



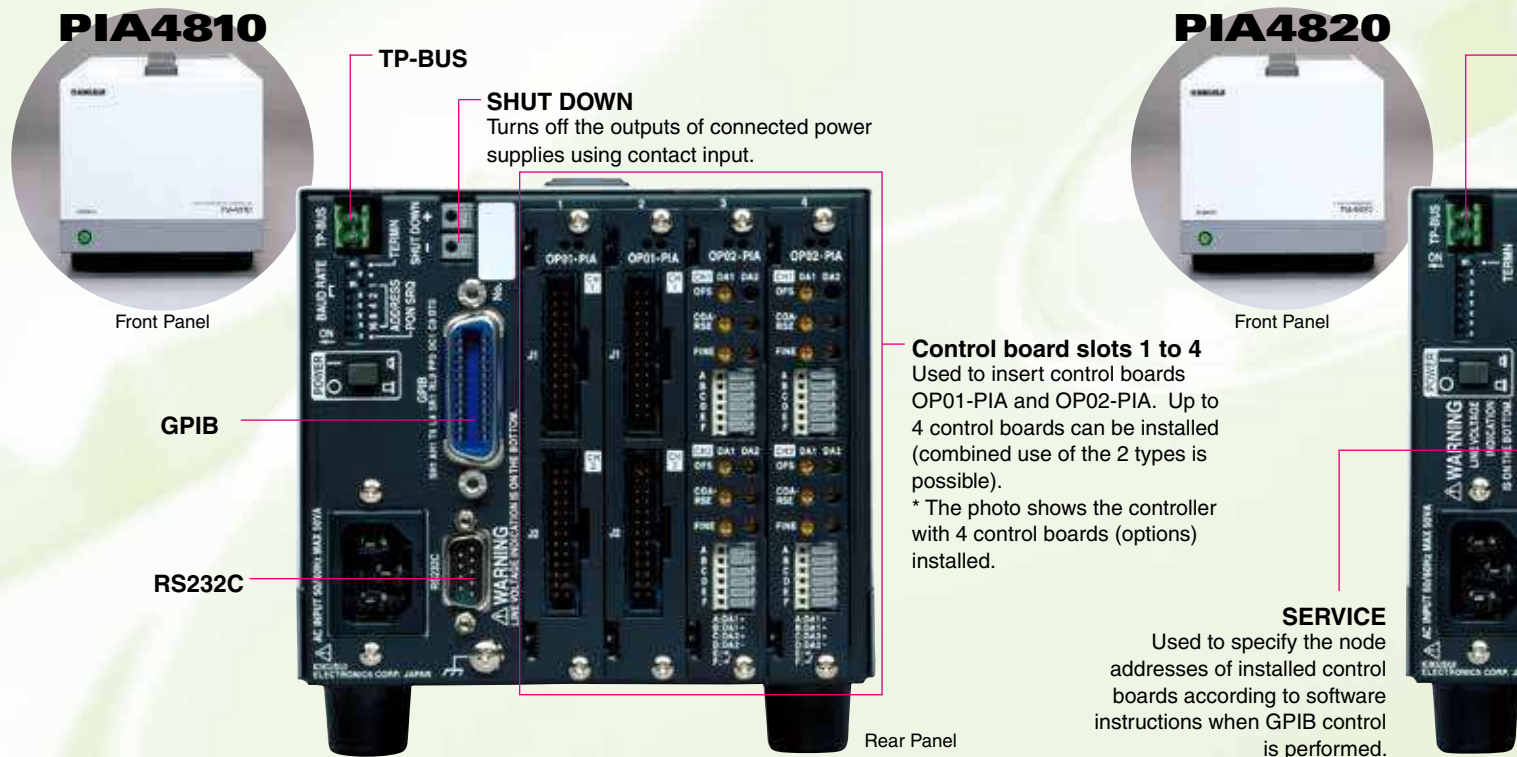
Power Supply Controller PIA4800 Series

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.



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

● Body Design & Equipment



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.

Power Supply Controller, Multiple Channels.

POWER SUPPLY CONTROLLER

PIA 4800
SERIES



Slot-in!

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

A single board can handle two channels.



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

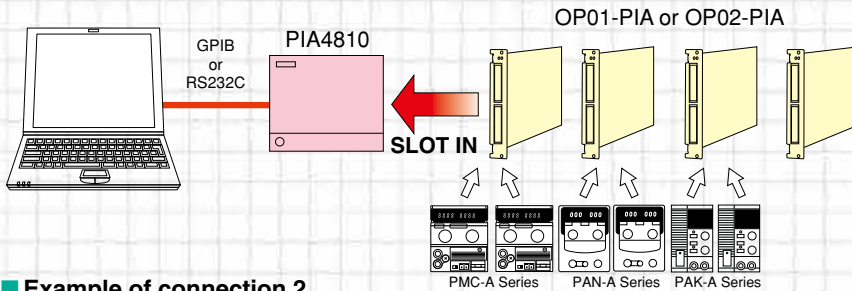
Model	Product Name	Remarks
PIA4810	Power supply controller	Allows both analog and digital control
PIA4820	Expansion unit	Up to 3 units of PIA4820 can be connected to each PIA4810, PIA4830 or PIA4850.
PIA4830	Power supply controller	For Digital control only
OP01-PIA	Control board	Full control
OP02-PIA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

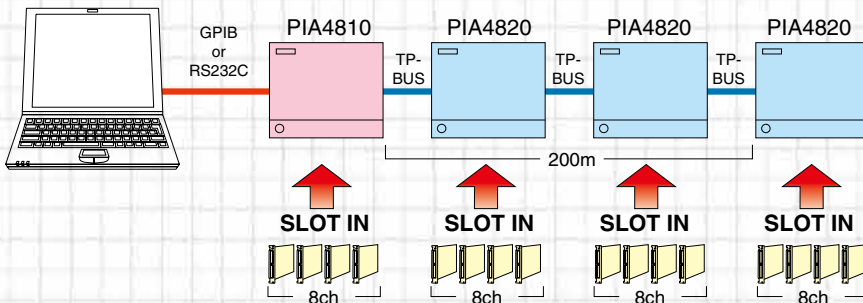
Example of connection 1

Power supply control system for 2 to 8 channels using one PIA4810



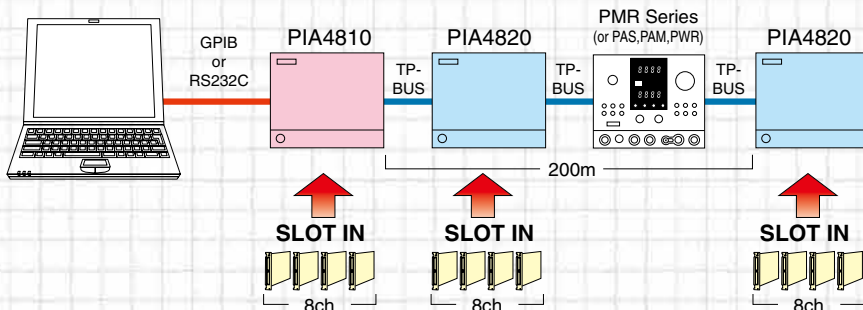
Example of connection 2

Power supply control system for 32 channels per one GPIB address using one PIA4810 and three PIA4820s



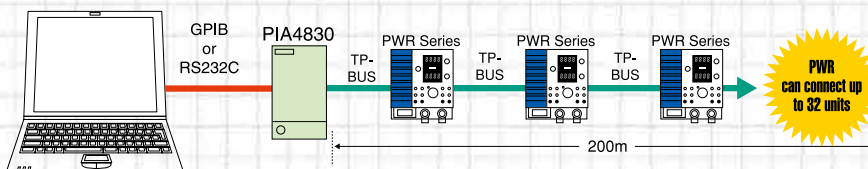
Example of connection 3

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)



Example of connection 4

Power supply control system using one PIA4830 (controls up to of 31 channels)



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 434 channels. (31 channels x 14 addresses = 434 channels)
It is also possible to construct a system with the same connections using the PIA4810.
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 PIA4820s, 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	PAK-A*1		PAD-L			PAD-LA	PAN/PAN-A*7			PMC-A	
Connection Type	PAK-1	PAK-2	PAD-1	PAD-2	PAD-3	PAD-LA-1	PAN-1	PAN-2	PAN-3	PMC-1	PMC-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	Flat cable accompanying OP01-PIA or optional flat cable SC01-10/20 *			provided by the user Connector accompanying OP01-PIA	Shielded cable SC05-PIA* (*9)	
Peripheral options	SH		TU01+SH	TU01			TU02+SH	TU02		SH	
Output Voltage setting	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Output Current setting	✓	✓	▲*4	▲*4	✓	✓	✓	✓	✓	✓	✓
Output Voltage readback	✓	✓	✓	✓		✓	✓	✓		✓	✓
Output Current readback	✓*2	✓*3	✓*2			▲*6	✓*2			✓*2	✓*10
Overvoltage protection setting	✓	✓									
Output ON/OFF	✓	✓	▲*4	▲*4		✓	✓	✓			
POWER switch OFF	✓	✓	✓	✓		✓					
Remote/Local switching	✓	✓									
Power switch OFF monitoring	✓	✓	▲*5	▲*5						✓	✓
C.V mode monitoring	✓	✓	▲*5	▲*5		▲*5	▲*5	▲*5		✓	✓
C.C mode monitoring	✓	✓	▲*5	▲*5		▲*5	▲*5	▲*5		✓	✓
Output ON/OFF monitoring	✓	✓								✓	✓
Overvoltage protection startup monitoring	✓	✓									
Overheat monitoring	✓	✓									
Alarm monitoring						▲*5	▲*5	▲*5		✓	✓

■ OP02-PIA

Applied Series	PAD-L	PAN/PAN-A	PMC-A	PLZ-W2 *8	PAD-LA
Connection	PAD-4	PAN-4	PMC-3	PLZ-W	PAD-LA-2
Connection Method	Twisted wire (provided by the user)		Option SC04-PIA	Twisted wire (provided by the user)	2 wires flat cable
Output voltage setting	✓	✓	✓		✓
Output current setting	▲*4	✓	✓	✓	✓
Output ON/OFF	▲*4	✓	✓		✓

✓ :controllable

No mark: not controllable

▲ : controllable under certain conditions

*1 : OP02-PIA cannot be used for PAK-A Series

*2 : Linearity 0.3% of FS

*3 : Linearity 1.5% of FS

*4 : Select between “Output current Settings” and “Output ON/OFF” (the Output ON/OFF function facilitates setting of the CC reference, to 0).

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

*6 : In regards to Model PAD16-100LA, PAD36-60LA, please ask our sales for details.

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

*8 : Using the electronic loads, read the output as a load value.

*9 : In regard to the previous models (14-pin connector), please use SC03-PIA. In this case, Only 2 items, “Output voltage setting” and “Output current setting,” can be controlled. (However, “Output current readback” is also possible when using peripheral option SH.)

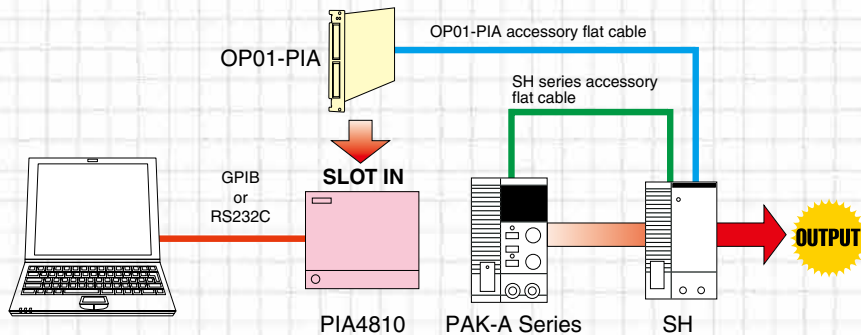
*10: Linearity 5% of FS

■ For Digital Control via TP-BUS Connection

Applied Series	PAS/PWR	PAM	PMR
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	✓	✓	✓

Connection Diagram [For OP01-PIA]

PAK-A Series [PAK-1]



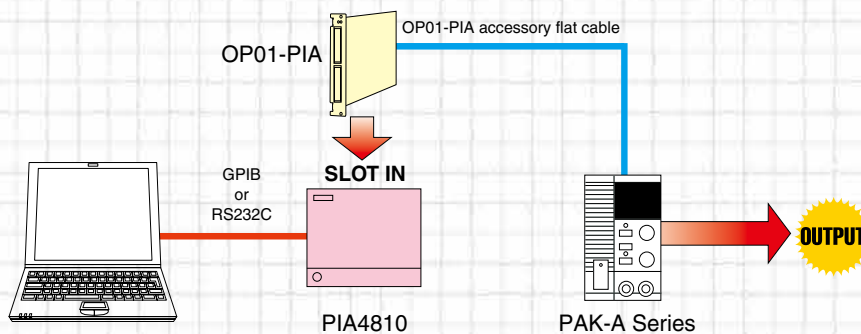
Note: The PAK-A series requires the IF01-PAK-A (factory-installed option).

Description of Control

- Output Voltage setting
- Output Current setting
- Output Voltage readback
- Output Current readback*
- Overvoltage protection setting
- Output ON/OFF
- POWER switch OFF
- Remote/Local switching
- Power switch OFF monitoring
- C.V mode monitoring
- C.C mode monitoring
- Output ON/OFF monitoring
- Overvoltage protection startup monitoring
- Overheat monitoring

* Conditionally controllable (for details, see the table on page 5.)

PAK-A Series [PAK-2]



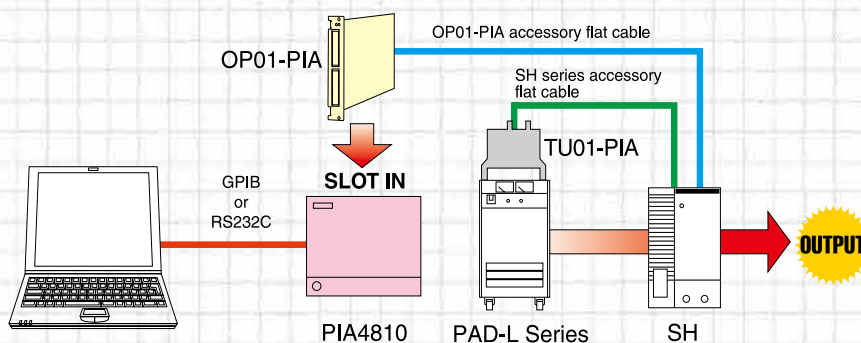
Note: The PAK-A series requires the IF01-PAK-A (factory-installed option).

Description of Control

- Output Voltage setting
- Output Current setting
- Output Voltage readback
- Output Current readback*
- Overvoltage protection setting
- Output ON/OFF
- POWER switch OFF
- Remote/Local switching
- Power switch OFF monitoring
- C.V mode monitoring
- C.C mode monitoring
- Output ON/OFF monitoring
- Overvoltage protection startup monitoring
- Overheat monitoring

* Conditionally controllable (for details, see the table on page 5.)

PAD-L Series [PAD-1]



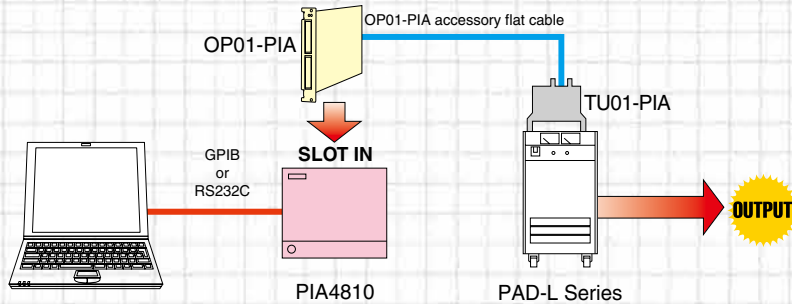
Note: The TU01-PIA is installed in the rear panel.

Description of Control

- Output Voltage setting
- Output Current setting*
- Output Voltage readback
- Output Current readback
- Output ON/OFF*
- POWER switch OFF*
- Power switch OFF monitoring*
- C.V mode monitoring*
- C.C mode monitoring*

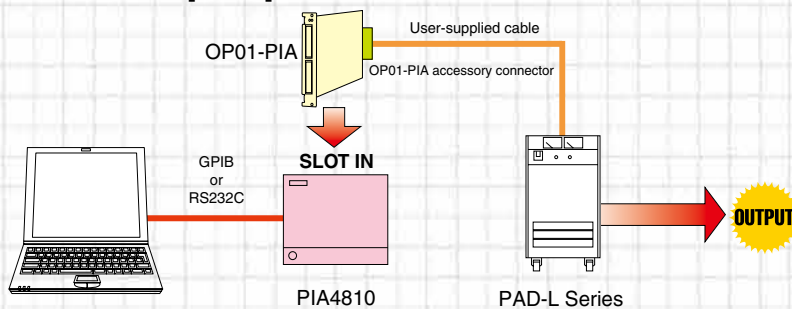
* Conditionally controllable (for details, see the table on page 5.)

■ PAD-L Series [PAD-2]



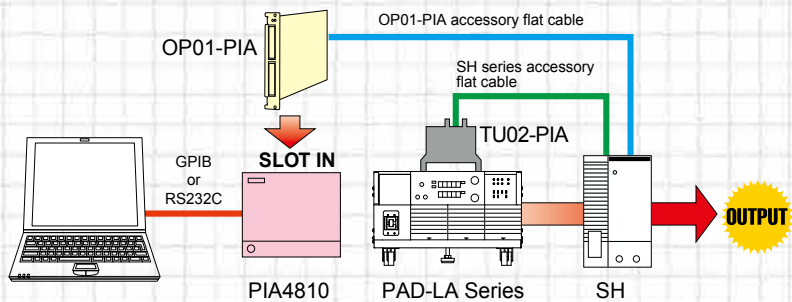
Note: The TU01-PIA is installed in the rear panel.

■ PAD-L Series [PAD-3]



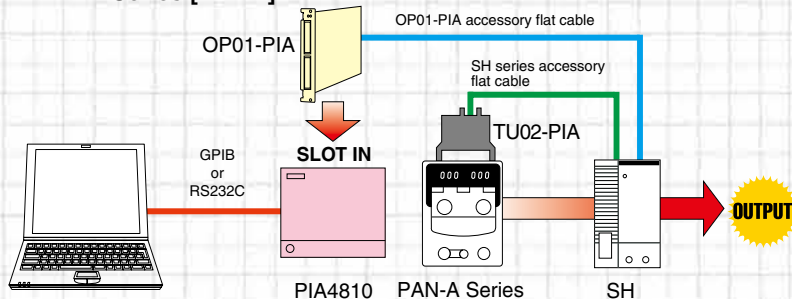
Note: To connect the power supply side of the user-supplied cable, fasten it with screws using crimp terminals.

■ PAD-LA Series [PAD-LA-1]



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

■ PAN-A Series [PAN-1]



Note: The TU02-PIA is installed in the rear panel.

Description of Control

- Output Voltage setting
 - Output Current setting*
 - Output Voltage readback
 - Output ON/OFF*
 - Power switch OFF*
 - Power switch OFF monitoring*
 - C.V mode monitoring*
 - C.C mode monitoring*
- * Conditionally controllable (for details, see the table on page 5.)

Description of Control

- Output Voltage setting
- Output Current setting

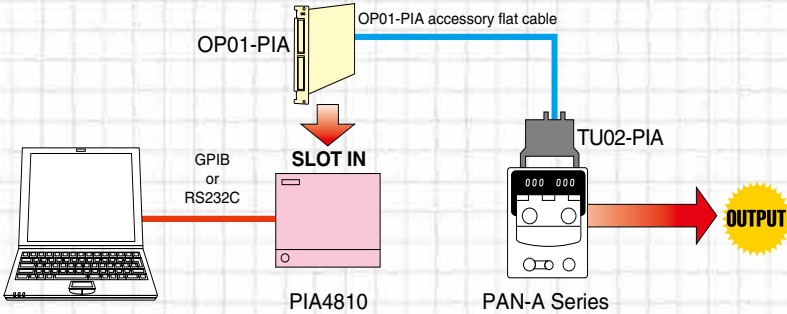
Description of Control

- Output Voltage setting
 - Output Current setting
 - Output Voltage readback
 - Output Current readback*¹
 - Output ON/OFF
 - POWER switch OFF
 - C.V mode monitoring*²
 - C.C mode monitoring*²
 - Alarm monitoring*²
- *¹: For Model PAD16-100LA/PAD36-60LA/PAD36-100LA/PAD60-60LA, please ask our Sales for details.
*²: It is required for the modification of attaching DIN connector to the Power Supply unit.

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]



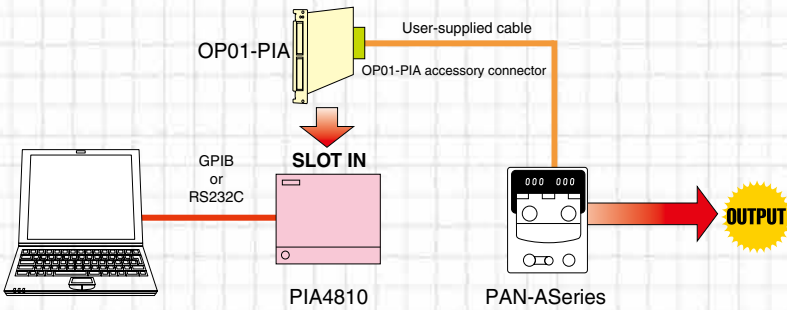
Note: The TU01-PIA is installed in the rear panel.

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-3]

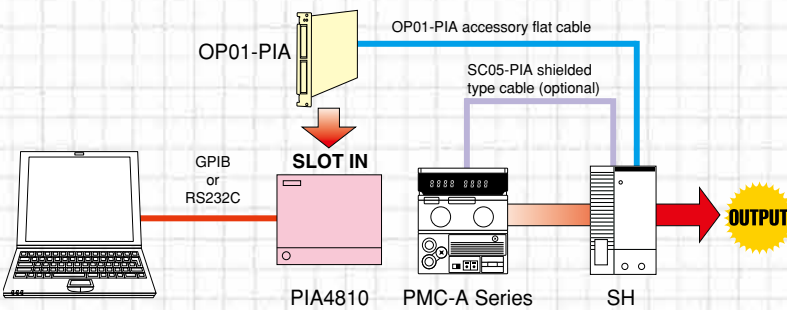


Note: To connect of the power supply side of the user-supplied cable, remove the covering from the wires and insert them into the terminals.

Description of Control

- Output Voltage setting
- Output Current setting

■ PMC-A Series [PMC-1]

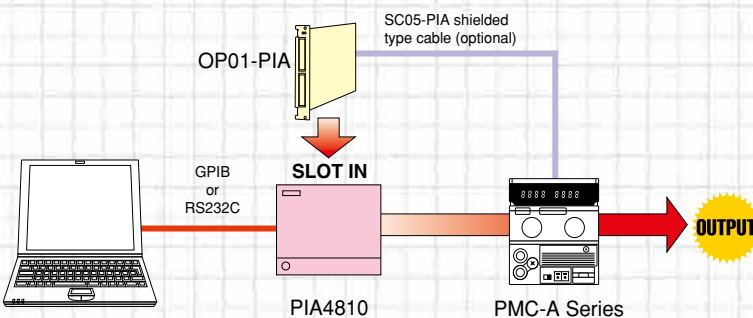


Description of Control

- 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*

* Conditionally controllable (for details, see the table on page 5.)

■ PMC-A Series [PMC-2]

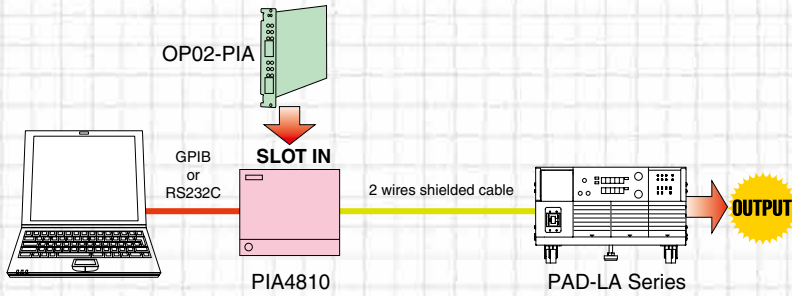


Description of Control

- 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-2]

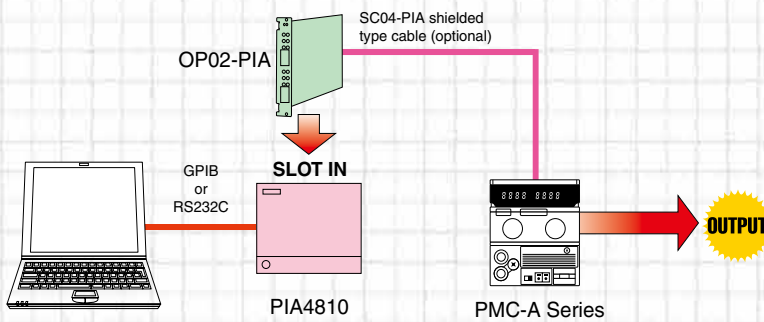


Note: In case of using PIA3200 controller, it is required for the modification of replacing ROM.

Description of Control

- Output Voltage setting
- Output Current setting
- Output ON/OFF

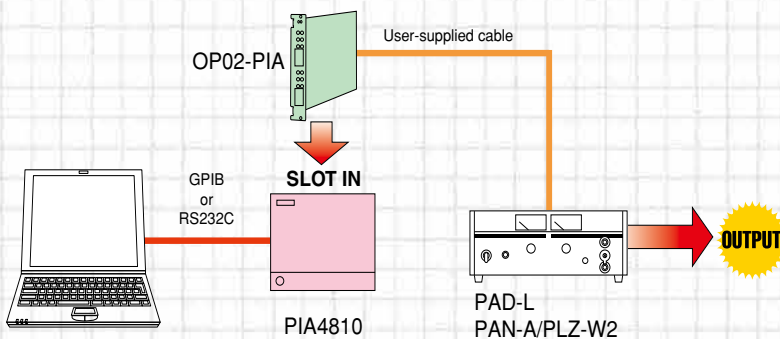
■ PMC-A Series [PMC-3]



Description of Control

- Output Voltage setting
- Output Current setting
- Output ON/OFF

■ PAD-L Series [PAD-4] , PAN-A Series [PAN-4] , PLZ-W2



Description of Control

PAD-L Series [PAD-4]

- Output Voltage setting
- Output Current setting*
- Output ON/OFF*

PAN-A Series [PAN-4]

- Output Voltage setting
- Output Current setting
- Output ON/OFF

PLZ-W2

- Output Current setting

* Conditionally controllable (for details, see the table on page 5.)

Easy to control DC power supplies or electronic loads by using Microsoft Excel.

Application Examples

Knowledge of Microsoft Excel Visual Basic is required.

PIA4800 IVI-COM Driver

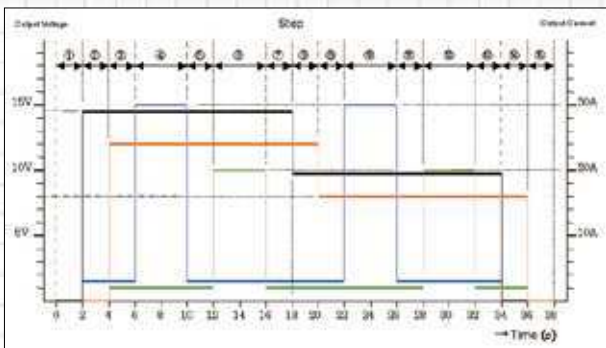
Installing PIA4800 IVI-COM Driver contained in the PIA4800 Utilities CD supplied with the PIA4800 Series (PIA4810 or PIA4830) under Windows allows a driver that can run when Microsoft Excel is installed. Microsoft Excel contains Excel Visual Basic for the macro feature. The driver uses this feature to control the power supplies or electronic loads. Moreover, pasting data loaded from a power supply into Microsoft Excel allows you to draw graphs of that data on the spot using the extensive graphing features of Excel.

For Controlling Power Supplies or Electronic Loads

If you write a simple program using Excel Visual Basic, simply entering voltage and current values and setting time in cells that allows you to control voltage and current as shown in the graph below.

The table and graph below show the results obtained when two power supplies were simultaneously tested using two loads.

Step	Supply 1 Voltage (V)	Load 1 (mA)	Supply 2 Voltage (V)	Load 2 (mA)	Set Time (s)	Num Of Step
1	0	0	0	0	2	15
2	14.4	0	0	0	2	
3	14.4	30	0	0	2	
4	14.4	50	0	0	2	
5	14.4	70	0	0	2	
6	14.4	90	0	0	2	
7	14.4	110	0	0	2	
8	14.4	130	0	0	2	
9	14.4	150	0	0	2	
10	0	0	0	0	2	
11	0	0	0	0	2	
12	0	0	0	0	2	
13	0	0	0	0	2	
14	0	0	0	0	2	
15	0	0	0	0	2	
16	0	0	0	0	2	
17	0	0	0	0	2	
18	0	0	0	0	2	
19	0	0	0	0	2	
20	0	0	0	0	2	

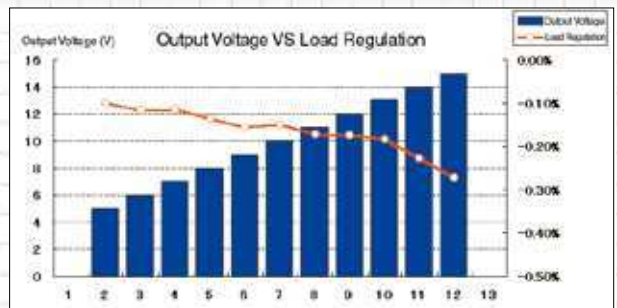


Graphing Readout Data on the Spot

Using the readout function of the OP01-PIA and pasting data written in Excel Visual Basic into cells in Microsoft Excel allows that data to be graphed on the spot using the extensive graphing features of Excel.

The table and graph below show the results obtained when two power supplies were simultaneously tested using two loads.

Step	Output Voltage	Load Regulation	No load Voltage	Full load Voltage	Full load Current
1	0	0.00%	0	0	0
2	5	0.17%	5.000	4.999	10
3	6	0.15%	6.000	5.997	10
4	7	0.17%	7.000	6.997	10
5	8	0.14%	8.000	7.998	10
6	9	0.15%	9.000	8.996	10
7	10	0.15%	10.011	9.998	10
8	11	0.12%	11.012	10.995	10
9	12	0.12%	12.013	11.992	10
10	13	0.10%	13.015	13.008	10
11	14	0.27%	14.021	13.987	10
12	15	0.26%	15.020	0	0
13	0	0.00%	0	0	0
14	0	0.00%	0	0	0
15	0	0.00%	0	0	0
16	0	0.00%	0	0	0
17	0	0.00%	0	0	0
18	0	0.00%	0	0	0
19	0	0.00%	0	0	0
20	0	0.00%	0	0	0



System Requirements of PIA4800 IVI-COM Driver

For users using GPIB

- PC with Windows 98, Me, 2000 or XP
- GPIB board that operates with VISA Library
- GPIB cable
- Microsoft Visual Basic 5.0 or later, or Microsoft Office 2000 or later

For users using RS-232C

- PC with Windows 98, Me, 2000 or XP
- VISA Library
- One or more free RS-232C ports
- RS-232C cross-cable
- Microsoft Visual Basic 5.0 or later, or Microsoft Office 2000 or later

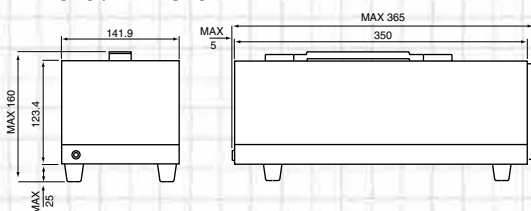
Notes •Microsoft Windows, Microsoft Excel 97, and Microsoft Visual Basic are registered trademarks of Microsoft Corporation in USA.
•When using the RS-232C interface, set the communications setting (baud rate) of the PIA4830 to 19,200 bps.

Specifications (Main Unit)

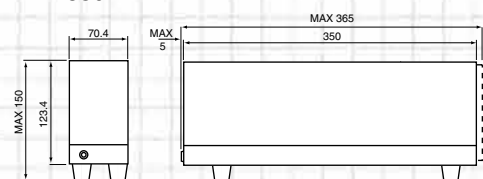
Item	Specifications		
	PIA4810	PIA4820	PIA4830
TU-BUS	Connection	Using the accompanying TP-BUS connector, connect the following: DC power supply unit with digital remote - control function: Up to 31 units (PAM,PMR) / Up to 32 units (PAS,PWR) Expansion unit PIA4820: Up to three units (Total cable length: 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	
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)	
Insulation 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 PIA4800 Utilities CD: 1 TP-BUS connector: 1 TP-BUS core: 1 Operation Manual for controller: 1

Dimensions(mm)

PIA4810 / PIA4820



PIA4830



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
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.

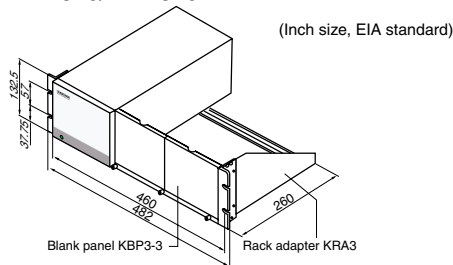
*2: Indicates the standard value.

Options

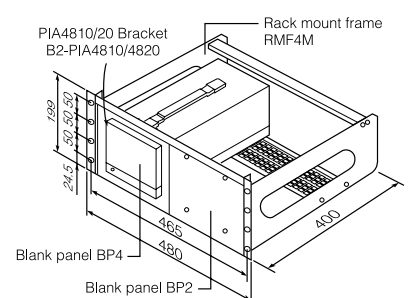
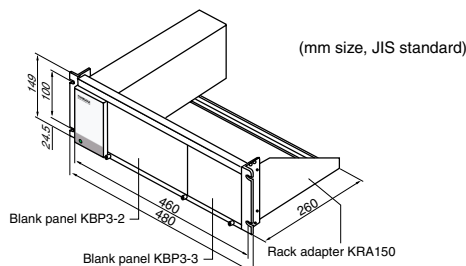
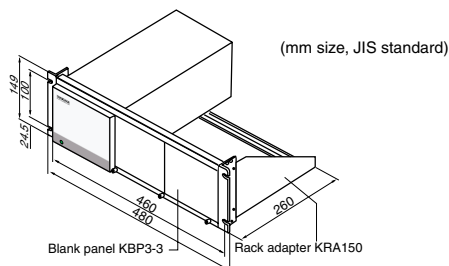
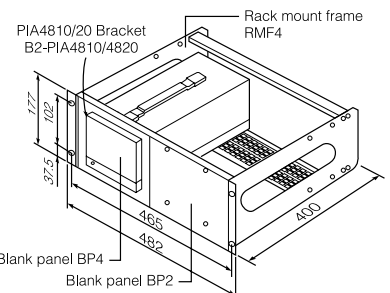
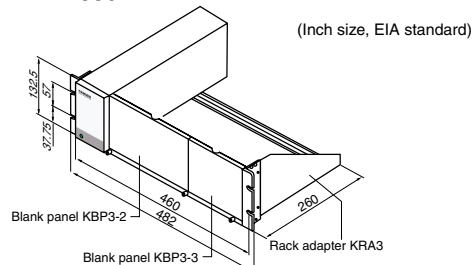
- Interface card
(Factory option)
IF01-PAK-A (PAK-A compatible)
- Shunt units
SH10 (output current rating: 2.5 A to 10 A)
SH50 (output current rating: 12.5 A to 50 A)
- Terminal units
TU01-PIA (PAD-L/LP compatible)
TU02-PIA (PAN-A compatible)
- Shielded 26-conductor flat cables
(OP01-PIA, PAD-L/LP, PAK-A, and PAN-A compatible)
SC01-10 (about 1.0 m)
SC01-20 (about 2.0 m)
- 2-core shielded cables
SC03-PIA (OP01-PIA and PMC-A compatible, about 1.0 m / for 14-pin)
SC04-PIA (OP02-PIA and PMC-A compatible, about 1.0 m)
SC05-PIA (OP01-PIA and PMC-A compatible, about 1.0 m / for 26-pin)
- GPIB cables
(Available for all models)
408J-101 (about 1.0 m)
408J-102 (about 2.0 m)
408J-104 (about 4.0 m)

Rack Mount Options

PIA4810/PIA4820



PIA4830



* 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.



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For our local sales distributors and representatives, please refer to "sales network" of our website.

●Distributor:

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