

DA-820 Series

Preliminary

Multi-function substation computer



- > Intel Core i7 dual/quad core processor with Intel QM77 Express chipset
- > 2 x 204-pin SO-DIMM DDR3 sockets, supporting DDR3 1066/1333 ECC registered, 16 GB max.
- > 6 USB 2.0 ports for high speed peripherals
- > 3 PCIe slots/2 PCI slots for expansion modules
- > 1 PCIe x16 slot for additional video card
- > High reliability design, supporting dual power, RAID 0/1/5/10 and PRP/HSR technology
- > Cybersecurity function
- > IEC 61850-3 compliant (EMC Level 4, C3, Bm)
- > IEEE 1613, IEC 60255 compliant



Overview

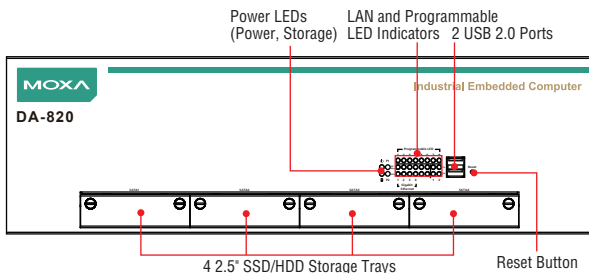
The DA-820's main operating system is based on the Intel Quad core i7-3612QE CPU and QM77 chipset, which supports standard X86, 2 VGA ports, 1 USB port, 4 Gigabit LAN ports, and 2 3-in-1 RS-232/422/485 serial ports. The DA-820 is equipped with a 4 SATA disk interface and supports RAID 0/1/5/10 functionality. The DA-820 is specifically designed for substation applications that require precise time synchronization and adherence to the IEC 61850-3 standards. The flexible design makes the DA-820 suitable for local SCADA,

environmental monitoring, video surveillance, protocol conversion, and PRP/HSR redundancy applications. In addition, the cybersecurity function makes the DA-820 an ideal solution for secure network communication applications.

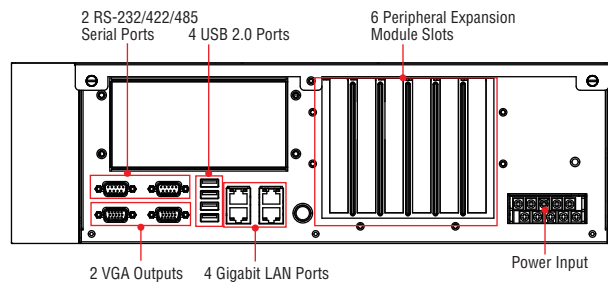
The housing is a standard 3U, 19-inch wide rack-mounted rugged enclosure. This robust, rack-mountable design provides the hardened protection needed for industrial environment applications.

Appearance

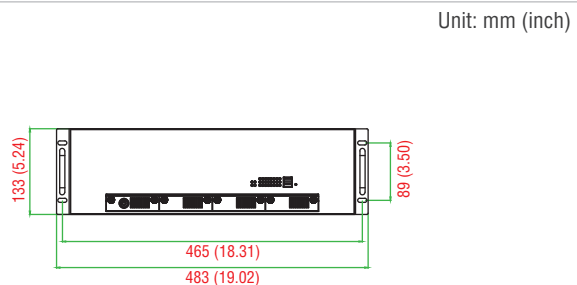
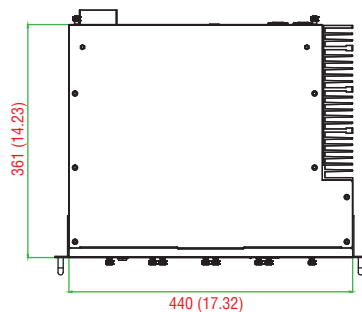
Front View



Rear View



Dimensions



Unit: mm (inch)

Hardware Specifications

Computer

CPU:

- DA-820-C7: Intel dual core i7-3555LE 2.5 GHz processor
- DA-820-C8: Intel quad core i7-3612QE 2.1 GHz processor

OS: 64-bit Debian 7 or 64-bit Windows Embedded Standard 7

System Chipset:

QM77

BIOS: 64 Mbit Flash BIOS, PCI Plug & Play, ACPI function support

System Memory: 16 GB capacity, 8 GB pre-installed: 2 slots of 8 GB 204 pin DDR3 1066/1333 SO-DIMM with ECC registered

USB:

- 4 x USB 2.0 ports type A (rear panel)
- 2 x USB 2.0 ports type A (front panel)

Storage

Built-in: CFast socket onboard to store OS (CFast card needs to be purchased separately)

Storage Expansion: 4 SATA 2.0 interfaces, supporting RAID 0, 1, 5, 10, and hot-swappable

Display

Graphics Controller: Intel® HD Graphics 4000

Display Interface: 2 VGA outputs (DB15 female connector)

Resolution: CRT display mode with pixel resolution up to 2048 x 1536 at 75 Hz

Ethernet Interface

LAN: 4 auto-sensing 10/100/1000 Mbps ports

- Ethernet 1 to 3: Intel 82574 Gigabit Ethernet Controller
- Ethernet 4: Intel 82579 Gigabit Ethernet Controller supports Intel AMT technology

Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface

Serial Standards: 2 RS-232/422/485 ports (DB9 male)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND, RI

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

LEDs

System: Power, Storage

Gigabit LAN: 100M x 4, 1000M x 4

Serial: TX/RX

Programmable: LED x 8

Switches and Buttons

Power Switch: on/off (on rear panel)

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 6 kg

Dimensions: 315 x 440 x 90 mm (12.40 x 17.32 x 3.54 in) (without rackmount ears)

Mounting: Standard 19-inch rackmount

Environmental Limits

Operating Temperature:

- DA-820-C8: -40 to 60°C (-40 to 140°F)
- DA-820-C7: -40 to 75 °C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

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

Anti-vibration: 2 G^{rms} @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis

Anti-shock: 20 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Range:

- High Voltage: 100 to 240 VAC/VDC, 50/60 Hz, 1A
- Low Voltage: 24 to 110 VDC, 4.7 A

Multiple Power Supplies:

- SP: Single power supply
- DP: Dual power supplies

Power Consumption: 60 W

Standards and Certifications

Safety: LVD, UL, cUL

Electrical Substation: IEC 61850-3, IEC 60255, IEEE 1613

Protection Relay: IEC 60255

EMC: FCC, CE (Class A)

Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock) with lithium backup battery

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

OS: 64-bit 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

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: A watchdog timer that triggers a system reset upon software freezes, for both specific applications and system-wide failures.

Application Development Software:

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

Software Package:

- SNMP
- SafeGuard technology

Windows Embedded Standard 7

Core OS:

- 64-bit support
- 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 Storage:

- Windows Data Access Components
- Windows Backup and Restore

Diagnostics:

- Common Diagnostic Tools
- Problem Reports and Solutions

Fonts: Chinese (Trad. and Simp.), Japanese, Korean, Western, Middle Eastern, 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
- Create and Play DVDs
- Photo Viewer
- Remote media streaming
- Windows Media Center

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)
- MS AntiMalware
- Windows Defender
- Bitlocker Secure Startup
- Applocker

Enterprise Features:

- Enterprise Search Scopes
- BranchCache
- DirectAccess
- Windows XP Mode

Embedded Features:

- Enhanced Write Filter (EWF)
- File-Based Write Filter (FBWF)
- Message Box Default Reply
- Registry Filter
- WSDAPI for .NET

Embedded Self-Health Diagnostics: SNMP-based remote scripting layer for monitoring, reporting, and control

Package Checklist

- DA-820 rackmount computer
- Rackmount kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- Documentation CD or DVD
- Quick installation guide (printed)
- Warranty card

Ordering Information

Model	Configuration
DA-820-C7-SP-HV-T	i7-3355LE, dual-core 2.5 GHz, 100 ~ 240 VAC/VDC, -40 ~ 75°C, w/o CFast/RAM/OS
DA-820-C7-DP-HV-T	i7-3355LE, dual-core 2.5 GHz, 100 ~ 240 VAC/VDC x 2, -40 ~ 75°C, w/o CFast/RAM/OS
DA-820-C7-SP-LV-T	i7-3355LE, dual-core 2.5 GHz, 24 to 110 VDC, -40 to 75°C, w/o CFast/RAM/OS
DA-820-C7-DP-LV-T	i7-3355LE, dual-core 2.5 GHz, 24 to 110 VDC x 2, -40 to 75°C, w/o CFast/RAM/OS
DA-820-C8-SP-HV	i7-3612QE, quad-core 2.1 GHz, 100 to 240 VAC/VDC, -40 to 60°C, w/o CFast/RAM/OS
DA-820-C8-DP-HV	i7-3612QE, quad-core 2.1 GHz, 100 to 240 VAC/VDC x 2, -40 to 60°C, w/o CFast/RAM/OS
DA-820-C8-SP-LV	i7-3612QE, quad-core 2.1 GHz, 24 to 110 VDC, -40 to 60°C, w/o CFast/RAM/OS
DA-820-C8-DP-LV	i7-3612QE, quad-core 2.1 GHz, 24 to 110 VDC x 2, -40 to 60°C, w/o CFast/RAM/OS
Recommended Configuration	
Linux	RAM ≥ 2 GB, CFast > 2 GB
WS7P	RAM ≥ 4 GB, CFast > 8 GB
VMWare ESXi	CFast > 5 GB
CFast Card	
CFAST-SLC-I-04G	CFast card 4 GB, SLC, -40 to 85°C (Linux)
CFAST-SLC-I-08G	CFast card 8 GB, SLC, -40 to 85°C (VMWare ESXi)
CFAST-SLC-I-16G	CFast card 16 GB, SLC, -40 to 85°C (WS7P)
RAM	
DDR3L-I-02G	DDR3L, industrial-grade 2 GB
DDR3L-I-08G	DDR3L, industrial-grade 8 GB
SSD Drive	
SSD-SLC-0032G	SSD, SLC, 32 GB
SSD-SLC-0256G	SSD, SLC, 256 GB
SSD-MLC-0256G	SSD, MLC, 256 GB
Operating System	
WS7P-64	Windows Embedded Standard 7 Runtime (WS7P) (ESD)
Expansion Modules	
DA-IRIG-B-S-02	IRIG-B xpansion module, PCI interface, 1 fiber IRIG-B in, 1 DB9M in/out, 1 DB9M out
DA-IRIG-B-S-04	IRIG-B xpansion module, PCI interface, 1 fiber IRIG-B in, 1 DB9M in/out, 3 DB9M out
DE-PRP/HSR	PRP/HSR expansion module, PCIe interface
DE-GX02-SFP	2-port 1,000 Mbps fiber card, SFP slot x 2, PCIe interface (SFP module excluded)
DE-FX02-SFP	2-ports 10/100 Mbps fiber card, SFP slot x 2, PCIe interface (SFP module excluded)
Terminal Blocks	
Mini DB9F-to-TB	Mini female DB9 to terminal block
Thermal Kit	
DDR3-THERMAL-KIT-82001	Thermal kit for non-DDR3L SDRAM
Fan Kit	
FAN-KIT-82001	Fan kit for heat dissipation if system is overheated when using high performance graphic card in the PCIe x 16 slot