

DA-681 Series

x86 rackmount embedded computers with 4 isolated RS-232 and 8 isolated RS-485 ports, 6 LANs, VGA, CompactFlash, USB



- > EC 61850-3 certified for power substation automation systems (DPP-T models only)
- > 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 bps to 921.6 Kbps (nonstandard baudrates supported)
- > 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



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.

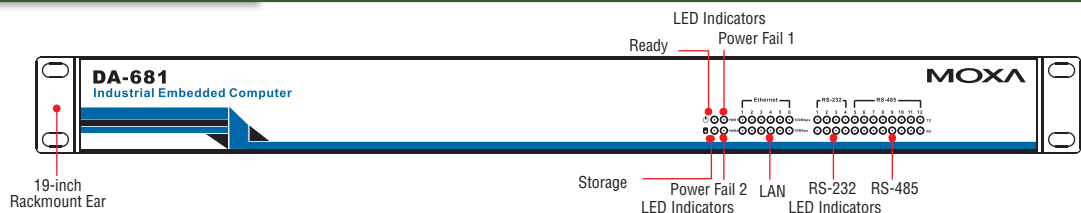
With its robust design, the DA-681 is suitable for industrial automation applications that require standard 19-inch rackmount solutions, such as power automation, transportation, and oil and gas. Another plus is that the serial ports come with 2 KV optical isolation protection to guarantee communication reliability in harsh industrial environments.

In addition, the DPP-T models have been certified to meet the IEC 61850-3 standard, making them ideal for power substation automation systems.

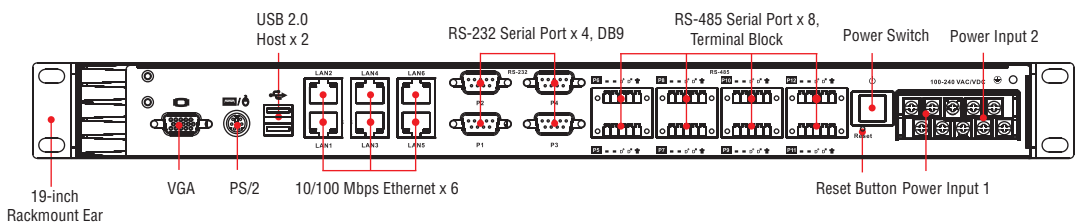
The DA-681 runs Linux, WinCE 6.0, or Windows XP Embedded (pre-installed), providing a friendly environment for developing sophisticated application software. The great software support that Moxa provides makes the programmer's job easier, and helps programmers develop bug-free code quickly and at a lower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

Appearance

Front View



Rear View



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 910GML E + ICH6M chipset
BIOS: 4 mega-bit Flash BIOS, PCI Plug & Play, ACPI function support
FSB: 400 MHz
System Memory: 1 x 200-pin DDR2 SODIMM socket supporting DDR2 400; up to 1 GB max. (512 MB built-in)
Expansion Bus: PCI/104 onboard
USB: USB 2.0 compliant hosts x 2, Type A connector, supports system boot up

Storage

Built-in: 1 GB (2 GB for DA-681-XPE) industrial 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: Tx/D, Rx/D, DTR, DSR, RTS, CTS, DCD, GND

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

LEDs

System: 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 315 x 45 mm (17.32 x 12.40 x 1.77 in), 19 inch 1U height

Mounting: Standard 19-inch rackmount

Environmental Limits

Operating Temperature:

SP and DP models: -10 to 60°C (14 to 140°F)

DPP-T models: -40 to 75°C (-40 to 167°F)

Storage Temperature:

SP and DP 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/s² @ IEC-61850-3, IEC 60870-2-2/Cm/(3M6)/(4M6), half sine wave, 11 ms

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

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1, CCC (GB4943, GB9254, GB17625.1)

EMC: EN 55022, EN 61000-3-2, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A

Power Automation: IEC 61850-3 (DPP-T models only)

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

MTBF (mean time between failures): 100,847 hrs

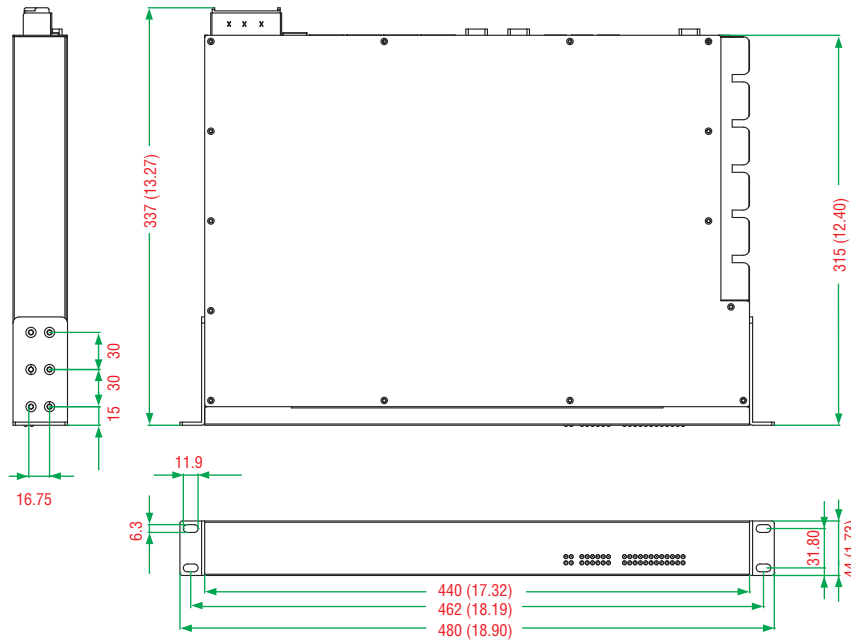
Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Software Specifications

Linux

OS: Linux 2.6.18, Debian Etch 4.0

File System: EXT2

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

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 Embedded CE 6.0

OS: Windows Embedded CE 6.0

File System: FAT (for on-board flash)

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SMTP, SMT, Telnet, FTP, PPP

Web Server (WinCE IIS): Supports ASP, ISAPI Secure Socket Layer (SSL 2/3) and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions

Dial-up Networking: Supports RAS client API and PPP, Extensible Authentication Protocol (EAP), and RAS scripting

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

Windows XP Embedded

OS: Windows XP Embedded

File System: NTFS

Internet Protocol Suite: DHCP, DNS, FTP, HTTP, SMTP, NTP, Telnet, SMT, SNMPv2, TCP, UDP, IPv4, ICMP, IGMP, IPsec, TAPI, ICS, PPP, CHAP, EAP, PPPoE, PPTP, NetBIOS

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

Application Development Software:

- Moxa API Library
- Microsoft .Net Framework 2.0 with SP 2
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL), ASP.NET 2.0
- 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

: 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, -10 to 60°C operating temperature

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 SP3, -10 to 60°C operating temperature

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, -10 to 60°C operating temperature

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, -10 to 60°C operating temperature

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 SP3, -10 to 60°C operating temperature

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, -10 to 60°C operating temperature

DA-681-I-DPP-T-CE: IEC 61850-3 x86 ready-to-run rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, dual power, WinCE 6.0, -40 to 75°C operating temperature

DA-681-I-DPP-T-XPE: IEC 61850-3 x86 ready-to-run rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, dual power, WinXPe SP3, -40 to 75°C operating temperature

DA-681-I-DPP-T-LX: IEC 61850-3 x86 ready-to-run rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, dual power, Linux 2.6, -40 to 75°C operating temperature

Package Checklist

- DA-681 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

Model Name	Serial Ports		LAN Ports	Storage			OS	Power	IEC 61850-3 Certified
	RS-232	RS-485	10/100 Mbps	SATA	CF	USB			
DA-681-I-SP-CE	4	8	6	✓	✓	✓	CE 6.0	Single	–
DA-681-I-SP-XPE	4	8	6	✓	✓	✓	XPE	Single	–
DA-681-I-SP-LX	4	8	6	✓	✓	✓	Linux	Single	–
DA-681-I-DP-CE	4	8	6	✓	✓	✓	CE 6.0	Dual	–
DA-681-I-DP-XPE	4	8	6	✓	✓	✓	XPE	Dual	–
DA-681-I-DP-LX	4	8	6	✓	✓	✓	Linux	Dual	–
DA-681-I-DPP-T-CE	4	8	6	✓	✓	✓	CE 6.0	Dual	✓
DA-681-I-DPP-T-XPE	4	8	6	✓	✓	✓	XPE	Dual	✓
DA-681-I-DPP-T-LX	4	8	6	✓	✓	✓	Linux	Dual	✓