Part 90 FCC PART 15 ETSI EN 302 326-1/2/3 RSS 197 SRSP 301.7 issue 2
Environmental	ETS 300 019
Hazardous Locations:	Class 1 Div 2 (UL 1604, CSA 22.2 No213- M1987) ATEX Zone 2 (EN60079-0, EN60079-15)
Ingress Protection:	IP67
Corrosion:	MIL-STD-810F 509.4- salt fog
Rail:	Designed to meet and exceed AREMA C&S Manual part 11.5.1 as applicable

Ordering Information:

Part Number: WiN51XX-Y-ZZ

- XX: Frequency range (See frequency table for details)
- Y:
  - 5 – Standard 5 year warranty
  - 1 – 1 year warranty
- ZZ:
  - AC – PoE powered, designed for use with approved injectors
  - DC – 10-30 VDC direct feed

RuggedCom Inc.
300 Applewood Crescent,
Concord, Ontario, Canada L4K 5C7

Tel: +1 (905) 856-5288 **Fax:** +1 (905) 856-1995
Toll Free: 1 (888) 264-0006
Technical Support Center: 1 (866) 922-7975

Rev 1g – 09/10/13

For additional information on our products and services, please visit our web site at: www.RuggedCom.com