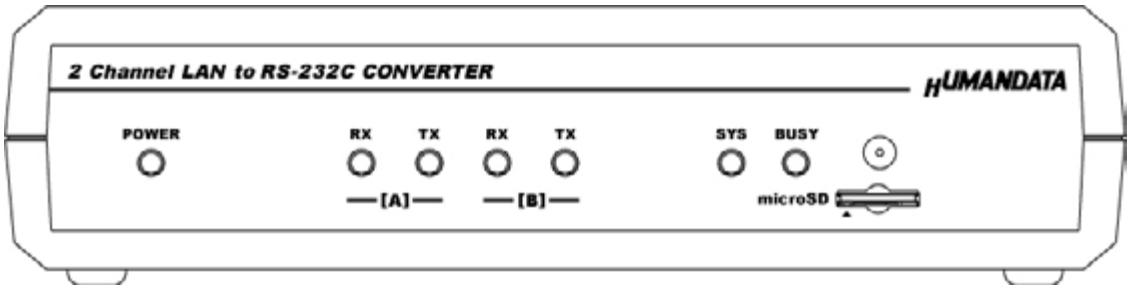
2 Channel
RS-232C LAN Converter
LNX-203
User's Manual
Ver. 1.0



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
December 6, 2018	v1.0	Initial release

● Introduction

Thank you very much for purchasing our product LNX-203.
LNX-203 is a 2 channel RS-232C LAN converter which makes it possible to use 2 channels of RS-232C devices via Ethernet local area network.

1. Product Configuration

The following lists the product configuration of the LNX-203.

2 Channel RS-232C LAN Converter (LNX-203)	1
microSD card with USB adapter	1
D-Sub 9pin M2.6 screw (#4-40 UNC is mounted)	4
AC adapter (DC5V)	1
Driver & Application CD	1

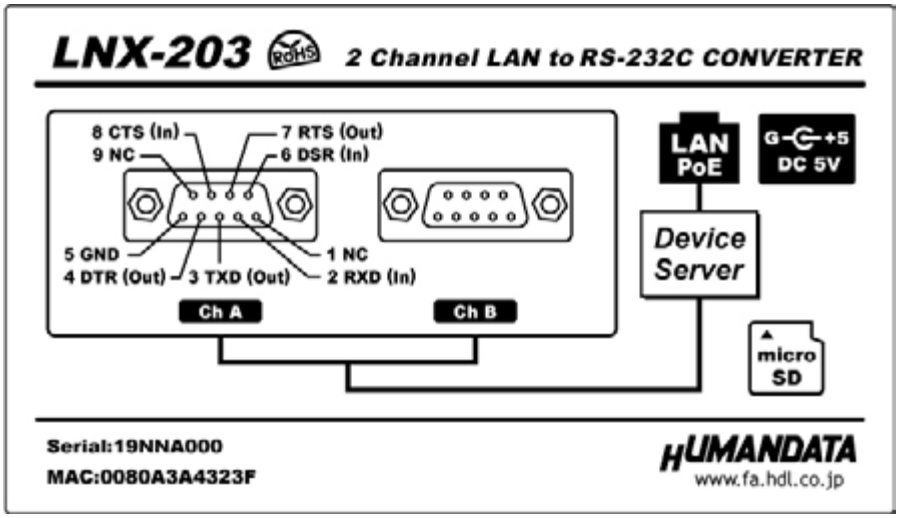
2. Product Summary

LNX-203 is a 2 channel RS-232C LAN converter which makes it possible to use 2 channels of RS-232C port from single LAN port via Ethernet local area network. Tunneling mode (transparent mode: connected on one-to-one connection without PC) is available with LNX-203 using LAN. By using TCP/UDP or Telnet, direct control from PC is also available.

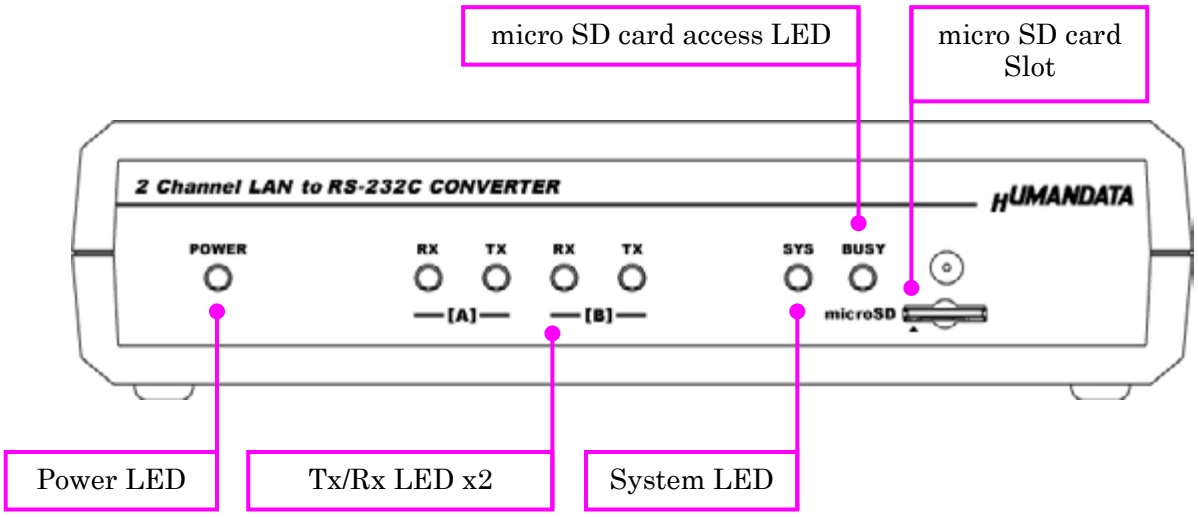
LNX-203 supports PoE. That makes it possible to be powered via a LAN cable (PoE compatible HUB or other is required). It can also be powered by the AC adapter. Network setting can be saved to and restored from a microSD card. Restoring the setting information from a microSD card is very convenient when replacing LNX-203.

3. Overview

3.1. Block Diagram



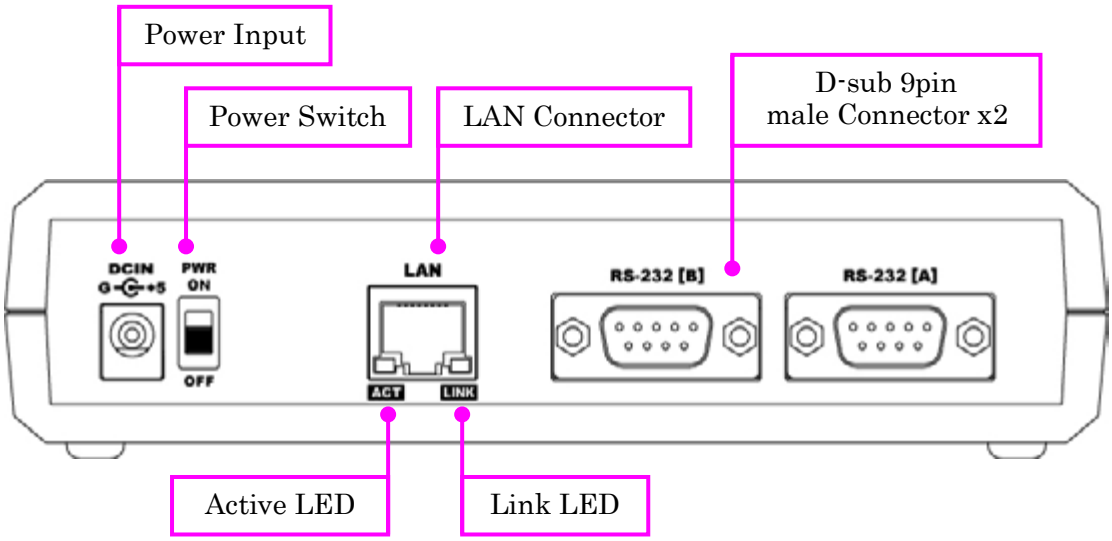
3.2. Front Side



LEDs

	Name (color)	Function
POWER	Power LED (red)	Turn on during the power is supplied.
RX	Reception LED (red)	Turn on when data is received from RS-232C side.
TX	Transmitter LED (red)	Turn on when data is transmitted to RS-232C side.
SYS	System LED (red)	Blink few seconds during reading process. Turn on when system is ready.
BUSY	micro SD card access LED (red)	Turn on during accessing micro SD card. When it turned off, you can extract the card.

3.3. Rear Side



LAN side and RS-232C side is isolated.

LEDs

	Name (color)	Function
ACT	Active LED (green)	Turn on during network port communication.
LINK	Link LED (yellow)	Turn on when the power is supplied and LAN cable is connected normally.

4. Specifications

Item	Description	Remarks
Model	LNX-203	
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	
Input/Output Interface	RS232C x 2 channel	ESD protection ±15KV
RS-232C Connector	D-Sub 9pin Male (#4-40 UNC screws are mounted)	M2.6 screws are also attached for accessary
Setting Memory Card	microSD card	For save and restore the product setting SPI mode
Baud Rate	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, 460800, 921600 bps	
Data Bits	7 or 8 bits	
Stop Bits	1 or 2 bits	
Parity	Even, Odd, No parity	
LED	POWER: Power LED RX: Receiver LED x 2 TX: Transmitter LED x 2 SYS: System LED BUSY: micro SD card access LED LINK (RJ45 Connector): LINK Status ACT (RJ45 Connector): ACT Status	

Operating Ambient Temp.	-10 to 55 [°C] (14 to 131 [°F])	No condensation permitted
Operating Ambient Humi.	30 to 85 %RH	
Storage Ambient Tem.	-20 to 60 [°C] (-4 to 140 [°F])	
Storage Ambient Humi.	30 to 85 % RH	
Weight	Approx. 300 [g]	Only main body
Dimensions	165 x 80.5 x 39 [mm] (6.496" x 3.169" x 1.535")	Without projections

*** There may be cases that these parts and specifications are changed.**

*** Power saving function (suspend, standby, sleep and others) is not supported**

*** Please use the microSD card that is included in the package.**

4.1. 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 Temp.	0 to 40 [°C] (32 to 104 [°F])	No condensation permitted
Operating Ambient Humi.	30 to 85 % RH	
Storage Ambient Temp.	-20 to 80 [°C] (-4 to 176 [°F])	
Storage Ambient Humi.	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.**

4.2. Optional Accessories

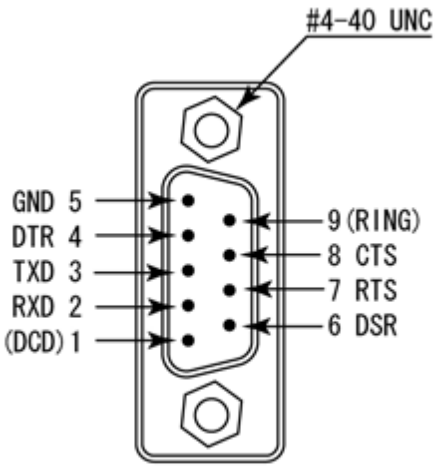
Model Name	Image	Description
ACC-027		Metal bracket type A for vertical mounting USB/LNX series JAN : 4937920801096
ACC-028		Metal bracket type A for horizontal mounting USB/LNX series JAN : 4937920801102
ACC-031		Din rail attachment type B for USB/LNX series JAN : 4937920801256
ACC-036		Neodymium magnet set for USB/LNX series JAN : 4937920801539

4.3. Power Supply

LNX-203 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



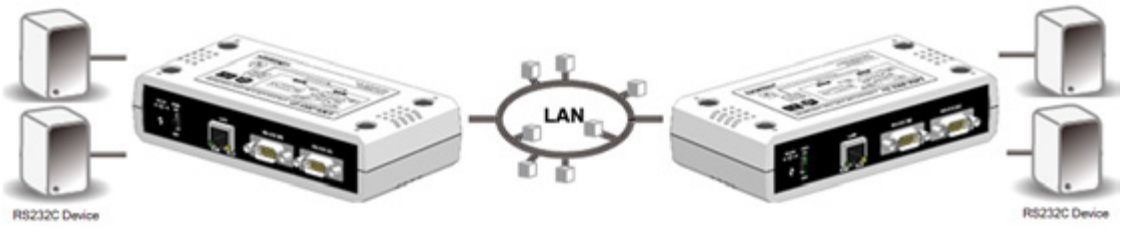
D-Sub 9pin Male

* DCD and RING signals are not supported.

* #4-40 UNC screws are mounted by factory setting. You can change them to attached M2.6 screws.

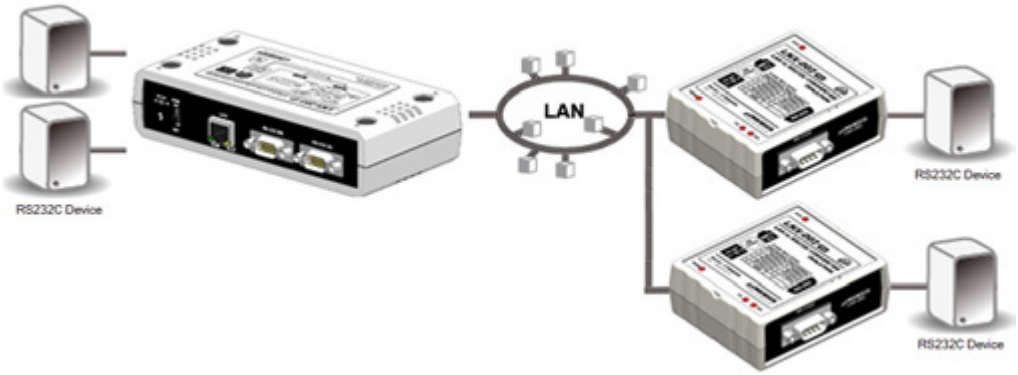
6. Connection examples

[Tunneling mode between two LNX-203]



Direct communication between two LNX-203s without any PCs offers you a way to connect separated RS-232C devices.

[Tunneling mode between LNX-203 and two LNX-002 with RS-232C]

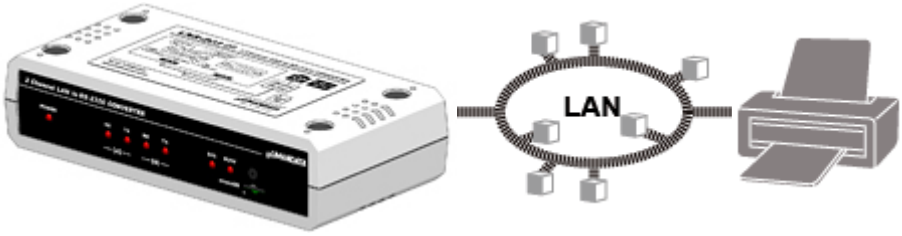


Direct communication between LNX-203 and LNX-002 without any PCs offers you a way to connect separated RS-232C devices.

[LNX-203 single operation]

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

[Connect LNX-203 and LAN printer and output from microcomputer and PLC devices]



Send print data to remote network printer using RS-232C interface of microcomputer and PLC devices.

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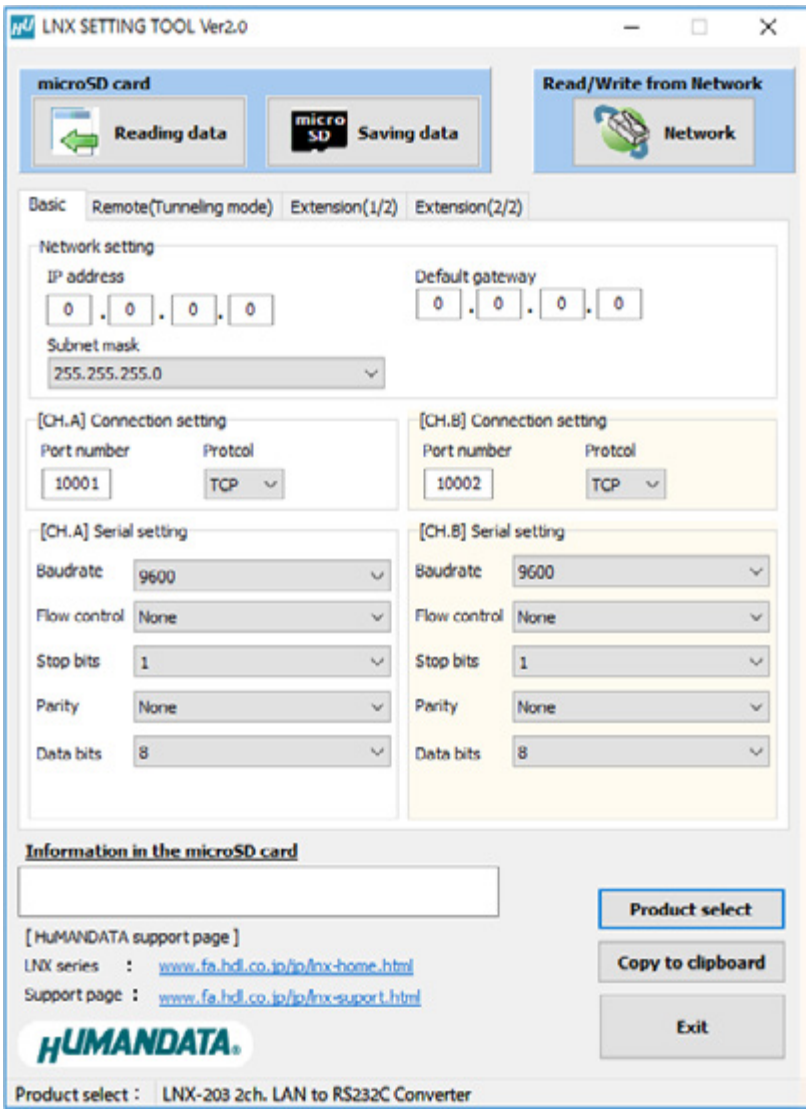
* Please use a cross cable to connect LNX-203 without using a hub.
(LNX-203 does not have a function for AutoMDI/MDI-X.)

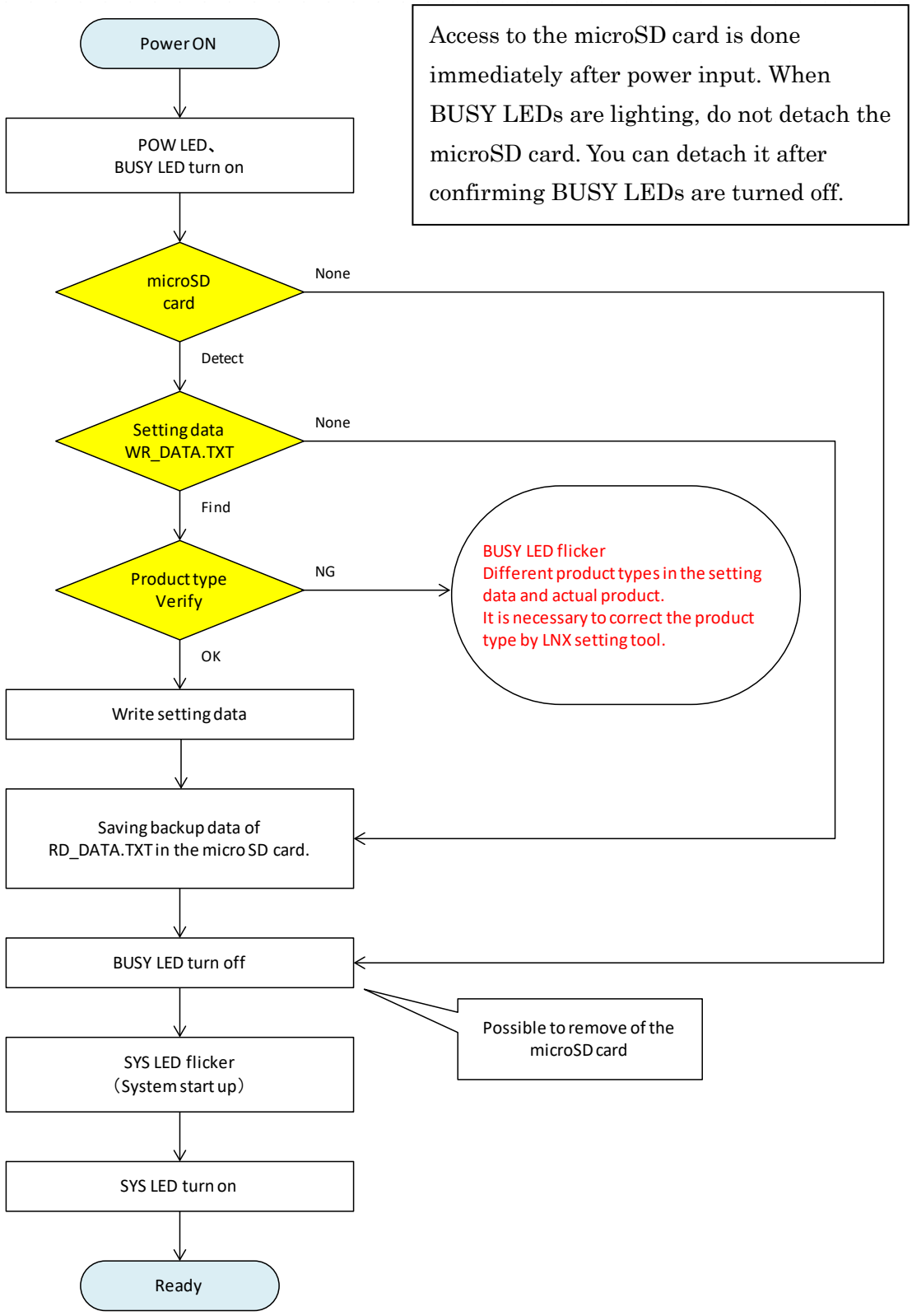
7. Setting Tool

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



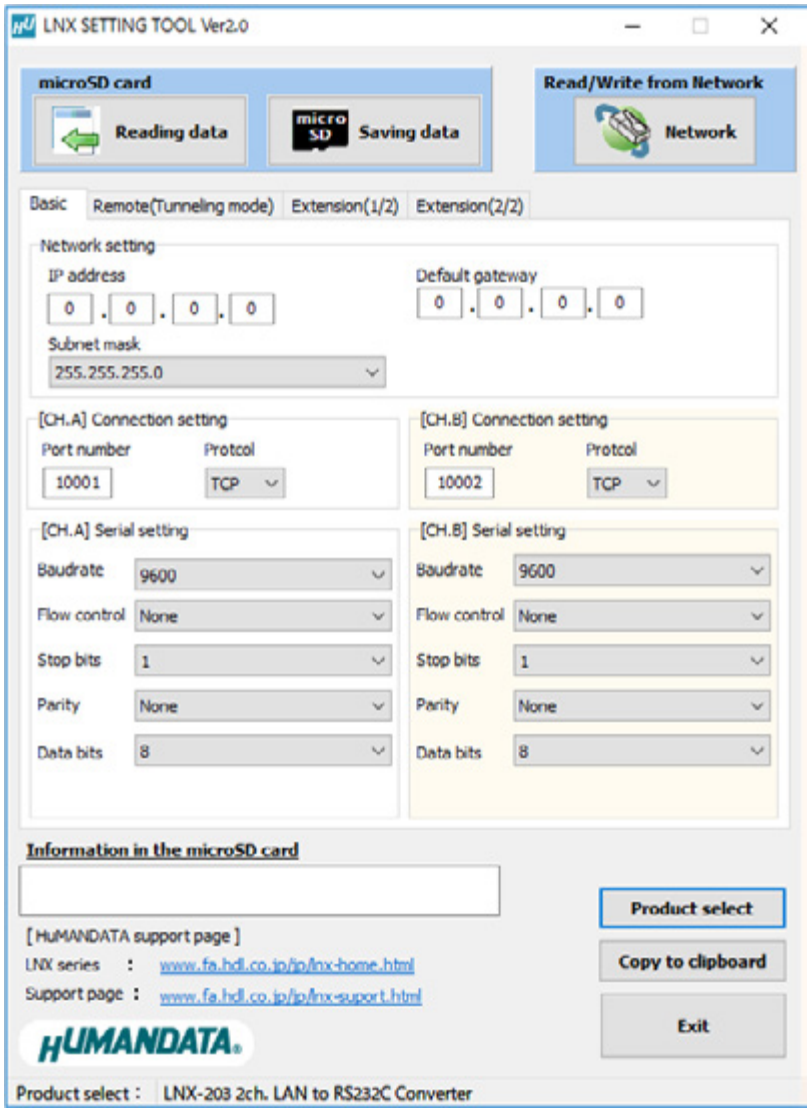
This is a screenshot from version 2.0

7.1. Access Flow of microSD card



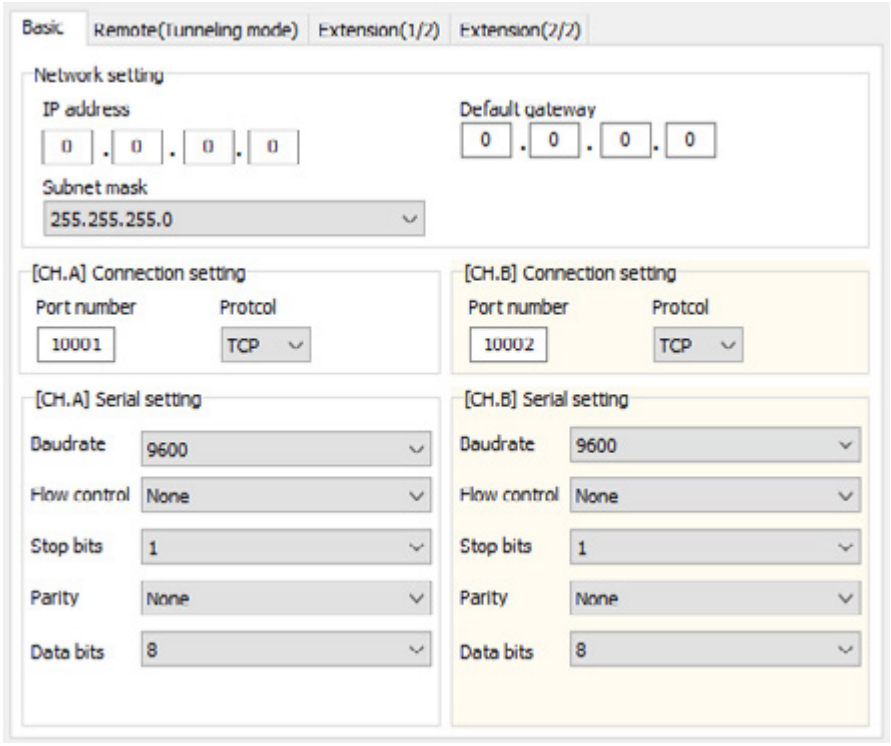
Access to the microSD card is done immediately after power input. When BUSY LEDs are lighting, do not detach the microSD card. You can detach it after confirming BUSY LEDs are turned off.

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.

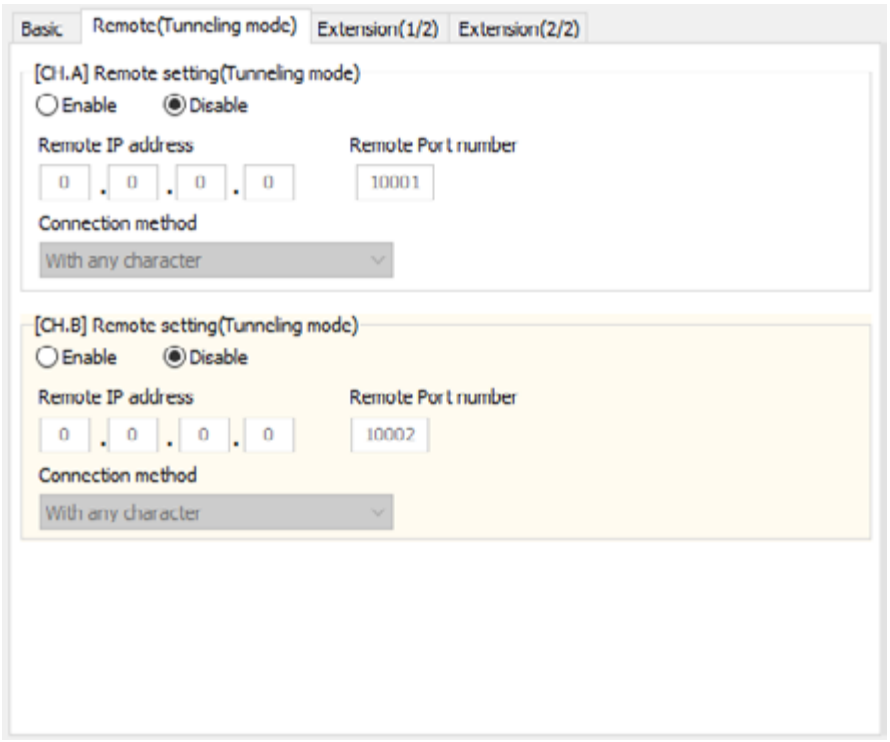
[Basic Setting]



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

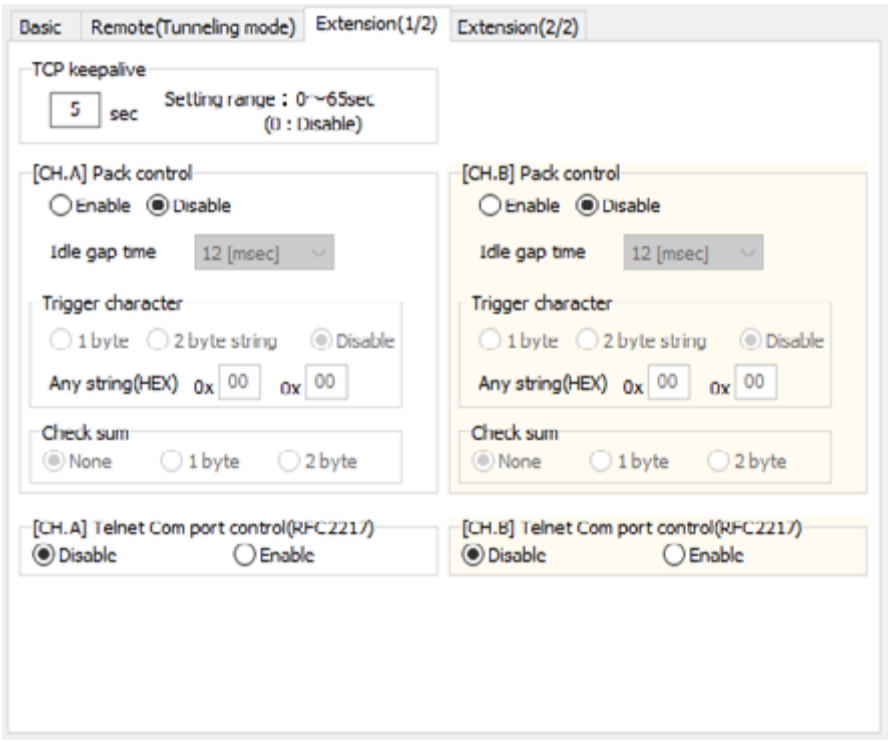
Protocol	From the drop-down menu, select TCP or UDP. Normally TCP is used, but when one-to-multiple communication like broadcast or sensitive-responsiveness is needed, please select UDP. The default setting is TCP.
Baudrate	LNX-203 and an attached serial device must agree on the baud rate to use for 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.

[Remote Setting (Tunneling Mode)]



Item	Contents
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.

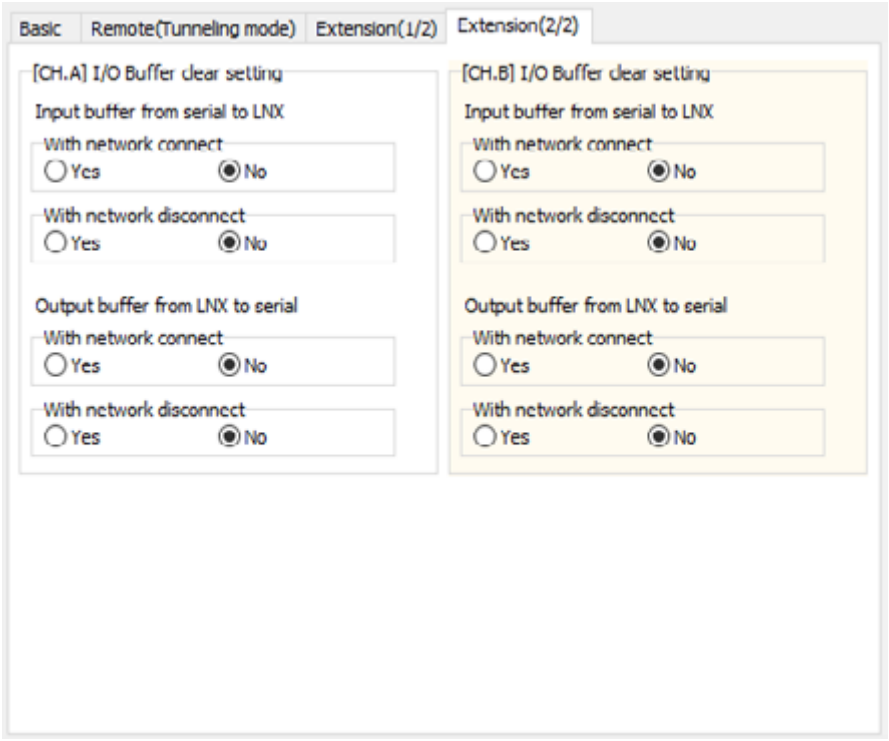
[Extension Setting (1/2)]



Item	Contents
TCP keepalive	TCP keepalive time defines how many seconds LNX-203 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 65 seconds. 0 disables keepalive. The default setting is 5.
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.
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.

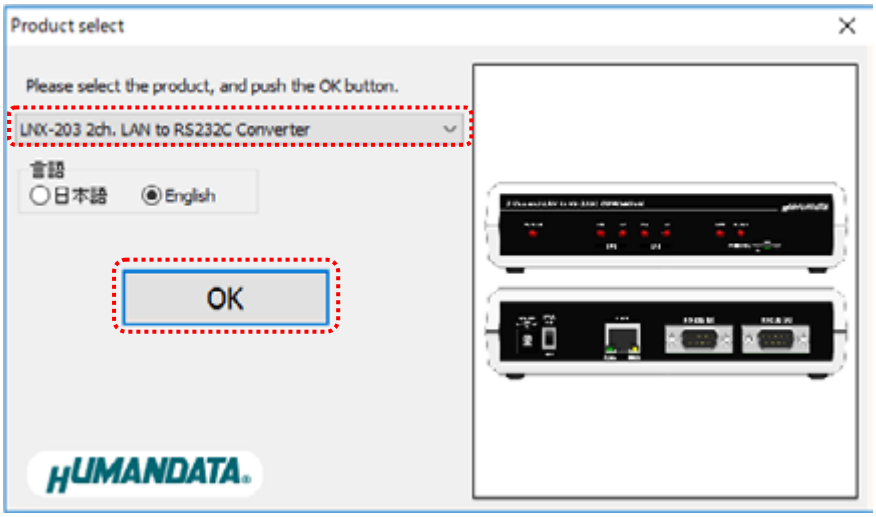
[Extension Setting (2/2)]



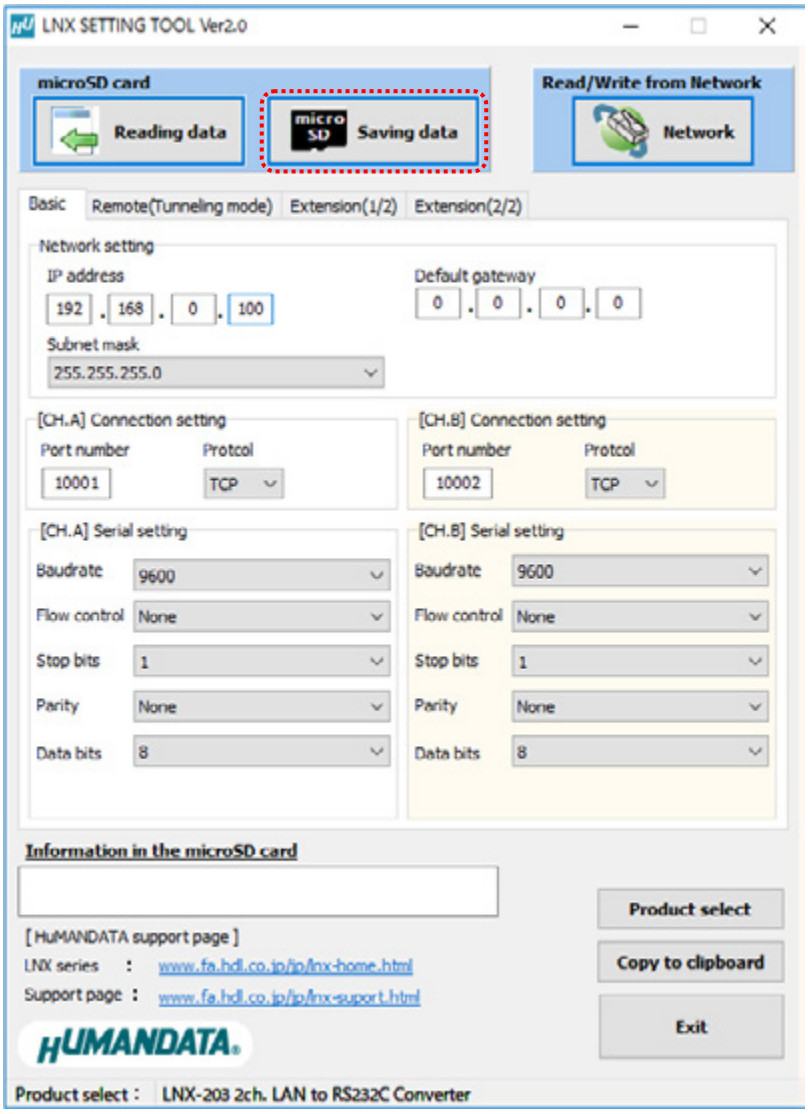
Item	Contents
I/O buffer clear setting	Set it whether input/output buffer clear at the time of network connection or disconnection.

7.3. Write Setting Data

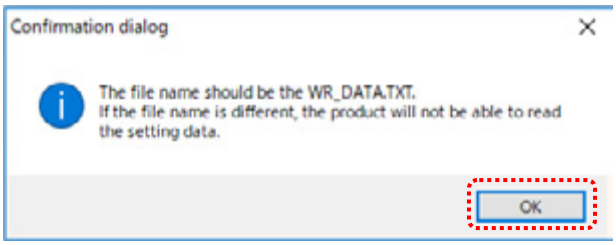
1. Open Setting Tool for LNX series (LNX SETTING TOOL Ver*.*).
2. Select “LNX-203 2ch LAN to RS232C Converter”, and click “OK”.



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.

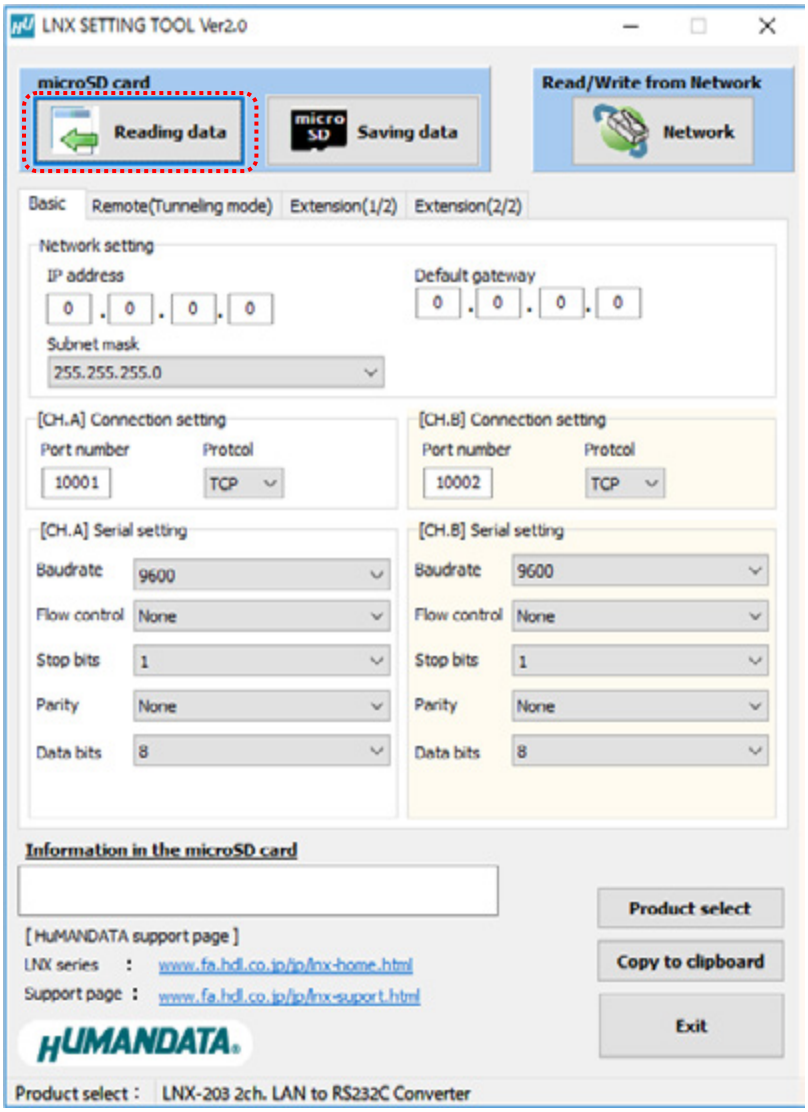


7. Specify the microSD card as saving destination. Please do not change the file name from “WR_DATA.TXT”.
8. Remove the microSD card from PC and insert it to the product. Please confirm that the product power is turned off.

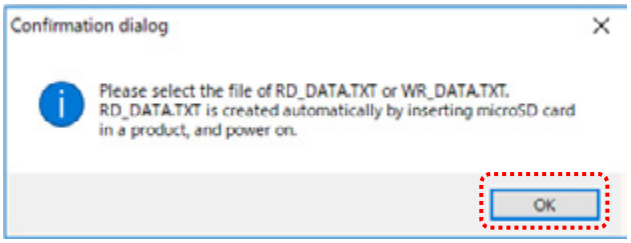
9. When the product is powered on, the setting data is configured to the product automatically. After the data is stored in the product, microSD card is not needed any more. The start-up time can be shortened if the microSD card is removed from the product.
   Please be careful not to detach the microSD card before TX/RX LED is turned off.

7.4. Read Setting Data

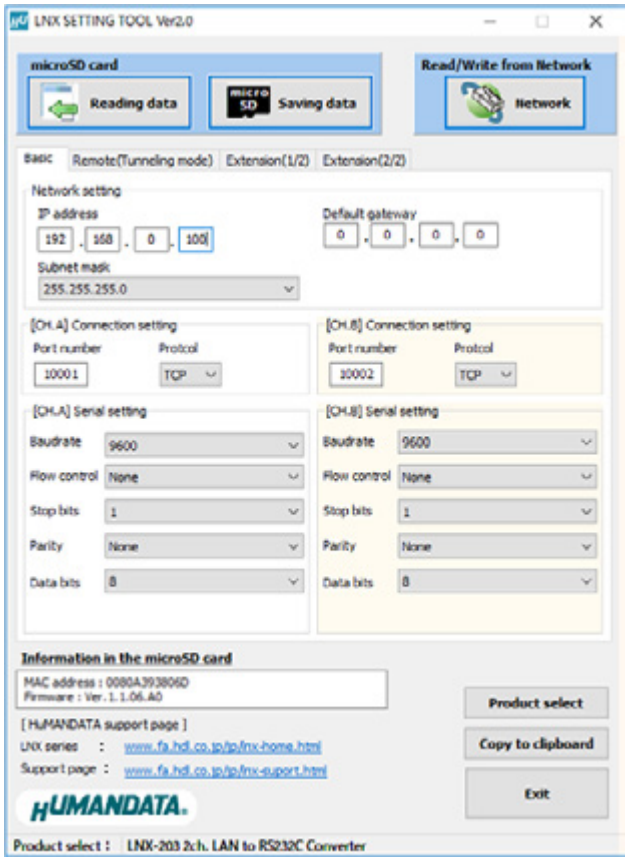
1. After confirming the power is off, insert the microSD card to the product.
2. When the product is powered on, the setting data will be reserved to the microSD card automatically. The data file name is “RD_DATA.TXT”.
   Please be careful not to detach the microSD card before TX/RX LED is turned off.
   * 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.

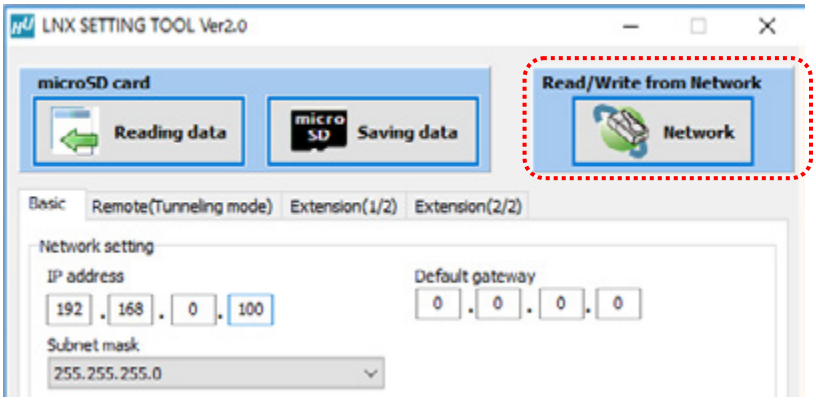


6. Open the “RD_DATA.TXT” in the microSD card.
7. Setting data is loaded.

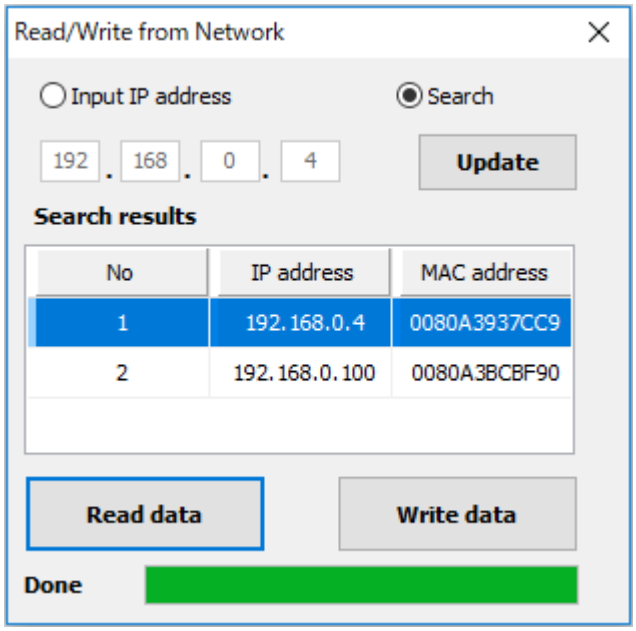


7.5. Write or Read setting data over the network

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



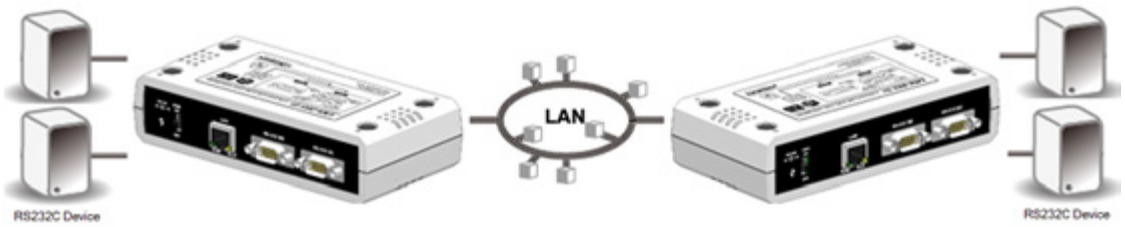
2. Enter an IP address manually or click “Search”. When some products are found, please select a number from a list.



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-203 (Ch A to Ch A, Ch B to Ch B)]



LNX-203		LNX-203
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

Ch A Setting		
10001	Port Number	10001
TCP	Protocol	TCP
Ch A Remote Setting (Tunneling)		
192.168.0.101	Remote IP Address	192.168.0.100
10001	Remote Port Number	10001
Ch A Serial Communication		
230400	Baud rate	19200
RTS/CTS (hard ware)	Flow Control	RTS/CTS (hard ware)
1	Stop Bits	1
None	Parity	None
8	Data Bits	8

Ch B Setting		
10002	Port Number	10002
TCP	Protocol	TCP
Ch B Remote Setting (Tunneling)		
192.168.0.101	Remote IP Address	192.168.0.100
10002	Remote Port Number	10002
Ch B Serial Communication		
230400	Baud rate	19200
RTS/CTS (hard ware)	Flow Control	RTS/CTS (hard ware)
1	Stop Bits	1
None	Parity	None
8	Data Bits	8

Communication with different baud rate is available as shown above. But please be sure to confirm the timing before running.

[LNX-203 single operation]

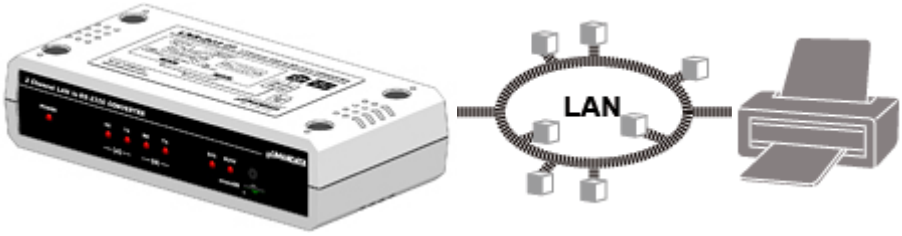
LNX-203 Side

Network Setting	
IP Address	192.168.0.100
Subnet Mask	255.255.255.0
Default Gateway	0.0.0.0

Ch A Setting	
Port Number	10001
Protocol	TCP
Ch A Remote Setting (Tunneling)	
Remote IP Address	0.0.0.0
Remote Port Number	0
Serial Communication	
Baud rate	230400
Flow Control	RTS/CTS (hard ware)
Stop Bits	1
Parity	None
Data Bits	8

Ch B Setting	
Port Number	10002
Protocol	TCP
Ch A Remote Setting (Tunneling)	
Remote IP Address	0.0.0.0
Remote Port Number	0
Serial Communication	
Baud rate	9600
Flow Control	None
Stop Bits	1
Parity	None
Data Bits	8

[Connect LNX-203 and LAN printer and output from microcomputer and PLC devices]



LNX-203		Printer
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

Ch A Setting		
10001	Port Number	9100
TCP	Protocol	-
Ch A Remote Setting (Tunneling)		
192.168.0.101	Remote IP Address	-
9100	Remote Port Number	-
Ch A Serial Communication		
230400	Baud rate	-
RTS/CTS (hard ware)	Flow Control	-
1	Stop Bits	-
None	Parity	-
8	Data Bits	-

When you connect LAN printer to also Ch B side, please set the parameters as shown above.

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-203. Rather than going out the local port, the data is transmitted across the Ethernet network using TCP/IP. LNX-203 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
https://www.hdl.co.jp/en/faspc/LNX/lnx-203

- LNX SETTING TOOL
- Virtual COM Port
- Outline Drawing

  … and more.

10. Warranty and Compensation

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

2 Channel RS-232C LAN Converter

LNX-203

User's Manual

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