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

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 Core Duo 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 certification 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 or Windows Embedded Standard 2009 (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

Intel Atom D510 1.66 GHz processor
1 DDR2 SODIMM 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 certified (DPP-T models only)
IEEE 1588 compliance for Precision Time Protocol (Linux models only)
Dual power input models available
Ready-to-run Embedded Linux, or Windows Embedded Standard 2009 platform
-40° to 70°C wide temperature models available
Power Substation Computers

Hardware Specifications

Computer
CPU: Intel Atom D510 1.66 GHz processor
OS (pre-installed): Linux or Windows Embedded Standard 2009
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 pre-installed: 1 slot 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 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

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 Gigabit ports
Magnetic Isolation Protection: 1.5 KV built-in

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

Serial Signals
RS-232: TxD, RxD, 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 x16

Switches and Buttons
Power Switch: on/off (on rear panel)
Reset Button: To reset system hardware (on front 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/s² (9-200 Hz), 15 m/s² (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/s² @ 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 A), 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

www.moxa.com  info@moxa.com
### 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, PPTP, PPPoE, PTP  
**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 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

**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  
- Map32 Libraries  
- Message Queuing (MSMQ) Core  
- Microsoft Visual C++ Run Time Libraries  
- Power Management dynamic-link library  
- RPC  
- Windows API, Script Engines, and WMI

### Dimensions

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Unit: mm (inch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>483 (19.02)</td>
</tr>
<tr>
<td>Height</td>
<td>440 (17.32)</td>
</tr>
<tr>
<td>Depth</td>
<td>315 (12.40)</td>
</tr>
</tbody>
</table>
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-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

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

Ordering Information
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