Empower Your Smart Grid

with Industrial Communication and Computing Solutions

| Solar Power | Substation | Critical Power

MOXA

Recommended Products

Distributed Energy Resources

Management System

IEC 61850-3 Ed.2, MMS management, PRP/HSR, RAID 0/1/5/10, and Proactive Monitoring tool
DA-820C/DA-720/DA-681C
- 4U PCI open platform
- 2U high-density interfaces (up to 22 GbE ports)
- 1U compact design

SCADA Computer

DA-820C | DA-720 | DA-681C

Communication Layer

IIoT Gateway
RISC/x86-based

UC-5100/UC-8100A/V2201 Computer
4G + -40 to 70°C wide temp., and Moxa Industrial Linux with 10-year support

Ethernet Switch

EDS-510E
3 GbE ports, Turbo Ring and Turbo Chain

Modbus Splitter

MGate MB3270 Protocol Gateway
Modbus RTU/TCP

Remote I/O

ioLogik E1200/ ioThinx 4510
Daisy-chain and Modbus RTU/TCP support, -40 to 70°C operating temp. range

Field Equipment

Base Station/ Weather Station

IEC 61850 Substation

Management System

Ethernet Switch
IEC 61850-3 compliant, supports PRP/HSR, IEEE 1588 PTP, MMS management, and GOOSE monitoring

Modular/Standalone Rackmount
PT-G7728/PT-7528

Modular DIN-rail
MDS-G4000

Redbox
PT-G503

Protocol Gateway
IEC 61850-3 compliance and IEC 60870-5-101/104, Modbus RTU/TCP, DNP 3.0, and MMS management support

Built-in Ethernet Switch
NPort S9000
Serial device server

MGate Series
Modbus gateway

Communication Layer

IED/Protection Relay

Critical Power

Management System

Ethernet Switch

IKS-G6524A
24-port full GbE

Network Management Software

MXview
Configuring and monitoring

Communication Layer

Protocol Gateway

MGate MB3000/MGate 5217I/MGate 5118
Modbus-to-BACnet, Modbus RTU/TCP, J1939-to-Modbus, PROFINET, EtherNet/IP

Remote I/O

Modular/Standalone
ioThinx 4510/ioLogik E1200
Modbus RTU/TCP, SNMPv1/v2c/v3

Ethernet Switch

Modular/Standalone
MDS-G4000/EDS-408A
Full GbE, optical fiber, Turbo Ring/ Turbo Chain

Data Concentrator

DA-681C
IEC 61850 computer with 6 GbE and 12 serial ports

Field Equipment

UPS/ATS/RPP/PDU

Ensure System Integration, Interoperability, and Availability

Moxa provides industry standards based communication and computing solutions, which allow you to easily manage distributed field devices and seamlessly integrate them with services and applications from SCADA systems and operator stations.

52+ GW Solar Energy Monitored by Moxa Connectivity Solutions

Moxa device-connectivity solutions monitor 52+ gigawatts (GW) of solar energy worldwide

7,500+ Substation Successes Worldwide

We have deployed 7,500+ substation transmission and distribution networks worldwide

Industry Leadership

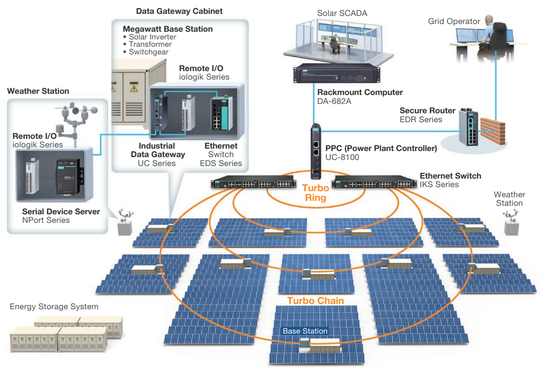
We contribute to forums such as CIGRE, IEC WG, PAC World, and UCAIug IOP on PRP/HSR and MMS solutions

1. Ground-mount Solar

Comprehensive Communications Solutions for Large-scale Solar Applications

Application Requirements
- Require a power plant controller (PPC) to elicit fast response times to grid-control commands
- Prevent data loss in the centralized platform that monitors and controls energy generation
- Operate in extreme temperatures to deliver accurate and timely data
- Support network infrastructure redundancy for continuous in-plant data acquisition
- Support diverse communication interfaces for data connectivity

Moxa Solutions
- Reliable computer with millisecond-level response time for use as a PPC and data gateway
- Patented Turbo Ring and Turbo Chain technologies to ensure network availability
- Ruggedized fanless hardware design to ensure system stability
- Support operations in -40 to 75°C range for deployment in harsh outdoor environments
- Support a variety of communication interfaces

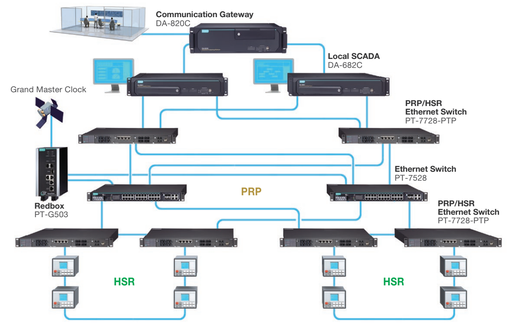


2. Utility Substation

Domain Expertise in IEC 61850 Network Redundancy and SCADA Computing Solutions

Application Requirements
- IEC 61850, IEEE 1588, and PRP/HSR compliant solutions
- One power SCADA platform to monitor both control devices and redundant networks
- Fast network failover for seamless communication
- Proactive monitoring of network and device statuses for predictive maintenance

Moxa Solutions
- World's first integrated MMS-based centralized management and GOOSE monitoring solution for PSCADA supervision
- Proactive Monitoring tool for predictive maintenance
- RSTP Grouping technology for easy integration of RSTP devices into PRP/HSR networks
- PRP/HSR redundancy and precise time synchronization using a single rackmount switch
- Support a variety of communication interfaces



3. Critical Power

Rugged Communication Networks for High Availability of Critical Power

Application Requirements
- Support diverse communication protocols and interfaces to connect field data to Ethernet networks
- Reliable devices with high MTBF values for use in critical power systems
- High availability of networks to ensure smooth operation of the main and backup systems

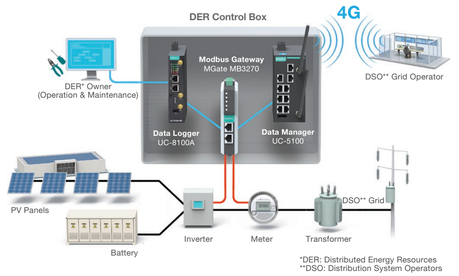
Moxa Solutions
- Multi-protocol connectivity for a diverse set of end devices
- Data-acquisition devices with high MTBF and under 0.5% RMA rates guaranteeing long-term operations
- Supports industrial-grade features, including EMC, wide temperature range, and millisecond-level network recovery time, to withstand harsh operating environments and ensure high availability

4. Distributed Energy Resources

Intelligent Energy IoT Connectivity for DER and Virtual Power Plants

Application Requirements
- Leverage IIoT connectivity in virtual power plants (VPPs) to aggregate data from various DER
- Acquire large volumes of data in real time and send the data to the cloud for processing and storage
- Operate reliably in extreme temperatures
- Support high system interoperability for easy integration

Moxa Solutions
- Rugged systems that provide reliable 4G connectivity in -40 to 70°C operating environments
- Intelligent Modbus gateway for interoperability with both DSO grid operators and DER owners
- RESTful APIs to remotely configure, monitor, and control devices
- Store and forward data using the DER control box during periods of intermittent connectivity
- Robust over-the-air (OTA) software upgrades



*DER: Distributed Energy Resources
**DSO: Distribution System Operators

MOXA

IEC 61850 Ethernet Switches

Product Series	PT-G7828	PT-G7728	PT-7728-PTP	PT-7828	PT-7728	PT-7528	PT-7710
Modular Switch	✓	✓	✓	✓	✓	✓	✓
Ethernet Interface							
Max. Number of Ports	28	28	28	28	28	28	10
Gigabit Ethernet 10/100/1000 BaseT(X)	2 to 26	2 to 26	–	–	–	–	–
Gigabit Ethernet 1000BaseSFP	2 to 26	2 to 26	Up to 4	Up to 4	Up to 4	Up to 4	Up to 2
Fast Ethernet 10/100 BaseT(X)	–	–	Up to 28	Up to 28	Up to 28	Up to 28	Up to 10
Fast Ethernet 100BaseFX	–	–	Up to 24	Up to 24	Up to 24	Up to 20	–
Filter							
802.1Q VLAN	✓	✓	✓	✓	✓	✓	✓
IGMP v1/v2/v3	✓	✓	✓	✓	✓	✓	✓
802.1p Class of Service	✓	✓	✓	✓	✓	✓	✓
Management							
DHCP Option 82	–	–	✓	✓	✓	✓	✓
SNMPv1/v2c/v3	✓	✓	✓	✓	✓	✓	✓
Fiber Check	✓	✓	✓	✓	✓	✓	–
Power Substation							
IEC 61850 QoS	✓	✓	✓	✓	✓	✓	✓
GOOSE Check	✓	✓	–	–	–	–	–
MMS Server	✓	✓	✓	–	✓	✓	–
Redundancy Protocols							
STP	✓	✓	✓	✓	✓	✓	✓
RSTP	✓	✓	✓	✓	✓	✓	✓
MSTP	✓	✓	✓	✓	✓	✓	✓
Turbo Ring/Turbo Chain	✓	✓	✓	✓	✓	✓	✓
PRP/HSR	–	–	✓	–	–	–	–
Layer 3 Software Features							
Multicast Routing	✓	–	–	✓	–	–	–
VRRP	✓	–	–	✓	–	–	–
Security							
Access Control List	✓	✓	–	✓	–	–	–
Broadcast Storm Protection	✓	✓	✓	✓	✓	✓	✓
HTTPS/SSL	✓	✓	✓	✓	✓	✓	✓
RADIUS/TACACS+	✓	✓	✓	✓	✓	✓	✓
Port Lock	✓	✓	✓	✓	✓	✓	✓
Rate Limit	✓	✓	✓	✓	✓	✓	✓
SSH	✓	✓	✓	✓	✓	✓	✓
Time Management							
SNTP/NTP Server/Client	✓	✓	✓	✓	✓	✓	✓
IEEE 1588v2 PTP (hardware-based)	✓	✓	✓	–	–	–	–
Available Power Input							
24/48 VDC	✓	✓	✓	✓	✓	✓	✓[1]
110/220 VDC/VAC	✓	✓	✓	✓	✓	✓	✓
Operating Temperature							
-40 to 85°C (-40 to 167°F)	✓	✓	✓[2]	✓[2]	✓[2]	✓[2]	✓[2]
Standards and Certifications							
Safety	UL 62368-1		UL 61010-1			UL 508	UL 60950-1, EN 60950-1, CSA C22.2 No. 60950-1
EMI	CISPR 32, FCC Part 15B Class A		EN 55032 Class A, CISPR 32, FCC Part 15B Class A				
Power Substation	IEC 61850-3 Edition 2.0 Class 2, IEEE 1613		IEC 61850-3, IEEE 1613			IEC 61850-3, IEEE 1613 Class 2[3]	IEC 61850-3, IEEE 1613

1. Supports 12/24/48 VDC.
2. Cold start requires minimum of 100 VAC at -40°C.
3. Models with MCS and SSC fiber ports are compliant with IEEE 1613 Class 1.

Product Series	MDS-G4028	MDS-G4020	MDS-G4012	PT-508/510	PT-G503-PHR-PTP
Ethernet Interface					
Max. Number of Ports	28	20	12	8/10	3
10/100/1000BaseT(X) or 1000BaseSFP Ports	Up to 28 (up to 24 for SFP ports)	Up to 20 (up to 16 for SFP ports)	Up to 12 (up to 8 for SFP ports)	–	3
10/100BaseT(X) or 100BaseSFP Ports	Up to 24	Up to 16	Up to 8	8/10	–
Filter					
802.1p Class of Service	✓	✓	✓	✓	–
802.1Q VLAN	✓	✓	✓	✓	–
IGMP v1/v2/v3 Snooping	✓	✓	✓	✓	–
Management					
MMS Server	–	–	–	–	✓
DHCP Option 82	–	–	–	✓	✓
Port Mirror	✓	✓	✓	✓	✓
RMON	✓	✓	✓	✓	✓
SNMPv1/v2c/v3	✓	✓	✓	✓	✓
Syslog	✓	✓	✓	✓	✓
Console Port	✓	✓	✓	✓	✓
Telnet/SSH	✓	✓	✓	✓	✓
TFTP	✓	✓	✓	✓	✓
Redundancy Protocols					
STP/RSTP	✓	✓	✓	✓	–
MSTP	–	–	–	✓	–
Turbo Ring/Turbo Chain	✓	✓	✓	✓	–
PRP / HSR	–	–	–	–	✓
RSTP Grouping	–	–	–	–	✓
Security					
HTTPS/SSL	✓	✓	✓	✓	✓
RADIUS / TACACS+	✓	✓	✓	✓	✓
MAC Sticky	✓	✓	✓	✓	–
SSH	✓	✓	✓	✓	✓
Rate Limit	✓	✓	✓	✓	–
Time Management					
SNTP / NTP Server / Client	✓	✓	✓	✓	✓
"IEEE 1588v2 PTP (hardware-based)"	–	–	–	–	✓
Input Voltage					
24/48 VDC	✓	✓	✓	✓	✓
110/220 VDC/VAC	✓	✓	✓	✓	✓
Installation					
DIN-rail Mounting	✓	✓	✓	✓	✓
Wall Mounting (with optional kit)	✓	✓	✓	✓	✓
Rack Mounting (with optional kit)	✓	–	–	–	–
Operating Temperature					
-10 to 60°C (14 to 140°F)	✓	✓	✓	–	–
-40 to 75°C (-40 to 167°F)	✓	✓	✓	–	–
-40 to 85°C (-40 to 185°F)	–	–	–	✓	✓
Standards and Certifications					
EMI	CISPR 32, FCC Part 15B Class A			CISPR 32, FCC Part 15B Class A	
Safety	UL 62368-1, IEC/EN 62368-1, IEC/EN 60950-1			UL 508, IEC/EN 60950-1	
Hazardous Locations	ATEX, Class I Division 2			–	
Railway	EN 50121-4			–	EN 50121-4
Traffic Control	NEMA TS2			–	
Power Substation	IEC 61850 Edition 2 Class 1, IEEE 1613 Class 1			IEC 61850 Edition 1 Class 1, IEEE 1613 Class 1	IEC 61850 Edition 1 Class 2, IEEE 1613 Class 2

Product Series	EDS-G516E	EDS-G512E	EDS-G509	EDS-G508E	EDS-528E	EDS-518E	EDS-510E
Ethernet Interface							
Max. Number of Ports	16	12	9	8	28	18	10
10/100/1000BaseT(X) Ports (RJ45 connector)	12	8	4	8	–	–	–
10/100BaseT(X) Ports (RJ45 connector)	–	–	–	–	24	Up to 14	7
Combo Ports (10/100/1000BaseT(X) or 100/1000BaseSFP+)	–	–	5	–	4	4	3
100/1000Base SFP Slots	4	4	–	–	–	–	–
100BaseFX Ports (ST or SC connector)	–	–	–	–	–	Up to 2	–
Filter							
802.1p Class of Service	✓	✓	✓	✓	✓	✓	✓
802.1Q VLAN	✓	✓	✓	✓	✓	✓	✓
IGMP v1/v2/v3 Snooping	✓	✓	✓	✓	✓	✓	✓
Industrial Protocols							
EtherNet/IP	✓	✓	✓	✓	✓	✓	✓
Modbus TCP	✓	✓	✓	✓	✓	✓	✓
PROFINET	✓	✓	–	✓	✓	✓	✓
Management							
DHCP Option 82	✓	✓	✓	✓	✓	✓	✓
Port Mirror	✓	✓	✓	✓	✓	✓	✓
RMON	✓	✓	✓	✓	✓	✓	✓
SNMPv1/v2c/v3	✓	✓	✓	✓	✓	✓	✓
Syslog	✓	✓	✓	✓	✓	✓	✓
Console Port	✓	✓	✓	✓	✓	✓	✓
Telnet/SSH	✓	✓	✓	✓	✓	✓	✓
TFTP	✓	✓	✓	✓	✓	✓	✓
Redundancy Protocols							
STP/RSTP/MSTP	✓	✓	✓	✓	✓	✓	✓
Turbo Ring/Turbo Chain	✓	✓	✓	✓	✓	✓	✓
Security							
HTTPS/SSL	✓	✓	✓	✓	✓	✓	✓
TACACS+	✓	✓	✓	✓	✓	✓	✓
Sticky MAC	✓	✓	–	✓	✓	✓	✓
MAB Authentication	✓	✓	–	✓	✓	✓	–
RADIUS	✓	✓	✓	✓	✓	✓	✓
Access Control List	✓	✓	–	✓	✓	✓	–
Layer 3 Switching	–	–	–	–	–	–	–
Input Voltage							
12 VDC	✓	✓	✓	✓	✓	✓	✓
24 VDC	✓	✓	✓	✓	✓	✓	✓
48 VDC	✓	✓	✓	✓	✓	✓	✓
-48 VDC	✓	✓	–	✓	✓	✓	✓
110/220 VDC/VAC	–	–	–	–	✓	–	–
Installation							
DIN-rail Mounting	✓	✓	✓	✓	✓	✓	✓
Wall Mounting (with optional kit)	✓	✓	✓	✓	✓	✓	✓
Operating Temperature							
0 to 60°C (32 to 140°F)	–	–	✓	–	–	–	–
-10 to 60°C (14 to 140°F)	✓	✓	–	✓	✓	✓	✓
-40 to 75°C (-40 to 167°F)	✓	✓	✓	✓	✓	✓	✓
Standards and Certifications							
EMI	FCC Part 15B Class A						
Safety	UL 508	Non-PoE models: UL 508 PoE models: EN 60950-1 (LVD)	UL 508, EN 60950-1	UL 508	UL 61010-2-201, EN 60950-1 (LVD)	UL 508, EN 60950-1 (LVD)	UL 508
Hazardous Locations	ATEX, Class I Division 2	Non-PoE models: ATEX, Class I Division 2	–	ATEX, Class I Division 2	–	ATEX, Class I Division 2	
Railway	EN 50121-4						
Traffic Control	NEMA TS2	Non-PoE models: NEMA TS2	–	NEMA TS2	–	NEMA TS2	
Power Substation	IEC 61850-3, IEEE 1613		–	IEC 61850-3, IEEE 1613			
Maritime	ABS, DNV GL, LR, NK	ABS, DNV GL, LR, NK	ABS, DNV GL, LR, NK	ABS, DNV GL, LR, NK	–	ABS, DNV GL, LR, NK	

IEC 61850 Computers

Product Series	DA-681C	DA-682C	DA-720	DA-820C
Computer				
CPU	• Intel® Celeron® 3965U, 2C/2T, 2.2 GHz • Intel® Core™ i3-7100U, 2C/4T, 2.4 GHz	• Intel® Core™ i7-7600U, 2C/4T, 2.8 GHz • Intel® Core™ i5-7300U, 2C/4T, 2.6 GHz • Intel® Core™ i3-7100U, 2C/4T, 2.4 GHz • Intel® Celeron® 3965U, 2C/2T, 2.2 GHz	• Intel® Core™ i5-6300U • Intel® Core™ i7-6600U	• Intel® Core™ i3-7102E • Intel® Core™ i5-7442EQ • Intel® Core™ i7-7820EQ • Intel® Xeon® E3-1505L v6 • Intel® Xeon® E3-1505M v6
System Memory Slot	SODIMM DDR4 slots x 2 (max. 32 GB)			SODIMM DDR4 slots x 2 (max. 64 GB)
Supported OS	• Windows 10 Embedded IoT Ent 2019 LTSC 64-bit • Linux Debian 9 Note: OS available by CTOS		• Linux Debian 8 • Windows 10 IoT Enterprise 2016 LTSB	• Linux Debian 9 • Windows 10 Embedded IoT Ent 2019 LTSC 64-bit
Storage Slot	2.5-inch HDD/SSD slots x 1 mSATA slot x 1	2.5-inch HDD/SSD slots x 2 mSATA slot x 1	2.5-inch HDD/SSD slot x 1 mSATA slot x 1	2.5-inch HDD/SSD slots x 4 mSATA x 1
Computer Interface				
Ethernet Ports	Auto-sensing 10/100/1000 Mbps ports (RJ45 connector) x 6	Auto-sensing 10/100/1000 Mbps ports (RJ45 connector) x 6	Auto-sensing 10/100/1000 Mbps ports (RJ45) x 14	Auto-sensing 10/100/1000 Mbps ports (RJ45) x 4
Serial Ports	RS-232/422/485 ports x 2, software-selectable (DB9 male) and RS-485 ports x 10 (terminal block)	RS-232/422/485 ports x 2, software-selectable (terminal block)		RS-232/422/485 ports x 2, software-selectable (DB9 male)
USB 2.0	USB 2.0 hosts x 2, type-A connectors			USB 2.0 hosts x 3, type-A connectors
USB 3.0	USB 3.0 hosts x 3, type-A connectors		USB 3.0 hosts x 2, type-A connectors	USB 3.0 hosts x 3, type-A connectors
Digital Input	DIs x 6	DIs x 6	–	DIs x 6
Digital Output	DOs x 2	DOs x 2	–	DOs x 2
Expansion Slots	–	Proprietary[1] PCI slots x 2	Proprietary[1] PCIe slots x 3	PCIe x1 slots x 2 PCIe x4 slot x 1 PCIe x16 slot x 1 PCI slot x 1
TPM	–			TPM v2.0
Video Output	HDMI x 2		DVI-D x 1 VGA x 1	HDMI x 2 VGA x 1
Power Parameters				
Input Voltage	100 to 240 VDC, 100 to 240 VAC		100 to 240 VAC, 110 to 240 VDC	
Physical Characteristics				
Dimensions (without ears)	483 x 316 x 44 mm (19 x 12.44 x 1.73 in)	483 x 282 x 88 mm (19.32 x 11.08 x 3.46 in)	440 x 301 x 90 mm (17.32 x 12.20 x 3.54 in)	281.4 x 440 x 132.8 mm (11.08 x 17.32 x 5.23 in)
Installation	19-inch rack mounting			
Environmental Limits				
Operating Temperature	-40 to 70°C (-40 to 158°F)		-25 to 55°C (-13 to 131°F)	Standard Models: -25 to 55°C (-13 to 131°F) Wide Temp. Models: -40 to 70°C (-40 to 158°F)
Standards and Certifications				
Power Substation	IEC 61850-3, IEC 60255			

1. Nonstandard PCIe slot.

Protocol Gateways

Product Series	MGate MB3170/MB3270	MGate MB3660	MGate 5109	MGate 5114	MGate 5217I
Ethernet Interface					
10/100BaseT(X) Ports (RJ45 connector)	2 (1 IP, Ethernet cascade, auto MDI/MDI-X connection)	2 (2 IP, auto MDI/MDI-X connection)	2 (1 IP, Ethernet cascade, auto MDI/MDI-X connection)		2 (1 IP, Ethernet cascade, auto MDI/MDI-X connection)
Magnetic Isolation Protection	1.5 kV (built-in)	1.5 kV (built-in)	1.5 kV (built-in)		1.5 kV (built-in)
Ethernet Software Features					
Industrial Protocols	Modbus TCP Client (master), Modbus TCP Server (slave)		Modbus TCP Client (master), Modbus TCP Server (slave), DNP3 TCP Master, DNP3 TCP Outstation	Modbus TCP Client (master), Modbus TCP Server (slave), IEC 60870-5-104 Client, IEC 60870-5-104 Server	BACnet/IP Server (slave), Modbus TCP Client (master)
Management	ARP, DHCP Client, DNS, HTTP, HTTPS, SMTP, SNMP Trap, SNMPv1/v2c/v3, TCP/IP, Telnet, UDP, NTP Client	ARP, DHCP Client, DNS, HTTP, HTTPS, SMTP, SNMP Trap, SNMPv1/v2c/v3, TCP/IP, Telnet, UDP, NTP Client, RADIUS	ARP, DHCP Client, DNS, HTTP, HTTPS, SMTP, SNMP Trap, SNMPv1/v2c/v3, TCP/IP, Telnet, SSH, UDP, NTP Client		ARP, DHCP Client, DNS, HTTP, HTTPS, SMTP, SNMP Trap, SNMPv1/v2c/v3,TCP/IP, Telnet, SSH, UDP, NTP Client
Serial Interface					
No. of Ports	MGate MB3170 Series: 1 MGate MB3270 Series: 2	MGate MB3660-8 Series: 8 MGate MB3660-16 Series: 16	1	1	2
Connector	MGate MB3170/MB3170I: DB9 male for RS-232 and terminal block for RS-422/485 MGate MB3270/MB3270I: 2 x DB9 male	MGate MB3660-8/16: DB9 male MGate MB3660-8/16-J: RJ45	DB9 male	DB9 male	DB9 male
Serial Standards	RS-232/422/485		RS-232/422/485	RS-232/422/485	RS-232/422/485
Baudrate	50 bps to 921.6 kbps		50 bps to 921.6 kbps	50 bps to 921.6 kbps	50 bps to 921.6 kbps
Flow Control	DTR/DSR, RTS Toggle (RS-232 only), RTS/CTS	DTR/DSR, RTS Toggle (RS-232 only), RTS/CTS	RTS Toggle (RS-232 only), RTS/CTS	RTS Toggle (RS-232 only), RTS/CTS	RTS Toggle (RS-232 only), RTS/CTS
RS-485 Data Direction Control	ADDC® (automatic data direction control)		ADDC® (automatic data direction control)	ADDC® (automatic data direction control)	ADDC® (automatic data direction control)
Pull High/Low Resistor for RS-485	1 kilo-ohm, 150 kilo-ohms		1 kilo-ohm, 150 kilo-ohms	1 kilo-ohm, 150 kilo-ohms	1 kilo-ohm, 150 kilo-ohms
Terminator for RS-485	120 ohms	120 ohms	120 ohms	120 ohms	120 ohms
Isolation	2 kV (I models)	2 kV (I models)	2 kV (built-in)	2 kV (built-in)	2 kV (built-in)
Serial Software Features					
Industrial Protocols	Modbus RTU/ASCII Master, Modbus RTU/ASCII Slave		Modbus RTU/ASCII Master, Modbus RTU/ASCII Slave, DNP3 Serial Master, DNP3 Serial Outstation	Modbus RTU/ASCII Master, Modbus, RTU/ASCII Slave, IEC 60870-5-101 Master, IEC 60870-5-101 Slave	Modbus RTU/ASCII Master
Power Parameters					
Input Voltage	12 to 48 VDC	All models: Redundant dual inputs AC models: 100 to 240 VAC (47 to 63 Hz) DC models: 20 to 60 VDC (1.5 kV isolation)	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC, 24 VAC
Relays					
Contact Current Rating	Resistive load: 1 A @ 30 VDC	Resistive load: 2 A @ 30 VDC	Resistive load: 2 A @ 30 VDC	Resistive load: 2 A @ 30 VDC	Resistive load: 1 A @ 30 VDC
Environmental Limits					
Operating Temperature	Standard Models: 0 to 60°C (32 to 140°F) Wide Temp. Models: -40 to 75°C (-40 to 167°F)	0 to 60°C (32 to 140°F)	Standard Models: 0 to 60°C (32 to 140°F) Wide Temp. Models: -40 to 75°C (-40 to 167°F)	Standard Models: 0 to 60°C (32 to 140°F) Wide Temp. Models: -40 to 75°C (-40 to 167°F)	Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Standards and Certifications					
Safety	EN 60950-1, IEC 60950-1, IEC 62368-1, UL 62368-1	EN 60950-1, UL 60950-1	EN 60950-1, UL 508	EN 60950-1, UL 508	EN 60950-1, IEC 60950-1 IEC 62368-1, UL 62368-1
EMC	EN 55032/24	EN 55032/24	EN 55032/24	EN 55032/24	EN 55032/35
EMI	CISPR 32, FCC Part 15B Class A	CISPR 32, FCC Part 15B Class A	CISPR 32, FCC Part 15B Class B	CISPR 32, FCC Part 15B Class B	CISPR 32, FCC Part 15B Class A
EMS	IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF IEC 61000-4-11 DIPs	IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 1 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF	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: 2 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m; Signal: 10 V/m IEC 61000-4-8 PFMF		IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF IEC 61000-4-11 DIPs
Hazardous Locations	ATEX, Class I Division 2, IECEx	–	ATEX, Class I Division 2, IECEx	ATEX, Class I Division 2, IECEx	–
Maritime	DNV GL	–			

Serial Device Servers

Product Series	NPort 6600	CN2600	NPort S9650I	NPort S9450I
LAN Interface				
10/100BaseT(X) Ports	1 port (8-pin RJ45 connector)	2 ports (2 IPs, 8-pin RJ45 connectors)	2 ports (8-pin RJ45 connector with the option for 2 more RJ45/fiber SC ports)	5 ports (8-pin RJ45 connector with the option for fiber ST/SC ports)
Magnetic Isolation Protection	1.5 kV			
Protocol	–	–	DNP3 TCP, Modbus RTU/ASCII, DNP3 Serial	Modbus TCP, Modbus RTU/ASCII, DNP3 TCP, DNP3 Serial
RS-232/422/485 Ports	8/16/32	8/16	8/16	4
Connectors	8-pin RJ45	CN2610/2650: 8-pin RJ45, CN2650I: DB9 male	DB9 male/DB9 female/multi-mode ST	DB9 male
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark
Flow Control	RTS/CTS, DTR/DSR, XON/XOFF	RTS/CTS, DTR/DSR, XON/XOFF	RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF
Baudrate	50 bps to 921.6 Kbps	50 bps to 921.6 Kbps	50 bps to 921.6 Kbps	50 bps to 921.6 Kbps
2-kV Isolation Protection	–	Optional (CN2650I)	Yes	Yes
RS-485 Data Direction Control	ADDC® (automatic data direction control)			
RS-232 Console Port	Yes	Yes	Yes	Yes
Advanced Features				
Serial Data Log	64 KB	–	–	–
Offline port Buffering	64 KB	–	–	–
SD Slot	Yes	–	–	–
Software				
Security Protocols	HTTPs, SSH, RADIUS, TACACS+	RADIUS, HTTPS, SSH, PAP, CHAP	HTTPS/SSL, TACACS+, RADIUS, SSH	HTTPS/SSL, TACACS+, RADIUS, SSH
Configuration Options	Web Console, Telnet Console, Serial Console, Windows Utility	Web Console, Serial Console, Telnet Console, Windows Utility	Web console, Serial console, Telnet console, Windows Utility	Web console, Serial console, Telnet console, Windows Utility
Driver Support	Windows Real COM Drivers,Linux Real TTY driver, Fixed TTY driver	Windows Real COM Drivers,Linux Real TTY driver, Fixed TTY driver	Windows Real COM drivers, Linux Real TTY drivers, Fixed TTY drivers	Windows Real COM drivers, Linux Real TTY drivers, Fixed TTY drivers
Management	SNMP MIB-II, SNMPv1/v2c/v3, Turbo Ring	SNMP MIB-II	SNMP MIB-II, SNMPv1/v2c/v3, IEC 61850 MMS, Turbo Ring, Turbo Chain	SNMP MIB-II, IEC 61850 MMS, Turbo Ring, Turbo Chain
Standard Operation Modes	Real COM, TCP Server, TCP Client, UDP, Pair Connection, RFC2217, Terminal, Reverse Telnet, Ethernet Modem, Printer, PPP, Disabled	Real COM, TCP Server, TCP Client, UDP, RFC2217, Terminal, Reverse Telnet, PPP, DRDAS, Redundant COM, Disabled	Real COM, RFC2217, TCP Server, TCP Client, UDP, DNP3, DNP3 Raw Socket, Modbus, Disabled	Real COM, RFC2217, TCP Server, TCP Client, UDP, DNP3, DNP3 Raw Socket, Modbus, Disabled
Secure Operation Modes	Secure Real COM, Secure TCP Server, Secure TCP Client, Secure Pair Connection, SSH, Reverse SSH	–	–	–
Physical Characteristics				
Housing	Metal			
Dimensions (mm)	440 x 195 x 44 mm	Without ears: 440 x 198 x 45.5 mm	Without ears: 457 x 32 x 330 mm	Without ears: 160 x 80 x 109 mm
Environmental Limits				
Operating Temperature	Standard Models: 0 to 55°C (32 to 131°F), CN2650-8-2AC-T/CN2650-16-2AC-T: -40 to 75°C (40 to 167°F), CN2650I-8-HV-T/CN2650I-16-HV-T: -40 to 85°C (-40 to 185°F)		-40 to 85°C (-40 to 185°F)	
Storage Temperature	Standard Models: 0 to 55°C (32 to 131°F), CN2650-8-2AC-T/CN2650-16-2AC-T: -40 to 75°C (40 to 167°F), CN2650I-8-HV-T/CN2650I-16-HV-T: -40 to 85°C (-40 to 185°F)		-40 to 85°C (-40 to 185°F)	
Ambient Relative Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Power Requirements				
Rated Voltage	AC Models: 100 to 240 VAC DC Models: ±48 VDC (20 to 72 VDC, -20 to -72 VDC), 110 VDC (88 to 300 VDC)	AC models: 100 to 240 VAC, 47 to 63 Hz DC models: 110 VDC (88 to 300 VDC)	110/220 VAC/VDC (100 to 240 VAC, 100 to 250 VDC)	NPort S9450I-WV-T Series: 24/48 VDC (18 to 72 VDC) NPort S9450I-HV-T Series: 110/220 VAC/VDC (85 to 264 VAC, 88 to 300 VDC)
Standards and Certifications				
Safety	UL 60950-1	Non -I models: UL 60950-1 -I models: UL 62368-1	EN 61010-2-201, UL 61010-2-201	EN 61010-2-201, UL 61010-2-201
EMC	EN 55032/24	Non -I models: EN 55032/24 -I models: EN 55032/35	EN 61000-6-2/-6-4	EN 61000-6-2/-6-4
Reliability				
MTBF	NPort 6610-8 Series: 135,891 hrs NPort 6610-16 Series: 102,373 hrs NPort 6610-32 Series: 68,707 hrs NPort 6650-8 Series: 636,600 hrs NPort 6650-16 Series: 439,673 hrs NPort 6650-32 Series: 310,078 hrs NPort 6650-8-HV-T: 501,171 hrs NPort 6650-16-HV-T: 380,006 hrs NPort 6650-32-HV-T: 290,914 hrs	CN2610-8: 831,925 hrs CN2610-16: 639,332 hrs CN2610-8-2AC/CN2650-8-2AC: 773,268 hrs CN2610-16-2AC: 604,346 hrs CN2650-8: 657,123 hrs CN2650-16: 457,175 hrs CN2650-16-2AC: 442,699 hrs CN2650I-8/CN2650I-8-2AC/CN2650-8-2AC-T: 190,562 hrs CN2650I-16/CN2650I-16-2AC/CN2650-16-2AC-T: 115,887 hrs CN2650I-8-HV-T: 191,326 hrs CN2650I-16-HV-T: 116,924 hrs	NPort S9650I-8-2HV-E-T: 224,670 hrs NPort S9650I-8-2HV-MSC-T: 220,944 hrs NPort S9650I-8-2HV-SSC-T: 220,944 hrs NPort S9650I-8B-2HV-IRIG-T: 213,025 hrs NPort S9650I-8F-2HV-E-T: 311,734 hrs NPort S9650I-8F-2HV-MSC-T: 304,587 hrs NPort S9650I-8F-2HV-SSC-T: 304,587 hrs NPort S9650I-16-2HV-E-T: 158,816 hrs NPort S9650I-16-2HV-MSC-T: 156,949 hrs NPort S9650I-16-2HV-SSC-T: 156,949 hrs NPort S9650I-16B-2HV-IRIG-T: 157,770 hrs NPort S9650I-16F-2HV-E-T: 261,817 hrs NPort S9650I-16F-2HV-MSC-T: 256,761 hrs NPort S9650I-16F-2HV-SSC-T: 256,761 hrs	347,436 hrs
Warranty	5 years			

Remote I/Os

Product Series	ioLogik E1210	ioLogik E1211	ioLogik E1212	ioLogik E1213	ioLogik E1214	ioLogik E1240	ioLogik E1241	ioLogik E1242	ioLogik E1260	ioLogik E1262
Input/Output Interface										
Analog Input Channels	–	–	–	–	–	8	–	4	–	–
Analog Output Channels	–	–	–	–	–	–	4	–	–	–
Configurable DIO Channels (by jumper)	–	–	8	4	–	–	–	4	–	–
Digital Input Channels	16	–	8	8	6	–	–	4	–	–
Digital Output Channels	–	16	–	4	–	–	–	–		
Relay Channels	–	–	–	–	6	–	–	–	–	–
RTD Channels	–	–	–	–	–	–	–	–	6	–
Thermocouple Channels	–	–	–	–	–	–	–	–	–	8
Digital Outputs										
I/O Type	–	Sink	Sink	Source	–	–	–	Sink	–	–
Ethernet Interface										
10/100BaseT(X) Ports (RJ45 connector)	2, 1 MAC address (Ethernet bypass)									
Ethernet Software Features										
Industrial Protocols	EtherNet/IP Adapter (slave), Modbus TCP Server (slave), Moxa AOPC (active tag), MXIO Library, RESTful API, SNMP v1/v2c, SNMP v1 Trap									
Environmental Limits										
Operating Temperature	Standard Models: -10 to 60°C (14 to 140°F) , Wide Temp. Models: -40 to 75°C (-40 to 167°F)									
Storage Temperature (including the package)	-40 to 85°C (-40 to 185°F)									
Ambient Relative Humidity	5 to 95% (non-condensing)									
Altitude	4000 meters[1]									
Standards and Certifications										
EMC	EN 55032/24, EN 61000-6-2/-6-4									
EMI	CISPR 32, FCC Part 15B Class A									
EMS	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV / IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m / IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV / IEC 61000-4-6 CS: 10 V / IEC 61000-4-8 PFMF									
Hazardous Locations	ATEX, Class I Division 2			–	ATEX, Class I Division 2					
Safety	UL 508									
Shock	IEC 60068-2-27									
Vibration	IEC 60068-2-6									
Declaration										
Green Product	RoHS, CRoHS, WEEE									

1. Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

ioThinx 4510 Module I/Os

Product Series	ioThinx 4510
Power Inputs	System Power: 12 to 48 VDC; Field Power: 12/24 VDC
Expansion Modules	32
IT Protocols	MQTT, MXIO Library, RESTful API, SNMPv1/v2c/v3, SNMPv1/v2c/v3 Trap, SNMPv2c/v3 Inform
OT Protocols	Modbus TCP Server (Slave)
Gateway Function	Modbus RTU Master to Modbus TCP/SNMP/RESTful API/MQTT
Operating Temperature	Standard Models: -20 to 60°C (-4 to 140°F); Wide Temp. Models (-T): -40 to 75°C (-40 to 167°F)

ioThinx 4500 Series (45MR) Modules

Product Series	45MR-1600	45MR-1601	45MR-2600	45MR-2601	45MR-2606	45MR-2404	45MR-3800	45MR-3810	45MR-4420	45MR-6600	45MR-6810
Digital Inputs	16 (PNP)	16 (NPN)	–	–	8 (PNP)	–	–	–	–	–	–
Digital Outputs	–	–	16 (sink)	16 (source)	8 (source)	–	–	–	–	–	–
Relays	–	–	–	–	–	4 (Form A)	–	–	–	–	–
Analog Inputs	–	–	–	–	–	–	8 (0/4-20 mA)	8 (-10/0-10 V)	–	–	–
Analog Outputs	–	–	–	–	–	–	–	–	4 (0/4-20 mA) (0-10 V)	–	–
RTDs	–	–	–	–	–	–	–	–	–	6	–
Thermocouples	–	–	–	–	–	–	–	–	–	–	8
Operating Temp.	Standard Models: -20 to 60°C (-4 to 140°F); Wide Temp. Models (-T): -40 to 75°C (-40 to 167°F)										

IIoT Gateways

Product Models	UC-5101 UC-5102 UC-5111 UC-5112	UC-8112-LX	UC-8112A UC-8112A (US) UC-8112A (EU) UC-8112A (AP)
Computer			
CPU	Armv7 Cortex-A8 (1 GHz)		
DRAM	512 MB DDR3		1 GB DDR3
Storage Preinstalled	8 GB eMMC flash		
Storage Slot	SD x 1		
Computer Interface			
Ethernet Ports	Auto-sensing 10/100 Mbps ports (RJ45) x 2		
Serial Ports	RS-232/422/485 ports x 4, software selectable (RJ45)	RS-232/422/485 ports x 2, software-selectable (5-pin terminal block)	
Digital Input	DIs x 4	–	
Digital Output	DOs x 4	–	
Expansion Slot	UC-5102: mPCIe x 1 (for Wi-Fi/LTE) UC-5112: mPCIe x 1 (for Wi-Fi/LTE)	mPCIe slot x 1 (for Wi-Fi/LTE)	UC-8112A: mPCIe x 1 (for Wi-Fi/LTE)
GPS	–	–	UC-8112A (US): GPS x 1 UC-8112A (EU): GPS x 1 UC-8112A (AP): GPS x 1
USB 2.0	1 (type-A connector)		
CAN Interface			
No. of Ports	UC-5111: CAN ports x 2, CAN 2.0A and CAN 2.0B compliant UC-5112: CAN ports x 2, CAN 2.0A and CAN 2.0B compliant	–	
Environmental Limits			
Operating Temperature	Standard Models: -10 to 60°C (14 to 140°F) Wide Temp. Models: Product only: -40 to 85°C (-40 to 185°F) With LTE accessory: -40 to 70°C (-40 to 158°F) With Wi-Fi accessory: -10 to 70°C (14 to 158°F)	-10 to 60°C (14 to 140°F)	Without LTE Module: -40 to 85°C (-40 to 185°F) With LTE Module: -40 to 70°C (-40 to 158°F)
Standards and Certifications			
Hazardous Locations	–		ATEX, Class I Division 2, IECEx
WLAN Interface			
WLAN Standards	–		
Cellular Interface			
Standard	–		UC-8112A (US): LTE Cat 4 compliant UC-8112A (EU): LTE Cat 4 compliant UC-8112A (AP): LTE Cat 4 compliant
Carrier Approval	–		UC-8112A (US): Verizon, AT&T
LTE Bands	–		UC-8112A (US): 2, 4, 5, 13, 17 UC-8112A (EU): 1, 3, 5, 7, 8, 20 UC-8112A (AP): 1, 3, 5, 7, 8, 28
UMTS Bands	–		UC-8112A (US): 850/1900 MHz UC-8112A (EU): 850/900/1900/2100 MHz UC-8112A (AP): 850/900/1900/2100 MHz
Power Parameters			
Input Voltage	9 to 48 VDC	12 to 24 VDC	12 to 36 VDC
Power Consumption (max.)	6 W	5.4 W	UC-8112A: 6 W UC-8112A (US): 8 W UC-8112A (EU): 8 W UC-8112A (AP): 8 W

Product Series	V2201
Computer	
CPU	• Intel Atom® E3815 • Intel Atom® E3826 • Intel Atom® E3845
System Memory Slot	SODIMM DDR3/DDR3L slot x 1 (max. 8 GB)
Supported OS	• Windows Embedded Standard 7 (WS7E) 32-bit/64-bit • Windows 10 IoT Enterprise 2016 LTSB
Storage Slot	mSATA x 1 SD x 1
Computer Interfaces	
Ethernet Ports	Auto-sensing 10/100/1000 Mbps ports (RJ45) x 2
Serial Ports	RS-232/422/485 ports x 2, software-selectable (DB9 male)
USB 2.0	USB 2.0 hosts x 2, type-A connectors
USB 3.0	USB 3.0 hosts x 1, type-A connector
Digital Input	DIs x 4
Digital Output	DOs x 4
Expansion Slots	Full-size mPCIe slots x 2 (PCIe and USB signals x 1, USB x 1) with single-SIM support
TPM	–
Video Output	HDMI x 1
Power Parameters	
Input Voltage	9 to 36 VDC
Physical Characteristics	
Dimensions (without ears)	150 x 48.8 x 120.2 mm (5.91 x 1.92 x 4.73 in)
Installation	DIN-rail mounting, wall mounting (with optional kit)
Environmental Limits	
Operating Temperature	E1/E2 Models: -40 to 85°C (-40 to 185°F) E4 Models: -40 to 70°C (-40 to 158°F)