

# W6000 Series Preliminary

**Compact, rugged, wireless computer with 3G/LTE, LAN, and 2 serial ports**



- > ARMv7 Cortex-A8 processor with 512 MB RAM
- > Built-in high speed HSPA+, LTE, and GPS support
- > -40 to 70°C LTE operating temperature for harsh environments
- > Compact size: 100 x 60 x 22 mm
- > Auto-sensing 10/100 Mbps Ethernet port
- > Dual software-selectable RS-232/422/485 serial ports
- > MicroSD socket for storage expansion
- > Debian ARM 8 open platform
- > Keep alive session persistence
- > Wireless, secure-router computer



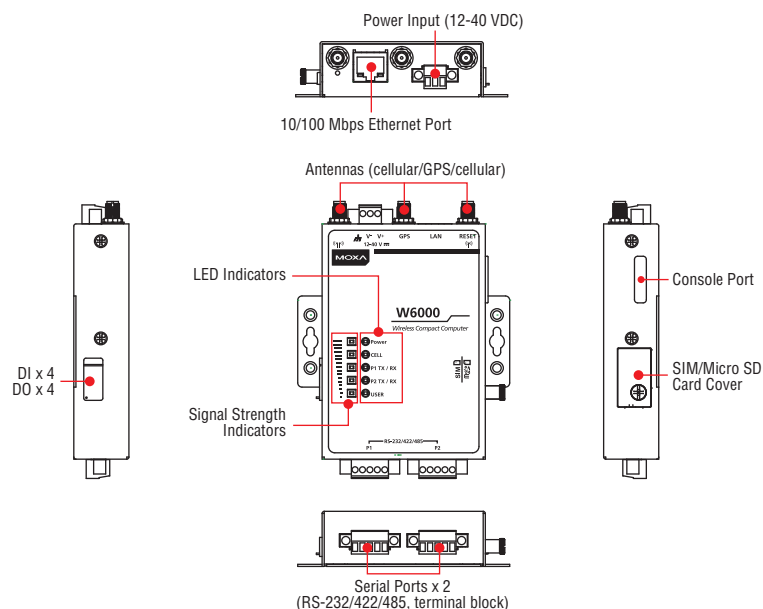
## Overview

The W6000 series computers are embedded Linux computers featuring 2 software selectable RS-232/422/485 ports, 1 Ethernet port, and LTE/US, HSPA, GPRS/GSM, and GPS for complex communication solutions. All W6000 computers come with a microSD socket for external storage expansion. The W6000 computers' Linux OS runs on the 32-bit ARM Cortex-A8 processor, which provides a powerful and reliable platform for harsh, industrial environments.

The W6000 is built around a low-power Cortex-A8 RISC processor

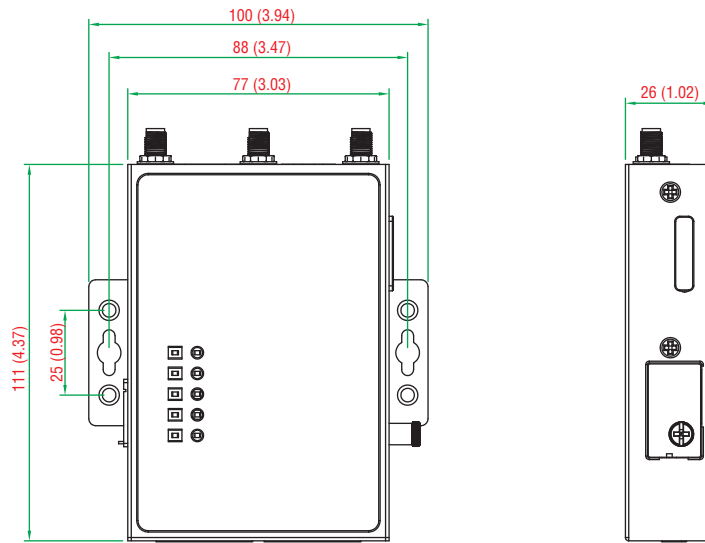
and Debian ARM Linux OS that has been optimized for use in energy monitoring systems, but is widely applicable to a variety of industrial solutions. With powerful computing and multiple communication options, this tiny embedded computer is a reliable and secure gateway for data acquisition and processing at field sites as well as a useful communication platform to replace individual computers and routers for many other large-scale deployments.

## Appearance



## Dimensions

Unit: mm (inch)



## Hardware Specifications

### Computer

**CPU:** ARMv7 Cortex-A8 300 MHz (600 MHz, 1 GHz by project)

**USB:** USB 2.0 hosts x 1, type A connector

**DRAM:** DDR3 SDRAM: 512 MB

**OS (pre-installed):** Debian ARM 8 (Kernel 4.0)

### Storage

**Storage Expansion:** MicroSD socket for storage expansion

### Ethernet Interface

**LAN:** Auto-sensing 10/100 Mbps ports (RJ45) x 1

**Magnetic Isolation Protection:** 1.5 kV, built-in

### Serial Interface

**Serial Standards:** RS-232/422/485 ports, software-selectable (5-pin terminal block connector) x 1 or 2

**Console Port:** RS-232 (TxD, RxD, GND), 4-pin pin header output (115200, n, 8, 1)

### Serial Communication Parameters

**Data Bits:** 5, 6, 7, 8

**Stop Bits:** 1, 1.5, 2

**Parity:** None, Even, Odd, Space, Mark

**Flow Control:** XON/XOFF, ADDC® (Automatic Data Direction Control) for RS-485

**Baudrate:** 921600 bps (max.)

### Serial Signals

**RS-232:** TxD, RxD, RTS, CTS, GND

**RS-422:** TxD+, TxD-, RxD+, RxD-, GND

**RS-485-4w:** TxD+, TxD-, RxD+, RxD-, GND

**RS-485-2w:** Data+, Data-, GND

### Digital I/O

**Digital Input:** 3.3V/TTL digital inputs x 4

**Digital Output:** 3.3V/TTL digital outputs x 4

### LEDs

**System:** Power x 1, cellular x 1, serial TX/RX x 2, signal strength x 5, user-defined x 1

**LAN:** 10M/100M on connector

### Physical Characteristics

**Housing:** Aluminum (1 mm)

**Weight:** 875 g (1.94 lb)

**Dimensions:** 111 x 25 x 77 mm (4.37 x 0.98 x 3.03 in)

**Mounting:** Wall, DIN rail (with optional kit)

### Environmental Limits

**Operating Temperature:** -40 to 70°C (-40 to 158°F)

**Storage Temperature:** -40 to 85°C (-40 to 185°F)

**Ambient Relative Humidity:** 5 to 95% (non-condensing)

**Anti-Vibration:** 2 Grms @ IEC 60068-2-64, random wave, 5-500 Hz, 1 hr per axis

**Anti-Shock:** 20 g @ IEC 60068-2-27, half sine wave, 30 ms

### Power Requirements

**Input Voltage:** 9 to 40 VDC (3-pin terminal block, V+, V-, SG)

**Input Current:**

- 450 mA @ 12 VDC

- 225 mA @ 24 VDC

**Power Consumption:** 5.4 W

### Standards and Certifications

**Safety:** UL 60950-1, EN 60950-1

**EMC:** EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4,

FCC Part 15 Subpart B Class A

**Green Product:** RoHS, CRoHS, WEEE

### Reliability

**Alert Tools:** Built-in RTC (real-time clock)

**Automatic Reboot Trigger:** Built-in WDT (watchdog timer)

### Warranty

**Warranty Period:** 5 years

**Details:** See [www.moxa.com/warranty](http://www.moxa.com/warranty)

## Software Specifications

### Linux

**OS:** Debian ARM 8 (Kernel 4.0)

**Web Server (Apache):** Allows you to create and manage web sites; supports PHP and XML

**Terminal Server (SSH):** Provides secure encrypted communications between two untrusted hosts over an unsecure network

**Kernel:** GNU/Linux 4.0

**System Shell:** DASH (default), BASH

**Text Editor:** vim, nano

**Internet Protocol Suite:** TCP, UDP, IPv4, IPv6, SNMPv2, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SSH, PPP, SFTP, RSYNC, SSL

**Programming Language Support:** PHP, Perl, Python

**Internet Security Suite:** OpenVPN, IPTables

**Cryptographic Hardware Accelerators:** AES, SHA, OpenSSL

**Linux Board Support Packages (BSP):**

- GCC C/C++ cross development tool chain
- Bootloader/ Kernel

**Cellular Networking:**

- WVDIAL: Point-to-Point Protocol dialer that dials a modem and uses the PPP protocol to connect to the Internet.
- QMI (Qualcomm MSM Interface): Glib-based library for talking to WWAN modems and devices that speak the Qualcomm MSM Interface (QMI) protocol.
- MODBUS: Software library to send/receive data according to the Modbus protocol. This library is written in C and supports RTU (serial) and TCP (Ethernet) communications.

- Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Linux standard API).

**Cybersecurity:**

- Secure Boot: A novel authentication algorithm proposed to secure platform integration. Only trusted Linux kernel and bootloader should be executed (Patent Pending).
- Sudo Mechanism: Sudo (sometimes considered short for super user) is a program designed to let system administrators allow some users to execute certain commands as the root user (or another user). The root user account is disabled by default. The basic philosophy is to give as few privileges as possible but still allow people to get their work.
- Security Update of Existing Software Packages: All software packages installed on the W6000 can be automatically updated using Debian Linux's Advanced Packaging Tool (APT) server or Moxa's server.
- microSD write protection: Provides a mechanism for disabling SD write permission to the microSD memory card plugged in directly into the card slot, or which is part of an extended storage system.

## Ordering Information

Model	Antennas	Primary Network	Auxiliary Network	Serial Ports	LAN
W6393-T-LX-US	3	LTE-US	GPS	2	1
W6273-T-LX	2	HSPA+	GPS	2	1

## Optional Accessories

### Antennas and Internal Antenna Cables

GPS Antenna	ANT-GPS-OSM-05-3M	Active GPS antenna, 26 dBi, 1572 MHz, L1 band antenna for GPS
LTE Antenna	ANT-LTE-OSM-03-3m BK	Multi-band antenna that covers 700-2700 MHz frequencies. Specially designed for 2G, 3G, and 4G applications. Magnetic mounting is available.
LTE Antenna	ANT-LTE-ASM-04 BK	LTE Stick antenna that covers 704-960/1710-2620 MHz, providing omnidirectional radiation with a gain of 4.5 dBi.
LTE Antenna	ANT-LTE-ASM-05 BK	LTE stick antenna that covers 704-960/1710-2620 MHz with a gain of 5 dBi.
LTE Antenna	ANT-LTE-OSM-06-3m BK MIMO	Multi-band antenna that covers 700-2700/2400-2500/5150-5850 MHz frequencies. Screw-fastened mounting and full IP67 waterproofing are available.

### Package Checklist

- W6000 embedded computer
- Power jack
- Ethernet cable
- LTE antennas
- Console cable
- Quick installation guide (printed)
- Warranty card