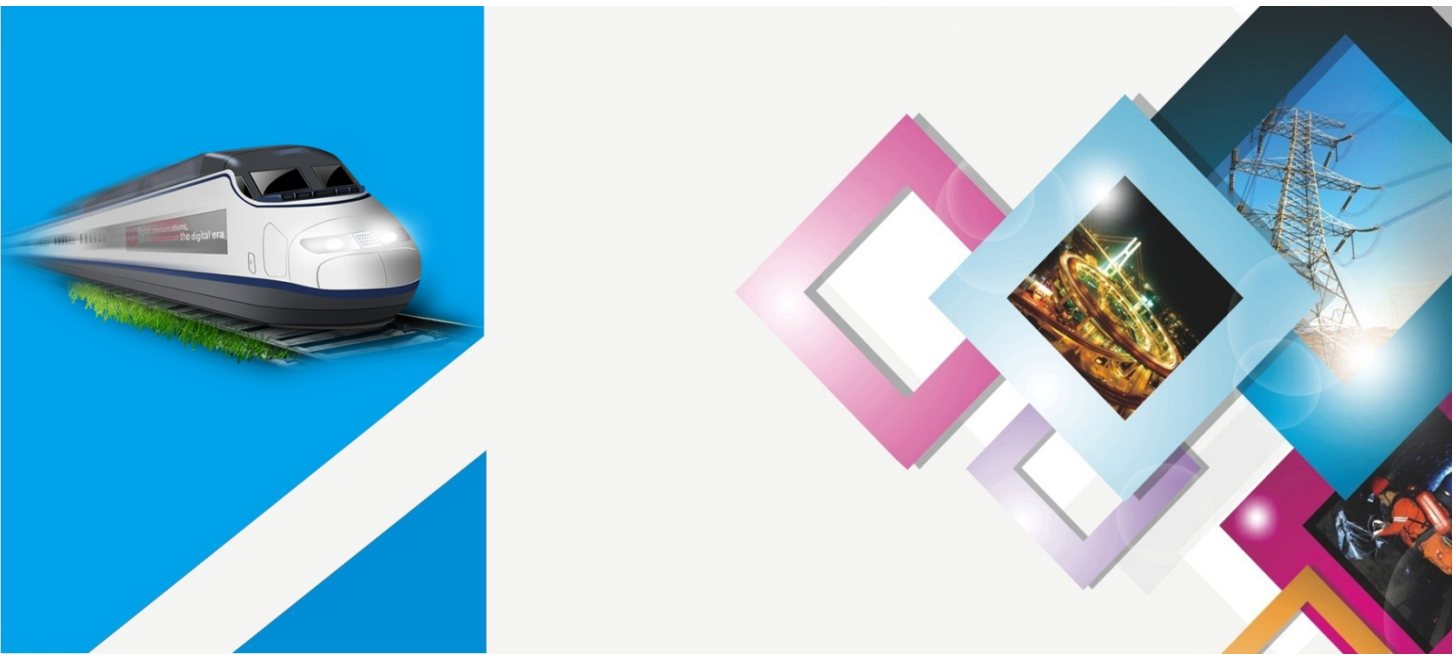
3onedata
Make network communication more reliable



NPM301

Embedded Serial Device Server Module

Hardware User Manual

Document Version: 03

Publication Date: Dec 28, 2017

Industrial Ethernet communication solutions experts **Shenzhen 3onedata Technology Co., Ltd.**

Copyright © 2017 3onedata Technology Co., Ltd. All rights reserved.

For this manual, all rights reserved by 3onedata Technology Co., Ltd. No company or individual is allowed to duplicate or translate this manual in any forms without written permission issued by 3onedata Technology Co., Ltd.

Trademark statement

3onedata Make network communication more reliable, 3onedata® and 3One data® is the registered trademark owned by Shenzhen 3onedata Technology Co., Ltd. And other trademarks mentioned in this manual belong to their corresponding companies.

Conventions Used in the Manual

Technical or printing errors might exist in the product or the instruction manual; therefore, Shenzhen 3onedata Technology Co., Ltd. reserves the right to change the manual entirely or partially with no advance notice required. 3onedata provides this document as is, without warranty of any kind, either expressed or implied, including, but not limited to, its particular purpose. Due to the improvement of the management software, the version of software that you are using might not be the latest or the perfect version. The manual is only for your reference, and please contact us if you have any questions.

3onedata
Make network communication more reliable



Shenzhen 3onedata Technology Co., Ltd.

Address:	3/B, Zone 1, Baiwangxin High Technology Industrial park, Nanshan District, Shenzhen, 518108 China
Tel:	+86-755-26702668
E-mail:	sales@3onedata.com
Fax:	+86-755-26703485
Website:	http://www.3onedata.com

Preface

The user manual describes the serial server module:

- Product features
- Hardware description

Audience

This manual applies to the following engineers:

- Network administrators
- Technical support engineers
- Hardware engineers

Conventions

Format	Description
“ ”	Words with the symbol “” mean that those are interface words. Fox example “Port number”.
>	Multiple paths are separated by the symbol ‘>’.
Light blue Font	Click light blue font to hyperlink The font color is as follows: ‘Light Blue’.
About This Chapter	The section ‘about this chapter’ provides links to various sections of this chapter, as well as links to the Principles Operations Section of this chapter.

Symbols

Format	Description
⚠ Notice	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.

Copyright © Shenzhen 3onedata Technology Co., Ltd.

Format	Description
 Warning	Ndicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 Note	Calls attention to important information, best practices and tips. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.
 Key	The tips of configuration and operation.

Revision History

Version No.	Date	Revision note
01	July 22, 2013	Layout Adjustment
02	October 1, 2013	Manual Maintenance
03	December 29,2017	Add password verification function

Copyright © Shenzhen 3onedata Technology Co., Ltd.

Contents

PREFACE 1
CONTENTS I
1 SUMMARIZE 1
1.1 INTRODUCTION 1
1.2 PRODUCTS FEATURES 1
2 PIN DEFINITIONS 3
2.1 PINOUT 3
2.2 PIN DESCRIPTION 4
2.3 ETHERNET INTERFACE DESCRIPTION 6
2.4 POWER INTERFACE DESCRIPTION 6
2.5 SERIAL PORT AND I/O PORT DESCRIPTION 6
2.6 LED PIN DESCRIPTION 7
2.7 OTHER PIN DESCRIPTION 7
3 EXTERIOR DIMENSIONS 9
4 PERFORMANCE AND PARAMETER 10

Copyright © Shenzhen 3onedata Technology Co., Ltd.

1 Summarize

1.1 Introduction

NPM301 is a multi-functional embedded Serial-to-Ethernet data converter device developed by Shenzhen 3onedata Technology Co., Ltd.; it integrates the TCP/IP protocol stack, which allows users to apply the network functions to their embedded devices easily without knowing the complex knowledge on network or TCP/IP protocols. It can save the expense on network interface and shorten the development period, further reduce the time to market and make the product more competitive to others. It supports TCP, UDP, ARP, ICMP, DHCP and Windows Native COM functions.

What's more, NPM301 serial devices server provides powerful management configuration tools based on Windows, guiding users' configuration of the devices step by step. All configurations can be done by network and serial port, supporting communication across gateway and router. In addition, it allows users to configurative flexibly IP address, Server or Client mode, size of packet, etc.

1.2 Products Features

- Adopt 32 bit ARM processor
- Support 3.3VDC TTL
- Support 10/100M self-adaptive Ethernet Interface
- Support ATUO MDI/MDIX, Support Baud rate between 300bps-115.2Kbps
- Support TCP, UDP, ARP, ICMP, HTTP and DHCP protocol
- Build-in WEB server, allowing users to configure their webpage easily

Copyright © Shenzhen 3onedata Technology Co., Ltd.

- Auto reconnection after a network break, ensure the reliable TCP connection for the whole network
- Support across gateway, router communication
- Compatible to SOCKET working modes (TCP Server, TCP Client, UDP and etc.)
- the upper layer machine software is written strictly following the SOCKET rules
- Support Windows serial interface driver mode
- Support Virtual serial driver access and auto connect once the network disconnect
- Support network and serial interface(AT) configuration mode
- Low consumption design
- Working temperature: -40～75℃

Copyright © Shenzhen 3onedata Technology Co., Ltd.

2 Pin Definitions

2.1 Pinout

Package pin diagram (top view)



The pin name of NPM301：

PIN NO.	Signal	PIN NO.	Signal
1	VCC	2	DTR
3	DSR	4	RTS/ 485EN
5	CTS	6	RXD
7	TXD	8	NC
9	RX-	10	RX+
11	TX+	12	TX-
13	ACT	14	LINK

Copyright © Shenzhen 3onedata Technology Co., Ltd.

PIN NO.	Signal	PIN NO.	Signal
15	NRESET	16	NC
17	NC	18	NC
19	NC	20	NC
21	DEF	22	NC
23	NC	24	COM_CFG
25	NC	26	NC
27	NC	28	GND

Note

Please leave the reserved pins unconnected in the design.

2.2 Pin description

NPM301 Pin description：

Pin NO.	Name	Type	Description
1	VCC	Input	VCC is an input power voltage pin, and its input voltage is 3.3VDC （±5%）
2	DTR	Output	Digital terminal equipment ready signal pins
3	DSR	Input	Digital communication device ready signal pin
4	RTS/ 485EN	Output	Equipment request signal pins（RS-232 full Duplex mode）; automatic direction control is implemented by the module(RS-485 half-duplex mode)
5	CTS	Input	Clear device sends a signal pin, when CTS is valid, set to work in full-duplex mode, the device sends clear signal (RS-232 full duplex), low level allowed to send.
6	RXD	Input	RXD is a serial signal input pin，0-5V TTL
7	TXD	Output	TXD is a serial signal output pin，3.3V TTL

Copyright © Shenzhen 3onedata Technology Co., Ltd.

Pin NO.	Name	Type	Description
8	NC		NC is the pin reserved for further use, this pin can be left unconnected
9	RX-	Input	Ethernet differential signal input negative
10	RX+	Input	Ethernet differential signal input positive
11	TX+	Output	Ethernet differential signal output negative
12	TX-	Output	Ethernet differential signal output positive
13	ACT	Output	ACT is an indication signal for Ethernet transmit/receive signal.
14	LINK	Output	LINK is an indication signal for Ethernet connection
15	NRESET	Input	RESET is an active low signal pin for device reset, a negative pulse that lasted over 200us on this pin can reset the device, since there are built-in power on reset circuit, this pin can be left unconnected
16	NC		NC is the pin reserved for further use, this pin can be left unconnected
17			
18			
19			
20			
21	DEF	Input	DEF is an active low signal pin for device recovery default factory, a negative pulse that lasted over 200us on this pin can recover the device default factory, since there are built-in power on reset circuit, this pin can be left unconnected
22	NC		NC is the pin reserved for further use, this pin can be left unconnected
23			
24	COM_CFG	Input	COM_CFG is an active low signal pin for device AT command mode, a negative pulse that lasted over 200us on this pin can

Copyright © Shenzhen 3onedata Technology Co., Ltd.

Pin NO.	Name	Type	Description
			access the device AT command mode. It is a serial configuration controller pin. When it is high or unconnected, the device will run in the normal working mode; and when it is low the device will run in the serial configuration mode.
25	NC		NC is the pin reserved for further use, this pin can be left unconnected
26			
27			
28	GND		GND is a power ground pin

2.3 Ethernet interface description

Name	Pin NO.	Type	Description
TX+	11	Output	Ethernet differential signal output negative
TX-	12	Output	Ethernet differential signal output positive
RX+	10	Input	Ethernet differential signal input positive
RX-	9	Input	Ethernet differential signal input negative

2.4 Power interface description

Name	Pin NO.	Type	Description
VCC	1	Input	VCC is an input power voltage pin, and its input voltage is 3.3VDC （±5%）

2.5 Serial port and I/O port description

Name	Pin NO.	Type	Description

Copyright © Shenzhen 3onedata Technology Co., Ltd.

Name	Pin NO.	Type	Description
TXD	7	Output	TXD is a serial signal output pin，3.3V TTL
RXD	6	Input	RXD is a serial signal input pin，0-5V TTL
RTS/ 485EN	4	Output	Equipment request signal pins（RS-232 full Duplex mode）; automatic direction control is implemented by the module(RS-485 half-duplex mode)
CTS	5	Input	Clear device sends a signal pin, when CTS is valid, set to work in full-duplex mode, the device sends clear signal (RS-232 full duplex), low level allowed to send.
DTR	2	Output	Digital terminal equipment ready signal pins
DSR	3	Input	Digital communication device ready signal pin


Warning

NPM301 all serial port and I/O port are satisfied with the TTL level standard (can be directly connected to the MAX485, MAX232 and other interface chips). The I/O port can be used as the output and can be used as input. The maximum driving capacity of each I/O port is 25mA.

2.6 LED pin description

Name	Pin NO.	Type	Description
ACT	13	Output	ACT is an indication signal for Ethernet transmit/receive signal.
LINK	14	Output	LINK is an indication signal for Ethernet connection

2.7 Other pin description

Name	Pin NO.	Type	Description

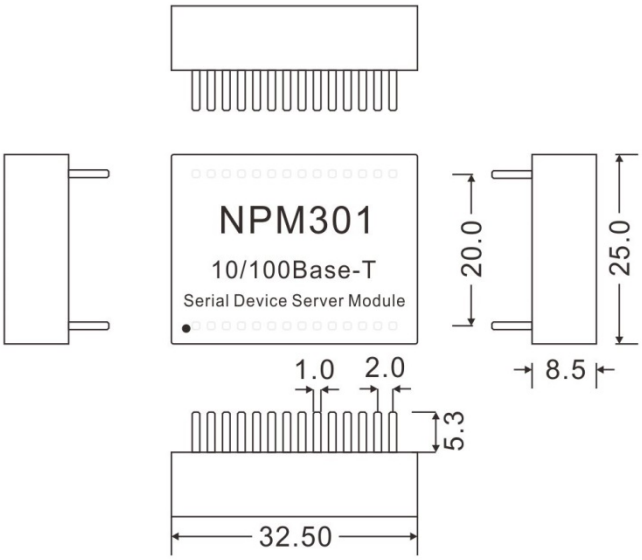
Copyright © Shenzhen 3onedata Technology Co., Ltd.

Name	Pin NO.	Type	Description
COM_CFG	24	Input	COM_CFG is an active low signal pin for device AT command mode, a negative pulse that lasted over 200us on this pin can access the device AT command mode. It is a serial configuration controller pin. When it is high or unconnected, the device will run in the normal working mode; and when it is low the device will run in the serial configuration mode.
NRESET	15	Input	RESET is an active low signal pin for device reset, a negative pulse that lasted over 200us on this pin can reset the device, since there are built-in power on reset circuit, this pin can be left unconnected
DEF	21	Input	DEF is an active low signal pin for device recovery default factory, a negative pulse that lasted over 200us on this pin can recover the device default factory, since there are built-in power on reset circuit, this pin can be left unconnected
GND	28		GND is a power ground pin
NC	8,16,17,18,19,20 22,23,25,26,27		NC is the pin reserved for further use, this pin can be left unconnected

Copyright © Shenzhen 3onedata Technology Co., Ltd.

3 Exterior Dimensions

Unit: mm



L	32.5mm	Length
W	25mm	Width
H	8.5mm	Height（Does not include pin length，pin length 5.3mm）
d	20mm	Width between two rows of pins
p	2.0mm	Pin spacing

Copyright © Shenzhen 3onedata Technology Co., Ltd.

4 Performance and parameter

LAN：

- Standard: 10Base-T, 100Base-TX
- Protocol: Support TCP, UDP, APR, ICMP and DHCP protocol
- Signal: Rx+,Rx-,Tx+,Tx-
- Speed: 10/100Mbps
- Working: Full-duplex and half-duplex
- Working mode: Support TCP Server, TCP Client, UDP, TCP Auto and Real com driver
- Transmission; 100m

Serial interface:

- Serial interface : 3.3VDC TTL
- TTL: TXD, RXD, CTS, RTS, DTR, DSR, GND
- Parity bit: None, Even, Odd, Space, Mark
- Data bit: 5bit,6bit,7bit,8bit
- Stop bit: 1bit, 1.5bit, 2bit
- Baud rate: 300bps～115200bps
- Flow control: none

Power supply:

- Power input: 3.3VDC ±5%
- No-load consumption:
- Full-load consumption: 0.64W@3.3VDC

Environment:

- Working temperature: -40℃~75℃
- Storage temperature: -40℃~85℃
- Humidity: Relative humidity 5%~95%（no condensation）

Structure:

- L×W×H: 32.5mm×25mm×8.5mm

Copyright © Shenzhen 3onedata Technology Co., Ltd.

- Weight: 9g

Copyright © Shenzhen 3onedata Technology Co., Ltd.

3onedata
Make network communication more reliable



Shenzhen 3onedata Technology Co., Ltd.

Address: 3/B, Zone 1, Baiwangxin High Technology Industrial park, Nanshan District, Shenzhen, 518108 China

Tel: +86-755-26702668

E-mail: sales@3onedata.com

Fax: +86-755-26703485

Website: http://www.3onedata.com

Copyright © Shenzhen 3onedata Technology Co., Ltd.