

# DA-683 Series

**x86 ready-to-run embedded computers with Intel Atom D510, DVI-I, 6 LANs, 2 serial ports, 4 DIs, 4 DOs, 4 USB 2.0 ports, CompactFlash, 2 peripheral expansion slots**



- > Intel Atom D510 1.66 GHz processor
- > 1 DDR2 SO-DIMM socket, supporting DDR2 667 up to 2 GB (max.)
- > 6 10/100/1000 Mbps Ethernet ports
- > 2 RS-232 serial ports
- > 4 USB 2.0 ports for high speed peripherals
- > 4 DIs, 4 DOs
- > CompactFlash socket for storage expansion
- > 2 SATA interfaces for hard disk drive expansion
- > 2 PCI expansion slots for inserting expansion modules
- > IEC 61850-3 compliant (DPP-T models only)
- > IEEE 1588 compliance for Precision Time Protocol (Linux models only)
- > Dual power input models available
- > Ready-to-run Embedded Linux, Windows Embedded Standard 2009, or Windows Embedded Standard 7 platform
- > -40° to 70°C wide temperature models available



## Overview

DA-683 industrial computers excel in a wide array of power automation applications. The DA-683 series is based on the Intel x86 processor and supports DVI-I, 6 Gigabit Ethernet ports, 2 RS-232 serial ports, CompactFlash, and USB. They come standard in a 19-inch, 2U high form factor. The Intel Atom D510 processor gives the DA-683 enough punch to perform demanding industrial tasks without consuming a lot of power, for a highly cost-effective overall system. DA-683 computers are IEEE 1588 compliant and support precision time protocol and clock synchronization to provide the time accuracy required for event logging in power substation systems.

IEC-61850-3 compliance confirms that the DA-683 can deliver stable and reliable system operations in power applications. Additional value and convenience is provided through a modular design with two

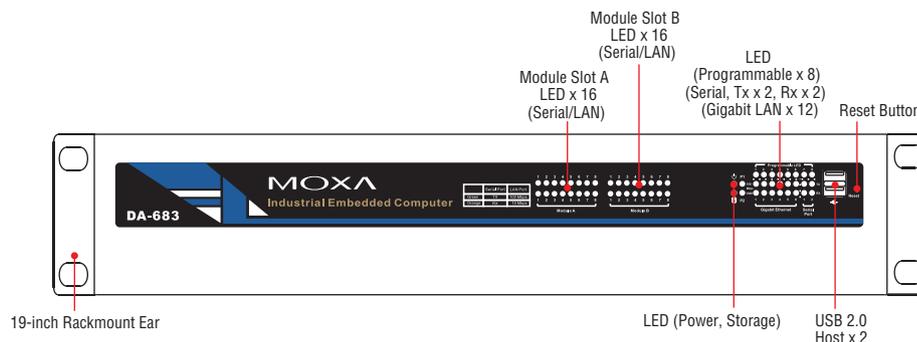
independent slots for flexible system integration and expansion. Users have the option to add a variety of different communications modules, including an 8-port RS-232/422/485 module, 8-port RS-422/485 module, 4-port 10/100 Mbps LAN module, 8-port 10/100 Mbps switch module, and a universal PCI expansion module.

The DA-683 series includes wide temperature models that operate reliably in a -40 to 70°C operating temperature range for the same great performance in applications in extremely harsh environments.

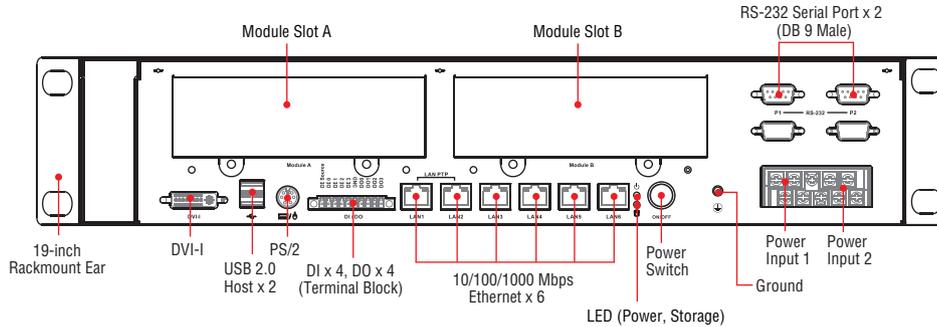
DA-683 computers run Linux, Windows Embedded Standard 2009, or Windows Embedded Standard 7 (pre-installed), providing a familiar environment for developing sophisticated application software. Moxa provides comprehensive software support to help programmers develop bug-free code quickly and at a lower cost.

## Appearance

Front View



Rear View



Hardware Specifications

Computer

**CPU:** Intel Atom D510 1.66 GHz processor  
**OS (pre-installed):** Linux, Windows Embedded Standard 2009, or Windows Embedded Standard 7  
**System Chipset:** Intel Pineview-D + ICH8M  
**BIOS:** 16 Mbit Flash BIOS, PCI Plug & Play, ACPI function support  
**FSB:** 667 MHz  
**System Memory:** 2 GB capacity, 1 GB (LX and XPE)/ 2 GB (W7E) pre-installed: 1 or 2 slots of 2 GB 200-pin DDR2-667 SO-DIMM  
**Expansion Bus:** PCI/104 interface reserved  
**USB:** USB 2.0 compliant hosts, Type A connector x 4, supports system boot up

Storage

**Built-in:** 2 GB (LX and XPE) / 8 GB (W7E) industrial DOM onboard to store OS  
**Storage Expansion:** CompactFlash socket for CF card expansion, supporting CF Type-I/II  
**HDD Support:** 2 SATA connectors for drive expansion (with optional HDD kit)

Other Peripherals

**KB/MS:** 1 PS/2 interface, supports standard PS/2 keyboard and mouse through Y-type cable

Display

**Graphics Controller:** Intel® GMA3150 graphics controller in Intel D510 card

DVI Interface:

- Analog RGB display; output resolution up to 2048 x 1536 @ 60 Hz
- Digital DVI display; output resolution up to 1024 x 768 @ 60 Hz

Ethernet Interface

**LAN:** 6 auto-sensing 10/100/1000 Mbps ports

**Magnetic Isolation Protection:** 1.5 KV built-in

Serial Interface

**Serial Standard:** 2 RS-232 ports (DB9 male)

Serial Signals

**RS-232:** Tx/D, Rx/D, DTR, DSR, RTS, CTS, DCD, GND, RI

Digital Input

**Input Channels:** 4, source type

**Input Voltage:** 0 to 30 VDC

**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)

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

**Isolation:** 3 KV optical isolation

Digital Output

**Output Channels:** 4, sink type

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

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

**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

**Gigabit LAN:** 100M x 6, 1000M x 6

**Serial:** TX/RX

**Programmable:** LED x 8

**Communication:** Module A x 16, Module B x 16

Switches and Buttons

**Reset Button:** To reset system hardware (on front panel)

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

Physical Characteristics

**Housing:** SECC sheet metal (1 mm)

**Weight:** 4 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:**

Standard models: -10 to 60°C (14 to 140°F)

DPP-T models: -40 to 70°C (-40 to 158°F)

**Storage Temperature:**

Standard models: -20 to 80°C (-4 to 176°F)

DPP-T models: -40 to 85°C (-40 to 185°F)

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

**Anti-vibration:** 7 mm (2-9 Hz), 20 m/s/s (9-200 Hz), 15 m/s/s (200-500 Hz) @ IEC-61850-3, IEC 60870-2-2/Cm/(3M6)/(4M6), sine wave, 2-500 Hz, 1 Oct/min, 10 cycles, 2 hrs 40 mins per axis

**Anti-shock:** 300 m/s<sup>2</sup> @ IEC-61850-3, IEC 60870-2-2/Cm/(3M6)/(4M6), half sine wave, 11 ms

Power Requirements

**Input Voltage:** 100 to 240 VAC, 50/60 Hz, 0.9-0.4 A

**Power Consumption:** 40 W

Standards and Certifications

**Safety:** UL/cUL (UL 60950-1, CSA C22.2 No. 60950-1-03), LVD (EN 60950-1), CCC (GB4943)

**EMC:** CE (EN 55022, EN 61000-3-2, EN 61000-3-3, EN 55024), FCC (Part 15 Subpart B, CISPR 22 Class ), CCC (GB9254, GB 17625.1), IEC 61850-3 (DPP-T models only)

**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

**MTBF (mean time between failures):** 134,407 hrs

Warranty

**Warranty Period:** 3 years

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

## Software Specifications

### Linux

**OS:** Linux 2.6.18, Debian Etch 5

**File System:** EXT2, JFFS2

**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, PTP

**Internet Security:** OpenVPN, iptables firewall

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

**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)
- GNU C/C++ cross-compiler
- GNU C library
- Perl

**Terminal Server (SSH):** Provides secure encrypted communications between two un-trusted hosts over an insecure network

### Windows Embedded Standard 7

#### Core OS:

- 32-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

#### 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

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

### Windows XP Embedded

**OS:** Windows Embedded Standard 2009

**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, PTP

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

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

**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

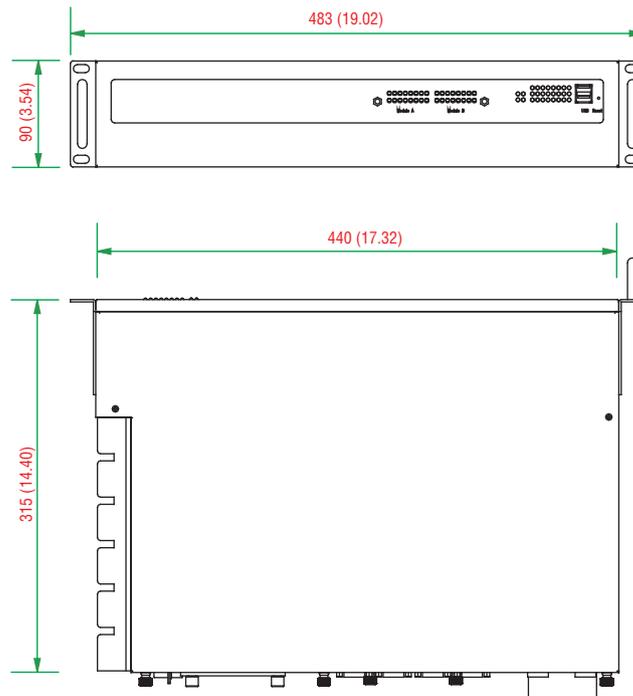
**File-based Writer Filter:** Redirects all write requests directed at protected volumes to the overlay cache, which records and displays the changes while preserving the protected status of the target volume.

#### Application Development Software:

- Moxa API Library
- Microsoft .Net Framework 3.5 with SP1
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL)
- 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

## Dimensions

Unit: mm (inch)



## : Ordering Information

## Available Models

**DA-683-SP-XPE:** x86 ready-to-run rackmount computer with 1.66 GHz CPU, DVI-I, 6 Giga LANs, 2 RS-232 serial ports, 4 DIs, 4 DOs, 2 peripheral expansion slots, CompactFlash, 4 USB ports, single power, Windows Embedded Standard 2009, -10 to 60°C operating temperature

**DA-683-SP-LX:** x86 ready-to-run rackmount computer with 1.66 GHz CPU, DVI-I, 6 Giga LANs, 2 RS-232 serial ports, 4 DIs, 4 DOs, 2 peripheral expansion slots, CompactFlash, 4 USB ports, single power, Linux, -10 to 60°C operating temperature

**DA-683-SP-W7E:** x86 ready-to-run rackmount computer with 1.66 GHz CPU, DVI-I, 6 Giga LANs, 2 RS-232 serial ports, 4 DIs, 4 DOs, 2 peripheral expansion slots, CompactFlash, 4 USB ports, single power, Windows Embedded Standard 7, -10 to 60°C operating temperature

**DA-683-DPP-T-XPE:** IEC 61850-3 x86 ready-to-run rackmount computer with 1.66 GHz CPU, DVI-I, 6 Giga LANs, 2 RS-232 serial ports, 4 DIs, 4 DOs, 2 peripheral expansion slots, CompactFlash, 4 USB ports, dual power, Windows Embedded Standard 2009, -40 to 70°C operating temperature

**DA-683-DPP-T-LX:** IEC 61850-3 x86 ready-to-run rackmount computer with 1.66 GHz CPU, VGA, 6 Gigabit Ethernet Ports, 2 RS-232 serial ports, 4 DIs, 4 DOs, 2 peripheral expansion slots, CompactFlash, 4 USB ports, dual power, Linux, -40 to 70°C operating temperature

**DA-683-DPP-T-W7E:** IEC 61850-3 x86 ready-to-run rackmount computer with 1.66 GHz CPU, DVI-I, 6 Giga LANs, 2 RS-232 serial ports, 4 DIs, 4 DOs, 2 peripheral expansion slots, CompactFlash, 4 USB ports, dual power, Windows Embedded Standard 7, -40 to 70°C operating temperature

## Expansion Modules (can be purchased separately)

**DA-SP08-I-DB:** 8-port RS-232/422/485 serial module with DB9 connector and digital isolation

**DA-SP08-DB:** 8-port RS-232/422/485 serial module with DB9 connector

**DA-SP08-I-TB:** 8-port RS-232/422/485 serial module with terminal block connector and digital isolation

**DA-SP38-I-TB:** 8-port RS-422/485 serial module with terminal block connector and digital isolation

**DA-SW08-RJ:** 8-port 10/100 Mbps unmanaged switch module

**DA-LN04-RJ:** 4-port 10/100 Mbps LAN module

**DA-UPCI-DK:** Universal PCI development kit

**DA-FX04-MM-ST-T:** 4-port (100BaseFX) fiber LAN module with multi-mode, ST connector, supports IP Teaming

## Optional Accessories (can be purchased separately)

**FK-76127-01:** Hard disk installation package

## Package Checklist

- DA-683 embedded computer
- Rackmount kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card