HUMANDATA®

LAN Multiplexer 4:1

LNX-204

User's Manual

Ver. 1.3

HuMANDATA LTD.

Table of Contents

● 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 26, 2018	v1.0	Initial release
July 9, 2019	v1.1	Replaced the order of section 7 and 8
September 5, 2019	v1.2	Added P, E, and D command Added password setting
March 9, 2021	v1.3	Added Additional notes to 4. Specifications

● Introduction

Thank you very much for purchasing our product LNX-204.

LNX-204 is a LAN multiplexer to switch 4 channel LAN port. LNX-204 can change the port physically by three ways: send simple command from PC via LAN, input control signal from an external contact point or change switches of the product body.

1. Product Configuration

The following lists the product configuration of the LNX-204.

LAN multiplexer (LNX-204)	1
microSD card with USB adapter	1
D-Sub 9pin M2.6 screw (#4-40 UNC is mounted)	2
AC adapter (DC5V)	1
Driver & Application CD	1

2. Product Summary

LNX-204 is a LAN multiplexer to switch 4 channel LAN port. LNX-204 can change the port physically by three ways: send simple command from PC via LAN, input control signal from an external contact point or change switches of the product body.

This is very useful to switch external network to internal network, and to connect with the network only when required. It can promote labor-saving for inspection process and auto-inspection system of LAN devices.

LNX-204 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-204.

3. Overview

3.1. Block Diagram
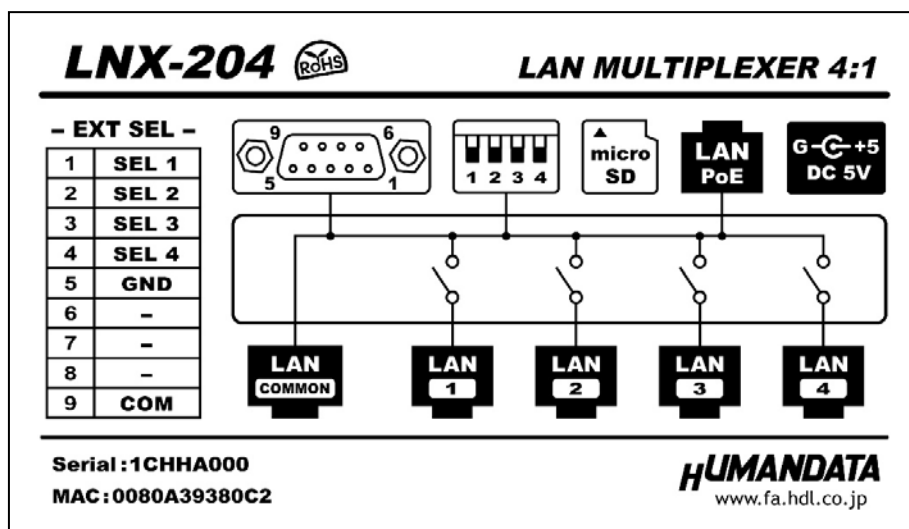
3.2. Front Side
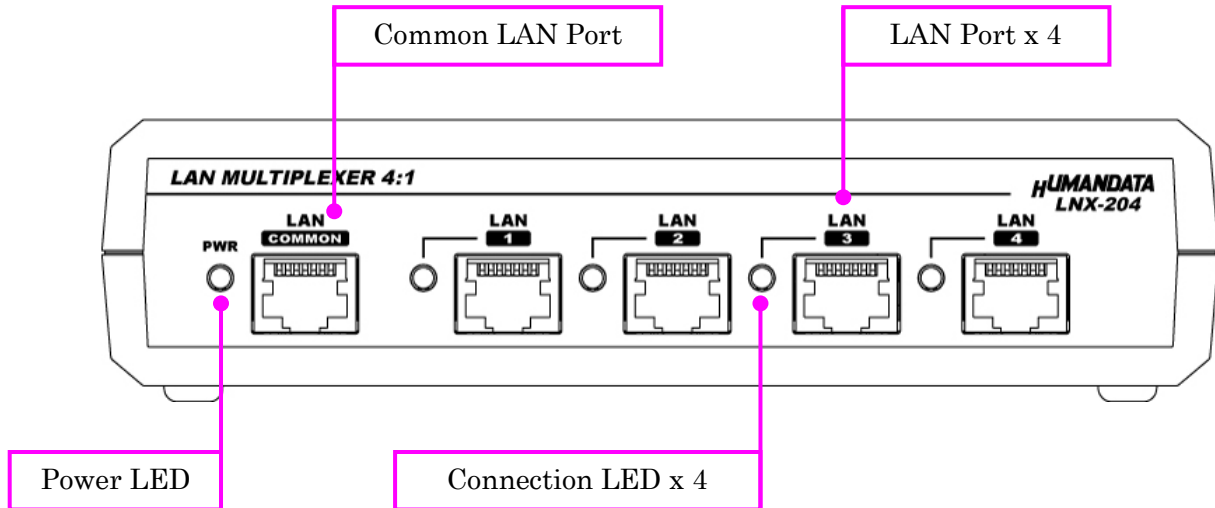
LEDs

	Name (color)	Function
PWR	Power LED (red)	Turn on during the power is supplied.
LAN1-4	Connection LED (red)	Turn on during connecting with common LAN Port.

3.3. Rear Side

Power Input — LAN Controller Port — System LED — micro SD card Access LED — D-sub 9pin male Connector — Active LED — Link LED — micro SD card Slot — FG Terminal — Selecting Switch
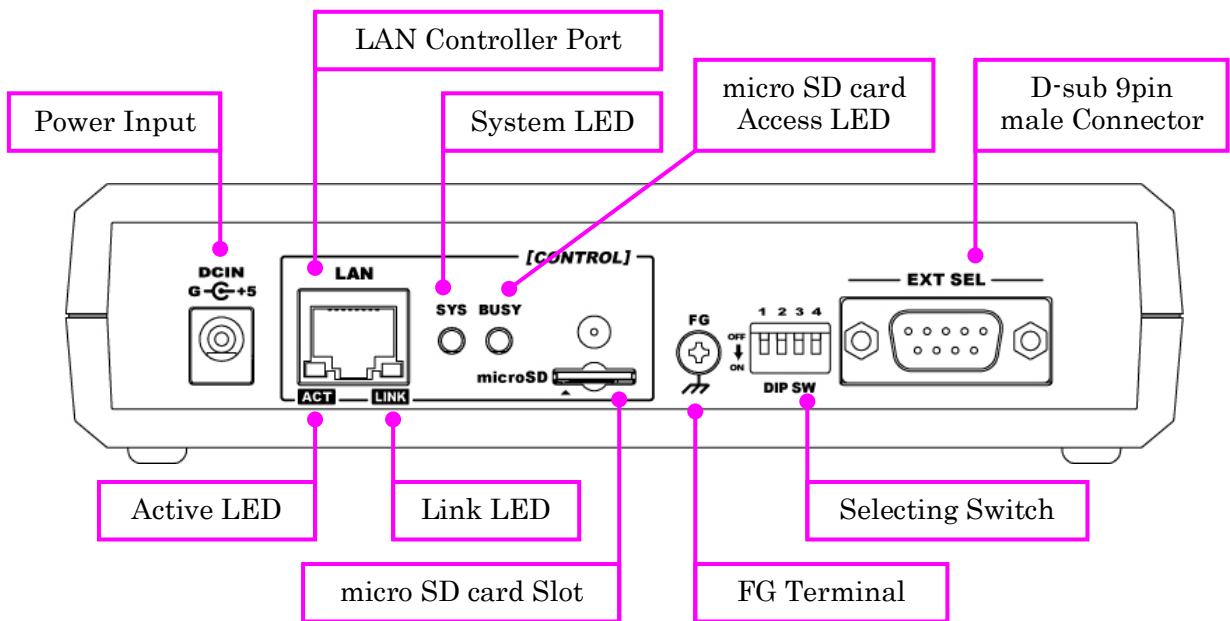
LEDs

	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.
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.

4. Specifications

Item	Description	Remarks
Model	LNX-204	
Power	5VDC, Supplied by AC adapter or LAN connector (PoE function)	PoE function supports both mode A and B
Current Consumption	Less than 300mA	
Network Interface	IEEE802.3 (10Base-T) IEEE802.3u (100Base-TX) half-duplex / full-duplex (auto detected)	
Common/Selecting Port	10/100/1000 Base-T *1	
LAN Connector	RJ45 x 6	ESD protection ±11KV
Protocol	TCP / UDP / Telnet	
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
LED	Power LED, Connection LED x 4 System LED, microSD card access LED LINK Status LED (RJ45 Connector) ACT Status LED (RJ45 Connector)	
Operating Ambient Temp.	-20 to 60 [°C] (-4 to 140 [°F])	No condensation permitted
Operating Ambient Hum.	10 to 85 %RH	
Storage Ambient Temp.	-20 to 60 [°C] (-4 to 140 [°F])	
Storage Ambient Hum.	10 to 85 % RH	
Weight	Approx. 250 [g]	Only main body
Dimensions	165 x 80.5 x 39 [mm] (6.496" x 3.169" x 1.535")	Without projections

*1 The operation of this product is confirmed with 10/100/100 BASE-T. But the product is inserted between LAN cables, speed reduction can be occurred. The communication speed is not guaranteed. When the LAN cable is long, using giga bit corresponding switching hub may improve the speed reduction.

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

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

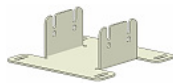* Please use the microSD card that is included in the package.

4.1. AC adapter (Japan's specifications)

Item	Description	Remarks
Input	AC100 to 240V, 50/60Hz 0.3A	
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 Hum.	30 to 85 % RH	
Storage Ambient Temp.	-20 to 80 [°C] (-4 to 176 [°F])	
Storage Ambient Hum.	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		Attachment for vertical direction JAN: 4937920801096
ACC-028		Attachment for horizontal direction JAN: 4937920801102
ACC-031		Attachment for DIN rail type B JAN: 4937920801256
ACC-036		Neodymium magnet set JAN: 4937920801539

4.3. Power Supply

LNX-204 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.

4.4. FG Terminal

Please connect FG terminal with earth ground as necessary.

FG

4.5. Selecting Switch

You can change 4 LAN ports manually by setting selecting switch. When power on, the setting is recognized as the default port setting.
If sending changing port command after setting this switch, the command is prior.
External contact point is also prior to this switch.
When you need to disable the selecting switch, set all the switches to ON.

| Select No Port	Select LAN1 Port	Select LAN2 Port	Select LAN3 Port	Select LAN4 Port
Factory Setting				

5. External Contact Connector

D-sub 9 pin connector is mounted as external contact. When SEL1-4 is shorted with GND, the LAN port is switched.

e.g. Short SEL3 (pin no. 3) with GND (pin no.5): Common LAN port and LAN3 port is connected.

> **Notice** To prevent the damage, for SEL 1 to 4 please use no-voltage contact (dry contact) like relay contact or switches.

Pin No	Name	Direction	Remarks
1	SEL 1	IN	Select LAN1
2	SEL 2	IN	Select LAN2
3	SEL 3	IN	Select LAN3
4	SEL 4	IN	Select LAN4
5	GND	-	GND
6	NC	-	-
7	NC	-	-
8	NC	-	-
9	(COM)	-	Power Input (option)
CASE	FG	-	Connect with FG Terminal

#4-40 UNC

GND 5
SEL4 4
SEL3 3
SEL2 2
SEL1 1
9 COM
8 −
7 −
6 −
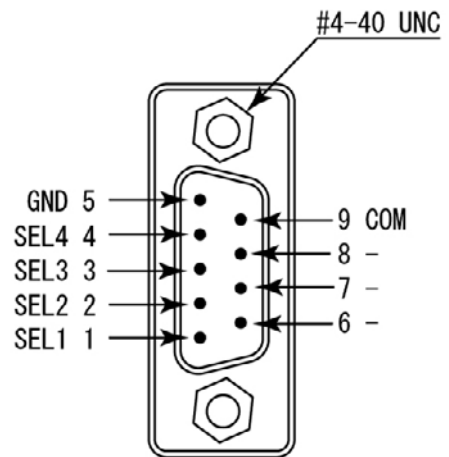
D-Sub 9pin Male

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

* COM (pin No.9) is an option for DC 5V to 24V power input.
If you need to change LAN port directly from open collector or transistor, please contact us.

6. Connection examples

Change common port LAN or external network to LAN1-4.
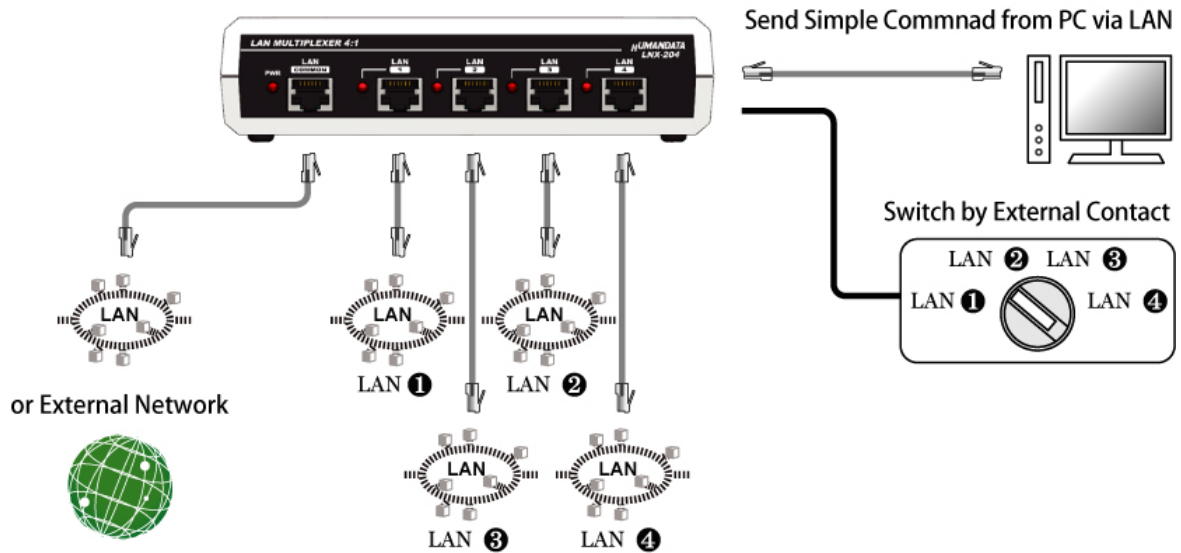
7. Setting Tool

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 2.3

7.1. Access Flow of microSD card

```
          ┌──────────────┐
          │  Power ON    │
          └──────┬───────┘
                 │
          ┌──────▼───────┐
          │ PWR LED turn on │
          └──────┬───────┘
                 │
             ◇ microSD        None
             ◇  card    ──────────────┐
                 │ Detect              │
          ┌──────▼───────┐             │
          │ BUSY LED turn on │         │
          └──────┬───────┘             │
                 │                     │
             ◇ Setting data   None     │
             ◇ WR_DATA.TXT ───────┐    │
                 │ Find            │    │
             ◇ Product type   NG   │    │
             ◇   Verify    ──────► │    │
                 │ OK                   │
          ┌──────▼───────┐             │
          │ Write setting data │       │
          └──────┬───────┘             │
                 │                     │
          ┌──────▼────────────┐        │
          │ Saving backup data of │◄───┘
          │ RD_DATA.TXT in the micro SD card. │
          └──────┬────────────┘
                 │
          ┌──────▼───────┐
          │ BUSY LED turn off │
          └──────┬───────┘
                 │
          ┌──────▼───────┐
          │ SYS LED flicker │
          │ (System start up) │
          └──────┬───────┘
                 │
          ┌──────▼───────┐
          │ SYS LED turn on │
          └──────┬───────┘
                 │
          ┌──────▼───────┐
          │    Ready     │
          └──────────────┘
```
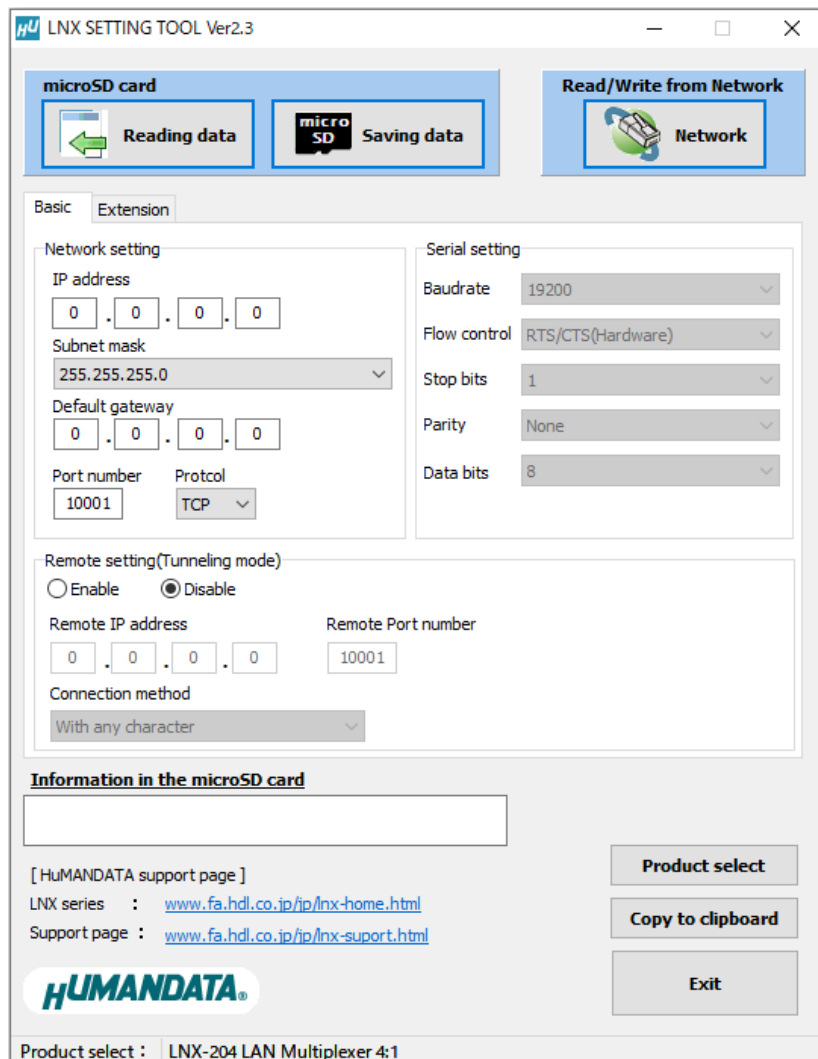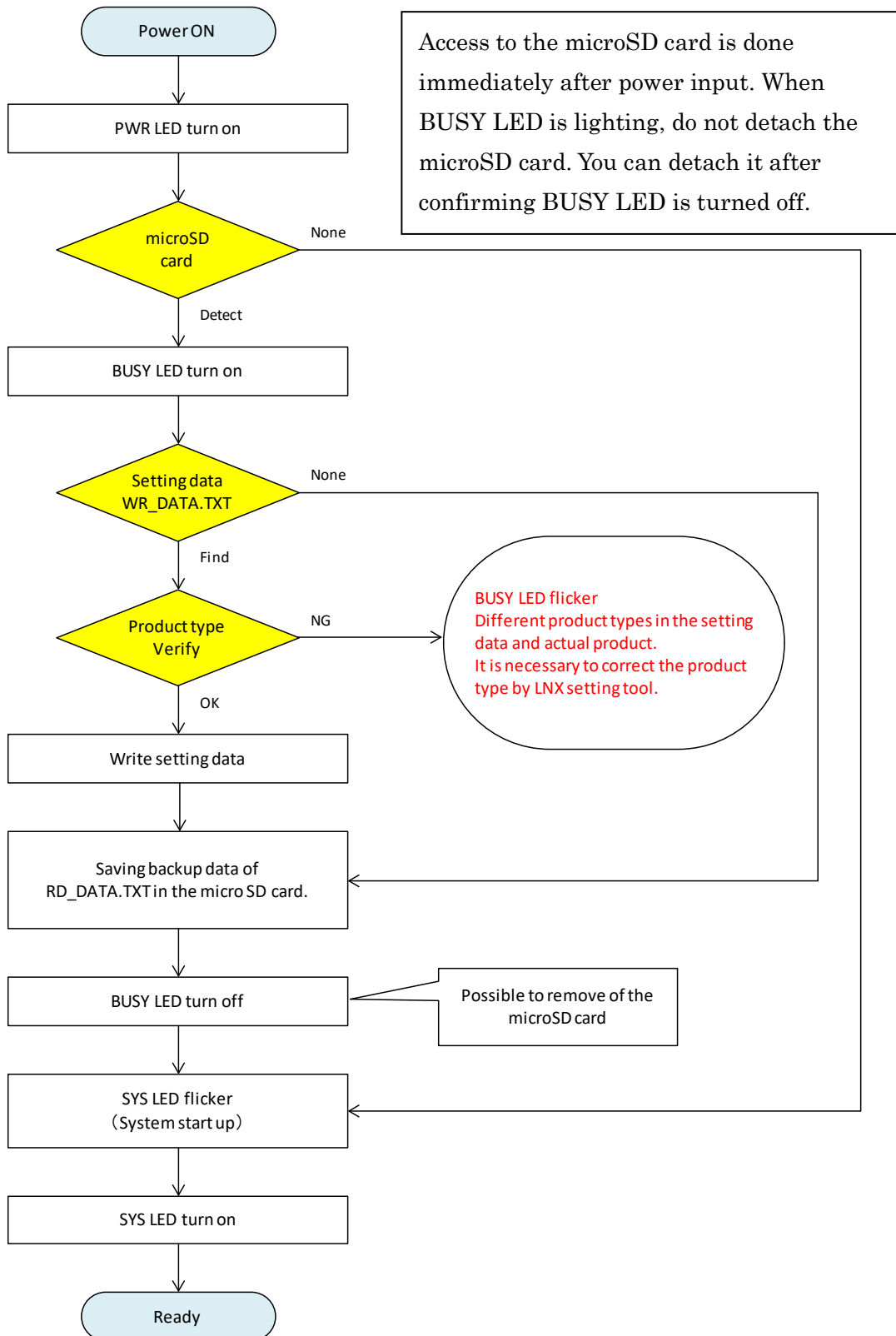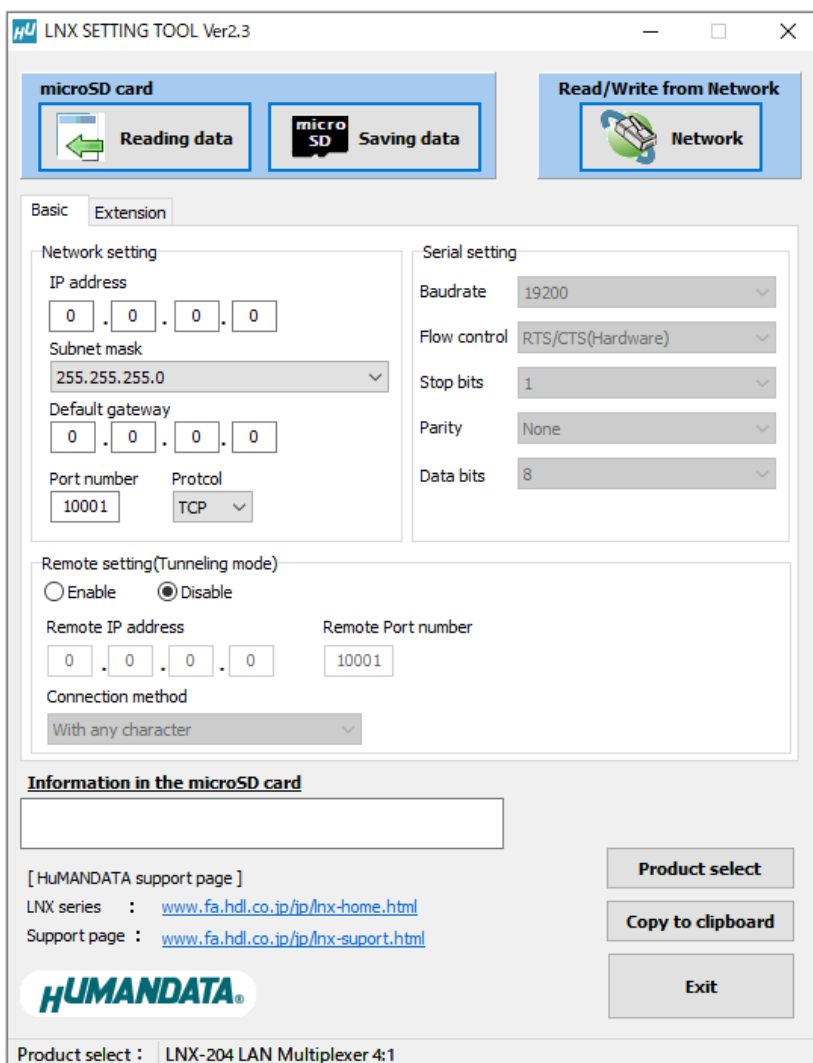
Access to the microSD card is done immediately after power input. When BUSY LED is lighting, do not detach the microSD card. You can detach it after confirming BUSY LED is turned off.

BUSY LED flicker
Different product types in the setting data and actual product.
It is necessary to correct the product type by LNX setting tool.

Possible to remove of the microSD card

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. <table><tr><td>1-1024</td><td>Reserved for well-known ports</td></tr><tr><td>9999</td><td>Reserved for telnet setup</td></tr><tr><td>14000-14009</td><td>Reserved for old redirector</td></tr><tr><td>30704</td><td>Reserved for remote control of user I/Os</td></tr><tr><td>30718</td><td>Reserved for configuration</td></tr></table>

|	
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.

* Serial setting of LNX-204 is fixed.

[Extension]

| 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.

|	
TCP keepalive	TCP keepalive time defines how many seconds LNX-204 waits during an inactive connection before checking its status. If the unit does not receive a response 7 consecutive times, it drops that connection. Enter a value between 0 and 65 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 enables 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.
Password setting	If you set a password for TCP connection, you must enter the password before connecting. If you set a configuration password, you can restrict access to the setting screen that is displayed by entering the IP address from the browser. TCP connection: half-width characters (up to 15 characters) Configuration: half-width characters (up to 16 characters) *Password is not read even if [Reading Data] or [Read from Network] is performed with this tool. * Password setting supported in product version 1.2 or later.

7.3. Write Setting Data

1. Open Setting Tool for LNX series (LNX SETTING TOOL Ver*.*).
2. Select "LNX-204 LAN Multiplexer 4:1", and click "OK".
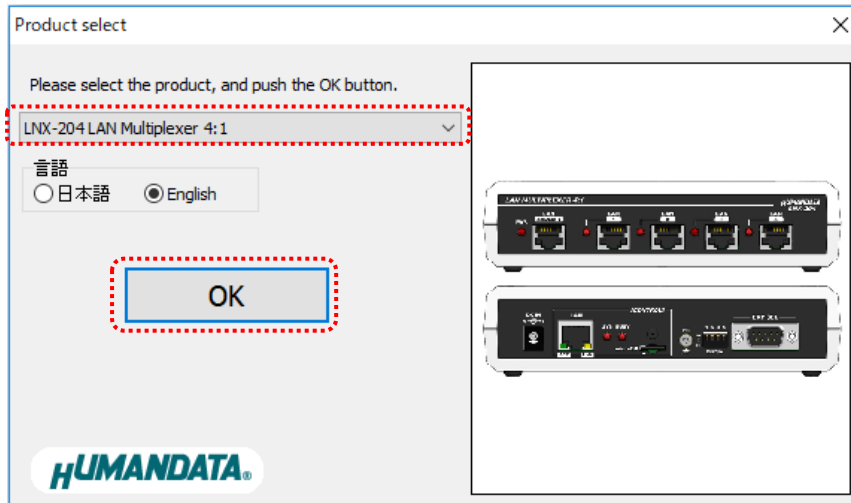
3. Enter the setting such as network or serial.
4. Insert a microSD card to PC (A USB adapter is included with the product)
5. Click "Saving data".
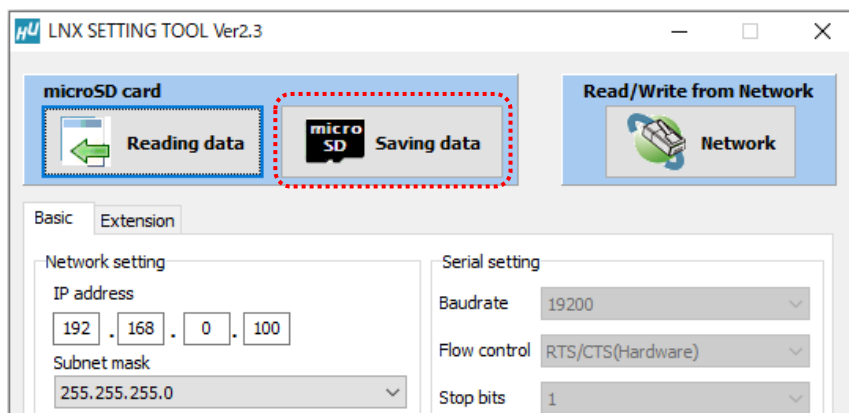
6. Click "OK" in the confirmation dialog.
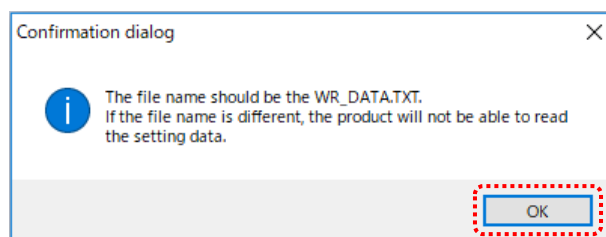
7. Specify the microSD card as saving destination. Please do not change the file name from "WR_DATA.TXT".

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 BUSY LED is turned off.
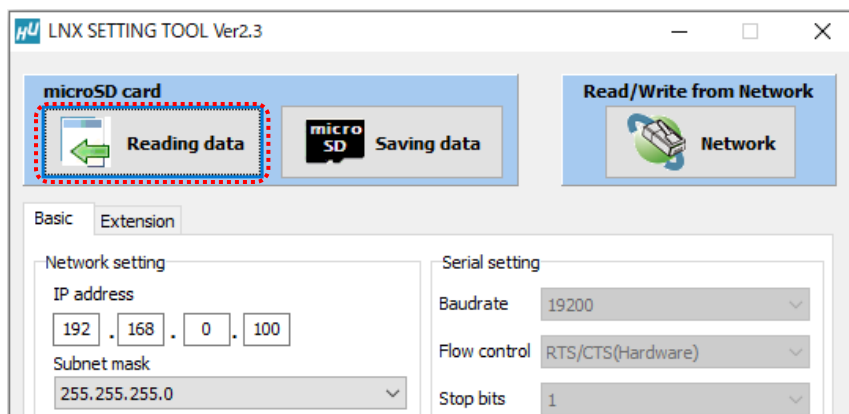
7.4. Read Setting Data

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".
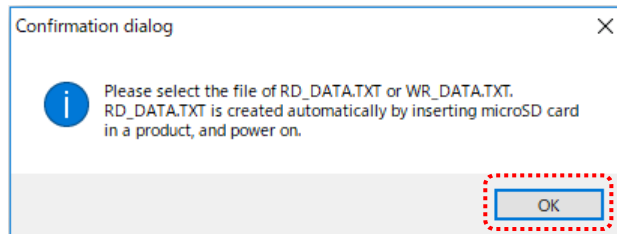
   Please be careful not to detach the microSD card before BUSY LED is turned off.

   * 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)

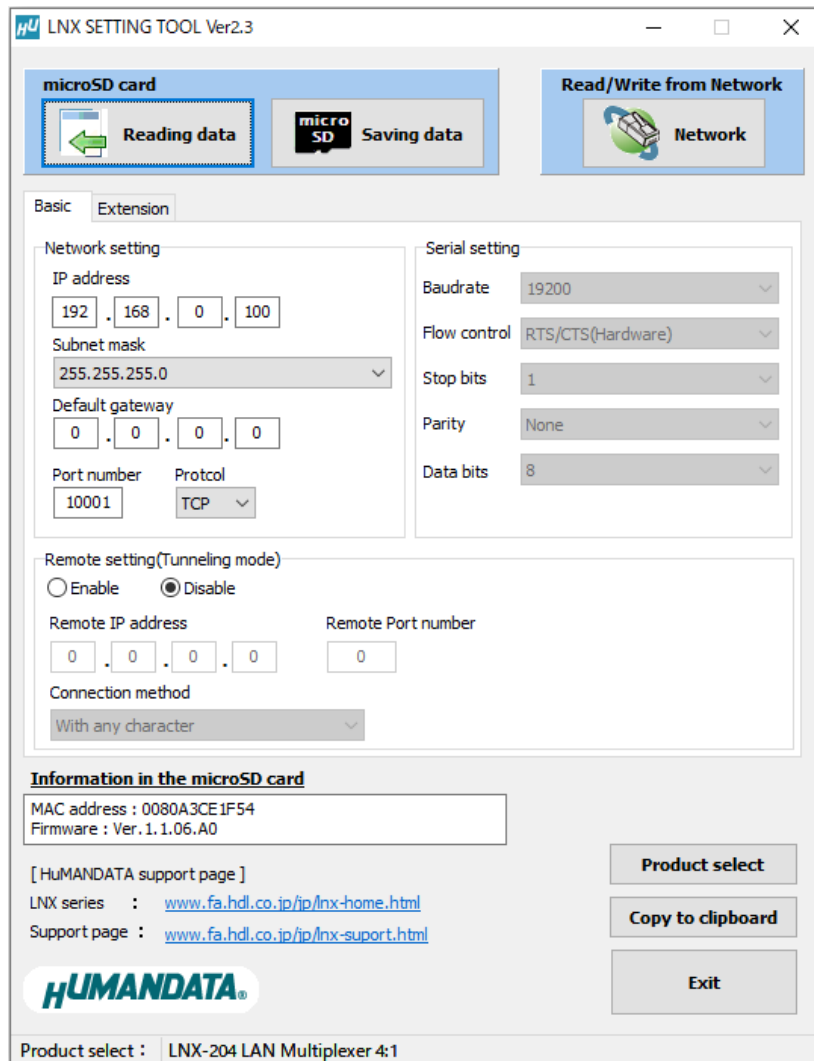4. Start the setting tool and click "Reading data".
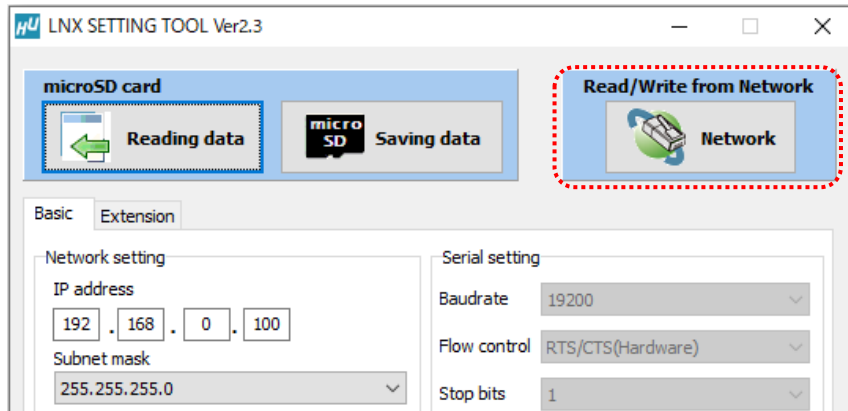

5. Click "OK" in the confirmation dialog.

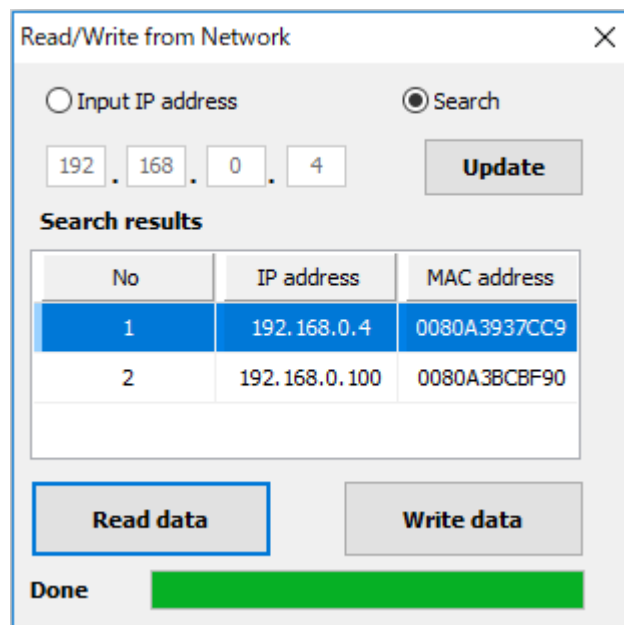6. Open the "RD_DATA.TXT" in the microSD card.

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.

8. Controller Command

You can control with simple single character command shown in the following
table by using terminal software and keyboard. Each controller command is an
ASCII text. The command is case sensitive.

	Command	Function	Format
1	'1'	Select LAN port 1	1<CR>
2	'2'	Select LAN port 2	2<CR>
3	'3'	Select LAN port 3	3<CR>
4	'4'	Select LAN port 4	4<CR>
5	'0'	Select no LAN port	0<CR>
6	'C'	Get active LAN port	C<CR>
7	'V'	Get product version	V<CR>
8	'P'	Set a password for port selection	P,{PRAM1},{PRAM2}<CR>
9	'E'	Enable port selection	E,{PRAM}<CR>
10	'D'	Disable port selection	D<CR>

* P,E, and D command supported in product version 1.2 or later.

1. **'1' : Select LAN port 1**

Format	1,<CR>	
Function	LAN port 1 is selected.	
e.g.	Send	1,<CR>
	Response	1,1<CR>　　*When selection of LAN port 1 is completed.
		Password required<CR>　*When port selection is disabled.

2. **'2' : Select LAN port 2**

Format	2,<CR>	
Function	LAN port 2 is selected.	
e.g.	Send	2,<CR>
	Response	2,2<CR>　　*When selection of LAN port 2 is completed.
		Password required<CR>　*When port selection is disabled.

3. '3' : Select LAN port 3

Format		3,<CR>
Function		LAN port 3 is selected.
e.g.	Send	3,<CR>
	Response	3,3<CR> *When selection of LAN port 3 is completed.
		Password required<CR> *When port selection is disabled.

4. '4' : Select LAN port 4

Format		4,<CR>
Function		LAN port 4 is selected.
e.g.	Send	4,<CR>
	Response	4,4<CR> *When selection of LAN port 4 is completed.
		Password required<CR> *When port selection is disabled.

5. '0' : Select no LAN port

Format		0,<CR>
Function		LAN port is not selected.
e.g.	Send	0,<CR>
	Response	0,0<CR> *When no selection of LAN port is completed.
		Password required<CR> *When port selection is disabled.

6. 'C' : Get active LAN port

Format		C,<CR>
Function		Get the active LAN port.
e.g.	Send	C,<CR>
	Response	C,1<CR> *When LAN port 1 is selected.

7. 'V' : Get product version

Format		0,<CR>
Function		Get the product version.
e.g.	Send	V,<CR>
	Response	LNX-204 Ver.1.2<CR> *When version is 1.2.

8. 'P' : Set a password for port selection

Format	P,{PRAM1},{PRAM2}<CR>	
Function	Set a password for port selection. The default password is set to "0000". After setting a password other than "0000", enable the port selection with the E command to enable the 0 to 4 command.	
Parameter	PRAM1 : Enter the old password. half-width characters (up to 4 characters) PRAM2 : Enter the new password. half-width characters (up to 4 characters)	
e.g.	Send	P,0000,1234<CR> *When changing the password from 0000 to 1234.
	Response	Password setting completed<CR> * When password change is completed
		Password do not match<CR> *When password do not match.

9. 'E' : Enable port selection

Format	E,{PRAM}<CR>	
Function	Port selection is enabled. The default password is set to "0000". After setting a password other than "0000", E command is enabled.	
Parameter	PRAM : Enter the password. half-width characters (up to 4 characters)	
e.g.	Send	E,1234<CR> *When a password is set to "1234".
	Response	Enable LAN port control<CR> *When port selection is enabled.
		Password do not match<CR> *When password do not match.

10. 'D' : Disable port selection

Format	D,<CR>	
Function	Port selection is disabled.	
e.g.	Send	D,<CR>
	Response	Disable LAN port control<CR>

*If the product receives an undefined command, "Undefined command<CR>" will be returned.

* <CR>: Carriage Return (0x0D)

9. 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-204.
Please refer to the "LNX series virtual COM port User's Manual" that are stored on the product supplied CD for details.

10. Additional Documentation and User Support

The following documents and other supports are available at

https://www.hdl.co.jp/en/faspc/LNX/lnx-204

- LNX SETTING TOOL
- Virtual COM Port
- Outline Drawing

  … and more.

11. Warranty and Compensation

Please refer to the following URL for the warranty.

https://www.fa.hdl.co.jp/en/fa-warranty.html

LAN Multiplexer 4:1

LNX-204

User's Manual

Ver. 1.3 .... Mar. 9, 2021