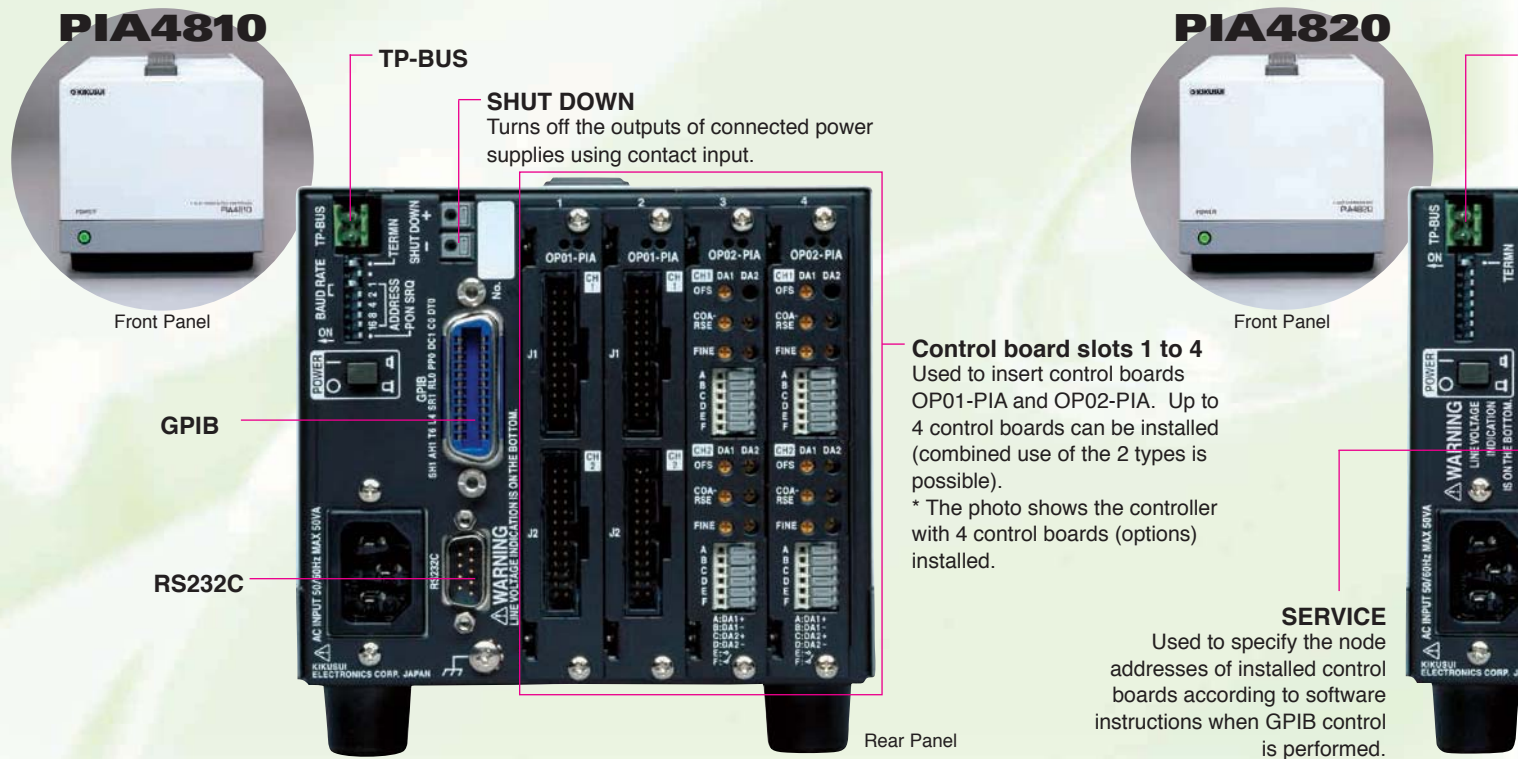# *Power Supply Controller PIA4800 Series*

Capable of controlling various power supplies and electronic loads.
Supports multiple channels via a highly extensible slot-in system.
Equipped with a high-speed serial communication function.

KIKUSUI

Introducing The Slot In type of Power PIA4800 Series, for Supporting Multi

● Body Design & Equipment

PIA4810

Front Panel

TP-BUS

SHUT DOWN
Turns off the outputs of connected power supplies using contact input.

GPIB

RS232C

Control board slots 1 to 4
Used to insert control boards OP01-PIA and OP02-PIA. Up to 4 control boards can be installed (combined use of the 2 types is possible).
* The photo shows the controller with 4 control boards (options) installed.

Rear Panel

PIA4820

Front Panel

SERVICE
Used to specify the node addresses of installed control boards according to software instructions when GPIB control is performed.

The PIA4810 is a power supply controller capable of analog and digital control. It is equipped with the GPIB and RS-232C interfaces and 4 slots, which allow 4 each of PIA4800 Series-specific control boards to be installed. A control board is capable of analog control of 2 channels of DC power supplies or electronic loads; a total of 8 channels can be controlled.

Moreover, DC power supplies with a digital remote-control function, such as the Kikusui PMR Series, can be directly connected to the PIA4810 via a TP-BUS (twisted pair bus), enabling a maximum
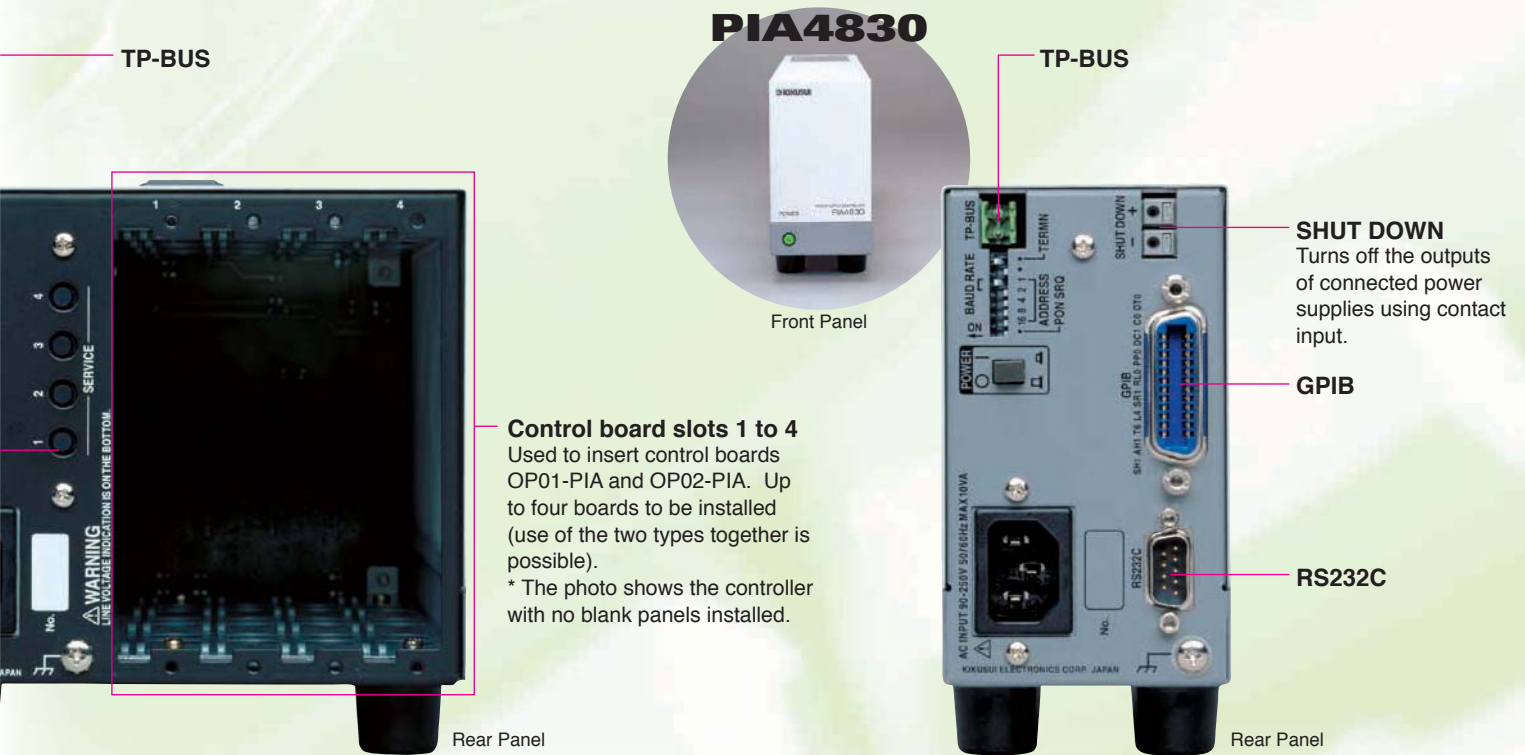
of 31 channels to be controlled digitally. PIA4820 is an expansion unit that can be connected to the PIA4810 or PIA4830 via a TP-BUS to provide additional control channels. In the same way as the PIA4810, it allows a maximum of 4 control boards to be installed.

Then it is possible to use up to 3 units of PIA4820 as an expansion that can be connected to the PIA4810 via the TP-BUS, the system is capable of controlling a maximum of 32 channels. Moreover, the combined use of the GPIB and TP-BUS allows the system to control a maximum of 448 channels.

PIA4830 is a power supply controller only for digital control. It is capable of digitally controlling a maximum of 31 channels of Kikusui PMR Series DC power supplies via the TP-BUS. OP01-PIA and OP02-PIA are control boards designed exclusively for the PIA4810 and PIA4820. A single control board is capable of analog control of 2 channels of DC power supplies or electronic loads. The OP01-PIA is a full-control board with voltage and current setting and read-back functions, while the OP02-PIA has only the voltage and current setting feature.

r Supply Controller,
ple Channels.

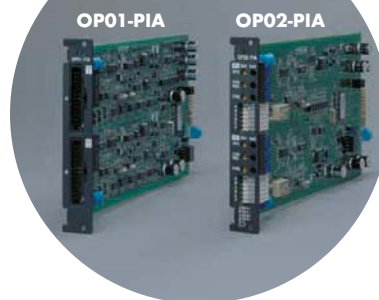TP-BUS

PIA4830

Front Panel

TP-BUS

SHUT DOWN
Turns off the outputs
of connected power
supplies using contact
input.

GPIB

RS232C

Control board slots 1 to 4
Used to insert control boards
OP01-PIA and OP02-PIA. Up
to four boards to be installed
(use of the two types together is
possible).
* The photo shows the controller
with no blank panels installed.

Rear Panel

Rear Panel

Slot-in!

Extensible, flexible construction using
the slot-in system (at the rear)

A single board can handle two channels.

OP01-PIA   OP02-PIA

Two types of control boards are
available, and can be selected in
accordance with user needs.

Easy connection!
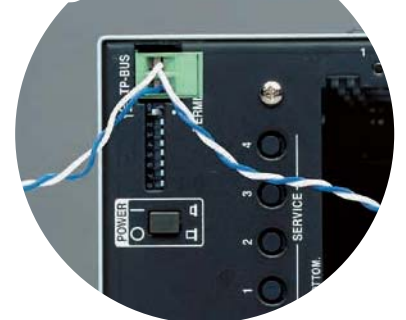
The easy-to-connect TP-BUS
is used for expansion.
The total extension length of
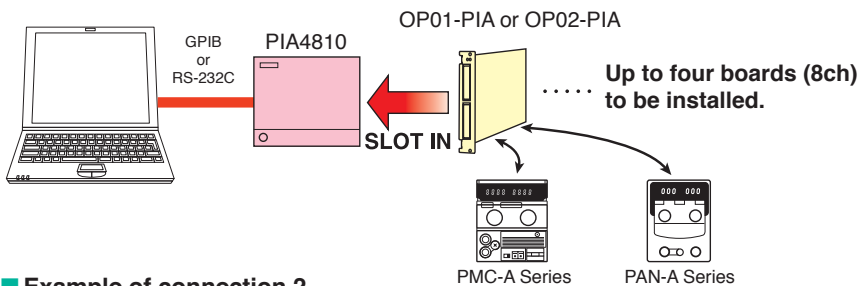the TP-BUS is 200 m.

Line of the PIA4800 Series

Model	Product Name	Remarks
PIA4810	Power supply controller	Allows both analog and digital control
PIA4820	Expansion unit	Up to 3 units of PIA4820 can be connected to each PIA4810, PIA4830 or PIA4850.
PIA4830	Power supply controller	For Digital control only
OP01-PIA	Control board	Full control
OP02-PIA	Control board	Allows only Voltage and Current setting.

Excellent expandability and flexibility allows you to configure various power supply systems on both small and large scales.
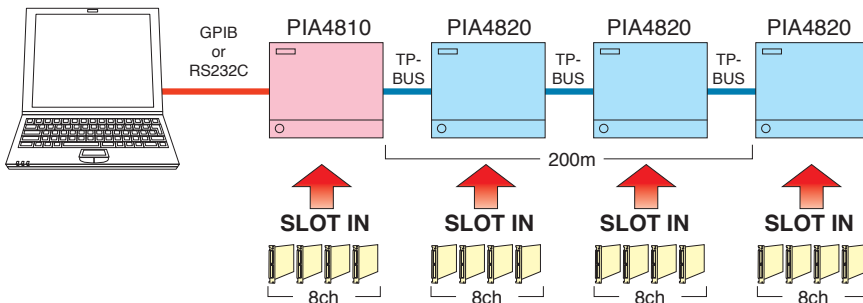
System Configuration

■ **Example of connection 1**
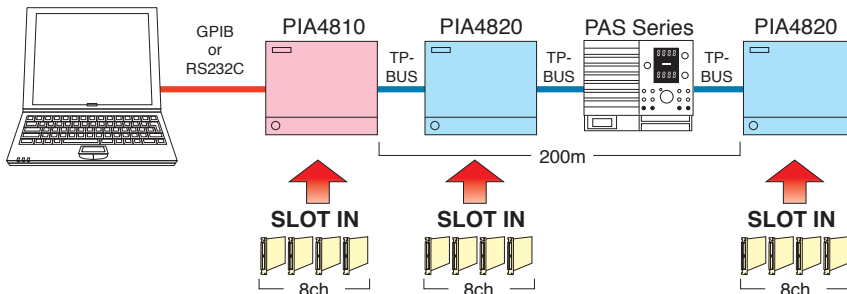**Power supply control system for 2 to 8 channels using one PIA4810**

OP01-PIA or OP02-PIA

GPIB or RS-232C   PIA4810

Up to four boards (8ch) to be installed.

SLOT IN

PMC-A Series   PAN-A Series

■ **Example of connection 2**
Power supply control system for 32 channels per one GPIB address using one PIA4810 and three PIA4820s

GPIB or RS232C   PIA4810   PIA4820   PIA4820   PIA4820

TP-BUS   TP-BUS   TP-BUS

200m

SLOT IN   **SLOT IN**   **SLOT IN**   **SLOT IN**
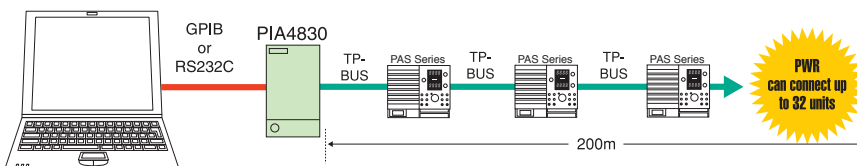
8ch   8ch   8ch   8ch

■ **Example of connection 3**
Power supply control system in which a power supply is directly connected to the system between two PIA 4820s (combination with power supply and power supply controllers)

GPIB or RS232C   PIA4810   PIA4820   PAS Series   PIA4820

TP-BUS   TP-BUS   TP-BUS

200m

SLOT IN   **SLOT IN**   **SLOT IN**

8ch   8ch   8ch

■ **Example of connection 4**
Power supply control system using one PIA4830 (controls up to of 31 channels)

GPIB or RS232C   PIA4830

TP-BUS   PAS Series   TP-BUS   PAS Series   TP-BUS   PAS Series

PWR can connect up to 32 units

200m

■ **Supplementary Note**

1. When the power supply control system in "Example connection 2" is provided as a basic configuration, the additional use of GPIB addresses allows it to control a maximum of 448 channels. (32 channels x 14 addresses = 448 channels)

2. The only models that can be directly connected for control to a power supply controller via a TP-BUS, as in "Example connection 3" or "4", are DC power supplies with a digital remote-control function.

3. When the power supply control system in "Example connection 4" is provided as a basis, the additional use of GPIB addresses allows it to control a maximum of 448 channels. (32 channels x 14 addresses = 448 channels) It is also possible to construct a system with the same connections using the PIA4810. Note:For PMR Series,up to 434 can be controlled. (31 channels x 14 addresses = 434 channels)

4. It is limited to use a TP-BUS for connecting up to 3 units of PIA4820. In case, If you wish to connect more than three PAI4820s, please consult with KIKUSUI.

5. The total extension length of the TP-BUS for connection is up to 200 m.

6. For advice on other connections, please consult with KIKUSUI.

Description of Control

■ OP01-PIA

Applied Series	PAD-LA	PAN-A *2			PMC-A	
Connection Type	PAD-LA(1)	PAN-A(1)	PAN-A(2)	PAN-A(3)	PMC-A(1)	PMC-A(2)
Connection Method (Those marked with are options.)	Flat cable accompanying OP01-PIA or optional flat cable SC01-10/20			Provided by the user Connector accompanying OP01-PIA	Shielded cable SC05-PIA *3	
Peripheral options		TU02				
Output Voltage setting		✔		✔	✔	
Output Current setting		✔		✔	✔	
Output Voltage readback		✔			✔	
Output Current readback					✔ *4	
Overvoltage protection setting						
Output ON/OFF		✔				
POWER switch OFF						
Remote/Local switching						
Power switch OFF monitoring					✔	
C.V mode monitoring		▲*1			✔	
C.C mode monitoring		▲*1			✔	
Output ON/OFF monitoring					✔	
Overvoltage protection startup monitoring						
Overheat monitoring						
Alarm monitoring		▲*1			✔	

■ OP02-PIA

Applied Series	PAN-A	PMC-A	PAD-LA
Connection	PAN-A(4)	PMC-A(3)	PAD-LA(2)
Connection Method	Twisted wire (provided by the user)	Option SC04-PIA	2 wires flat cable
Output voltage setting	✔	✔	✔
Output current setting	✔	✔	✔
Output ON/OFF	✔	✔	✔

■ For Digital Control via TP-BUS Connection

Applied Series	PWR	PAS
Output voltage setting	✔	✔
Output current setting	✔	✔
Queries the output voltage value	✔	✔
Queries the output current value	✔	✔
Output voltage readback	✔	✔
Output current readback	✔	✔
Designation / Queries of output channel number		
Designation of output channel number to be displayed		
Overvoltage protection startup monitoring setting	✔	✔
Queries the overvoltage protection startup monitoring	✔	✔
Overcurrent protection startup monitoring setting	✔	✔
Queries the overcurrent protection startup monitoring	✔	✔
Output ON/OFF	✔	✔
Queries the output ON/OFF	✔	✔
Power switch OFF	✔	✔
Panel Lock ON/OFF	✔	✔

✔　:controllable

No mark: not controllable

▲　: controllable under certain conditions

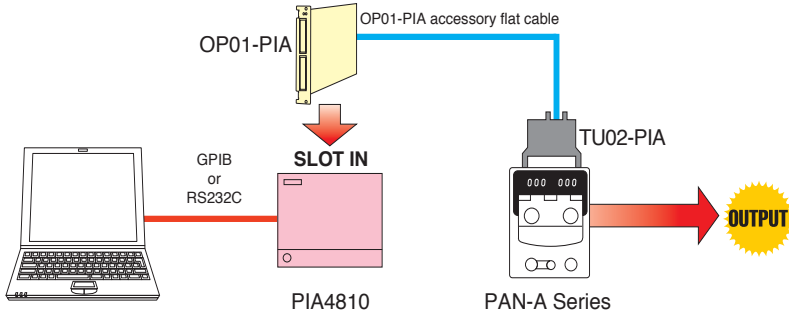*1: A DIN connector is required (Some types are not supported). (Available as factory option)

*2: OP01-PIA cannot control models with a rated output voltage exceeding 500 V.

*3: In regard to the previous models (with a 14-pin connector), please use SC03-PIA. In this case, Only 2 items, "Output voltage setting" and "Output current setting," can be controlled.

*4: Accuracy 5 % of FS

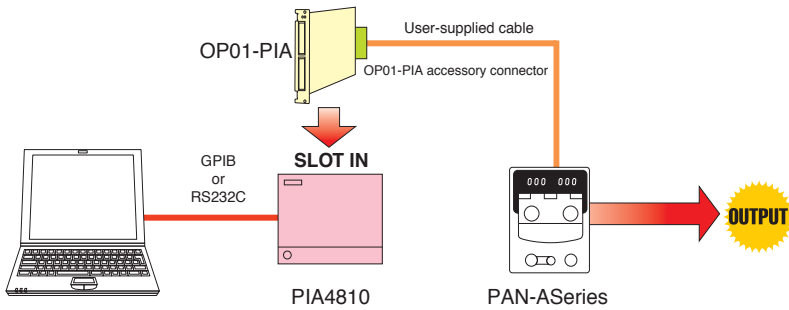# Connection Diagram [For OP01-PIA]

■ PAN-A Series [PAN-1]

OP01-PIA

OP01-PIA accessory flat cable

SLOT IN

GPIB
or
RS232C

TU02-PIA

OUTPUT

PIA4810

PAN-A Series

Note: The TU01-PIA is installed in the rear panel.

Description of Control
● Output Voltage setting
● Output Current setting
● Output Voltage readback
● Output Current readback
● Output ON/OFF
● C.V mode monitoring*
● C.C mode monitoring*
● Alarm monitoring*
* Conditionally controllable (for details, see the table on page 5.)

■ PAN-A Series [PAN-2]

OP01-PIA

User-supplied cable

OP01-PIA accessory connector

SLOT IN

GPIB
or
RS232C

OUTPUT

PIA4810

PAN-ASeries

Note: To connect of the power supply side of the user-supplied cable, remove the covering from the wires and insert them into the terminals.

Description of Control
● Output Voltage setting
● Output Current setting

■ PMC-A Series [PMC-1]

OP01-PIA

SC05-PIA shielded type cable (optional)

SLOT IN

GPIB
or
RS232C

OUTPUT

PIA4810

PMC-A Series
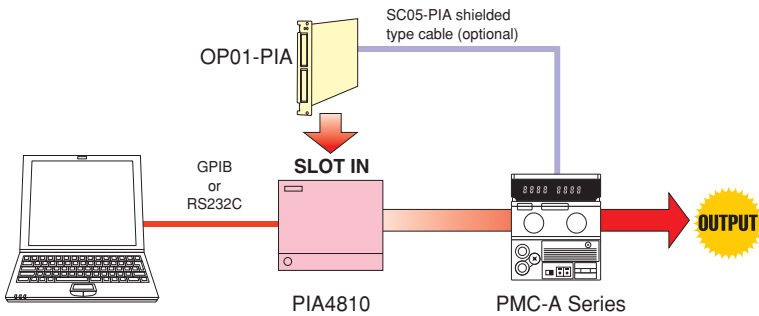
Description of Control
● Output Voltage setting
● Output Current setting
● Power switch OFF monitoring
● C.V mode monitoring
● C.C mode monitoring
● Output ON/OFF monitoring
● Alarm monitoring
● Output Voltage readback
● Output Current readback

Connection Diagram [For OP02-PIA]

■ PAD-LA Series [PAD-LA-1]

OP02-PIA

GPIB
or
RS232C

SLOT IN

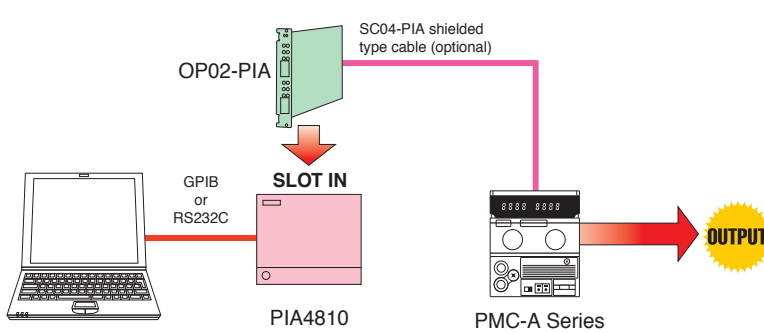2 wires shielded cable

OUTPUT

PIA4810

PAD-LA Series
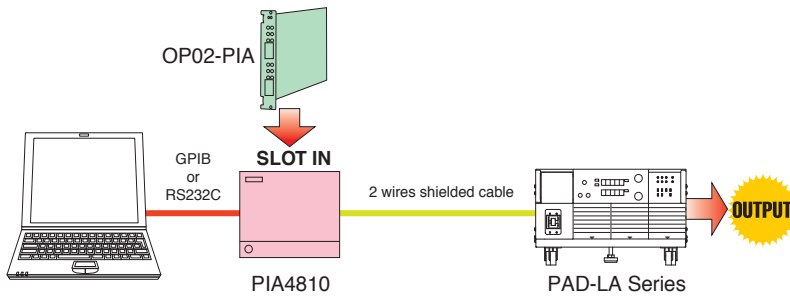
Note: In case of using PIA3200 controller, it is required for the modification of replacing ROM.

Description of Control
- Output Voltage setting
- Output Current setting
- Output ON/OFF

■ PMC-A Series [PMC-2]

SC04-PIA shielded
type cable (optional)

OP02-PIA

GPIB
or
RS232C

SLOT IN

OUTPUT

PIA4810

PMC-A Series

Description of Control
- Output Voltage setting
- Output Current setting
- Output ON/OFF

Specifications (Control Boards)

Item			OP01-PIA	OP02-PIA
Number of channels			2	2
Setting	Voltage setting	Output	0 to +10V	0 to +10V
		Resolution	0.025% of FS	0.025% of FS
		Linearity*1	0.013% of FS	0.013% of FS
		Temperature coefficient*2	50ppm/°C of FS	50ppm/°C of FS
	Current setting	Output (H)	0 to +10V	0 to +10V
		Output (M)	0 to +1.5V	0 to +1.5V
		Output (L)	0 to +0.4V	0 to +0.4V
		Resolution	0.025% of FS	0.025% of FS
		Linearity*1	0.025% of FS	0.025% of FS
		Temperature coefficient*2	100ppm/°C of FS	100ppm/°C of FS
Read-back	Voltage read-back	Input	0 to +10V	OP02-PIA has no read-back function.
		Resolution	0.025% of FS	
		Linearity*1	0.025% of FS	
		Temperature coefficient*2	100ppm/°C of FS	
	Current read-back	Input (H)	0 to +10V	
		Input (L)	0 to +1V	
		Resolution	0.025% of FS	
		Linearity*1	0.025% of FS	
		Temperature coefficient*2	100ppm/°C of FS	

FS is at the rated voltage or current.

*1: After 30 minutes of warm-up under 23 ±5°C and 80% R.H or less environment.

*2: Indicates the standard value.

Specifications (Main Unit)

Item		Specifications		
		PIA4810	PIA4820	PIA4830
TU-BUS	Connection	Using the accompanying TP-BUS connector, connect the following: DC power supply unit with digital remote - control function: Up to 31 units（PAM,PMR）/ Up to 32 units（PAS,PWR） Expansion unit PIA4820: Up to three units (Total cable length: Up to 200 m; Number of twists: 1 or more/cm)		
	Polarity	None		
	Applicable cable	Twisted wire: 0.32 mm^2 (AWG22)		
SHUT	Input signal	The output of all connected DC power- supply units is turned off when a contact signal is input for at least 1 second.		The output of all connected DC power- supply units is turned off when a contact signal is input for at least 1 second.
DOWN	+ terminal	Pull up to +5 V with 4.7 kΩ		Pull up to +5 V with 4.7 kΩ
	- terminal	Common for control block		Common for control block
	Applicable cable	Single wire: φ0.65 (AWG22) Twisted wire: 0.32 mm^2 (AWG22) Element wire diameter: of at least φ0.18		Single wire: φ0.65 (AWG22) Twisted wire: 0.32 mm^2 (AWG22) Element wire diameter: of at least φ0.18
Input	Line voltage range	The following ranges can be selected using the voltage switch on the bottom of the unit. 90 VAC to 110 VAC / 106 VAC to 125 VAC / 180 VAC to 220 VAC / 211 VAC to 250 VAC		85 VAC to 250 VAC
	Frequency	48Hz to 62Hz		
	Power consumption	UP to 50VA		UP to 17VA
Operating ambient temperature and humidity		0°C to 40°C, 10% to 90% (No dew condensation)		
Storage ambient temperature and humidity		-20°C to 70°C, 10% to 90% (No dew condensation)		
nsulation resistance	Input - chassis	500 VDC, 30MΩ or more		
	TP-BUS - chassis	1000 VDC, 30MΩ or more		
	CH terminals - chassis	500 VDC, 30MΩ or more		
Withstand voltage	Input - chassis	1500 V AC, 1 minute		
	Input - TP-BUS	1500 V AC, 1 minute		
	TP-BUS - chassis	600 V AC, 1 minute		
	CH terminals - chassis	600 V AC, 1 minute		
	Input - CH terminals	1500 V AC, 1 minute		
Weight		Approx. 5 kg		Approx. 2 kg
Dimensions		141.9 W × 123.4 (160) H × 350 (365) Dmm		70.4 W × 123.4 (150) H × 350 (365) Dmm
Accessories		AC power cable: 1 PIA4800 Utilities CD: 1 TP-BUS connector: 1 TP-BUS core: 1 Operation Manual for controller: 1	AC power cable: 1 TP-BUS connector: 1 TP-BUS core: 1 Operation Manual for controller: 1	AC power cable: 1 PIA4800 Utilities CD: 1 TP-BUS connector: 1 TP-BUS core: 1 Operation Manual for controller: 1

Dimensions(mm)

PIA4810 / PIA4820
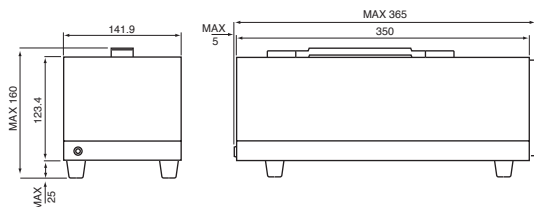
PIA4830
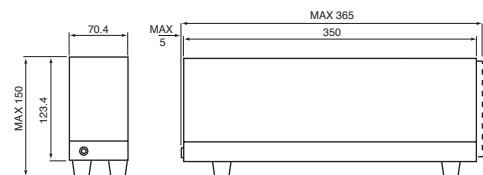
Options

■ Terminal Unit
TU01-PIA
TU02-PIA

*TU01-PIA: Exclusive for Model:
PAD-L/LP Series
*TU02-PIA: Exclusive for Model:
PAN-A Series/PAD-LA Series

■ Shielded 26 P Flat Cable
SC01-10
SC01-20

*SC01-10: 1 m length/*SC01-20: 2 m length
(OP01-PIA, PAD-LA, PAD-L/LP and PAN-A
compatible)

■ GPIB cables (Available for all models)
408J-101 (about 1.0 m)
408J-102 (about 2.0 m)
408J-104 (about 4.0 m)
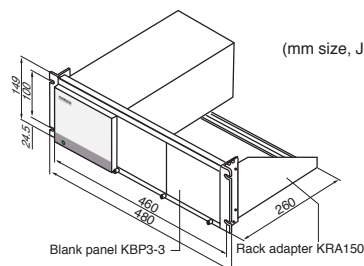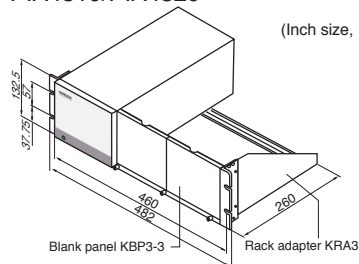

■ 2-core shielded cable
SC03-PIA
SC04-PIA
SC05-PIA

| SC03-PIA | SC04-PIA | SC05-PIA |

SC03-PIA: (OP01-PIA, PMC-A compatible, about 1.0 m/for 14-pin)

SC04-PIA: (OP02-PIA, PMC-A compatible, about 1.0 m)

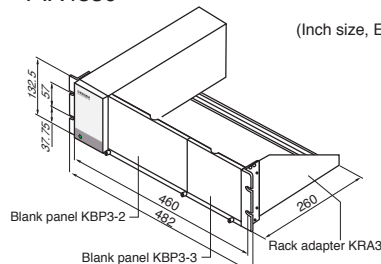SC05-PIA: (OP01-PIA, PMC-A compatible, about 1.0 m/for 26-pin)

Rack Mount Options

PIA4810/PIA4820

(Inch size, EIA standard)

Blank panel KBP3-3   Rack adapter KRA3

(mm size, JIS standard)

Blank panel KBP3-3   Rack adapter KRA150

PIA4830

(Inch size, EIA standard)

Blank panel KBP3-2
Blank panel KBP3-3   Rack adapter KRA3

(mm size, JIS standard)

Blank panel KBP3-2
Blank panel KBP3-3   Rack adapter KRA150

Rack mount frame RMF4
PIA4810/20 Bracket
B2-PIA4810/4820

Blank panel BP4
Blank panel BP2

Rack mount frame RMF4M
PIA4810/20 Bracket
B2-PIA4810/4820


Blank panel BP4
Blank panel BP2
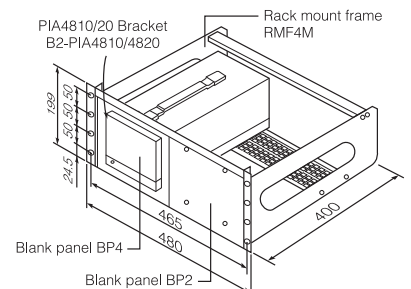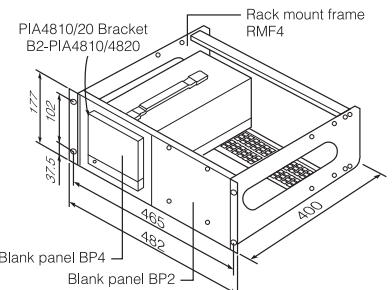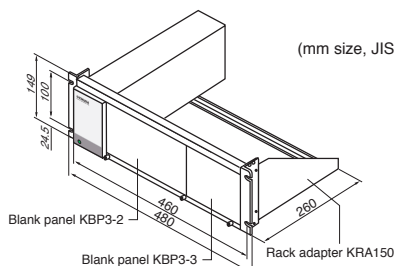
* When mounting the PIA4800 Series in racks, the specified space are required to be provided above and below the instruments. (Specified space: 44.45 mm in EIA standard or 50 mm in JIS standard) For more information, contact your Kikusui distributor.

* Only PIA4810 and PIA4820 can be equipped with RMF4 or RMF4M, PIA4830 can be equipped with KRA or KRA150.

Digital control of DC power by USB!!

● Actual size

KIKUSUI
◀ TP-BUS   POWER ●
                        TP ●
◀ 📱
USB·TP
◀ USB
POWER SUPPLY CONTROLLER PIA4850
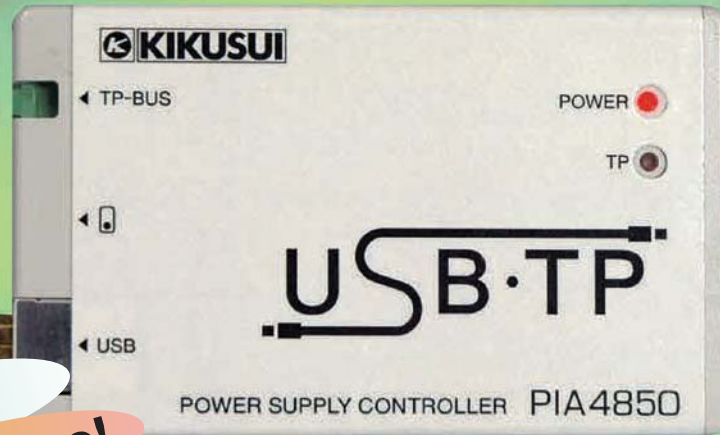
**Simple!
Easy to use!**
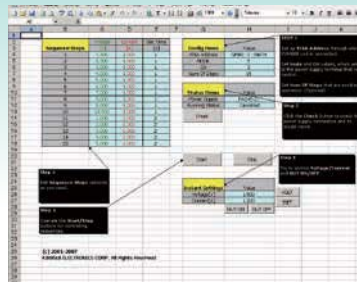
Power Supply Controller
PIA4850

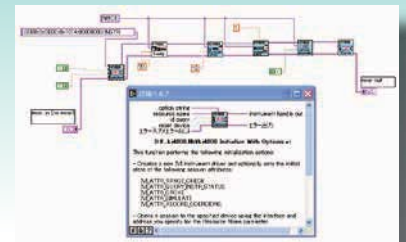## Sequence control & data logging!

With **Wavy** ...

WAVY Sequence Creation Software
Sequence can be created and edited by drawing with the mouse or by inputting with a spreadsheet.
A trial version available at our Kikusui website!!

The PIA4850 is a power supply controller with USB interface to control Kikusui DC power supply with TP-BUS.

PAS Series, PWR Series or other models that equips TP-BUS can be digitaly controled by PC, as well as for read-back of output values and status monitoring. It operates using bus power and with its simple system and compact structure, you can use whenever you need with easy setup.

With **Excel** ...
(Visual Basic)

With **LabVIEW** ...

● USB 2.0 compatible
● Can be used with Windows Vista/XP/2000.
● Operates using bus power. Requires no AC adapter.
● Bus power operation. No AC adapter required.
● Allows read-back of output values and status monitoring.
● Can control up to 32[*1] DC power supplies that equip TP-BUS[*2].
  (Different power supply models can be combined.)
  TP-BUS connection can be extended up to 200 m. Ideal for remote monitoring!

Click

Includes a magnet sheet to hold the device in place.
Can be attached directly to the power supply.

Snap

The TP-BUS utilizes a daisy-chain connection. This makes adding power supplies easy and keeps cables neatly together.

*1: The maximum controlable units are 31 when the connections include PAM series or PMR series unit.
*2: TP-BUS (Twist-Pair BUS) is an original Kikusui interface.

Control Description

✔ : controllable
No mark : not controllable

DC Power Supply Series	PWR	PAS
Output voltage setting	✔	✔
Output current setting	✔	✔
Query for output voltage setting value	✔	✔
Query for output current setting value	✔	✔
Output voltage value read-back	✔	✔
Output current value read-back	✔	✔
Designation/Query of output channel number		
Designation of output channel number to display		
Overvoltage protection activation point setting	✔	✔
Query for overvoltage protection activation point	✔	✔
Overcurrent protection activation point setting	✔	✔
Query for overcurrent protection activation point	✔	✔
Output ON/OFF	✔	✔
Power switch shutoff	✔	✔
Panel lock ON/OFF	✔	✔

Required Drivers and Components

		WAVY application software	VB, VBA, VC++ LabVIEW
VISA (including USB-TMC driver)		Required	Required
PIA4800 instrument driver	IVI-COM/C	Not required	Required in some cases
	IVI Shared Components		

● The latest drivers available at the Kikusui website.

Specifications

Item	Details	
TP-BUS	Connections	The connections given below are possible using the provided TP-BUS connector. Expansion unit PIA4820: 4 units can be connected (Extension length: Maximum 200 m, Twist count: 1 time/ cm or more)
	Number of controlled units*1	PAS Series : Maximum 32 units PWR Series: Maximum 32 units
	Polarity	None
	Conforming power wiring	Twisted wire: 0.32 mm² (AWG22) Extended length: Maximum 200 m 0.20 mm² (AWG24) Extended length: Maximum 20 m
USB		Conforms to USB 2.0 specifications, and to USBTMC-USB488 device class specifications. Communications speed: 12 Mbps (full speed) (High power device (power consumption: 200 mA)
OS		Windows2000 Professional (SP4 or later) Windows XP Professional (SP2 or later, 32-bit versions) Vista Home Premium, Business, Ultimate (32-bit versions)
VISA specifications		Ver. 3.0 or higher
Operating ambient temperature/ Humidity range		0 °C to 40 °C, 10 % rh – 90 % rh (No condensation.)
Storage ambient temperature/ Humidity range		-20 °C to 70 °C, 10 % rh – 90 % rh (No condensation.)
Installation location		Indoors, maximum height 2000 m
Safety		Conforms to Low-Voltage Directive 2014/35/EU, EN61010-1 Protection Class I, Pollution Degree 2.

*1: The maximum controlable units are 31 when the connections include PMR series unit.
*2: TP-BUS (Twist-Pair BUS) is an original Kikusui interface.

Sequence Creation Software

Wavy

Wavy for PAS&PWR

This software supports to create and execute sequences of DC power supply. Sequences can be created and edited by drawing with the mouse or by inputting in a spreadsheet.

■ Easily create and edit the test conditions data for sequence operation.

■ Easily manage test conditions template using the function for saving test condition data files.

■ The execution graph function displays the execution status as a cursor on the settings graph, and can be used to verify the progress of the execution sequence.

■ Easy to monitor the actual output using the monitor graph function that plots the monitored output values during test execution.

■ The acquired monitor data can be saved as the test results.

Operating environment: Windows Vista / 7 / 8

*Refer to the Kikusui products catalog and website for detail of Wavy.

Creating sequence conditions
The sequence can be created in one of two ways: either by using the mouse or by numerical input!!
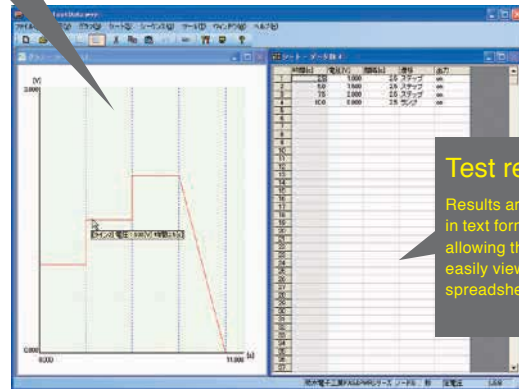
Test results
Results are saved in text format, allowing them to be easily viewed using spreadsheet software.

KIKUSUI

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