NPort Express

Hardware Installation Guide

for DE-311

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NPort Express
Hardware Installation Guide for DE-311

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address: http://www.moxa.com

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Table of Contents

1
Introduction

Welcome to Moxa NPort Express, 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 Express and includes the following sections:

- Features
- Product Specifications
- Package Checklist
- Front/Top/Rear/Bottom Panel Views

NPort Express DE-311 provides a data communications solution for connecting Windows and Linux hosts to asynchronous serial devices over a TCP/IP Ethernet. You may connect your Windows 95/98/Me/NT/2000/XP host to a native RS-232/422/485 serial port, or your PC-based Linux host to a real tty port, through a TCP/IP Ethernet. With one asynchronous serial port connection on one end, and a 10/100 Mbps Ethernet connection on the other, NPort Express allows virtually any serial device to attach to a network. NPort Express works like an add-on single-port serial board to your PC server, but with one major advantage—the TCP/IP network. Since the host communicates with the COM port on NPort Express over a TCP/IP network, you are able to control your asynchronous serial device from virtually any location.

Although it connects through the virtual link of the Ethernet, the port on NPort Express is recognized as a real COM port by Windows or a real tty port by Linux. NPort Express provides both the basic transmit/receive data functions, as well as RTS, CTS, DTR, DSR, and DCD control signals.

NPort Express can be used with your existing applications that support serial communication, and comes with a utility program providing a simple step-by-step installation procedure and a maintenance wizard that gives you easy access to your asynchronous device.

Features

- ❑ Auto-detecting 10/100 Mbps Ethernet connection
- ❑ 3-in-1 RS-232/422/485 serial interface
- ❑ Convenient cigarette pack size for easy integration
- ❑ Supports MAC based IP configuration
- ❑ Supports configuration store and copy for easy deployment
- ❑ Supports Windows Real COM drivers and Linux real TTY drivers
- ❑ Built-in Ethernet and TCP/IP protocol supports TCP Server, TCP Client, UDP Server/Client, Ethernet Modem, and Pair connection operation modes

Product Specifications

Hardware

Processor	16 bit CPU
Memory	512 KB
Connector	Female DB9

Interface

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

Performance

Speed	50 bps – 230.4 Kbps

Configuration

DE-311

Parity	None, Even, Odd
Data bits	7, 8
Stop bits	1, 2 (with parity setting of None)

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

OS Supported

Windows XP, Windows 2000, Windows NT, Windows 95/98/Me Real COM driver, Unix fixed tty driver for UnixWare SVR4.2, UnixWare 7 SVR5, SCO Open Server, SCO Unix, Linux real tty driver

Protocols

TCP, IP, UDP, Telnet, RTelnet, DHCP, ICMP, BootP

Operation Modes

Driver Mode, TCP Server, TCP Client, UDP Server/Client, Ethernet Modem, Pair Connection

Management

Serial console
Telnet console
NPort Configurator for Windows/Linux
Real COM Installer for Windows
Monitor Utility for Windows
Firmware upgrade function supported
NPort Admin for Linux tty driver

Power and Environment

Power requirements	
DE-311	DC 9V to 20V, 400 mA (max.) at 9V
DE-311 Rev. 2	DC 9V to 30V, 300 mA (max.) at 9V
Operating temp.	0 – 55°C
Operating humidity	5 – 95% RH
Dimensions (W×D×H)	90 × 100.4 × 22 mm (including ears)
	67 × 100.4 × 22 mm (without ears)
Regulatory approvals	FCC, CE, UL, CUL, TÜV

Package Checklist

DE-311/110V	1 NPort Express DE-311 Universal Serial Device Server
DE-311/230V	1 NPort Express DE-311 Universal Serial Device Server

Both models include

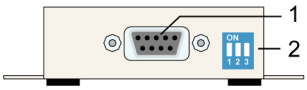
- Windows 95/98/ME/NT/2000/XP Real COM driver, Linux real tty driver
- NPort Management Suite software
- Power Adapter
- User's Manual, software CD-ROM
- Mini adapter DB9/M – DB9/M

Optional Accessories

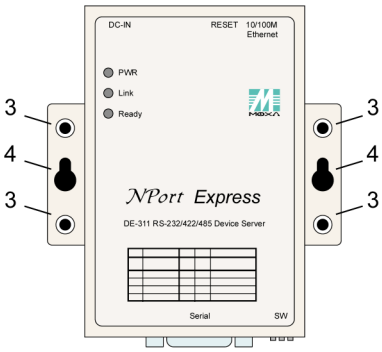
DIN Rail mounting kit	For 35 mm DIN Rail; includes 4 screws

Front/Top/Rear/Bottom Panel Views

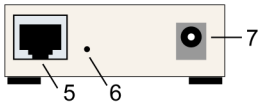
Front Panel View



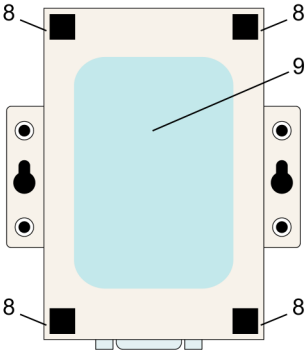
Top Panel View



Rear Panel View



Bottom Panel View



1. Female DB9 serial port
2. DIP Switches
3. DIN Rail screw holes
4. Wall mount screw holes
5. RJ45 10/100BaseTX Ethernet port
6. Reset button—press continuously for
   a. 3 sec to erase 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.
7. Power input ⊖—⊙—⊕
8. Rubber base pads
9. Technical information

2
Overview

This chapter includes:

- ❑ LED Indicators
- ❑ Housing
  - DIN Rail
  - Wall Mount

LED Indicators

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

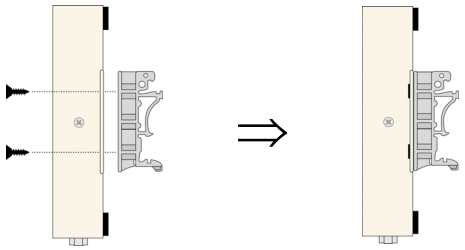
LED Name	LED Color	LED Function
PWR	red	Power is on
	off	Power is off, or power error condition exists
Link	orange	10 Mbps Ethernet connection
	green	100 Mbps Ethernet connection
	off	Ethernet cable is disconnected, or has a short
Ready	green	NPort Server system is ready
	blinking	NPort is requesting an IP address from the DHCP or BootP server. After receiving the IP, the LED will stop blinking. *Note: The LED will also blink when you press the reset button; see page 1-5 for details.*
	off	NPort Server has malfunctioned

Housing

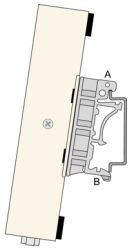
DIN Rail

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

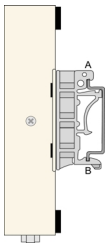
STEP 1: Use 2 screws per ear to attach DIN Rail mounts to each of NPort Express's two ears.



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



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



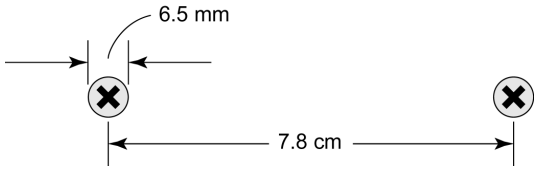
✎ *NOTE: The Din Rail mounting kit is an optional accessory.*

To remove NPort Express from the DIN Rail, simply reverse Steps 2 and 3 above by grasping the bottom of the NPort Express unit with both hands, and then using your fingers to pull down slightly on the DIN Rail mounts at slot B. This releases the bottom of the DIN Rail from the DIN Rail mount.

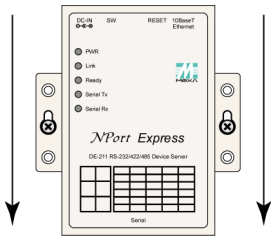
Wall Mount

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

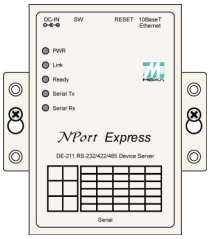
STEP 1: Screw two screws, separated by 7.8 cm, into the wall. The heads of the screws should be no greater than 6.5 mm in diameter, and the shafts should be no greater than 3 mm in diameter. Do not screw the screws in all the way—leave a space of about 2 mm to allow room for sliding the NPort Express 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 Express downwards, as indicated.



STEP 3: For added stability, simply tighten the two screws.



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

3

Serial Installation

We discuss the following topics:

- DIP Switch Settings
- DB9 Female Connector Pinouts

DIP Switch Settings

The top panel of NPort Express contains the following table, which describes how to set up the serial port using the three DIP switches—SW1, SW2, and SW3—located on NPort Express's rear panel.

SW1	Serial Connection	SW2	SW3	Serial Interface Mode
ON	Console (19200,N,8,1)	–	–	RS-232
OFF	Data Comm.	OFF	OFF	RS-232
		OFF	ON	RS-422
		ON	OFF	RS-485 by RTS
		ON	ON	RS-485 ADDC

Switch SW1 controls the function of the serial port (ON, or up, for RS-232 Console connection, and down for Data Communication, such as when NPort Express is connected to your serial device). Note that after changing the setting of SW1, NPort Express will reboot to initialize the new setting. You must wait a few seconds for the green Ready light to blink off and then on again, indicating that the function of the serial port has been changed.

Switches SW2 and SW3 control the serial port's data communication Interface Mode. (Note that RTS stands for *Ready To Send* and ADDC stands for *Automatic Data Direction Control*.)

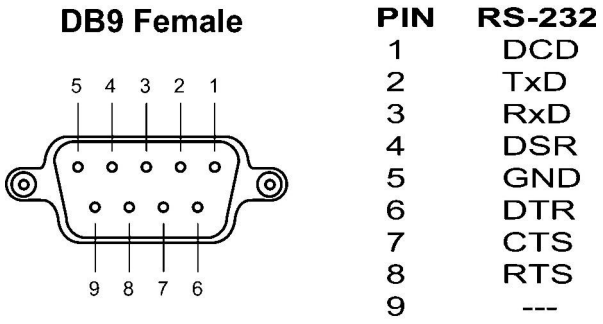
Keep the following points in mind when setting the DIP switches.

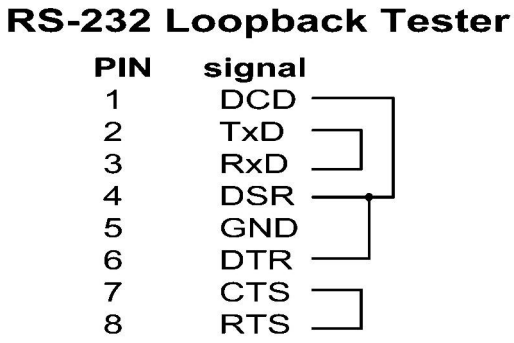
- **RS-232 Console**
  To use the serial port as a console connection, such as when using MOXA PComm Terminal Emulator or HyperTerminal, set SW1 to the ON position.

- **Telnet Connection**
  Some setup procedures can be carried out through a Telnet connection, during which data is transmitted through NPort Express's Ethernet port. However, you must set SW1 to the OFF position to establish a Telnet connection.

DB9 Female Connector Pinouts

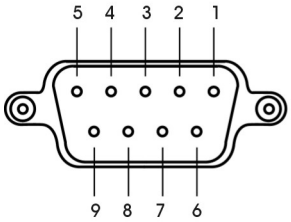
RS-232 Pinouts and Loopback Tester





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)	

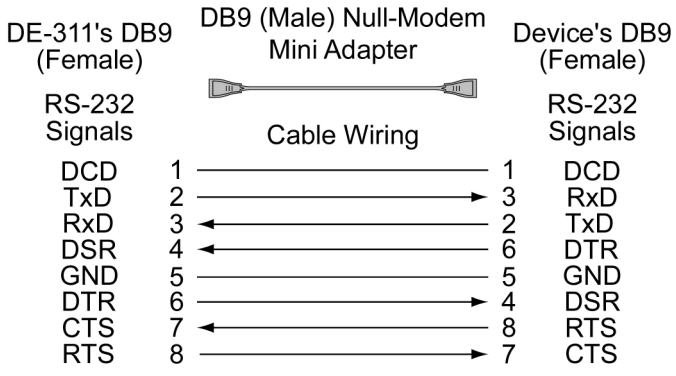
RS-422 Loopback Tester

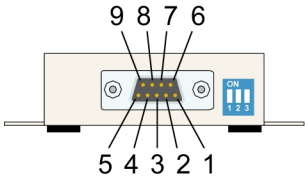
PIN	signal
1	RxD-(A)
2	RxD+(B)
3	TxD+(B)
4	TxD-(A)
5	GND
6	CTS-(A)
7	CTS+(B)
8	RTS+(B)
9	RTS-(A)

Mini Adapter

NPort Express DE-311 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 DE-311 to any serial device, a DB9 (Male) to DB9 (Male) mini null-modem adapter is included as a standard accessory with DE-311.

If you want to make your own DB9 male to DB9 male null-modem (or cross-over) cable, the correct pinouts are as follows:





Pin	RS-232	RS-422	RS-485
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)	

✎ *NOTE: The mini adapter is now included with DE-311 as a standard accessory.*

4
Ethernet Installation

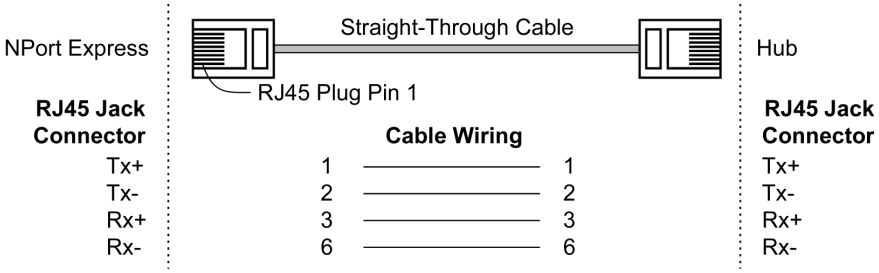
We discuss the following topics:

- ❑ Connecting to the Ethernet Port
  - Connecting to a Hub or Switch
  - Connecting to a PC

Connecting to the Ethernet Port

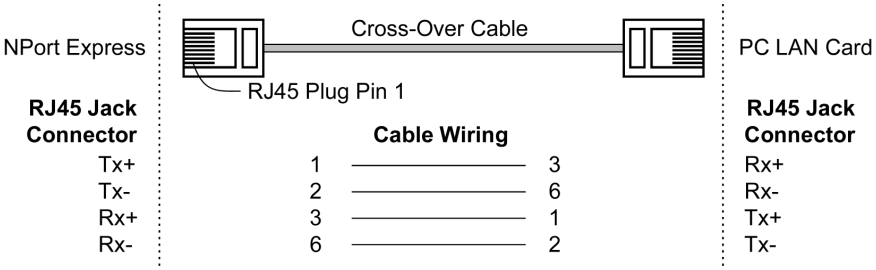
Connecting to a Hub or Switch

For most applications, you will simply plug one end of your Ethernet cable into NPort Express'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. If necessary however, 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 drivers and software, you will find it convenient to connect NPort Express 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.



5
Power Connection

We discuss the following topics:

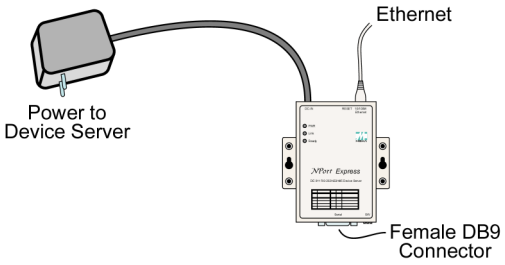
- ❑ Using the Power Adapter
- ❑ Power Status Check

Connecting the Power Adapter

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

1. Plug the power adapter's DC plug into NPort Express'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 Express's top panel will glow to indicate that it is receiving power.



Power Status Check

Use the PWR LED on NPort Express'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 shows that something is wrong with the NPort Express unit's operation.

A
Declaration of Conformity

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

declares that the product:

Product Name:	NPort Express
Model Number:	DE-311

conforms to the following standards:

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

B

Problem Report Form

NPort Express

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

1. Moxa Product: ☐ DE-311 (1 RS-232/422/485 port)

2. Interface: ☐ RS-232 ☐ RS-422 ☐ RS-485 (ADDC) ☐ RS-485 (by RTS)

3. Operation mode:

☐ Host Based ☐ Pair Connection

☐ Raw Connection (TCP Server) ☐ Raw Connection (TCP Client)

☐ UDP Server/Client ☐ Ethernet Modem

4. Serial Number: _____

5. NPort Firmware Version: _____

6. NPort Manager Version: _____

7. NPort Configurator Version: _____

8. PC Host: Make _____ Model _____

9. Your Installation Type: ☐ Single-Host ☐ Custom

10. 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.

C

Revision History

Document Edition	Revision Date	Revision Details
2nd	December 1, 2002	1. Moxa FTP site changed to Moxa website (Moxa Internet Services page). 2. Added a description of what it means when the Ready LED is blinking (p. 2-1)

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.