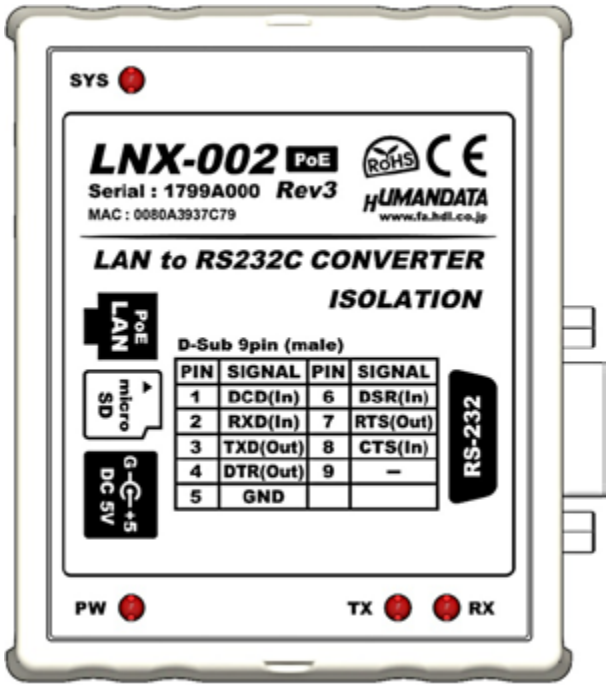
HUMANDATA

RS-232C LAN Converter

LNX-002 (Rev3)

User's Manual

Ver. 3.0



HuMANDATA LTD.

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● Precautions

Do Not	1	This product uses ordinary off-the-shelf electronic components, and is therefore inappropriate for use in applications that require special quality or reliability and are expected to protect human lives or prevent accidents, such as safety mechanisms in fields including space, aeronautics, medicine, and nuclear power.
	2	Do not be used underwater or in high-humidity environments.
	3	Do not be used in the presence of corrosive gases, combustible gases, or other flammable gases.
	4	Do not turn on power when circuit board surface is in contact with other metal.
	5	Do not apply voltage higher than rated voltage.

Attention	6	This manual may be revised in the future without notice owing to improvements.
	7	All efforts have been made to produce the best manual possible, but if users notice an error or other problem, we ask that they notify us.
	8	Item 7 notwithstanding, HuMANDATA cannot be held liable for the consequences arising from use of this product.
	9	HuMANDATA cannot be held liable for consequences arising from using this product in a way different from the uses described herein, or from uses not shown herein.
	10	This manual, circuit diagrams, sample circuits, and other content may not be copied, reproduced, or distributed without permission.
	11	If the product emits smoke, catches fire, or becomes unusually hot, cut the power immediately.
	12	Do not install the control cables or communication cables together with the main circuit lines or power cables. In such an environment, it may result in malfunction due to noise.
	13	Be careful of static electricity.

● Revision History

Date	Revision	Description
Feb. 13, 2018	3.0	Upgrade product version to Rev 3.

● Introduction

Thank you for purchasing our product of RS-232C LAN Converter LNX-002.
LNX-002 is a LAN converter which makes it possible to use a RS-232C device via Ethernet local area network.

1. Product Configuration

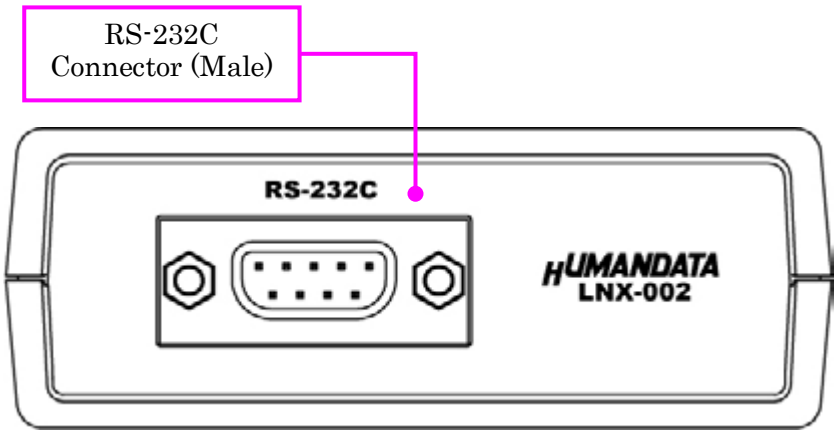
The following lists the product configuration of the LNX-002.

RS-232C LAN Converter (LNX-002)	1
microSD card with USB adapter	1
AC adapter (DC5V)	1
Driver & Application CD	1

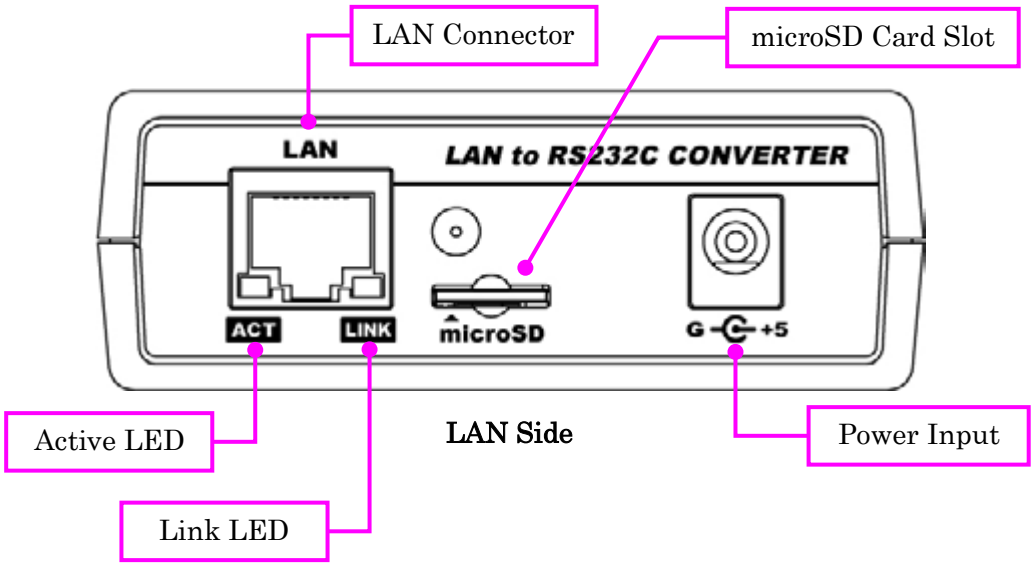
2. Product Summary

LNX-002 is a LAN converter which makes it possible to use a RS-232C device via Ethernet local area network.
Tunneling mode is available with a LNX-001 (USB to LAN converter) or one more LNX-002.
By using TCP/UDP or Telnet, direct control from PC is also available.
LNX-002 supports PoE function as a standard model, making it possible to be powered via a LAN cable (PoE compatible HUB or other is required). It can also be powered by the AC adapter.
Network setting can be saved to and restored from a microSD card. Restoring the setting information from a microSD card is very convenient when replacing LNX-002.

3. Part Names and Functions



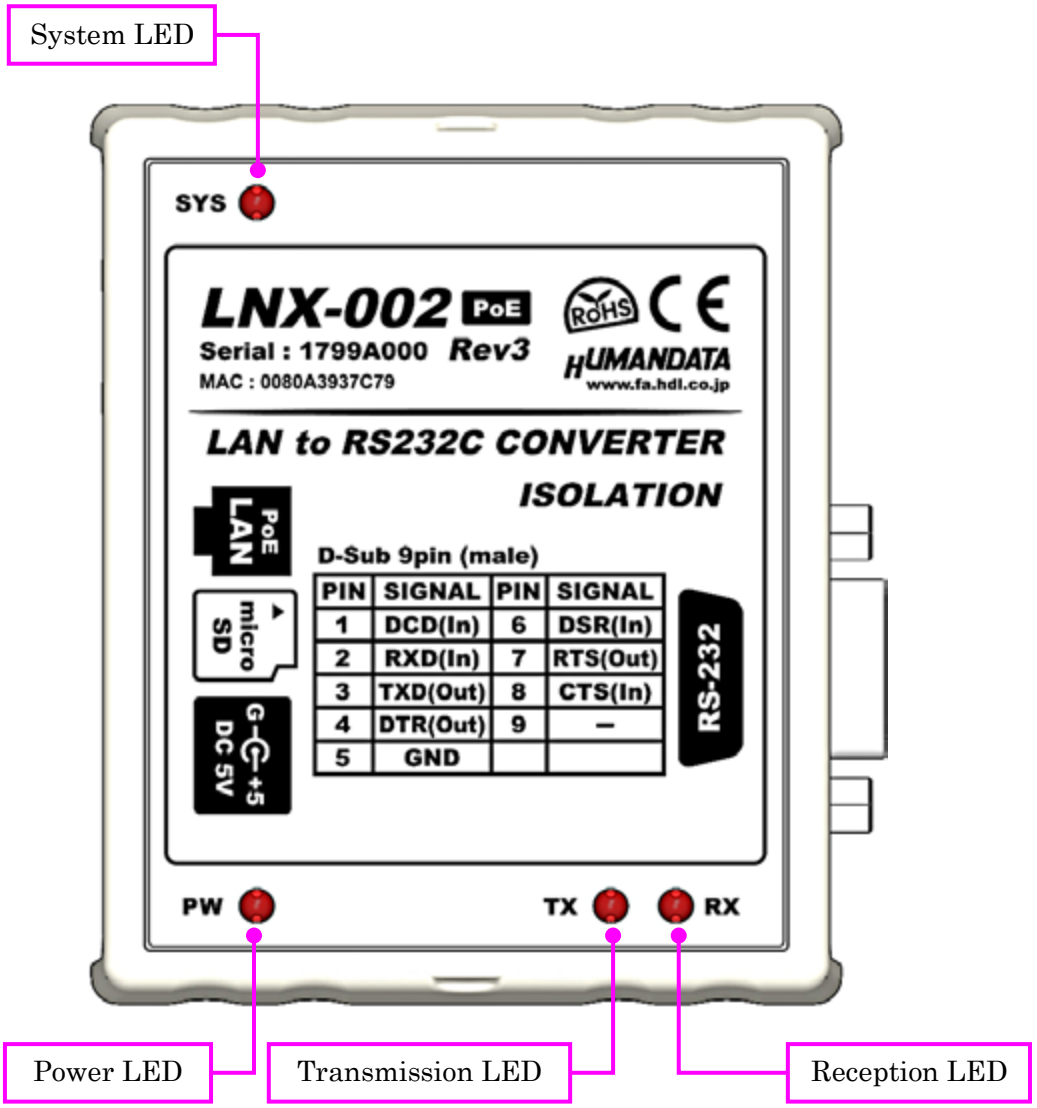
RS-232C Side



LAN Side

LEDs

	Name(color)	Function
ACT	Active LED (green)	Turn on during network port communication.
LINK	Link LED (yellow)	Turn on when LNX-002 is powered and LAN cable is connected normally.



TOP Side

LEDs

	Name (color)	Function
SYS	System LED (red)	Blink few seconds during reading process. Turn on when system is ready.
PW	Power LED (red)	Turn on when the power is supplied to the LNX-002.
TX	Transmission LED (red)	Turn on when data are transmitted to RS-232C side.
RX	Reception LED (red)	Turn on when data are received from RS-232C side.

4. Specifications

4.1. Product Specification

Item	Description	Remarks
Model	LNX-002	
Power	5VDC Supplied by AC adapter or LAN connector (PoE function)	PoE function supports both mode A and B
Current Consumption	Less than 350mA	
Network Interface	IEEE802.3 (10Base-T) IEEE802.3u (100Base-TX) half-duplex / full-duplex (auto detected)	
LAN Connector	RJ45	ESD protection ±11KV isolation over 1500Vrms
Protocol	TCP / UDP / Telnet	
Interface	RS-232C	ESD protection ±15KV
Connector	D-Sub 9pin Male	#4-40 UNC
Setting Memory Card	microSD card	SPI mode
Baud Rate	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, 460800, 921600bps	
Data Bits	7 or 8 bits	
Stop Bits	1 or 2 bits	
Parity	Even, Odd, No parity	
LED	PW: Power LED RX: Reception LED TX: Transmission LED SYS: System LED LINK (RJ45 Connector): LINK Status ACT (RJ45 Connector): ACT Status	
Operating Ambient Temperature	-10 to 55 [°C] (14 to 131 [°F])	No condensation permitted. Except AC adapter
Operating Ambient Humidity	30 to 85 % RH	
Storage Ambient Temperature	-20 to 60 [°C] (-4 to 140 [°F])	
Storage Ambient Humidity	30 to 85 % RH	

Item	Description	Remarks
Weight	approx. 120 [g]	Only main body
Dimensions	69 x 82.5 x 30 [mm] 2.638" x 3.248" x 1.181"	Without projections
RoHS Compliance	YES	
Applicable standards	CE	Except for PoE function

* There may be cases that these parts and specifications are changed.
* Power saving functions (suspend, standby, sleep and others) are not supported.
* Please use the microSD card that is included in the package.

4.2. AC adapter (Japan's specifications)

Item	Description	Remarks
Output	5VDC 2.0A	
Plug	2.1mm inner diameter	Positive Tip
Compatible DC Jack	2.1mm inner diameter	
Operating Ambient Temperature	0 to 40 [°C] (32 to 104 [°F])	No condensation permitted
Operating Ambient Humidity	30 to 85 % RH	
Storage Ambient Temperature	-20 to 80 [°C] (-4 to 176 [°F])	
Storage Ambient Humidity	10 to 95 % RH	
Wire Length	1.6m	
Weight	approx. 70 [g]	
Dimensions	46 x 34 x 25 [mm] 1.811" x 1.339" x 0.984"	Without projections

* This AC adapter is attached for use mainly in Japan. If you use in the other countries, please check the specifications above and plug shape.
* There may be cases that this part and specifications are changed.

[CE marking]

LNX-002 have applied the common standard for industrial environment EN61000-6-2 and EN61000-6-4. **(except for PoE function)**

--- Application of the standards ---

EMS: EN61000-6-2

· EN61000-4-2(2009) Electrostatic discharge requirements

· EN61000-4-3(2010) Radiated electromagnetic field requirements

· EN61000-4-4(2010) Electrical fast transient burst requirements

· EN61000-4-5(2006) Surge immunity test requirements

· EN61000-4-6(2009) Conducted radio frequency requirements

EMI: EN61000-6-4

· EN61000-6-4(2007)+A1(2011) Radiated Emissions

· EN61000-6-4(2007)+A1(2011) Conducted Emissions

4.3. Optional Accessories

Model Name	Image	Description
PEN-003		Attachment with clamping screw JAN：4937920800709
PEN-003-DIN		Attachment for 35mm DIN rail JAN：4937920800716
PEN-003-MG		Attachment with neodymium magnet JAN：4937920801201

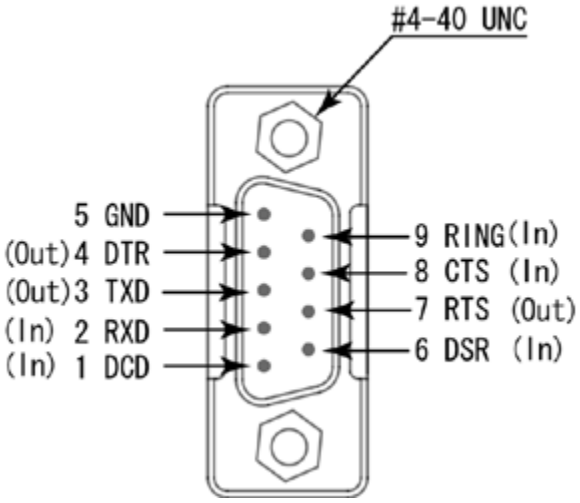
4.4. Power Supply

LNX-002 supports PoE function both A and B type as standard which make it possible to be powered via a LAN cable (PoE compatible HUB is required). It also can be powered by the AC adapter.

5. RS232C Pin Assignment

Pin No	Name	Direction	Remarks
1	(DCD)	In	Data carrier detect
2	RXD	In	Receive data
3	TXD	Out	Transmit data
4	DTR	Out	Data terminal ready
5	GND	-	Signal ground
6	DSR	In	Data set ready
7	RTS	Out	Request to send
8	CTS	In	Clear to send
9	(RING)	In	Ring indicator
CASE	FG	-	Connect to GND

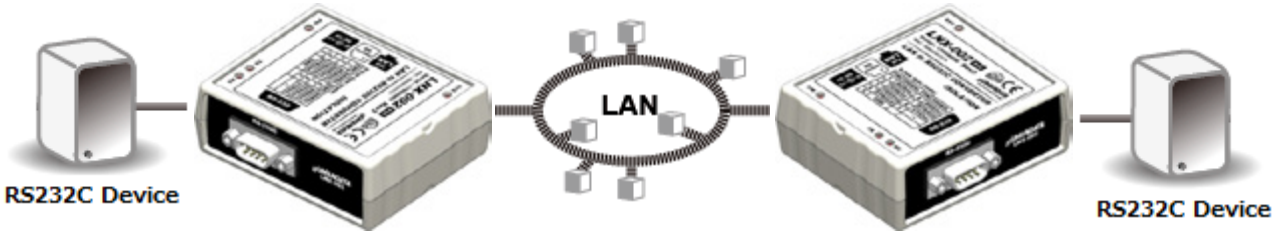
*** DCD and RING signals are not supported.**



D-Sub 9pin Male

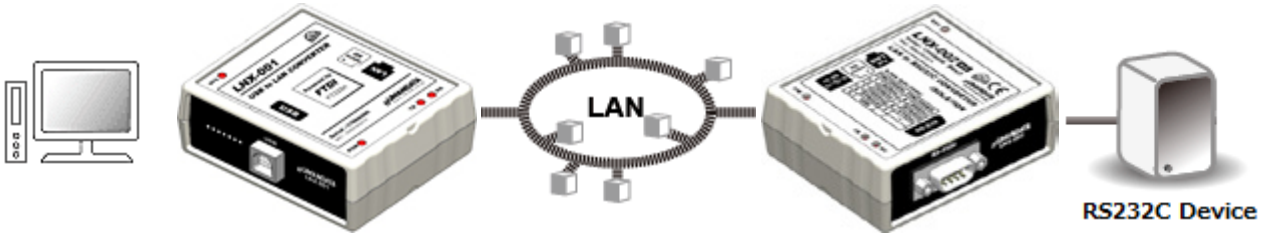
6. Connection examples

[Tunneling mode between two LNX-002]



Direct communication between two LNX-002s without any PCs offers you a way to connect separated two RS-232C devices. By using a cross cable, one to one connection is also available.

[Tunneling mode between LNX-001 and LNX-002]



LNX-001 offers you to control as USB interface via a LAN. And is able to connect to a LNX-002 in tunneling mode, virtual COM port and D2XX-API by FTDI is available.
Technical knowledge about the network is not needed.

[LNX-002 single operation]

Communication with RS-232C devices via a local area network is available.

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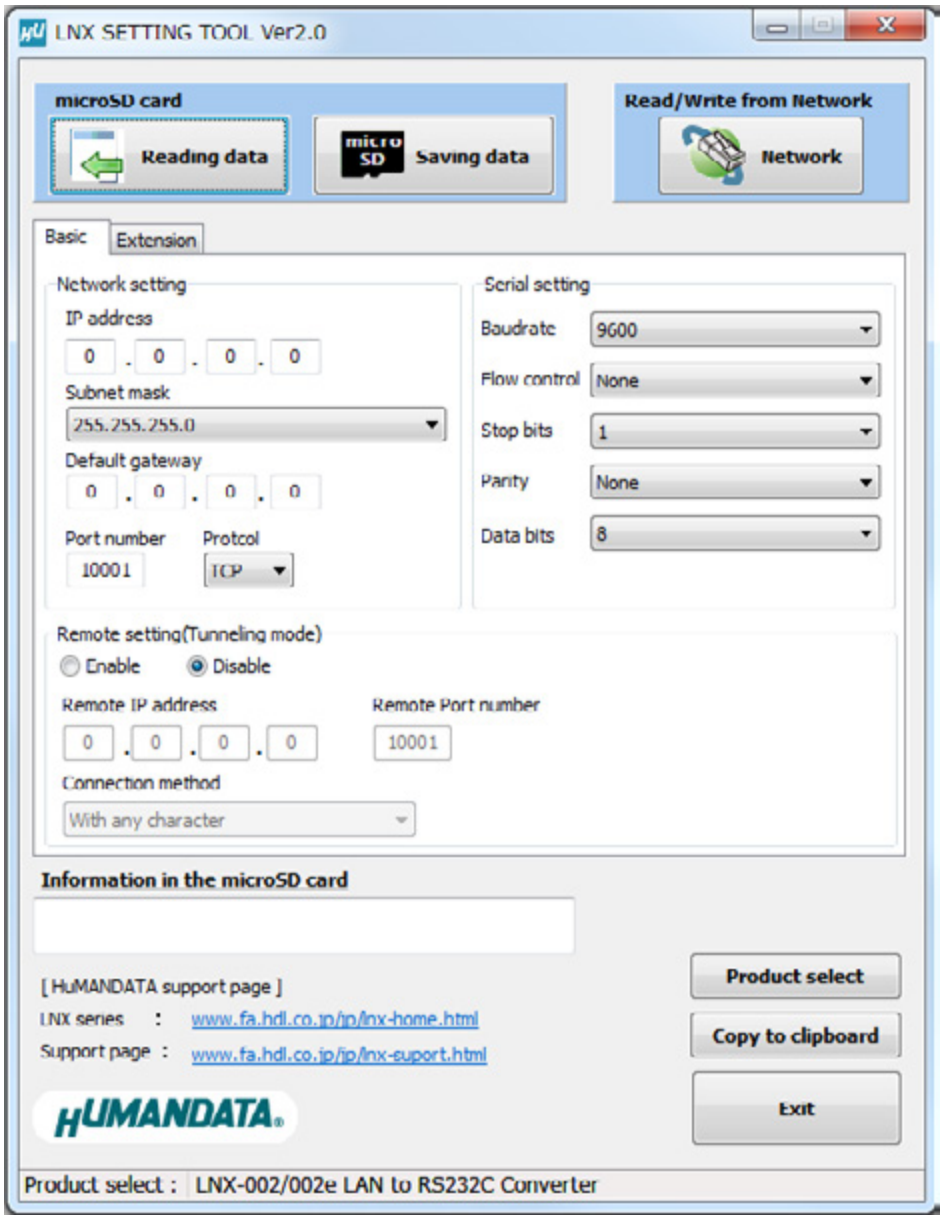
* Please use a cross cable to connect LNX-002 without using a hub.
(LNX-002 does not have a function for AutoMDI/MDI-X.)

7. Setting Tool

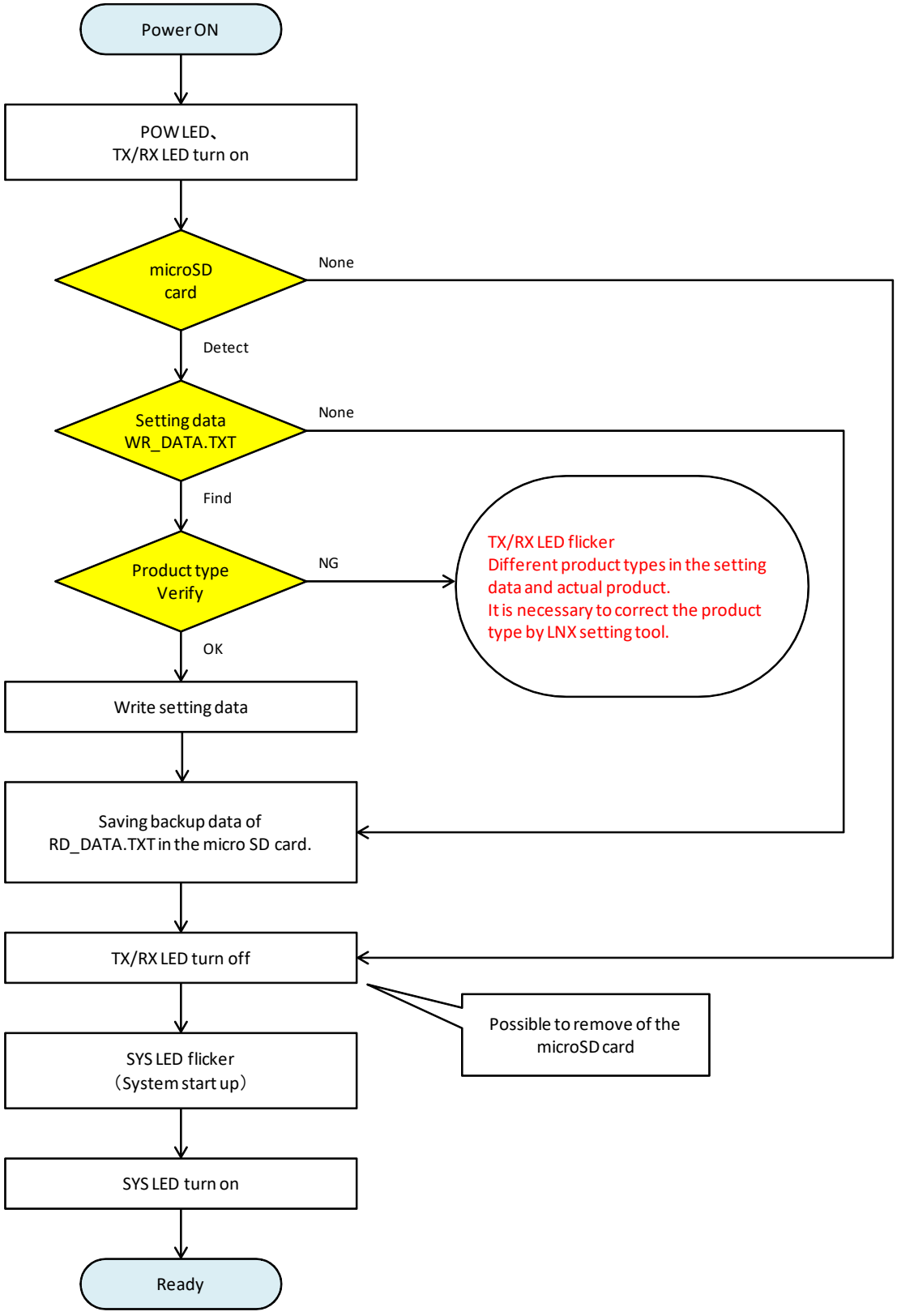
Setting tool supports to save and read network setting by a microSD card. This tool does not require installation.



This is a screenshot from version 2.0

7.1. Access Flow of microSD card

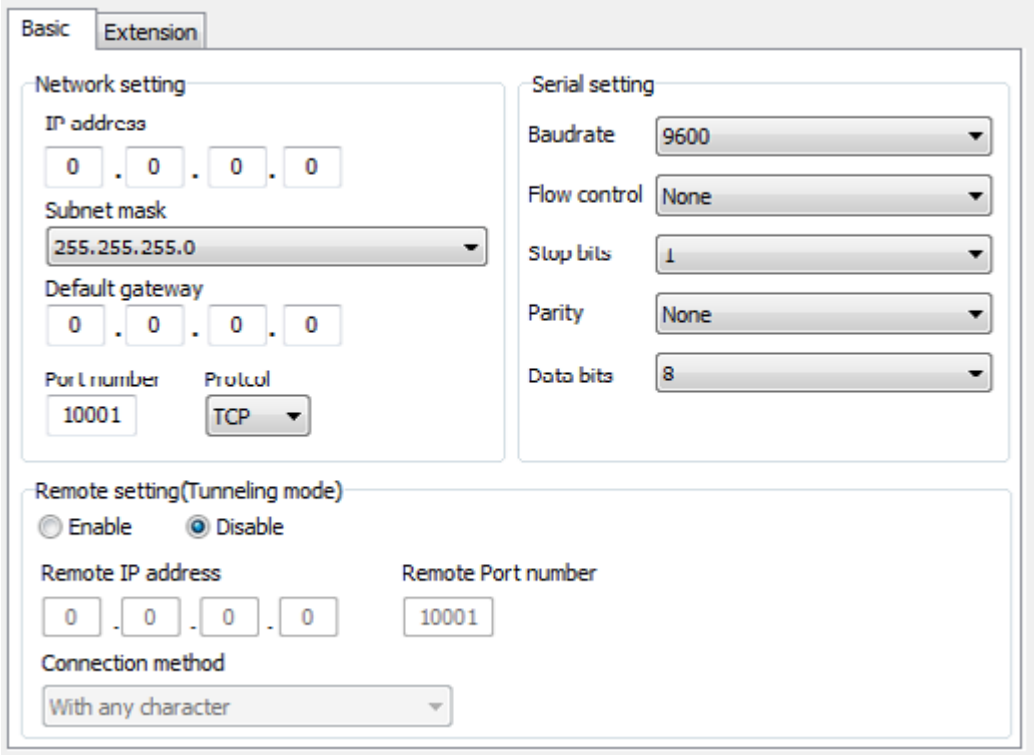
Access to the microSD card is done immediately after power input. When TX/RX LEDs are lighting, do not detach the microSD card. You can detach it after confirming TX/RX LEDs are turned off.



7.2. Function

Item	Contents
Reading data	Read setting data (RD_DATA.txt) from microSD card.
Saving data	Save setting data (WR_DATA.txt) to microSD card.
Network	Read or write setting data over the network. LNX product and PC must be connected to the same network segment.
Product select	Display product select window.
Copy to clipboard	Copy a display image to clipboard.
Exit	Terminate the application.

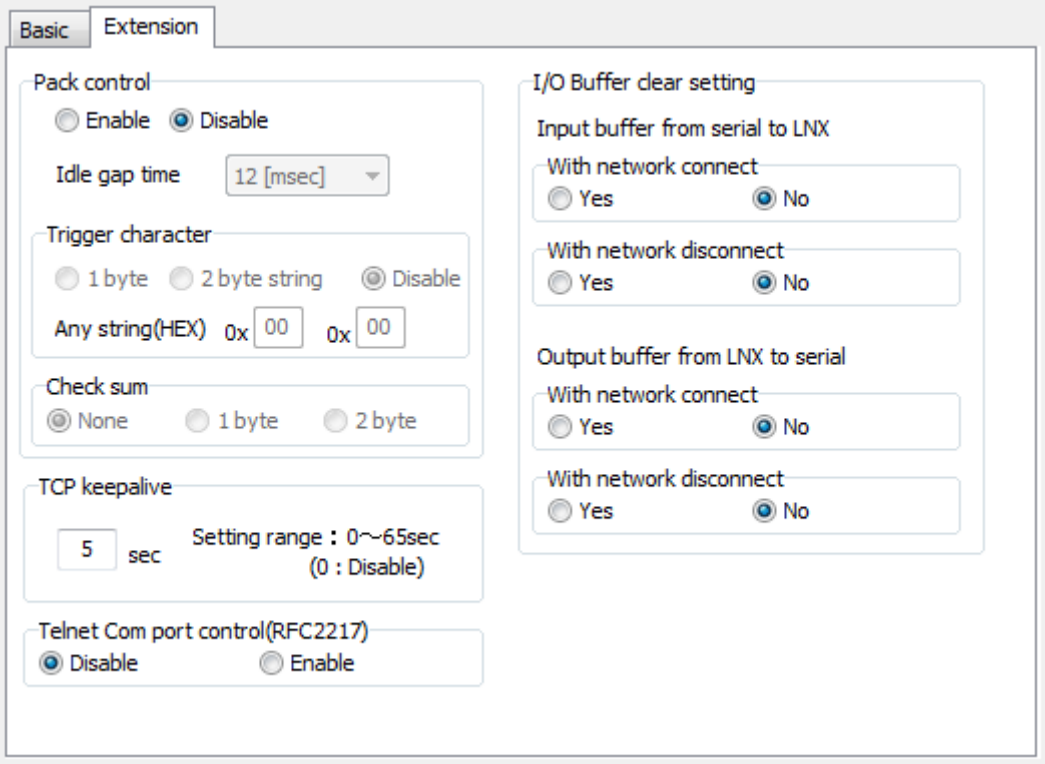
[Basic Setting]



Item	Contents
IP address	If DHCP is not used to assign an IP address, enter it manually. Unique IP address must be used in the network. The default setting is 0.0.0.0 (DHCP is enabled)
Subnet mask	A subnet mask defines the number of bits taken from the IP address that are assigned for the host part.
Default gateway	A gateway address of a router which is allowed to communicate to other LAN segments. This address should be an IP address of the router which is in the same LAN segment.
Port number	Enter the local port number. The default setting is 10001. If you change the value, please avoid the following numbers. They are allocated to other function. 1-1024 — Reserved for well-known ports 9999 — Reserved for telnet setup 14000-14009 — Reserved for old redirector 30704 — Reserved for remote control of user I/Os 30718 — Reserved for configuration

Item	Contents
Protocol	From the drop-down menu, select TCP or UDP. Normally TCP is used, but when one-to-multiple communication like broadcast or sensitive-responsiveness is needed, please select UDP. The default setting is TCP.
Remote Setting (Tunneling mode) Enable/Disable	Select to enable remote connection (tunneling). The default setting is disable.
Remote IP address	Enter the remote IP address of tunneling target.
Remote Port number	Enter the remote port number of tunneling target.
Connection method	Select connection method to the target.
Baudrate	LNX-002 and an attached serial device must agree on the baud rate to use for the serial connection. Valid baud rates are 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, 460800 or 921600. The default setting is 9600.
Flow control	Flow control manages data flow between devices in a network to ensure it is processed efficiently. Too much data arriving before a device is prepared to receive it causes lost or retransmitted data. Select from None, Xon/Xoff, Xon/Xoff Pass Chars to Host or RTS/CTS (hardware). The default setting is none.
Stop bits	Select from 1 or 2 bit. The default setting is 1.
Parity	Select from Even, Odd or None. The default setting is none.
Data bits	Select from 7 or 8 bit. The default setting is 8.

[Extension Setting]

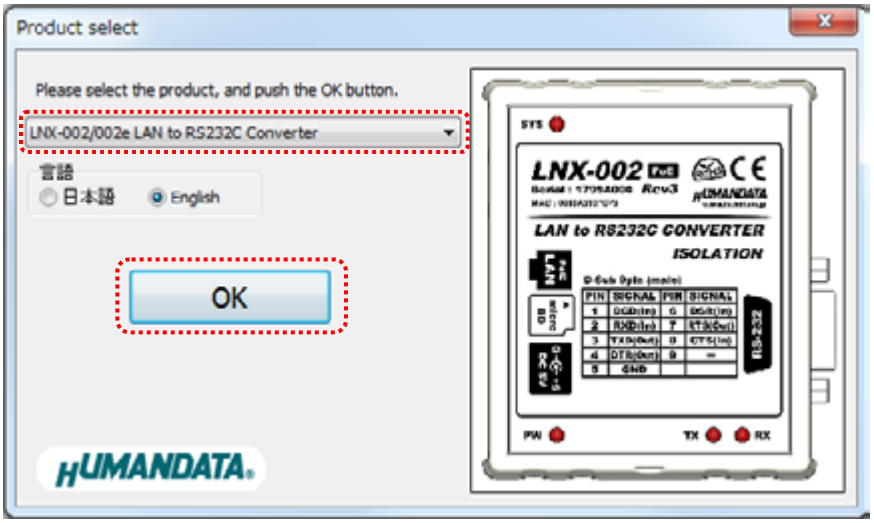


Item	Contents
Pack control Enable/Disable	Select to enable pack control. Two packing algorithms define how and when packets are sent to the network. The standard algorithm is optimized for applications in which the unit is used in a local environment, allowing for very small delays for single characters, while keeping the packet count low. The alternate packing algorithm minimizes the packet count on the network and is especially useful in applications in a routed Wide Area Network (WAN). Adjusting parameters in this mode can economize the network data stream. The default setting is disable.
Idle gap time	Select idle gap time from 12, 52, 250 or 5000 msec. After this idle gap time with no response from a serial device, data is packetized and transmitted to the target. The default setting is 12.
Trigger character	Select packet size and set trigger character (hexadecimal digits).
Check sum	Select check sum size.

Item	Contents
TCP keepalive	TCP keepalive time defines how many seconds LNX-002 waits during an inactive connection before checking its status. If the unit does not receive a response, it drops that connection. Enter a value between 0 and 60 seconds. 0 disables keepalive. The default setting is 5.
Telnet Com port control (RFC2217)	Set to enable when control COM port using Telnet. The product enable a RFC2217 function to use a control signal used in a serial port on a network. When it is not used this function, set to disable.
I/O buffer clear setting	Set it whether input/output buffer clear at the time of network connection or disconnection.

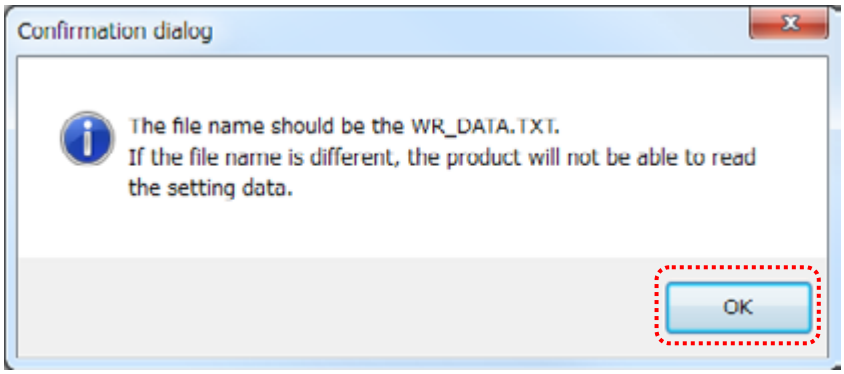
7.3. Write Setting Data

1. Open Setting Tool for LNX series (LNX SETTING TOOL Ver*.*).
2. Select “LNX-002/LNX-002e LAN to RS232C Converter”, and click “OK”.



3. Enter the setting such as network or serial.
4. Insert a microSD card to PC (A USB adapter is included with the product)
5. Click “Saving data”.

6. Click “OK” in the confirmation dialog.

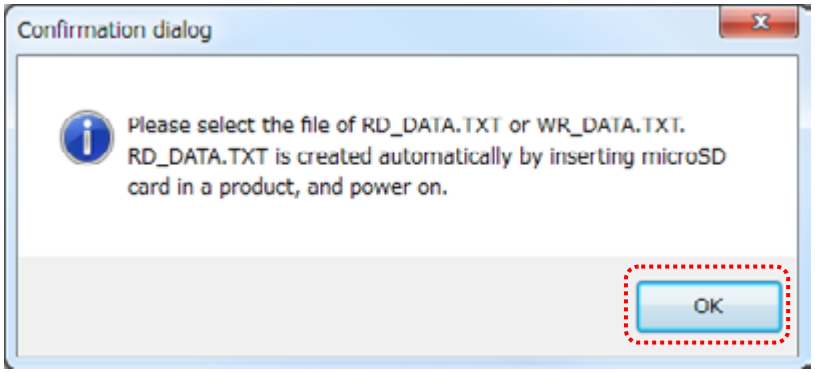


7. Specify the microSD card as saving destination. Please do not change the file name from “WR_DATA.TXT”.
8. Remove the microSD card from PC and insert it to the product. Please confirm that the product power is turned off.
9. When the product is powered on, the setting data is configured to the product automatically. After the data is stored in the product, microSD card is not needed any more. The start-up time can be shortened if the microSD card is removed from the product.
   Please be careful not to detach the microSD card before TX/RX LED is turned off.

7.4. Read Setting Data

1. After confirming the power is off, insert the microSD card to the product.
2. When the product is powered on, the setting data will be reserved to the microSD card automatically. The data file name is “RD_DATA.TXT”.
   Please be careful not to detach the microSD card before TX/RX LED is turned off.
   * If there is the same file name in the microSD card, the data will be overwritten.
3. Insert a microSD card to PC (A USB adapter is included with the product)
4. Start the setting tool and click “Reading data”.

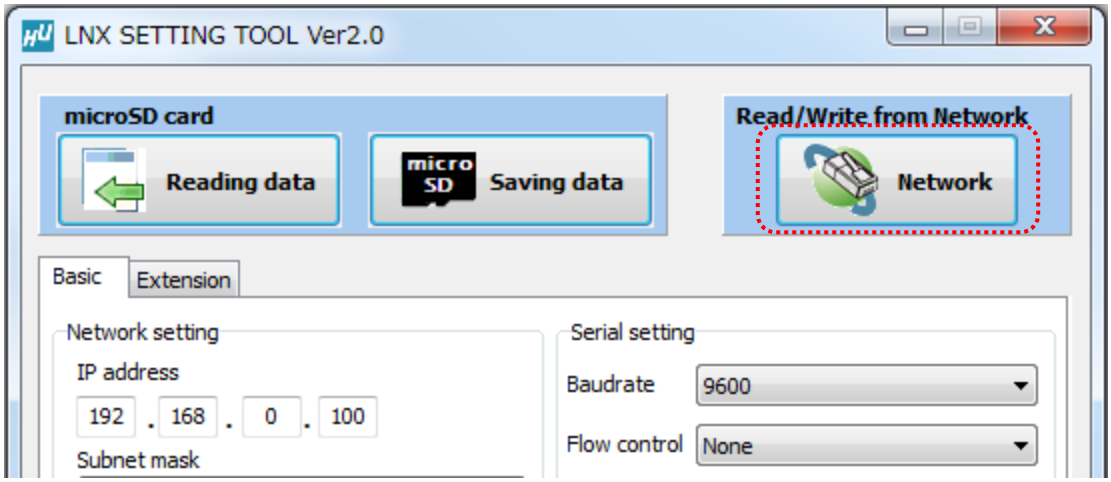
5. Click “OK” in the confirmation dialog.



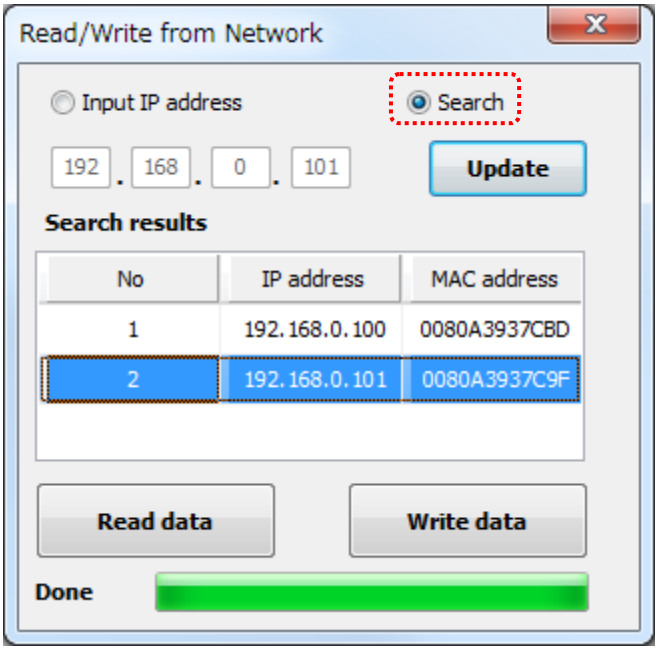
6. Open the “RD_DATA.TXT” in the microSD card.
7. Setting data is loaded.

7.5. Write or Read setting data over the network

1. Enter the setting such as network or serial and click “Network”.
   * Please confirm that microSD card is not inserted in a product.



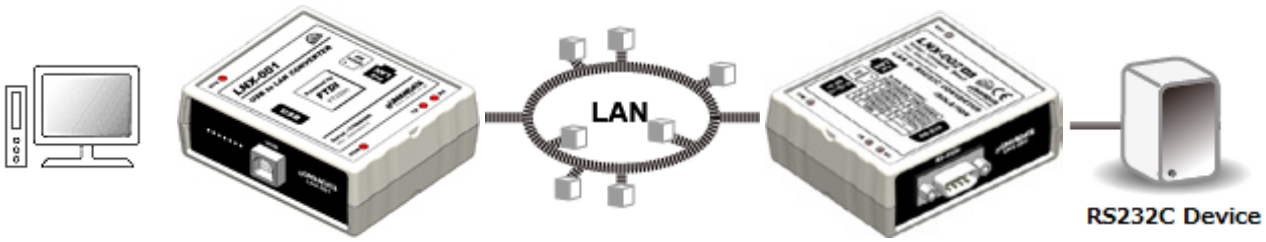
2. Enter an IP address manually or click “Search”. When some products are found, please select a number from a list.



3. Click “Read data” or “Write data”
   * Even if some devices will be listed in the list and occur process time out. In this case, please change the PCs’ network setting to the same network segment as the product or using microSD card.

7.6. Setting Example

[Tunneling mode between LNX-001 and LNX-002]



LNX-001 Side		LNX-002 Side
Network Setting		
192.168.0.100	IP Address	192.168.0.101
255.255.255.0	Subnet Mask	255.255.255.0
0.0.0.0	Default Gateway	0.0.0.0
10005	Port Number	10005
TCP	Protocol	TCP
192.168.0.101	Remote IP Address	192.168.0.100
10005	Remote Port Number	10005
Serial Communication		
230400	Baudrate	230400
RTS/CTS (hard ware)	Flow Control	RTS/CTS (hard ware)
1	Stop Bits	1
None	Parity	None
8	Data Bits	8

[LNX-002 single operation]

LNX-002 Side

Network Setting	
IP Address	192.168.0.100
Subnet Mask	255.255.255.0
Default Gateway	0.0.0.0
Port Number	10005
Protocol	TCP
Remote IP Address	0.0.0.0
Remote Port Number	0
Serial Communication	
Baudrate	230400
Flow Control	RTS/CTS (hard ware)
Stop Bits	1
Parity	None
Data Bits	8

8. Virtual COM Port

You can use the software that creates Virtual COM ports on your PC. You can use the COM port to communicate to an IP address of LNX-002. Rather than going out the local port, the data is transmitted across the Ethernet network using TCP/IP. LNX-002 attached to the network receives the data and transfers it from its own serial port to the attached equipment. Please refer to the "LNX series virtual COM port User's Manual" that are stored on the product supplied CD for details.

9. Additional Documentation and User Support

The following documents and other supports are available at
http://www.hdl.co.jp/en/faspc/LNX/lnx-002/

- Outline drawing
- Outline drawing of the AC Adapter
- LNX SETTING TOOL
- External Dimension

  … and more.

10. Warranty and compensation

Please refer to the following URL for the warranty.
http://www.fa.hdl.co.jp/en/fa-warranty.html

RS-232C LAN Converter

LNX-002 (Rev3)

User's Manual

Ver. 3.0 .....Feb. 13, 2018

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