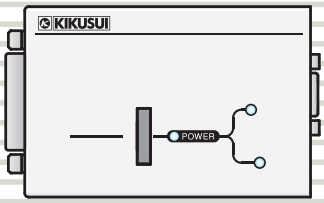
KIKUSUI PART NO. Z1-006-430, I0034201
Jan 2021

Operation Manual

GPIB Converter

PIA5100



About this Manual

These manuals are intended for users of this product and their instructors. It provides an overview of the product, connecting procedures, safety precautions, and so on. Please read this manual before you operate the product.

Explanations are given under the presumption that the reader has knowledge of electricity.

Every effort has been made to ensure the accuracy of this manual. However, if you have any questions or find any errors or omissions, please contact your Kikusui agent or distributor.

If you find any misplaced or missing pages in the manuals, they will be replaced. If the manual gets lost or soiled, a new copy can be provided for a fee. In either case, please contact your Kikusui agent or distributor. At that time, inform your agent or distributor of the “Part No.” written on the front cover of this manual.

After you have finished reading this manual, store it so that you can use it for reference at any time.

Notations used in this manual

- The term “PC” is used to refer generally to both personal computers and workstations.
- The screen captures and illustrations used in this manual may differ from the actual items.
- The following markings are used in the explanations in this manual.

—Note—

Indicates information that you should know.

Firmware versions that this manual covers

This manual applies to products with firmware versions 1.0X.

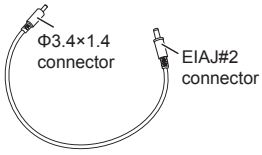
For information on how to check the current firmware version, see step 2 in “Changing the communication conditions” (p. 4).

When making an inquiry about the product, please provide us with the model (PIA5100), firmware version and serial number.

Checking the Package Contents

When you receive the product, check that all accessories are included and that the accessories have not been damaged during transportation. If any of the accessories are damaged or missing, contact your Kikusui agent or distributor.

Accessories



Input power cord
(length: approx. 50 cm)

USB Btype-EIAJ#2
adapter for input
power supply

☐ Power cord set (1 set) [91-80-9929]

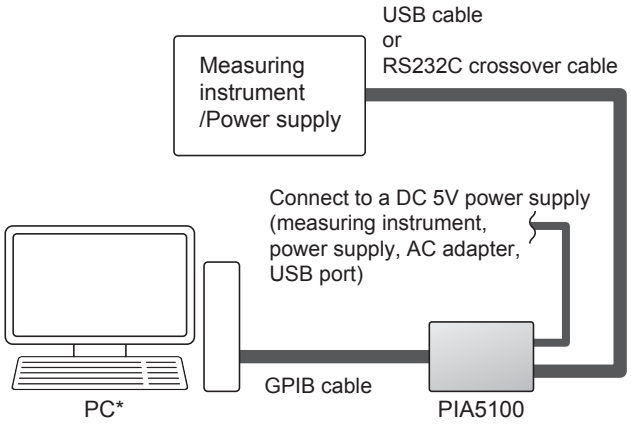
☐ Magnetic sheet (1 sheet)
[R7-000-001]

☐ Operation manual
(this manual; 1 copy)

Features

The PIA5100 is an interface converter that provides GPIB function through the RS232C or USB interface of an measuring instrument/power supply without GPIB.

It enables communication with IEEE488.2-compatible measuring instruments/power supply without difficult configuration and communication even with incompatible instruments/power supply by editing communication conditions in custom mode.



* A GPIB interface by National Instruments, Keysight, or Contec (32 bit only) is required.

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Safety Information

Safety precautions

The following safety precautions must be observed to avoid fire hazards, electric shock, accidents, and device failures.

Using the product in a manner that is not specified in this manual may impair the protection functions provided by the product.

- Never use the product for purposes other than the product's intended use.
- This product is not designed or manufactured for general home or consumer use.
- Always use the product within the rated input line voltage range.
- Use the power cord provided to apply power. For details, see "Accessories" (p. 1) or "Component Names" (p. 2).
- Do not remove the external cover.
- If you notice a malfunction or abnormality in the product, stop using it immediately, and remove the power cord plug from the outlet. Make sure the product is not used until it is completely repaired.
- Do not disassemble or modify the product.
- Check periodically that there are no tears or breaks in the power cord.
- If a panel needs cleaning, gently wipe it using a soft cloth with water-diluted neutral detergent. Do not use volatile chemicals such as benzene or thinner.
- Kikusui service engineers will repair the product. If the product needs to be repaired, contact your Kikusui agent or distributor.

Precautions when choosing the installation location

- When installing this product, be sure to observe the temperature and humidity ranges indicated below.

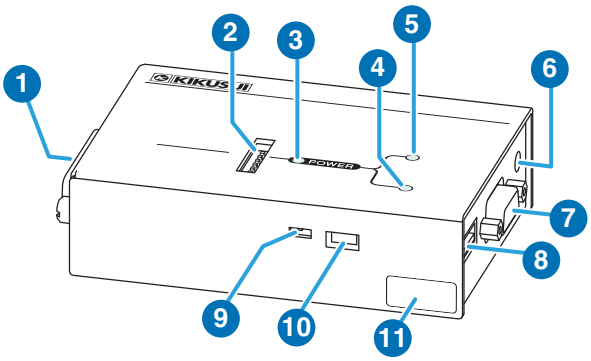
  Operating temperature range: 0 °C to 50 °C (32 °F to 122 °F)

  Operating humidity range: 20 %rh to 85 %rh (no condensation)
- When storing this product, be sure to observe the temperature and humidity ranges indicated below.

  Storage temperature range: -20 °C to 70 °C (-4 °F to 158 °F)

  Storage humidity range: 90 %rh or less (no condensation)
- Do not place objects on top of the product. Placing heavy objects on top of the product may cause it to malfunction.
- When you move the product, be sure to include this manual.

Component Names



No.	Name	Description
1	GPIB port	A port for connecting a GPIB cable. It is for connecting to a PC that will control a measuring instrument/power supply.
2	DIP switch	For setting the GPIB address of the PIA5100 as seen from the PC. For setting custom mode on and off. For switching the RS232C and USB connection.
3	POWER LED	Lights green when the PIA5100 is turned on. Lights red when DFU mode is turned on.
4	USB LED	Lights when an instrument/power supply is connected through USB. Lights orange while an instrument/power supply is being detected. Lights green when it is detected.
5	RS232C LED	Lights when an instrument/power supply is connected through RS232C. Lights orange while an instrument/power supply is being detected. Lights green when it is detected.
6	DC IN 5V connector	Power supply connector (EIAJ#2 jack). For connecting the AC adapter. For an instrument/power supply with dedicated power supply wires (DC OUT 5V connector), connect the supplied input power cord to connect to the DC OUT 5V connector.
7	RS232C port	A Dsub9 pin port for connecting a RS232C cable.
8	USB port	A port for connecting a USB cable. Standard A type socket. For connecting to a measuring instrument/power supply complying with USBTMC (USB488).
9	DFU MODE switch	For setting DFU mode, which is used for firmware updating, on and off.
10	SERVICE PORT connector	For connecting to a PC through a USB cable when changing communication conditions in custom mode and when updating firmware. Mini B type socket.
11	Serial No.	Serial number.

Functional Limitations

The following GPIB-specific functions cannot be used on the PIA5100.[1]

- Serial polling, parallel polling
- Remote local control
- Device clear

However, for serial polling and remote local control, equivalent functions can be used through similar commands.

1. If KISTD Mode is set to YES on the RS232C Host tab (p. 4), the above limitations are cleared.

Substitute commands

The following are substitute commands that are supported by typical measuring instruments/power supply supporting the SCPI language.

GPIB function	Substitute command	Description
Serial Polling	*STB?	Queries the status byte
GET (Group Execute Trigger)	*TRG	Executes device trigger
GTL (Go To Local)	SYSTem:LOCal	Switches from remote to local control
REN (Remote Enable)	SYSTem:REMote	Switches from local to remote control
LLO (Local Lock Out)	SYSTem:RWLock	Switches to remote control and locks local control

—Note—

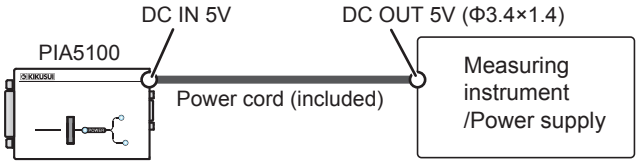
The above substitute commands may not be supported depending on the measuring instrument/power supply. Before using substitute commands, check whether they are supported in the manual for the measuring instrument/power supply.

Power Supply Methods

The PIA5100 supports the following power supply methods.

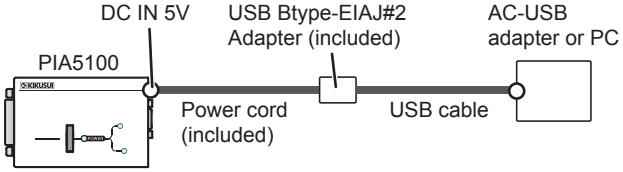
■ Power supply from the instrument/power supply

If the measuring instrument/power supply has a DC OUT 5V connector, you can use the supplied input power cord to supply power from the instrument/power supply.



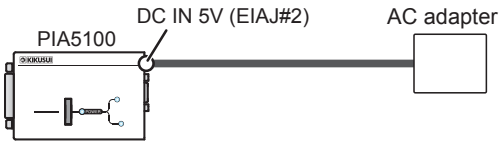
■ Power supply from the USB port

You can use the supplied power cord set to supply power from an AC-USB adapter or the PC's USB port.



■ Power supply from the AC adapter

The AC adapter can be used to supply power.



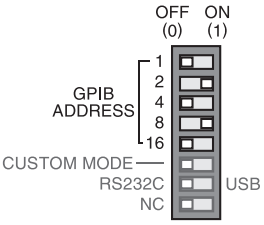
Installation and Preparation

When you connect a PC and an IEEE488.2-compatible measuring instrument/power supply to the PIA5100, you can control the measuring instrument/power supply as a GPIB instrument.

To use an incompatible measuring instrument/power supply, change the communication conditions (p. 4) immediately after making the connections.

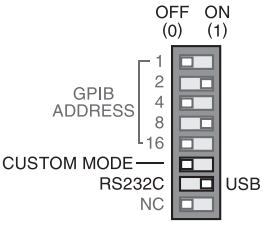
1 **Use the DIP switch to set the GPIB address.**

Set the address by setting the top five switches ON and OFF. The selectable range is 1 to 30.
Example: When the GPIB address is 10.

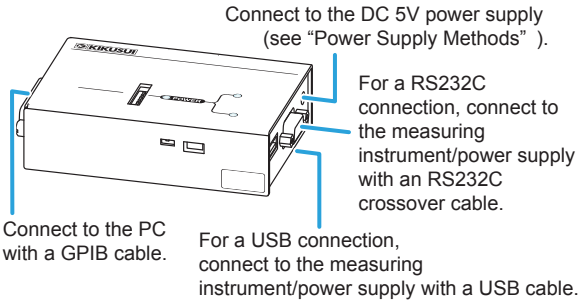


2 **Use the DIP switch to set CUSTOM MODE to OFF, and then select RS232C or USB.**

Example: USB connection.



3 **Connect the PIA5100 to a DC 5V power supply, PC, and measuring instrument/power supply.**



4 **For a RS232C connection, set the communication conditions of the measuring instrument/power supply as follows.**

Baudrate	19200 bps
Parity bit	None
Data length	8 bit
Stop bits	1 bit
Flow control	None

For the setting procedure, see the manual for the measuring instrument/power supply.
This setting is not necessary for the PMX series.

5 **Turn on the PC and the measuring instrument/ power supply.**

When the measuring instrument/power supply is detected, for a RS232C connection, the RS232C LED lights green. For a USB connection, the USB LED lights green.

—Note—

- If a communication error occurs, it may take time before the measuring instrument/power supply is detected due to retry.
- If you affix the supplied magnetic sheet to the rear panel of the PIA5100, you can attach the PIA5100 to the measuring instrument's/power supply's case or the like.

Changing Communication Conditions (custom mode)

When connecting to a measuring instrument/power supply not compatible with IEEE488.2 or when communication is not possible using the RS232C communication conditions set in “Installation and Preparation” (p. 3), change the PIA5100 communication conditions and switch to custom mode.

Use the dedicated application GPIB-CONV Custom Config to change the communication conditions.

Installing the application

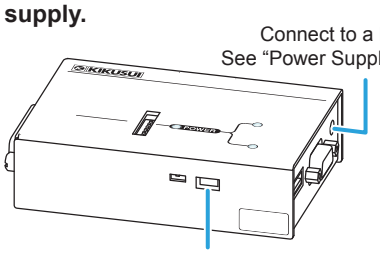
1 **Download GPIB-CONV Custom Config from the Kikusui Electronics Corporation website (http://www.kikusui.co.jp/en/download/).**

2 **Install GPIB-CONV Custom Config in the PC.**
Double-click the installer to start the installation wizard. Follow the instructions on the screen to install the application.

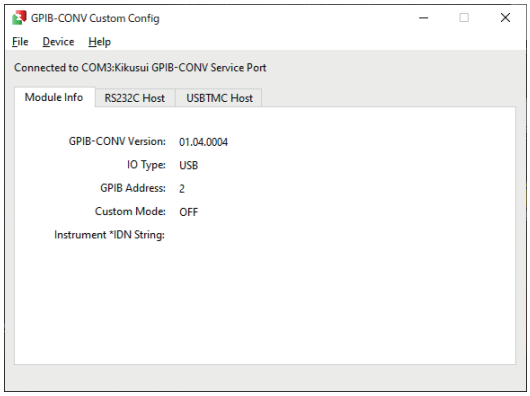
Changing the communication conditions

To change communication conditions, connect the PIA5100’s SERVICE PORT to the PC.

1 **Connect the PIA5100’s SERVICE PORT to the PC using a USB cable, and connect the DC 5V power supply.**



2 **Click Start, All Programs, kikusui GPIB-CONV, and GPIB-CONV.**
GPIB-CONV Custom Config starts.



The PIA5100 firmware version is displayed in “GPIB-CONV Version.”
Example: If the display is “01.04.0004,” the firmware version is 1.04 (the underlined section).

3 **Click the RS232C Host tab or USBTMC Host tab, and change the communication conditions by referring to the following.**

■ RS232C Host tab

The underlined values are the factory default values.

Item	Value	Description
Bitrate	1200 bps to 115200 bps Factory default is 19200 bps.	Sets the bit rate.
Stopbits	1/ 2	Sets the stop bits.
Flow Control	None/ Hardware/ Software	Sets flow control X-Flow for software CTS-RTS for hardware.
Termination Character	Any ASCII code Factory default is 0x0A.	Sets the terminator character.
488.2 Block Transfer	NO/ YES	Disables/enables IEEE488.2 block transfer.
IDN Query	Any string (up to 15 characters) Factory default is *IDN?.	Query for detecting measuring instruments/power supply at startup.
KISTD Mode[1]	NO/ YES	Disables/enables the KISTD SAFU protocol for clearing the limitation on GPIB-specific functions.

1. Only available on KISTD-compatible products. PWX series, PMX series, and PLZ-5W series are compatible (as of February 2016).

■ USBTMC Host tab

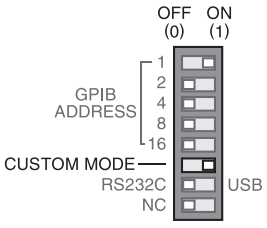
The underlined values are the factory default values.

Item	Value	Description
Auto Serial Polling	NO/ YES	Disables/enables auto serial polling.
Auto Serial Poll Interval	50 ms~	Auto serial polling interval.

4 **Remove the USB cable from the SERVICE PORT.**
From this point, if you will use the same conditions, you will no longer need to connect the SERVICE PORT to the PC.

Switching between custom mode and normal mode

1 **Set the DIP switch’s CUSTOM MODE.**
To use the communication conditions that you specified, set it to ON (custom mode).
To use the factory default communication conditions, set it to OFF (normal mode).
Example: Switching to custom mode.



2 **Disconnect and reconnect the PIA5100 DC 5V power supply to restart the PIA5100.**
The communication conditions are applied.

Updating the Firmware

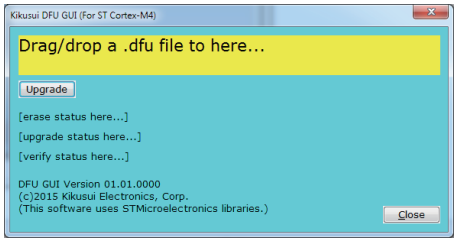
You can download the latest firmware from the Kikusui Electronics Corporation website, and update the PIA5100 firmware.

To update the firmware, you will use the dedicated application Kikusui DFU GUI.

1 **Download the latest firmware (.dfu file) and Kikusui DFU GUI from the Kikusui Electronics Corporation website (http://www.kikusui.co.jp/en/download/).**

2 **Install Kikusui DFU GUI in the PC.**
Double-click the installer to start the installation wizard. Follow the instructions on the screen to install the application.

3 **On the PC, click Start, All Programs, Kikusui DFU Gui, and KiDfuGui.**
Kikusui DFU GUI starts.



4 **Set the PIA5100 DFU MODE switch to ON, and connect the DC 5V power supply to the PIA5100.**

5 **Connect the PIA5100's SERVICE PORT to the PC using a USB cable.**

6 **In Windows Device Manager, check that STM Device in DFU Mode is shown under Universal Serial Bus controllers.**

7 **Drag the firmware that you downloaded (.dfu file) to the Kikusui DFU GUI window.**

8 **Click Upgrade in the window.**
Firmware updating starts.

9 **When updating is complete, disconnect and reconnect the PIA5100 DC 5V power supply to restart the PIA5100.**
This completes the firmware updating.

Troubleshooting

This section lists representative symptoms and remedies. If following these remedies does not solve the problem, or if none of the items listed here match your situation, contact your Kikusui agent or distributor.

Symptom	Remedy
The USB LED does not light green.	Check that the USB cable is connected properly. Connect to a measuring instrument/power supply that supports USBTMC.
The RS232C LED does not light green.	Check that the RS232C cable is connected properly. For the RS232C cable, use a crossover cable. Check whether the measuring instrument's/power supply's communication conditions are correct. See "Installation and Preparation" (p. 3).

Specifications

GPIB port

GPIB specifications	IEEE488.1-1987
Primary address	0 to 30

USB port

USB specifications	Standard type A socket, USB1.1 Full-Speed
Control target measuring instrument/ power supply	Measuring instrument/power supply with SCPI or IEEE488.2 language specifications complying with USBTMC-USB488. However, operation is guaranteed only for measuring instruments/power supplies listed in "Measuring Instruments/power supplies Whose Operations Have Been Checked" (p. 6).

RS232C port

UART specifications	Dsub 9 pin (Crossover cable connection with the measuring instrument/power supply)
Control target measuring instrument/ power supply	Measuring instrument/power supply with SCPI or IEEE488.2 language specifications and whose communication conditions can be set to 19200, no parity, 8, 1, and no flow. However, operation is guaranteed only for measuring instruments/power supplies listed in "Measuring Instruments/power supplies Whose Operations Have Been Checked" (p. 6).

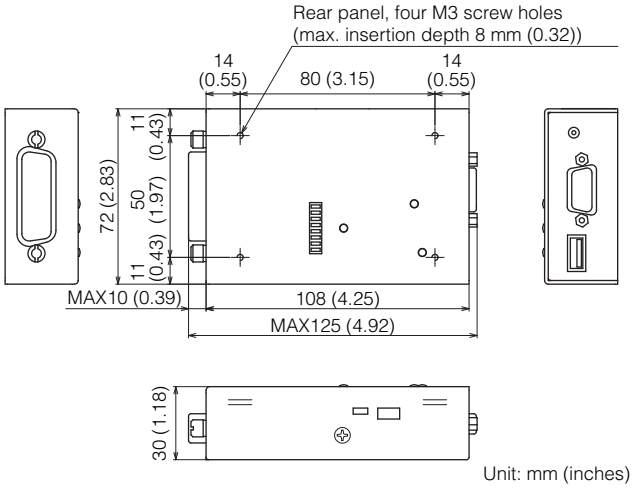
SERVICE PORT connector

USB specifications	Mini B type socket, USB1.1 Full-Speed
Supported protocol	Communication Device Class, Abstract Control Model (CDC-ACM)

General specifications

Input power supply	5 V 0.25 A
DC IN 5V connector	EIAJ#2
Operating temperature range	0 °C to 50 °C (32 °F to 122 °F)
Operating humidity range	20%rh to 85%rh (no condensation)
Storage temperature range	-20 °C to 70 °C (-4 °F to 158 °F)
Storage humidity range	90%rh or less (no condensation)
Weight	Approx. 200 g (7.05 oz).
Accessories	See (p. 1).

Outline drawing



Unit: mm (inches)

Measuring Instruments/power supplies Whose Operations Have Been Checked

This section lists measuring instruments/power supplies whose operations have been checked and the recommended settings (as of December 2017).

Model name	Recommended settings
PLZ5W Series Electronic Load	GPIB-CONV settings: RS232, CUSTOM MODE OFF
PWX Series Regulated DC Power Supply	GPIB-CONV settings: RS232, CUSTOM MODE OFF Queries need to be inserted periodically to avoid buffer overrun.[1]
PMX Series Regulated DC Power Supply	GPIB-CONV settings: RS232, CUSTOM MODE OFF Queries need to be inserted periodically to avoid buffer overrun.[1]
PWR-01 Series Regulated DC Power Supply	GPIB-CONV settings: RS232, CUSTOM MODE OFF Queries need to be inserted periodically to avoid buffer overrun.[1]
PCZ1000A AC Electronic Load	GPIB-CONV settings: RS232, CUSTOM MODE ON CUSTOM MODE settings: Bitrate = 9600 Stopbits = 2 Flow Control = Software Termination Character = 0x0A 488.2 Block Transfer = No IDN Query = IDN? KISTD Mode = No Queries need to be inserted periodically to avoid buffer overrun.[1]

1. For the setting procedure, see the manual for the measuring instrument to be connected.

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http://www.kikusui.co.jp/pi/

有毒有害物质或元素名称及含有標示

Name of hazardous materials and symbol of element in the equipment and quantity

部件名称	有毒有害物质或元素					
	铅 Pb	汞 Hg	镉 Cd	六价铬 Cr(VI)	多溴联苯 PBB	多溴二苯醚 PBDE
印刷电路板组装品	×	○	○	○	○	○
内部接线	○	○	○	○	○	○
外壳	○	○	○	○	○	○
底盘组装品	○	○	○	○	○	○
辅助设备	○	○	○	○	○	○

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