

## SW2001 Sample Application Manual

### Overview

The SW2001 Sample Application (hereafter referred to as "this application") allows you to perform the following operations on SW2001 (hereafter referred to as "this instrument").

- Set up this instrument
- Check the relay operation status
- Send and receive communications commands

### Operating environment

- CPU: Operating clock 1 GHz or more
- Memory: 512 MB or more
- OS: Windows 10, Windows 11
- Microsoft .NET Framework 4.8.1 must work
- Interface: USB, LAN
- Monitor resolution: 1024 x 768 dots or more
- Hard drive: At least 5 MB of free space  
(if .NET Framework 4.8.1 is not installed, an additional approximately 2.5 GB is required.)

### Installing this application

1. Double-click "Setup\_SW2001 Sample Application.exe".  
The installer screen is displayed.
2. Click "Next" for everything.
3. The installation begins.

Once the installation is complete, a shortcut with the following icon will be created on the desktop.



### Uninstalling this application

The application can be uninstalled by opening the Windows Setting, choosing Apps.

### Connecting this instrument to your computer

- Connecting this instrument via USB

Connect this instrument to your computer with a USB cable.

No device driver is required. The device is automatically recognized when connected to your computer with a USB cable.

Recommended cable: L1002 USB cable (A-B)

- Connecting this instrument via LAN

Connect this instrument to your computer with a LAN cable.

Recommended cable:

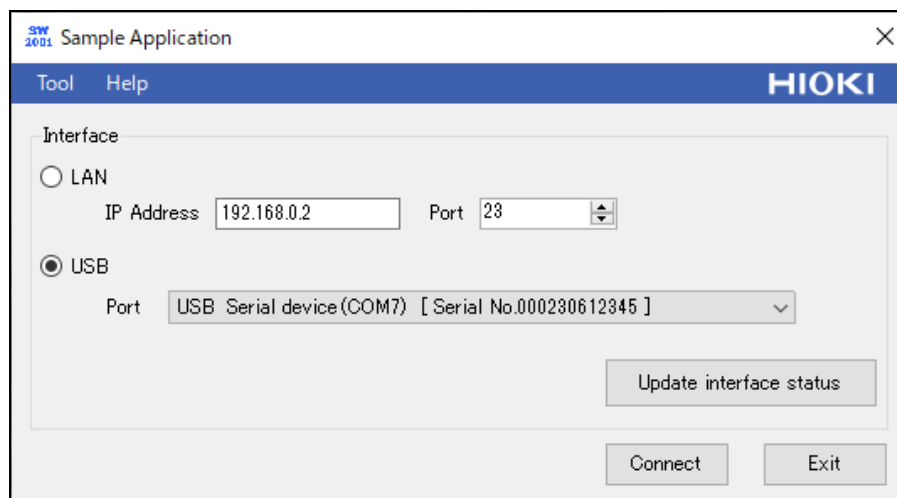
As long as the LAN cable is 100BASE-TX or 10BASE-T compliant, either straight or cross cables can be used.

Use a communication cable of 3 meters or less in length; a cable longer than 3 meters may malfunction due to noise.

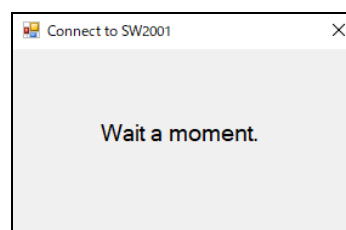
## Launching this application and connecting to this instrument

The procedure for starting this application and connecting it to this instrument is shown.

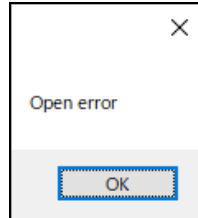
1. Double click on the shortcut created on your desktop.  
The following interface selection screen will appear.



2. Select the type of interface to be used.
3. If use LAN, set the IP address and Port.  
If use USB, select the Port.  
If your computer and this instrument are connected via USB after starting this application, click on [\[Update interface status\]](#).
4. Click on [\[Connect\]](#).  
The following message is displayed during the connection with this instrument.



If the connection fails, an error message will appear.  
Please check if the IP address and port you are using are correct.  
Also, the port may be in use by another application.



If the connection with this instrument is successful, the screen on the next page will be displayed.

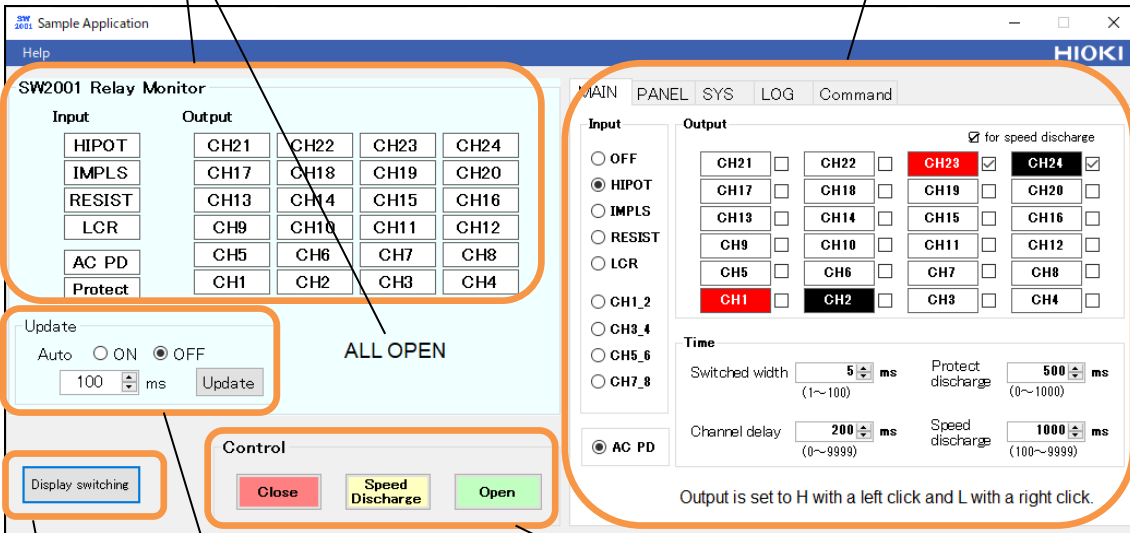
Click [\[Exit\]](#) to close the window.

## Explanation of this application

When connected to this instrument, this application reads the relay status and various settings from this instrument and displays them on the screen.

Displays current relay status.

You can configure this instrument and check the log of commands sent and received.



The screenshot shows the SW2001 Relay Monitor application window. It has a menu bar with 'Help' and a toolbar with 'MAIN', 'PANEL', 'SYS', 'LOG', and 'Command'. The main area is divided into several sections:

- SW2001 Relay Monitor**: A section on the left with 'Input' (HIPOT, IMPLS, RESIST, LCR, AC PD, Protect) and 'Output' (CH21-CH24) buttons. Below it is an 'Update' section with 'Auto', 'ON', 'OFF' radio buttons, a '100 ms' timer, and an 'Update' button. At the bottom left is a 'Display switching' button.
- ALL OPEN**: A large text label in the center.
- Control**: A section at the bottom with 'Close', 'Speed Discharge', and 'Open' buttons.
- MAIN**: A section on the right with 'Input' (OFF, HIPOT, IMPLS, RESIST, LCR, CH1\_2, CH3\_4, CH5\_6, CH7\_8, AC PD) and 'Output' (CH21-CH24) buttons. Below it are 'Time' settings for 'Switched width' (5 ms), 'Protect discharge' (500 ms), 'Channel delay' (200 ms), and 'Speed discharge' (1000 ms). A note at the bottom says 'Output is set to H with a left click and L with a right click.'

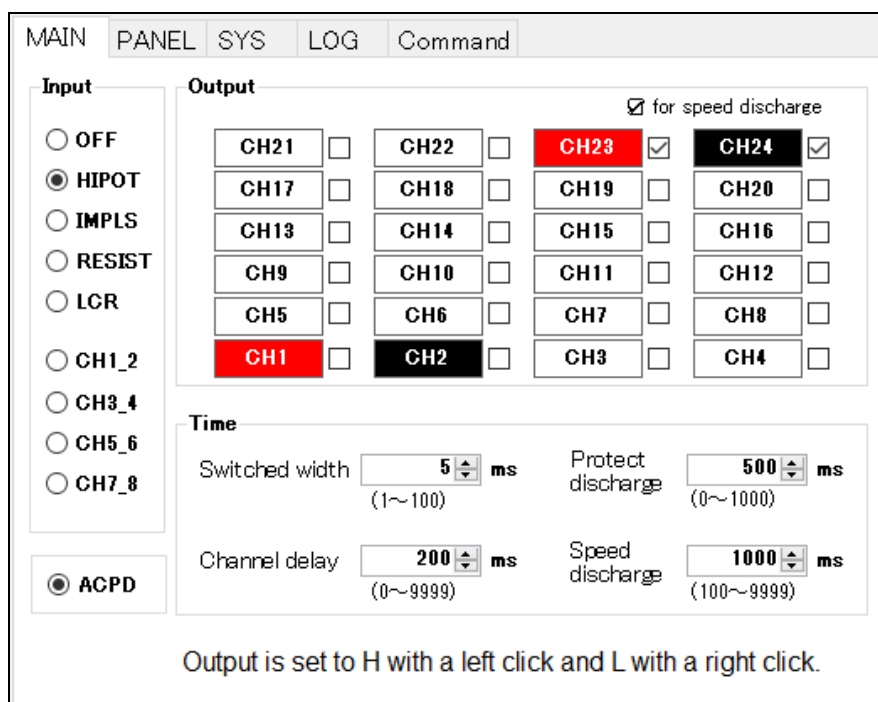
You can configure settings related to the display update of the relay monitor.

Relay control.

The screen can be switched between relay monitor only and full screen.

## Setting (MAIN)

This screen is used to make various settings related to relays.  
If you change the screen settings, the settings of this instrument will also change.



MAIN PANEL SYS LOG Command

**Input**

- ☐ OFF
- ☒ HIPOT
- ☐ IMPLS
- ☐ RESIST
- ☐ LCR
- ☐ CH1\_2
- ☐ CH3\_4
- ☐ CH5\_6
- ☐ CH7\_8
- ☒ ACPD

**Output**

☒ for speed discharge

CH21	<input type="checkbox"/>	CH22	<input type="checkbox"/>	CH23	<input checked="" type="checkbox"/>	CH24	<input checked="" type="checkbox"/>
CH17	<input type="checkbox"/>	CH18	<input type="checkbox"/>	CH19	<input type="checkbox"/>	CH20	<input type="checkbox"/>
CH13	<input type="checkbox"/>	CH14	<input type="checkbox"/>	CH15	<input type="checkbox"/>	CH16	<input type="checkbox"/>
CH9	<input type="checkbox"/>	CH10	<input type="checkbox"/>	CH11	<input type="checkbox"/>	CH12	<input type="checkbox"/>
CH5	<input type="checkbox"/>	CH6	<input type="checkbox"/>	CH7	<input type="checkbox"/>	CH8	<input type="checkbox"/>
CH1	<input type="checkbox"/>	CH2	<input type="checkbox"/>	CH3	<input type="checkbox"/>	CH4	<input type="checkbox"/>

**Time**

Switched width  ms (1~100)

Protect discharge  ms (0~1000)

Channel delay  ms (0~9999)

Speed discharge  ms (100~9999)

Output is set to H with a left click and L with a right click.

### Input

Select an input channel.

You can select one of the following: OFF, HIPOT, IMPLS, RESIST, LCR, CH1\_2, CH3\_4, CH5\_6, CH7\_8.

### AC PD

Sets ON/OFF of relay for AC PD detection when HIPOT is specified for input. It can be set only when the optional ST9200 is mounted.

### Output

Set OFF/HIGH/LOW for the output channels (CH1 to CH24).

OFF: White

HIGH: Red (can be set by Left-clicking the mouse)

LOW: Black (can be set by Right-clicking the mouse)

In a red or black state, click the mouse again to return to white (OFF).

☒ **for speed discharge**

Set the channel used for accelerated discharge.

☐: Normal output channel

☒: Channel for accelerated discharge

**Switched width**

Set the pulse width for the EXT. I/O SWITCHED signal.

**Channel delay**

Set the channel delay time.

**Protect discharge**

Set the protective discharge time.

**Speed discharge**

Set the accelerated discharge time.

## PANEL

This is the screen where you can make panel settings.

Up to 1000 different panels can be saved.

Specify the panel number to Save, Load, or Delete.

Displays the panel name.  
Allows you to set the panel name when saving.

No.	Name
1	TestHip
2	TestImp
3	abc
4	<None>
5	<None>
6	<None>
7	<None>
8	<None>
9	<None>
10	<None>
11	<None>
12	<None>
13	<None>
14	<None>

Panel list:  
Click to change the panel No.

### [Save]

Save the current settings to the specified panel number.

If panel data already exists, it will be overwritten.

### [Load]

Loads the settings for the specified panel number.

### [Delete]

Deletes the specified panel number setting.

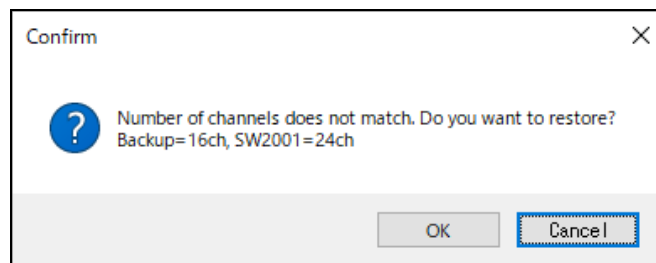


## [Backup]

Backup all panel settings to a file on your computer.  
The file extension is ".pnl".

## [Restore]

Restore the backup panel settings to SW2001.  
If the number of channels in the SW2001 you are restoring does not match the number of channels in the backup, the following message will appear.  
Click "OK" to restore the settings according to the lower number of channels.



## System (SYS)

This is a screen where you can make system-related settings.

MAIN PANEL **SYS** LOG Command

LAN

IP Address: 192,168,0,32

Subnet Mask: 255,255,0,0

Gateway: 0,0,0,0

Port: 23

MAC Address: "00-01-67-01-02-03"

Reflect

Backup

☒ ON ☐ OFF

Reset

Normal System

Information

Version: V1.00

Serial No.: 230612345

FPGA Main: A2306160

FPGA Sub: E2306160

# of channels: 24

ST9200: Included

ST9201: Included

### LAN

You can set the IP address, subnet mask, gateway, and port number. If you want to change the settings, click [\[Reflect\]](#).

This instrument's settings will not be changed until you click [\[Reflect\]](#).

### Backup

Sets ON/OFF the backup function of SW2001.

For details on the backup function, please refer to the instruction manual of this instrument.

### Reset

[\[Normal\]](#) This instrument's settings other than communication and panel settings are initialized.

[\[System\]](#) This instrument's settings other than communication settings are initialized.

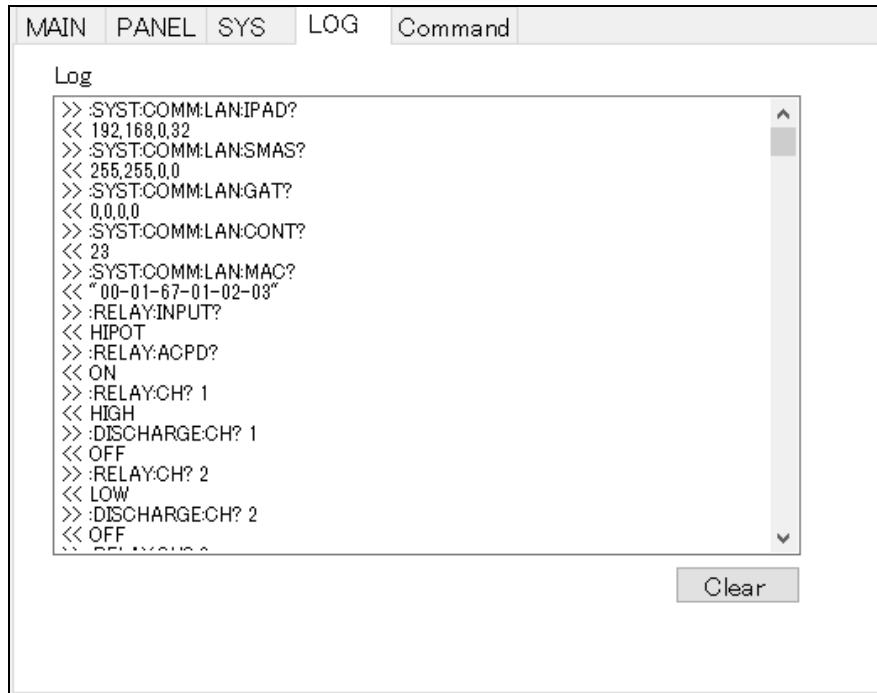
## Information

Shows information about this instrument.

Version:	Firmware version
Serial No.:	Serial number
FPGA Main:	Main FPGA Revision
FPGA Sub:	Sub FPGA Revision
# of channels:	Number of output channels
ST9200:	Included or Not included of a PD Sensor (for AC PD detection)
ST9201:	Included or Not included of a PD Sensor (for impulse PD detection)

## Communication log (LOG)

The communication log between this application and this instrument is displayed.



The symbols "<<" and ">>" preceding data have the following meanings.  
This symbol is not sent or received.

- << ... Data sent to this instrument
- >> ... Data received from this instrument

### [Clear]

Clear the communication log.

Commands sent to and received from this instrument to display the relay monitor are not recorded in the communication log.

## Send command (Command)

You can send any command.

The screenshot shows the HIOKI Command interface. At the top, there are five tabs: MAIN, PANEL, SYS, LOG, and Command. The Command tab is selected. Below the tabs, there are three main sections. The first section is 'Send Command', which contains a dropdown menu with the text '\*IDN?' and a 'Send' button. The second section is 'Receive Data', which contains a large, empty text area and a 'Clear' button. The third section is 'Clear Error', which contains a '\*CLS' button. To the right of the 'Clear Error' section is a 'Timeout' section with three radio buttons: 1s, 10s (which is selected), and 30s.

### [Send]

The command entered in the "Send Command" field is sent to this instrument.

If the automatic setting of "Update" on the Relay Monitor screen is set to ON, the command cannot be sent. Please turn OFF the automatic setting when sending.

### [Clear]

Clear the "Receive Data" list.

### Clear Error ([\*CLS])

Clear the error of this instrument.

(The ERROR LED on this instrument will turn off.)

### Timeout

Select the communication timeout period.

## Relay monitor

The relay status of this instrument is displayed.

**SW2001 Relay Monitor**

Input	Output
<b>HIPOT</b>	CH21 CH22 CH23 CH24
IMPLS	CH17 CH18 CH19 CH20
RESIST	CH13 CH14 CH15 CH16
LCR	CH9 CH10 CH11 CH12
<b>ACPD</b>	CH5 CH6 CH7 CH8
Protect	<b>CH1</b> <b>CH2</b> CH3 CH4

Update  
 Auto ☐ ON ☒ OFF  
 100 ms Update

**SWITCHED** (Relay operating status)

Control  
 Display switching Close Speed Discharge Open

### Input

White indicates relay OFF, Red indicates relay ON.

### Output

White indicates relay OFF, **Red indicates HIGH** relay ON, and **Black indicates LOW** relay ON.

### Update

- If the automatic setting is OFF, the relay monitor is updated every time the [\[Update\]](#) is pressed.
- If the automatic setting is ON, the relay monitor is updated at the set time interval.

## Relay operating status

Indicates the operating status of the relay.

INTERLOCKED:	Interlocked
ALL OPEN:	All relays open
CLOSE START:	Close start
CH DELAY:	During channel delay
SWITCHED:	Closed
DISCHARGE:	During accelerated discharge
OPEN START:	Open start

The blue text indicates the state of the relay in the middle of relay switching.

The relay state transitions as follows.

[Close]	ALL OPEN → CLOSE START → CH DELAY → SWITCHED
[Speed Discharge]	SWITCHED → DISCHARGE → SWITCHED
[Open]	SWITCHED → OPEN START → ALL OPEN

## [Display switching]

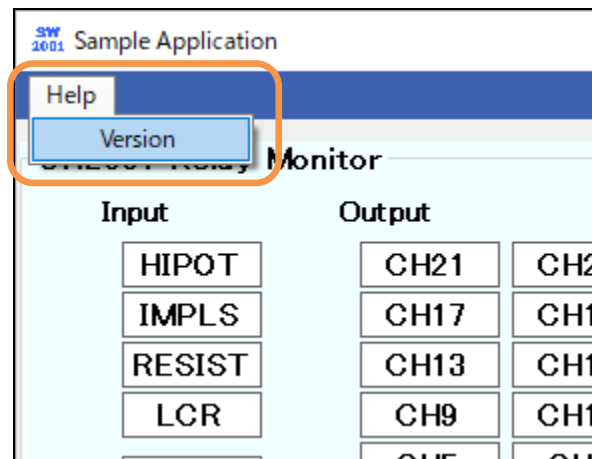
Each time you click, the relay monitor-only screen switches between the full-screen display.

## Control

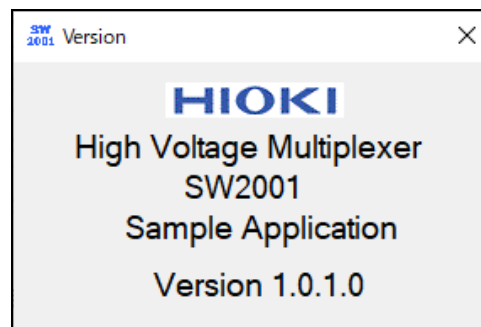
[Close]	Close the relay. It cannot be closed when interlocked. Please unlock the interlock on this instrument.
[Speed Discharge]	Perform accelerated discharge. It is valid only when the relay status is SWITCHED. Clicking when the relay is not SWITCHED will result in an execution error.
[Open]	Open all relays.

## Version Display

To view the version of this application, click [\[Help\]](#) and select [\[Version\]](#).



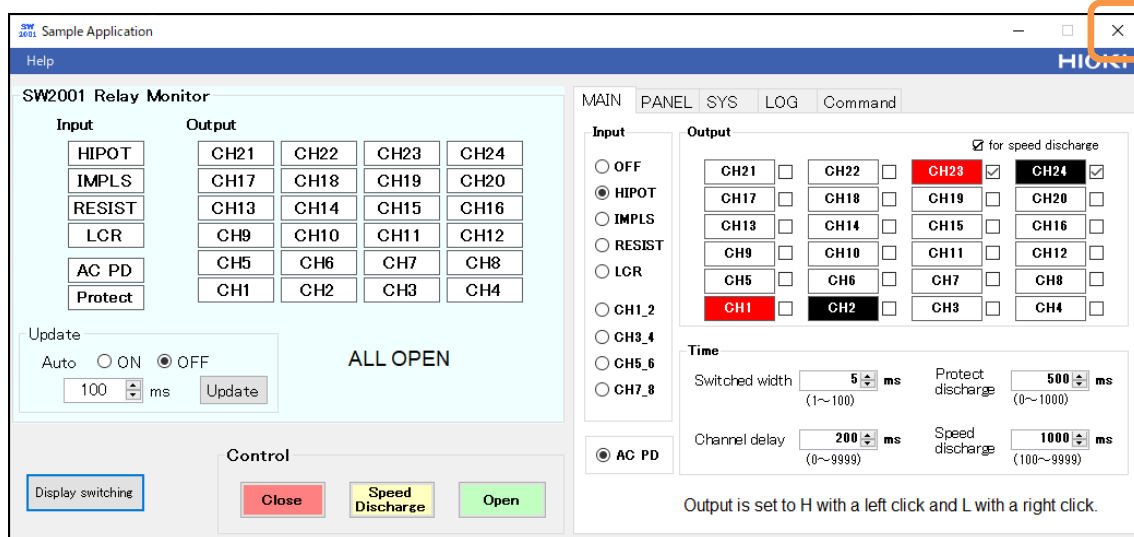
The version number is displayed.



Click the [\[x\]](#) in the upper right corner to return to the original screen.



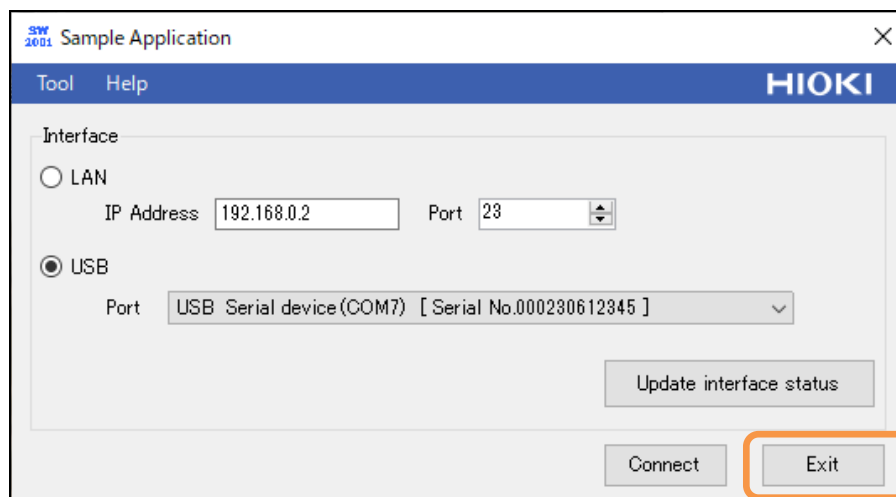
Exit this application



Click the [x] in the upper right corner of the screen.

Communication with this instrument is disconnected and the interface selection screen is displayed.

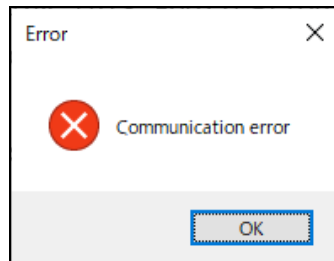
(The REMOTE LED on this instrument will turn off.)



Click [Exit] to close the window.

## Communication error

If communication with this instrument fails during this application operation, the following error message will be displayed.



Clicking [OK] closes the settings screen and displays the interface selection screen.

## Disclaimer

This application is freeware. Hioki is not liable for any damage or loss sustained as a result of its use or for any bugs, issues, or defects that it may contain.

Please note that Hioki is unable to respond to questions about this software.