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 SODIMM 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, supporting non-standard baudrates
> 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

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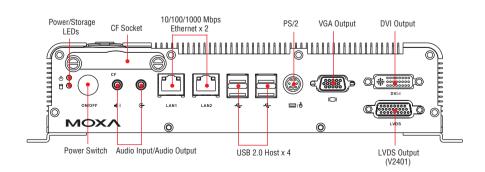
The V2401 and V2402 come with 4 RS-232/422/485 serial ports, and the V2401 has an additional 8 RS-232 ports, making them ideal for connecting a wide range of serial devices, and the dual 10/100/1000 Mbps Ethernet ports offer a reliable solution for network redundancy,

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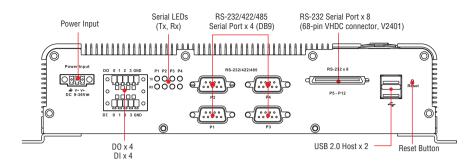
Pre-installed with Linux, Windows CE 6.0, or Windows Embedded Standard 2009, the V2401/2402 Series provides programmers with a friendly environment for developing sophisticated, bug-free application software at a low cost.
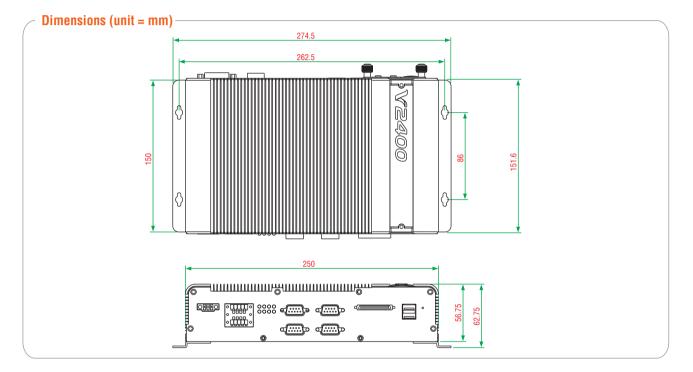
Appearance

Front View

Rear View

Power Input

Serial LEDs (Tx, Rx)

RS-232/422/485 Serial Port x 4 (DB9)

RS-232 Serial Port x 8 (68-pin VHDC connector, V2401)

DO x 4
DI x 4

USB 2.0 Host x 2

Reset Button

Dimensions (unit = mm)

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: 1 x 200-pin DDR2 SODIMM socket support DDR2 533 up to 2 GB, built-in 1 GB
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: SATA-150 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:
• 4 RS-232/422/485 ports*, software selectable (DB9 male)
• 8 RS-232 ports, (68-pin VHDC connector)
* COM1 pin 9 signal can be selected as N/C (default), +5 V, or +12 V by jumper
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, 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 5 VDC at 15 Hz
Digital Input Levels:
• Logic level 0: Close to GND
• Logic level 1: Open
Connector Type: Terminal Block

Digital Output
Output Channels: 4, source type, 0 to 5 VDC
Output Current: Max. 20 mA per channel
Output Voltage:
• Logic 0: 0-0.55 V
• Logic 1: 4.2-5.0 V
Connector Type: Terminal Block

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: -10 to 60°C (14 to 140°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -40 to 85°C (-40 to 185°F)
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

Regulatory Approvals
EMC: CE, FCC, CCC
Safety: UL/cUL, LVD, CCC
Green Product: RoHS, CRoHS, WEEE

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

Warranty
Warranty Period: 3 years
Details: See www.moxa.com/warranty

: Software Specifications

Linux
Distribution: Debian Lenny 5.0
Kernel Version: 2.6.26
Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, PPP, PPPoE
File System: EXT2
System Utilities: bash, busybox, login, telnet, ftp, ssh, openbsd-inetd, apt, apt-utils, dpkg, grub, udev
telnetd: telnet Server daemon
ftpd: FTP server daemon
sshd: secure shell server
Apache: web server daemon, supporting PHP and XML
openvpn: virtual private network service manager
iptables: Firewall service manager
NAT: Network Address Translation
pppd: dial in/out over serial port daemon & PPPoE
pppoe: PPP over ethernet
tftp/tftpd: Trivial file transfer protocol client/server
snmpd: snmpd agent daemon
usbmount: supports USB PnP
DHCP Client: dhcp3-client
cron: to manage regular background processing
grep: NU grep, egrep, and fgrep
minicom: friendly serial communication program
watchdog: software watchdog
inetd: TCP server manager program
Application Development Environment: GNU Make 3.8.1 (GNU make utility to maintain groups of programs)

Automatic Configuration Script Builder: autoconf 2.13
gcc: GNU C compiler
g++: GNU C++ compiler
libc6-dev: GNU C library (development libraries and headers)
Perl: Pratical Extraction and Report Language
Vim: Vi IMproved (enhanced vi editor)

Windows Embedded CE 6.0
Version: Windows Embedded CE 6.0 R3
System Utilities: Windows command shell, telnet, ftp
File System: FAT (on-board flash)
Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP
Telnet Server: Allows remote administration through a standard telnet client.
FTP Server: Used for transferring files to and from remote computer systems over a network.
File Server: Enables clients to access files and other resources over the network (Microsoft® Wincows® CE).
Web Server (httpd): Includes ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.
Dial-up Networking Service: RAS client API and PPP, supporting Extensible Authentication Protocol (EAP) and RAS scripting.
Watchdog Service: CPU Hardware function to reset CPU in a user specified time interval (triggered by calling a MOXA library function).

MOXA®

Application Development Software:
- Moxa WinCE 6.0 SDK
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 3.5
- XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
- SOAP Toolkit Client
- Winsock 2.2

Windows XP Embedded

Version: Windows Embedded Standard 2009
File System: NTFS
Protocol Stack: DHCP, IPv4, DNS, IPsec, HTTP, TCP, UDP, ICMP, IGMP, ARP, TAPI, TSP, SNMP V2, NTP, ICS, PPP, CHAP, EAP, SNTP, Telnet, FTP, SMTP, PPPoE, PPTP, NetBIOS, remote Desktop Protocol 6.1
Telnet Server: Allows users to connect to Telnet servers from remote computers.
IIS Web Server: Allows you to create and manage Web sites.
Terminal Server: Microsoft Terminal Server client application (mstsc. exe).
COM+ Services: The next evolution of Microsoft Component Object Model (COM) and Microsoft Transaction Server (MTS).
Computer Browser Service: Computer browsing functionality exposed by Windows through Microsoft Networking. Allows a client machine to browse its network neighborhood for available computers exposing file and print sharing services.
Internet Explorer 7: The Internet Explorer Web browser that allows customers to connect to the Internet or to an intranet (see properties via inetcpl.cpl)
Windows Media Player 11: Playback functionality for digital media that includes videos, CDs, and DVDs for end users and developers.
Wi-Fi Protected Access 2: Enhances the Windows XP wireless client software with support for the new Wi-Fi Alliance certification for wireless security

Silverlight 1.1: A free runtime that powers rich application experiences and delivers high quality, interactive video across multiple platforms and browsers, using the .NET framework.
Disk Management Services: Support for disk and volume management operations. The component implements a Component Object Model (COM) interface that can be used to query and configure disks and volumes, both basic and dynamic. The component also monitors disk arrivals and removals and other changes in the storage subsystem.
Remote Registry Service: Enables remote users to modify registry settings on this computer.
Watchdog: A hardware function to reset CPU in a user specified time interval (triggered by calling a MOXA library function).
Enhanced Write Filter: Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage
Application Development Software:
- Microsoft .Net Framework 3.5 (CLR and the .NET Framework class library)
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL),ASP.NET 2.0
- Certificate Request Client & Certificate Autoenrollment
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow and Direct show filters
- Distributed Transaction Coordinator (MSDTC)
- Event Log, Internet Explorer
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- Registry Editor
- Registry Filter
- RPC
- Smart Card Cryptographic Service Providers
- USB 2.0 core drivers compliant with USB .95 or 1.0
- Windows API, Script Engines, and WMI
- XML paper specification

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
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

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
DK-DC50131-01: DIN-Rail mounting kit

Package Checklist

- 1 V2401 or V2402 computer
- Terminal block to power jack converter
- PS2 to KB/MS Y-type cable
- Wall mounting kit
- Document & Software CD or DVD
- Quick Installation Guide (printed)
- Product Warranty Statement (printed)