MOXA®

DA-661/662/663-CE
Quick Installation Guide

Third Edition, April 2009

1. Overview

The DA-661/662/663-CE are RISC-based, ready-to-run embedded computers designed for industrial data acquisition applications. Each of the three models has 16 RS-232/422/485 serial ports. In addition, the DA-661 has two Ethernet ports, the DA-662 has 4 Ethernet ports, and the DA-663 has 2 fiber Ethernet channels, all based on the Intel XScale IXP425 communication processor. The casing is a standard 1U, 19-inch wide rack-mounted rugged enclosure. The robust, rack-mountable mechanism design provides the hardened protection needed for industrial environment applications, and makes it easy for users to install the DA-661/662/663 on a standard 19-inch rack. The DA-661/662/663 are ideal for applications that require a distributed embedded technology, such as SCADA systems, plant floor automation, and power electricity monitoring applications.

2. Package Checklist

Before installing the DA-661/662/663-CE, verify that the package contains the following items:

- 1 DA-661-CE, DA-662-CE, or DA-663-CE
- 19-inch Rackmount Kit
- DA-661/662/663-CE Quick Installation Guide (this guide)
- DA-661/662/663-CE Document & Software CD
- Cross-over Ethernet cable
- CBL-RJ45M9-150: 150 cm, 8-pin RJ45 to DB9 (M) serial port cable
- CBL-RJ45F9-150: 150 cm, 8-pin RJ45 to DB9 (F) console port cable
- Power Cord
- Product Warranty Statement

Notify your sales representative if any of the above items are missing or damaged.

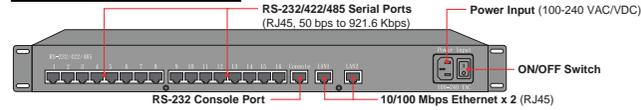## 3. DA-661/662/663-CE Panel Layout

The DA-661/662/663-CE have 16 RS-232/422/485 serial ports.
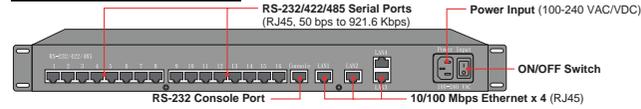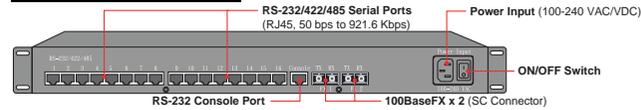
Front View of DA-661/662/663-CE
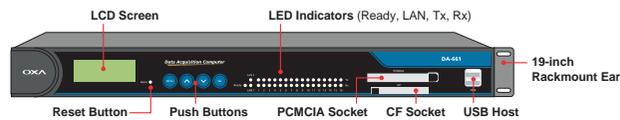
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Rear View of DA-661-CE

Rear View of DA-662-CE

Rear View of DA-663-CE

LED Indicators

The following LED indicators are located on the front panel of the DA-661/662/663-CE.

LED Name	LED Color	LED Function
Ready	Green	Power is on and functioning normally
LAN1, LAN2, LAN3, LAN4	Orange	10 Mbps Ethernet connection
	Green	100 Mbps Ethernet connection
P1-P16 (Tx)	Green	Serial port is transmitting data
	Off	Serial port is not transmitting data
P1-P16 (Rx)	Orange	Serial port is receiving data
	Off	Serial port is not receiving data
FX1, FX2	Green (steady on)	Fiber channel is connected
	Green (flickering)	Fiber channel is transmitting data

4. Installing Your DA-661/662/663

Desktop Mounting

Place the DA-661/662/663 on a clean, flat, well-ventilated desktop. For better ventilation, attach the 4 pads from the desktop kit to the bottom of the unit, and leave some space between the DA-661/662/663 and other equipment. Do not place equipment or objects on top of the unit, as this can cause damage to the product.

Rack Mounting

The DA-661/662/663 can be mounted on a standard 19-inch rack. Use the enclosed pair of L-shaped metal plates and screws to fasten the DA-661/662/663 to the rack cabinet. You can lock either the front panel or the rear panel of the DA-661/662/663 to the front side of the rack. Each L-shaped plate has 6 holes, leaving two outer or inner holes open for your convenience.

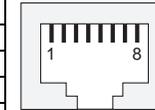## 5. Connecting Your

Power Connector

Connect the 100-240 VAC power line to the DA-661/662/663's power

connector. The Ready LED on the front panel will glow a steady green when the OS is ready.
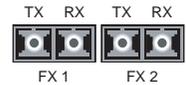
Ethernet Ports (DA-661/662)

The 10/100 Mbps Ethernet ports (2 LAN ports for DA-661, 4 LAN ports for DA-662) use RJ45 connectors.

| Pin	Signal
1	ETx+
2	ETx-
3	ERx+
6	ERx-

Fiber Ports (DA-663)

The DA-663 has 2 100BaseFX multi mode fiber channel ports. Use multi mode optical fiber cable (SC connector) to connect to these ports.

Serial Ports

There are 16 serial ports on the DA-661/662/663. The serial ports use RJ45 connectors. The ports can be configured independently for RS-232, RS-422, or RS-485 by software.

Pin	RS-232	RS-422	RS-485
1	DSR	---	---
2	RTS	TXD+	---
3	GND	GND	GND
4	TXD	TXD-	---
5	RXD	RXD+	Data+
6	DCD	RXD-	Data-
7	CTS	---	---
8	DTR	---	---
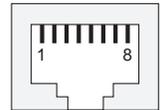
Console Ports

The console port is an RJ45 RS-232 port. It can be connected to a V90 or GPRS modem via PPP. The pin definitions are the same as for the serial ports.

Reset Button

Press the "Reset" button on the front panel continuously for at least 5 seconds to load the factory default configuration. After the factory default configuration has been loaded, the system will reboot automatically. The Ready LED will blink for the first 5 seconds, and then maintain a steady glow once the system has rebooted.

LCD Screen

The DA-661/662/663 have an LCD screen on the front panel. The LCD screen displays 16 columns and 2 rows of text. On boot-up, the LCD screen displays the model name and firmware version, as shown here:

D	A	-	6	6	1	-	1	6							
V	E	R	.	1	.	0									

Push Buttons

There are four push buttons on the DA-661/662/663's front panel. The buttons are used to enter text onto the LCD screen. The buttons are MENU, ∧ (up cursor), ∨ (down cursor), and SEL:

Button	Action
MENU	Displays the main menu
∧	Scrolls up through a list of items shown on the LCD screen's second line
∨	Scrolls down through a list of items shown on the LCD screen's second line
SEL	Selects the option listed on the LCD screen

Real-time Clock

The DA-661/662/663's real-time clock is powered by a lithium battery. We strongly recommend that you do not replace the lithium battery without help from a qualified Moxa support engineer. If you need to change the battery, contact the Moxa RMA service team.

ATTENTION

There is a risk of explosion if the battery is replaced by an incorrect type.

6. Powering on Your DA-661/662/663

To power on the DA-661/662/663, connect the power line to the DA-661/662/663's AC/DC power connector (located on the right side of the rear panel) with the power cord that is shipped with the product, and then turn on the power switch. It takes about 30 seconds for the system to boot up. Once the system is ready, the Ready LED on the front panel will light up, and the DA-661/662/663 will display the model name and firmware version on the LCD screen.

7. Connecting to the DA-661/662/663 from a PC

There are two ways to connect to the DA-661/662/663 from a PC: through the serial console port or by Telnet over the network. The COM settings for the serial console port are: **Baudrate = 115200 bps, Parity = None, Data bits = 8, Stop bits = 1, Flow Control = None**.

ATTENTION

Remember to choose the "VT100" terminal type. Use the CBL-RJ45F9-150 cable included with the product to connect a PC to the DA-661/662/663's serial console port.

When using Telnet, you need to know the DA-661/662/663's IP address and netmask. The default LAN settings are shown below. For first-time configuration, you may find it convenient to use a cross-over Ethernet cable to connect directly from the PC to the DA-661/662. Please use a Fiber-to-Ethernet converter to connect to the DA-663.

	Default IP Address	Netmask
LAN 1 (FX1)	192.168.3.127	255.255.255.0
LAN 2 (FX2)	192.168.4.127	255.255.255.0
LAN 3	192.168.5.127	255.255.255.0
LAN 4	192.168.6.127	255.255.255.0

Once the DA-661/662/663 is powered on, the Ready LED will light up, and a login page will open. Use the following default Login name and Password to proceed.

Login: root
Password: root

8. Configuring the Network Settings

Normally, you are required to change the IP address of the DA-661/662/663-CE because it is located in a different local network from that of your development workstation. Use the *netconfig* utility to complete the task. Before using this utility, type *netconfig -h* to see how to use the command.

```
\> netconfig –h
Usage: netconfig -n <"LAN1" or "LAN2"> [-m <netmask>] [-d
<DNS server>] [-g <gateway>] [-i <IP address>]
```

For example, if your DA-661 has a LAN port at 192.168.1.5, and the Domain Name Server (DNS) is at 192.168.2.6, execute the following command to change the DA-661 network settings.

```
\> netconfig –n LAN1 –i 192.168.1.5 –m 255.255.255.0 –g
192.168.1.254 –d 192.168.2.6
```

Type *netconfig* to view the new settings.

```
\> netconfig
LAN1 Interface Configuration:
IP Address: 192.168.1.5
SubNet Mask:  255.255.255.0
Gateway:  192.168.1.254
DNS:   192.168.2.6

LAN2 Interface Configuration:
IP Address: 192.168.4.127
SubNet Mask:  255.255.255.0
Gateway:
DNS:
```

9. Developing Your Application

Application development on the DA-661/662/663 computer takes advantage of a number of well-known tools that are provided by the Windows environment in programmers' workstations. These tools are trouble-free to use for Windows programmers. Check the following development tools for Windows Embedded Application Development.

- **VB.NET/C#** Applications: Use **Visual Studio 2005**
- **VB.NET/C#** Applications: Use **Visual Studio .NET 2003**
- **C/C++** Applications: Use **eMbedded Visual C++ (eVC) 4.0**

Visual Studio 2005
You do not need to install additional packages.

Visual Studio .NET 2003
1. Install Visual Studio .NET 2003
2. Install Windows® CE Utilities for Visual Studio .NET 2003 Add-on Pack (550KB) for VB .NET
3. Import Compact .NET Framework SDK

eMbedded Visual C++ (eVC) 4.0
1. Install eMbedded Visual C++ 4.0 (230 MB)
2. Install Service Pack 4 for eVC 4.0 (68 MB)
3. Install MOXA Windows® CE 5.0 C/C++ SDKs

Developing applications with eVC 4.0 and MOXA SDKs
1. Open Microsoft® eMbedded Visual C++ 4.0.
2. From the **File** menu, choose **New**.
3. Choose the **Projects** tab and then select the type of application.
4. In the **Project name** box, type project name, then click **OK**.
5. Choose the application type you want to create and click **Finish**.
6. On the **Build** toolbar, choose the MOXA DA-661/662/663-CE SDK, the type of run-time image (Release or Debug), and the DA-661/662/663-CE device.
7. Write your application code.
8. From the **Build** menu, choose **Rebuild All** to build the application.
9. When you complete your application, use the web-based management system to upload it to the target computer.

Developing a VB.NET / C# application with .NET Compact Framework
1. Open Microsoft® Visual Studio .NET 2003.
2. From the **File** menu, choose **New → Project**.
3. Choose the **Project Type** and then select the **Smart Device Application** type of application.
4. In the **Project name** box, type a name for the project, and click **OK**.
5. Choose the **Windows CE** target platform.
6. Select the project type and click **OK**.
7. Write your application code.
8. From the **Device** toolbar, choose Windows **CE.NET Device**.
9. From the **Build** menu, choose **Build Project** or **Rebuild Project**.
10. When you complete your application, use the web-based management system to upload it to the target computer.

10. Environmental Specifications

Power requirements	100 to 240 VAC auto ranging (47 to 63 Hz for AC input)
Dimensions (W×D×H)	480 × 198 × 45 mm (including rack-mount ears) 440 × 198 × 45 mm (without rack-mount ears)
Operating temperature	-10 to 60°C (14 to 140°F), 5 to 95% RH
Storage temperature	-20 to 70°C (-4 to 176°F), 5 to 95%
Serial protection	15 KV ESD for serial port
Magnetic isolation	1.5 KV for Ethernet
Regulatory approvals	FCC Class A, CE Class A, UL, CUL, TÜV
Warranty	5 years

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