

# DA-820 Series

**3U 19-inch IEC 61850 native PRP/HSR computers with Intel® Celeron®, Core™ i3 or i7 CPU**



## Features and Benefits

- IEC 61850-3, IEEE 1613, and IEC 60255 compliant for power substation automation systems
- Intel® Core™ Celeron, i3, and i7 CPU and QM77 chipset
- 1 CFast slot for OS and 4 SATA III for storage expansion (support Intel® RST RAID 0/1/5/10)
- 6 USB 2.0 ports for high-speed peripherals
- 3 PCIe x1 slots and 2 PCI slots for expansion modules
- 1 PCIe x16 slot for an additional video card
- Highly reliable design, supporting dual power and PRP/HSR technology (with PRP/HSR expansion module)
- Onboard TPM module for enhanced cybersecurity

## Certifications



## Introduction

The DA-820 is based on the Intel® Core™ Celeron, i3, and i7 CPU and QM77 chipset, which supports the standard x86 OS and comes with 2 VGA ports, 6 USB ports, 4 Gigabit LAN ports, and 2 3-in-1 RS-232/422/485 serial ports. The DA-820 is equipped with a 4 SATA disk interface and supports RAID 0/1/5/10 functionality. The DA-820 is specifically designed for substation applications that require precise time synchronization and adherence to the IEC 61850-3 standards. The flexible design makes the DA-820 suitable for local SCADA, environmental monitoring, video surveillance, protocol conversion, and PRP/HSR redundancy applications. In addition, the cybersecurity functions make the DA-820 an ideal solution for secure network communication applications.

The DA-820 complies with the IEC 60255 standards to enable the protection of electrical relays in a smart substation. IEC 60255 is one of the most widely used standards for testing relays and protection equipment, and compliance ensures that the DA-820 will work reliably and seamlessly with IEDs (intelligent electronic devices) as a part of the robust substation automation system.

The housing is a standard 3U, 19-inch wide, rack-mounted rugged enclosure. This robust, rack-mountable design provides the hardened protection needed for industrial environment applications.

## Smart Recovery Function

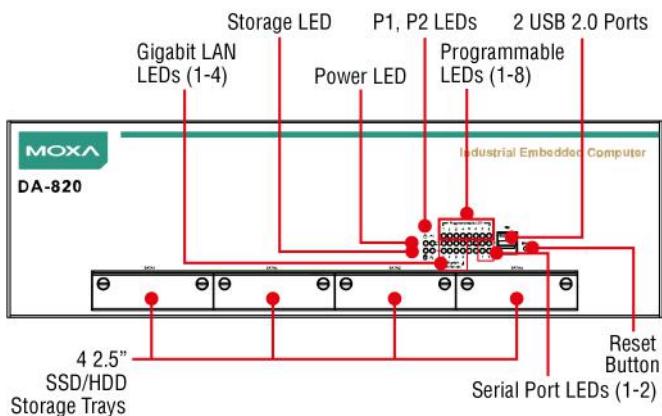
The DA-820's Smart Recovery function makes it easy to troubleshoot system software errors on computers to minimize downtime. Engineers who are experts in a particular vertical market may not have enough computer domain knowledge to know how to fix the operating system problems. Moxa Smart Recovery™ is an automated BIOS-level recovery system tool that allows engineers to automatically trigger OS recovery to minimize downtime.

## Proactive Monitoring Function

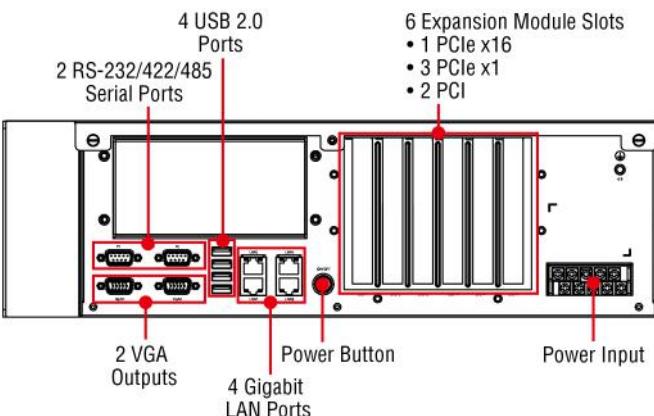
Moxa Proactive Monitoring is a small-footprint, resource-friendly, easy-to-use utility that allows users to track a number of system parameters. Users can view the current parameter values for these key parts by simply clicking on the icons corresponding to the parameters in the user interface. User-defined key part indicators (KPIs) are used to monitor the computer's key parts. Visible and/or audio alerts are triggered automatically via relay and SNMP traps when these KPIs exceed their preset threshold values, making it extremely convenient for operators to avoid system downtime by setting up predictive maintenance tasks well in advance.

## Appearance

### Front View



### Rear View



## Specifications

### Computer

CPU	DA-820-C1 Series: Intel® Celeron® Processor 1047UE (2M cache, 1.40 GHz) DA-820-C3 Series: Intel® Core™ i3-3217UE Processor (3M cache, 1.6 GHz) DA-820-C7 Series: Intel® Core™ i7-3555LE Processor (4M cache, up to 3.20 GHz) DA-820-C8 Series: Intel® Core™ i7-3612QE Processor (6M cache, up to 3.10 GHz)
System Chipset	Mobile Intel® QM77 Express Chipset
Graphics Controller	Intel® HD Graphics 4000 (integrated)
System Memory Slot	SODIMM DDR3/DDR3L slot x 2
Supported OS	Linux Debian 7 Windows Embedded Standard 7 (WS7P) 32-bit Windows Embedded Standard 7 (WS7P) 64-bit Windows Embedded Standard 7 (WS7E) 32-bit Windows Embedded Standard 7 (WS7E) 64-bit Note: OS available by CTOS
Storage Slot	2.5-inch HDD/SSD slots x 4 CFast slot x 1

### Computer Interface

Ethernet Ports	Auto-sensing 10/100/1000 Mbps ports (RJ45 connector) x 4
Serial Ports	RS-232/422/485 ports x 2, software selectable (DB9 male)
USB 2.0	USB 2.0 hosts x 6, type-A connectors
Expansion Slots	PCIe x1 slots x 3 PCIe x16 slot x 1 PCI slots x 2
Video Input	VGA x 2, 15-pin D-sub connector (female)

### LED Indicators

System	Power x 1 Storage x 1 Programmable x 8
LAN	8 per port (10/100/1000 Mbps)
Serial	2 per port (Tx, Rx)

## Serial Interface

Baudrate	50 bps to 115.2 kbps
Connector	DB9 male
ESD	8 kV (level 4)
Isolation	2 kV
Serial Standards	RS-232/422/485
Surge	2 kV

## Serial Signals

RS-232	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422	Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w	Data+, Data-, GND
RS-485-4w	Tx+, Tx-, Rx+, Rx-, GND

## Power Parameters

Power Button	Reset button (front panel) ON/OFF (rear panel)
Power Consumption	60 W (max.)

## Physical Characteristics

Housing	Metal
Dimensions (without ears)	361 x 440 x 133 mm (14.23 x 17.32 x 5.24 in)
Weight	14,000 g (31.11 lb)
Installation	19-inch rack mounting

## Environmental Limits

Operating Temperature	Standard Models: -40 to 60°C (-40 to 140°F) Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature (package included)	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)

## Standards and Certifications

EMC	EN 61000-6-2/-6-4
EMI	CISPR 32, FCC Part 15B Class A
EMS	IEC 61000-4-11 DIPs IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8: 20 A/m
Power Substation	IEC 61850-3, IEEE 1613
Protection Relay	IEC 60255

Safety	EN 60950-1, IEC 60950-1, UL 60950-1
Shock	IEC 60068-2-27, IEC 60870-2-2, IEC 61850-3 Edition 1.0

## Declaration

Green Product	RoHS, CRoHS, WEEE
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## MTBF

Time	DA-820-C1-SP-HV-T: 193,537 hrs DA-820-C1-DP-HV-T: 222,207 hrs DA-820-C1-SP-LV-T: 283,281 hrs DA-820-C1-DP-LV-T: 288,116 hrs DA-820-C3-SP-HV-T: 193,537 hrs DA-820-C3-DP-HV-T: 222,207 hrs DA-820-C3-SP-LV-T: 283,281 hrs DA-820-C3-DP-LV-T: 288,116 hrs DA-820-C7-SP-HV-T: 191,570 hrs DA-820-C7-DP-HV-T: 219,618 hrs DA-820-C7-SP-LV-T: 240,015 hrs DA-820-C7-DP-LV-T: 285,508 hrs DA-820-C8-SP-HV: 172,182 hrs DA-820-C8-DP-HV: 194,509 hrs DA-820-C8-SP-LV: 240,015 hrs DA-820-C8-DP-LV: 285,508 hrs
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## Warranty

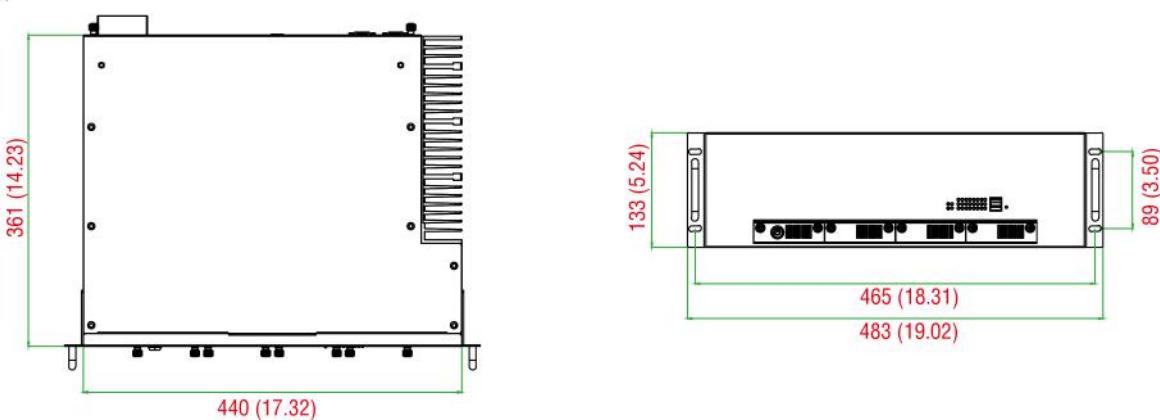
Warranty Period	3 years
Details	See <a href="http://www.moxa.com/warranty">www.moxa.com/warranty</a>

## Package Contents

Device	1 x DA-820 Series computer
Installation Kit	1 x rack-mounting ear
Documentation	1 x quick installation guide 1 x warranty card
Note	This product requires additional modules (sold separately) to function.

## Dimensions

Unit: mm (inch)



## Ordering Information

Model Name	CPU	Power Module	Power Input 100-240 VAC/VDC	Power Input 24-110 VDC	Operating Temp.
DA-820-C8-SP-HV	i7-3612QE	Single	✓	—	-40 to 60°C
DA-820-C8-DP-HV	i7-3612QE	Dual	✓	—	-40 to 60°C
DA-820-C8-SP-LV	i7-3612QE	Single	—	✓	-40 to 60°C
DA-820-C8-DP-LV	i7-3612QE	Dual	—	✓	-40 to 60°C
DA-820-C7-SP-HV	i7-3555LE	Single	✓	—	-40 to 60°C
DA-820-C7-SP-HV-T	i7-3555LE	Single	✓	—	-40 to 75°C
DA-820-C7-DP-HV	i7-3555LE	Dual	✓	—	-40 to 60°C
DA-820-C7-DP-HV-T	i7-3555LE	Dual	✓	—	-40 to 75°C
DA-820-C7-SP-LV-T	i7-3555LE	Single	—	✓	-40 to 75°C
DA-820-C7-DP-LV-T	i7-3555LE	Dual	—	✓	-40 to 75°C
DA-820-C3-SP-HV-T	i3-3217UE	Single	✓	—	-40 to 75°C
DA-820-C3-DP-HV-T	i3-3217UE	Dual	✓	—	-40 to 75°C
DA-820-C3-SP-LV-T	i3-3217UE	Single	—	✓	-40 to 75°C
DA-820-C3-DP-LV-T	i3-3217UE	Dual	—	✓	-40 to 75°C
DA-820-C1-SP-HV-T	Celeron 1047UE	Single	✓	—	-40 to 75°C
DA-820-C1-DP-HV-T	Celeron 1047UE	Dual	✓	—	-40 to 75°C
DA-820-C1-SP-LV-T	Celeron 1047UE	Single	—	✓	-40 to 75°C
DA-820-C1-DP-LV-T	Celeron 1047UE	Dual	—	✓	-40 to 75°C

## Accessories (sold separately)

### Expansion Modules

DA-IRIG-B-S-02-T	IRIG-B expansion module, PCI interface, 1 fiber IRIG-B in, 1 DB9M in/out, 1 DB9M out
DA-IRIG-B-S-04-T	IRIG-B expansion module, PCI interface, 1 fiber IRIG-B in, 1 DB9M in/out, 3 DB9M out
DA-PRP-HSR	PRP, HSR expansion module, PCIe interface
DE-GX02-SFP-T	2-port 1000 Mbps fiber card, SFP slot x 2, PCIe interface (SFP module excluded)
DE-FX02-SFP-T	2-port 100 Mbps fiber card, SFP slot x 2, PCIe interface (SFP module excluded)

### Cables

RG58AU BNC Male to DB9 Male cable, 150 cm	RG58AU BNC male to DB9 male cable for the DA-IRIG-B-S-02-T and DA-IRIG-B-S-04-T, 1.5 m
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### Storage Kits

HDD kit with lock	HDD/SSD kit (lock included)
HDD/SSD kit with heat dissipation vent (lock not included)	HDD/SSD kit with heat dissipation vent (lock not included)
HDD/SSD kit with heat dissipation vent and lock	HDD/SSD kit with heat dissipation vent (lock included)

### Connectors

DB9 female to terminal block adapter	DB9 female to terminal block connector for the DA-IRIG-B-S-02-T and DA-IRIG-B-S-04-T
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### USB Dongle Kits

USB Dongle Kit

Internal USB dongle kit installation package

Thermal Kits

DDR3-THERMAL-KIT-82001

DDR3 SDRAM thermal kit

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