

GP-610A/GP-610D
GP - I B A D A P T E R
I N S T R U C T I O N M A N U A L

KENWOOD CORPORATION

FCC WARNING:

This equipment may generate or use radio frequency energy. Changes or modifications to this equipment may cause harmful interference unless the modifications are expressly approved in the instruction manual. The user could lose the authority to operate this equipment if an unauthorized change or modification is made.

NOTE:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CONTENTS

1 . OUTLINE	1
2 . SPECIFICATIONS	2
3 . PRECAUTIONS FOR USE	5
4 . SYSTEM CONFIGURATION	7
1 Theory of Operation	7
2 System Configuration	8
5 . PANEL EXPLANATION	10
6 . OPERATING PROCEDURE	14
1 Each Part Setting and Connection	14
1) GP-IB bus cable connection	14
2) Address mode and listen-only mode setting	14
3) Transition to the local state	15
4) Transition to the remote state	15
2 Connection of the Controlled Power Supply	16
1) Connecting GP-610D with PD power supply	16
2) Connecting GP-610A with PA power supply	17
3) Analog output connection	19
4) Digital I/O connection	20
3 Code Format Setting	22
4 Total System Adjustment	28
7 . PROGRAM APPLICATION EXAMPLES	30
8 . MAINTENANCE	33
9 . EXTERNAL VIEW	35
10. MOUNTING ON THE RACK-MOUNT ADAPTER	36

1. OUTLINE

This adapter is used to set the constant voltage or constant current and control the OUTPUT switch on/off our PD or PA series DC regulated power supply from a computer by using the GP-IB bus (IEEE-488-1978).

- The interface function complying with IEEE-488-1978 is provided. Also, since the SRQ function is provided, errors of the controlled power supply can be detected and system control can be done more safely.
- This adapter can convert the digital signal from the GP-IB bus into the analog signal by using three mutually insulated D/A's and obtain three independent analog signal outputs. The voltage or current of up to three PD or PA series power supplies can be controlled.
Since two-channel 12-bit resolution and one-channel 8-bit resolution are used on the D/A converter, high-accuracy setting can be done.

< WARNING >

Before using this component, modify our PD or PA series power supply for GP-IB.

For details, call your dealer or our distributor.

Note : This manual covers two models; GP-610A (for PA power supply) and GP-610D (for PD power supply)

2. SPECIFICATIONS

【GP-1B】

Electrical specifications : IEEE488-1978
 Mechanical specifications : IEEE488-1978
 Interface function : SH1, AH1, TG, L3, SR1, RL1, PPO, DC1, DT1, C0
 Address setting : Address 0 to 30 can be arbitrarily set by using
 the address switch.
 Listen-only mode : Can be set by using the L-ONLY switch.
 Remote-local function : Switching can be done by using the local switch.
 Service request function : Input data format error
 Input setting error
 Controlled power supply OVP operation, circuit
 breaker off (PD power supply only), or power
 switch off
 Controlled power supply CC/CV state change

【Analog output】

	A/B channel	C channel
Output voltage range	: 0 to +/- 10 V (bipolar)	0 to 10 V (monopolar)
Full-scale voltage variable range	: +/- 10 V +/- 15%	+10 V +/- 15%
Maximum output current	: 3 mA	
D/A converter resolution	: 12-bit, 0.05% (4.8 mV) (Monotony: 8 bits)	8-bit, 0.4% (39 mV) (Monotony: 8 bits)
D/A converter accuracy (Ta = 25°C)	: 0.025% (1/2LSB)	0.2% (1/2LSB)
Setting accuracy	: 0.0275%	0.22%
Output ripple & noise (10 Hz to 1 MHz)	: 300 μ Vrms or less	
Input power fluctuation (+/- 10% fluctuation)	: 1.5 mV or less	
Load fluctuation(0 to 100%)	: 1.5 mV or less	

Temperature coefficient : 50 ppm/°C (typical)

Rising time
(10 to 90%, 10 kilohm load) : 100 μ s or less

【Digital I/O】

OUTPUT ON/OFF signal output : TTL level High: ON
Low : OFF
Interrupt signal (CV/CC) signal input : TTL level High: CV
Low : CC
Interrupt signal (POWER OFF) signal input : TTL level High: OFF
Low : ON

【Operating condition】

Specified temperature/humidity range: 0 to 40 °C, 80% or less

【Insulation dielectric strength】

Between GP-1B connector outputs : 500 VAC for 1 minute
(Analog output A, B, C)
Between analog output : Same as above
Between the output and case : Same as above
Between the input power supply and case : 1 kVAC for 1 minute
Between the input power supply and output : Same as above

【Insulation resistance】

Between the input power supply and case : 30 megohms or more at 500 VDC
Between the output and case : same as above

【Power supply】

100 VAC +/- 10%, 50/60 Hz. Switching to 120 V, 220 V, or 240 V (maximum 250 V) can be done.

【Power consumption】

15 W, 19 VA (at 100 V rating)

【Dimensions】

68 (W) × 147 (H) × 251 (D)mm (Cabinet)

73 (W) × 161.5 (H) × 284 (D)mm (Maximum size)

【Weight】

Approximately 2.3 kg

【Accessories】

GP-610A :

Instruction manual : 1

Replacement fuse : 2

OP-15 : 1

{ 3-pin DIN - 2-pin cable: 2 }
{ 7-pin DIN - 6-pin cable: 1 }

GP-610D :

Instruction manual : 1

Replacement fuse : 2

OP-14 : 1

{ 3-pin DIN - 3 arrow type terminal cable: 2 }
{ 7-pin DIN - 7-pin DIN cable : 1 }

3. PRECAUTIONS FOR USE

● Input power check

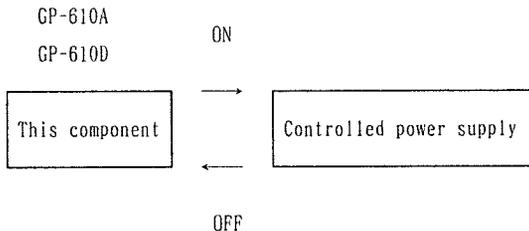
- Use the input power in the range of the rated input voltage.
Single-phase 100, 120, 220, or 240 VAC +/- 10%, maximum 250 VAC, 50/60 Hz
- To change the rated input voltage, see the section of maintenance.

● Ambient temperature and location of installation

- Do not use the component at a high-temperature and high-humidity place exceeding the rating.
- Do not use the component at a place where is much dust and vibration.
- If a noise source exists near the component, take the proper action.

● Before power on

- Complete connections before power on and check that the connections are correct.
- Power on/off order should be as shown below.
- Do not replace the connector while power is on.

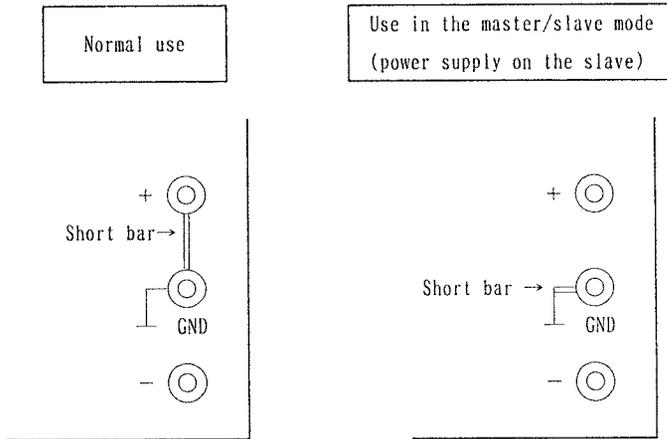


- Be sure to ground the GND terminal of this component and the GND terminal of the controlled power supply. Without grounding, the component may be affected by external noise and result in malfunction.

● Note on connecting the short bar

- When this component is used in a combination with a floating circuit type power supply (PD or PA series), normal operation may not be done depending on connection of the short bar if the power input cord of the PD or PA power supply is the 3-pin type.

In this case, connect the short bar on the power supply (PD or PA series) as shown below.



* Connect the short bar between the + terminal and GND or remove it as shown at right.

* Be sure to remove the short bar.

● Output ripple/noise

When this component is connected to the controlled power supply, the output ripple/noise of the stabilized DC power supply may increase compared with the output ripple/noise of the independent stabilized DC power supply. Because the power supply is affected by wiring and the output ripple/noise of this component is amplified by the stabilized DC power supply.

4. SYSTEM CONFIGURATION

1 Theory of Operation

The block diagram of this component is shown below.

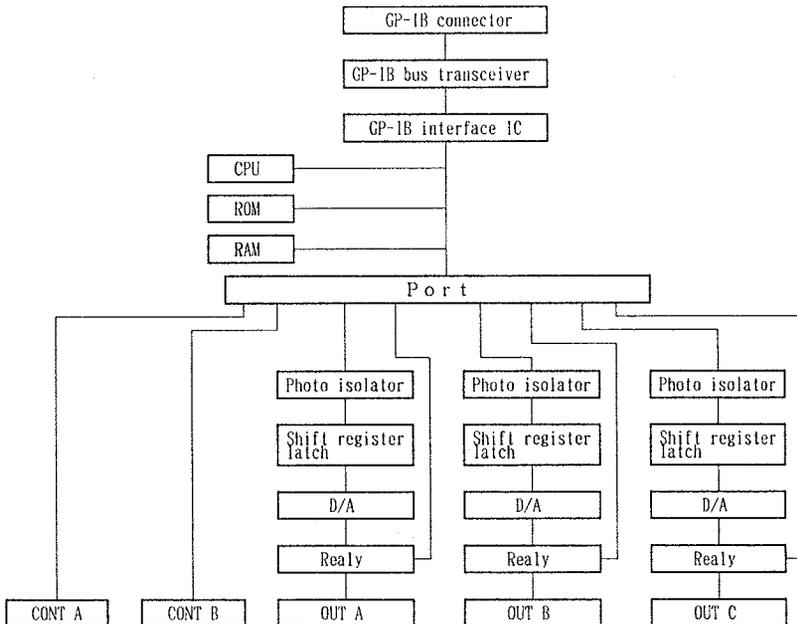
The digital signal input from the GP-IB connector is fed to the GP-IB interface IC via the bus transceiver. This GP-IB interface performs handshaking in the timing complying with IEEE488-1978.

The received code is then decoded by the CPU. The CPU converts the data into the binary type. Data is sent from the serial output port to the D/A. Then, data passes through the photo isolator and is insulated.

Data is converted into parallel data by the shift register and fed to the D/A converter. The analog output of the D/A converter passes through the relay and is output. This relay performs switching over remote and local.

In addition, the CPU controls the control connector and processes SRQ.

Block diagram



2 System Configuration

To configure a system of this component and the power supply, carefully examine the specifications of this component and the power supply.

1) I/O specifications of this component

1. Analog output	OUTPUT A	0 ~ ±10V	12 bits (binary)
	OUTPUT B	0 ~ ±10V	12 bits (binary)
	OUTPUT C	0 ~ 10V	8 bits (binary)
2. Interrupt signal input	2 bits in CONTROL A		CV/CC POWER OFF and OVP
	2 bits in CONTROL B		CV/CC POWER OFF and OVP
3. OUTPUT ON/OFF control signal output	1 bit in CONTROL A		
	1 bit in CONTROL B		
4. Local setting signal input (PD power supply only)	1 contact in OUTPUT A		Local signal setting analog signal
	1 contact in OUTPUT B		Local signal setting analog signal
	1 contact in OUTPUT C		Local signal setting analog signal

2) Details of control by this component to a power supply

Control item		Voltage only	Current only	Both voltage and current	OUTPUT ON/OFF	CV→CC CC→CV mode interrupt	POWER OFF interrupt	Q.V.P. operation interrupt	Local setting
		PD series power supply	With OP-12 *1	○	○	○	○	○	○
	Without OP-12 *2	○	○	○	×	×	×	×	○
PA series power supply	With OP-13 *1	○	○	○	○	○	○	×	×
	Without OP-13 *2	○	○	○	×	×	×	×	×

* Note1: By using the LOCAL/REMOTE changeover switch on the rear of the PA power supply,

LOCAL can be set.

*1 When control in 2) above is done by using this component, the EXT I/O interface for GP-1B, OP-12 or OP-13 (option), should have been incorporated into the PD or PA power supply.

For details, contact the sales office of our Measuring Equipment Division.

*2 If voltage and current only are controlled, the I/O interface, OP-12 or OP-13, is not needed.

*3 When OP-13 is incorporated, the PA series power supply manufactured in or before October, 1990 should be partly modified.

Contact your dealer or our distributor if you need modification. If the serial number is the following or larger, modification is not needed.

No.

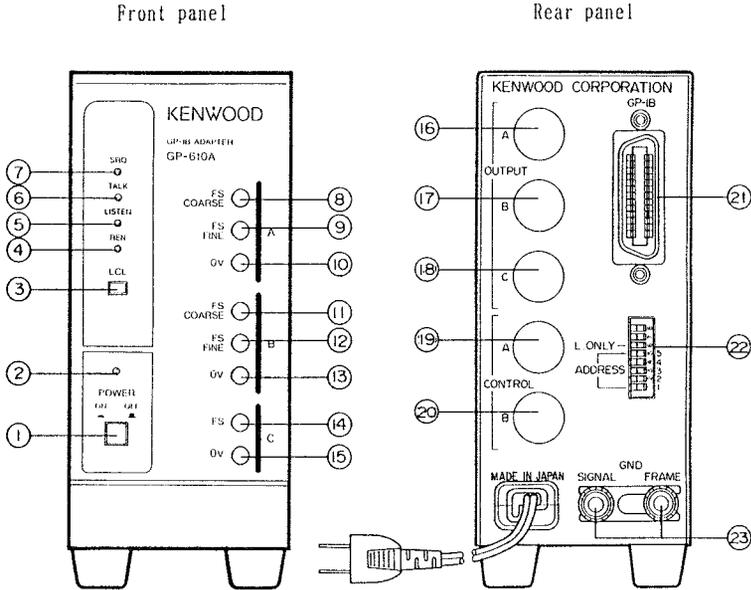
2	0	8	0	0	0	1
---	---	---	---	---	---	---

3) Model to be connected

Models that can be connected are as follows:

	Rated full-scale voltage (V)	Rated full-scale current (A)
PD8-20	8	20
PD8-20D	8	20
PD8-30	8	30
PD8-30D	8	30
PD18-10	18	10
PD18-10D	18	10
PD18-20	18	20
PD18-20D	18	20
PD18-30	18	30
PD18-30D	18	30
PD35-10	36	10
PD35-10D	36	10
PD35-20	36	20
PD35-20D	36	20
PD56-6	56	6
PD56-6D	56	6
PD56-10	56	10
PD56-10D	56	10
PD110-3	110	3
PD110-3D	110	3
PD110-5	110	5
PD110-5D	110	5
PA18-1.2	18	1.2
PA18-3	18	3
PA36-1.2	36	1.2
PA36-3	36	3
PA70-1	70	1

5. INDICATORS AND CONTROLS



Note: The figure shows GP-610A.

① POWER

Power switch. If this switch is pressed, the POWER LED goes on.

② POWER LED

This LED is on during operation.

③ LCL

Remote/local changeover switch. (Non-lock type)

If this switch is pressed in remote mode (operating with GP-1B), the local mode is set and the power supply is operated from the front panel. (PD series power supply only)

④ REN

This LED indicates the remote mode.

This LED is on in remote mode (i.e. power supply being controlled through the GP-IB bus).

⑤ LISTEN

This LED indicates the listen mode.

It is on while the listener is specified on the GP-IB bus.

⑥ TALK

This LED indicates the talk mode.

It is on while the talker is specified on the GP-IB bus. Also, it is on while the status byte and data are being transferred.

⑦ SRQ

This LED indicates the service request mode.

It is on while SRQ is generated on the GP-IB bus.

⑧ CH A FS COARSE

Channel A output voltage coarse adjustment semi-fixed variable resistor
(15 turns)

⑨ CH A FS FINE

Channel A output voltage fine adjustment semi-fixed variable resistor (1 turn)

⑩ CH A 0V

Channel A output offset adjustment semi-fixed variable resistor

⑪ CH B FS COARSE

Channel B output voltage coarse adjustment semi-fixed variable resistor
(15 turns)

⑫ CH B FS FINE

Channel B output voltage fine adjustment semi-fixed variable resistor (1 turn)

⑬ CH B OV

Channel B output offset adjustment semi-fixed variable resistor

⑭ CH C FS

Channel C output voltage adjustment semi-fixed variable resistor (1 turn)

⑮ CH C OV

Channel C output offset adjustment semi-fixed variable resistor

⑯ OUTPUT A

Channel A analog output DIN connector. It supplies the output setting analog signal to the power supply connected.

⑰ OUTPUT B

Channel B analog output DIN connector. It supplies the output setting analog signal to the power supply connected.

⑱ OUTPUT C

Channel C analog output DIN connector. It supplies the output setting analog signal to the power supply connected.

⑲ CONTROL A

Channel A digital control DIN connector. It outputs the OUTPUT switch control signal and outputs the interrupt signal.

⑳ CONTROL B

Channel B digital control DIN connector. It outputs the OUTPUT switch control signal and outputs the interrupt signal.

㉑ GP-IB connector

24-pin Amphenol connector complying with GP-IB standard (IEEE488-1978) Connect the GP-IB bus cable.

②② Address switch

The address of this component on the GP-IB bus and the listen-only mode are set.

②③ GND terminal

SIGNAL: Signal grounding to which the circuit ground is connected

FRAME : Frame grounding to which the case is connected

Be sure to perform grounding to secure safety and to prevent malfunctions due to external noise.

6. OPERATING PROCEDURE

1. Each Part Setting and Connection

1) GP-IB bus cable setting

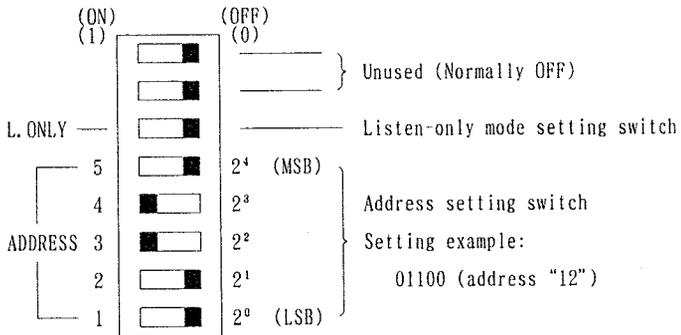
- By using the GP-IB bus cable, connect the GP-IB connector of this component to the controller.

Note: Setting or removal of the connector while power is on will cause malfunctions or errors. Be sure to turn off power before setting or removal.

Fix the GP-IB bus cable securely onto the GP-IB connector of this component.

2) Address and listen-only mode setting

- The address of this component on the GP-IB bus and the listen-only mode are set by using the address switch (8-bit DIP switch) on the rear of this component.



- The address is set with binary numbers by using the address switch (1 to 5). A number, 0 to 30, can be arbitrarily set.

- By turning on the L. ONLY switch, the listen-only mode can be set. (Switch 6)

Note : • Other switches (7 and 8) are not used. Be sure to set them to OFF.

- The contents set by the address switch are read upon power on. Be sure to set the address switch before power on.

3) Transition to the local mode

Switching from the remote mode (GP-IB operating) to the local mode

① PD power supply

If the LCL key on the panel of this component is pressed, the PD power supply changes from the remote mode to the local mode and operation on the panel is allowed.

② PA power supply

By switching the CV/CC external control switch S1/S2 on the rear of the PA power supply from REMOTE to LOCAL, the local mode of the PA power supply is set and operation on the panel is allowed.

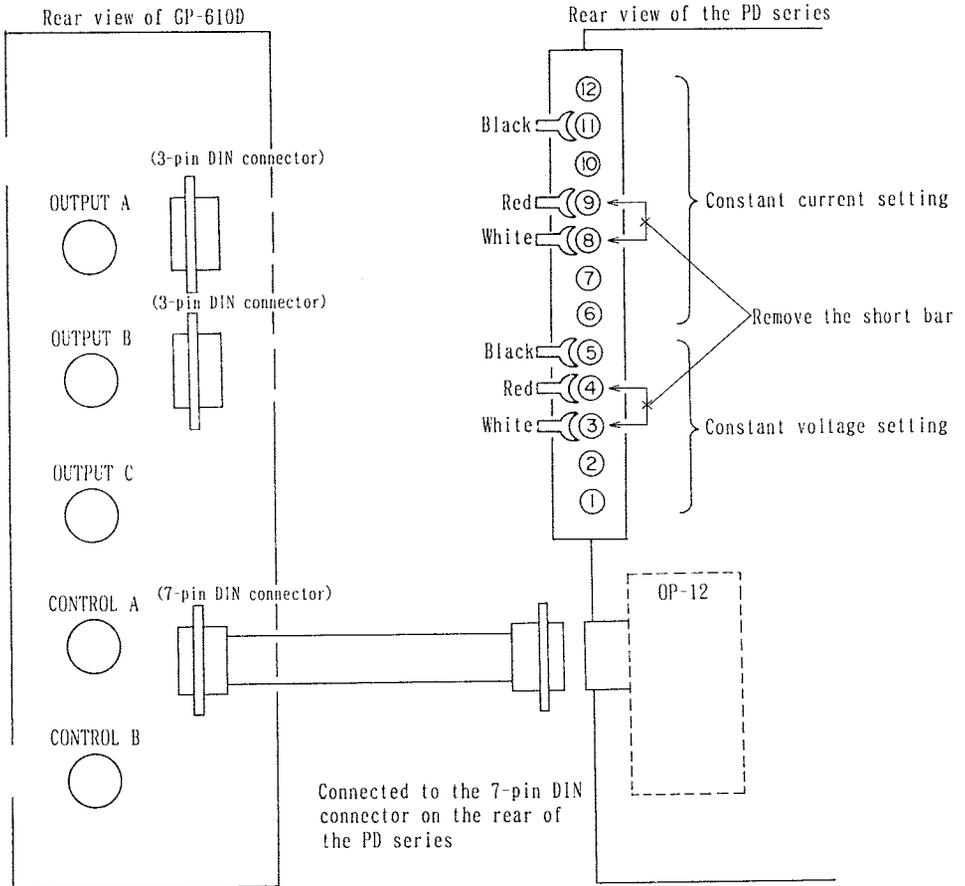
If OP-13 is not used, switch external resistor S2/S4 to LOCAL at the same time.

4) Transition to the remote mode

When the controller sends the setting command for the controlled power supply according to the GP-IB input cord format, the controlled power supply is set into the remote mode (controlled through the GP-IB bus).

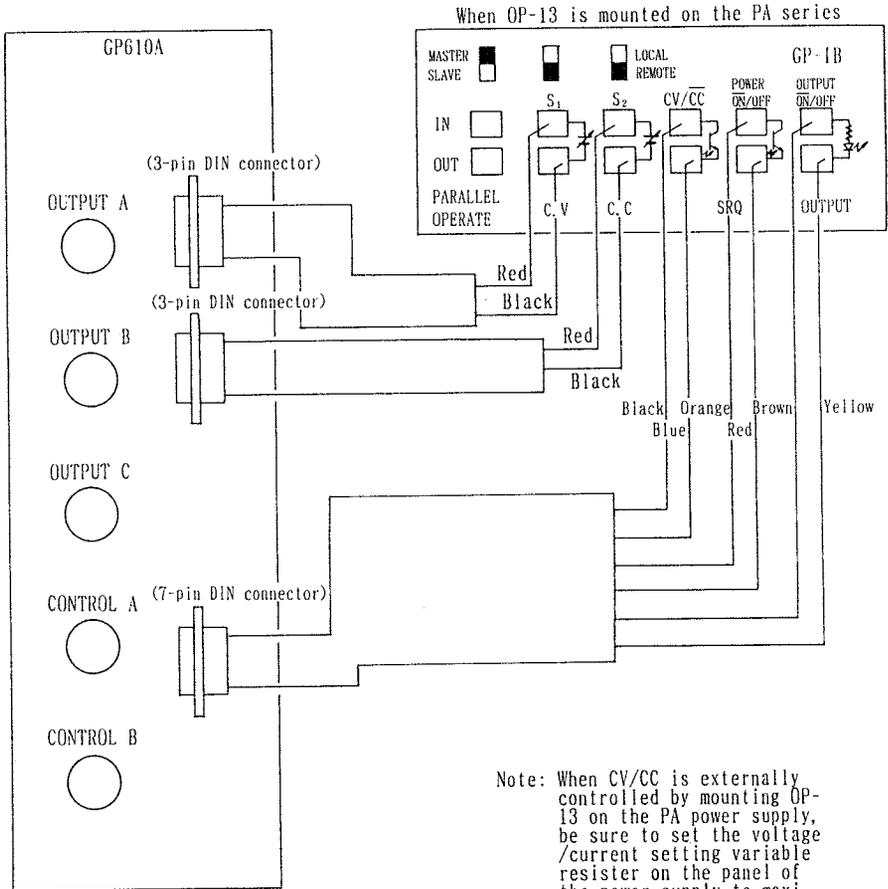
2 Connection of the Controlled Power Supply

1) Connecting GP-610D with PD power supply

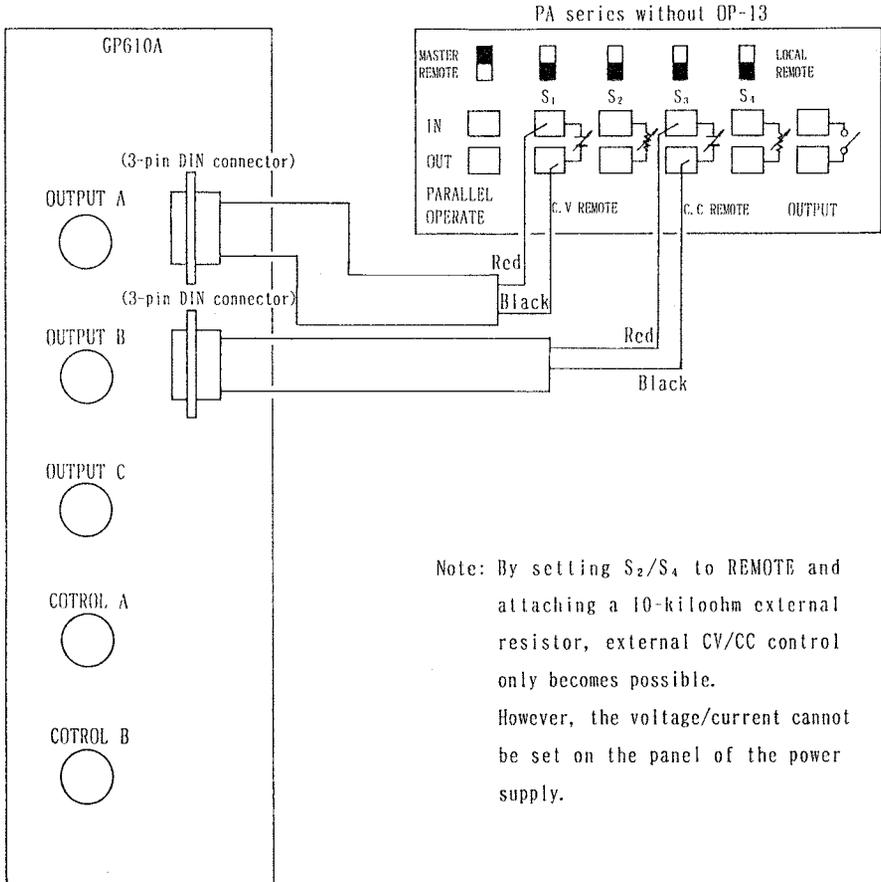


2) Connecting GP-610A with PA power supply

① When OP-13 is attached



② When OP-13 is not attached



Note: By setting S_2/S_4 to REMOTE and attaching a 10-kiloohm external resistor, external CV/CC control only becomes possible. However, the voltage/current cannot be set on the panel of the power supply.

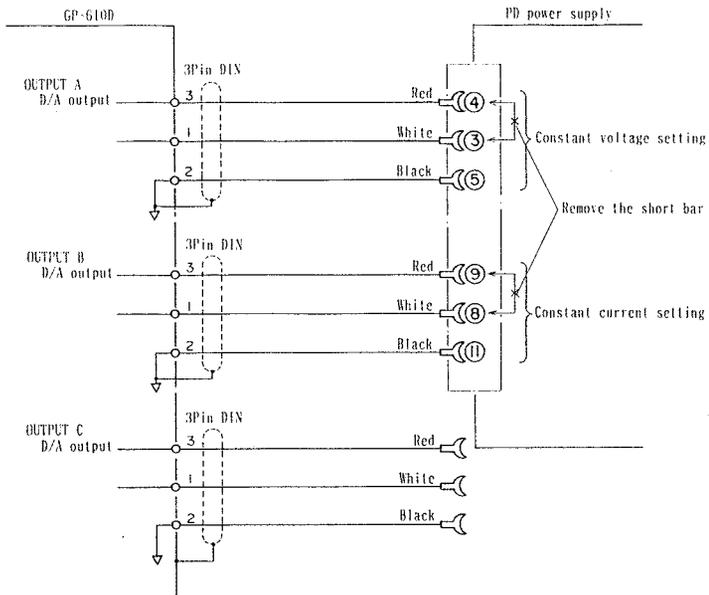
3) Analog output connection

The analog output voltage of this component is fed to the pin "which controls the output voltage with an external voltage" or "which controls the output current with an external voltage" as described in explanation of applications in the instruction manual of the power supply (PD/PA series) to be controlled.

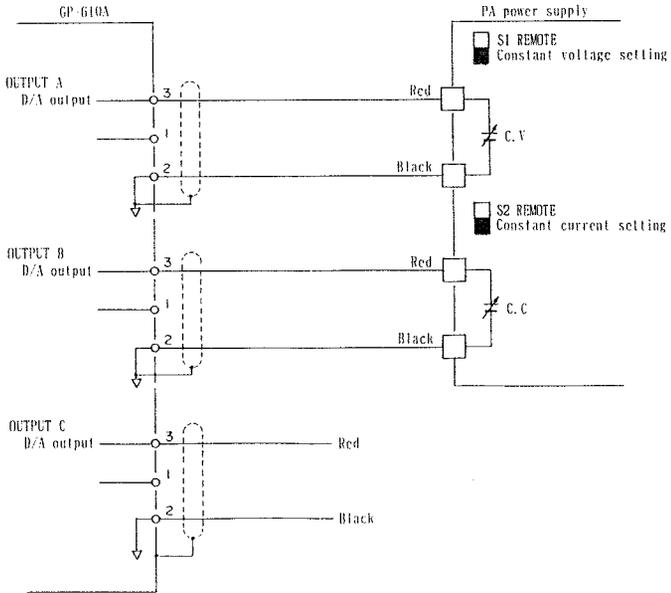
- For connection between this component and the controlled power supply, be sure to use the attached cable.
- Be sure to ground the GND terminal of this component and the GND terminal of the controlled power supply. External noise may cause malfunctions.

	Analog output	Output voltage	Analog input	PD reference voltage
OUTPUT A	pin 2, 3	0 ~ +10V (11 bit) 0 ~ -10V (11 bit)	pin 1	0 ~ +10V
OUTPUT B	pin 2, 3	-10 ~ +10V (12 bit)	pin 1	Voltage/current setting reference voltage
OUTPUT C	pin 2, 3	0 ~ +10V (8 bit)	pin 1	

① GP-610D



② GP-610A



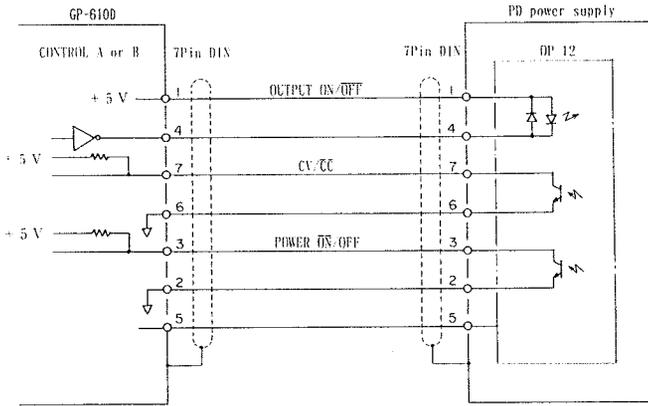
Note: For connecting the CV/CC external control without OP-13, connect the external resistor and set the S_2/S_4 switch to REMOTE as described in "control of output voltage/current by an external voltage" of the PA series instruction manual.

4) Digital I/O connection

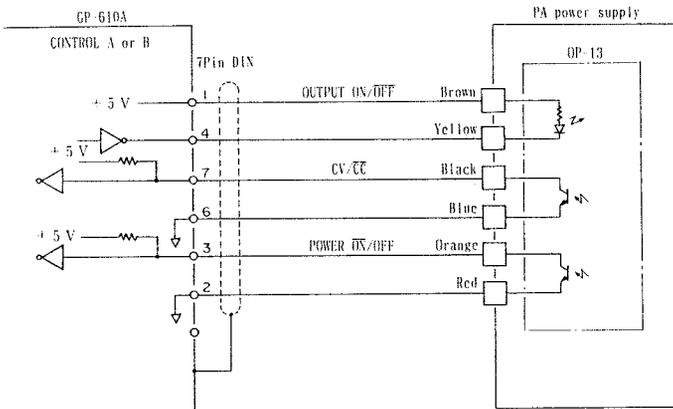
The digital I/O connector (7-pin DIN) of this component inputs a pair of interrupt signals and output the OUTPUT ON/OFF control signal. If an interrupt occurs, service request (SRQ) is generated for the GP-IB bus. Also, the status byte is sent corresponding to serial polling.

	Interrupt signal input	OUTPUT ON/OFF signal output
CONTROL A	Pin 2, 3, 6, 7	1, 4
CONTROL B	Pin 2, 3, 6, 7	1, 4

① PD series



② PA series



3 Code Format Setting

This component operates by receiving the ASCII code through the PG-IB bus. Describe the necessary code characters for control of this component upon programming into the computer. The code characters are converted into ASCII codes and output to the GP-IB bus.

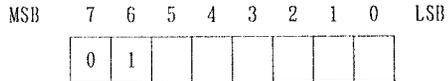
1. GP-IB Input Code Format

1) Delimiter

There are three demiliters for the input code.

- CR, LF
- CR, LF + EOI
- EOI

2) Status byte

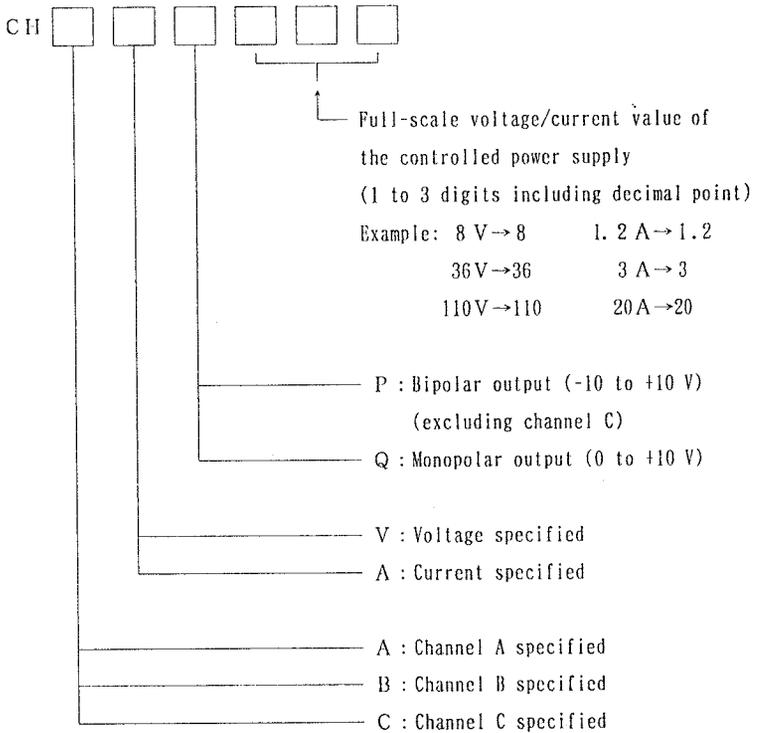


Indicates occurrence of SRQ

Input syntax error	97 (61H)	1	0	0	0	0	1
Input setting error	98 (62H)	1	0	0	0	1	0
Breaker off	100 (64H)	1	0	0	1	0	0
Transition to CC operation	104 (68H)	1	0	1	0	0	0
Transition to CV operation	88 (58H)	0	1	1	0	0	0

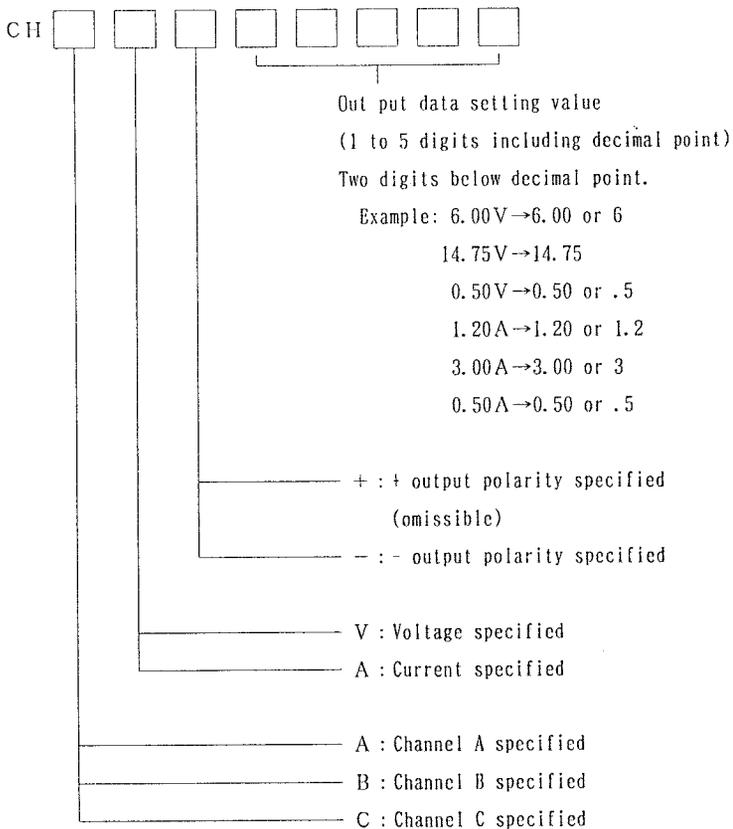
3) GP-IB input code format

Setting of the controlled power supply



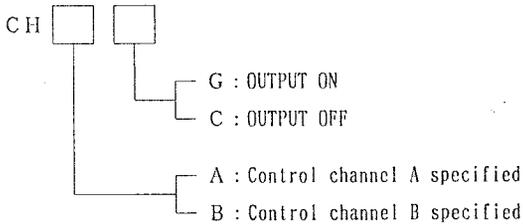
If any other setting is done, SRQ occurs.

4) Each channel output data setting



Note: If the controlled power supply is not set before this code is input, SRQ occurs.

5) Output ON/OFF



Note: If the GP-IB address command, GET, is executed, output can be turned on at the same time for both channel A and B.

Note: Before controlling the output switch, turn on the output switch of the PD/PA power supply.

6) Service request

If an abnormal command is sent or an error occurs on PD/PA when the PD/PA series power supply is controlled by using this component, service request (SRQ) is generated for the GP-IB bus. In this case, the details can be known by reading the status byte.

The following SRQ generating causes are provided for GP-610A/D:

	Status byte	
Ⓐ Input syntax error	97	(61H)
Ⓑ Input setting error	98	(62H)
Ⓒ Breaker off	100	(64H)
Ⓓ Transition to CC operation	104	(68H)
Ⓔ Transition to CV operation	88	(58H)

• SRQ generating causes

1. Input syntax error : A code deviating from the specified input code format is input.

2. Input setting error : Setting deviates from the specified setting range.
- Current output data is input to the voltage setting channel.
 - Voltage output data is input to the current setting channel.
 - The controlled power supply is not set before output data is set.
 - The controlled power supply is not set before output is turned on.
3. Braker off : The circuit breaker of the controlled power supply goes off.
4. Transition to CC operation: Operation of the controlled power supply changes from the CV mode to CC mode.
5. Transition to CV operation: Operation of the controlled power supply changes from the CC mode to CV mode.

• SRQ masking command

Masking factors

- a. Braker off 100
- b. Transition to CC operation 104
- c. Transition to CV operation 88

Masking command

CHMS1: Masks the SRQ cause, a, b or c, for control channel A/B.

CHMS2: Masks the SRQ cause, b or c, for control channel A/B.

SRQ occurs for factor a only.

CHMS3: Masks the SRQ cause, a, for control channel A/B.

SRQ occurs for factor b or c.

CHMS4: Masks the SRQ cause for control channel A/B.

SRQ occurs for any factor.

• Processing the SRQ factor in each mode

1. Addressible mode

- (1) SRQ cause for the input syntax error : This component accepts the cause and generates SRQ.
- (2) SRQ cause for the input setting error : This component accepts the cause and generates SRQ.
- (3) SRQ cause for breaker off : This component accepts the cause, is initialized, and generates SRQ.
- (4) SRQ cause for transition to CC operation: This component accepts the cause and generates SRQ.
- (5) SRQ cause for transition to CV operation: This component accepts the cause and generates SRQ.

2. Listen-only mode

- (1) SRQ cause for the input syntax error : This component accepts the cause and is initialized.
- (2) SRQ cause for the input setting error : This component accepts the cause and is initialized.
- (3) SRQ cause for breaker off : This component does not accept the cause.
- (4) SRQ cause for transition to CC operation: This component does not accept the cause.
- (5) SRQ cause for transition to CV operation: This component does not accept the cause.

4 Total System Adjustment

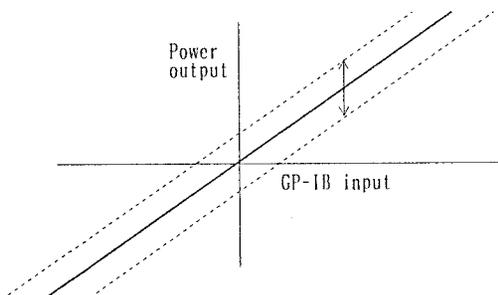
Adjustment

To obtain the necessary accuracy when the power supply is controlled by using this component, adjustment should be done in advance.

- Aging

Before starting adjustment, connect this component to the controlled power supply and perform aging for at least 30 minutes.

- Offset adjustment



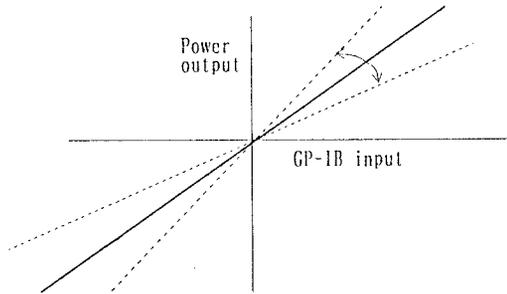
The full-scale voltage (current) output corresponding to the controlled power supply is set from the GP-IB bus. Full-scale adjustment is done by using the FS semi-solid variable resistor on the panel of GP-610A/D. For output A and B, the COARSE (coarse adjustment) and FINE (fine adjustment) VRs are provided for full-scale adjustment.

When channel A is used, use VR ⑩ on the panel.

When channel B is used, use VR ⑬ on the panel.

When channel C is used, use VR ⑮ on the panel.

• Full-scale adjustment



The full-scale voltage (current) output corresponding to the controlled power supply is set from the GP-IB bus. Full-scale adjustment is done by using the FS semi-solid variable resistor on the panel of GP-610A/D. For output A and B, the COARSE (coarse adjustment) and FINE (fine adjustment) VRs are provided for full-scale adjustment.

When channel A is used, use VR (8) and (9) on the panel.

When channel B is used, use VR (11) and (12) on the panel.

When channel C is used, use VR (14) on the panel.

Note: Models whose rated full-scale voltage is 36 V or more indicates the lowest digit in units of 100 mV in full-scale indication. Therefore, when a voltage which is 20 V or less is set and the lowest digit is indicated in units of 10 mV after full-scale adjustment, the voltage set from the controller may differ by several digits from power supply indication on these models.

Note: When the PA series is controlled by this component with OP-13 incorporated, set the voltage/current setting variable resistor on the panel of the PA series power supply to maximum.

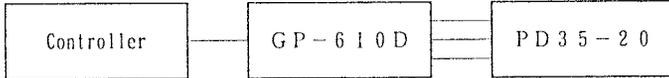
Perform offset adjustment and full-scale adjustment in this state.

In this case, if the setting variable resistor on the panel of the PA power supply is operated during control through the GP-IB bus, the output setting value changes. Therefore, care must be taken.

7. PROGRAM APPLICATION EXAMPLES

• Program example

The voltage/current of PD35-20 is controlled.



Connection

OUTPUT A : Voltage setting
OUTPUT B : Current setting
CONTROL A: Control terminal
ADDRESS : 7

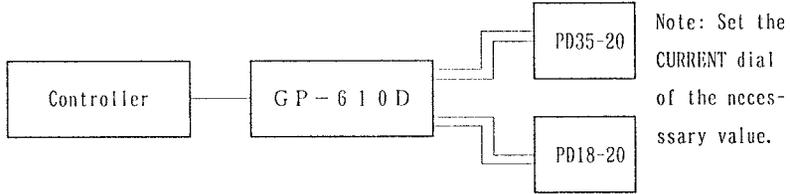
Program example using PC9801F or PC9801-19

```
10 REM **** SAMPLE 1 ****
20 PRINT"&H7 ; "CHAVQ36"
30 PRINT"&H7 ; "CHBAQ20"
40 PRINT"&H7 ; "CHBA10"
50 PRINT"&H7 ; "CHAG"
60 GOSUB10000
70 PRINT"&H7 ; "CHAV10"
80 GOSUB10000
90 PRINT"&H7 ; "CHAV36"
100 END
1000 REM **** WAIT ****
1010 FOR T=0 TO 1000 ; NEXT
1020 RETURN
```

Controlled power supply specified
Limiting current setting
OUTPUT ON
Output voltage setting (10 V output)
Output voltage setting (36 V output)
Interval time setting

• Program example

Voltage of PD35-20 and PD18-20 are controlled.



Connection

- OUTPUT A : PD35-20 voltage setting
- OUTPUT B : PD18-20 voltage setting
- CONTROL A: PD35-20 control terminal
- CONTROL B: PD18-20 control terminal
- ADDRESS : 7

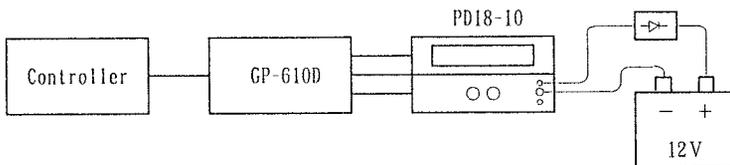
```

10 REM **** SAMPLE 2 ****
20 PRINT"&H7 ; "CHAVQ36"
30 PRINT"&H7 ; "CHBVQ18"
40 WBYTE &H27, &H8 ;      OUTPUT ON (GET sending)
50 GOSUB10000
60 PRINT"&H7 ; "CHAV18"   PD35-20 18 V setting
70 GOSUB10000
80 PRINT"&H7 ; "CHBV18"   PD18-20 18 V setting
90 GOSUB10000
100 PRINT"&H7 ; "CHAV36"   PD35-20 36 V setting
120 END
1000 REM **** WAIT ****
1010 FOR T=0 TO 1000 ; NEXT   Interval time setting
1020 RETURN
    
```

• Application example

Application program

Battery automatic recharging



Connection

[OUTPUT A : PD18-10 voltage setting
 OUTPUT B : PD18-10 current setting
 CONTROL A : PD18-10 control terminal
 ADDRESS : 7

```

10 REM **** SAMPLE 3 ****
20 SRQ=0
30 ON SRQ GOSUB 1000
40 PRINT"&H7 ; "CHAVQ18"
50 PRINT"&H7 ; "CHBAQ10"
60 PRINT"&H7 ; "CHAV1"
70 PRINT"&H7 ; "CHAV12"
80 PRINT"&H7 ; "CHAG"
90 SRQ ON
100 IF SRQ=1 GOTO120
110 IF SRQ=2 GOTO150 ELSE 100
120 PRINT"&H7 ; "CHAC"
130 PRINT "BATTERY CHARGE END"
140 END
150 PRINT"&H7 ; "CHAC"
160 PRINT "PD18-10 EMERGENCY"
170 END

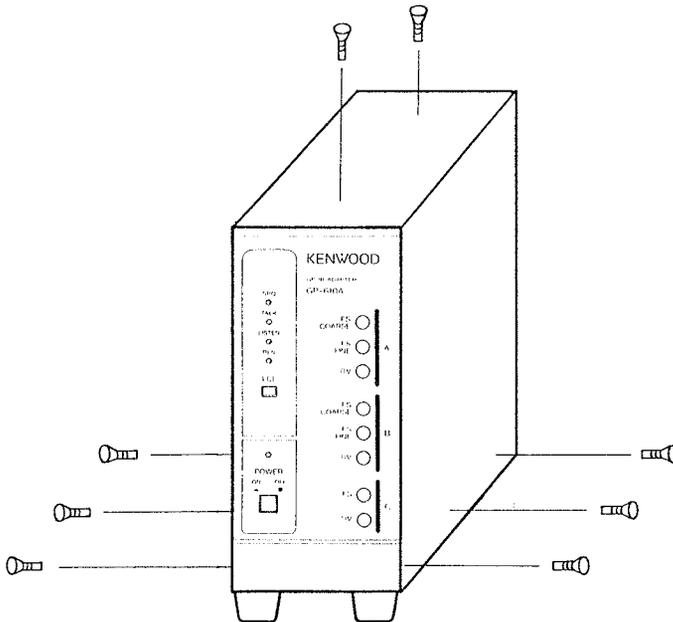
1000 REM **** SRQ CHECK ****
1010 POLL &H7, S1
1020 IF S=88 THEN SRQ=1
1030 IF S=100 THEN SRQ=2
1040 RETURN
  
```

8. MAINTENANCE

• How to remove the case

Remove the case after power is turned off and the power cord is removed from the outlet.

- ① By using a Philips screwdriver, remove two screws on the top of the case and six screws on the sides of the case.
- ② Pull up the case.



• Power voltage change

For switching the rated input voltage, open the case and change the connectors (P4, 5, 6) and fuse on the GP-1B unit (X81-1630-00) in the component as shown below.

Note: Before the change, remove the AC plug from the outlet.

Rated input voltage	100V	100V	100V	100V
Switching				
Fuse	0.7A	0.7A	0.4A	0.4A

10. MOUNTING ON THE RACK-MOUNT ADAPTER

GP-610A : RK-604J (JIS)

RK-604E (EIA)

GP-610D : RK-601 (JIS/EIA)

This component can be mounted on the rack-mount adapter shown above.
For details, contact your dealer or our distributor.

A product of
KENWOOD CORPORATION
17-5, 2-chome, Shibuya, Shibuya-ku, Tokyo 150, Japan

863-0048-00