W406 Series

RISC-based wireless embedded computer with GSM/GPRS/EDGE, 4 DIs, 4 DOs, 2 serial ports, Ethernet, SD

The W406 is an embedded Linux or WinCE computer that features 2 software selectable RS-232/422/485 ports, 1 Ethernet port, and quad-band GSM/GPRS/EDGE 900/1800/850/1900 MHz for cellular communication. It also comes with an SD socket, USB host, and 4 digital input and 4 digital output channels, making it the ideal computer for a variety of industrial applications such as data acquisition, data processing, protocol conversion, and remote device control and monitoring via wireless communication. The W406 comes pre-installed with either Linux or WinCE 6.0, and offers a reliable and powerful computing platform for industrial environments. Programmers will find that the W406 provides a convenient programming environment for producing bug-free industrial applications at a lower cost.

Overview

The W406 features Cirrus Logic EP9302 32-bit ARM9 processor, 32 MB RAM on-board (maximum 64 MB), 16 MB Flash built in (maximum 32 MB), built-in GSM/GPRS/EDGE cellular communication, GSM 850/900/1800/1900 MHz supported, GPRS/EDGE Class 12 supported, SMS tunnel mode provided, 4 DIs, 4 DOs, two software selectable RS-232/422/485 serial ports, 50 bps to 921.6 Kbps (non-standard baudrates supported), 10/100M Ethernet for network redundancy, SD socket for storage expansion, WinCE 6.0 or Linux 2.6 platform, Din-Rail or wall mount installation, robust, fanless design, and wide temperature models available by request.

Appearance

W406 Front View

- LED Indicators (Ready/Storage)
- Signal Strength
- SD/SIM Card Socket
- 10/100 Mbps Ethernet x 1
- GSM/GPRS/EDGE Antenna

W406 Top/Bottom View

- LED Indicators (Serial Rx/Tx)
- Cellular Enable
- USB 2.0 Host x 1

W406 Rear View

- DO x 4
- DI x 4
- Power Input
- Serial Port x 2 (RS-232/422/485)
- Reset Button
- Console Port (RS-232)
- DIN-rail Kit

Cirrus Logic EP9302 32-bit ARM9 processor
- 32 MB RAM on-board (maximum 64 MB)
- 16 MB Flash built in (maximum 32 MB)
- Built-in GSM/GPRS/EDGE cellular communication
- GSM 850/900/1800/1900 MHz supported
- GPRS/EDGE Class 12 supported
- SMS tunnel mode provided
- 4 DIs, 4 DOs
- Two software selectable RS-232/422/485 serial ports
- 50 bps to 921.6 Kbps (non-standard baudrates supported)
- 10/100M Ethernet for network redundancy
- SD socket for storage expansion
- WinCE 6.0 or Linux 2.6 platform
- Din-Rail or wall mount installation
- Robust, fanless design
- Wide temperature models available by request
# Hardware Specifications

**Computer**
- CPU: Cirrus Logic EP9302 ARM9 32-bit RISC CPU, 200 MHz
- OS (pre-installed): WinCE 6.0/Embedded Linux with MMU support
- DRAM: 32 MB (64 MB max.)
- Flash: 16 MB (16 MB max.)
- USB: USB 2.0 compliant hosts x 1, type A connector

**Storage**
- Storage Expansion: SD slot

**Ethernet Interface**
- LAN: 1 auto-sensing 10/100 Mbps port (RJ45)
- Magnetic Isolation Protection: 1.5 KV built-in

**Cellular Interface**
- Cellular Modes: GSM, GPRS, EDGE
- Radio Frequency Bands: 850/900/1800/1900 MHz
- GPRS Class: 12
- EDGE Class: 12
- Coding Schemes: CS1 to CS4

**Serial Interface**
- Serial Standards: 2 RS-232/422/485 ports, software-selectable (DB9 male)
- ESD Protection: 15 KV ESD protection for all signals
- Console Port: RS-232 interface (TxD, RxD, GND), with 4-pin pin header output

**Serial Communication Parameters**
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Parity: None, Even, Odd, Space, Mark
- Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
- Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user’s manual for details)

**Serial Signals**
- RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
- RS-422: TxD+, TxD-, RxD+, RxD-, GND
- RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
- RS-485-2w: Data+, Data-, GND

**Digital Input**
- Input Channels: 4, source type
- Input Voltage: 0 to 30 VDC
- Digital Input Levels for Dry Contacts:
  - Logic level 0: Close to GND
  - Logic level 1: Open
- Digital Input Levels for Wet Contacts:
  - Logic level 0: -3 V max.
  - Logic level 1: +10 V to +30 V (COM to DI)
- Connector Type: 6-pin screw terminal block (4 points, COM, GND)
- Isolation: 3 KV optical isolation

**Digital Output**
- Output Channels: 4, sink type
- Output Current: Max. 200 mA per channel
- On-state Voltage: 24 VDC nominal, open collector to 30 V
- Connector Type: 5-pin screw terminal block (4 points, GND)
- Isolation: 3 KV optical isolation

**LEDs**
- System: Ready, Storage
- LAN: 10M/100M/1000M/10000M Link (on connector)
- Cellular: Cellular Enable, Signal Strength (5 LEDS)
- Serial: TxD, RxD

**Switches and Buttons**
- Reset Button: Supports “Reset to Factory Default”
- Cellular Reset Button: Supports cellular reset function

**Physical Characteristics**
- Housing: Aluminum (1 mm)
- Weight: 1 kg
- Dimensions: (without ears or antenna)
  - 144 x 119 x 40 mm (5.67 x 4.69 x 1.57 in)
- Mounting: DIN-rail, wall (requires optional wall mount kit)
- Antenna Length: 85 mm

**Environmental Limits**

**Operating Temperature**
- Standard Models: -10 to 60°C (14 to 140°F)
- Wide Temp. Models: Available by request

**Storage Temperature**
- Standard Models: -20 to 80°C (-4 to 176°F)
- Wide Temp. Models: -40 to 85°C (-40 to 185°F)

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

**Anti-vibration**
- 2 g’s @ IEC-68-2-6, half sine wave, 5-500 Hz, 1 Oct./min, 1 hr/axis

**Anti-shock**
- 6 g’s @ IEC-68-2-27, half sine wave, 11 ms (when attached to DIN-Rail kit)
- 20 g’s @ IEC-68-2-27, half sine wave, 11 ms (when attached to optional wall mount kit)

**Power Requirements**
- Input Voltage: 12 to 48 VDC
- Power Consumption:
  - With no load on USB ports: 7.2 W
  - 300 mA @ 24 VDC
  - 600 mA @ 12 VDC
  - With full load on USB ports: 14.4 W
  - 600 mA @ 24 VDC
  - 1200 mA @ 12 VDC

**Standards and Certifications**

**Safety**
- EN 60950-1, CSA C22.2 No. 60950-1-03

**EMC**
- EN 55022 Class B, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class B

**Radio**
- EN 301 489-1, EN 301 489-7, EN 301 511

**Green Product**
- RoHS, CRoHS, WEEE

**Reliability**
- Alert Tools: Built-in buzzer and RTC (real-time clock) with battery backup
- Automatic Reboot Trigger: Built-in WDT (watchdog timer)
- MTBF (mean time between failures): 170,162 hrs

**Warranty**

**Warranty Period:** 5 years

**Details:** See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.
### Software Specifications

**Linux**

- **OS:** Linux 2.6.23
- **File System:** JFFS2 (for on-board flash)
- **Internet Protocol Suite:** TCP, UDP, IPv4, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPTP
- **Internet Security:** OpenVPN, iptables firewall
- **Web Server (Apache):** Allows you to create and manage Web sites, supporting PHP and XML
- **Terminal Server (SSH):** Provides secure encrypted communications between two un-trusted hosts over an insecure network
- **Dial-up Networking:** PPP Daemon for Linux allows Unix machines to connect to the internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with ‘chat’, ‘dip’, and ‘diald’, among (many) others. Supports IP, TCP, UDP and (for Linux) IPX (Novell)
- **Watchdog:** Features a software function to trigger system reset in a user specified time interval. (MOXA API provided)
- **Application Development:**
  - Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
  - GNU C/C++ Cross-Compiler
  - GNU C library
  - GDB source-level debugging server
- **Software Protection:** Encryption tool for user executable files (based on patented Moxa technology)

**Windows Embedded CE 6.0**

- **OS:** Windows Embedded CE 6.0 R2
- **File System:** FAT (for on-board flash)
- **Internet Protocol Suite:** TCP, UDP, IPv4, SNMPv2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SMTP, SMPT, Telnet, FTP, PPP
- **Web Server (WinCE IIS):** Supports ASP, ISAPI Secure Socket Layer (SSL 2/3) and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions
- **Dial-up Networking:** Supports RAS client API and PPP, Extensible Authentication Protocol (EAP), and RAS scripting
- **Watchdog:** Features a hardware function to trigger system reset in a user specified time interval. (Moxa API provided)
- **Application Development Software:**
  - Moxa WinCE 6.0 SDK
  - Moxa API Library
  - C Libraries and Run-times
  - Component Services (COM and DCOM)
  - Microsoft® .NET Compact Framework 2.0 with SP2
  - Winsock 2.2

### Dimensions

![Dimensions Diagram]

Unit: mm (inch)
### Ordering Information

**Available Models**

- **W406-LX:** RISC-based wireless embedded computer with GSM/GPRS/EDGE, 4 DIs, 4 DO, 2 serial ports, Ethernet, SD, Linux 2.6 OS, -10 to 60°C operating temperature
- **W406-CE:** RISC-based wireless embedded computer with GSM/GPRS/EDGE, 4 DIs, 4 DO, 2 serial ports, Ethernet, SD, WinCE 6.0 OS, -10 to 60°C operating temperature
- **W406-T-LX:** RISC-based wireless embedded computer with GSM/GPRS/EDGE, 4 DIs, 4 DO, 2 serial ports, Ethernet, SD, Linux 2.6 OS (contact Moxa for details about this wide temp. computer)
- **W406-T-CE:** RISC-based wireless embedded computer with GSM/GPRS/EDGE, 4 DIs, 4 DO, 2 serial ports, Ethernet, SD, WinCE 6.0 OS (contact Moxa for details about this wide temp. computer)

**Optional Accessories** (can be purchased separately)

- PPWR-24250-DT-ST: Power adaptor
- PWC-C7US-2B-183: Power cord with 2-pin connector, USA plug
- PWC-C7EU-2B-183: Power cord with 2-pin connector, Euro plug
- PWC-C7UK-2B-183: Power cord with 2-pin connector, British plug
- PWC-C7AU-2B-183: Power cord with 2-pin connector, Australia plug
- PWC-C7CN-2B-183: Power cord with 2-pin connector, China plug

### Package Checklist

- W406 embedded computer
- Wall mounting kit (optional)
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- GSM/GPRS/EDGE Antenna
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card