NPort 4511

Hardware Installation Guide

Second Edition, April 2003

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Hardware Installation Guide for NPort 4511

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address: http://www.moxa.com

or

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1
Introduction

Welcome to Moxa NPort 4511 Programmable Communication Gateway, a compact palm-sized communications device that allows you to control RS-232/422/485 serial devices over a TCP/IP Ethernet.

This chapter is an introduction to NPort 4511 and includes the following sections:

- Features
- Product Specifications
- Package Checklist
- Front/Top/Rear Panel Views
- Schematic
- LED Indicators
- Housing
  - DIN-Rail
  - Wall Mount

NPort 4511 is a Programmable Communication Gateway (PCG) that provides a stable, second stage platform for System Integrators (SI) or large-scale customers to develop their own communication gateway functions and user interface.

The typical Communication Gateway (CG) is a special purpose server used to transform between the serial and Ethernet interfaces. Communication Gateways have one or more Ethernet port and one or more serial port, and are commonly referred to as serial-to-Ethernet devices. Their main purpose is to provide serial devices with a simple and straightforward means of connecting to an Ethernet network. In this way, can transparently connect to a network, and can make use of different types of transmission methods, including TCP Server, TCP Client, and UDP.

Moreover, PCG's most important function is to provide something that the typical CG does not have—second stage program development. This gives the developer more options for handling character streams, multipoint connections, and data storage functions. Depending on the kind of program you write, your PCG can be made into different types of Communication Gateway that can be used for different types of applications.

Features

- Auto-detecting 10/100 Mbps Ethernet connection
- Software selectable 3-in-1 RS-232/422/485 serial interface
- Convenient cigarette pack size for easy integration
- SDK Utility — convenient configuration/debug/download utility
- Supports easy development platforms: Turbo C 2.*x* / Borland C 3.*x*
- SDK Library that supports more than 100 function calls
- 64 KB of memory for program and data space
- 32 KB Flash ROM for data storage

Product Specifications

Hardware

Processor	16-bit CPU
Memory	512 KB DRAM, 512K Flash
Connector	Female DB9

Interface

LAN	Auto-detecting 100Base-TX (10/100 Mbps)
Serial	RS-232/422/485 (API selectable)
No. of network ports	1
No. of serial ports	1
Serial port signals	RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND RS-422: TxD+/-, RxD+/-, RTS+/-, CTS+/-, GND RS-485: Data+/-, GND

Performance

Serial speed	50 bps – 230.4 Kbps
No. of TCP connections	10 (by socket)

Configuration

Parity	None, Even, Odd, Space, Mark
Data bits	5, 6, 7, 8
Stop bits	1, 1.5, 2

IP Configuration

Static IP, DHCP Client, BootP

Management Utility

Yes, configuration and debugging tools

Management Platforms Supported

Windows XP/2000/NT, Windows 95/98/Me

Developing Platforms Supported

Windows XP/2000/NT, Windows 95/98/Me

Operation Modes

Developing Mode, Running Mode

Power and Environment

Power requirements	9 to 30 VDC, 300 mA (max.) at 9V 100 to 240 VAC, switching power adapter included (12 VDC, 400 mA)
Operating temp.	0 – 55°C
Operating humidity	5 – 95% RH
Dimensions (W×D×H)	including ears: 90 × 100.4 × 22 mm (3.54 × 3.95 × 0.87 in) without ears: 67 × 100.4 × 22 mm (2.64 × 3.95 × 08.7 in)
Gross weight	0.88 kg (1.94 lb)
Regulatory approvals	FCC, CE, UL, CUL, TÜV

Package Checklist—NPort 4511-ST

OEM Option

NPort 4511	1 NPort 4511 unit

Software CD

	Auto-Run Installation Shell
	Software Development Kit (SDK)
	User's Manuals
	Turbo C 2.01 installation package

Printed User's Manuals

	NPort 4511 Hardware Installation Guide
	NPort PCG Programmer's Guide
	NPort PCG API Reference

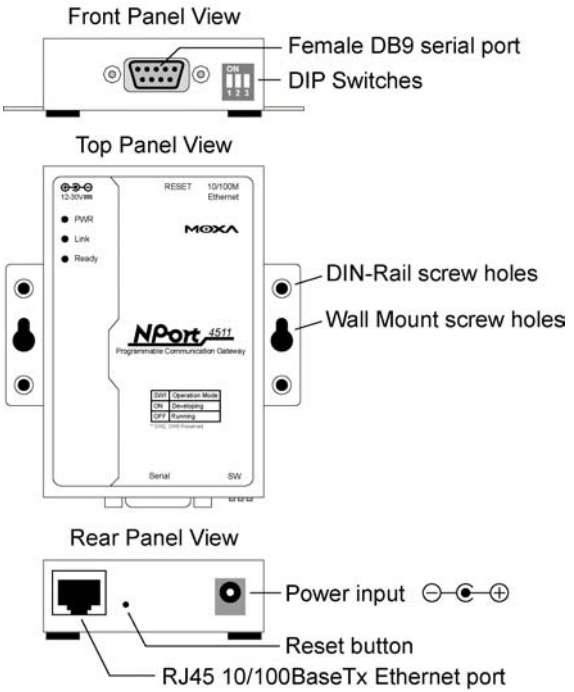
Optional Accessories

Power Adapter	100 – 240 VAC to 12 VDC 400 mA switching power adapter
Cable	150 cm DB9 (Male) to DB9 (Female) serial cable
	100 cm Ethernet cross-over cable
Connector	RS-232 Loopback testing header
	DB9 (Male) to Terminal Block connector
	DB9 (Male) mini adapter
DIN-Rail mounting kit	For 35 mm DIN-Rail (includes 4 screws)

Miscellaneous

	Moxa Product Warranty Booklet
	Turbo C License Card

Front/Top/Rear Panel Views



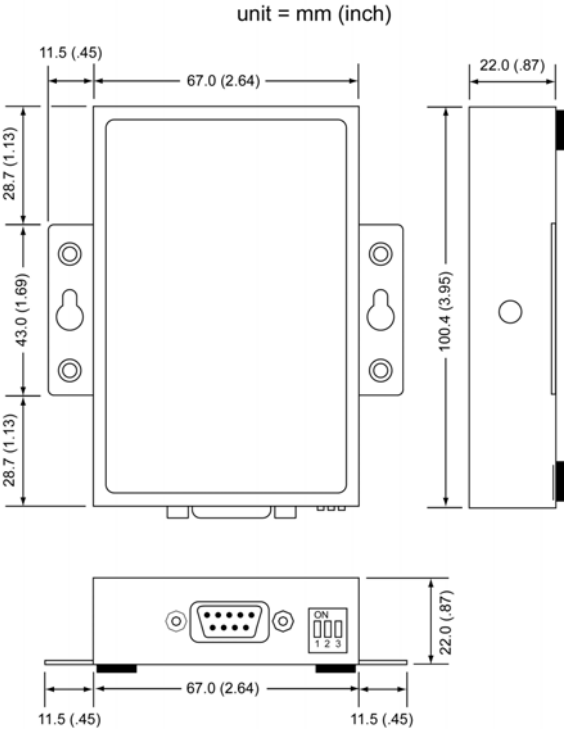
The reset button can be used in two different ways, so it requires further explanation.

To use the reset button, press continuously for:

a. **3 sec to erase the password**
After 3 sec, the ready LED will flash on/off every half second. Release the reset button at this time to erase password.

b. **10 sec to load factory defaults**
After 10 sec, the ready LED will flash on/off every fifth of a second. Release the reset button at this time to load factory defaults.

Schematic



LED Indicators

NPort 4511's top panel contains three LED indicators, as described in the following table.

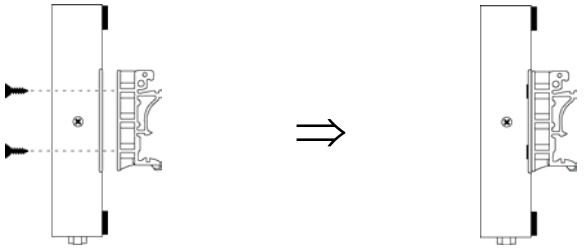
LED Name	LED Color	LED Function
PWR	red	Power is on
	off	Power is off, or power error condition exists
Link	orange	10 Mbps Ethernet connection
	green	100 Mbps Ethernet connection
	off	Ethernet cable is disconnected, or has a short
Ready	green	NPort 4511 system is ready
	off	NPort 4511 has malfunctioned (if PWR LED is on)

Housing

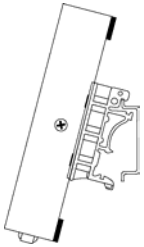
DIN-Rail

For many industrial applications, you will find it convenient to use the DIN-Rail attachments, as shown below.

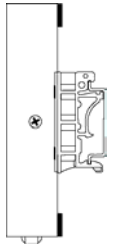
STEP 1: Use 2 screws per ear to attach DIN-Rail mounts to each of NPort 4511's two ears.



STEP 2:
Insert the top of the DIN-Rail into the top slot of the DIN-Rail mount.



STEP 3:
Push the bottom of NPort 4511 so that the bottom of the DIN-Rail snaps into the bottom slot of the DIN-Rail mount.



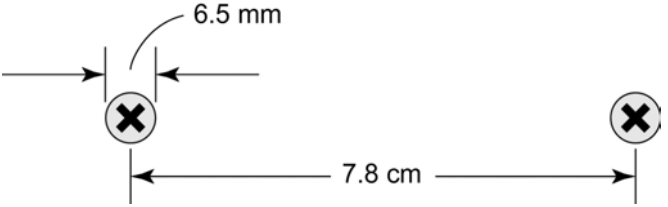
NOTE: The DIN-Rail mounting kit is an optional accessory.
To remove NPort 4511 from the DIN-Rail, simply reverse Steps 2 and 3 above by grasping the bottom of the NPort 4511 unit with both hands, and then using your fingers to pull down slightly on the bottom DIN-Rail mounts. This releases the bottom of the DIN-Rail from the DIN-Rail mount.

Wall Mount

For many industrial applications, you will find it convenient to mount NPort 4511 on the wall, using two screws, as indicated below.

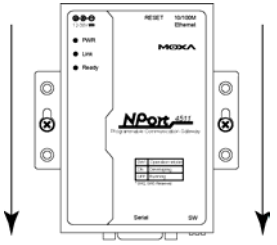
STEP 1:

Screw two screws, separated by 7.8 cm, into the wall. The heads of the screws should be no greater than 6.5 mm in diameter, and the shafts should be no greater than 3 mm in diameter. Do not screw the screws in all the way—leave a space of about 2 mm to allow room for sliding the NPort 4511 unit's ears between the wall and the screws.



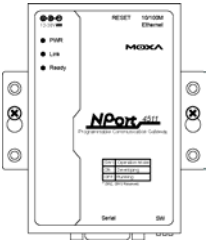
STEP 2:

Insert the two screw heads through the large parts of the keyhole shaped apertures, and then slide NPort 4511 downwards, as indicated.



STEP 3:

For added stability, simply tighten the two screws.



To remove NPort 4511 from the wall mount, simply reverse Steps 2 and 3.

2
Power Connection

We discuss the following topics in this chapter:

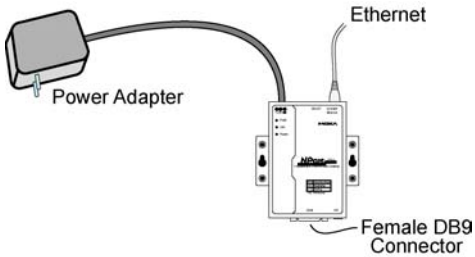
- Connecting the Power Adapter
- Power Status Check

Connecting the Power Adapter

Take the following steps to connect NPort 4511's power adapter.

1. Plug the power adapter's DC plug into NPort 4511's DC-IN jack.
2. Plug the power adapter into an electrical outlet.

Note that there is no on/off switch. The server turns on as soon as the connected power adapter is plugged into a live outlet. The red PWR light on NPort 4511's top panel will glow to indicate that it is receiving power.



Power Status Check

Use the PWR LED on NPort 4511's top panel to see if it is receiving power. A red light indicates that power is being received. The absence of a light indicates that power is not being received. If the unit is plugged in, then an unlit PWR LED indicates that something is wrong with the NPort 4511 unit's operation.

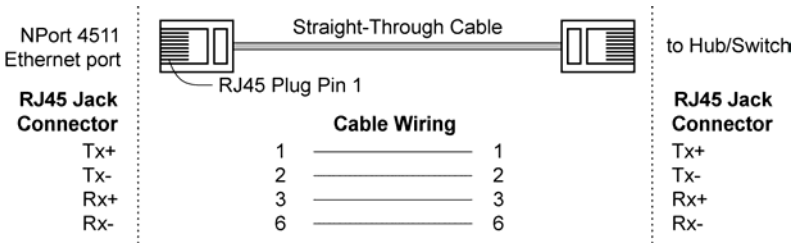
3
Ethernet Installation

We discuss the following topics in this chapter:

- Connecting to a Hub or Switch
- Connecting to a PC

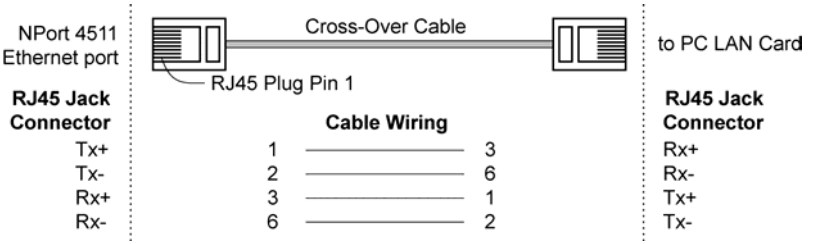
Connecting to a Hub or Switch

For most applications, you will simply plug one end of your Ethernet cable into NPort 4511's 10/100BaseTX port, and the other end into a Hub or Switch that is connected to your network. In this case, you should use a standard straight-through Ethernet cable, which is readily available from many commercial vendors. However, if necessary you can make your own cable by referring to the following cable wiring diagram.



Connecting to a PC

In some cases, such as when configuring NPort 4511 or downloading software, you may find it convenient to connect NPort 4511 directly to your computer's Ethernet card. To do this, you will need to use a cross-over Ethernet cable. This type of Ethernet cable is harder to find, although you can make your own cable by referring to the following cable wiring diagram.

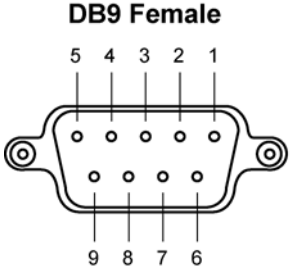


4
Serial Port Installation

In this chapter, we give the DB9 Female Connector Pinouts. The following topics are discussed:

- RS-232 Pinouts and Loopback Tester
- RS-422/485 Pinouts and RS-422 Loopback Tester
- Mini Adapter

RS-232 Pinouts and Loopback Tester



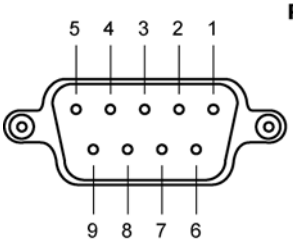
PIN	RS-232
1	DCD
2	TxD
3	RxD
4	DSR
5	GND
6	DTR
7	CTS
8	RTS
9	---

RS-232 Loopback Tester

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

RS-422/485 Pinouts and RS-422 Loopback Tester

DB9 Female



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

RS-422 Loopback Tester

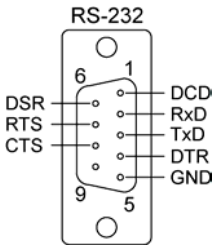
PIN	signal
1	RxD-(A)
2	RxD+(B)
3	TxD+(B)
4	TxD-(A)
5	GND
6	CTS-(A)
7	CTS+(B)
8	RTS+(B)
9	RTS-(A)

Loopback Header

NPort 4511 comes with an RS-232 loopback header as a standard accessory. The loopback header, which can be used to test NPort 4511's data transmission, connects the TxD pin to the RxD pin, the DSR pin to the DTR pin, and the CTS pin to the RTS pin (see the *RS-232 Pinouts and Loopback Tester* section above for the wiring diagram).

Mini Adapter

NPort 4511 was designed with a built-in D-shell female serial connector, which most serial devices also have. In order to make it easier for our customers to attach NPort 4511 to any serial device, a DB9 (male) to DB9 (male) mini null-modem adapter is included as a standard accessory with NPort 4511.

<table>
<tr>
<td> 
Null-Modem Adapter</td>
<td> 
Null-Modem Adapter and NPort 4511</td>
</tr>
<tr>
<td>After the mini adapter is attached, the pin assignments are as shown here →</td>
<td>DB9 Male
 
</td>
</tr>
</table>

Terminal Block

To ease wiring concerns, NPort 4511 now comes with a 9-pin terminal block as a standard accessory, as shown below. The terminal block has a Male DB9 connector that can be used in conjunction with the mini adapter to connect directly to NPort 4511 (note that the terminal block is wired pin-to-pin).

Another alternative is to use the Male DB9 to Female DB9 cable, included as a standard accessory, to easily connect NPort 4511 to the terminal block, as shown below.

5
Operation Mode Settings

To make full use of NPort 4511's hardware functions, you must first develop your own customized program to be downloaded to NPort 4511. This allows you to use NPort 4511 as a major component in your communications system. The program is developed on a PC with a Turbo C or Borland C development platform, and then downloaded to NPort 4511. NPort 4511's Developing Mode and Running Mode are designed to make this procedure as straightforward as possible.
Refer to the *NPort Programmable Communication Gateway Programmer's Guide* and *NPort PCG API Reference* for information on how to develop your NPort 4511 program.
In this chapter, we discuss the following topics related to NPort 4511's operation:

- DIP Switch Settings
- Operation Mode Introduction
  - Developing Mode
  - Running Mode

DIP Switch Settings

The top panel of NPort 4511 contains the following table, which shows how DIP switch 1 (SW1) is used to select NPort 4511's operation mode. SW1 is located on NPort 4511's front panel.

SW1	Operation Mode
ON	Developing
OFF	Running

Keep the following points in mind when setting the DIP switches.

- DIP Switch SW1 controls the function of NPort 4511's Operation Mode.
- DIP Switches SW2 and SW3 are not functional.

Operation Mode Introduction

NPort 4511's two Operation Modes are described in the following subsections.

Developing Mode

Developing Mode is used when configuring NPort 4511 and when developing and/or downloading a program. The following functions are available when NPort 4511 is in Developing Mode:

- Run/Stop NPort 4511's program manually for testing and debugging
- Configure NPort 4511
- Download a program
- Monitor program behavior
- Upgrade firmware

Running Mode

Running Mode is used during NPort 4511's normal operation. The following functions are available when NPort 4511 is in Running Mode:

- Activate a program automatically after NPort 4511 is powered on
- Configure NPort 4511
- Download a program
- Monitor program behavior
- Upgrade firmware

A

Declaration of Conformity

Manufacturer	Moxa Technologies Co., Ltd.
Manufacturer's Address	Fl.4, No.135, Lane 235, Pao-Chiao Rd., Shing Tien City, Taipei, Taiwan, R.O.C.

The manufacturer declares that this product conforms to the following standards:

Product Name	Programmable Communication Gateway
Model Number	NPort 4511
EMC	FCC Class B EN55022: 1998 class B EN61000-3-2: 1995 class B EN61000-3-3: 1995 EN55082-1:1997EN61000-4-2:1995 Contact Discharge: 4 KV Air Discharge: 8 KV EN61000-4-3: 1995 EN61000-4-4: 1995 AC/DC Power supply: 1 KV Data/Signal lines: 5 KV EN61000-4-5:1995 AC/DC Line to Line: 1 KV AC/DC Line to Earth: 2 KV EN61000-4-6: 1995 EN61000-4-8: 1993 3 A/m at 50 Hz EN61000-4-11: 1994
Safety	UL/CUL, TUV EN60950

B
Return Procedure

For product repair, exchange, or refund, the customer must:

- Provide evidence of original purchase.
- Obtain a Product Return Agreement (PRA) from the sales representative or dealer.
- Fill out the Problem Report Form (PRF). Include as much detail as possible for a shorter product repair time.
- Carefully pack the product in an anti-static package, and send it, pre-paid, to the dealer. The PRA should be visible on the outside of the package, and include a description of the problem, along with the return address and telephone number of a technical contact.

C

Problem Report Form

NPort 4511
Programmable Communication Gateway

Customer name:	
Company:	
Tel:	Fax:
Email:	Date:

1. Moxa Product:
   ☐ NPort 4511 (1 RS-232/422/485 port)
2. Interface:
   ☐ RS-232 ☐ RS-422 ☐ RS-485 (ADDC)
3. Serial Number: _____
4. NPort Firmware Version: _____
5. NPort Manager Version: _____
6. PC Host: Make _____
   Model _____
7. Problem Description: Please describe the symptoms as clearly as possible, including all error messages. Be complete, since we may need to follow your description to reproduce the symptoms.