# DA-681 Series

## *x86-based rackmount embedded computer with 4 isolated RS-232 and 8 isolated RS-485 ports, 6 LANs, VGA, CompactFlash, USB*

> Intel Celeron M 1 GHz processor with 400 MHz FSB
> 1 x 200-pin DDR2 SODIMM socket, supporting DDR2 400 up to 1 GB (512 MB built-in)
> Six 10/100 Mbps Ethernet ports
> 1 CompactFlash socket, 1 IDE ATA-150 connector for storage expansion
> USB 2.0 ports for high speed peripherals
> 4 isolated RS-232 and 8 isolated RS-485 ports
> Serial port speed from 50 to 921.6 Kbps, supporting nonstandard baudrates
> Embedded Linux, WinCE 6.0, or WinXPe platform
> 19-inch rackmount model, 1U height
> Dual 100/240 VAC/VDC power input (single power and dual power models available)
> Fanless Design

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

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*Embedded Computers for Communication* › *DA-681 Series*
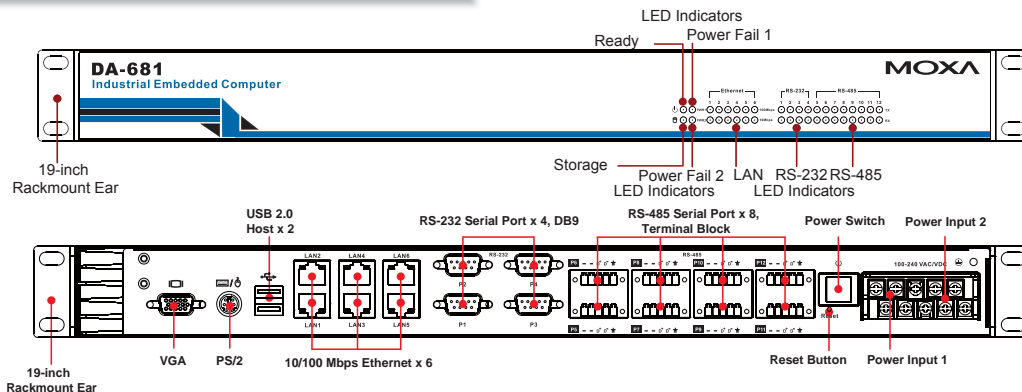
## :: Overview

The DA-681 computer is based on the Intel x86 processor and supports VGA, 6 Ethernet ports, 4 RS-232 and 8 RS-485 serial ports with optical isolation, CompactFlash, and USB. The DA-681 comes in a standard 19-inch, 1U high form factor, making it an ideal platform for industrial applications.

With its robust design, the DA-681 is suitable for industrial automation applications that require standard 19-inch rackmount solutions, such as power automation, transportation, and oil and gas. Another plus

is that the serial ports come with 2 KV optical isolation protection to guarantee communication reliability in harsh industrial environments.

The DA-681 runs Linux, WinCE 6.0, or Windows XP Embedded (pre-installed), providing a friendly environment for developing sophisticated application software. The great software support that Moxa provides makes the programmer's job easier, and helps programmers develop bug-free code quickly and at a lower cost.

## :: Appearance



## :: Hardware Specifications

### Computer

**CPU:** Intel Celeron M 1 GHz processor

**OS (pre-installed):** WinCE 6.0, Windows XP Embedded SP3, Linux 2.6

**System Chipset:** Intel 910GMLE + ICH6M chipset

**BIOS:** 4 mega-bit Flash BIOS, PCI Plug & Play, ACPI function support

**FSB:** 400/533 MHz

**System Memory:** 1 x 200-pin DDR2 SODIMM socket supporting DDR2 400; up to 1 GB max. (512 MB built-in)

**USB:** USB 2.0 compliant hosts x 2, Type A connector, supports system boot up

### Storage

**Built-in:** 1 GB SSD (DOM) onboard to store OS via IDE interface

**Storage Expansion:** CompactFlash socket

**HDD Support:** SATA connector for HDD expansion

## Other Peripherals

**KB/MS:** 1 PS/2 interface, supports standard PS/2 keyboard and PS/2 mouse

## Display

**Graphics Controller:** Integrated graphics with built-in Intel 910GME, and built-in Intel extreme Graphics 2 technology

**Display Memory:** Dynamic video memory (shares up to 32 MB of system memory)

**Display Interface:** CRT Interface for VGA output (DB15 female connector)

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

## Ethernet Interface

**LAN:** 6 auto-sensing 10/100 Mbps ports (RJ45)

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

## Serial Interface

**Serial Standards:**
• 4 RS-232 ports (DB9 male)
• 8 RS-485 ports (terminal block)

**ESD Protection:** 15 KV for all signals

**Isolation:** 2 KV digital isolation

## 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 (supports non-standard baudrates; see user's manual for details)

## Serial Signals

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

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

## LEDs

**Sytem:** Power x 1, Storage x 1

**LAN:** 10M x 6, 100M x 6

**Serial:**
RS-232: 4 x Tx, 4 x Rx
RS-485: 8 x Tx, 8 x Rx

**Power Failure:** LED x 2 (dual power models)

## Physical Characteristics

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

**Weight:** 4.5 kg

**Dimensions:** 440 x 253 x 45 mm (19-inch 1U height)

**Mounting:** Standard 19-inch rackmount

## Environmental Limits

**Operating Temperature:** -10 to 60°C (14 to 140°F)

**Operating Humidity:** 5 to 95% RH

**Storage Temperature:** -20 to 80°C (-4 to 176°F)

## Power Requirements

**Input Voltage:** Single or dual inputs, 100 to 240 VAC/VDC auto-ranging, 47 to 63 Hz, terminal block

**Power Consumption:** 26 W

## Regulatory Approvals

**EMC:** CE (EN55022, EN61000-3-2, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class ), CCC (GB9254, GB 17625.1)

**Safety:** UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD (EN60950-1), CCC (GB4943)

**Green Product:** RoHS, CRoHS, WEEE

## Reliability

**Alert Tools:** Built-in buzzer and RTC (real-time clock) with battery lithium backup
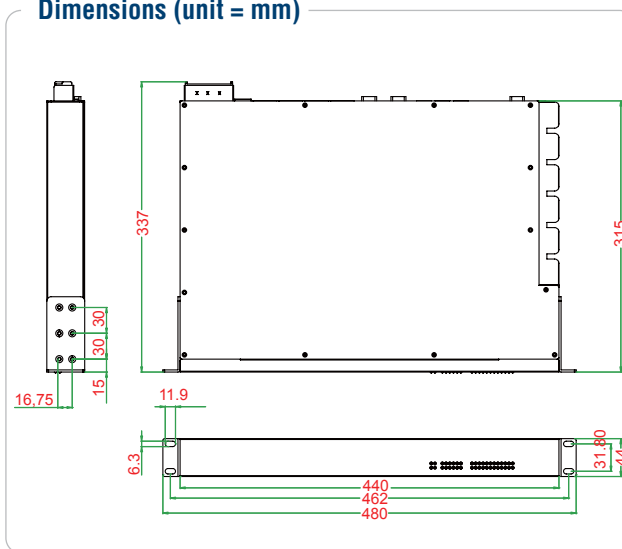
**Automatic Reboot Trigger:** Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

## Warranty

**Warranty Period:** 5 years

**Details:** See www.moxa.com/warranty

### Dimensions (unit = mm)



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## : Software Specifications

### Linux

**Distribution:** Debian Etch 4.0

**Kernel Version:** 2.6.18

**Protocol Stack:** TCP, UDP, IPv4, SNMP V1, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, PPP, PPPoE

**File System:** EXT2 (1G DOM)

**System Utilities:** bash, busybox, login, telnet, ftp, ssh, openbsd-inetd, apt, apt-utils, dpkg, grub, udev

**telnetd:** telnet Server daemon

**ftpd:** FTP server daemon

**sshd:** secure shell server

**Apache:** web server daemon, supporting PHP and XML

**OpenVPN:** virtual private network service manager

**iptables:** Firewall service manager

**NAT:** Network Address Translation

**pppd:** dial in/out over serial port daemon & PPPoE

**pppoe:** PPP over ethernet

**tftp/tftpd:** Trivial file transfer protocol client/server

**snmpd:** snmpd agent daemon

**usbmount:** supports USB PnP

**DHCP Client:** dhcp3-client

**cron:** to manage regular background processing

**grep:** NU grep, egrep, and fgrep

**minicom:** friendly serial communication program

**watchdog:** software watchdog

**inetd:** TCP server manager program

**Application Development Environment:** GNU Make 3.8.1 (GNU make utility to maintain groups of programs)

**Automatic configuration script builder:** autoconf 2.13

**gcc:** GNU C compiler

**g++:** GNU C++ compiler

**libc6-dev:** GNU C library (development libraries and headers)

**Perl:** Pratical Extraction and Report Language

**Vim:** Vi IMproved (enhanced vi editor)

## Windows Embedded CE 6.0

**System Utilities:** Windows command shell, telnet, ftp, web-based administration manager

**File System:** FAT (on-board flash)

**Protocol Stack:** TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

**Telnet Server:** Allows remote administration through a standard telnet client.

**FTP Server:** Used for transferring files to and from remote computer systems over a network.

**File Server:** Enables clients to access files and other resources over the network (Microsoft® Wincows® CE).

**Web Server (httpd):** Includes ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.

**Dial-up Networking Service:** RAS client API and PPP, supporting Extensible Authentication Protocol (EAP) and RAS scripting.

**Watchdog Service:** CPU Hardware function to reset CPU in a user specified time interval (triggered by calling a MOXA library function).

**Application Development Software:**
• Moxa WinCE 6.0 SDK
• C Libraries and Run-times
• Component Services (COM and DCOM)
• Microsoft® .NET Compact Framework 2.0 SP2
• XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
• SOAP Toolkit Client
• Winsock 2.2

## Windows XP Embedded

**System Utilities:** Windows command shell, Telnet, ftp, web-based administration manager, Wireless Zero Configuration

**File System:** NTFS

**Protocol Stack:** DHCP, IPv4, DNS, IPsec, HTTP, TCP, UDP, ICMP, IGMP, ARP, TAPI, TSP, SNMP V2, NTP, ICS, PPP, CHAP, EAP, SNTP, Telnet, FTP, SMTP, PPPoE, PPTP, NetBIOS

**Telnet Server:** Allows users to connect to Telnet servers from remote computers.

**IIS Web Server:** Allows you to create and manage Web sites.

**Terminal Server:** Microsoft Terminal Server client application (mstsc.exe).

**COM+ Services:** The next evolution of Microsoft Component Object Model (COM) and Microsoft Transaction Server (MTS).

**Computer Browser Service:** Computer browsing functionality exposed by Windows through Microsoft Networking. Allows a client machine to browse its network neighborhood for available computers exposing file and print sharing services.

**Disk Management Services:** Support for disk and volume management operations. The component implements a Component Object Model (COM) interface that can be used to query and configure disks and volumes, both basic and dynamic. The component also monitors disk arrivals and removals and other changes in the storage subsystem.

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

**Application Development Software:**
• Microsoft .Net Framework 2.0 with service pack 2 (CLR and the .NET Framework class library)
• Active Directory Service Interface (ADSI) Core
• Active Template Library (ATL),ASP.NET 2.0
• Certificate Request Client & Certificate
• Autoenrollment (CLR and the .NET Framework class library)
• COM APIs
• Common Control Libraries
• Common File Dialogs
• Direct3D, DirectPlay, DirectShow and Direct show filters
• Distributed Transaction Coordinator (MSDTC)
• Enhanced Write Filter (Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage)
• Event Log, Internet Explorer
• Mapi32 Libraries
• Message Queuing (MSMQ) Core
• Microsoft Visual C++ Run Time Libraries
• Power Management dynamic-link library
• Registry Editor
• RPC
• Smart Card Cryptographic Service Providers
• USB 2.0 core drivers compliant with USB .95 or 1.0
• Windows API, Media Player 10, Script Engines, and WMI

# Ordering Information

## Available Models

**DA-681-I-SP-CE:** x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Single Power, WinCE 6.0

**DA-681-I-SP-XPE:** x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Single Power, WinXPe SP2

**DA-681-I-SP-LX:** x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Single Power, Linux 2.6

**DA-681-I-DP-CE:** x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Dual Power, WinCE 6.0

**DA-681-I-DP-XPE:** x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Dual Power, WinXPe SP2

**DA-681-I-DP-LX:** x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Dual Power, Linux 2.6

## Package Checklist

• DA-681 computer
• Ethernet Cable: RJ45 to RJ45 cross-over cable, 100 cm
• Quick Installation Guide (printed)
• Document and Software CD or DVD
• Product Warranty Statement