V2616A Series

High performance network video recorder computer

> Compliant with EN 50121-4
> Essential compliance with EN 50155*
> IEC 61373 certified for shock and vibration resistance
> Two hot-swappable storage trays for 2.5" SSDs or HDDs
> SynMap for system health monitoring
> 24 to 110 VDC wide range isolated power input
> Easy coin battery replacement
> Smart Recovery for manual or automatic system recovery

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
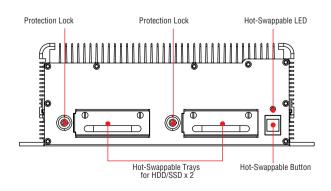
EN 50155

Introduction

The V2616A series of embedded computers are based on the Intel Core i5/i7 processor, and feature 2 RS-232/422/485 serial ports, dual Gigabit LAN ports, 3 USB 2.0 ports, and dual VGA/DVI-D video output. V2616A computers are compliant with essential sections of EN 50155, covering operating temperature, power input voltage, surge, ESD, and vibration, as well as conformal coating and power insulation, making them suitable for a variety of industrial applications.

The V2616A computers come with a CFast socket that provides ample and secure data buffering or additional storage expansion, as well as 2 hot-swappable storage trays that accept 2.5" solid state or hard disk storage drives, and may be arranged in RAID 1 arrays to give full data redundancy.
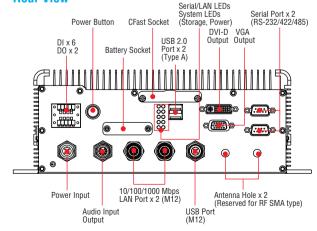
The V2616A series comes with pre-installed Windows Embedded Standard 7 or Debian 7 environments, allowing programmers and system integrators their choice of preferred computing and development platform.

Appearance

Front View

Protection Lock   Protection Lock   Hot-Swappable LED

Hot-Swappable Trays for HDD/SSD x 2   Hot-Swappable Button

Rear View

Power Button   CFast Socket   Serial/LAN LEDs System LEDs (Storage, Power)   Serial Port x 2 (RS-232/422/485)

DI x 6 DO x 2   Battery Socket   USB 2.0 Port x 2 (Type A)   DVI-D Output   VGA Output

Power Input   10/100/1000 Mbps LAN Port x 2 (M12)   Antenna Hole x 2 (Reserved for RF SMA type)

Audio Input Output   USB Port (M12)

MOXA®

⁝ Hardware Specifications

Computer

CPU:
- Intel® Core™ i5-3610ME dual-core processor (3M Cache, 2.7 GHz) for V2616A-C5 series
- Intel® Core™ i7-3517UE dual-core processor (4M Cache, 1.7 GHz) for V2616A-C7-T series
- Intel® Core™ i7-3612QE quad-core processor (6M Cache, 2.1 GHz) for V2616A-C8 series

OS (pre-installed): Linux or Windows Embedded Standard 7
System Chipset: Mobile Intel HM65 Express Chipset
System Memory: 16 GB capacity, 4 GB pre-installed: 2 slot of 8 GB DDR3-1600 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: 8 GB CFast to store OS
Storage Expansion: 2 hot-swappable storage trays for 2.5" SATA SSD or HDD
HDD Support: 1 internal SATA-II storage connector for 2.5" SSD or HDD
Expansion Slot:
1 full-size/half-size mini PCIe socket with 1 SIM card socket. Mini PCIe socket supports power on/off control

Other Peripherals

Audio: Line-in, line-out (M12)

Display

Graphics Controller: Intel® HD Graphics 4000 (integrated)
VGA Interface: DB15 female connector, max. resolution 2048 x 1536
DVI Interface: DVI-D connector (Chrontel CH7307 SDVO to DVI transmitter), max. resolution 1920 x 1200

Ethernet Interface

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

Serial Interface

Serial Standards: 2 software-selectable RS-232/422/485 ports (DB9 male)
Isolation Protection: 1.5 kV
ESD Protection: 4 kV for all signals

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

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)

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 Protection: 3 kV

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

Physical Characteristics

Housing: Aluminum
Weight: 5 kg
Dimensions: 287 x 290 x 101 mm (11.29 x 11.41 x 3.97 in)
Mounting: wall

Environmental Limits

Operating Temperature: (without HDD installed)
Standard models: -25 to 55°C (-13 to 131°F)
Wide temp. models: -40 to 70°C (-40 to 158°F)
Storage Temperature: (with SSD installed) -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-vibration: EN 50155 standard
Anti-shock: EN 50155 standard

Power Requirements

Input Voltage: 24 to 110 VDC, M12 connector
Note: 24 and 110 VDC are EN 50155 compliant
Power Consumption:
- 60 W (no SSD/HDD attached)
- 2.5 A @ 24 VDC to 0.55 A @ 110 VDC (no SSD/HDD attached)

Power Button: On/off (rear panel)

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 (essential compliance*), EN 50121-3-2, EN 50121-4, IEC 61373
*Please contact Moxa or a Moxa distributor for details.
Green Product: RoHS, CRoHS, WEEE

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 second system reset, software programmable
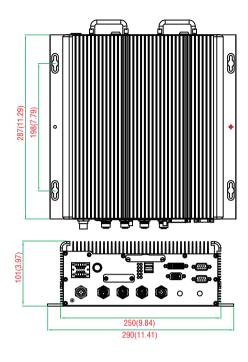
Warranty

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 adapters and cables.

Dimensions

Unit: mm (inch)

287(11.29)
198(7.79)
101(3.97)
250(9.84)
290(11.41)

: Software Specifications

Linux

OS: Linux Debian 7
File System: EXT 4
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, Netfilter/iptables
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
Secure Shell for Remote Access: SSH allows remote logins to a secure encrypted console from any connected network
Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network
ntpdate: Sets the date and time via NTP
Ethernet bonding: The Ethernet bonding for combination of network interfaces on one host for redundancy and/or increased throughput
Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the Point-to-Point Protocol (PPP). Works with 'chat', 'dip', and 'dialup', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).
mdadm: A Linux utility used to manage software RAID devices
Dmraid: Discovers software RAID devices and activates RAID sets
File Server: Enables remote clients to access files and other resources over the network
alsa-utils: Contains various utilities for controlling audio cards
Watchdog: A watchdog timer that triggers a system reset upon software freezes, for both specific applications and system-wide failures.
Moxa mini-PCIe Reset Utility: Resets the mini-PCIE module on the mini-PCIE slot
Moxa Hotplug Daemon: Monitors and manages the hard disk status

Application Development Software:
• Moxa API library
• GNU C/C++ cross compiler
• GNU C library
• Perl
Software Package:
• SNMP
• mx-e1000e
• mx-ptpd2

Windows Embedded Standard 7

Core OS:
• Windows 7 Embedded, 32 bit
• Remote Client
• Remote Procedure Call
Applications and Services Development:
• .Net Framework 3.5
• Remote Desktop Protocol 7.1
• COM OLE Application Support
• COM+ Application Support
• MSMQ
Internet Services:
• Internet Explorer 8.0
• IIS 7.0
File Systems and Data Store:
• Windows Data Access
• Windows Backup and Restore
Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Fonts:
• Chinese (Trad. and Simp.), Japanese, Korean, Western, Middle East, South East Asian, and South Asian Fonts

Graphics and Multimedia:
• MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
• MPEG Layer-3 Audio Codecs(MP3)
• MPEG4 Decoders
• Windows Media Video VC-1 (WMV) Codecs
• DirectX and Windows Device Experience
• Windows Media Player 12
International:
• IME Simplified Chinese Support
• IME Traditional Chinese Support
• IME Japanese Support
• IME Korean Support
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update
Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center

• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)
Embedded Features:
• Enhanced Write Filter (EWF)
• File-Based Write Filter (FBWF)
• Message Box Default Reply
• Registry Filter
• WSDAPI for .NET
File Systems and Data Storage:
• Windows Data Access Components
• Windows Backup and Restore
Embedded Self-Health Diagnostics: SNMP-based remote scripting layer for monitoring, reporting, and control

Ordering Information

Available Models

V2616A-C5: (Barebone) x86 embedded computer with Intel Core i5-3610ME, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, -25 to 55°C operating temperature (EN 50155 Class T1)

V2616A-C5-W7E: x86 embedded computer with Intel Core i5-3610ME, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 Ports, 24 to 110 VDC Power, Win7 Embedded, -25 to 55°C operating temperature (EN 50155 Class T1)

V2616A-C5-CT-W7E: x86 embedded computer with Intel Core i5-3610ME, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Windows Embedded Standard 7, -25 to 55°C operating temperature (EN 50155 Class T1), conformal coating

V2616A-C5-LX: x86 embedded computer with Intel Core i5-3610ME, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Linux, -25 to 55°C operating temperature (EN 50155 Class T1)

V2616A-C5-CT-LX: x86 embedded computer with Intel Core i5-3610ME, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Linux, -25 to 55°C operating temperature (EN 50155 Class T1), conformal coating

V2616A-C7-T: (Barebone) x86 embedded computer with Intel Core i7-3517UE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, -40 to 70°C operating temperature (EN 50155 Class TX)

V2616A-C7-T-W7E: x86 embedded computer with Intel Core i7-3517UE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC Power, Windows Embedded Standard 7, -40 to 70°C operating temperature (EN 50155 Class TX)

V2616A-C7-CT-T-W7E: x86 embedded computer with Intel Core i7-3517UE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC Power, Windows Embedded Standard 7, -40 to 70°C operating temperature (EN 50155 Class TX), conformal coating

V2616A-C7-T-LX: x86 embedded computer with Intel Core i7-3517UE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Linux, -40 to 70°C operating temperature (EN 50155 Class TX)

V2616A-C7-CT-T-LX: x86 embedded computer with Intel Core i7-3517UE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Linux, -40 to 70°C operating temperature (EN 50155 Class TX), conformal coating

V2616A-C8: (Barebone) x86 embedded computer with Intel Core i7-3612QE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, -25 to 55°C operating temperature (EN 50155 Class T1)

V2616A-C8-W7E: x86 embedded computer with Intel Core i7-3612QE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Windows Embedded Standard 7, -25 to 55°C operating temperature (EN 50155 Class T1)

V2616A-C8-CT-W7E: x86 embedded computer with Intel Core i7-3612QE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Windows Embedded Standard 7, -25 to 55°C operating temperature (EN 50155 Class T1), conformal coating

V2616A-C8-LX: x86 embedded computer with Intel Core i7-3612QE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Linux, -25 to 55°C operating temperature (EN 50155 Class T1)

V2616A-C8-CT-LX: x86 embedded computer with Intel Core i7-3612QE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Linux, -25 to 55°C operating temperature (EN 50155 Class T1), conformal coating

Package Checklist
• V2616A embedded computer
• 2 storage tray keys
• Power cable (CBL-M12FF5PPJ21-BK-15-IP68)
• Documentation and software CD or DVD
• Quick installation guide (printed)
• Warranty card
• 2 5-pin terminal blocks

: Optional Accessories

Type	Model	Description
Ethernet		
Cable & Connector	CBL-M12XMM8PRJ45-BK-100-IP67	1-meter X-coded M12-to-RJ45 Cat-5E UTP Gigabit Ethernet cable, 8-pin male M12 connector, IP67-rated
Connector	M12X-8PMM-IP67	Field-installation X-coded screw-in Gigabit Ethernet connector, 8-pin male M12 connector, IP67-rated
Power		
Connector	M12A-5P-IP68	Field-installation A-coded screw-in power connector, 5-pin female M12 connector, IP68-rated
Adapter	PWR-24250-DT-S1	Power adapter with input: 100 - 240 VAC, 50-60 Hz, 1.5 A, output: 24 VDC,2.5 A, 60 W, for test and system development in the office under ambient temperature
Power Cord	PWC-C7US-2B-183	Power cord with 2-pin connector, USA plug
Power Cord	PWC-C7EU-2B-183	Power cord with 2-pin connector, Euro plug
Power Cord	PWC-C7UK-2B-183	Power cord with 2-pin connector, British plug
Power Cord	PWC-C7AU-2B-183	Power cord with 2-pin connector, Australia plug
Power Cord	PWC-C7CN-2B-183	Power cord with 2-pin connector, China plug
Audio		
Connector	M12A-8PMM-IP67	Field-installation A-coded 8-pin male screw-in M12 connector, IP67-rated
USB		
Connector	M12A-5PMM-IP68	D-coded screw-in USB connector, 5-pin male M12 connector, IP68-rated
Storage Kit		
Internal Storage Kit	V2616A Internal Storage Kit	EN 50155 compliant HDD/SSD installation package
Storage Tray	V2616A Hot-swappable Storage Kit	EN 50155 compliant HDD/SSD installation faceplate