Serial Device Servers

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Serial Device Servers

Combo Switch / Serial Device Server

NPort S8000: Ethernet Switch Specifications

Ethernet Interface	
Standards	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) and 100Base FX IEEE 802.3x for Flow Control IEEE 802.1D for Spanning Tree Protocol IEEE 802.1w for Rapid STP IEEE 802.1Q for VLAN Tagging IEEE 802.1p for Class of Service IEEE 802.1X for Authentication IEEE 802.3ad for Port Trunk with LACP
Network Protocols	ICMP, IP, TCP, UDP, ARP, Telnet, DNS, HTTP, SMTP, SNTP, IGMPv1/v2 device, GVRP, SNMPv1/v2c/v3, DHCP Server/ Client, DHCP Option 82, BootP, TFTP, SNTP, SMTP, RARP, GMRP, LACP, RMON
MIB	MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control	IEEE 802.3x flow control, back pressure flow control interface
Optical Fiber Interface	
Type	Multi-mode
Distance	0 to 2 km, 1310 nm (62.5/125 µm, 500 MHz*km)
Min. TX Output	-20 dBm
Max. TX Output	-14 dBm
Sensitivity	-34 to -30 dBm
Switch Properties	
Priority Queues	4
Max. Number of Available VLANs	64
VLAN ID Range	VID 1 to 4094
IGMP Groups	256
Switch Interface	
RJ45 Ports	10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
DIP Switches	Turbo Ring, Master, Coupler, Reserve
Alarm Contact	2 relay outputs with current carrying capacity of 1A @ 24 VDC

NPort S8000: General Specifications

Port Summary	
Serial Ports	4 RS-232/422/485 ports
Ethernet Switch Ports	3 RJ45 copper ports, 2 multi-mode fiber ports
Console Ports	1 (8-pin RJ45 connector)
LED Indicators	PWR1, PWR2, READY, MASTER, COUPLER, LINK4, LINK5
Physical Characteristics	
Housing	Metal
Weight	995 g
Dimensions	73.1 x 134 x 105 mm
Environmental Limits	
Operating Temperature	0 to 60°C
Operating Humidity	5 to 95% RH
Storage Temperature	-40 to 85°C
Power Requirements	
Input Voltage	12 to 48 VDC
Power Consumption	935mA @ 12 V, 470 mA @ 24 V
Regulatory Approvals	
EMC	CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A
Safety	UL-508, UL (UL60950-1), LVD (EN60950-1)
EMS	IEC 61000-4-2, Level 4 (ESD) IEC 61000-4-4, Level 4 (EFT) IEC 61000-4-5 for serial port, Level 1 (Surge) IEC 61000-4-5 for Power Line, Level 3 (Surge) IEC 61000-4-5 for LAN port, Level 2 (Surge)
Reliability	
Buzzer, RTC, WDT	√
Warranty	5 years (see www.moxa.com/warranty)

NPort S8000: Device Server Specifications

Serial Interface	
Number of Ports	4
Serial Standards	RS-232/422/485
Connectors	DB9 male
Serial Line Protection	15 KV ESD protection for all signals 2 KV isolation protection
RS-485 Data Direction Control	ADDC® (automatic data direction control)
Pull High/Low Resistor for RS-485	1 KΩ, 150 KΩ
Terminator for RS-485	55 Ω, 120 Ω
Console Port	Dedicated RS-232 console port (8-pin RJ45)
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 and XON/XOFF
Baudrate	50 bps to 921.6 Kbps
Serial Signals	
RS-232	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422	Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w	Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w	Data+, Data-, GND
Software	
Configuration Options	Web Console, Telnet Console, Serial Console, Windows Search Utility
Windows Real COM Drivers	Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i
Linux Real TTY Drivers	2.4.x, 2.6.x
Operation Modes	Real COM, TCP Server, TCP Client, UDP, RFC2217
Management	SNMP MIB-II
IP Routing	Static, RIP-I, RIP-II
Reliability	
Alert Tools	Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger	Built-in WDT (watchdog timer)

General-purpose Device Servers

	NPort® 5110 NPort® 5110-T	NPort® 5130	NPort® 5150	NPort® DE-211	NPort® DE-311	NPort® 5210 NPort® 5210-T	NPort® 5230 NPort® 5230-T
Ethernet Interface							
10BaseT Ports	---	---	---	1	---	---	---
10/100BaseT(X) Ports	1	1	1	---	1	1	1
100BaseFX	---	---	---	---	---	---	---
Connector	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface							
RS-232 Ports	1	---	---	---	---	2	1
RS-232/422 Ports	---	1	---	---	---	---	1
RS-232/422/485 Ports	---	---	1	1	1	---	---
Connector	DB9-M	DB9-M	DB9-M	DB25-F	DB9-F	RJ45	TB
15 KV ESD Protection	√	√	√	√	√	√	√
2 KV Isolation Protection	---	---	---	---	---	---	---
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						
Baudrate	110 bps to 230.4 Kbps	50 bps to 921.6 Kbps		50 bps to 230.4 Kbps		110 bps to 230.4 Kbps	
Software							
Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP			DHCP, BOOTP, Telnet, TCP, UDP, IP, ICMP, ARP		ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP	
Web Console	√	√	√	---	---	√	√
Serial Console	√	---	√	√	√	√	√
Telnet Console	√	√	√	√	√	√	√
Windows Utility	√	√	√	√	√	√	√
Windows Real COM Drivers	Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded						
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i						
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x						
Onsite Configuration							
Mini Screen with Push Buttons	---	---	---	---	---	---	---
Physical Characteristics							
Housing	Metal	Metal	Metal	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)
Weight	340 g	340 g	340 g	480 g	480 g	340 g	360 g
Dimensions	52 x 80 x 22 mm			67 x 100.4 x 22 mm			
Environmental Limits							
Operating Temparture	0 to 55°C or -40 to 75°C	0 to 55°C		0 to 55°C		0 to 55°C or -40 to 75°C	
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-40 to 85°C	-40 to 85°C
Power Requirements							
Input Voltage	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 30 VDC	9 to 30 VDC	12 to 48 VDC	12 to 48 VDC
Power Consumption @ 12/24/48 VDC	128.7/72/--- mA	200/106/--- mA	200/106/--- mA	180/100/--- mA	---/150/--- mA	325/190/--- mA	325/190/--- mA
Power Consumption @ 100/240 VAC	---	---	---	---	---	---	---
Regulatory Approvals							
EMC	CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A			CE (EN55022 Class B, EN55024 Class B), FCC Part 15 Subpart B		CE (EN55022 and EN55024 Class A), FCC Part 15 Subpart B Class A	
Safety	UL (UL60950-1), TÜV (EN60950-1)			UL (UL60950), TÜV (EN60950)		UL (UL60950-1), TÜV (EN60950-1)	
Marine	---	---	---	---	---	DNV	
Medical	---	---	---	---	EN60601-1-2 Class B, EN55011	---	---
Reliability							
Buzzer, RTC, WDT	WDT only	WDT only	WDT only	---	---	√	√
MTBF	279122 hrs	246505 hrs	246034 hrs	347822 hrs	225529 hrs	134850 hrs	106955 hrs
Warranty	5 years (see www.moxa.com/warranty)						

General-purpose Device Servers

	NPort® 5232 NPort® 5232-T	NPort® 5232I NPort® 5232I-T	NPort® 5410	NPort® 5430	NPort® 5430I	NPort® 5450	NPort® 5450I
Ethernet Interface							
10BaseT Ports	---	---	---	---	---	---	---
10/100BaseT(X) Ports	1	1	1	1	1	1	1
100BaseFX	---	---	---	---	---	---	---
Connector	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface							
RS-232 Ports	---	---	4	---	---	---	---
RS-232/422 Ports	2	2	---	4	4	---	---
RS-232/422/485 Ports	---	---	---	---	---	4	4
Connector	TB	TB	DB9-M	TB	TB	DB9-M	DB9-M
15 KV ESD Protection	√	√	√	√	√	√	√
2 KV Isolation Protection	---	√	---	---	√	---	√
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	RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF
Baudrate	110 bps to 230.4 Kbps		50 bps to 921.6 Kbps				
Software							
Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP		ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP, Rtelnet, ARP				
Web Console	√	√	√	√	√	√	√
Serial Console	---	---	---	---	---	---	---
Telnet Console	√	√	√	√	√	√	√
Windows Utility	√	√	√	√	√	√	√
Windows Real COM Drivers	Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded						
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i						
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x						
Onsite Configuration							
Mini Screen with Push Buttons	---	---	√	√	√	√	√
Physical Characteristics							
Housing	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)
Weight	360 g	380 g	740 g				
Dimensions	67 x 100.4 x 22 mm	67 x 100.4 x 35 mm	158 x 103 x 33 mm				
Environmental Limits							
Operating Temparture	0 to 55°C or -40 to 75°C		0 to 55°C (32 to 131°F)				
Operating Humidity	5 to 95% RH		5 to 95% RH				
Storage Temperature	-40 to 85°C		-20 to 70°C				
Power Requirements							
Input Voltage	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC
Power Consumption @ 12/24/48 VDC	280/150/--- mA	509.4/200/--- mA	350/190/--- mA	320/175/--- mA	530/280/--- mA	350/190/--- mA	554/294/--- mA
Power Consumption @ 100/240 VAC	---	---	---	---	---	---	---
Regulatory Approvals							
EMC	CE (EN55022 and EN55024 Class A), FCC Part 15 Subpart B Class A						
Safety	UL (UL60950-1), TÜV (EN60950-1)						
Marine	DNV						
Medical	---	---	EN60601-1-2 Class B, EN55011				
Reliability							
Buzzer, RTC, WDT	√	√	√	√	√	√	√
MTBF	102344 hrs	87083 hrs	206903 hrs	206903 hrs	206903 hrs	206903 hrs	206903 hrs
Warranty	5 years (see www.moxa.com/warranty)						

General-purpose Device Servers

	NPort® 5610-8	NPort® 5610-8-48V	NPort® 5630-8	NPort® 5650-8	NPort® 5650-8-M-SC	NPort® 5650-8-S-SC	NPort® 5610-16	NPort® 5610-16-48V
Ethernet Interface								
10BaseT Ports	---	---	---	---	---	---	---	---
10/100BaseT(X) Ports	1	1	1	1	---	---	1	1
100BaseFX Ports	---	---	---	---	1 (multi-mode)	1 (single-mode)	---	---
Connector	RJ45	RJ45	RJ45	RJ45	SC	SC	RJ45	RJ45
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	---	---	1.5 KV	1.5 KV
Serial Interface								
RS-232 Ports	8	8	---	---	---	---	16	16
RS-232/422 Ports	---	---	8	---	---	---	---	---
RS-232/422/485 Ports	---	---	---	8	8	8	---	---
Connector	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45
15 KV ESD Protection	√	√	√	√	√	√	√	√
2 KV Isolation Protection	---	---	---	---	---	---	---	---
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							
Baudrate	50 bps to 921.6 Kbps							
Software								
Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP, ARP, PPP, SLIP, RTelnet, RFC2217							
Web Console	√	√	√	√	√	√	√	√
Serial Console	---	---	---	---	---	---	---	---
Telnet Console	√	√	√	√	√	√	√	√
Windows Utility	√	√	√	√	√	√	√	√
Windows Real COM Drivers	Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded							
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i							
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x							
Onsite Configuration								
Mini Screen with Push Buttons	√	√	√	√	√	√	√	√
Physical Characteristics								
Housing	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)
Weight	3340 g	3160 g	3380 g	3360 g	3380 g	3380 g	3420 g	3260 g
Dimensions	440 x 45 x 198 mm							
Environmental Limits								
Operating Temparture	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 75°C
Power Requirements								
Input Voltage	100 to 240 VAC, 47 to 63 hz	±48 VDC	100 to 240 VAC, 47 to 63 hz	100 to 240 VAC, 47 to 63 hz	100 to 240 VAC, 47 to 63 hz	100 to 240 VAC, 47 to 63 hz	100 to 240 VAC, 47 to 63 hz	±48 VDC
Power Consumption @ 12/24/48 VDC		---/---/135 mA	---	---	---	---	---	---/---/135 mA
Power Consumption @ 100/240 VAC	141/93 mA	---	152/98 mA	158/102 mA	174/113 mA	164/110 mA	141/93 mA	---
Regulatory Approvals								
EMC	CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A, IEC61000-4-12		CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A				CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A, IEC61000-4-12	
Safety	UL (UL60950-1), TÜV (EN60950-1)							
Marine	---	---	---	---	---	---	---	---
Medical	EN60601-1-2 Class B, EN55011							
Reliability								
Buzzer, RTC, WDT	√	√	√	√	√	√	√	√
MTBF	97294 hrs	96758 hrs	118405 hrs	117584 hrs	116914 hrs	116914 hrs	94928 hrs	94417 hrs
Warranty	5 years (see www.moxa.com/warranty)							

General-purpose Device Servers

	NPort® 5630-16	NPort® 5650-16	NPort® 5650-16-M-SC	NPort® 5650-16-S-SC	NPort® 5610-8-DT	NPort® 5610-8-DT-J	NPort® 5650-8-DT	NPort® 5650I-8-DT	NPort® 5650-8-DT-J
Ethernet Interface									
10BaseT Ports	---	---	---	---	---	---	---	---	---
10/100BaseT(X) Ports	1	1	---	---	2	2	2	2	2
100BaseFX Ports	---	---	1 (multi-mode)	1 (single-mode)	---	---	---	---	---
Connector	RJ45	RJ45	SC	SC	RJ45	RJ45	RJ45	RJ45	RJ45
Magnetic Isolation Protection	1.5 KV	1.5 KV	---	---	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface									
RS-232 Ports	---	---	---	---	8	8	---	---	---
RS-232/422 Ports	16	---	---	---	---	---	---	---	---
RS-232/422/485 Ports	---	16	16	16	---	---	8	8	8
Connector	RJ45	RJ45	RJ45	RJ45	DB9-M	RJ45	DB9-M	DB9-M	RJ45
15 KV ESD Protection	√	√	√	√	√	√	√	√	√
2 KV Isolation Protection	---	---	---	---	---	---	---	√	---
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								
Baudrate	50 bps to 921.6 Kbps								
Software									
Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP, ARP, PPP, SLIP, RTelnet, RFC2217				ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP, Rtelnet, ARP, RFC2217				
Web Console	√	√	√	√	√	√	√	√	√
Serial Console	---	---	---	---	√	√	√	√	√
Telnet Console	√	√	√	√	√	√	√	√	√
Windows Utility	√	√	√	√	√	√	√	√	√
Windows Real COM Drivers	Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded								
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i								
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x								
Onsite Configuration									
Mini Screen with Push Buttons	√	√	√	√	√	√	√	√	√
Physical Characteristics									
Housing	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)
Weight	3400 g	3460 g	3440 g	3440 g	1760 g	1170 g	1770 g	1850 g	1710 g
Dimensions	440 x 45 x 198 mm				197 x 44 x 135.5 mm				
Environmental Limits									
Operating Temparture	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C
Power Requirements									
Input Voltage	100 to 240 VAC, 47 to 63 hz	100 to 240 VAC, 47 to 63 hz	100 to 240 VAC, 47 to 63 hz	100 to 240 VAC, 47 to 63 hz	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC
Power Consumption @ 12/24/48 VDC	---	---	---	---	611/300/140 mA	611/300/140 mA	615/300/156 mA	1066/510/200 mA	615/300/156 mA
Power Consumption @ 100/240 VAC	152/98 mA	158/102 mA	174/113 mA	164/110 mA	---	---	---	---	---
Regulatory Approvals									
EMC	CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A				CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A				
Safety	UL (UL60950-1), TÜV (EN60950-1)								
Marine	---	---	---	---	---	---	---	---	---
Medical	EN60601-1-2 Class B, EN55011	EN60601-1-2 Class B, EN55011	EN60601-1-2 Class B, EN55011	EN60601-1-2 Class B, EN55011	---	---	---	---	---
Reliability									
Buzzer, RTC, WDT	√	√	√	√	√	√	√	√	√
MTBF	91483 hrs	104767 hrs	87528 hrs	87528 hrs	163356 hrs	163356 hrs	163356 hrs	163356 hrs	163356 hrs
Warranty	5 years (see www.moxa.com/warranty)								

Industrial-grade Device Servers

	NPort® IA5150 NPort® IA5150-T	NPort® IA5150I NPort® IA5150I-T	NPort® IA5150-M-SC NPort® IA5150-M-SC-T	NPort® IA5150I-M-SC NPort® IA5150I-M-SC-T	NPort® IA5150-S-SC NPort® IA5150-S-SC-T	NPort® IA5150I-S-SC NPort® IA5150I-S-SC-T	NPort® IA5250 NPort® IA5250-T
Ethernet Interface							
10/100BaseT(X) Ports	2	2	---	---	---	---	2
100BaseFX Ports	---	---	1 (multi-mode)	1 (multi-mode)	1 (single-mode)	1 (single-mode)	---
Connector	RJ45	RJ45	SC	SC	SC	SC	RJ45
Magnetic Isolation Protection	1.5 KV	1.5 KV	---	---	---	---	1.5 KV
Serial Interface							
RS-232/422/485 Ports	1	1	1	1	1	1	2
Connector	DB9-M/TB	DB9-M/TB	DB9-M/TB	DB9-M/TB	DB9-M/TB	DB9-M/TB	DB9-M
15 KV ESD Protection	√	√	√	√	√	√	√
2 KV Isolation Protection	---	√	---	√	---	√	---
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						
Baudrate	110 bps to 230.4 Kbps						
Software							
Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, Rtelnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP						
Configuration Options	Web Console, Serial Console, Telnet Console, Windows Utility						
Windows Real COM Drivers	Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded						
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i						
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x						
Physical Characteristics							
Housing	Plastic (IP30)						
Weight	360 g						
Dimensions	29 x 89.2 x 118.5 mm						
Environmental Limits							
Operating Temparture	0 to 55°C or -40 to 75°C						
Operating Humidity	5 to 95% RH						
Storage Temperature	-40 to 85°C						
Power Requirements							
Input Voltage	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC
Power Consumption	360 mA @ 12 V, 195 mA @ 24 V	420 mA @ 12 V, 215 mA @ 24 V	500 mA @ 12 V, 250 mA @ 24 V	510 mA @ 12 V, 260 mA @ 24 V	470 mA @ 12 V, 210 mA @ 24 V	490 mA @ 12 V, 250 mA @ 24 V	440 mA @ 12 V, 200 mA @ 24 V
Regulatory Approvals							
EMC	CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A						
Safety	UL (UL60950-1), UL508, TÜV (EN60950-1)						
Hazardous Location	UL/cUL Class 1 Division 2 Groups A, B, C and D						
ATEX	Class I, Zone 2						
Marine	DNV						
EMS	EN61000-4-2 (ESD), Level 3; EN61000-4-3 (RS), Level 3; EN61000-4-4 (EFT), Level 4; EN61000-4-5 (Surge), Level 3; EN61000-4-6 (CS), Level 3; EN61000-4-8; EN61000-4-11; EN61000-4-12						
IEC	IEC60068-2-27 (Shock); IEC60068-2-32 (Freefall); IEC60068-2-6 (Vibration)						
Dust-proof	IP30	IP30	IP30	IP30	IP30	IP30	IP30
Reliability							
Buzzer, RTC, WDT	√	√	√	√	√	√	√
MTBF	183747 hrs	195614 hrs	183747 hrs	195614 hrs	183747 hrs	195614 hrs	194765 hrs
Warranty	5 years (see www.moxa.com/warranty)						

Embedded Device Servers

	MiiNePort E1 MiiNePort E1-T	NE-4110S	NE-4110A	NE-4120S	NE-4120A	NE-4100T	WE-2100T
Form Factor							
Type	Drop-in module	Ready-to-go stand-alone modules				26-pin dual-in-line package	Small metal housing
Dimensions	33.9 x 16.25 x 13.5 mm	57 × 40 mm	57 × 40 mm	57 × 40 mm	57 × 40 mm	45 × 36 mm	54 x 40 x 13.3 mm
Ethernet Interface							
10/100BaseT(X) Ports	1	1	1	1	1	1	1
Connector	RJ45	RJ45	RJ45	5-pin pin header		26-pin dual-in-line	44-pin dual-in-line
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
WLAN Interface							
Standard Compliance	---	---	---	---	---	---	IEEE 802.11a/b/g
Radio Frequency Type	---	---	---	---	---	---	DSSS, CCK, DFDM
Wireless Security	---	---	---	---	---	---	SEP, SPA, SPA2, 802.11i
Network Modes	---	---	---	---	---	---	Infrastructure (a/b/g), Ad Hoc (b/g)
Serial Interface							
TTL Ports	1 (data port)	1 (console port)				2 (1 data port, 1 console port)	
RS-232 Ports	---	1 (data port)	---	1 (data port)	---	---	---
RS-232/422 Ports	---	---	1 (data port)	---	1 (data port)	---	---
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						
Baudrate	50 bps to 230.4 Kbps* (supports non-standard baudrates)	110 bps to 230.4 Kbps					50 bps to 921.6 Kbps
Programmable GPIO Pins	3	4	4	4	4	4	---
Software							
Network Protocols	ICMP, IP, TCP, UDP, DHCP, Telnet, HTTP, SNMP V1/V2c, SMTP ARP, TFTP, Auto IP, BOOTP	ARP					DNS, SNTP, SSH, HTTPS
Configuration Options	Web/Serial/Telnet Console, Windows Utility						
Serial Command Mode	√	---	---	---	---	---	√
Windows Real COM Drivers	Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded						
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i						
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x						
Operation Modes	TCP Server, TCP Client, UDP, Real COM mode, Modem Mode, RFC2217	Real COM, TCP Server, TCP Client, UDP					Real COM, TCP Server, TCP Client, UDP, RFC2217
Environmental Limits							
Operating Temparture	0 to 55°C or -40 to 85°C	0 to 55°C or -40 to 75°C					0 to 55°C
Operating Humidity	5 to 95% RH						5 to 95% RH
Storage Temperature	-40 to 85°C	-20 to 70°C					-20 to 70°C
Power Requirements							
Input Voltage	3.3 VDC (±5%)	5 VDC (±5%)	5 VDC (±5%)	5 VDC (±5%)	5 VDC (±5%)	5 VDC (±5%)	3.3 VDC (±5%)
Power Consumption	160 mA @ 3.3 VDC max.	290 mA @ 5 VDC max.					540 mA (at full speed)
Regulatory Approvals							
EMC	EN55022:1998, Class B (radiated & conducted emissions); EN55024:1998 (direct & indirect ESD, electrical fast-transient/ burst immunity, power frequency magnetic field immunity)	CE (EN55022 Class A), FCC Part 15 Subpart B Class A					CE (EN55022 and EN55024 Class A, ETSI EN 301 489-17, ETSI EN 301 489-1)
Reliability							
Watchdog Timer	√	√	√	√	√	√	√
MTBF	---	290276 hrs	289573 hrs	289573 hrs	289573 hrs	288173 hrs	505288 hrs
Warranty	5 years (see www.moxa.com/warranty)						

* Baudrates up to 921.6 Kbps available by request

Introduction to Serial Device Servers

Device server technology makes device networking easy

Device servers are used to connect serial devices to Ethernet LANs, and are able to transmit data both to and from the serial device. Moxa's NPort® line of device servers are essentially pre-programmed computers that have a real-time OS and built-in TCP/IP protocol suite that allows you to access, manage, and configure remote facilities and equipment from anywhere in the world over the Internet.

No Restrictions on Host Type or Operating System

Any host computer that supports the TCP/IP protocol can access the NPort®'s serial ports, eliminating the need for special-purpose drivers. In addition, you will not be held back by your PC's limited number of serial bus slots.

Real COM/TTY Drivers for Existing Software

NPort® device servers also come with Real COM/TTY drivers for accessing devices through a "virtual" COM or TTY port.

Serial Device Server Selection Table

Number of Serial Ports	General-purpose Device Servers			Device Servers with Optical Isolation	Device Servers for Wide Temperature Applications
	RS-232	RS-422/485	RS-232/422/485		
1	NPort® 5110	NPort® 5130	NPort® DE-211 NPort® DE-311 NPort® 5150 NPort® IA5150 NPort® IA5150-M-SC NPort® IA5150-S-SC	NPort® IA5150I NPort® IA5150I-M-SC NPort® IA5150I-S-SC	NPort® 5110-T NPort® IA5150-T NPort® IA5150I-T NPort® IA5150-M-SC-T NPort® IA5150-S-SC-T NPort® IA5150I-M-SC-T NPort® IA5150I-S-SC-T
2	NPort® 5210	NPort® 5232	NPort® 5230 NPort® IA5250	NPort® 5232I	NPort® 5210-T NPort® 5230-T NPort® 5232-T NPort® IA5250-T NPort® 5232I-T
4	NPort® 5410	NPort® 5430	NPort® 5450	NPort® 5430I NPort® 5450I	---
8	NPort® 5610-8 NPort® 5610-8-48V NPort® 5610-8-DT NPort® 5610-8-DT-J	NPort® 5630-8	NPort® 5650-8 NPort® 5650-8-M-SC NPort® 5650-8-S-SC NPort® 5650-8-DT NPort® 5650-8-DT-J	NPort® 5650I-8-DT	---
16	NPort® 5610-16 NPort® 5610-16-48V	NPort® 5630-16	NPort® 5650-16 NPort® 5650-16-M-SC NPort® 5650-16-S-SC	---	---

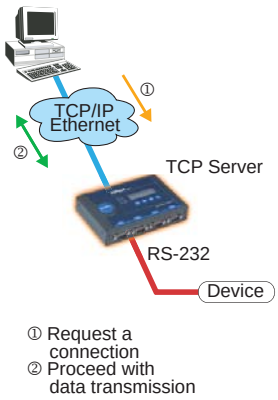
Note: See Chapter 7, "Terminal Servers," for information about our NPort® 6000 series and CN2600 series of serial-to-Ethernet terminal servers.

NPort® Provides a Choice of Operation Modes

Socket Modes

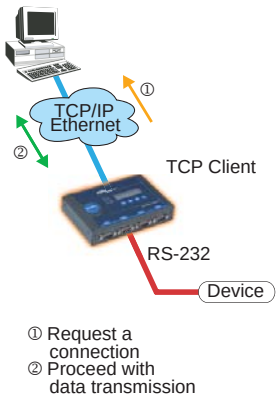
TCP Server Mode

When the NPort® is configured for TCP Server Mode, each serial port is assigned a unique IP:Port combination on the TCP/IP network, and the NPort® waits passively for a host computer to establish a connection with the attached serial device. TCP Server mode supports up to 4 simultaneous connections, allowing multiple hosts to collect data from the same serial device at the same time.



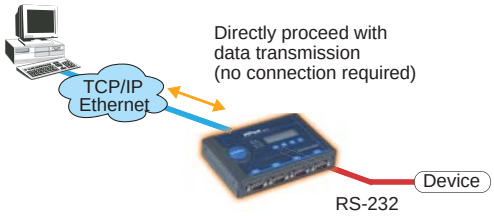
TCP Client Mode

When the NPort® is configured for TCP Client mode, the NPort® establishes a TCP connection between the attached device and a specified host computer when data is received from the attached device. After the data has been transferred, the NPort® automatically closes the connection. TCP Client mode supports up to 4 simultaneous connections, allowing multiple hosts to collect data from the same serial device at the same time.



UDP Mode

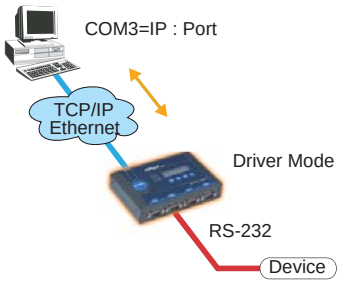
UDP mode supports up to 4 IP groups. In UDP mode, the attached device can exchange data simultaneously with up to 4 network destinations, and at a higher speed than when using TCP. This mode is ideal for message display applications.



Driver Modes

Real COM Mode

When configured for Real COM mode, each serial port is assigned an IP:Port combination that is mapped to a host computer's local COM or TTY port using Moxa's NPort® drivers. Legacy applications can access the attached serial device using the host's local COM or TTY port, without the need to modify serial COM software to account for network protocols.



RFC2217 Mode

When the NPort® is configured for RFC2217 mode, each serial port is assigned an IP:Port combination that is mapped by RFC2217-compliant drivers to a virtual COM port. The RFC2217 protocol defines general COM port control options based on the Telnet protocol. The NPort® supports any third party driver that is RFC2217-compliant.

Other Modes

Pair Connection Mode

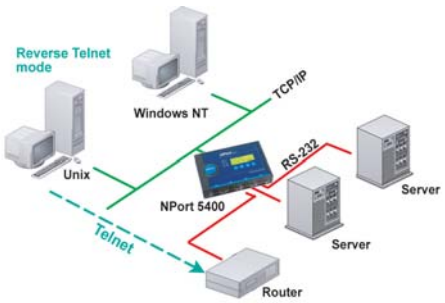
When configured for Pair Connection mode, two NPort® device servers can be used to transmit RS-232 signals over Ethernet, and in this way overcome the 15-meter limitation imposed by the RS-232 standard. One NPort® connects to the PC's COM port, and the other NPort® connects to the serial device. The two NPort® device servers are either connected to each other with a cross-over Ethernet cable, or are each connected to an Ethernet LAN or WAN. Both data and modem control signals can be exchanged between the PC and device over Ethernet, but DCD signals are not supported.

Ethernet Modem Mode

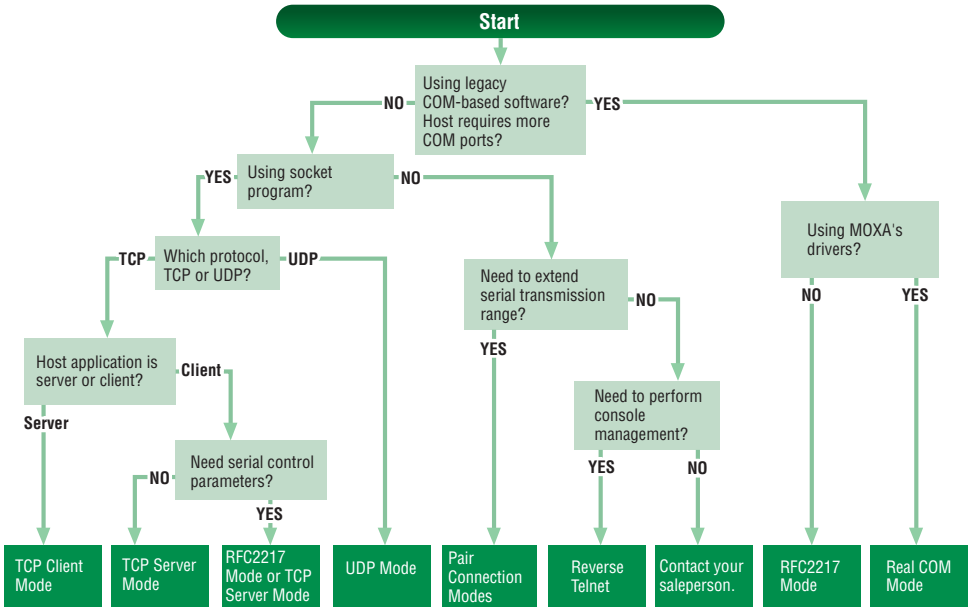
When configured for Ethernet Modem mode, the serial port on the NPort® behaves as if it were attached to a modem, except that data is transmitted over a network instead of over phone lines. Ethernet Modem Mode enables network access for legacy software that was originally designed to transmit data by modem.

Reverse Telnet Mode

When configured for Reverse Telnet mode, the NPort® device server's serial ports provide a connection to a server, with connections initiated by a host over Ethernet. This is similar to TCP server mode, except that Reverse Telnet mode also provides Telnet-style CR/LF conversion. Reverse Telnet mode can be used for remote console management, in which the NPort® is used to enable network access to the serial console ports of different equipment, such as routers, switches, and servers.



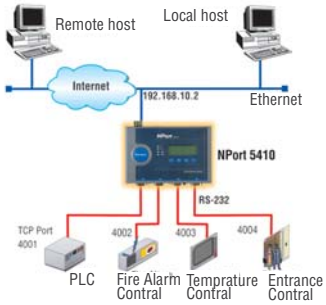
Mode Selection Flowchart



Typical Applications

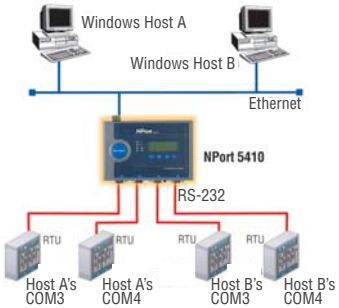
Use only one IP address to control multiple serial devices over the network

Automatic or remote data acquisition can be accomplished with NPort® 5000 device servers, which only require one IP address to connect up to 16 serial devices to an Ethernet network. By specifying the IP address and TCP port number, a host computer can access the serial devices connected to the NPort® 5000 from over the network. In the example shown here, data from the NPort® 5410's first serial port can be obtained by connecting to 192.168.10.2:4001.



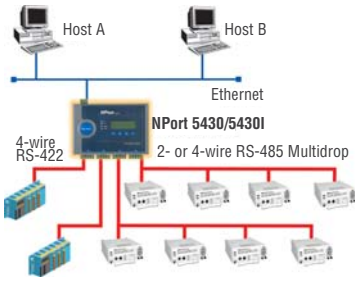
Use server sharing from a central location for greater device management flexibility

Serial devices connected to the NPort® 5000 device server can communicate over the network with more than one host computer.



Centralize RS-422/485 serial device control

Up to 31 RS-485 devices, or 9 RS-422 devices, can be connected to each serial port on the NPort® 5000 device server. The web console or Windows utility can be used to configure RS-422 or RS-485 operation for each port, with both 2-wire and 4-wire RS-485 supported.

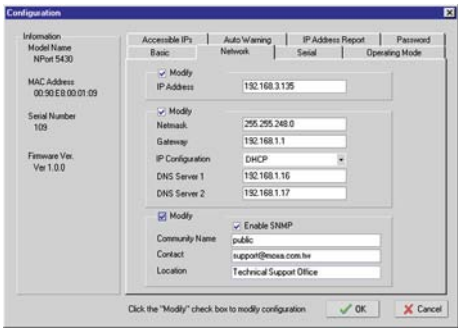


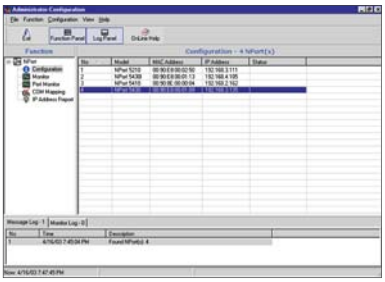
NPort® Administrator Makes Installation Easy

NPort® Administrator is designed to make it easy to install and configure NPort® 5000 device servers over the network. Five groups of functions are supported to allow off-line COM mapping, device monitoring, and searching for NPort® device severs over the network. Both NPort® Administrator and an IP Serial Library are bundled with NPort®'s integrated software suite, giving you everything you need to manage, monitor, and reconfigure your NPort® from remote locations.

Configuration Features

- Broadcast search over the LAN for NPort® device servers
- Select and configure the NPort®'s operation mode
- Upgrade the NPort®'s firmware
- Export and import the NPort's configurations
- Monitor the NPort's status
- Auto IP report





Web Console Provides Exceptional Convenience

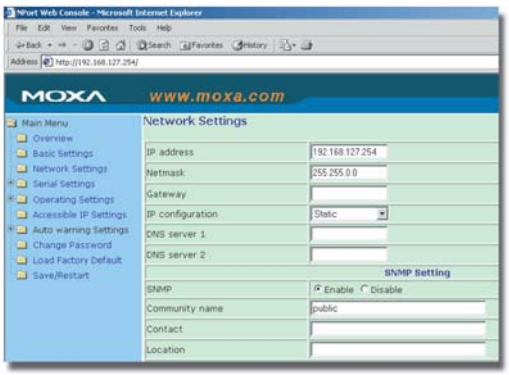
NPort® 5000 device servers are easily configured over the network with the web console or Telnet console.

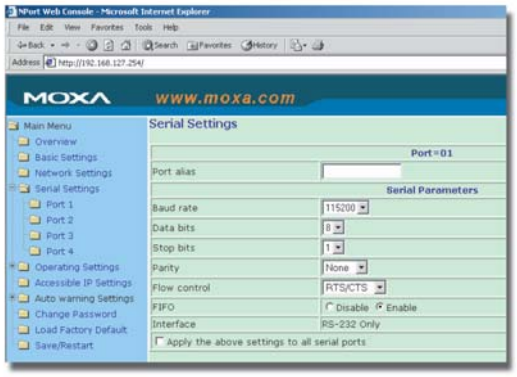
Network Settings

- IP, netmask, gateway
- Static IP, DHCP, BOOTP
- DNS server

Serial Settings

- Baudrate
- Data bits, stop bit, parity
- Flow control
- Communication interface





Operation Settings

- Operation mode
- TCP alive check time
- Inactivity time
- Delimiter
- Force transmit
- Packet length
- Allow driver control
- Maximum connection

IP Serial Library

What is IP Serial Library?

The IP Serial Library is a collection of Windows functions for NPort® 5000 device servers. Serial command sets and common subroutines are provided. The purpose of the library is to help reduce complexity and increase efficiency when programming serial communication applications that run over a TCP/IP network. For example, Telnet is limited because it can only transfer data but cannot monitor or configure serial line parameters. The IP Serial Library can be used to add new functionality to your Telnet sessions.

Use IP Serial Library for easier socket-based serial COM programming

For programmers who are familiar with serial communication, the IP Serial Library provides well-designed function calls that have the same style as Moxa's PComm Library.

The IP Serial Library is amazingly simple and easy to understand. By including the library in your VB, C, or Delphi programming environment, you will be able to develop TCP/IP applications that can control serial communication parameters.

When Real COM mode is used, the NPort® serial device servers use two TCP ports for communication between an attached device and a host computer's Real COM driver. The two ports, a data port and a command port, provide pure data transfer without requiring encoding and decoding. With the IP Serial Library, only one port is used to communicate with a user's application, and no encoding or decoding is required.

IP Serial Library Example

```
char NPortip="192.168.1.10";
char buffer[255];int port = 1;        /*data buffer, 255 chars */
int portid;        /*port handle*/
nsio_init();        /*initialize IP Serial Library*/
portid = nsio_open(NPortip, port);        /*1st port, NPort IP=192.168.1.10 */
nsio_ioctl(portid, B9600, (BIT_8 | STOP_1 | P_NONE) );        /*set 9600, N81 */
sleep(1000);        /* wait for 1000 ms for data */
nsio_read(port, buffer, 200);        /* read 200 bytes from port 1 */
nsio_close(portid);        /* clost this serial port */
nsio_end();        /* close IP Serial Library */
```

IP Serial API Function List

Server Control	Port Control	Input/Output Data	Port Status Inquiry	Miscellaneous
nsio_init	nsio_open	nsio_read	nsio_lstatus	nsio_break
nsio_end	nsio_close	nsio_SetReadTimeouts	nsio_data_status	nsio_break_on
nsio_resetserver	nsio_ioctl	nsio_write	---	nsio_break_off
nsio_checkalive	nsio_fl owctrl	nsio_SetWriteTimeouts	---	nsio_breakcount
---	nsio_DTR	---	---	---
---	nsio_RTS	---	---	---
---	nsio_lctrl	---	---	---
---	nsio_baud	---	---	---
---	nsio_resetport	---	---	---

CASE STUDY

Power Generation

Remote Monitoring and Control of a Windmill Generator

As concerns over global warming continue to grow, green technologies are becoming increasingly popular. Wind turbine companies provide an excellent alternative to burning fossil fuels by harnessing kinetic energy from the wind and converting it into electricity. A typical wind farm may include over 80 wind turbines, so maintaining efficient and reliable networks to manage and control these installations is imperative.

Each wind turbine includes a generator and a variety of serial components such as a water cooler, high voltage transformer, ultrasonic wind sensors, yaw gear, blade bearing, pitch cylinder, and hub controller. All of these components are controlled by a PLC and communicate with the host on the ground. Due to the total integration of these devices into an Ethernet network, one of our customers in the wind turbine industry needed a serial-to-Ethernet solution that can operate reliably for years without interruption.

Application Requirements

- Must be able to connect with many serial devices, with total integration of the devices into an Ethernet network.
- The system must exhibit high reliability and performance, and be easy to maintain.

Why Moxa?

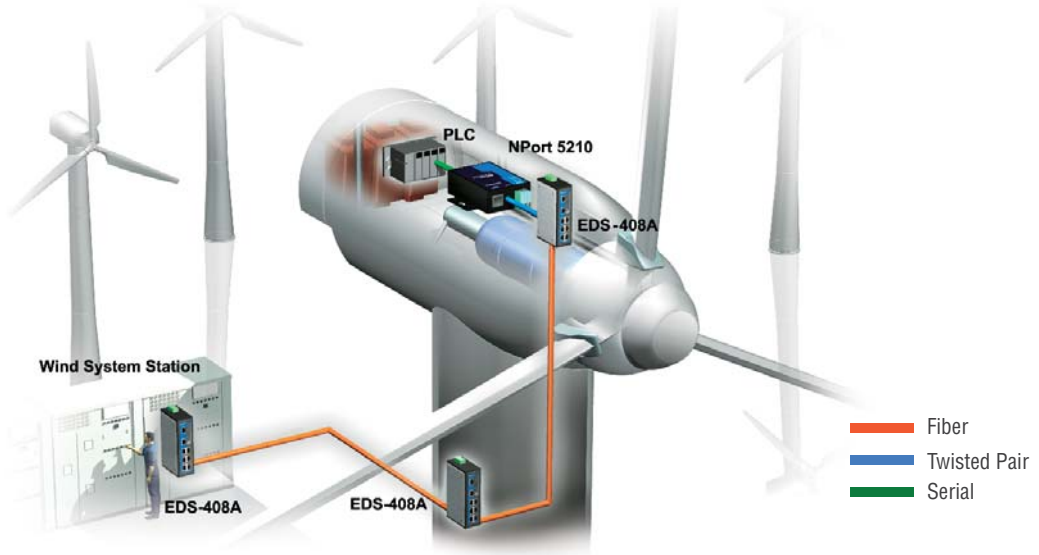
- Long MTBF with high reliability and effective system maintenance
- Small size for easy configuration
- High performance serial-to-Ethernet solution

Key Products

- Small size for easy installation
- Versatile socket operation modes, including TCP Server, TCP Client, and UDP
- Easy-to-use Windows utility for configuring multiple device servers
- Supports 10/100M Ethernet
- Patented ADDC® (Automatic Data Direction Control) for 2-wire and 4-wire RS-485
- Built-in 15 KV ESD protection for all serial signals
- SNMP MIB-II for network management

NPort® 5130

Application Topology



CASE STUDY

Automatic Meter Reading

Automatic Meter Reading for a Centralized Power Meter Application

Automated meter reading (AMR) technology automatically collects data from devices such as electricity, water, and gas meters, and transfers that data to a central database for billing or analysis.

A particular tower in the Middle East has a large number of devices and communication media on each floor. In addition, the control room needs to gather and monitor a great deal of information, including security alarm signals, air conditioner controls, signal controls, and power meters. However, there was insufficient space to install serial communication wiring to connect the power meters to the control room. Since an Ethernet network was already installed, the client wanted a solution that satisfied the following requirements:

- Data transmission from each group of power meters to the control room
- Additional wiring space must be kept to a minimum
- Only a limited number of public IP addresses could be used for the entire building

Application Requirements

- Use the existing Ethernet infrastructure to transmit power meter data
- Use NPort® 5130 device servers to connect power meters over RS-485

Why Moxa?

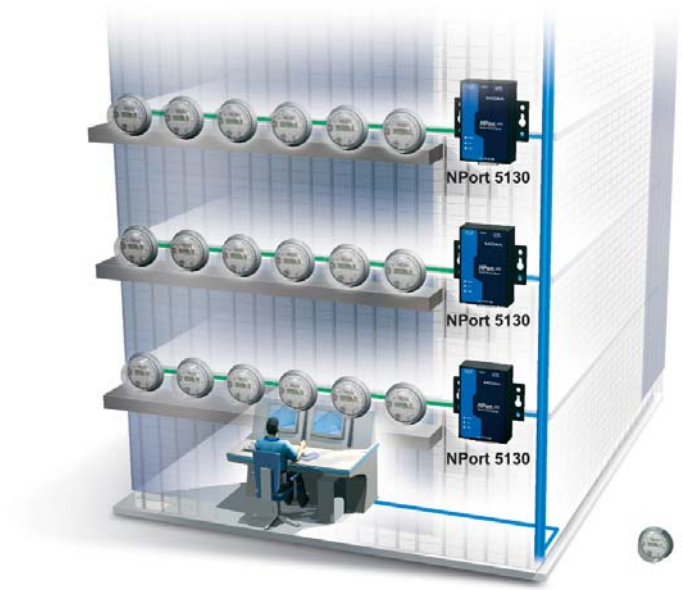
- The NPort® 5130 offers an effective serial-to-Ethernet solution for data transmission
- Do not need to spend additional effort and cost for wiring

Key Products

NPort® 5130

- Real COM/TTY drivers for Windows and Linux
- Standard TCP/IP interface and versatile operation modes
- Easy-to-use Windows utility for configuring multiple device servers
- Built-in 15 KV ESD protection for all serial signals
- SNMP MIB-II for network management
- Configure by Telnet or web browser
- Adjustable termination resistor for RS-485 ports

Application Topology



NPort® S8000 Series

Combo switch / serial device server

NPort S8455I-MM-SC

> **4-port RS-232/422/RS-485 serial device server**
- Serial QoS for configuring serial data transmission priority
- 2 KV (DC) isolation protection for each serial port
- Adjustable pull high/low resistor for RS-485 ports

> **5-port managed Ethernet switch built in**
- Two fiber Ethernet ports and three Ethernet ports
- Ethernet redundancy with Turbo Ring® (recovery time < 20 ms) or RSTP/STP (IEEE 802.1w/D) supported
- QoS, IGMP-snooping/GMRP, VLAN, LACP, SNMPv1/v2c/v3, RMON supported
- Surge protection for serial, power, and Ethernet

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The first model available from the NPort® S8000 series is the NPort® S8455I-MM-SC, which combines an industrial device server with a full-function managed Ethernet switch. The NPort® S8455I-MM-SC integrates 2 fiber ports, 3 Ethernet ports, and 4 RS-232/422/485 serial ports, allowing you to save space in your cabinet, reduce your overall power consumption, and reduce your costs since you will not need to purchase separate switch and serial device server products.

Supports all NPort® 5000 Series Device Server Functions

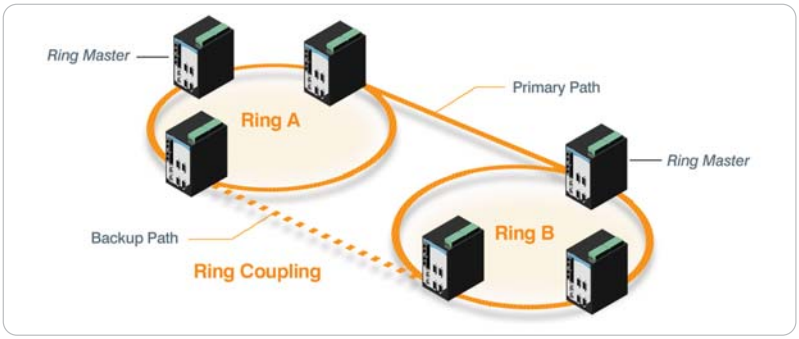
The NPort® S8455I-MM-SC supports the complete array of NPort® 5000 series device server functions. Network your existing serial devices by connecting up to 4 serial devices through each of the 5 Ethernet ports, with only basic configuration required. Data transmission between the serial and Ethernet interfaces is bi-directional.

Full-function Managed Ethernet Switch

The NPort® S8455I-MM-SC has a built-in full-function managed Ethernet switch that supports QoS, IGMP-snooping/GMRP, VLAN, Port Trunking, SNMPv1/v2c/v3, and IEEE 802.1X, allowing you to handle virtually any kind of application. Ethernet redundancy, which is used to increase the reliability and availability of your industrial Ethernet network, is provided by Moxa's own Turbo Ring® technology (recovery time < 20 ms) or RSTP/STP (IEEE 802.1w/D).

Couple Several Turbo Rings for Distributed Applications

For some systems, it may not be convenient to connect all devices in the system to create one BIG redundant ring, since some devices could be located at a remote site. The NPort® S8455I-MM-SC supports Turbo Ring's "Ring Coupling" function, which allows you to separate distributed devices into different smaller redundant rings, without a control line, and in such a way that the smaller rings will still be able to communicate with each other.



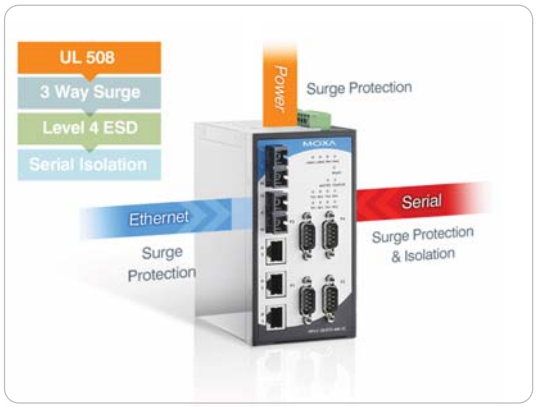
Rugged Design with Complete Protection

> **UL508 safety**
To meet customers' critical application requirements, the NPort® S8455I-MM-SC has been certified to meet the UL 508 national and international standard. The UL 508 standard covers the safety requirements for industrial control equipment.

> **3-way surge protection**
The NPort® S8455I-MM-SC is equipped with a surge protector for power, Ethernet interface, and serial interface for protection against voltage spikes.

> **Level 4 ESD**
The NPort® S8455I-MM-SC supports high level, 8/15 KV, ESD protection to avoid damage from static electricity.

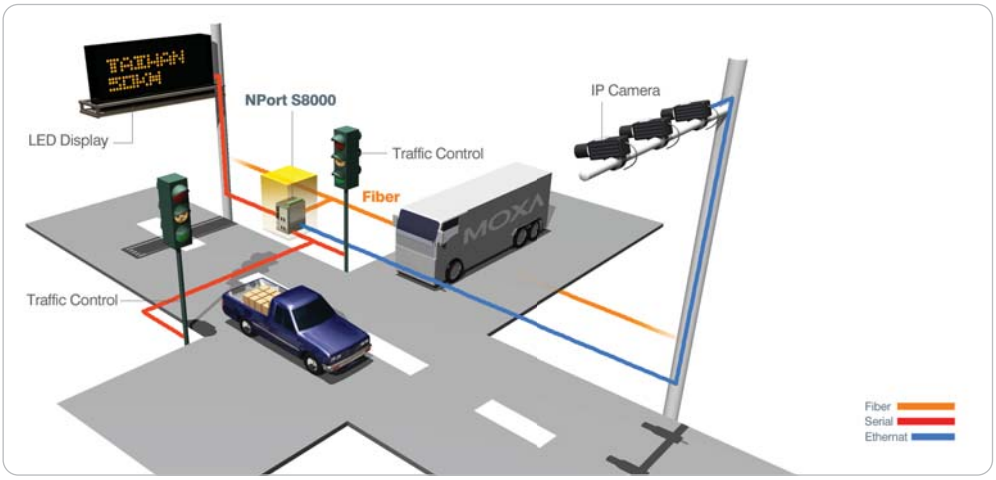
> **2 KV Serial Isolation**
Each serial port is protected by 2 KV of isolation against harmful currents from high voltages caused by a difference in ground potential between points in a communications system.



Typical Applications

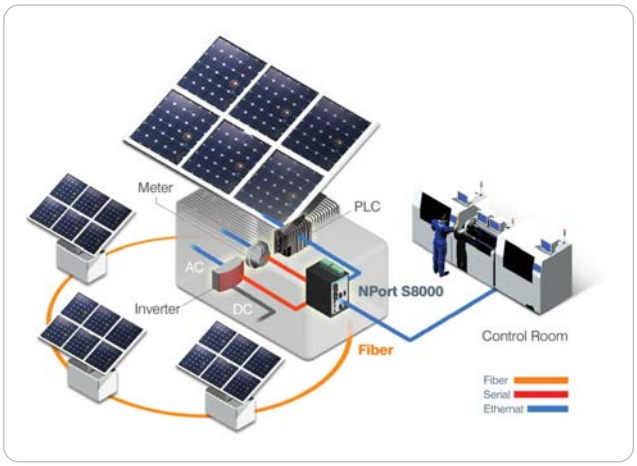
Roadway Traffic Monitoring and Control

Intelligent transportation systems (ITS) are playing a major role in modern transportation construction, with ITS technology applied to roadway traffic control systems. In general, ITS involves integrating communication, control, and electronics technologies, and is used to monitor and manage traffic flow, reduce congestion, provide alternative routes to travelers, and enhance productivity to save lives, time, and money. Traffic monitoring and control systems are usually housed in a small cabinet located by the roadside or at an intersection. Such systems usually include a camera for monitoring traffic, a traffic light control system, as well as other devices. The NPort S8455I-MM-SC is the best choice for traffic monitoring and control applications, since the compact size and all-in-one switch/device-server design saves a significant amount of space in a small cabinet.

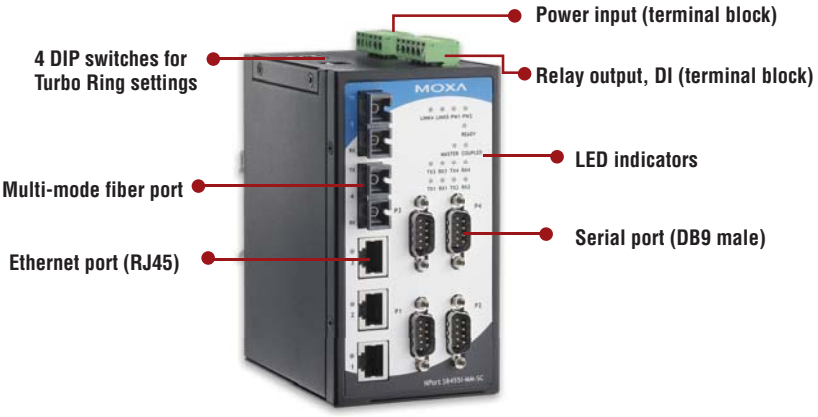


Solar Power Station

All solar power stations include three major devices—a power inverter, a PLC, and meters. The power inverter converts the energy generated by the plant into the power that is transmitted to end-users. The PLC controls the sun tracking system of the base. These devices are often serial devices, although some may be Ethernet-ready. Now you can connect all of these Ethernet and serial devices to the control center easily and economically with one With the NPort® S8455I-MM-SC. The Ethernet redundancy function and ring structure increase the reliability and availability of the system. The NPort® S8000 series is definitely the best solution for this type of solar power system.



Appearance



General Specifications

Port Summary

Serial Ports: 4 RS-232/422/485 ports

Ethernet Switch Ports: 3 RJ45 copper ports, 2 multi-mode fiber ports

Console Ports: 1 (8-pin RJ45 connector)

LED Indicators: PWR1, PWR2, READY, MASTER, COUPLER, LINK4, LINK5

Physical Characteristics

Housing: Metal

Weight: 995 g

Dimensions: 73.1 x 134 x 105 mm (2.88 x 5.27 x 4.13 in)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption: 935mA @ 12 V, 470 mA @ 24 V

Regulatory Approvals

EMC: FCC Class A, CE Class A

Safety: UL-508

EMS:
IEC 61000-4-2, Level 4 (ESD)
IEC 61000-4-4, Level 4 (EFT)
IEC 61000-4-5 for serial port, Level 1 (Surge)
IEC 61000-4-5 for LAN port, Level 2 (Surge)
IEC 61000-4-5 for Power Line, Level 3 (Surge)

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Device Server Specifications

Serial Interface

Number of Ports: 4

Serial Standards: RS-232/422/485

Connectors: DB9 male

Serial Line Protection:
15 KV ESD protection for all signals
2 KV isolation protection

RS-485 Data Direction Control: ADDC® (automatic data direction control)

Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ

Terminator for RS-485: 55 Ω, 120 Ω

Console Port: Dedicated RS-232 console port (8-pin RJ45)

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 and XON/XOFF

Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: Tx+, Tx-, Rx+, Rx-, GND

RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND

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

Software

Configuration Options: Web Console, Telnet Console, Serial Console, Windows Search Utility

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Operation Modes: Real COM, TCP Server, TCP Client, UDP, RFC2217

Management: SNMP MIB-II

IP Routing: Static, RIP-I, RIP-II

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

Ethernet Switch Specifications

Ethernet Interface

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Network Protocols: ICMP, IP, TCP, UDP, ARP, Telnet, DNS, HTTP, SMTP, SNTP, IGMPv1/v2 device, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 82, BootP, TFTP, SNTP, SMTP, RARP, GMRP, LACP, RMON

MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Flow Control: IEEE 802.3x flow control, back pressure flow control interface

Optical Fiber Interface

Type: Multi-mode

Distance: 0 to 2 km, 1310 nm (62.5/125 µm, 500 MHz*km)

Min. TX Output: -20 dBm

Max. TX Output: -14 dBm

Sensitivity: -34 to -30 dBm

Switch Properties

Priority Queues: 4

Max. Number of Available VLANs: 64

VLAN ID Range: VID 1 to 4094

IGMP Groups: 256

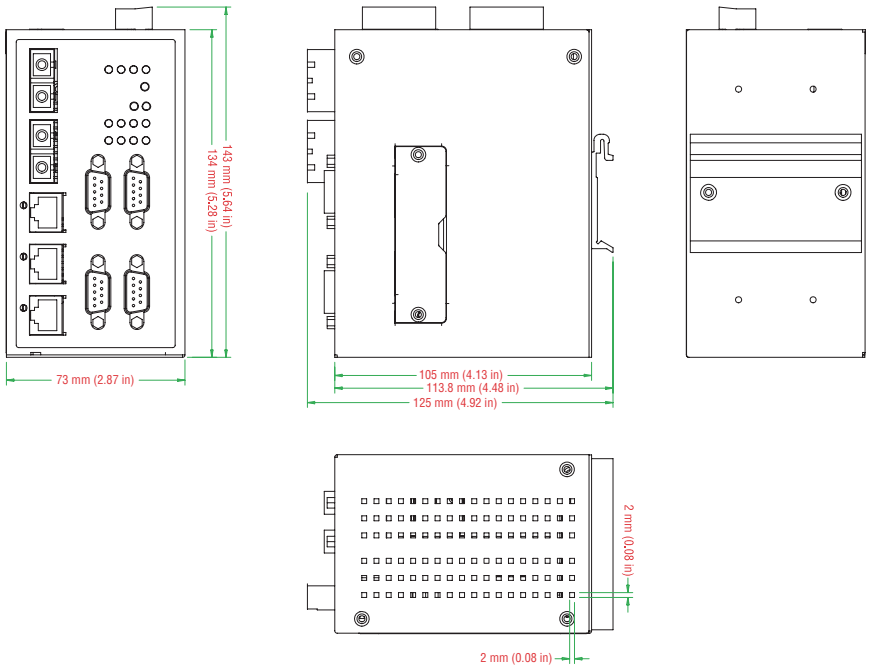
Switch Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection

DIP Switches: Turbo Ring, Master, Coupler, Reserve

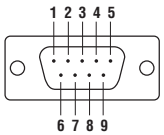
Alarm Contact: 2 relay outputs with current carrying capacity of 1A @ 24 VDC

Dimensions



Pin Assignment

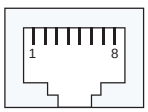
DB9 male connector



Serial Port (DB9 male connector)

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

8-pin RJ45 connector



Console Port (RJ45)

PIN	RS-232
1	DSR
2	RTS
3	GND
4	TxD
5	RxD
6	DCD
7	CTS
8	RTS

Ethernet Port (RJ45)

PIN	Signal
1	RXD+
2	RXD-
3	TXD+
4	---
5	---
6	TXD-
7	
8	

Ordering Information

Available Models

NPort S8455I-MM-SC: 5-port Ethernet switch and 4-port serial device server combo

Package Checklist

- NPort S8455I-MM-SC
- Two power jack to TB power cables
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

NPort® 5100 Series

1-port RS-232/422/485 serial device servers

- Real COM/TTY drivers for Windows and Linux
- Standard TCP/IP interface and versatile operation modes
- Easy-to-use Windows utility for configuring multiple device servers
- Built-in 15 KV ESD protection for all serial signals
- SNMP MIB-II for network management
- Configure by Telnet or web browser
- Adjustable termination resistor for RS-485 ports

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

NPort® 5100 device servers are designed to make serial devices network-ready in an instant. The small size of the servers makes them ideal for connecting devices such as card readers and payment terminals to an IP-based Ethernet LAN. Use the NPort® 5100 device servers to give your PC software direct access to serial devices from anywhere on the network.

Most Cost-effective Serial-to-Ethernet Solution

Using serial device servers to connect legacy serial devices to Ethernet is now commonplace, and users expect device servers to be cost-effective and to provide a broad selection of useful functions. With their full support of Microsoft and Linux operating systems and solid 5-year warranty, the NPort® 5100 series device servers provide the best choice for serial-to-Ethernet converters.

Standard TCP/IP Interface and Broad Choice of Operation Modes

The NPort® 5100 device servers can be configured for TCP Server, TCP Client, UDP Server/Client, Pair Connection, or Ethernet Modem mode, ensuring compatibility with software based on a standard network API (e.g., Winsock or BSD Sockets).

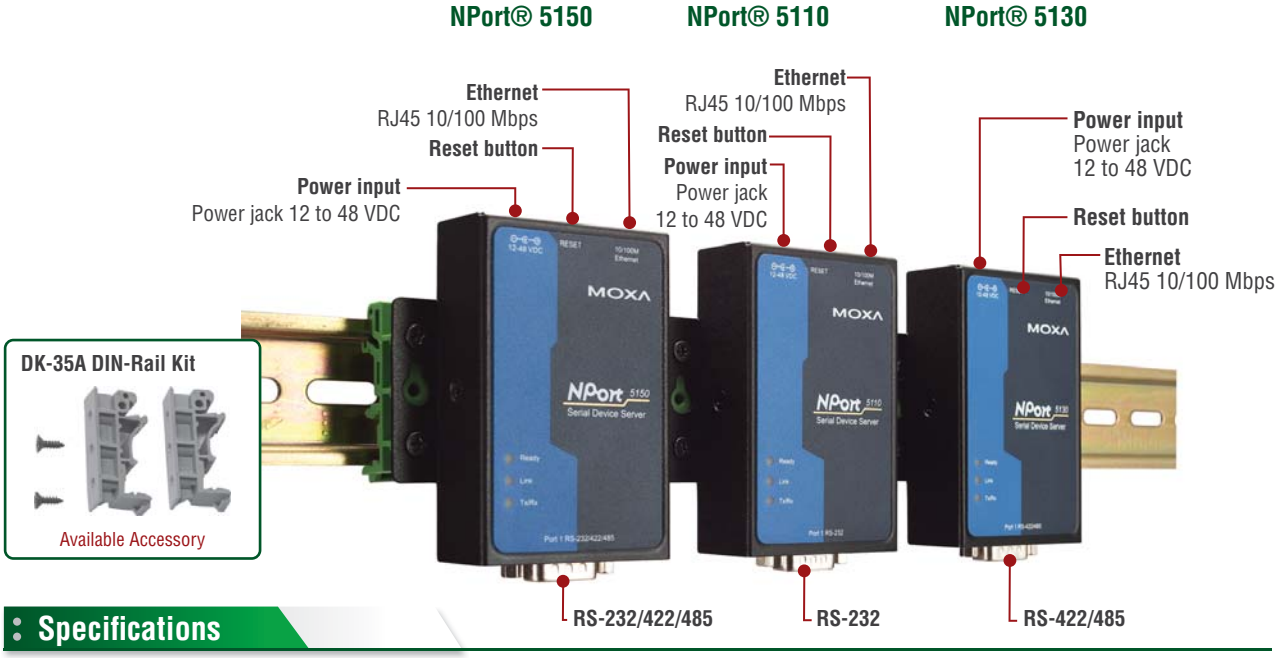
Real COM/TTY Drivers for Existing Software

The Real COM/TTY drivers provided with the NPort® 5100 device servers allow you to continue using software designed for communicating through COM/TTY ports. Installation and configuration is painless, and allows your serial devices and PC to communicate seamlessly over a TCP/IP network. Using Moxa's Real COM/TTY drivers is an excellent way to preserve your software investment, while still allowing you to enjoy the benefits of networking your serial devices.

Easy to Troubleshoot

NPort® 5100 device servers support SNMP V2, which can be used to monitor all units over Ethernet. Each unit can be configured to send trap messages automatically to the SNMP manager when user-defined errors are encountered. For users who do not use SNMP manager, an e-mail alert can be sent instead. Users can define the trigger for the alerts using Moxa's Windows utility, or the web console. For example, alerts can be triggered by a warm start, a cold start, or a change in password.

Appearance



Specifications

Ethernet Interface

Number of Ports: 1

Speed: 10/100 Mbps, auto MDI/MDIX

Connector: 8-pin RJ45

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Number of Ports: 1

Serial Standards:
NPort® 5110: RS-232
NPort® 5130: RS-422/485
NPort® 5150: RS-232/422/485

Connector: DB9 male

Serial Line Protection: 15 KV ESD protection for all signals

RS-485 Data Direction Control: ADDC® (automatic data direction control)

Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ

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 and DTR/DSR (RS-232 only), XON/XOFF

Baudrate:
NPort® 5110: 110 bps to 230.4 Kbps
NPort® 5130/5150: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: Tx+, Tx-, Rx+, Rx-, GND

RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND

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

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP

Configuration Options: Web Console, Serial Console (NPort 5110/5150 only), Telnet Console, Windows Utility

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Physical Characteristics

Housing: Metal

Weight: 340 g

Dimensions:
Without ears: 52 x 80 x 22 mm (2.05 x 3.15 x 0.87 in)
With ears: 75.2 x 80 x 22 mm (2.96 x 3.15 x 0.87 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 85°C (-4 to 185°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption:
NPort® 5110: 128.7 mA @ 12 V, 72 mA @ 24 V
NPort® 5130/5150: 200 mA @ 12 V, 106 mA @ 24 V

Regulatory Approvals

EMC: CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A

Safety: UL (UL60950-1), TÜV (EN60950-1)

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (meantime between failures):
NPort® 5110: 279122 hrs
NPort® 5130: 246505 hrs
NPort® 5150: 246034 hrs

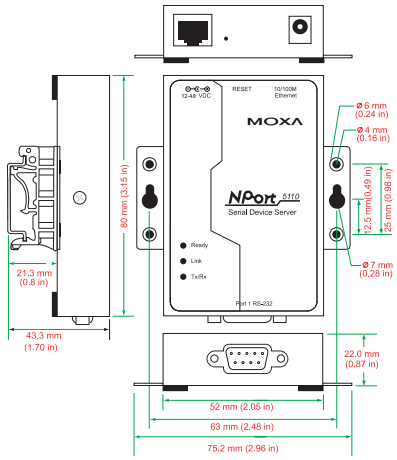
Warranty

Warranty Period: 5 years

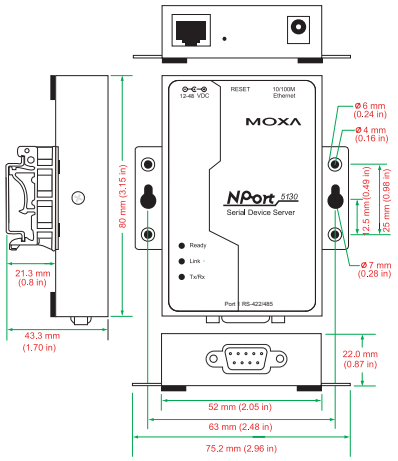
Details: See www.moxa.com/warranty

Dimensions

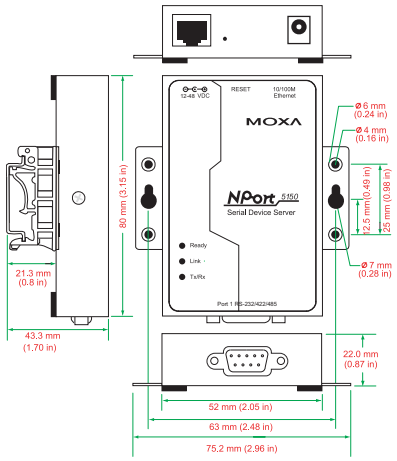
NPort® 5110



NPort® 5130

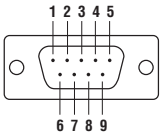


NPort® 5150



Pin Assignment

DB9 male connector



NPort® 5110 (RS-232)

PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

NPort® 5130 (RS-422/485)

PIN	RS-422/485-4w	RS-485-2w
1	TxD-(A)	–
2	TxD+(B)	–
3	RxD+(B)	Data+(B)
4	RxD-(A)	Data-(A)
5	GND	GND
6	–	–
7	–	–
8	–	–

NPort® 5150 (RS-232/422/485)

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

Ordering Information

Available Models

NPort® 5110: 1-port RS-232 device server, 0 to 55°C operating temperature
NPort® 5130: 1-port RS-422/485 device server, 0 to 55°C operating temperature
NPort® 5150: 1-port RS-232/422/485 device server, 0 to 55°C operating temperature
NPort® 5110-T: 1-port RS-232 device server, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DK-35A: Mounting Kit for 35-mm DIN-Rail

Package Checklist

- NPort® 5100 series device server
- Power Adaptor (only for non-T models)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

NPort® DE-211/311

1-port RS-232/422/485 serial device servers

NPort® DE-311

NPort® DE-211

- 3-in-1 serial port: RS-232, RS-422, or RS-485
- Versatile operation modes, including TCP Server, TCP Client, UDP, Ethernet Modem, and Pair Connection
- Real COM/TTY drivers for Windows and Linux
- 10M and 100M Ethernet speeds detected automatically
- 2-wire RS-485 with patented Automatic Data Direction Control (ADDC®)
- Built-in 15 KV ESD protection for all serial signals

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The NPort® DE-211 and DE-311 are 1-port serial device servers that support RS-232, RS-422, 4-wire RS-485, and 2-wire RS-485. The DE-211 supports 10 Mbps Ethernet connections and has a DB25 female connector for the serial port. The DE-311 supports 10/100 Mbps Ethernet connections and has a DB9 female connector for the serial port.

Both device servers are ideal for applications that involve information display boards, PLCs, flow meters, gas meters, CNC machines, and biometric identification card readers.

Specifications

Ethernet Interface

Number of Ports: 1

Speed:
NPort® DE-211: 10 Mbps, auto MDI/MDIX
NPort® DE-311: 10/100 Mbps, auto MDI/MDIX

Connector: 8-pin RJ45

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Number of Ports: 1

Serial Standards: RS-232/422/485 (selectable by DIP Switch)

Connector:
NPort® DE-211: DB25 female
NPort® DE-311: DB9 female

Serial Line Protection: 15 KV ESD protection for all signals

RS-485 Data Direction Control: ADDC® (automatic data direction control)

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

Baudrate: 50 bps to 230.4 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: Tx+, Tx-, Rx+, Rx-, RTS+, RTS-, CTS+, CTS-, GND

RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND (DE-211 only)

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

Software

Network Protocols: DHCP, BOOTP, Telnet, TCP, UDP, IP, ICMP, ARP

Configuration Options: Serial Console, Telnet Console, Windows Utility

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Physical Characteristics

Housing: Metal, IP30 protection

Weight: 480 g

Dimensions:
Without ears: 67 x 100.4 x 22 mm (2.64 x 3.95 x 0.87 in)
With ears: 90.2 x 100.4 x 22 mm (3.55 x 3.95 x 0.87 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage:
DE-211: 12 to 30 VDC
DE-311: 9 to 30 VDC

Power Consumption:
NPort® DE-211: 180 mA @ 12 V, 100 mA @ 24 V
NPort® DE-311: 300 mA @ 9 V, 150 mA @ 24 V

Regulatory Approvals

EMC: CE (EN55022 Class B, EN55024 Class B), FCC Part 15 Subpart B

Safety: UL (UL60950), TÜV (EN60950)

Medical: EN60601-1-2 Class B, EN55011 (DE-311 only)

MTBF (meantime between failures):
NPort DE-211: 347822 hrs
NPort DE-311: 225529 hrs

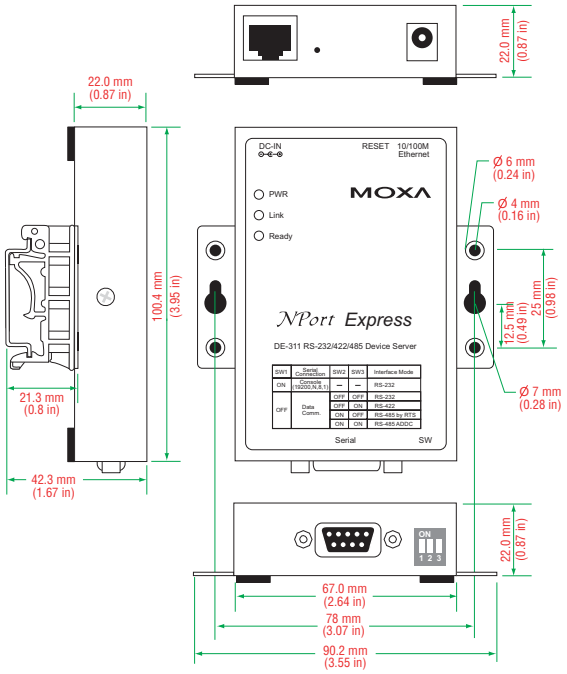
Warranty

Warranty Period: 5 years

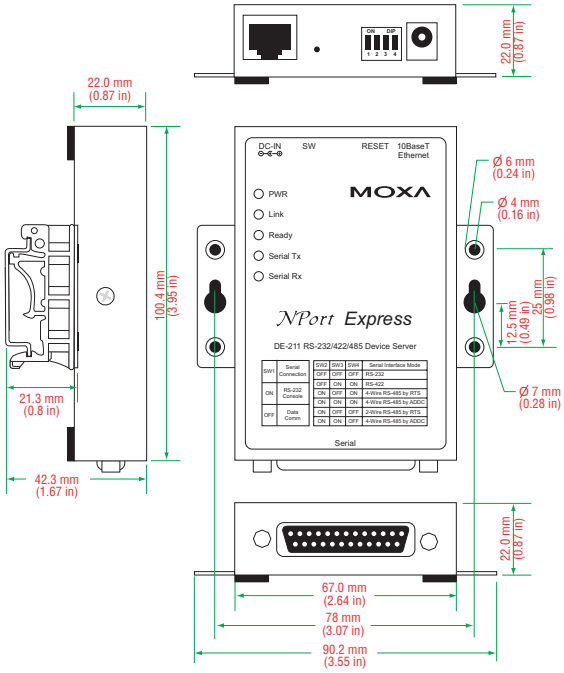
Details: See www.moxa.com/warranty

Dimensions

NPort® DE-311

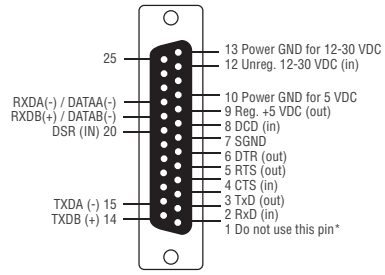


NPort® DE-211

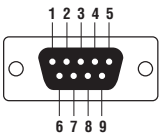


Pin Assignment

NPort® DE-211
(RS-232/422/485, DB25 female connector)



NPort® DE-311
(RS-232/422/485, DB9 female connector)



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	RxD-(A)	----
2	TxD	RxD+(B)	----
3	RxD	TxD+(B)	Data+(B)
4	DSR	TxD-(A)	Data-(A)
5	GND	GND	GND
6	DTR	CTS-(A)	----
7	CTS	CTS+(B)	----
8	RTS	RTS+(B)	----
9	----	RTS-(A)	----

Ordering Information

Available Models

NPort® DE-211: 1-port RS-232/422/485 device server with 10 Mbps Ethernet connection
NPort® DE-311: 1-port RS-232/422/485 device server with 10/100 Mbps Ethernet connection

Optional Accessories (can be purchased separately)

NP21101: DB25 male to DB9 female cable for RS-232 transmission, 30 cm (for DE-211)
NP21102: DB25 male to DB9 male cable for RS-232 transmission, 30 cm (for DE-211)
NP21103: DB25 male terminal block kit for RS-422/485 transmission (for DE-211)
TB-M25: DB25 male DIN-Rail wiring terminal (for DE-211)
TB-M9 (for DE-311): DB9 male DIN-Rail wiring terminal (for DE-311)
DK-35A: Mounting Kit for 35-mm DIN-Rail

Package Checklist

- NPort® DE-211 or DE-311 serial device server
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

NPort® 5200 Series

2-port RS-232/422/485 serial device servers

- Small size for easy installation
- Versatile socket operation modes, including TCP Server, TCP Client, and UDP
- Easy-to-use Windows utility for configuring multiple device servers
- Supports 10/100M Ethernet
- Patented ADDC® (Automatic Data Direction Control) for 2-wire and 4-wire RS-485
- Built-in 15 KV ESD protection for all serial signals
- SNMP MIB-II for network management

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Standard TCP/IP Protocols and Choice of Operation Modes

NPort® 5200 device servers can operate in TCP Server, TCP Client, or UDP operation mode, ensuring compatibility with software based on a standard network API (Winsock, BSD Sockets).

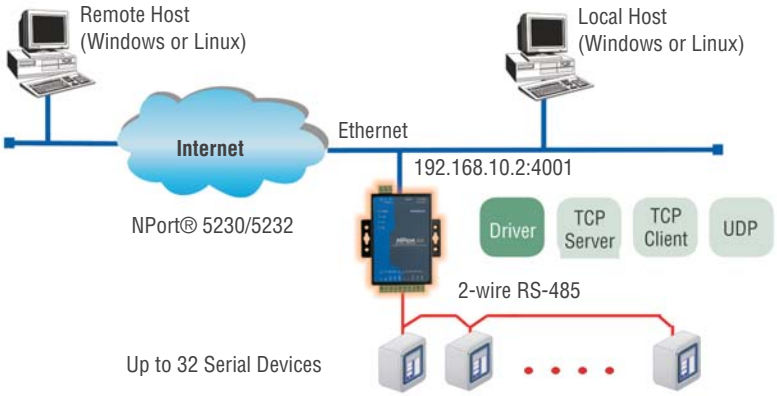
Real COM/TTY Drivers for Existing Software

With the Real COM/TTY drivers that are provided with each NPort®, software designed for communication with COM/TTY ports can be instantly and seamlessly integrated into a TCP/IP network. This is an excellent "no fuss" way to preserve your software investment and enjoy the benefits of networking your serial devices.

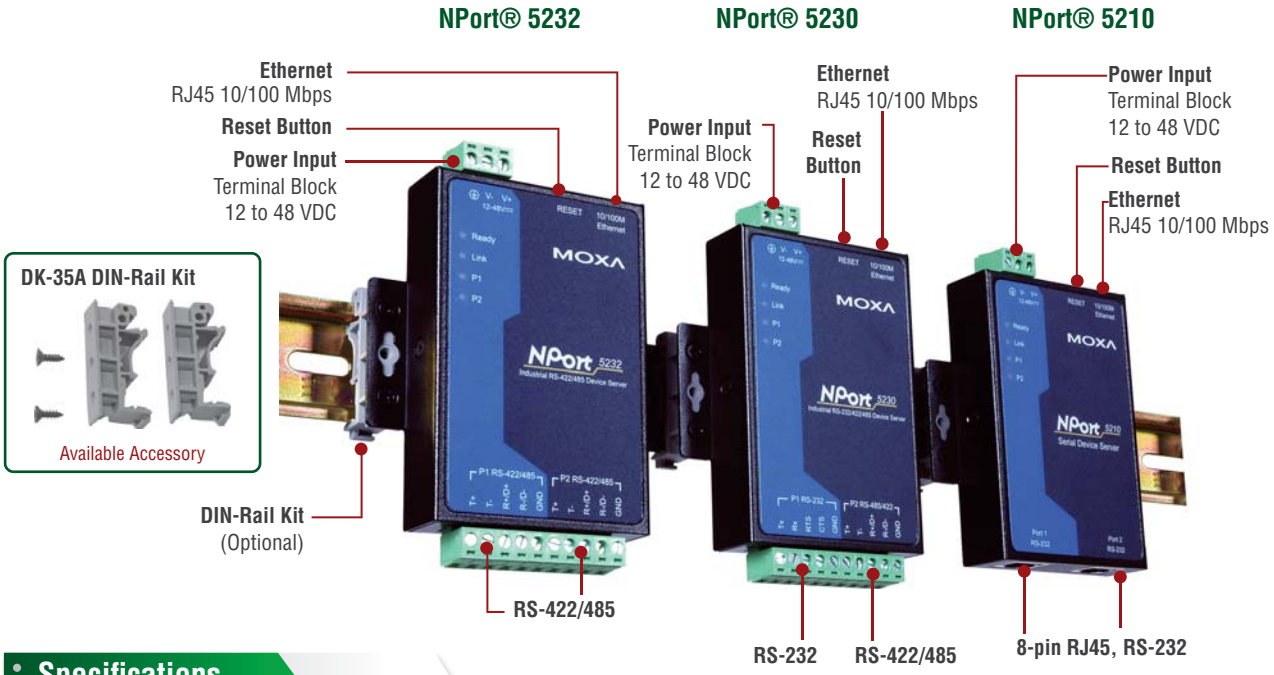
Control Remote Serial Devices with TCP/IP or Traditional COM/TTY Port

By specifying the NPort® 5200's IP address and port number, a network sockets API can obtain access to the attached serial device over the network, from any host computer that supports TCP/IP. For legacy Windows or Linux software that is COM or TTY-based, Moxa's COM/TTY drivers provide a seamless way of operating over the network.

COM Driver or Network Socket Operation



Appearance



Specifications

Ethernet Interface

Number of Ports: 1

Speed: 10/100 Mbps, auto MDI/MDIX

Connector: 8-pin RJ45

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Number of Ports: 2

Serial Standards:
NPort® 5210: RS-232
NPort® 5230: 1 RS-232 port, 1 RS-422/485 port
NPort® 5232/5232I: RS-422/485

Connector:
NPort® 5210: RJ45 (8 pins)
NPort® 5230/5232/5232I: Terminal Block (5 contacts per port)

Serial Line Protection:
15 KV ESD protection for all signals
2 KV isolation protection (NPort® 5232I/5232I-T)

RS-485 Data Direction Control: ADDC® (automatic data direction control)

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 (RS-232 only), DTR/DSR (NPort® 5210 only), XON/XOFF

Baudrate: 110 bps to 230.4 Kbps

Serial Signals

RS-232:
NPort® 5210: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
NPort® 5230: TxD, RxD, RTS, CTS, GND

RS-422: Tx+, Tx-, Rx+, Rx-, GND

RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND

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

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP

Configuration Options: Web Console, Serial Console (NPort® 5210/5230 only), Telnet Console, Windows Utility

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Physical Characteristics

Housing: Metal, IP30 protection

Weight:
NPort® 5210: 340 g
NPort® 5230/5232: 360 g
NPort® 5232I: 380 g

Dimensions:
NPort® 5210/5230/5232:
Without ears: 67 x 100.4 x 22 mm (2.64 x 3.95 x 0.87 in)
With ears: 90 x 100.4 x 22 mm (3.54 x 3.95 x 0.87 in)
NPort® 5232I:
Without ears: 67 x 100.4 x 35 mm (2.64 x 3.95 x 1.37 in)
With ears: 90 x 100.4 x 35 mm (3.54 x 3.95 x 1.37 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption:
NPort® 5210: 325 mA @ 12 V, 190 mA @ 24 V
NPort® 5230: 325 mA @ 12 V, 190 mA @ 24 V
NPort® 5232: 280 mA @ 12 V, 150 mA @ 24 V
NPort® 5232I: 509.4 mA @ 12 V, 200 mA @ 24 V

Regulatory Approvals

EMC: CE (EN55022 and EN55024 Class A), FCC Part 15 Subpart B Class A

Safety: UL (UL60950-1), TÜV (EN60950-1)

Marine: DNV

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (meantime between failures):
NPort® 5210: 134850 hrs
NPort® 5230: 106955 hrs
NPort® 5232: 102344 hrs
NPort® 5232I: 87083 hrs

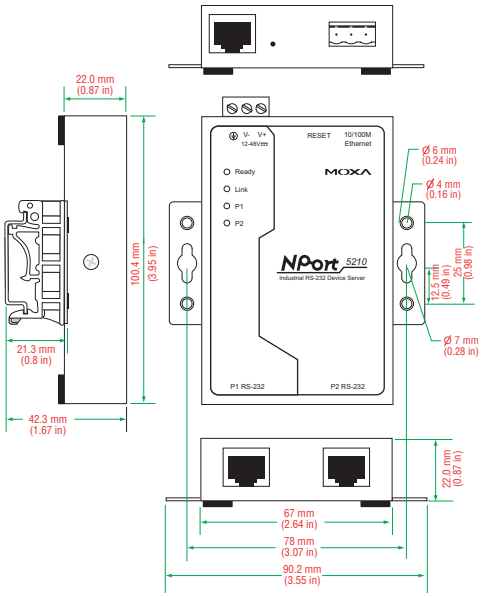
Warranty

Warranty Period: 5 years

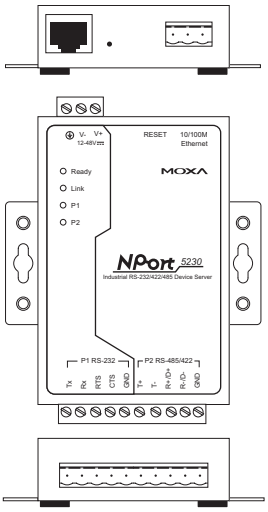
Details: See www.moxa.com/warranty

Dimensions

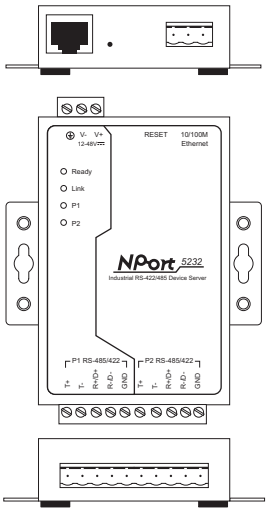
NPort® 5210



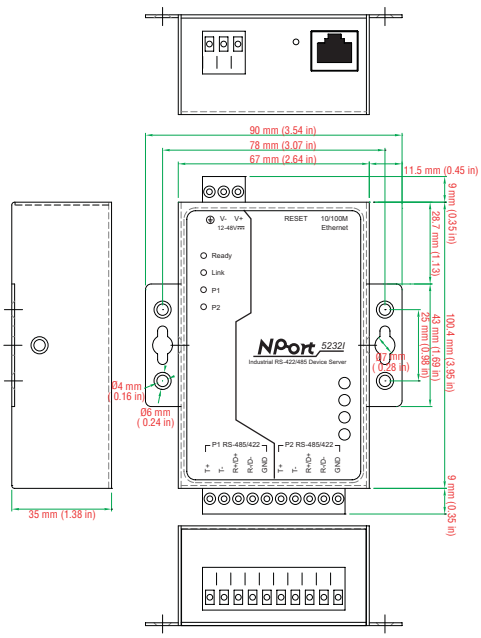
NPort® 5230



NPort® 5232

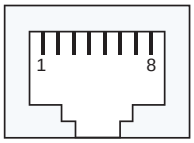


NPort® 5232I



Pin Assignment

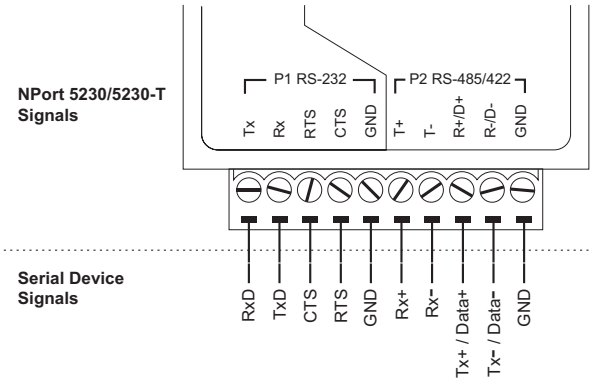
8-pin RJ45 connector



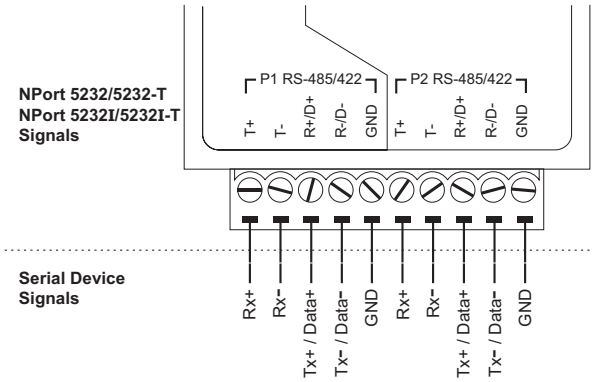
NPort® 5210/5210-T (RS-232)

PIN	RS-232
1	DSR (in)
2	RTS (out)
3	GND
4	TxD (out)
5	RxD (in)
6	DCD (in)
7	CTS (in)
8	DTR (out)

NPort® 5230/5230-T
(RS-232/422/485, terminal block connector)



NPort® 5232/5232I/5232-T/5232I-T
(RS-422/485, terminal block connector)



Ordering Information

Available Models

NPort® 5210: 2-port RS-232 device server, 0 to 55°C operating temperature

NPort® 5230: 2-port device server with 1 RS-232 port and 1 RS-422/485 port, 0 to 55°C operating temperature

NPort® 5232: 2-port RS-422/485 device server, 0 to 55°C operating temperature

NPort® 5232I: 2-port RS-422/485 device server with 2 KV optical isolation, 0 to 55°C operating temperature

NPort® 5210-T: 2-port RS-232 device server, -40 to 75°C operating temperature

NPort® 5230-T: 2-port device server with 1 RS-232 port and 1 RS-422/485 port, -40 to 75°C operating temperature

NPort® 5232-T: 2-port RS-422/485 device server, -40 to 75°C operating temperature

NPort® 5232I-T: 2-port RS-422/485 device server with 2 KV optical isolation, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DK-35A: Mounting Kit for 35-mm DIN-Rail

DIN-Rail Power Supply: See page A-8 for details

Terminal Block: See page A-7 for details

Package Checklist

- NPort® 5200 series device server
- Power jack to 3-pin terminal block adaptor
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

NPort® 5400 Series

4-port RS-232/422/485 serial device servers

- Easy IP address configuration with built-in LCD panel
- 10/100M auto-sensing Ethernet
- 4 serial ports, with support for RS-232, RS-422, and RS-485
- Built-in 15 KV ESD surge protection for all serial signals
- Versatile socket operation modes, including TCP Server, TCP Client, and UDP
- Choice of configuration methods: Web console, Telnet console, and Windows utility
- SNMP MIB-II for network management
- 2 KV isolation protection for NPort® 5430I/5450I

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Network Readiness for up to Four Serial Devices

NPort® 5400 device servers can conveniently and transparently connect up to four serial devices to an Ethernet network, allowing you to network your existing serial devices with only basic configuration. Data transmission between the serial and Ethernet interfaces is bi-directional. By using NPort® device servers, you not only protect your current hardware investment, but also allow for future network expansion. You can both centralize the management of your serial devices, and distribute management hosts over the network.

Independent Operation Mode for each Serial Port

NPort® 5400 device servers can be used to connect different devices for remote data polling or event handling over a TCP/IP network. Each serial port on the NPort® 5400 operates independently to provide maximum versatility. For example, port 1 can operate in Driver mode, port 2 in TCP Server mode, and ports 3 and 4 in TCP Client mode.

User-friendly LCD Panel for Easy Installation

An LCD panel is built into the NPort® 5400's top panel, with four buttons for inputting data, configuration, and selecting the operation mode. The LCD panel displays the server name, serial number, and IP address, and can be used to enter or modify parameters such as IP address, netmask, and gateway.

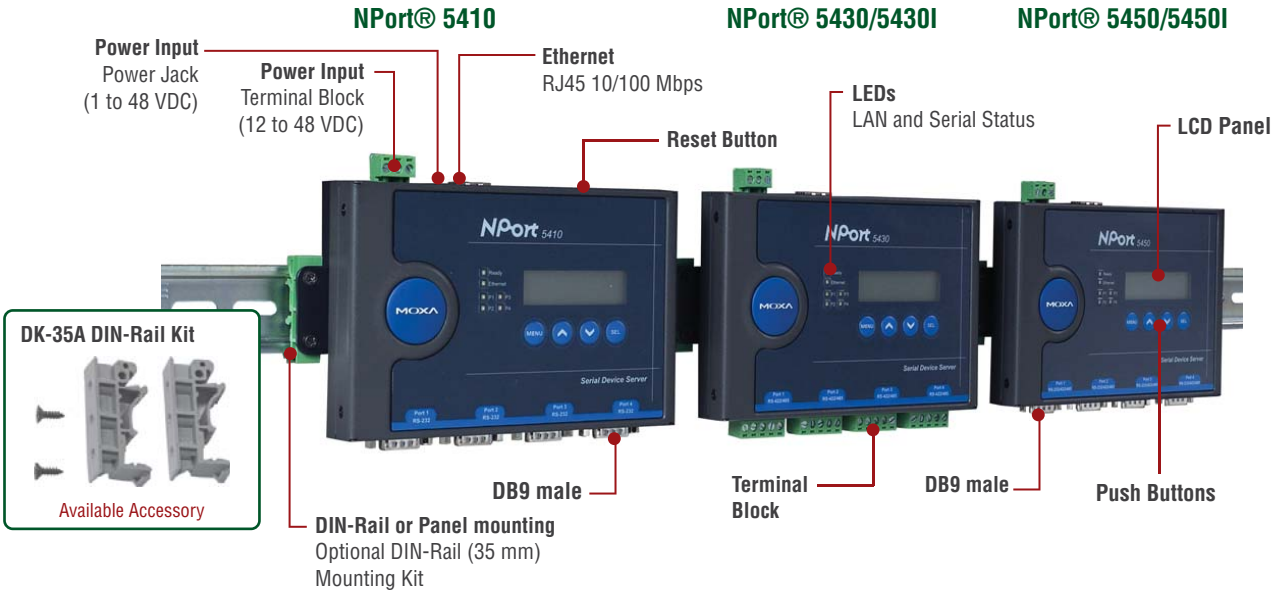
Redundant DC Power Inputs

NPort® 5400 device servers support redundant power sources and provide both a DC terminal block input and a DC power jack input. The two power inputs not only provide power redundancy, but also allow greater flexibility for use with different applications.

Adjustable Termination and pull High/Low Resistors

Termination resistors may be needed in some critical environments to prevent the reflection of serial signals. When using termination resistors, it is important to set the pull high/low resistors correctly to prevent the electrical signal from being corrupted. Since no set of resistor values is universally compatible with all environments, the NPort® 5400 has four sets of DIP switches on the bottom panel to set the termination and pull high/low resistor values.

Appearance



Specifications

Ethernet Interface

Number of Ports: 1

Speed: 10/100 Mbps, auto MDI/MDIX

Connector: 8-pin RJ45

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Number of Ports: 4

Serial Standards:
NPort® 5410: RS-232
NPort® 5430/5430I: RS-422/485
NPort® 5450/5450I: RS-232/422/485

Connector:
NPort® 5410/5450/5450I: DB9 male
NPort® 5430/5430I: Terminal block

Serial Line Protection:
15 KV ESD protection for all signals
2 KV isolation protection (NPort® 5430I/5450I)

RS-485 Data Direction Control: ADDC® (automatic data direction control)

Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ

Terminator for RS-485: 120 Ω

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 and DTR/DSR (RS-232 only), XON/XOFF

Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: Tx+, Tx-, Rx+, Rx-, GND

RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND

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

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP, Rtelnet, ARP

Configuration Options: Web Console, Telnet Console, Windows Utility

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Mini Screen with Push Buttons

LCD Panel: Liquid Crystal Display on the case

Push Buttons: Four push buttons for convenient on-site configuration

Physical Characteristics

Housing: Metal, IP30 protection

Weight: 740 g

Dimensions:
Without mounting kit: 158 x 103 x 33 mm (6.22 x 4.06 x 1.30 in)
With mounting kit: 176 x 103 x 33 mm (6.93 x 4.06 x 1.30 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 70°C (-4 to 158°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption:
NPort® 5410: 350 mA @ 12 V, 190 mA @ 24 V
NPort® 5430: 320 mA @ 12 V, 175 mA @ 24 V
NPort® 5430I: 530 mA @ 12 V, 280 mA @ 24 V
NPort® 5450: 350 mA @ 12 V, 190 mA @ 24 V
NPort® 5450I: 554 mA @ 12 V, 294 mA @ 24 V

Regulatory Approvals

EMC: CE (EN55022 and EN55024 Class A), FCC Part 15 Subpart B Class A

Safety: UL (UL60950-1), TÜV (EN60950-1)

Marine: DNV

Medical: EN60601-1-2 Class B, EN55011

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

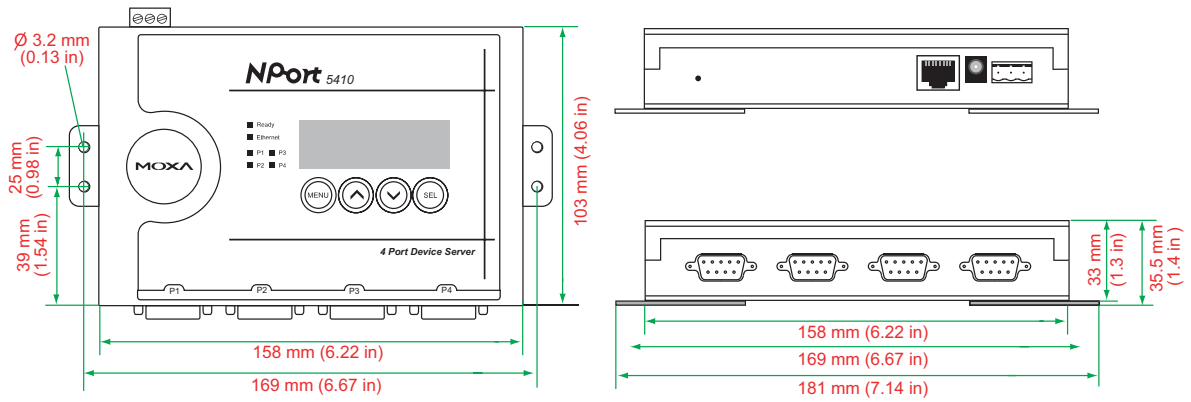
MTBF (meantime between failures):
NPort® 5410: 205153 hrs
NPort® 5430: 201699 hrs
NPort® 5430I: 114540 hrs
NPort® 5450: 206903 hrs
NPort® 5450I: 206903 hrs

Warranty

Warranty Period: 5 years

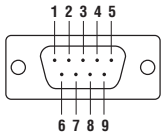
Details: See www.moxa.com/warranty

Dimensions



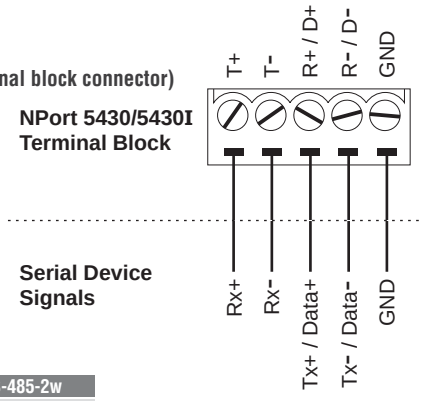
Pin Assignment

NPort® 5410
(RS-232, DB9 male connector)

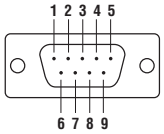


PIN	RS-232
1	DCD
2	RxD
3	RxD
4	DTR
5	GND
6	DSR
7	TRS
8	CTS
9	---

NPort® 5430/5430I
(RS-422/485, terminal block connector)



NPort® 5450/5450I (RS-232/422/485, DB9 male connector)
(RS-232/422/485, DB9 male connector)



PIN	RS-232	RS-422/RS-485-4w	RS-485-2w
1	DCD	TxD-(A)	---
2	RxD	TxD+(B)	---
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	---	---
7	RTS	---	---
8	CTS	---	---

Ordering Information

Available Models

NPort® 5410: 4-port RS-232 device server

NPort® 5430: 4-port RS-422/485 device server

NPort® 5430I: 4-port RS-422/485 device server with 2 KV optical isolation

NPort® 5450: 4-port RS-232/422/485 device server

NPort® 5450I: 4-port RS-232/422/485 device server with 2 KV optical isolation

Package Checklist

- NPort® 5400 series device server
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Optional Accessories (can be purchased separately)

DK-35A: Mounting Kit for 35-mm DIN-Rail

DIN-Rail Power Supply: See page A-8 for details

Terminla Block: See page A-7 for details

Power Adaptor: See page A-9 for details

NPort® 5600 Rackmount Series

8 and 16-port RS-232/422/485 serial device servers

- 8 or 16 serial ports supporting RS-232/422/485
- Standard 19-inch rackmount size
- 10/100M auto-sensing Ethernet
- Built-in 15 KV ESD protection for all serial signals
- Easy IP address configuration with LCD panel
- Choice of configuration methods: Web console, Telnet console, and Windows utility
- Versatile socket operation modes, including TCP Server, TCP Client, UDP, and Real COM
- SNMP MIB-II for network management

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

With the NPort® 5600 rackmount series, you not only protect your current hardware investment, but also allow for future network expansion by centralizing the management of your serial devices and distributing management hosts over the network.

Network Readiness for up to 16 Serial Devices

Only basic configuration is needed with the NPort® 5600 to connect up to 16 serial devices to an Ethernet network.

19-inch Rackmount Device Server

NPort® 5600 device servers come with Tx/Rx LEDs for the serial ports on the front panel, and 8 or 16 RJ45 serial port connectors on the rear panel. This makes the NPort® 5600 device servers suitable for standard 19-inch rack mounting, allowing you to simplify operation, maintenance, and administrative tasks.

Real COM/TTY Ports

Real COM/TTY drivers are provided to make the serial ports on the NPort® 5600 recognizable as Real COM ports by Windows, or Real TTY ports by Linux. In addition to supporting basic data transmission and reception, the NPort® drivers also support the RTS, CTS, DTR, DSR, and DCD control signals.

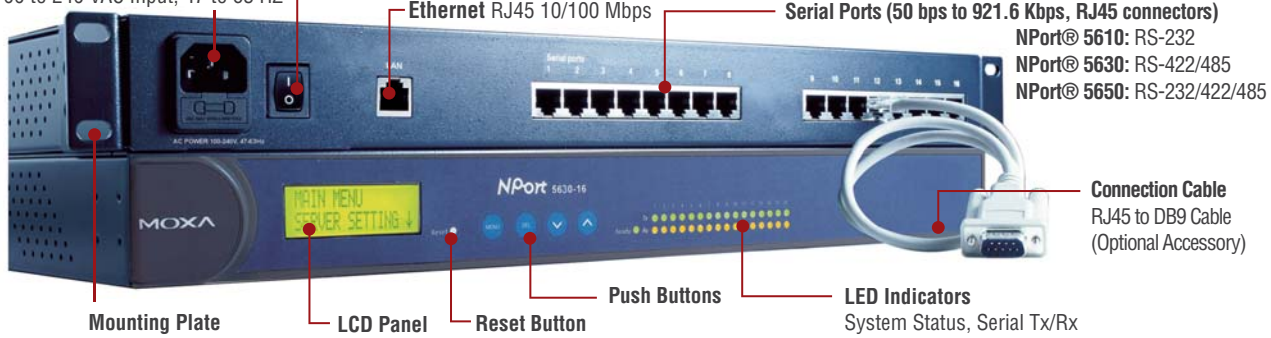
LED Indicators to Ease Your Maintenance Tasks

The System LED, serial Tx/Rx LEDs, and Ethernet LEDs (located on the RJ45 connector) provide a great tool for basic maintenance tasks, and help engineers analyze problems in the field. The LEDs not only indicate current system and network status, but also help field engineers monitor the status of attached serial devices.

Adjustable Termination and Pull High/Low Resistors

When using termination resistors to prevent serial signal reflection, it is important to set the pull high/low resistors correctly so that the electrical signal is not corrupted. Since no set of resistor values is universally compatible for all environments, the NPort® 5600 has DIP switches on the bottom panel for setting the termination and pull high/low resistor values.

Appearance



Specifications

Ethernet Interface

Number of Ports: 1

Speed: 10/100 Mbps, auto MDI/MDIX

Connector: 8-pin RJ45

Magnetic Isolation Protection: 1.5 KV built-in

Optical Fiber Interface

Distance:
Multi mode: 0 to 2 km, 1310 nm (62.5/125 µm, 500 MHz*km)
Single mode: 0 to 40 km, 1310 nm (9/125 µm, 3.5 PS/(nm*km))

Min. TX Output: -20 dBm (Multi mode), -5 dBm (Single mode)

Max. TX Output: -14 dBm (Multi mode), 0 dBm (Single mode)

Sensitivity: -34 to -30 dBm (Multi mode), -36 to -32 dBm (Single mode)

Serial Interface

Number of Ports: 8 or 16

Serial Standards:
NPort® 5610: RS-232
NPort® 5630: RS-422/485
NPort® 5650: RS-232/422/485

Connector: RJ45 (8 pins)

Serial Line Protection:
15 KV ESD protection for all signals

RS-485 Data Direction Control: ADDC® (automatic data direction control)

Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: DSR/DTR and RTS/CTS (RS-232 only), XON/XOFF

Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: Tx+, Tx-, Rx+, Rx-, GND

RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND

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

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP, ARP, PPP, SLIP, RTelnet, RFC2217

Configuration Options: Web Console, Telnet Console, Windows Utility

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Mini Screen with Push Buttons

LCD Panel: Liquid Crystal Display on the case

Push Buttons: Four push buttons for convenient on-site configuration

Physical Characteristics

Housing: Metal, IP30 protection

Weight:
NPort® 5610-8: 3340 g
NPort® 5610-8-48V: 3160 g
NPort® 5630-8, 5650-8-S-SC, 5650-8-M-SC: 3380 g
NPort® 5650-8: 3360 g
NPort® 5610-16: 3420 g
NPort® 5610-16-48V: 3260 g
NPort® 5630-16: 3400 g
NPort® 5650-16: 3460 g
NPort® 5650-16-S-SC, 5650-16-M-SC: 3440 g

Dimensions:
Without ears: 440 x 45 x 198 mm (17.32 x 1.77 x 7.80 in)
With ears: 480 x 45 x 198 mm (18.90 x 1.77 x 7.80 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 75°C (-4 to 167°F)

Power Requirements

Input Voltage:
NPort® 5610/5630/5650: 100 to 240 VAC, 47 to 63 hz
NPort® 5610-48V: ±48 VDC (20 to 72 VDC, -20 to -72 VDC)

Power Consumption:
NPort® 5610-8/16: 141 mA @ 100 VAC, 93 mA @ 240 VAC
NPort® 5630-8/16: 152 mA @ 100 VAC, 98 mA @ 240 VAC
NPort® 5610-8/16-48V: 135 mA @ 48 VDC
NPort® 5650-8/16: 158 mA @ 100 VAC, 102 mA @ 240 VAC
NPort® 5650-8/16-S-SC: 164 mA @ 100 VAC, 110 mA @ 240 VAC
NPort® 5650-8/16-M-SC: 174 mA @ 100 VAC, 113 mA @ 240 VAC

Regulatory Approvals

EMC: CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A
NPort® 5610 only: IEC61000-4-12

Safety: UL (UL60950-1), TÜV (EN60950-1)

Medical: EN60601-1-2 Class B, EN55011

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

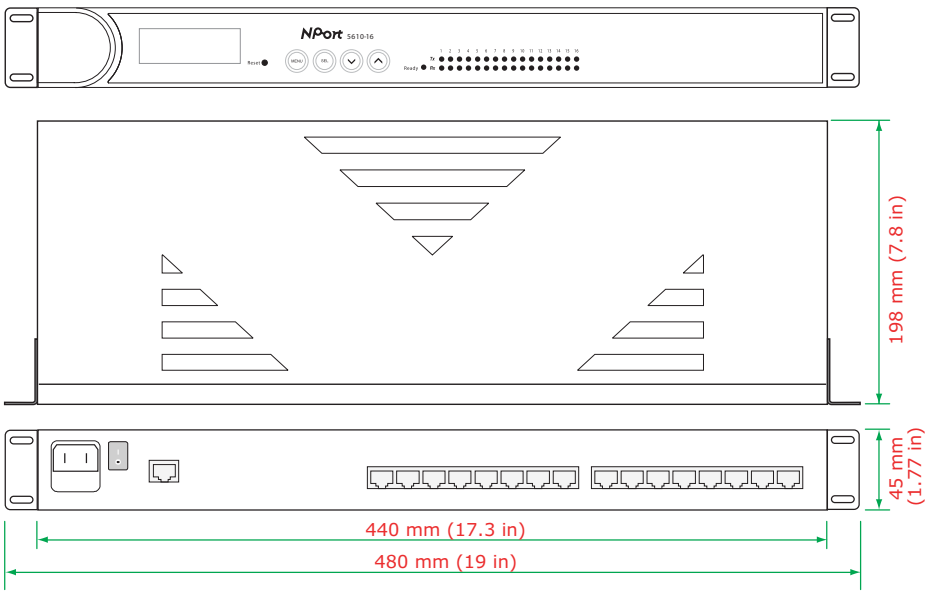
MTBF (meantime between failures):
NPort® 5610-8: 97294 hrs
NPort® 5610-16: 94928 hrs
NPort® 5610-8-48V: 96758
NPort® 5610-16-48V: 94417 hrs
NPort® 5630-8: 118405 hrs
NPort® 5630-16: 91483 hrs
NPort® 5650-8: 117584 hrs
NPort® 5650-16: 104767 hrs
NPort® 5650-S-SC-8: 116914 hrs
NPort® 5650-S-SC-16: 87528 hrs
NPort® 5650-M-SC-8: 116914 hrs
NPort® 5650-M-SC-16: 87528 hrs

Warranty

Warranty Period: 5 years

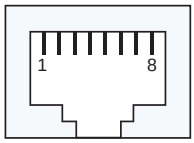
Details: See www.moxa.com/warranty

Dimensions



Pin Assignment

(8-pin RJ45 connector)



NPort® 5610: RS-232

PIN	RS-232
1	DSR
2	RTS
3	GND
4	TXD
5	RxD
6	DCD
7	CTS
8	DTR

NPort® 5630: RS-422/485

PIN	RS-422/485-4w	RS-485-2w
1	---	---
2	---	---
3	TxD+	---
4	TxD-	---
5	RxD-	Data+
6	RxD+	Data-
7	GND	GND
8	---	---

NPort® 5650: RS-232/422/485

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DSR	---	---
2	RTS	TxD+	---
3	GND	GND	GND
4	TXD	TxD-	---
5	RxD	RxD+	Data+
6	DCD	RxD-	Data-
7	CTS	---	---
8	DTR	---	---

Ordering Information

Available Models

NPort® 5610-8: 8-port RS-232 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort® 5610-8-48V: 8-port RS-232 rackmount device server with RJ45 connectors and 48 VDC power input
NPort® 5630-8: 8-port RS-422/485 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort® 5650-8: 8-port RS-232/422/485 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort® 5650-8-M-SC: 8-port RS-232/422/485 rackmount device server with RJ45 connectors and 100BaseF(X) multi-mode fiber (SC connector)
NPort® 5650-8-S-SC: 8-port RS-232/422/485 rackmount device server with RJ45 connectors and 100BaseF(X) single-mode fiber (SC connector)
NPort® 5610-16: 16-port RS-232 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort® 5610-16-48V: 16-port RS-232 rackmount device server with RJ45 connectors and 48 VDC power input
NPort® 5630-16: 16-port RS-422/485 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort® 5650-16: 16-port RS-232/422/485 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort® 5650-16-M-SC: 16-port RS-232/422/485 rackmount device server with RJ45 connectors and 100BaseF(X) multi-mode fiber (SC connector)
NPort® 5650-16-S-SC: 16-port RS-232/422/485 rackmount device server with RJ45 connectors and 100BaseF(X) single-mode fiber (SC connector)

Optional Accessories (can be purchased separately)

CBL-RJ45F25-150: 8-pin RJ45 to DB25 female cable, 150 cm
CBL-RJ45M25-150: 8-pin RJ45 to DB25 male cable, 150 cm
CBL-RJ45F9-150: 8- pin RJ45 to DB9 female cable, 150 cm
CBL-RJ45M9-150: 8-pin RJ45 to DB9 male cable, 150 cm

Package Checklist

- NPort® 5600 series device server
- Power Cord (see Appendix A)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

NPort® 5600 Desktop Series

8-port RS-232/422/485 serial device servers

- 8 serial ports supporting RS-232/422/485
- Compact desktop design
- 10/100M auto-detecting Ethernet
- Built-in 15 KV ESD protection for all serial signals
- Easy IP address configuration with LCD panel
- Choice of configuration methods: Web console, Telnet console, and Windows utility
- Versatile socket operation modes, including TCP Server, TCP Client, UDP, and Real COM
- SNMP MIB-II for network management
- Built-in speaker: Use your own voice as the alert when exceptions occur

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

NPort® 5600-8-DT device servers can conveniently and transparently connect 8 serial devices to an Ethernet network, allowing you to network your existing serial devices with only basic configuration. You can both centralize management of your serial devices and distribute management hosts over the network. Since the NPort® 5600-8-DT device servers have a smaller form factor compared to our 19-inch models, they are a great choice for applications that need additional serial ports, but for which mounting rails are not available.

Convenient Design for RS-485 Applications

The NPort® 5650-8-DT device servers support selectable 1 KΩ and 150 KΩ pull high/low resistors and a 120 Ω terminator. In some critical environments, termination resistors may be needed to prevent the reflection of serial signals. When using termination resistors, it is also important to set the pull high/low resistors correctly so that the electrical signal is not corrupted. Since no set of resistor values is universally compatible with all environments, NPort® 5600-8-DT device servers use DIP switches to allow users to adjust termination and pull high/low resistor values manually for each serial port.

Convenient Power Inputs

The NPort® 5650-8-DT device servers support both power terminal blocks and power jacks for ease of use and greater flexibility. Users can connect the terminal block directly to a DC power source, or use the power jack to connect to an AC circuit through an adaptor.

LED Indicators to Ease Your Maintenance Tasks

The System LED, Serial Tx/Rx LEDs, and Ethernet LEDs (located on the RJ45 connector) provide a great tool for basic maintenance tasks and help engineers analyze problems in the field. The NPort® 5600's LEDs not only indicate current system and network status, but also help field engineers monitor the status of attached serial devices.

Two Ethernet Ports for Convenient Cascade Wiring

The NPort® 5600-8-DT device servers come with two Ethernet ports that can be used as Ethernet switch ports. Connect one port to the network or server, and the other port to another Ethernet device. The dual Ethernet ports eliminate the need to connect each device to a separate Ethernet switch, reducing wiring costs.

Automatic Warning Function by Speaker and/or E-mail

The built-in speakers can be used to alert administrators of problems with the Ethernet links or power input. The web console indicates which Ethernet link or power input has failed. An e-mail warning can also be issued when an exception is detected. These functions are valuable tools that enable maintenance engineers to react promptly to emergency situations.

Appearance

Specifications

Ethernet Interface

Number of Ports: 2

Speed: 10/100 Mbps, auto MDI/MDIX

Connector: 8-pin RJ45

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Number of Ports: 8

Serial Standards:
NPort® 5610-8-DT: RS-232
NPort® 5650-8-DT: RS-232/422/485

Connector:
NPort® 5610-8-DT/5650-8-DT/5650I-8-DT: DB9 male
NPort® 5610-8-DT-J/5650-8-DT-J: RJ45 (8 pins)

Serial Line Protection:
15 KV ESD protection for all signals
2 KV isolation protection (NPort® 5650I-8-DT only)

RS-485 Data Direction Control: ADDC® (automatic data direction control)

Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ

Terminator for RS-485: 120 Ω

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: DSR/DTR and RTS/CTS (RS-232 only), XON/XOFF

Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: Tx+, Tx-, Rx+, Rx-, GND

RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND

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

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP, Rtelnet, ARP, RFC2217

Configuration Options: Web Console, Telnet Console, Serial Console, Windows Utility

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Mini Screen with Push Buttons

LCD Panel: Liquid Crystal Display on the case

Push Buttons: Four push buttons for convenient on-site configuration

Physical Characteristics

Housing: Metal, IP30 protection

Weight:
NPort® 5610-8-DT: 1760 g
NPort® 5610-8-DT-J: 1170 g
NPort® 5650-8-DT: 1770 g
NPort® 5650-8-DT-J: 1710 g
NPort® 5650I-8-DT: 1850 g

Dimensions:
Without ears: 197 x 44 x 135.5 mm (7.76 x 1.73 x 5.33 in)
With ears: 229 x 46 x 135.5 mm (9.01 x 1.81 x 5.33 in)
With DIN-Rail kit on bottom panel: 197 x 53 x 135.5 mm (7.76 x 2.09 x 5.33 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 70°C (-4 to 158°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption:
NPort® 5610-8-DT:
611 mA @ 12 V, 300 mA @ 24 V, 140 mA @ 48 V
NPort® 5610-8-DT-J:
611 mA @ 12 V, 300 mA @ 24 V, 140 mA @ 48 V
NPort® 5650-8-DT:
615 mA @ 12 V, 300 mA @ 24 V, 156 mA @ 48 V
NPort® 5650I-8-DT:
1066 mA @ 12 V, 510 mA @ 24 V, 200 mA @ 48 V
NPort® 5650-8-DT-J:
615 mA @ 12 V, 300 mA @ 24 V, 156 mA @ 48 V

Regulatory Approvals

EMC: CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A

Safety: UL (UL60950-1), TÜV (EN60950-1)

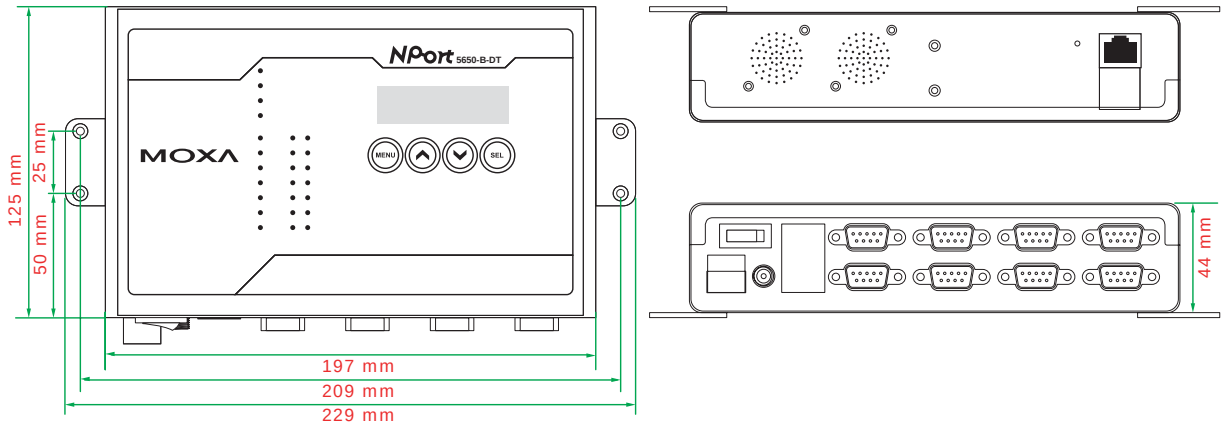
Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (meantime between failures): 163356 hrs

Warranty

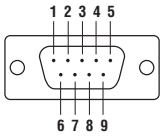
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions



Pin Assignment

DB9 male connector



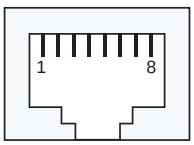
NPort® 5610-8-DT (RS-232)

PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

NPort® 5650-8-DT/5650I-8-DT (RS-232/422/485)

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

8-pin RJ45 connector



NPort® 5610-8-DT-J (RS-232)

PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

NPort® 5650-8-DT-J (RS-232/422/485)

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DSR	---	---
2	RTS	TxD+	---
3	GND	GND	GND
4	TXD	TxD-	---
5	RxD	RxD+	Data+
6	DCD	RxD-	Data-
7	CTS	---	---
8	DTR	---	---

Ordering Information

Available Models

NPort® 5610-8-DT: 8-port RS-232 desktop device server with DB9 male connectors and 48 VDC power input
NPort® 5610-8-DT-J: 8-port RS-232 desktop device server with RJ45 connectors and 48 VDC power input
NPort® 5650-8-DT: 8-port RS-232/422/485 desktop device server with DB9 male connectors and 48 VDC power input
NPort® 5650-8-DT-J: 8-port RS-232/422/485 desktop device server with RJ45 connectors and 48 VDC power input
NPort® 5650I-8-DT: 8-port RS-232/422/485 desktop device server with DB9 male connectors, 48 VDC power input, and 2 KV optical isolation

Optional Accessories (can be purchased separately)

CBL-RJ45F25-150: 8-pin RJ45 to DB25 female cable, 150 cm
CBL-RJ45M25-150: 8-pin RJ45 to DB25 male cable, 150 cm
CBL-RJ45F9-150: 8-pin RJ45 to DB9 female cable, 150 cm
CBL-RJ45M9-150: 8-pin RJ45 to DB9 male cable, 150 cm

Package Checklist

- NPort® 5600 series device server
- Power Adaptor (see Appendix A)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

NPort® IA5000 Series

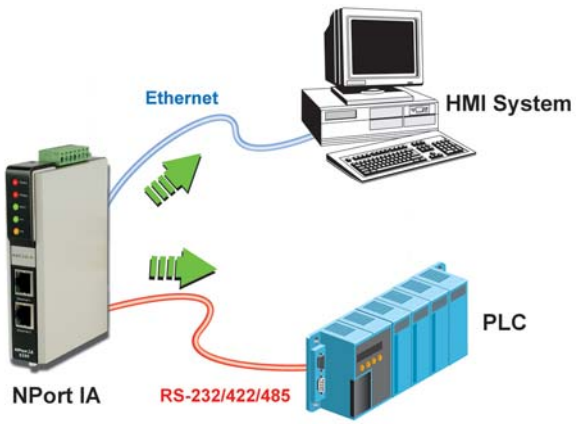
1 and 2-port serial device servers for industrial automation

- Versatile socket operation modes, including TCP Server, TCP Client, UDP
- Patented ADDC® (automatic data direction control) for 2-wire and 4-wire RS-485
- Cascading Ethernet ports for easy wiring (applies only to RJ45 connectors)
- Redundant DC power inputs
- Warning by relay output and e-mail
- 10/100BaseTX (RJ45) or 100BaseFX (single mode or multi-mode with SC connector)
- IP30-rated housing

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

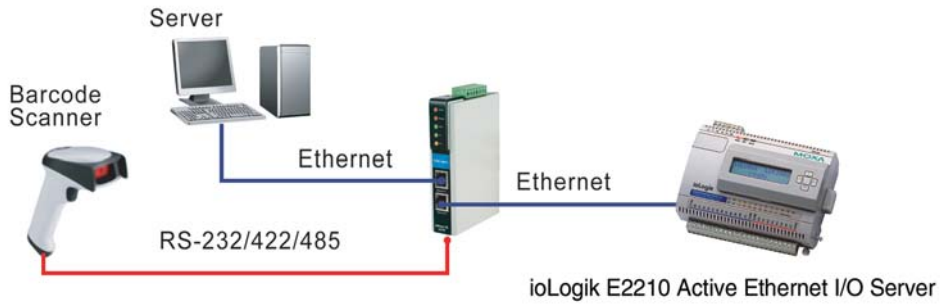
Overview

NPort® IA device servers provide easy and reliable serial-to-Ethernet connectivity for industrial automation applications. The device servers can connect any serial device to an Ethernet network, and to ensure compatibility with network software, they support a variety of port operation modes, including TCP Server, TCP Client, and UDP. The rock-solid reliability of the NPort® IA device servers makes them an ideal choice for establishing network access to RS-232/422/485 serial devices such as PLCs, sensors, meters, motors, drives, barcode readers, and operator displays. All models are housed in a compact, rugged housing that is DIN-rail mountable.



Cascading Ethernet Ports Make Wiring Easy (10/100BaseTX models only)

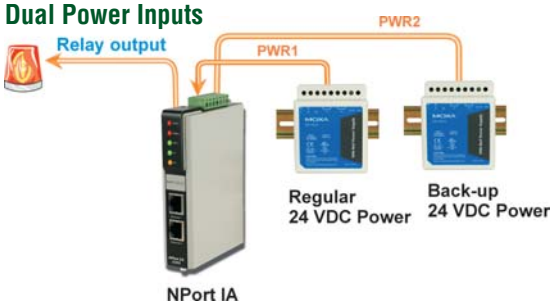
The NPort® IA5150 and IA5250 device servers each have two Ethernet ports that can be used as Ethernet switch ports. One port connects directly to the network or server, and the other port can be connected to another NPort® IA device server or another Ethernet device. The dual Ethernet ports help reduce wiring costs by eliminating the need to connect each device to a separate Ethernet switch.



Redundant Power Inputs

The NPort® IA5000 device servers have two power inputs that can be connected simultaneously to live DC power sources. If one power source fails, the other source takes over automatically. Redundant power inputs help assure non-stop operation of your device server.

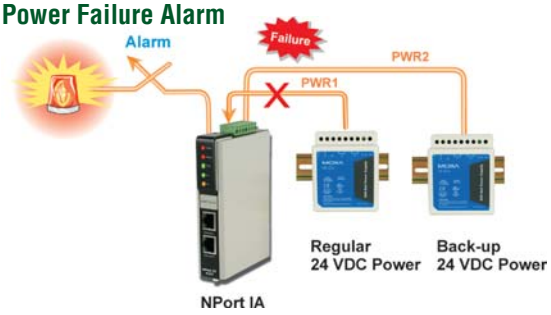
Dual Power Inputs



Relay Output Warning and E-mail Alerts

The built-in relay output can be used to alert administrators of problems with the Ethernet links or power inputs, or when there is a change in the DCD or DSR serial signals. The web console indicates which Ethernet link or power input has failed, or which serial signal has changed. An e-mail warning can also be issued when an exception is detected. These functions are valuable tools that enable maintenance engineers to react promptly to emergency situations.

Power Failure Alarm



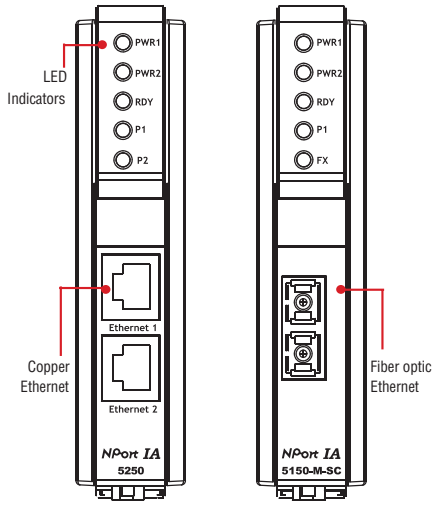
Optical Fiber for Ethernet Communication

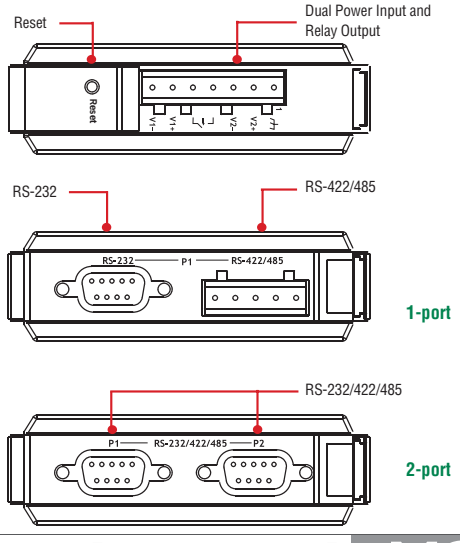
The NPort® IA5000 series includes 100BaseFX fiber models that support transmission distances up to 2 km for multi-mode models, and up to 40 km for single-mode models. Optical fiber is well-suited for industrial applications because it is immune to electromagnetic noise and interference. For environments that experience high ground loop voltages, fiber provides the best isolation protection, and because there is no danger of sparking, optical fiber is safer than copper wire to use in hazardous environments.

Industrial-grade Certification

To ensure safe and reliable operation in industrial environments, the NPort® IA5000 device servers have obtained various industrial certifications, including an IP30 rating for mechanical protection, UL508 safety certification for industrial control equipment, and explosion-safe certifications for hazardous locations. Certifications include UL/cUL Class 1 Division 2 Groups A, B, C, D, and ATEX Class 1 Zone 2.

Appearance





Specifications

Ethernet Interface (NPort® IA5150/5150I/5250)

Number of Ports: 2

Speed: 10/100 Mbps, auto MDI/MDIX

Connector: 8-pin RJ45

Magnetic Isolation Protection: 1.5 KV built-in

Optical Fiber Interface (-M-SC and -S-SC models)

Fiber Port: 100 BaseFX, SC connector

Distance:
Multi mode: 0 to 2 km, 1310 nm (62.5/125 µm, 500 MHz*km)
Single mode: 0 to 40 km, 1310 nm (9/125 µm, 3.5 PS/(nm*km))

Min. TX Output: -20 dBm (Multi mode), -5 dBm (Single mode)

Max. TX Output: -14 dBm (Multi mode), 0 dBm (Single mode)

Sensitivity: -34 to -30 dBm (Multi mode), -36 to -32 dBm (Single mode)

Serial Interface

Number of Ports:
NPort® IA5150: 1
NPort® IA5250: 2

Serial Standards: RS-232/422/485

Connector:
NPort® IA5150: DB9 male for RS-232, terminal block for RS-422/485
NPort® IA5250: DB9 male for RS-232/422/485

Serial Line Protection:
15 KV ESD protection for all signals
2 KV isolation protection (NPort® IA5150I, NPort® 5150I-M-SC, NPort® 5150I-S-SC)

RS-485 Data Direction Control: ADDC® (automatic data direction control)

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 and DTR/DSR (RS-232 only), XON/XOFF

Baudrate: 110 bps to 230.4 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: Tx+, Tx-, Rx+, Rx-, GND

RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND

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

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, Rtelnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP

Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Physical Characteristics

Housing: Plastic, IP30 protection

Weight:
NPort® IA5150: 360 g
NPort® IA5250: 380 g

Dimensions: 29 x 89.2 x 118.5 mm (0.82 x 3.51 x 4.57 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption:
NPort® IA5150: 360 mA @ 12 V, 195 mA @ 24 V
NPort® IA5150I: 420 mA @ 12 V, 215 mA @ 24 V
NPort® IA5250: 440 mA @ 12 V, 200 mA @ 24 V
NPort® IA5150-S-SC: 470 mA @ 12 V, 210 mA @ 24 V
NPort® IA5150I-S-SC: 490 mA @ 12 V, 250 mA @ 24 V
NPort® IA5150-M-SC: 500 mA @ 12 V, 250 mA @ 24 V
NPort® IA5150I-M-SC: 510 mA @ 12 V, 260 mA @ 24 V

Regulatory Approvals

EMC: CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A

Safety: UL (UL60950-1), UL508, TÜV (EN60950-1)

Hazardous Location: UL/cUL Class 1 Division 2 Groups A, B, C and D

ATEX: Class I, Zone 2

Marine: DNV

EMS:
EN61000-4-2 (ESD), Level 3
EN61000-4-3 (RS), Level 3
EN61000-4-4 (EFT), Level 4
EN61000-4-5 (Surge), Level 3
EN61000-4-6 (CS), Level 3
EN61000-4-8
EN61000-4-11
EN61000-4-12

Shock: IEC60068-2-27

Freefall: IEC60068-2-32

Vibration: IEC60068-2-6

Dust-proof: IP30

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (meantime between failures):
NPort IA5150 Series: 183747 hrs
NPort IA5150I Series: 195614 hrs
NPort IA5250 Series: 194765 hrs

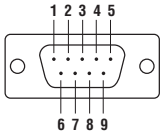
Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

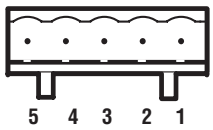
Pin Assignment

RS-232/422/485 DB9 male port



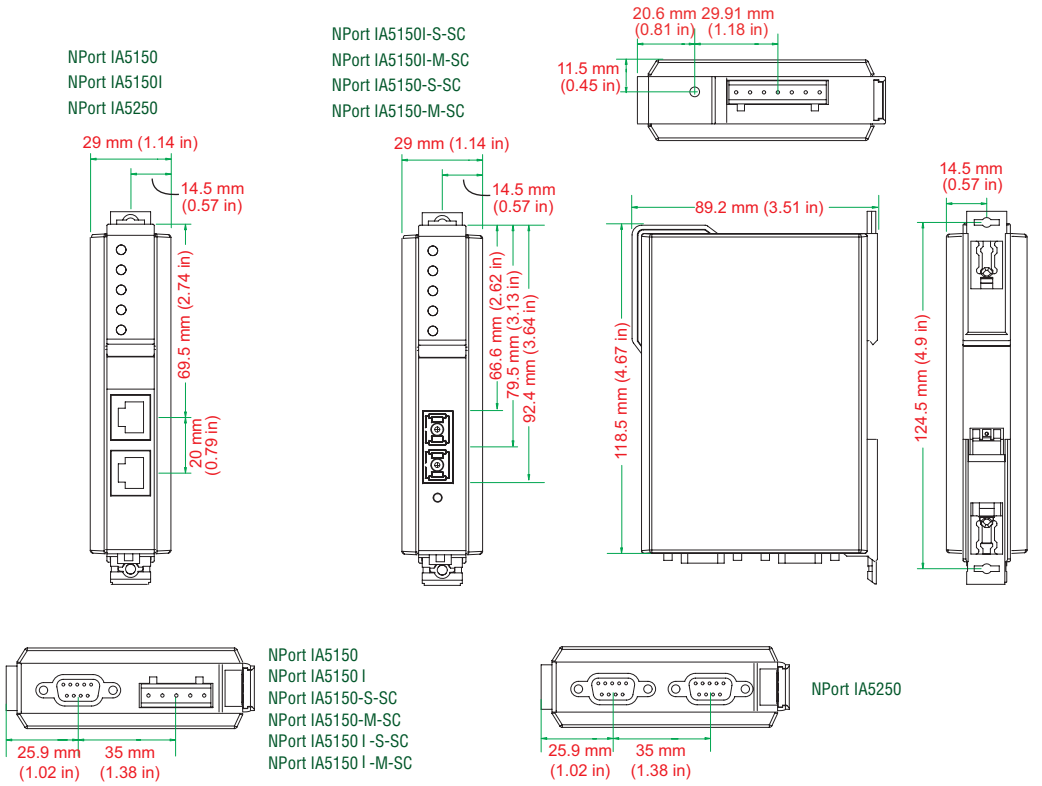
PIN	RS-232	RS-422/RS-485-4w	RS-485-2W
1	DCD	TxD-(A)	–
2	RXD	TxD+(B)	–
3	TXD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

RS-422/485 Terminal Block Wiring



PIN	RS-422/RS-485-4w	RS-485-2w
1	TxD+(B)	–
2	TxD-(A)	–
3	RxD+(B)	Data+(B)
4	RxD-(A)	Data-(A)
5	GND	GND

Dimensions



Ordering Information

Available Models

NPort® IA5150: 1-port RS-232/422/485 device server with 2 10/100BaseT(X) ports (RJ45 connectors, single IP), 0 to 55°C operating temperature

NPort® IA5150I: 1-port RS-232/422/485 device server with 2 10/100BaseT(X) ports (RJ45 connectors, single IP) and 2 KV optical isolation, 0 to 55°C operating temperature

NPort® IA5150-M-SC: 1-port RS-232/422/485 device server with 1 100BaseF(X) multi-mode fiber port (SC connectors), 0 to 55°C operating temperature

NPort® IA5150I-M-SC: 1-port RS-232/422/485 device server with 1 100BaseF(X) multi-mode fiber port (SC connectors) and 2 KV optical isolation, 0 to 55°C operating temperature

NPort® IA5150-S-SC: 1-port RS-232/422/485 device server with 1 100BaseF(X) single-mode fiber port (SC connectors), 0 to 55°C operating temperature

NPort® IA5150I-S-SC: 1-port RS-232/422/485 device server with 1 100BaseF(X) single-mode fiber port (SC connectors) and 2 KV optical isolation, 0 to 55°C operating temperature

NPort® IA5250: 2-port RS-232/422/485 device server with 2 10/100BaseT(X) ports (RJ45 connectors, single IP), 0 to 55°C operating temperature

NPort® IA5150-T: 1-port RS-232/422/485 device server with 2 10/100BaseT(X) ports (RJ45 connectors, single IP), -40 to 75°C operating temperature

NPort® IA5150I-T: 1-port RS-232/422/485 device server with 2 10/100BaseT(X) ports (RJ45 connectors, single IP) and 2 KV optical isolation, -40 to 75°C operating temperature

NPort® IA5150-M-SC-T: 1-port RS-232/422/485 device server with 1 100BaseF(X) multi-mode fiber port (SC connectors), -40 to 75°C operating temperature

NPort® IA5150I-M-SC-T: 1-port RS-232/422/485 device server with 1 100BaseF(X) multi-mode fiber port (SC connectors) and 2 KV optical isolation, -40 to 75°C operating temperature

NPort® IA5150-S-SC-T: 1-port RS-232/422/485 device server with 1 100BaseF(X) single-mode fiber port (SC connectors), -40 to 75°C operating temperature

NPort® IA5150I-S-SC-T: 1-port RS-232/422/485 device server with 1 100BaseF(X) single-mode fiber port (SC connectors) and 2 KV optical isolation, -40 to 75°C operating temperature

NPort® IA5250-T: 2-port RS-232/422/485 device server with 2 10/100BaseT(X) ports (RJ45 connectors, single IP), -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

Optical Fiber Patch Cord: See page A-14

Terminal Block for RS-422/485 ports: See page A-7

Power Jack to Terminal Block Cable: See page A-7

Package Checklist

- NPort IA series device server
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Coming Soon

MiiNePort E1 Series

10/100 Mbps embedded serial device servers

- Same size as an RJ45 connector—only 33.9 x 16.25 x 13.5 mm
- Extremely low power consumption—only 160 mA @ 3.3 VDC input
- Uses the MiiNe, Moxa's second generation SoC
- NetEZ technology makes integration incredibly easy
- Versatile choice of operation modes: Real COM, RFC2217, TCP Server, TCP Client, UDP, and Modem

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

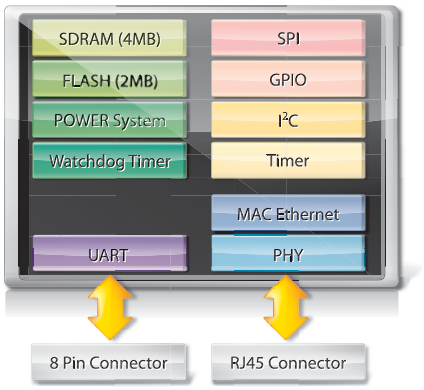
Overview

Moxa's MiiNePort E1 embedded device servers are designed for manufacturers who want to add sophisticated network connectivity to their serial devices with minimal integration effort. The MiiNePort E1 is empowered by the MiiNe, Moxa's second generation SoC, which supports 10/100 Mbps Ethernet, up to 921.6 Kbps serial baudrate, a versatile selection of ready-to-use operation modes, and requires only a small amount of power. By using Moxa's innovative NetEZ technology, the MiiNePort E1 can be used to convert any device with a standard serial interface to an Ethernet enabled device in no time. In addition, the MiiNePort E1 is the size of an RJ45 connector, making it easy to fit into virtually any existing serial device.

The MiiNe—Moxa's 2nd Generation SoC

The MiiNe was created to provide manufacturers with a competitive embedded serial-to-Ethernet solution. The MiiNePort E1, which uses the MiiNe for its SoC, is one of the world's tiniest embedded device servers, and has the lowest power consumption of any similar product. The MiiNe has the following features:

- Designed for 1 or 2-port serial-to-Ethernet applications
- Uses a 32-bit ARM 7 core
- Uses Moxa's own advanced UART technology
- Has 2 MB Flash and 4 MB SDRAM memory built in

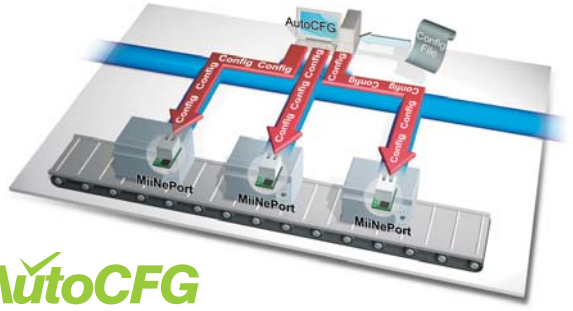


NetEZ Technology

Moxa's NetEZ technology gives serial device manufacturers a range of powerful tools for integrating Ethernet capability into serial devices:

- SCM: The MiiNePort E1's Serial Command Mode (SCM) enables the device's main system to reset the network and configure both serial and Ethernet settings. This is done using simple command frame format, and provides the convenience of being able to easily configure the network settings at anytime.
- AutoCFG: The MiiNePort E1 supports AutoCFG, which provides an effortless way of configuring network settings of many devices during mass production.

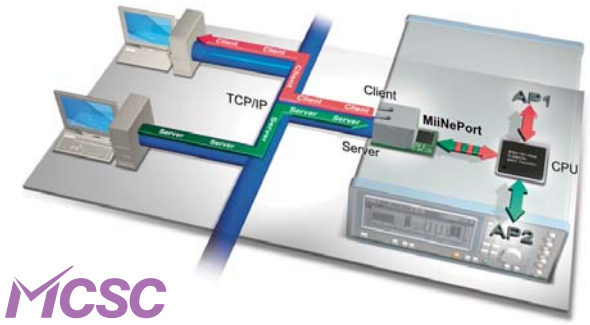
SCM



AutoCFG

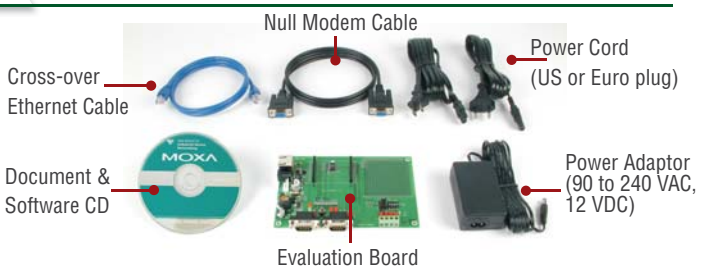
- MCSC: In some special circumstances, device end-users need the device to be in Server mode and Client mode at the same time, which requires that the embedded device server support multi-channel communication. The MiiNePort E1's Multi-Channel Serial Communication (MCSC) feature uses a clever software solution to provide the device with multi-channel functionality.

Moxa's NetEZ technology makes the MiiNePort E1 the world's most user-friendly embedded device server by promising ease-of-use with minimal integration work required.

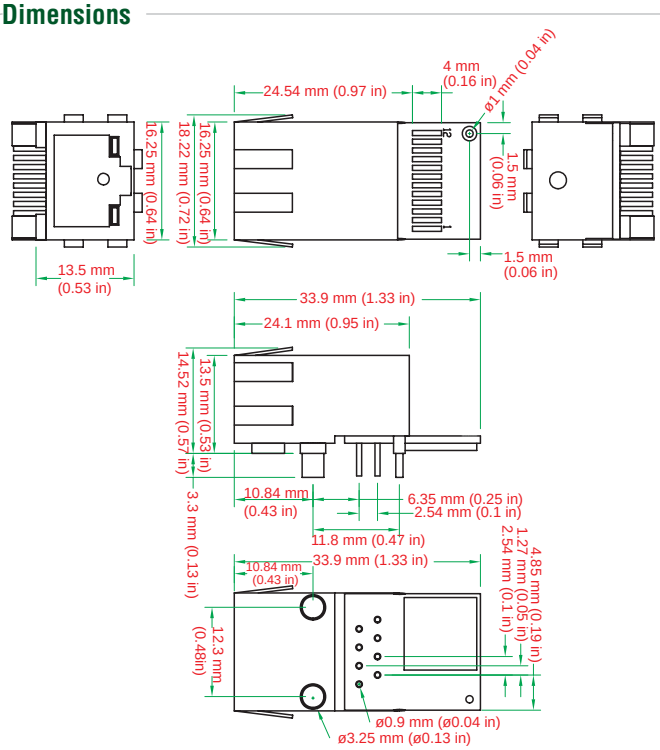


MiiNePort E1 Starter Kit

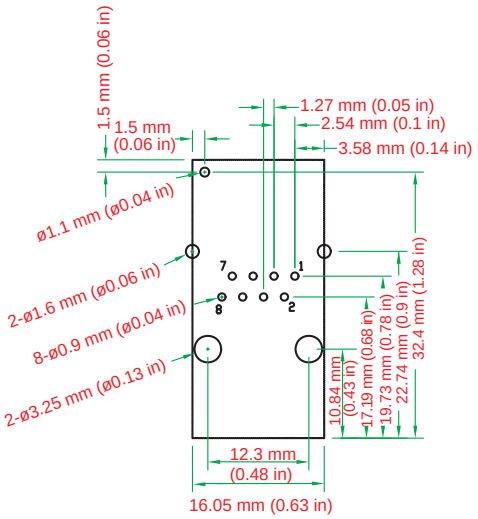
The MiiNePort E1 Starter Kit includes the MiiNePort E1 module, an evaluation board, power adaptor, software, and serial and Ethernet cables to allow quick and easy evaluation of all embedded device server functions. The evaluation board is equipped with serial, Ethernet, digital I/O, and power circuits to help you test your MiiNePort E1 modules and applications.



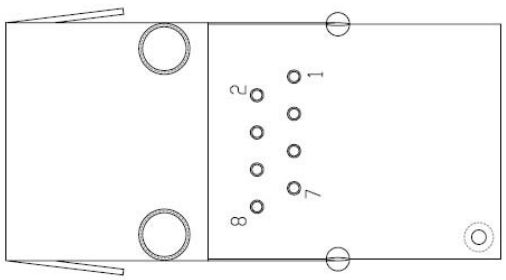
Dimensions



Recommended PC Board Layout



Pin Assignment



Pin	Function	Pin	Function
1	GND	5	Data In
2	VCC	6	Ready/RTS[a]
3	Reset	7	DIO[b]
4	Data Out	8	CTS[c]

a. Pin 6 can be configured as Ready/RTS (Request to Send), Ready/DO, or RS-485 Tx Enabled (default is Ready/RTS)
b. Pin 7 can be configured as DIO, Modem Control Out, RS-485 Tx Enable, or Reset to Default (default is DIO)
c. Pin 8 can be configured as CTS (Clear to Send), DI, or Modem Control In (default is CTS)

Specifications

Form Factor

Type: Drop-in module

Dimensions: 33.9 x 16.25 x 13.5 mm (13.35 x 6.4 x 5.31 in)

Weight: 9 g

System Information

CPU: 32-bit ARM 7 Core

RAM: 4 MB built in

Flash: 2 MB built in

Ethernet Interface

Number of Ports: 1

Speed: 10/100 Mbps, auto MDI/MDIX

Connector: RJ45 (with magnetics)

Magnetic Isolation Protection: 1.5 KV built-in

LEDs: 10BASE-T & 100BASE-TX Link Activity, Fault/In-Use

Serial Interface

Number of Ports: 1

Transmission Format: Standard TTL

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

Baudrate: 50 bps to 230.4 Kbps* (supports non-standard baudrates)

* Baudrates up to 921.6 Kbps available by request

Serial Signals

TTL: TxD, RxD, RTS, CTS, RST (reset circuit), GND

Digital I/O Pins

GPIO: 3 programmable I/O pins (1 DO, 1 DI, 1 DI/O)

Software

Network Protocols: ICMP, ARP, IP, TCP, UDP, DHCP, HTTP, SNMP V1/V2c, SMTP, TFTP, Auto IP, Telnet, BOOTP

Configuration Options: Web Console, Serial Console (Serial Command Mode), Telnet Console, Windows Utility

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x

Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Operation Modes: TCP Server, TCP Client, UDP, Real COM mode, Modem Mode, RFC2217

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: 3.3 VDC (±5%)

Power Consumption: 160 mA @ 3.3 VDC max.

Regulatory Approvals

EMC:

- Radiated & conducted emissions: Complies with Class B limits of EN55022:1998
- Direct & Indirect ESD: Complies with EN55024:1998
- Electrical Fast Transient/Burst Immunity: Complies with EN55024:1998
- Power Frequency Magnetic Field Immunity: Complies with EN55024:1998

Shock: 500 g's for non-operational shock

Vibration: 20 g's for non-operational vibration

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Ordering Information

Available Modules

MiiNePort E1: Embedded device server module for TTL devices supporting 10/100BaseT(x) with RJ45 connector, 0 to 55°C operating temperature

MiiNePort E1-T: Embedded device server module for TTL devices supporting 10/100BaseT(x) with RJ45 connector, -40 to 75°C operating temperature

Available Starter Kits

MiiNePort E1-ST: Starter kit for the MiiNePort E1 Series

Package Checklist (modules)

- MiiNePort E1 Series module

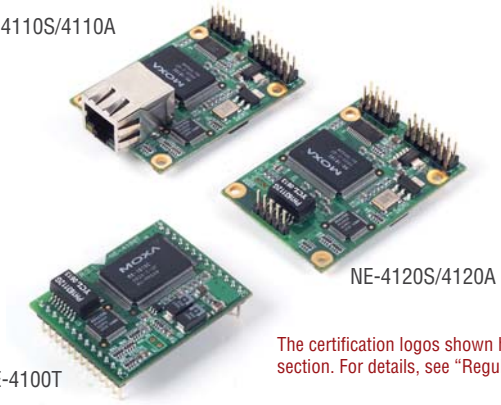
Package Checklist (starter kits)

- MiiNePort E1 module
- MiiNePort E1-ST evaluation board
- Universal power adaptor
- 2 power cords
- Null modem cable
- Cross-over Ethernet cable
- Document and Software CD
- Quick Installation Guide
- Warranty Card

NE-4100 Series

10/100 Mbps embedded serial device servers

NE-4110S/4110A



NE-4120S/4120A

NE-4100T

- 10/100 Mbps Ethernet interface
- Up to 230.4 Kbps baudrate support
- Choice of operation modes: Real COM, TCP Server, TCP Client, and UDP
- DHCP, BootP, Static IP, and ARP supported
- SNMP and e-mail alerts for event trapping and notification
- Half the size of a credit card—only 57 × 40 mm
- Low power consumption at 1.5W, with single +5V input

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

Moxa's NE-4100 embedded device servers are designed for manufacturers who want to add sophisticated network connectivity to their serial devices. Moxa's embedded device servers can be used to convert any device with a standard serial interface to an Ethernet-enabled device in no time. The NE-4100 embedded device servers support 10/100 Mbps Ethernet, and provide ready-to-use operation modes, including TCP Server, TCP Client, and UDP. In addition, a Real COM driver is included for backward compatibility with legacy software.

SNMP and E-mail Alerts for Event Trap and Notification

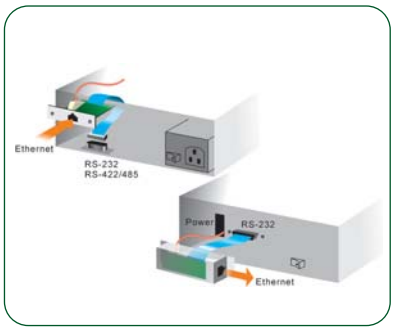
NE-4100 embedded device servers can be configured to send an SNMP trap or e-mail under the following conditions:

- Cold/warm start
- Password authentication failure
- Change in DSR/DCD line signal
- Change in IP address
- Change in password

On-site Configuration with Serial Command Mode

- Easy on-site configuration of network settings
- Simple command frame format
- Comprehensive command set for serial and network configuration
- Easily switch between software and hardware triggers
- Software reset

Typical Installation Examples



NE-4110: RJ45 Ethernet connector in stand-alone form factor

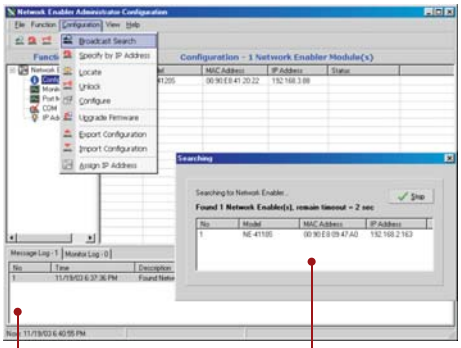
NE-4120: Pin-header Ethernet in stand-alone form factor

NE-4100T: Dual-in-line pin header in drop-in form factor

Powerful, User-friendly Utilities

Web-based Configuration

NE-4100 embedded device servers can be configured with the web console, which can be accessed from the web browser of any networked computer.



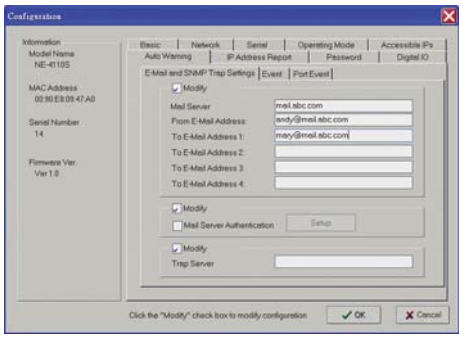
System log for cold boot, warm boot, etc.

Search for installed embedded device servers

Configure and manage embedded device servers with Moxa's Windows Utility

Network Enabler Administrator is a powerful, Windows-based configuration and management tool for NE-4100 embedded device servers. With Network Enabler Administrator, users can modify IP addresses, update communication parameters, and configure all other settings over the network. This utility has the following useful features:

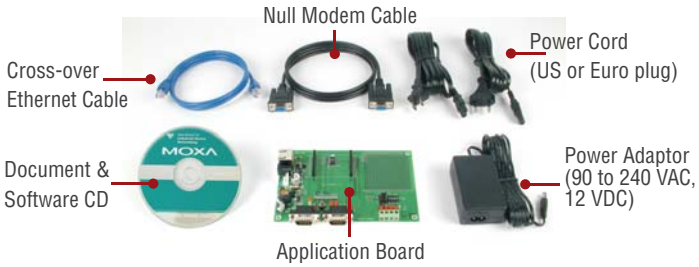
- Search your LAN for embedded device servers
- Export and import configuration parameters
- Upgrade firmware over the network
- Remotely monitor data traffic, serial line status, and TCP/IP connections
- Configure SNMP and e-mail alerts



Remotely configure serial, network, alarm, and other parameters

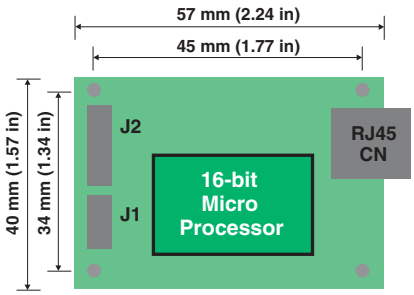
NE-4100 Starter Kit

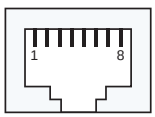
The Network Enabler Starter Kit includes an evaluation board, power adaptor, software, and serial and Ethernet cables to allow quick and easy evaluation of all embedded device server functions. The evaluation board is equipped with serial, Ethernet, digital I/O, and power circuits to help you test your modules and applications.



Dimensions and Pin Assignment

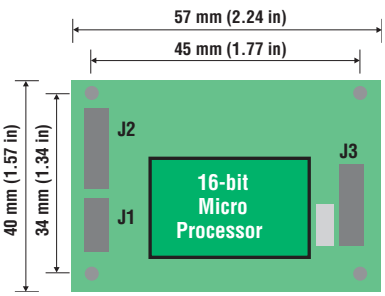
NE-4110S/4110A





PIN	Signals
1	Tx+
2	Tx-
3	Rx+
6	Rx-

NE-4120S/4120A



J3

Ethernet Pin-header

1	Tx+
2	Tx-
3	
4	Rx+
5	Rx-

NE-4110/4120 Series

J2

GND	14	13	VCC(+5V)
GND	12	11	VCC(+5V)
DIO0	10	9	10M_LED
DIO1	8	7	100M_LED
DIO2	6	5	Ready_LED
DIO3	4	3	Reset
TxD1	2	1	RxD1

NE-4110S/4120S

J1

NC	10	9	NC
CTS0	8	7	RTS0
DSR0	6	5	GND
DTR0	4	3	TxD0
RxD0	2	1	DCD0

NE-4110A/4120A

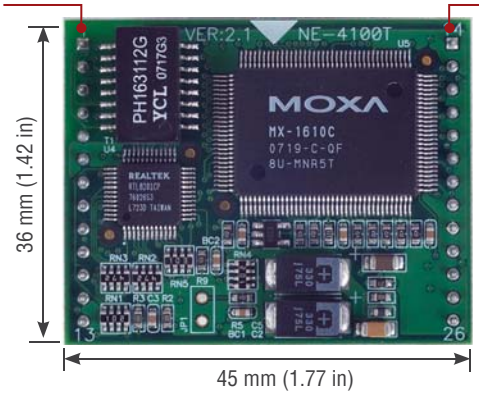
J1

NC	10	9	NC
NC	8	7	NC
NC	6	5	GND
RxD- (Data-)	4	3	RxD+ (Data+)
TxD+	2	1	TxD-

For 2-wire RS-485 mode, Pin 3 is Data+, Pin 4 is Data-

NE-4110T

Pin No.	Signal
1	ETx+
2	ETx-
3	ERx+
4	ERx-
5	LED 10M
6	TxD0
7	RxD0
8	RTS0
9	CTS0
10	Reset
11	GND
12	GND
13	TxD1



Pin No.	Signal
14	PIO0
15	PIO1
16	PIO2
17	PIO3
18	LED 100M
19	DCD0
20	DSR0
21	DTR0
22	GND
23	Ready LED
24	+5V
25	+5V
26	RxD1

(45 × 36 mm, 26-pin DIL package, 2.54 mm pitch)

Specifications

Form Factor

Type:
NE-4110/4120: Ready-to-go stand-alone modules
NE-4100T: 26-pin dual-in-line package

Dimensions:
NE-4110/4120: 57 × 40 mm (2.24 x 1.57 in)
NE-4100T: 45 × 36 mm (1.77 x 1.42 in)

Weight:
NE-4110S/4110A: 40 g
NE-4120S/4120A/4100T: 20 g

Ethernet Interface

Number of Ports: 1

Speed: 10/100 Mbps, auto MDI/MDIX

Connector:
NE-4110 Series: RJ45
NE-4120 Series: 5-pin pin header
NE-4100T: 26-pin dual-in-line

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Number of Ports: 2

Serial Standards:
Port 1:
NE-4110S/4120S: RS-232
NE-4110A/4120A: RS-422, RS-485-4w, RS-485-2w
NE-4100T: TTL
Port 2:
TTL console port

RS-485 Flow Control: ADDC® (automatic data direction control)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: DSR/DTR and RTS/CTS (RS-232 only), XON/XOFF

Baudrate: 110 bps to 230.4 Kbps

Serial Signals

TTL:
Port 1: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
Port 2: TxD, RxD, GND

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: Tx+, Tx-, Rx+, Rx-, GND

RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND

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

Digital I/O Pins

GPIO: 4 programmable I/O pins

Software

Network Protocols: ICMP, ARP, IP, TCP, UDP, DHCP, Telnet, HTTP, SNMP V1/V2c, SMTP

Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Operation Modes: Real COM, TCP Server, TCP Client, UDP

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 70°C (-4 to 158°F)

Power Requirements

Input Voltage: 5 VDC (±5%)

Power Consumption: 290 mA @ 5 VDC max.

Regulatory Approvals

EMC: CE EN55022 Class A, FCC Part 15 Subpart B Class A

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (meantime between failures):
NE-4100T: 288173 hrs
NE-4110A: 289573 hrs
NE-4110S: 290276 hrs
NE-4120A: 289573 hrs
NE-4120S: 285874 hrs

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Ordering Information

Available Modules

NE-4110S: Device server module for RS-232 devices, supports 10/100BaseT(x) with RJ45 connector

NE-4110A: Device server module for RS-422/485 devices, supports 10/100BaseT(x) with RJ45 connector

NE-4120S: Device server module for RS-232 devices, supports 10/100BaseT(x) with 5-pin Ethernet pin header

NE-4120A: Device server module for RS-422/485 devices, supports 10/100BaseT(x) with 5-pin Ethernet pin header

NE-4100T: Device server module for TTL devices, supports 10/100BaseT(x) with DIL package

Available Starter Kits

NE-4110-ST: Starter kit for the NE-4110S and NE-4110A

NE-4120-ST: Starter kit for the NE-4120S and NE-4120A

NE-4100-ST: Starter kit for the NE-4100T

Package Checklist (modules)

- NE-4100 series module

Package Checklist (starter kits)

- NE-4100-ST or NE-4110-ST or NE-4120-ST evaluation board
- Universal power adaptor
- 2 power cords
- Null modem cable
- Cross-over Ethernet cable
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

WE-2100T Series

Wireless LAN embedded serial device servers

- Connects serial devices to IEEE 802.11a/b/g networks
- Choice of operation modes: Real COM, TCP Server, TCP Client, UDP, and RFC2217
- Windows (including Vista!) real COM and Linux fixed TTY drivers provided
- Wireless security with WEP, WPA, and WPA2
- Select any baudrate between 50 bps and 921.6 Kbps
- 9 programmable digital I/O channels
- SSL/SSH encryption for configuration
- Compact size and easily mounted housing

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The WE-2100T is a secure and compact embedded wireless module for connecting serial devices to access points in infrastructure mode, or to other WE-2100T's in ad-hoc mode. When using the WE-2100T, complex RF know-how is not needed to connect serial devices to a wireless Ethernet network. Encryption for secure data transfer is supported, along with the 802.11a/b/g radio specifications.

Operation Modes for Embedded Applications

The WE-2100T supports Real COM, TCP Server, TCP Client, UDP, and RFC 2217 operation modes, which are designed to fulfill the requirements of embedded module applications. Complete driver support for Real COM mode is included and easy to install.

On-site Configuration with Serial Command Mode

- Easy on-site configuration of network settings
- Simple command frame format
- Comprehensive command set for serial and network configuration
- Easily switch between software and hardware triggers
- Software reset

Specifications

Form Factor

Type: Small metal housing that encloses advanced ARM-based 32-bit processor; supports both wireless and Ethernet connections

Dimensions: 54 x 40 x 13.3 mm (2.13 x 1.57 x 0.52 in)

Weight: 100 g

Automatic Network Selection

Wireless or Ethernet: The WE-2100T will activate the Ethernet connection if detected at boot-up. If an Ethernet connection is not detected, the WE-2100T will choose wireless as the communication interface. Which interface to use can also be configured with the WE-2100T's configuration utilities.

Ethernet Interface

Number of Ports: 1

Speed: 10/100 Mbps, auto MDI/MDIX

Connector: 44-pin dual-in-line

Magnetic Isolation Protection: 1.5 KV built-in

WLAN Interface

Standard Compliance: IEEE 802.11a/b/g

Network Mode: Infrastructure mode (a/b/g), Ad-Hoc mode (b/g)

Spread Spectrum Technology: DSSS, CCK, OFDM

Transmit Power:
5.15 to 5.25 GHz: 15 dBm @ 6 Mbps; 12 dBm @ 54 Mbps 5.725 to 5.825 GHz: 15 dBm @ 6 Mbps; 12 dBm @ 54 Mbps
2.412 to 2.483 GHz: 17 dBm @ 6 Mbps; 15 dBm @ 54 Mbps
2.412 to 2.472 GHz: 18 dBm @ 1 to 11 Mbps

Receive Sensitivity:
5.15 to 5.25 GHz: 6 Mbps @ -90 dBm; 54 Mbps @ -72 dBm
5.725 to 5.825 GHz: 6 Mbps @ -89 dBm; 54 Mbps @ -72 dBm
2.412 to 2.483 GHz: 6 Mbps @ -90 dBm; 54 Mbps @ -73 dBm
2.412 to 2.472 GHz: 11 Mbps @ -87 dBm; 1 Mbps @ -94 dBm

Transmission Rate:
802.11a: 54 Mbps
802.11b: 11 Mbps
802.11g: 54 Mbps

Transmission Distance: Up to 100 meters (in open areas)

Wireless Security: AES, WEP 64/128-bit, WPA, WPA2, PSK, 802.11i

802.11i Authentication: TLS, PEAP/GTC, PEAP/MD5, PEAP/MSCHAPv2, TTLS/PAP, TTLS/CHAP, TTLS/MSCHAP, TTLS/MSCHAPv2, TTLS/EAP-MSCHAPv2, TTLS/EAP-GTC, TTLS/EAP-MD5, LEAP

Channels:
North America: CH1 to CH11, 5150-5825 MHz
Europe: CH1 to CH13, 5150-5875 MHz
Japan: CH1 to CH14, 5150-5350 MHz

Antenna Connector: Reverse SMA

Antenna Gain: 2 DBi

Serial Interface

Number of Ports: 1

Serial Standards:
Port 1: TTL
Port 2: TTL console port

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: DSR/DTR and RTS/CTS (RS-232 only), XON/XOFF

Baudrate: 50 bps to 921.6 Kbps (non-standard buadrates supported)

Serial Signals

TTL:
Port 1: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
Port 2: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP, SSH, HTTPS

Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility, Serial command mode (configured through the data port)

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Operation Modes: Real COM, TCP Server, TCP Client, UDP, RFC2217

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 70°C (-4 to 158°F)

Surface Temperature (at full baudrate of 921.6 Kbps)

Top Panel:
43.0°C, when air temp = 25°C
55.0°C, when air temp = 55°C

Bottom Panel:
44.5°C, when air temp = 25°C
67.0°C, when air temp = 55°C

Power Requirements

Input Voltage: 3.3 VDC (±5%)

Power Consumption:
921.6 Kbps (full speed): 540 mA
Idle: 190 mA
Ethernet mode: 670 mA
Inrush current: 2100 mA

Regulatory Approvals

EMC: CE (EN55022 and EN55024 Class A, ETSI EN 301 489-17, ETSI EN 301 489-1)

Safety: UL (UL60950-1), TÜV (EN60950-1)

EMI: FCC Part 15 (Subpart B Class A, Subpart C, Subpart E)

Radio: CE (ETSI EN 301 893, ETSI EN 300 328), ARIB RCR STD-33, ARIB STD-66

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

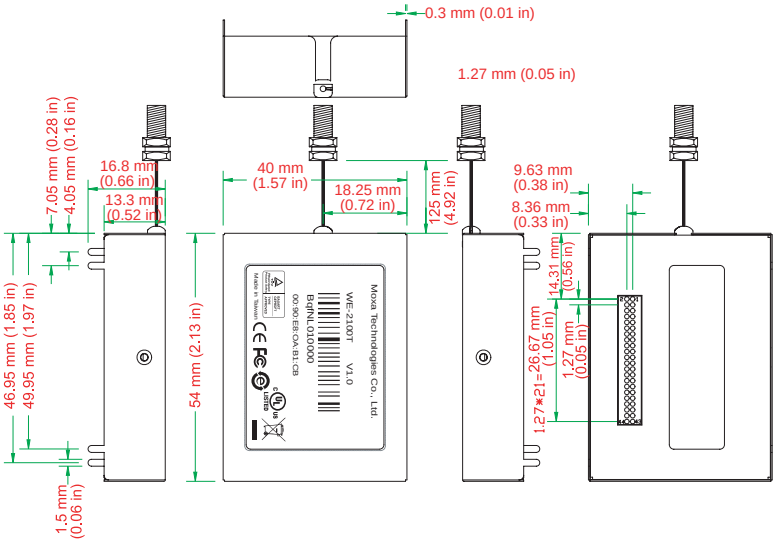
MTBF (meantime between failures):
WE-2100T: 505288 hrs

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions and Pin Assignment



3.3V	1	2	GND
3.3V	3	4	GND
3.3V	5	6	GND
Console_TxD	7	8	Console_RxD
Console_RTS	9	10	Console_CTS
Console_DTR	11	12	Console_DSR
PIO0	13	14	Console_DCD
PIO1	15	16	PIO4(WLAN strength 1)
PIO2	17	18	PIO5(WLAN strength 2)
PIO3	19	20	PIO6(WLAN strength 3)
Data_TxD	21	22	PIO7(WLAN strength 4)
Data_RTS	23	24	Data_RxD
Data_DTR	25	26	Data_CTS
Ready_LED	27	28	Data_DSR
Fault_LED	29	30	Data_DCD
Eth_Tx+	31	32	WLAN_Active_LED
Eth_Tx-	33	34	SW_RESET
Eth_Center_TAP	35	36	HW_RESET
Eth_Center_TAP	37	38	Eth_100M_LED
Eth_Rx+	39	40	Eth_10M_LED
Eth_Rx-	41	42	Reserved
PIO8(WLAN strength 0)	43	44	Reserved

Ordering Information

Available Modules

WE-2100T: 1-port wireless module supporting IEEE 802.11a/b/g

Available Starter Kits

WE-2100T-ST: Starter Kit for the WE-2100T

Package Checklist (module)

- WE-2100T wireless module
- IEEE 802.11a/b/g Antenna

Package Checklist (starter kit)

- WE-2100T-ST evaluation board
- WE-2100T wireless module
- Power adaptor
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card