HUMANDATA.

USB Analog Multiplexer 4:1

USB-208

User's Manual

Ver. 1.0

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
May 21, 2024	v1.0	Initial release

● Introduction

USB-208 is a multiplexer that can switch one common port to one of four channels. RS-232C, RS-422/485, and other analog signals can be switched by the following three ways.

- ● Sending simple commands from a PC via USB.
- ● External input, no-voltage contact input or DC input can be selected.
- ● Switching manual switch on the side panel.

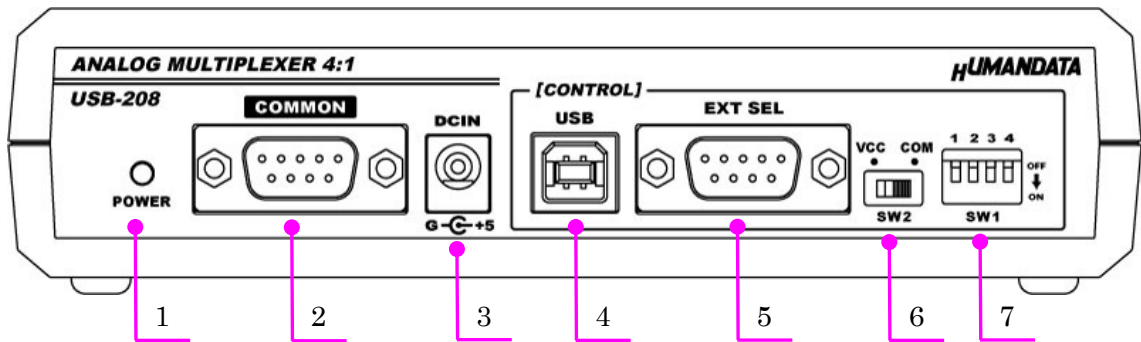It supports analog signal voltage range of ±25V and data rate up to 20Mbps.
The system can also be used to save labor in the inspection process. It allows four units in a single setting during automatic equipment inspection.

1. Overview

Top side
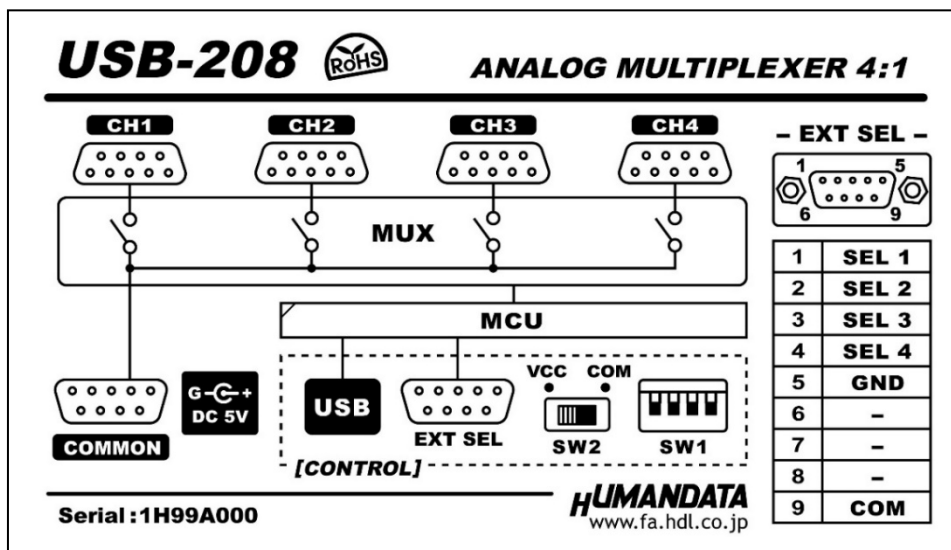
USB Host side

	Name	Function
1	POWER LED (green)	Light up when power ON
2	COMMON	Common port for multiplexer, connect switching source
3	DCIN	AC adapter jack, DC 5V center negative
4	USB	USB port for controlling by sending command from PC
5	EXT SEL	External input connector for changing input signal
6	SW2 (VCC/COM)	Switch for changing external common input voltage
7	SW1 (1/2/3/4)	Switch for changing port manually

USB Target side
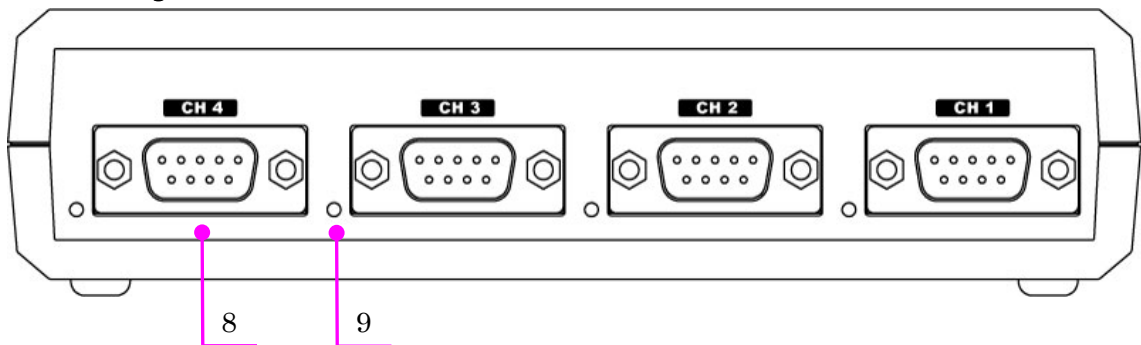
	Name	Function
8	CH.1 to 4	Each port connector, connect switching destination
9	CH.1 to 4 LED (green)	Light up when the port is selected

2. Specifications

2.1. Product Specification

Item	Description	Remarks
Model	USB-208	
Input Power	5VDC, less than 150mA Supplied through a USB port (Bus-powered) or AC adapter	
Number of Switching Port	4	
Analog Signal Range	±25V	
Analog Signal Data Rate	max. 20Mbps	
LSI	MAX14778 analog multiplexer	ADI
Common Port	D-SUB 9pin Male (#4-40 UNC) [*1]	
Switching Port	D-SUB 9pin Male x 4 (#4-40 UNC) [*1]	
Control Port	USB2.0 B connector, Virtual COM Port (Support Full Speed)	ESD protection ±11KV
Support OS for controller side	Windows 11/10/8.1/8/7	CDC driver OS of common/switching ports are not limited
External Input Connector	D-SUB 9pin Male (#4-40 UNC) [*1]	
External Input Specification	No-Voltage Dry Contact Input	Switch setting: VCC side
	Photocoupler Isolated Input Input: DC5 to 24V Input impedance: 2.8KΩ OFF to ON Voltage: more than 4.3V ON to OFF Voltage: up to 3.6V Minimum OFF-state Current: 0.9mA	Switch setting: COM side
LED	Power LED, Channel LED x 4	
Operating Ambient Temp.	-20 to 60[°C] (-4 to 140 [°F])	No condensation permitted (excludes AC adapter)
Operating Ambient Humi.	10 to 85%RH	
Storage Ambient Temp.	-20 to 60[°C] (-4 to 140 [°F])	
Storage Ambient Humi.	10 to 85%RH	
Weight	Approx. 350 [g]	Only main body
Dimensions	165 x 80.5 x 39 [mm] (6.496" x 3.169" x 1.535")	Without projections

There is a case that these parts to be changed to the parts of the compatibility.
Power saving function (suspend, standby, sleep and others) is not supported.

*1: M2.6 screws are also included in the package.

2.2. 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 Humi.	30 to 85 % RH	
Storage Ambient Temp.	-20 to 80 °C [°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.

2.3. 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
ACC-045		D-sub 9pin to 6P adapter with FG terminal JAN : 4937920801782

3. Main Power

USB-208 is powered through a USB port (Bus-powered) or an AC adapter (Self-powered). An AC adapter has priority when both are applied.

# 4. Pinouts and Wiring between COMMON and each Channel

Common port and each channel connector are D-Sub 9pin. The common port and each channel are wired as straight through. Only 9-pin is unconnected, NC. The following diagram shows the internal wiring.
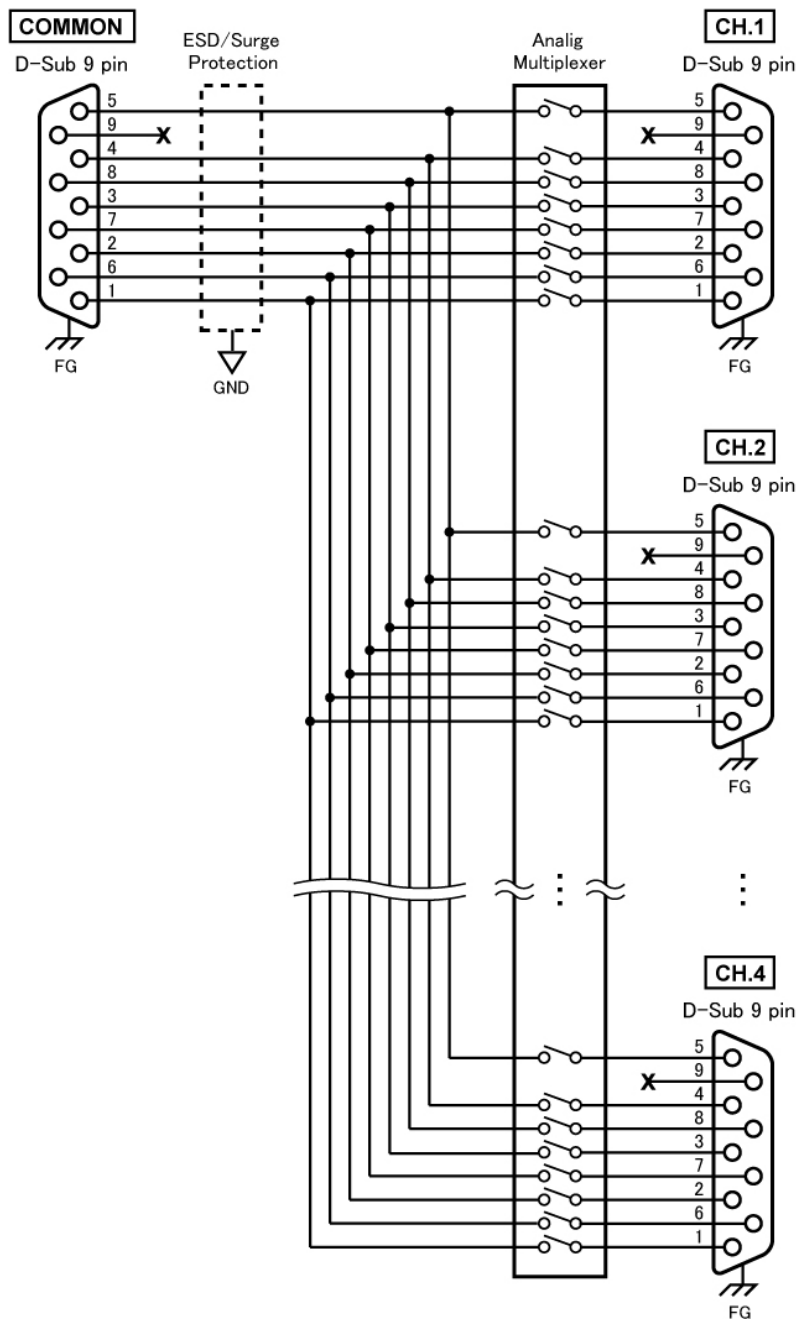
5. Connection examples

5.1. Switching RS-232C equipment via USB

The following diagram shows an example of switching channels by sending a control command from a PC via the common USB port. An RS-232C device connected to the common port can be connected to one of the channels from Ch.1 to Ch.4.
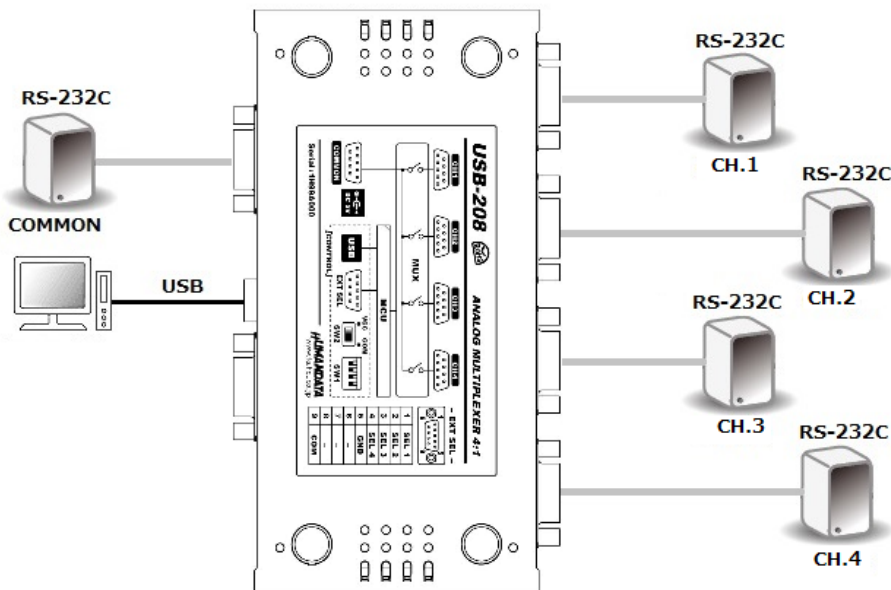
5.2. Switching RS-485/422 signal by external switch box

The following diagram shows an example of switching channels by the 4Ch switching box connected to the external connector. An RS-485/422 converter, USB-010, connected to the common port can be connected to one of RS-485/422 device network from Ch.1 to Ch.4.
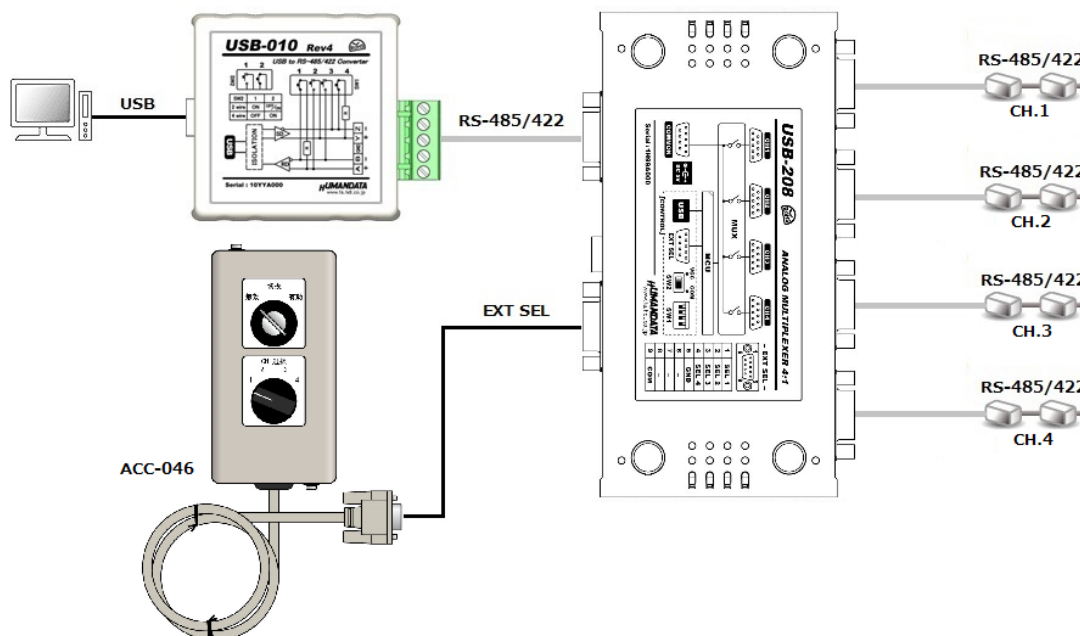
* ACC-046 is optional accessory.

6. Control Commands

To change channels via USB you can use 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.

Each command receives response text. Please refer to the following table.

Command	Function	Description
'1' to '4'	Select Channel	<CMD>, [active channel]<CR>
'0'	No selection	<CMD>, 0<CR>
'C'	Get active channel	<CMD>, [active channel]<CR>
'V'	Get product version	"USB-208 Ver.***"<CR>
other	-	"Undefined command"<CR>

6.1. Send Command from Original Application

You can test how the product works with an original application, AMUX-Select.

You can download this application from our web site.

Please refer to the chapter 10. Additional Documentation and User Support.
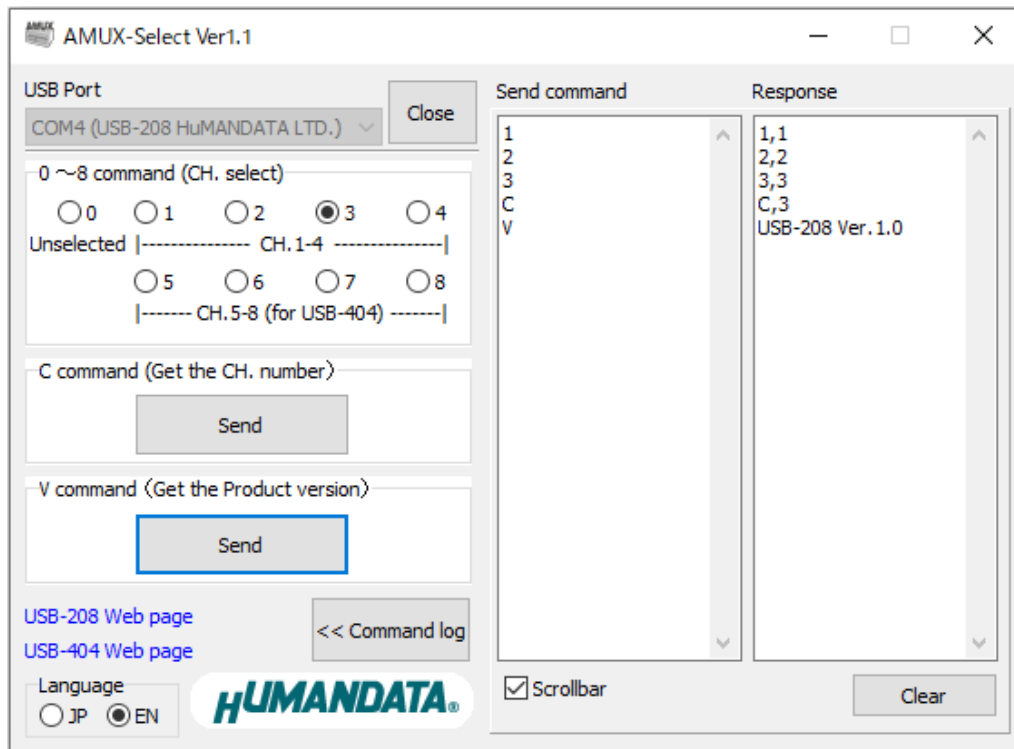

6.2. Send Command from Terminal Application

Tera Term is a terminal software for Windows that can send characters entered from the keyboard to the terminal and display the characters sent by the terminal.
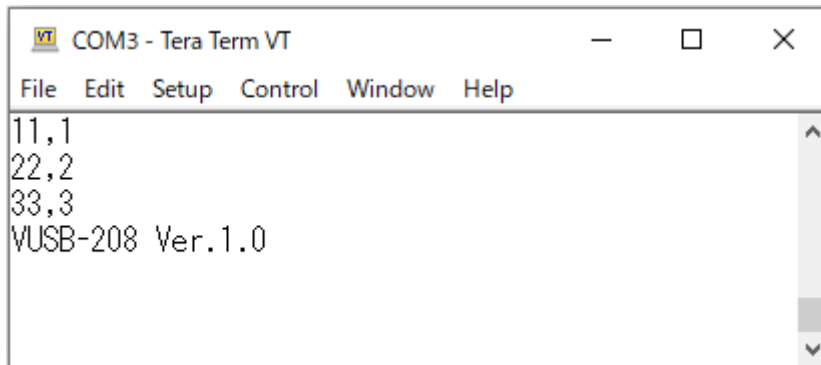
1. Connect control USB port to a PC using a USB cable
2. Open Tera Term and select new connection. Then select COM number from serial ports.
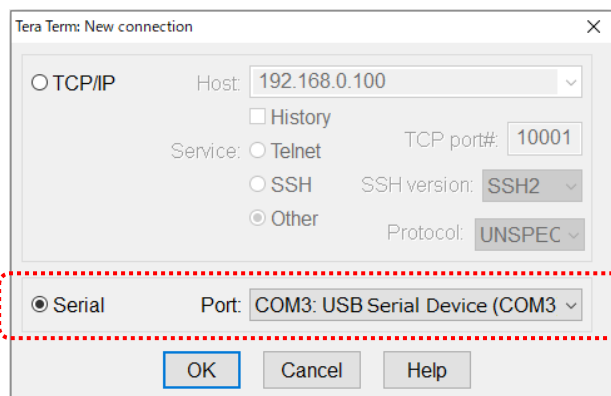
3. Check the Local echo check box and click OK in the Terminal set up window. When the Local echo is set to valid, sending character can be displayed in the terminal window.
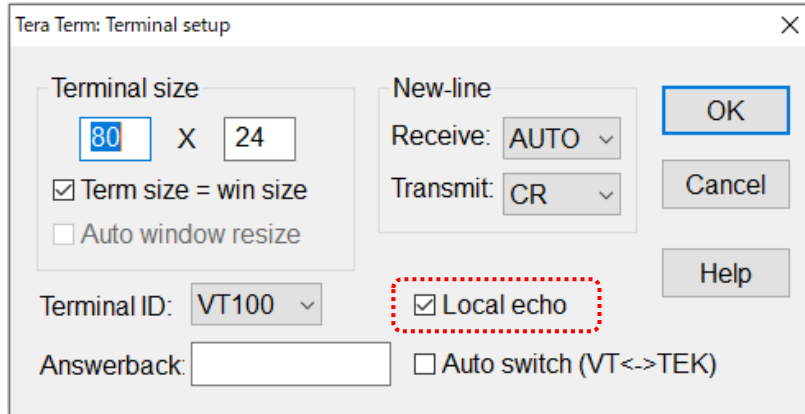
4. Enter control command and check the operation

7. Changing Switch (SW1)

Each channel can be switched by changing the switch (SW1) manually. When supplying power, the port is selected as the default channel depending on this switch setting.

After applying power, when switching command is sent via USB port or changing signal is input from external connector, the port is changed to selected channel. When the all switches are turned on and power is applied, this manual switch is disabled.
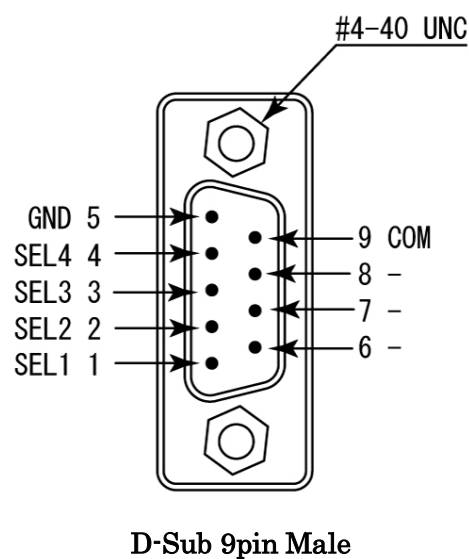
Not Selected	Select CH.1	Select CH.2	Select CH.3	Select CH.4
Factory setting				
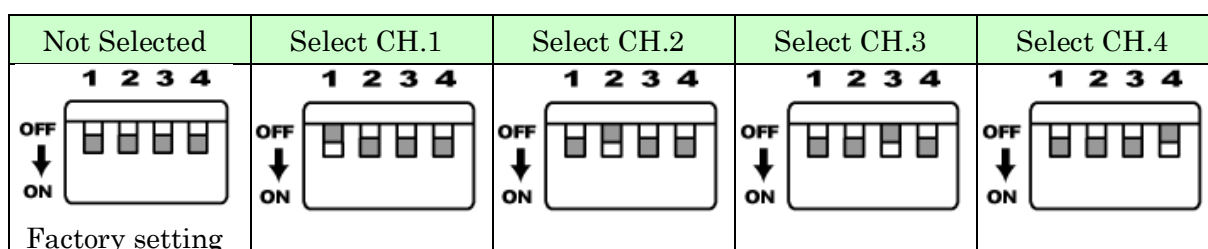
8. External Input

8.1. External Input Connector (EXT SEL)

D-sub 9pin connector is mounted for an external input.

| Pin No	Signal	Dir.	Remarks
1	SEL 1	In	Select CH.1
2	SEL 2	In	Select CH.2
3	SEL 3	In	Select CH.3
4	SEL 4	In	Select CH.4
5	GND	-	GND
6	-	-	NC
7	-	-	NC
8	-	-	NC
9	COM	-	Input DC5 to 24V
CASE	FG	-	FG Terminal

D-Sub 9pin Male

#4-40 UNC screws are attached to D-sub 9pin connector when shipping a product. You can change those screws to included M2.6 screws.

8.2. Common Voltage (SW2)

This is a common voltage selection switch for external input. You can select no-voltage dry contact input or DC input.
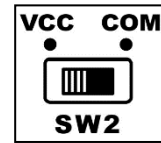
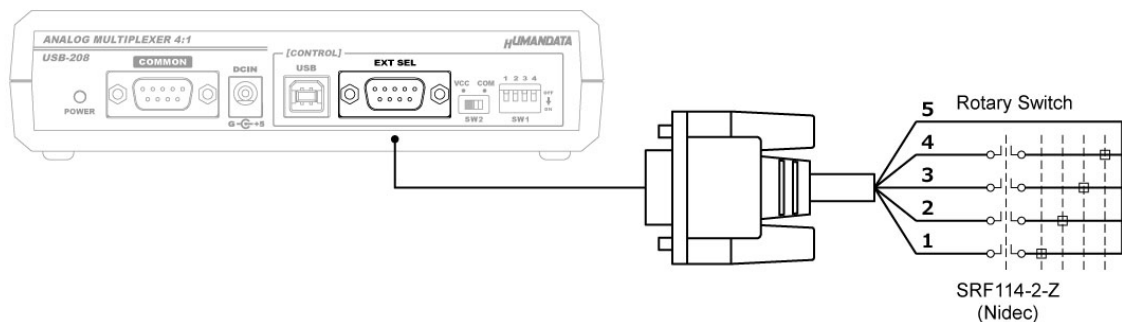VCC: no-voltage dry contact input (use internal power) * Factory Setting
COM: DC5 to 24Vinput (use external input)

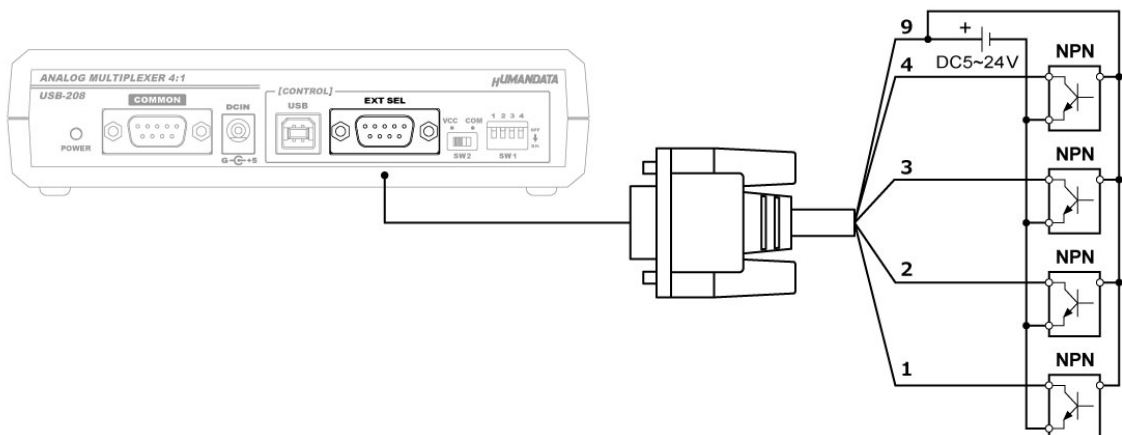| Notice	When you select no-voltage dry contact input, you need to connect no-voltage dry contact such as relay contact. If voltage is applied, the internal circuit may be damaged.

8.3. Example: No-Voltage Dry Contact Input
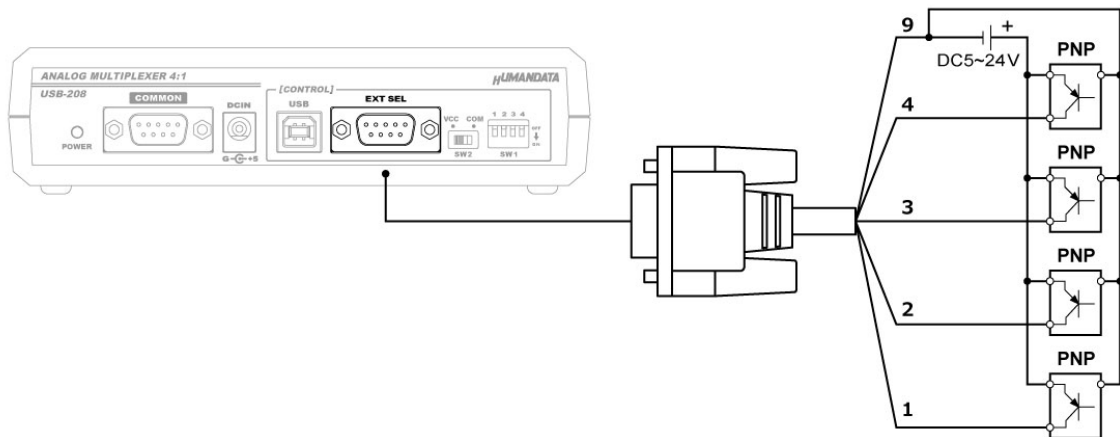
SW2 is required to be set to the VCC side.

8.4. Example: Photocoupler Isolated Input, NPN device connection

SW2 is required to be set to the COM side.

8.5. Example: Photocoupler Isolated Input, PNP device connection

SW2 is required to be set to the COM side.

9. CDC Class Driver Installation Guide

This product uses the CDC (Communication Device Class) driver, which is included in the operating system.

- **Windows 10 or later:**

  No driver installation required

  Automatically recognized as a "USB Serial Device (COM*)".

- **Windows 8.1 or earlier or to display the model number of this device on the Device Manager in Windows 10 or later:**

  Driver installation required

10. Additional Documentation and User Support

The following documents and other supports are available at

https://www.hdl.co.jp/en/faspc/USB/usb-208

- Device Driver
- Outline Drawing
- Original tool, AMUX-Select

… 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

USB Analog Multiplexer 4:1

USB-208

User's Manual

Ver. 1.0 .... **May 21, 2024**

HuMANDATA LTD.

Address:	1-2-10-2F, Nakahozumi, Ibaraki
	Osaka, Japan
	ZIP 567-0034
Tel:	81-72-620-2002 (Japanese)
Fax:	81-72-620-2003 (Japanese/English)
URL:	https://www.fa.hdl.co.jp/en/ (Global)
	https://www.fa.hdl.co.jp/jp/ (Japan)