DA-720 Series
Quick Installation Guide

x86 Rackmount Embedded Computers

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MOXA®

P/N: 1802007200012

1802007200012

Overview

The DA-720 Series computers are x86 platforms with 14 Gigabit Ethernet ports, 2 isolated RS-232/422/485 serial ports, USB, VGA, and 2 PCIe ports for expansion modules. The DA-720 comes in a standard 19-inch 2U rack-mountable case. Its robust design is ideal for specialized industrial automation applications, including power substations, transportation and shipping, and oil and gas production and supply.

IEC-61850-3 and IEEE 1613 compliance ensures that the DA-720 can deliver stable and reliable system operations in power applications. The DA-720 also complies with the IEC 60255 standards to provide electrical protection relays for use in a smart substation. IEC 60255 is one of the most widely used standards for testing relays and protection equipment, and compliance with the standard ensures that DA-720 will work reliably and efficiently with IEDs as part of a robust substation automation system.

EN 50121-4 compliance ensures that the DA-720 can deliver stable and reliable system operations in rail track-side applications.

The DA-720 comes with two different CPU options and basic models that allow system designers to install the mSATA interface, RAM, and operating system according to their specific requirements. This flexibility is particularly helpful when designing customized industrial solutions.

The DA-720 is provided with 2 PCIe ports for expansion modules, which include 8-port RS-232/422/485 module as well as 4-port and 8-port 10/100/1000 Mbps LAN modules. The DA-720 computer can support up to 22 Gigabit LAN ports plus 10 serial ports, or 14 Gigabit LAN ports plus 18 serial ports, making it an ideal solution for a wide range of industrial automation applications.

Model Names and Package Checklist

The DA-720 Series includes the following models:

- **DA-720-C5-DPP:** Rackmount computer with Core i5-6300U, 2.4 GHz, dual-core CPU, without mSATA/RAM/OS, 14 gigabit Ethernet ports, 2 isolated RS-232/422/485 ports, 2 PCIe expansion slots, VGA x 1, DVI-D x 1, 4 USB hosts, IEC 61850-3 compliant, -25 to 55°C operating temperature
- **DA-720-C5-DPP-LX:** Rackmount computer with Core i5-6300U, 2.4 GHz, dual-core CPU, with 8G mSATA, 4G RAM and Linux Debian 8 64-bit OS preinstalled, 14 gigabit Ethernet ports, 2 isolated RS-232/422/485 ports, 2 PCIe expansion slots, VGA x 1, DVI-D x 1, 4 USB hosts, IEC 61850-3 compliant, -25 to 55°C operating temperature
- **DA-720-C7-DPP**: Rackmount computer with Core i7-6600U, 2.6 GHz dual-core CPU without mSATA/RAM/OS, 14 gigabit Ethernet ports, 2 isolated RS-232/422/485 ports, 2 PCIe expansion slots, VGA x 1, DVI-D x 1, 4 USB hosts, IEC 61850-3 compliant, -25 to 55°C operating temperature
- **DA-720-C7-DPP-LX**: Rackmount computer with Core i7-6600U, 2.6 GHz dual-core CPU, with 8G mSATA, 4G RAM and Linux Debian 8 64-bit OS preinstalled, 14 gigabit Ethernet ports, 2 isolated RS-232/422/485 ports, 2 PCIe expansion slots, VGA x1, DVI-D x 1,

4 USB ports, IEC 61850-3 compliant, -25 to 55°C operating temperature

> **NOTE** To order a DA-720 system with a pre-installed Windows 10 Enterprise LTSB 64 Bit OS, please contact a Moxa sales representative.

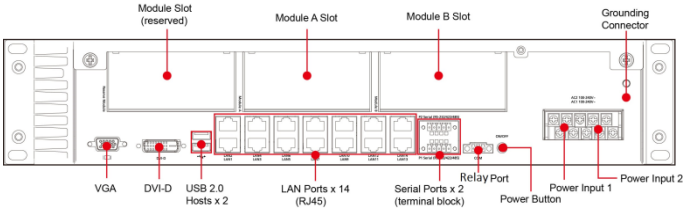Each basic system model is shipped with following standard items:

- DA-720 Series embedded computer
- Rackmount kit
- Quick installation guide (printed)
- Warranty card
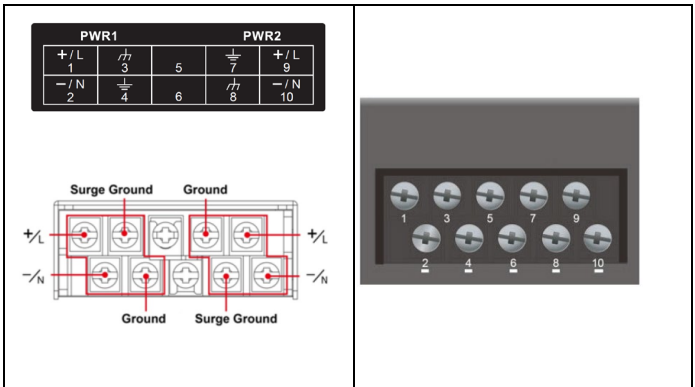
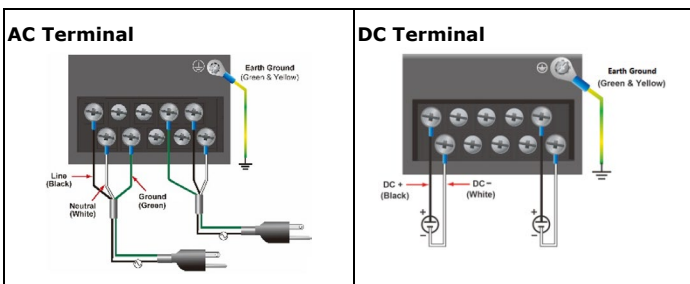# Hardware Installation

Front View
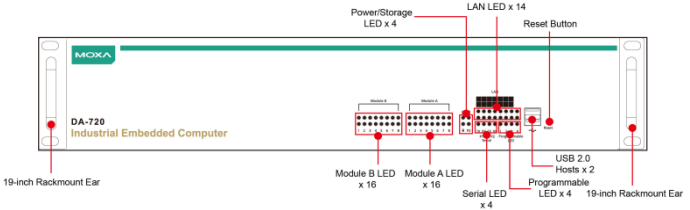
Rear View

Connecting the Power

The DA-720 has dual power inputs. Use a Phillips screwdriver to remove the terminal clamp screws. Connect the power cord to the screws, and then fasten the screws to the unit. Refer to the following figure for detailed information:

AC Terminal	DC Terminal

Power Terminal Block Pin Assignment

Terminal Number	Description	Note
1	PWR1 Line/DC+	**PWR1 Line/DC+** is connected to the positive (+) terminal if the power source is DC, or to the Line terminal if the power source is AC.
2	PWR1 Neutral/DC-	**PWR1 Neutral/DC-** is connected to the negative (-) terminal if the power source is DC, or to the Neutral terminal if the power source is AC.
3	Surge Ground	**Surge Ground** is connected to the **Ground** via a jumper on the terminal block. It is used as the ground conductor for all surge and transient suppression circuitry. **NOTE**: You must disconnect the **Surge Ground** from the **Ground** during HIPOT (dielectric strength) testing.
4	Ground	**Ground** should be connected to the ground terminal for AC power source 1.
5	NC	Reserved for future customization.
6	NC	Reserved for future customization.
7	Ground	**Ground** should be connected to the ground terminal for AC power source 2.
8	Surge Ground	**Surge Ground** is connected to the **Ground** via a jumper on the terminal block. It is used as the ground conductor for all surge and transient suppression circuitry. **NOTE**: You must disconnect the **Surge Ground** from the **Ground** during HIPOT (dielectric strength) testing.
9	PWR2 Line/DC+	**PWR2 Line/DC+** is connected to the positive (+) terminal if the power source is DC, or to the Line terminal if the power source is AC.
10	PWR2 Neutral/DC-	**PWR2 Neutral/DC-** is connected to the negative (-) terminal if the power source is DC, or to the Neutral terminal if the power source is AC.

After you have connected the power cords to the power input unit, the system will automatically boot up. Depending on the operating system installed, the boot-up process will take about 30 to 60 seconds.

Front Panel LEDs

There are 60 LED indicators on the front panel of the DA-720.
Information about each LED is given in the following table:

| LED	Color	Description
Power	Green	Power is on
	Off	No power input or a problem in the power supply
Storage	Yellow/Blinking	Data is being written to or read from the storage unit
	Off	Storage unit is idle
Power Input 1 Status	Red	Power Input 1 has failed
	Off	Power is being properly supplied to Power Input 1
Power Input 2 Status	Red	Power Input 2 has failed
	Off	Power is being properly supplied to Power Input 2
Gigabit Ethernet LEDs 1-14	Green	Ethernet link is up
	Blinking	Ethernet is transmitting or receiving data
	Off	No connection
Serial Port TX 1-2	Green/Blinking	Serial port is transmitting data
	Off	No operation on the serial TX ports
Serial Port RX 1-2	Yellow/Blinking	Serial port is receiving data
	Off	No operation on the serial RX ports
Programmable 1-4	Green	As defined by the user

Connecting to a Display

The DA-720 comes with two display ports, one VGA and one DVI-D display ports that support both clone and extend modes.

USB Ports

The DA-720 comes with four USB ports, two USB 3.0 ports on the rear panel and two USB 2.0 ports on the front panel. Users may use these USB ports to connect keyboard, mouse, or other peripherals such as flash drives to expand the system's storage capacity.

Ethernet Ports

The DA-720 provides 14 100/1000 Mbps Ethernet RJ45 ports. The pin assignments are shown in the table below:
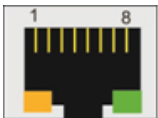
Pin	100 Mbps	1000 Mbps
1	Tx+	TRD(0)+
2	Tx-	TRD(0)-
3	Rx+	TRD(1)+
4	–	TRD(2)+
5	–	TRD(2)-
6	Rx-	TRD(1)-
7	–	TRD(3)+
8	–	TRD(3)-

The default IP addresses and netmasks of the Ethernet ports are as follows:

	Default IP Address	Netmask
LAN 1	192.168.3.127	255.255.255.0
LAN 2	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
LAN 5	192.168.7.127	255.255.255.0
LAN 6	192.168.8.127	255.255.255.0
LAN 7	192.168.9.127	255.255.255.0
LAN 8	192.168.10.127	255.255.255.0
LAN 9	192.168.11.127	255.255.255.0
LAN 10	192.168.12.127	255.255.255.0
LAN 11	192.168.13.127	255.255.255.0
LAN 12	192.168.14.127	255.255.255.0
LAN 13	192.168.15.127	255.255.255.0
LAN 14	192.168.16.127	255.255.255.0

NOTE The Windows 7E and Windows 10 models use DHCP for IP address assignment.

Installing Expansion Modules

The DA-720 is provided with two expansion slots, which can be used to connect Moxa's DE Series expansion modules. Slot A is available for both serial and LAN modules while slot B is for serial module only. You can mount expansion modules using these slots located on the rear panel of the DA-720.
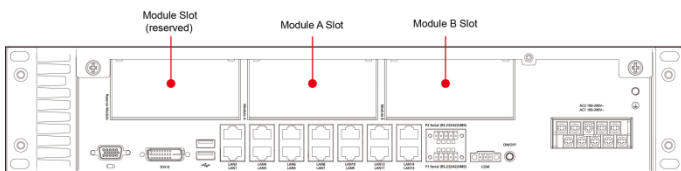
Configuring the Ethernet Interface

Moxa Debian 8 Linux users should follow these steps:

If you are using the console cable to configure network settings for the first time, use the following commands to edit the interfaces file:

STEP 1: Take all network interfaces offline, before you reconfigure the LAN settings using the following command:

```
Moxa:~# ifdown –a
```

STEP 2: Edit the network interfaces file.
You can use a text editor of your choice, but VI is the default text editor on the DA-720.

```
Moxa:~#vi /etc/network/interfaces
```

STEP 3: Set the DA-720 for either dynamic IP addressing or static addressing.

To set it for dynamic IP addressing, enter the following lines into the network interfaces file:

```
# The primary network interface
auto eth0
```

```
iface eth0 inet dhcp
```

To set an interface for static IP addressing, use the following configuration:

```
# The loopback network interface
auto lo
iface lo inet loopback

# The first LAN interface, LAN 1
auto eth0
iface eth0 inet static
      address 192.168.3.127
      netmask 255.255.255.0
      broadcast 192.168.3.255

# The second LAN interface, LAN 2
auto eth1
iface eth1 inet static
      address 192.168.4.127
      netmask 255.255.255.0
      broadcast 192.168.4.255
```

Each interface must be configured with separate entries in the network/interfaces file. LAN1 corresponds to eth0, LAN 2 corresponds to eth1, and so forth for the remaining interfaces.

STEP 4: Exit the text editor.

Use the following command to exit VI:

```
:wq
```

STEP 5: After the interfaces file has been configured, use the following command to reinitialize the network interfaces and to activate the new settings:
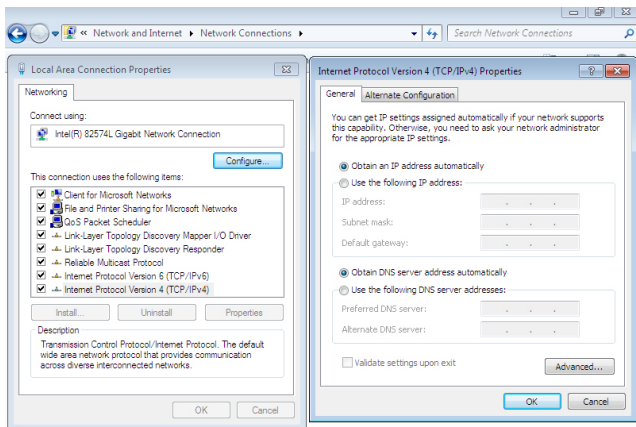
```
Moxa:~#sync; ifup –a
```

Windows 7E and Windows 10 users should follow these steps:

Step 1: Go to **Start → Control Panel → Network and Internet → Network Connections**.

Step 2: In **Local Area Connection Properties**, select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**.

Step 3: Click **OK** after entering the preferred IP address and netmask.

NOTE For additional configuration settings, refer to the *DA-720 software user's manual* for the OS installed on your machine.