

# V2401/2402 Series

***x86 ready-to-run embedded computers with Intel Atom N270, VGA, DVI, LVDS, audio, 2 LANs, 12 serial ports, 4 DIs, 4 DOs, 6 USB 2.0 ports, CompactFlash***



- > Intel Atom N270 1.6 GHz processor
- > DDR2 SO-DIMM socket supporting DDR2 533 up to 2 GB (max.)
- > Dual independent displays (VGA, DVI, LVDS)
- > 2 Gigabit Ethernet ports
- > 4 RS-232/422/485 serial ports (non-standard baudrates supported)
- > 8 RS-232 serial ports
- > 6 USB 2.0 ports for high speed peripherals
- > 4 DIs, 4 DOs
- > CompactFlash socket for storage expansion
- > Ready-to-run Embedded Linux, Windows CE 6.0, or Windows Embedded Standard 2009 platform
- > -40° to 70°C operating temperature for harsh environment (V2402-T models only)

e Mark



## Overview

The V2401/2402 Series embedded computers are based on the Intel Atom N270 x86 processor, and feature 4 RS-232/422/485 serial ports, 8 RS-232 serial ports, dual Gigabit LAN ports, 6 USB 2.0 hosts, and a CompactFlash socket. The V2401 computer provides VGA, DVI, and LVDS outputs, and the V2402 computer provides both VGA and DVI outputs, making them particularly well-suited for industrial applications such as SCADA and factory automation.

The V2401 and V2402 come with 4 RS-232/422/485 serial ports, and the V2401 has an additional 8 RS-232 ports, making them ideal for connecting a wide range of serial devices, and the dual 10/100/1000 Mbps Ethernet ports offer a reliable solution for network redundancy,

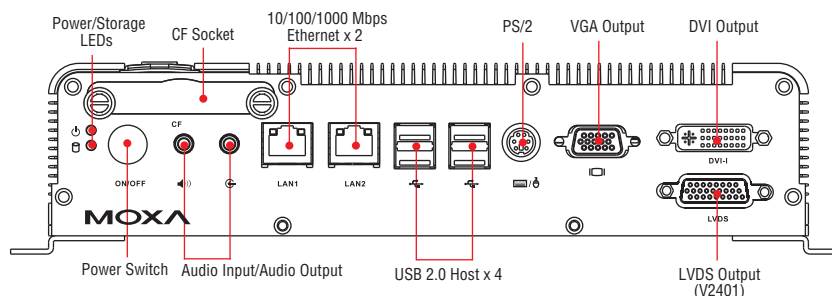
promising continuous operation for data communication and management. As an added convenience, the V2401/2402 computers have 4 DIs, and 4 DOs for connecting digital input/output devices. In addition, the CompactFlash and USB sockets provide the V2401/2402 computers with the reliability needed for industrial applications that require data buffering and storage expansion.

Pre-installed with Linux, Windows CE 6.0, or Windows Embedded Standard 2009, the V2401/2402 Series provides programmers with a friendly environment for developing sophisticated, bug-free application software at a low cost.

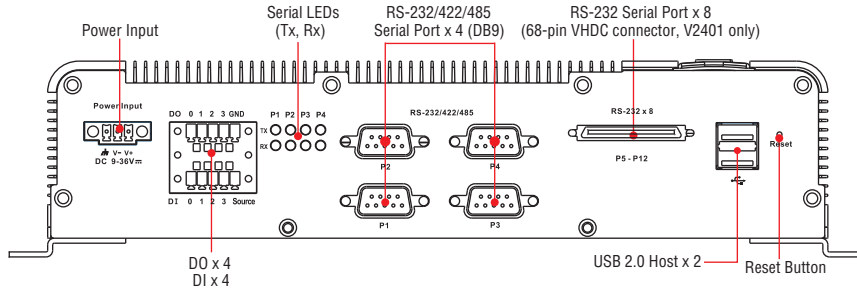
In addition, the V2402 series also offers -40 to 70°C wide temperature models for harsh environments.

## Appearance

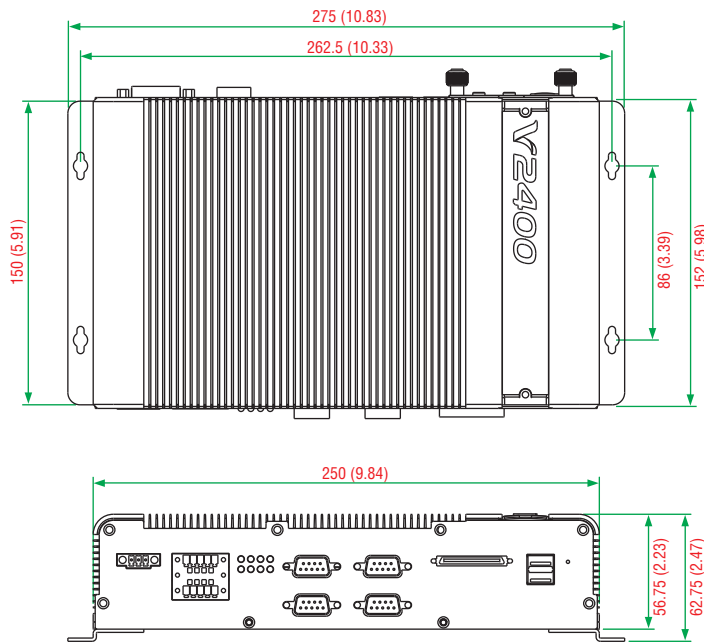
Front View



Rear View



Dimensions



Unit: mm (inch)

Hardware Specifications

Computer

- CPU:** Intel Atom N270 1.6 GHz processor
- OS (pre-installed):** Linux, Windows CE 6.0 or Windows Embedded Standard 2009
- System Chipset:** Intel 945GSE + ICH7-M
- BIOS:** 8 Mbit Flash BIOS, SPI type, ACPI function supported
- FSB:** 400/533 MHz
- System Memory:** 2 GB capacity, 1 GB pre-installed: 1 x 2 GB DDR2-533 200 pin SO-DIMM SDRAM slot
- USB:** USB 2.0 compliant hosts x 6, type A connector, supports system boot up

Storage

- Built-in:** 2 GB onboard industrial DOM to store OS
- Storage Expansion:** CompactFlash socket for CF card expansion, supporting CF Type-I/II socket with DMA mode
- HDD Support:** 1 SATA-II connector for HDD expansion

Other Peripherals

- KB/MS:** 1 PS/2 interface supporting standard PS/2 keyboard and mouse through Y-type cable
- Audio:** HD audio, with line-in and line-out interface

Display

- Graphics Controller:** Intel Gen 2.5 Integrated Graphics Engine, 250 MHz core render clock and 200 MHz core display clock at 1.05-V core voltage

- VGA Interface:** DB15 female connector
- LVDS Interface:** Onboard HIROSE DF13-40DP-1.25 V connector (V2401 only)
- DVI Interface:** DVI-connector (chrontel CH7307 SDVO to DVI transmitter)

Ethernet Interface

- LAN:** 2 auto-sensing 10/100/1000 Mbps ports (RJ45)

Serial Interface

- Serial Standards:**
  - V2401/2402: 4 RS-232/422/485 ports\*, software selectable (DB9 male connector)
  - V2401 only: 8 RS-232 ports (68-pin VHDC connector)

\*COM1's pin 9 signal can be set by jumper as N/C (default), +5 V, or +12 V

**ESD Protection:** 4 kV for all signals

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, ADCC® (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 at 25 Hz

**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 (Source to DI)

**Isolation:** 3 kV optical

## Digital Output

**Output Channels:** 4, sink type

**Output Current:** Max. 200 mA per channel

**On-state Voltage:** 24 VDC nominal, open collector to 30 VDC

**Connector Type:** 10-pin screw terminal block (4 DI points, 4 DO points, DI Source, GND)

**Isolation:** 3 kV optical isolation

## LEDs

**System:** Power, Storage

**LAN:** 100M/Link x 2, 1000M/Link x 2 (on connector)

## Switches and Buttons

**Power Switch:** on/off (front panel)

**Reset Button:** For warm reboot (rear panel)

## Physical Characteristics

**Housing:** Aluminum

**Weight:**

- V2401: 2.1 kg
- V2402: 2 kg

**Dimensions:**

Without ears: 250 x 57 x 152 mm (9.84 x 2.24 x 5.98 in)

With ears: 275 x 63 x 152 mm (10.83 x 2.48 x 5.98 in)

**Mounting:** DIN rail, wall, VESA

## Environmental Limits

**Operating Temperature:**

- Standard models: -10 to 60°C (14 to 140°F)
- Wide temp. models: -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:** 5 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr/axis

**Anti-shock:** 50 g @ IEC-68-2-27, half sine wave, 11 ms

## Power Requirements

**Input Voltage:** 9 to 36 VDC (3-pin terminal block for V+, V-, SG)

**Power Consumption:** 26 W (without LVDS output)

2.9 A @ 9 VDC

1.08 A @ 24 VDC

720 mA @ 36 VDC

## Standards and Certifications

**Safety:** UL 508, UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1, CCC (GB9254, GB17625.1)

**EMC:** EN 55022 Class A, EN 61000-3-2 Class D, EN 61000-3-3, EN

55024, FCC Part 15 Subpart B Class A

**Wheeled Vehicles:** e-Mark (e4)

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

## Reliability

**Automatic Reboot Trigger:** Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

**MTBF (mean time between failures):**

V2401: 238,762 hrs

V2402: 228,172 hrs

## Warranty

**Warranty Period:** 3 years

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

## Software Specifications

### Linux

**OS:** Linux 2.6.26, Debian Lenny 5.0

**File System:** EXT2

**Internet Protocol Suite:** TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE

**Internet Security:** OpenVPN, iptables firewall

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

**File Server:** Enables remote clients to access files and other resources over the network

**Watchdog:** Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

**Application Development Software:**

- Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
- GNU C/C++ compiler
- GNU C library
- Perl

### Windows XP Embedded

**OS:** Windows Embedded Standard 2009 SP3

**File System:** NTFS

**Internet Protocol Suite:** DHCP, DNS, FTP, HTTP, SMTP, NTP, Telnet, SMTP, SNMPv2, TCP, UDP, IPv4, ICMP, IGMP, IPsec, TAPI, ICS, PPP, CHAP, EAP, PPPoE, PPTP, NetBIOS

**Web Server (IIS):** Allows users to create and manage websites

**Silverlight 2.0:** A free runtime that powers rich application experiences and delivers high quality, interactive video across multiple platforms and browsers, using the .NET framework

**Remote Registry Service:** Enables remote users to modify registry settings on this computer

**Remote Desktop:** The Terminal Server Remote Desktop component provides remote access for the desktop of a computer running Terminal Services

**Watchdog:** Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

**Enhanced Writer Filter:** Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage

**File Based Write Filter:** The File Based Write Filter (FBWF) component redirects all write requests directed at protected volumes to the overlay cache, which records and displays the changes while preserving the protected status of the target volume.

**Application Development Software:**

- Moxa API Library
- Microsoft .Net Framework 3.5 with SP1
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL), ASP.NET 2.0
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow, and Direct show filters

- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- RPC
- Windows API, Script Engines, and WMI

### Windows Embedded CE 6.0

**OS:** Windows Embedded CE 6.0 R3

**File System:** FAT (for on-board flash)

**Internet Protocol Suite:** TCP, UDP, IPv4, SNMPv2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, 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

**File Server:** Enables remote clients to access files and other resources over the network

**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
- XML, including DOM, XQL, XPath, XSLT, SAX, SAX2
- SOAP Toolkit Client
- Winsock 2.2

## Ordering Information

### Available Models

**V2401-CE:** x86 ready-to-run embedded computer with Intel Atom N270, VGA, LVDS, DVI, Audio, 2 LANs, 12 serial ports, 4 DIs, 4 DOs, 6 USB 2.0 ports, CF, WinCE 6.0

**V2401-XPE:** x86 ready-to-run embedded computer with Intel Atom N270, VGA, LVDS, DVI, Audio, 2 LANs, 12 serial ports, 4 DIs, 4 DOs, 6 USB 2.0 ports, CF, Windows Embedded Standard 2009

**V2401-LX:** x86 ready-to-run embedded computer with Intel Atom N270, VGA, LVDS, DVI, Audio, 2 LANs, 12 serial ports, 4 DIs, 4 DOs, 6 USB 2.0 ports, CF, Linux 2.6

**V2402-CE:** x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI, Audio, 2 LANs, 4 serial ports, 4 DIs, 4 DOs, 6 USB 2.0 ports, CF, WinCE 6.0

**V2402-XPE:** x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI, Audio, 2 LANs, 4 serial ports, 4 DIs, 4 DOs, 6 USB 2.0 ports, CF, Windows Embedded Standard 2009, -10 to 60°C operating temperature

**V2402-LX:** x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI, Audio, 2 LANs, 4 serial ports, 4 DIs, 4 DOs, 6 USB 2.0 ports, CF, Linux 2.6, -10 to 60°C operating temperature

**V2402-T-XPE:** x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI, Audio, 2 LANs, 4 serial ports, 4 DIs, 4 DOs, 6 USB 2.0 ports, CF, Windows Embedded Standard 2009, -40 to 70°C operating temperature

**V2402-T-LX:** x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI, Audio, 2 LANs, 4 serial ports, 4 DIs, 4 DOs, 6 USB 2.0 ports, CF, Linux 2.6, -40 to 70°C operating temperature

### Optional Accessories (can be purchased separately)

**CBL-M68M9x8-100:** 8-port RS-232 cable with VHDC connector

**PWR-24250-DT-S1:** 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

**FK-75125-01:** Hard disk installation package (for SSD)

**DK-DC50131-01:** DIN-Rail mounting kit

### Package Checklist

- V2401 or V2402 embedded computer
- Terminal block to power jack converter
- PS2 to KB/MS Y-type cable
- Wall mounting kit
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card