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
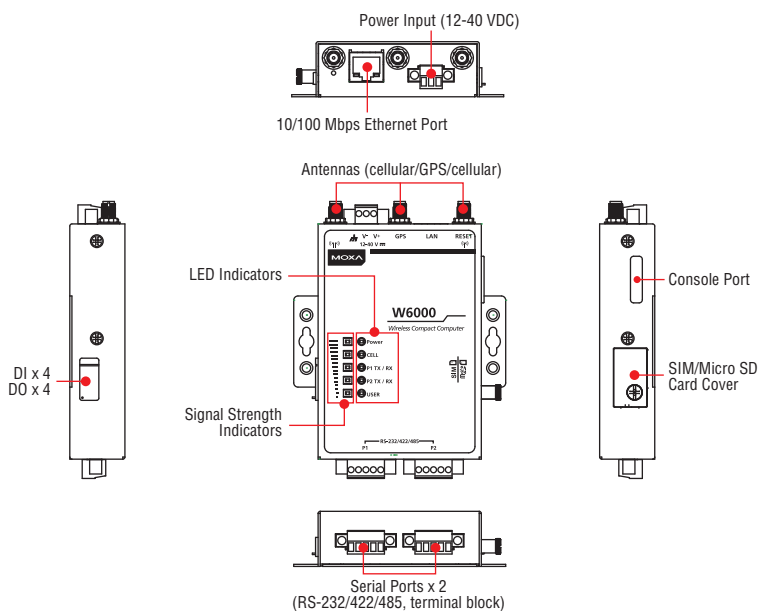> Wireless, secure-router computer

: 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 Debain 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.
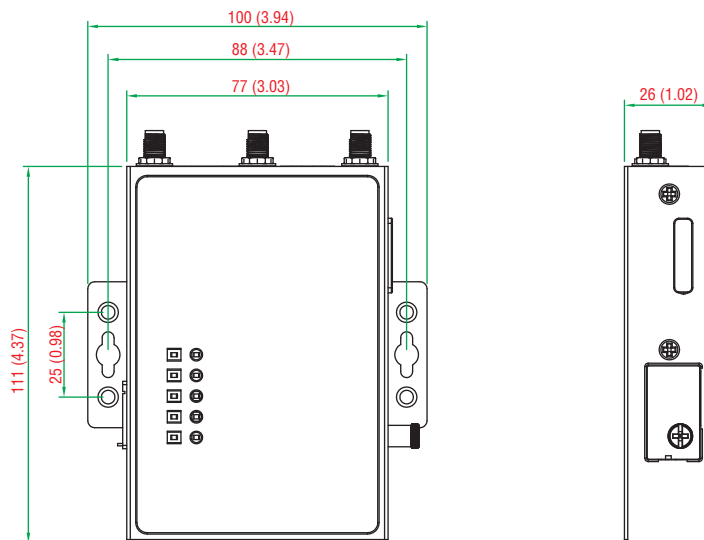
: Appearance

Power Input (12-40 VDC)

10/100 Mbps Ethernet Port

Antennas (cellular/GPS/cellular)

LED Indicators

Console Port

W6000
Wireless Compact Computer

Power
CELL
P1 TX / RX
P2 TX / RX
USER

SIM/Micro SD
Card Cover

DI x 4
DO x 4

Signal Strength
Indicators

RS-232/422/485
P1   P2

Serial Ports x 2
(RS-232/422/485, terminal block)

MOXA®

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 55032 Class B, EN 55024, 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

: 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 do 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