V2616 Series

x86-based embedded computer with Intel Core 2 Duo, dual LANs (M12 connectors), serial ports, 6 DIs, 2 DOs, VGA, DVI-D, 3 USB ports, 1 SATA storage connector, 2 removable storage trays, CompactFlash

- High performance network video recorder for rolling stock applications
- Compliant with EN 50121-4 and essential sections of EN 50155
- IEC 61373 certified for shock and vibration resistance
- Two removable drive trays for 2.5" SSDs or HDDs
- Supports RAID 1/0 functions for data reliability

EN 50155

Microsoft® Windows® Embedded

RoHS

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CE FC

Introduction

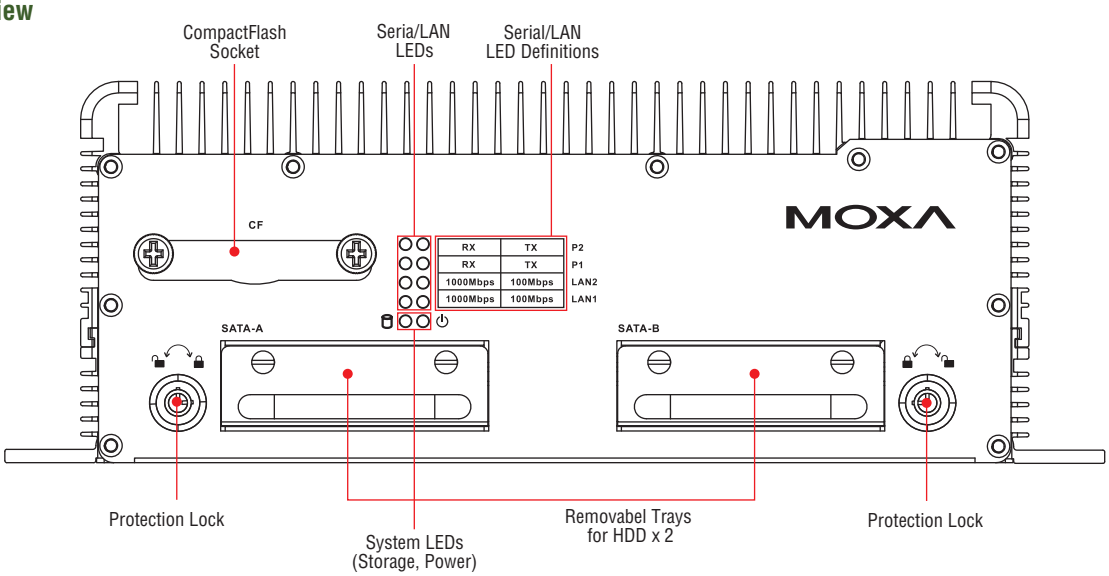
V2616 Series embedded computers are based on the Intel Core 2 Duo x86 processor, and feature 2 RS-232/422/485 serial ports, dual LAN ports, and 3 USB 2.0 hosts. V2616 computers also provide VGA and DVI-I outputs, and are also compliant with the essential sections of EN 50155 covering operating temperature, power input voltage, power surges, ESD, and vibration, making them particularly well-suited for railway and industrial applications.

The V2616's CompactFlash socket provides these computers with the reliability needed for industrial applications that require data buffering and storage expansion. Most importantly, the V2616 computers come with 2 removable slots for inserting additional storage media, such as hard disks or SSD drives, and can offer RAID 0 and RAID 1 functions for data reliability.

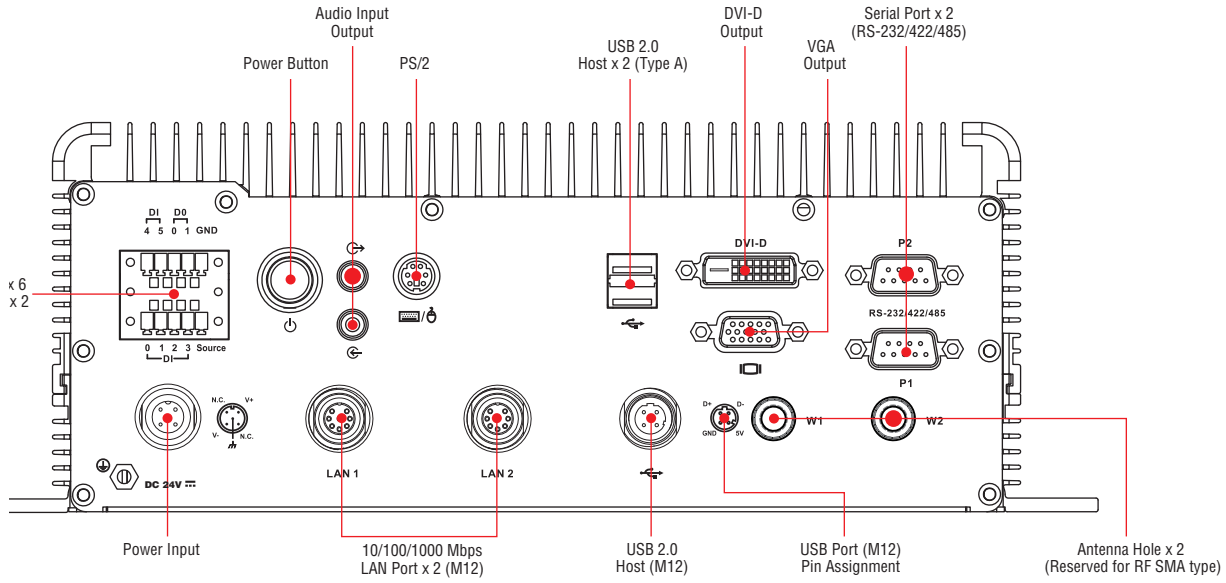
The V2616 series come pre-installed with Linux or Windows Embedded Standard 2009 to provide programmers with a familiar environment in which to develop sophisticated, bug-free application software at a low cost.

Appearance

Front View



Rear View



Hardware Specifications

Computer

CPU: Intel Core 2 Duo SP9300, dual core 64 bit threaded 2.26 GHz, 6 MB for L2 cache
OS (pre-installed): Linux, or Windows Embedded Standard 2009
System Chipset: Intel GS45 + ICH9-M
FSB: 1066
System Memory: 4 GB capacity, 2 GB pre-installed: 2 slots of 2 GB DDR3-1066 200 pin SO-DIMM SDRAM
USB: 3 USB 2.0 compliant hosts; 2 with type A connectors supporting system bootup, 1 with M12 connector

Storage

Built-in: 2 GB onboard industrial CompactFlash card, for root file system
Storage Device Support:
• 2 removable drive trays, for 2.5" SSD or HDD
• (Optional) Internal SATA II drive slot, for 2.5" SSD or HDD

Other Peripherals

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

Display

Graphics Controller: Intel GS45 integrated graphics engine
VGA Interface: DB15 female connector, up to 2048 x 1536 resolution
DVI Interface: DVI-D connector (chrontel CH7307 SDVO to DVI transmitter), up to 1600 x 1200 resolution

Ethernet Interface

LAN: 2 auto-sensing 10/100/1000 Mbps ports (M12)

Serial Interface

Serial Standards: 2 software-selectable RS-232/422/485 ports* (DB9 male)
Optical Isolation Protection: 2 KV
ESD Protection: 4 KV for all signals
Magnetic Isolation Protection: 1.5 KV built-in

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxDA(-), TxDB(+), RxDB(+), RxDA(-), GND
RS-485-4w: TxDA(-), TxDB(+), RxDB(+), RxDA(-), GND
RS-485-2w: DataA(-), DataB(+), GND

Digital Input

Input Channels: 6, 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 isolation

Digital Output

Output Channels: 2, 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 (6 DI points, 2 DO points, DI Source, GND)
Isolation: 3 KV optical isolation

LEDs

System: Power x 1, Storage x 1
LAN: 100M/Link x 2, 1000M/Link x 2
Serial: TX x 2, RX x 2

Physical Characteristics

Housing: Aluminum
Weight: 5 kg
Dimensions:
Without ears: 287 x 250 x 101 mm (11.29 x 9.84 x 3.97 in)
With ears: 287 x 290 x 101 mm (11.29 x 11.41 x 3.97 in)
Mounting: wall

Environmental Limits

Operating Temperature: (with SSD installed) -25 to 55°C (-13 to 140°F)
Storage Temperature: (with SSD installed) -30 to 60°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-vibration: EN 50155 standard
Anti-shock: EN 50155 standard
Conformal Coating: Available on request

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1

EMC: EN 55022 Class A, EN 61000-3-2 Class D, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A
Rail Traffic: EN 50155, EN 50121-2-3, EN 50121-4, IEC 61373
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
Note: These hardware specifications describe the embedded computer unit itself, but not its official accessories. In particular, the wide temperature specification does not apply to accessories such as power adaptors and cables.

Serial Communication Parameters

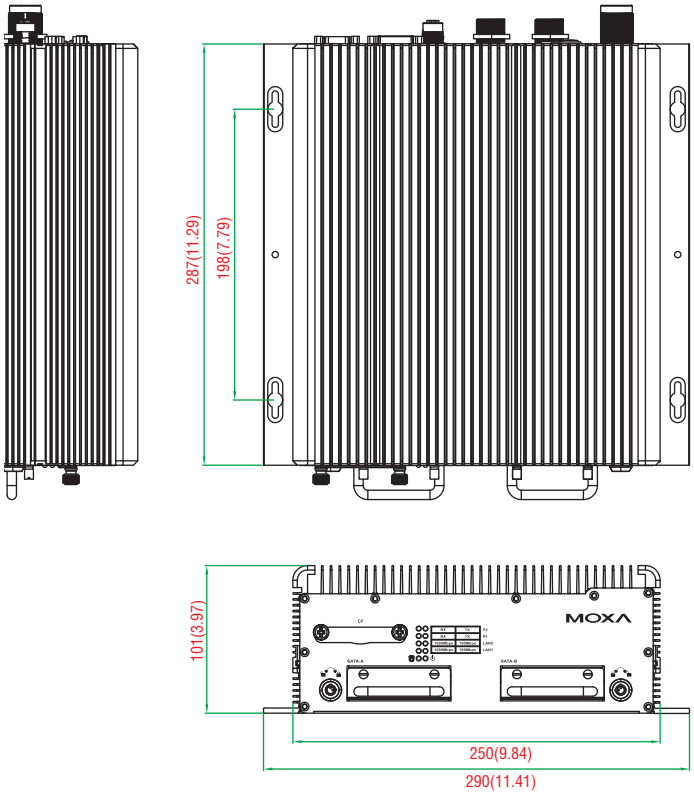
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

Power Requirements

Input Voltage: 24 VDC (9 to 36 V), M12 connector
Note: 24 VDC is EN 50155 compliant
Power Consumption: • 50 W
• 2 A @ 24 VDC
Power Button: On/off (front panel)

Dimensions

Unit: mm (inch)



Software Specifications

Linux

OS: Debian Linux 5.0, Lenny; kernel 2.6.32
File System: EXT2/EXT3
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 (Linux) allows machines to connect to the Internet through dialup lines as either PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and Novell IPX.
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, SNTP, 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
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 3.5, with SP1
- Active Directory Service Interface (ADSI) Core
- 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

Silverlight 4: A free runtime framework that powers rich application experiences and delivers high quality, interactive video across multiple platforms and browsers, using the .NET framework

Ordering Information

Available Models

V2616-XPE: x86 Embedded computer with Intel Core 2 Duo, VGA, DVI, 2 LANs, 2 Serial Ports, 6 DIs, 2 DOs, 3 USB 2.0 Ports, 24 VDC Power ,Windows XPE, -25 to 55°C operating temperature (EN 50155 Class T1)
V2616-LX: x86 Embedded computer with Intel Core 2 Duo, VGA, DVI, 2 LANs, 2 Serial Ports, 6 DIs, 2 DOs, 3 USB 2.0 Ports, 24 VDC Power, Linux, -25 to 55°C operating temperature (EN 50155 Class T1)
Note: Conformal Coating is available on request.

Package Checklist

- V2616 embedded computer
- Wall mounting Kit
- PS2 to KB/MS Y-type cable
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

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
DK-DC50131-01: DIN-Rail mounting kit

M12 Connectors (can be purchased separately)

M12A-5P-IP68: Field-installation A-coded screw-in power connector, 5-pin female M12 connector, IP68-rated
M12A-8PMM-IP68: Field-installation A-coded screw-in Gigabit Ethernet connector, 8-pin female M12 connector, IP68-rated
M12A-5PMM-IP68: D-coded screw-in USB connector, 5-pin male M12 connector, IP68-rated

M12 Cables (can be purchased separately)

CBL-M12(FF5P)/Open-100 IP67: 1-meter A-coded M12-to-5-pin power cable, 5-pin female M12 connector, IP67-rated
CBL-M12MM8PRJ45-BK-100-IP67: 1-meter A-coded M12-to-RJ45 Cat-5E UTP Gigabit Ethernet cable, 8-pin male M12 connector, IP67-rated

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