

Instruction Manual

MODEL CO Series

CO-G32
CO-U32
CO-E32
CO-HV
CO-RG

 **Matsusada Precision**



このページは安全に
お使いいただくために
と差し替えること

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1 Introduction

1-1 Introduction

- Thank you very much for your purchase of our product unit.
- We have done our best to exercise quality control of our products.
- Please handle this unit properly according to this instruction manual so that you can display the full capacity of this unit, operate it smoothly in high efficiency for many years and safely.
- We have done our best to prepare this manual but if you find any doubtful or unknown point or omission, please contact our company immediately, and we will be very grateful.

1-2 Unpacking the unit

When unpacking the unit, you will please check the following accessories before the unit main body.

Accessories

- Instruction manual
- Control cable (Assorted with CO-HV/CO-RG)
- Optical fiber cable (Assorted with CO-HV/CO-RG)
- Rubber feet (4)
- Install manual (Assorted with CO-U32)
- USB driver disk (Assorted with CO-U32)

1-3 Environmental requirements

Warning

- Install the unit horizontally and use it.
- Do not place any object on the unit absolutely.
- There are air suction holes and exhaust holes for cooling at upper part and sides of the unit.
- Provide an ample space to the unit, use it at the place where the ventilating condition is good, and avoid using the unit at such places where it is very dusty or there is corrosive gas.

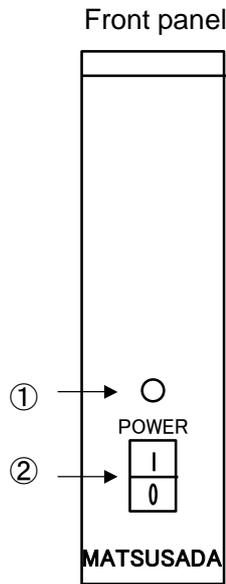
1-4 Notes

Warning

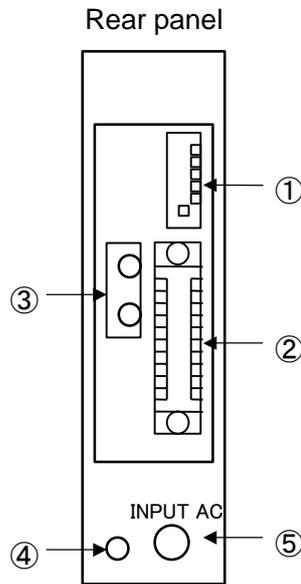
- Sometimes it prevents the unit to function properly that causing of high voltage.
- Disconnect all the cables and the unit not to operate.
- Ensure that all power of each unit is turned to off, before changing to install the system.

2 Exterior view diagram

2-1 CO-G32

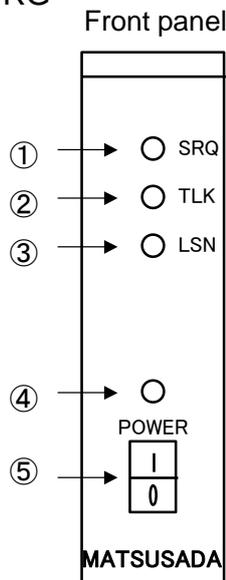


- ① Power LED
- ② Power on/off switch

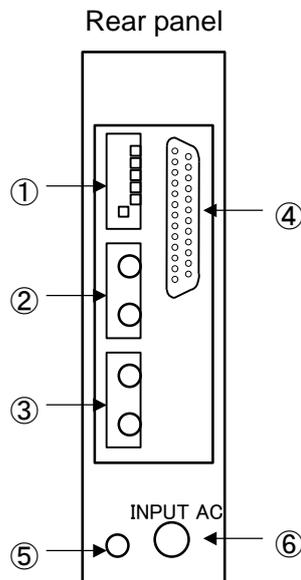


- ① Address switch
- ② IEEE-488 connector
- ③ Optical fiber cable connector (OUT)
- ④ Ground
- ⑤ AC cable

2-2 CO-HV/CO-RG

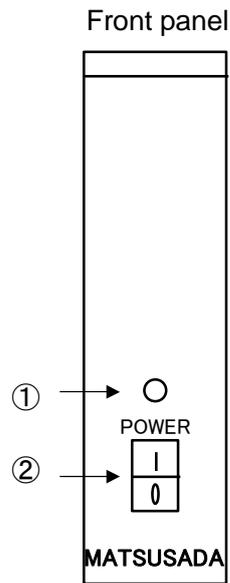


- ① SRQ LED
- ② TLK LED
- ③ LSN LED
- ④ Power LED
- ⑤ Power on/off switch

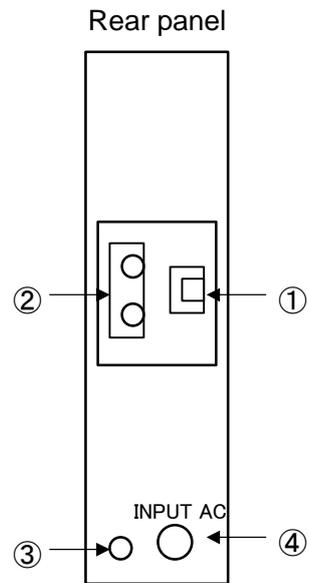


- ① Unit number and upper connection switch
- ② Optical fiber cable connector (IN)
- ③ Optical fiber cable connector (OUT)
- ④ Control cable connector
- ⑤ Ground
- ⑥ AC cable

2-3 CO-U32

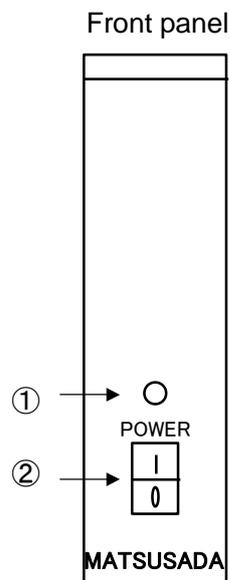


- ① Power LED
- ② Power on/off switch

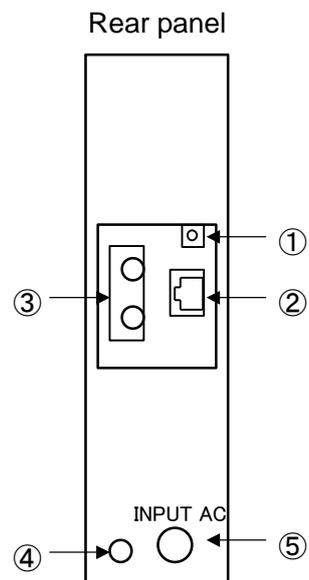


- ① USB connector
- ② Optical fiber cable connector (OUT)
- ③ Ground
- ④ AC cable

2-4 CO-E32

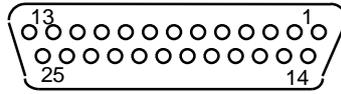


- ① Power LED
- ② Power on/off switch



- ① Ethernet reset switch
- ② Ethernet connector
- ③ Optical fiber cable connector (OUT)
- ④ Ground
- ⑤ AC cable

2-5 Control cable connector pin assignment



D-Sub 25 pins (female)

table 1 Pin assignment

Pin No.	Function	Commands
1	Output voltage set	CH0,VCN
2	Output current set	CH1,VCN
15	Output voltage monitor	MN1,VM
3	Output current monitor	MN2,IM
16	SRQ	SRQ
21	Output on/off	SW
8	Cut-off reset signal	RST
9	Output polarity set	PL
13	Output polarity status	PLM
5,10	COMMON	

2-6 AC cord

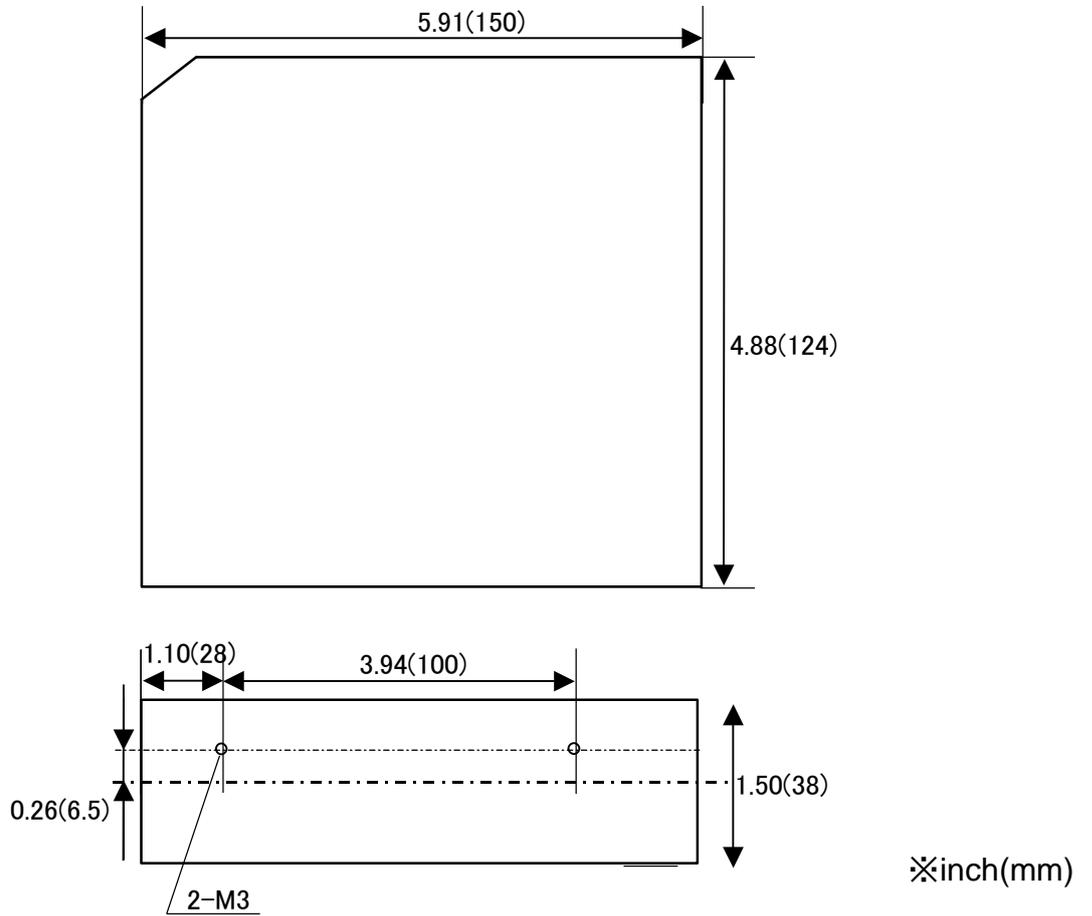
AC cord is to be attached to switch board of a commercial supply with solderless terminal or something.

Switch board should be connected as

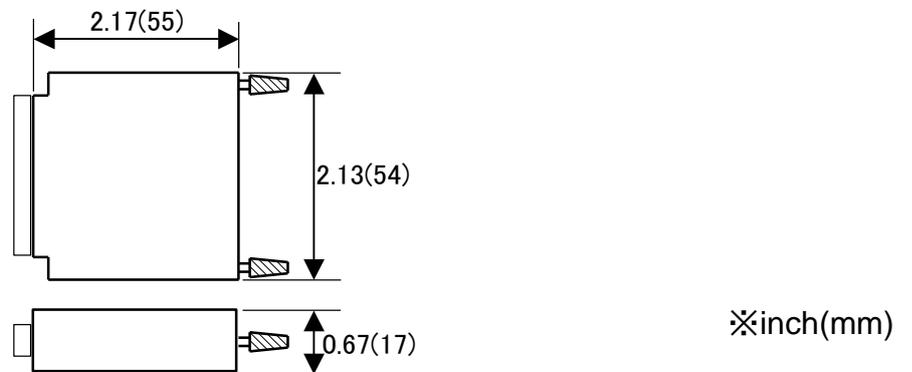
- NEUTRAL = BLUE**
- LINE = BROWN**
- GND = YELLOW/GREEN**

2-7 Dimensions

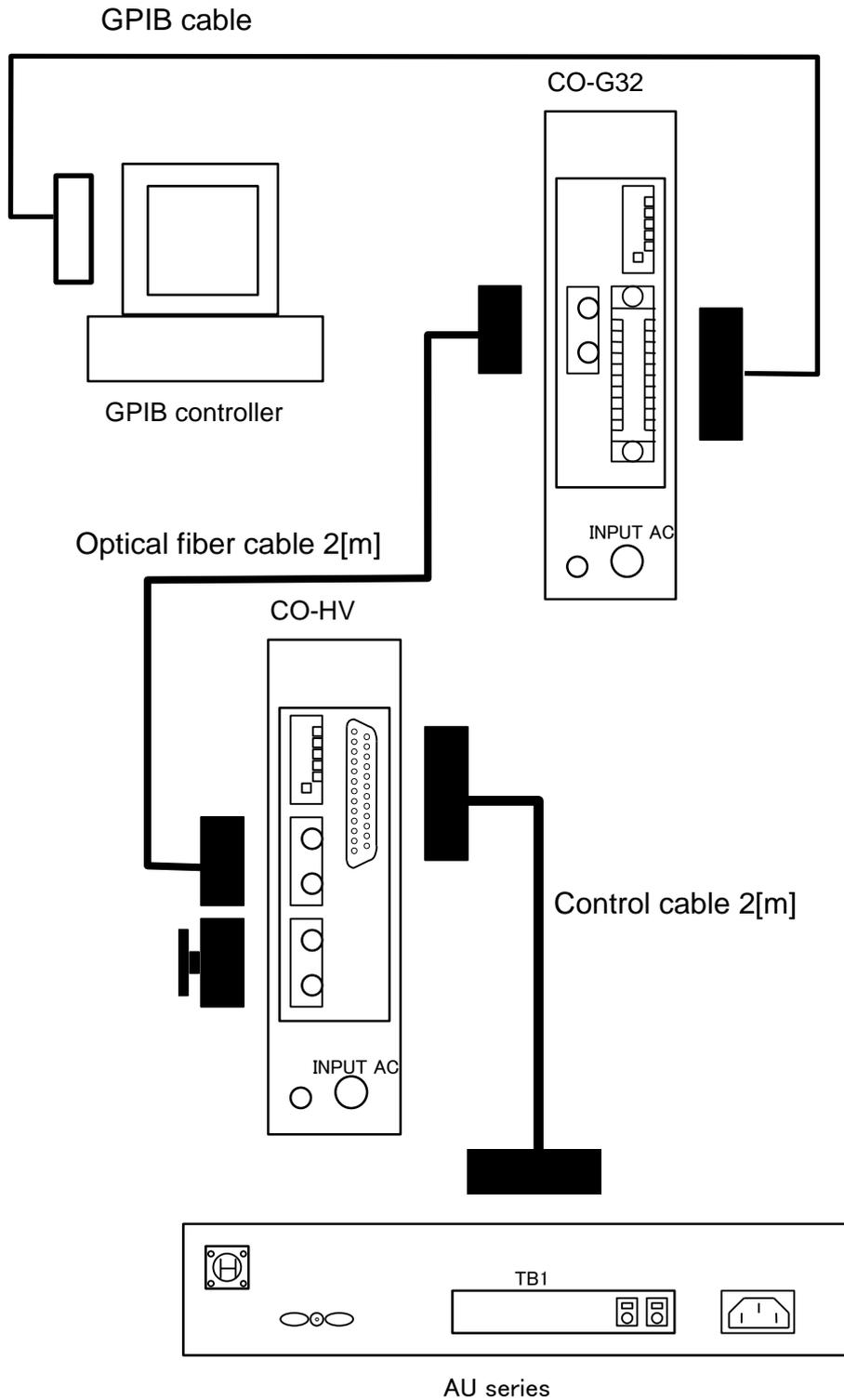
•CO-G32/CO-U32/CO-E32/CO-HV/CO-RG dimensions



•Optical RS-232C module/Optical RS-485 module dimensions

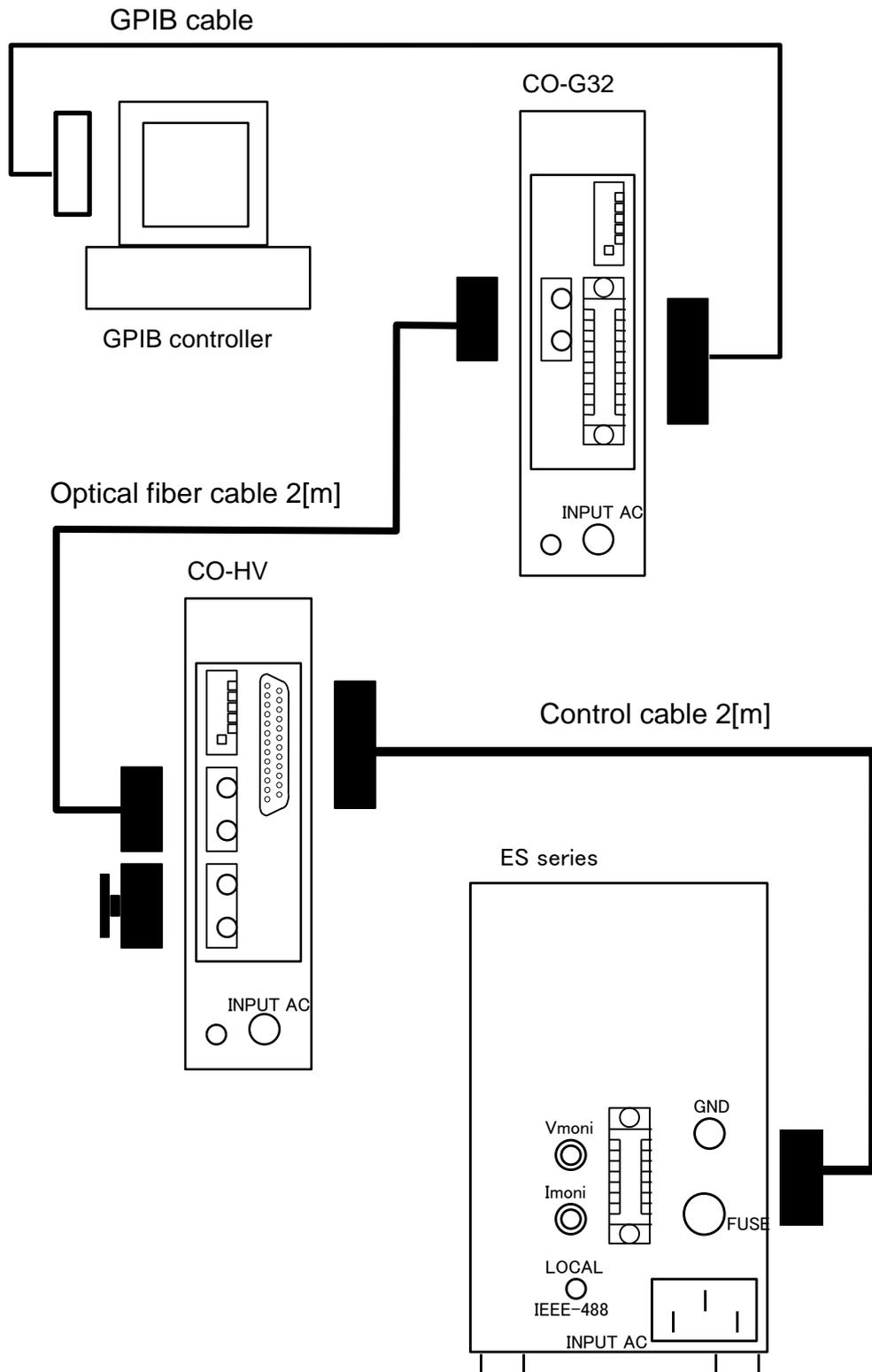


3 Connection

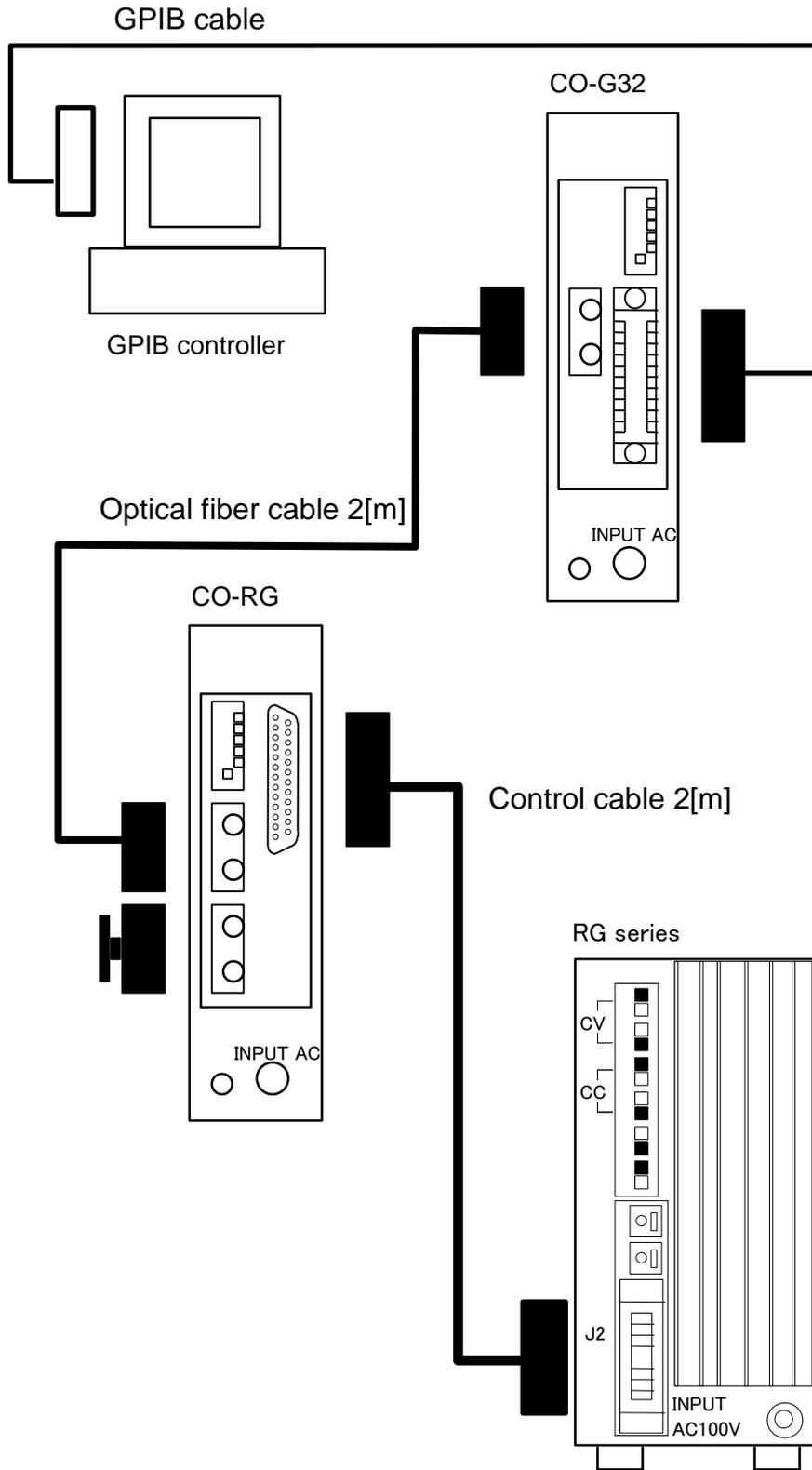


Note

It must be covered with a cap that each optical fiber cable connectors are not in use. We recommend that AC power source connecting this unit is differing from high voltage power supplies'. That prevents CO series confusing, which the noise supplies to AC power line as the output of high voltage power supplies is shorted.

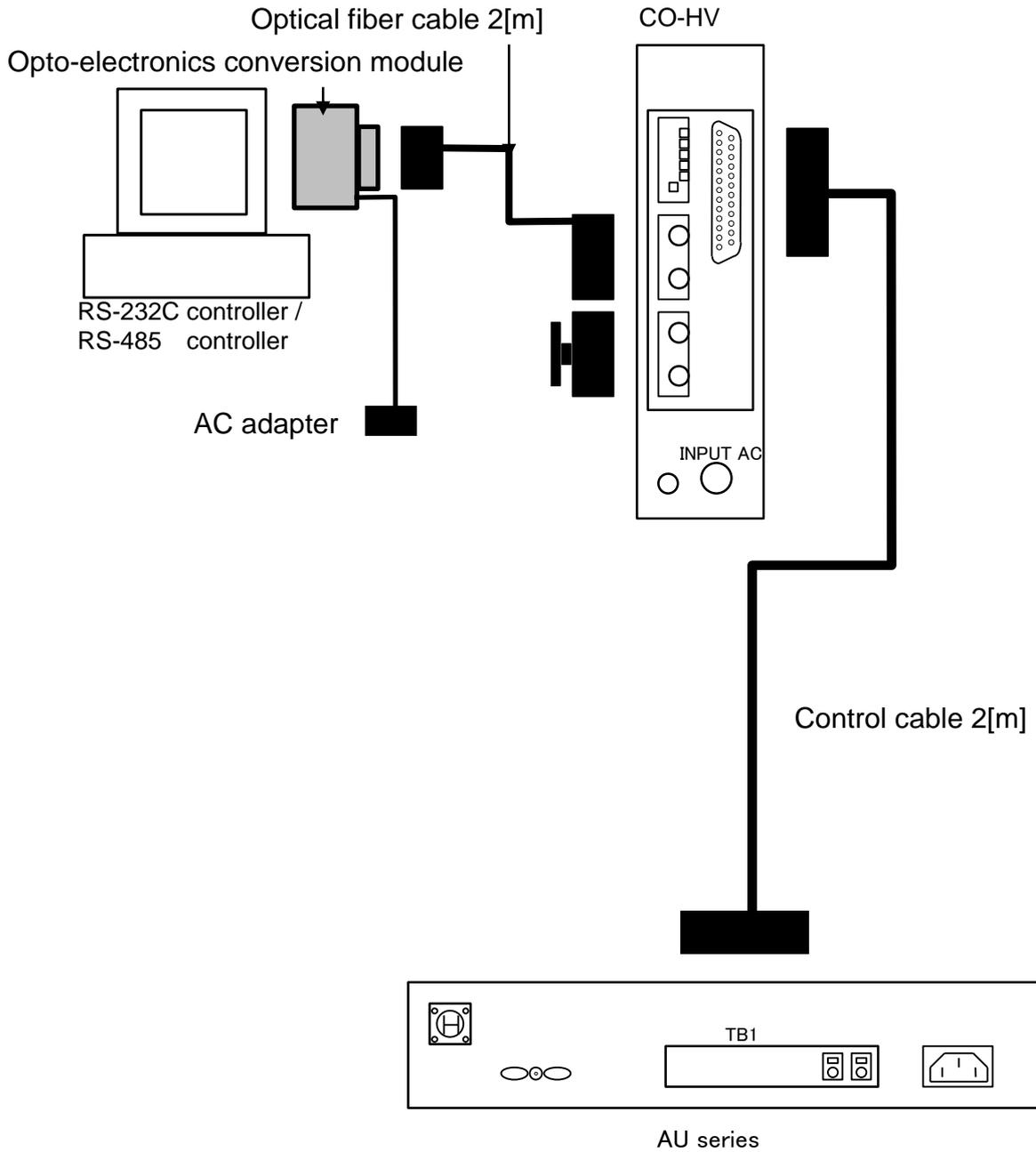
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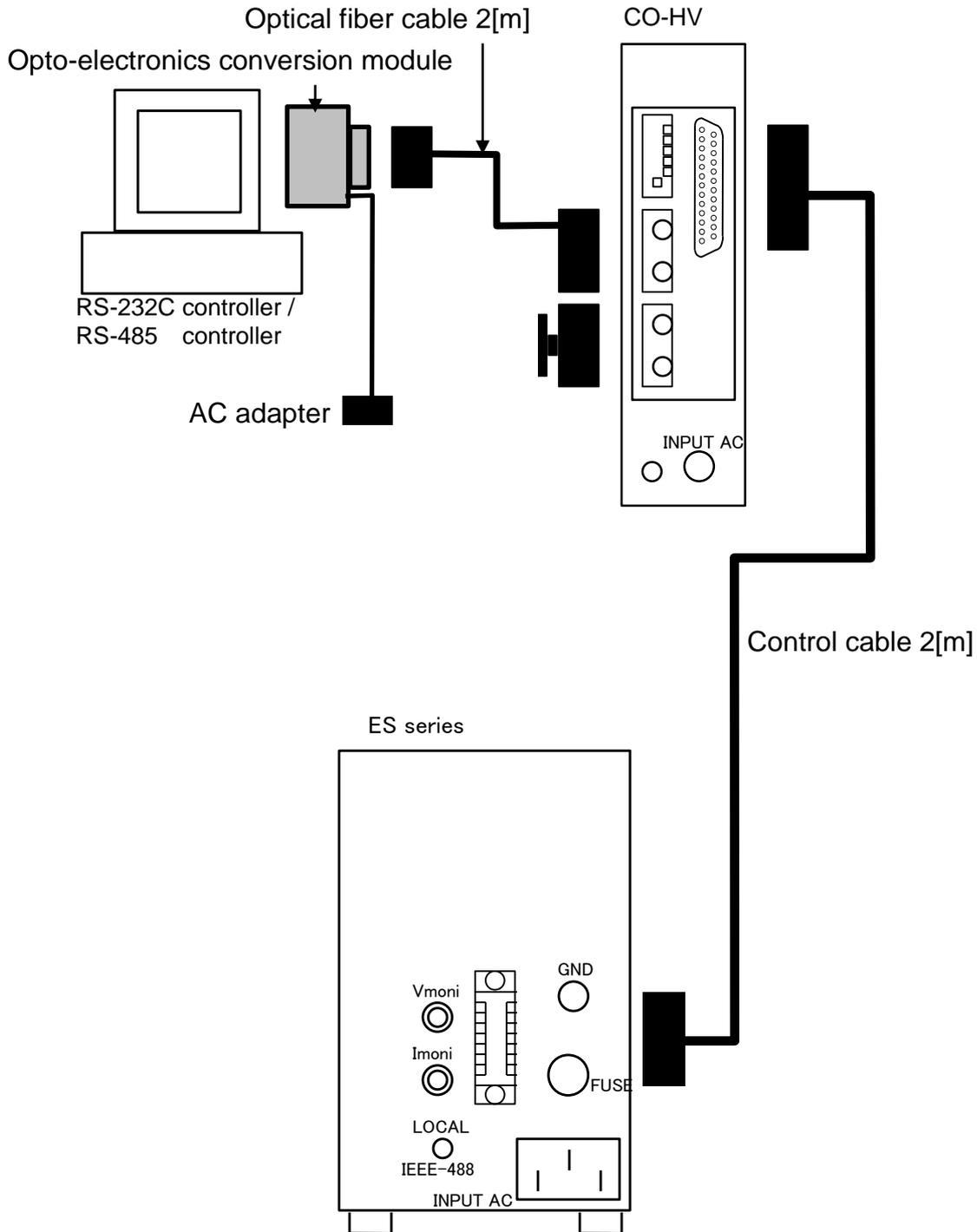
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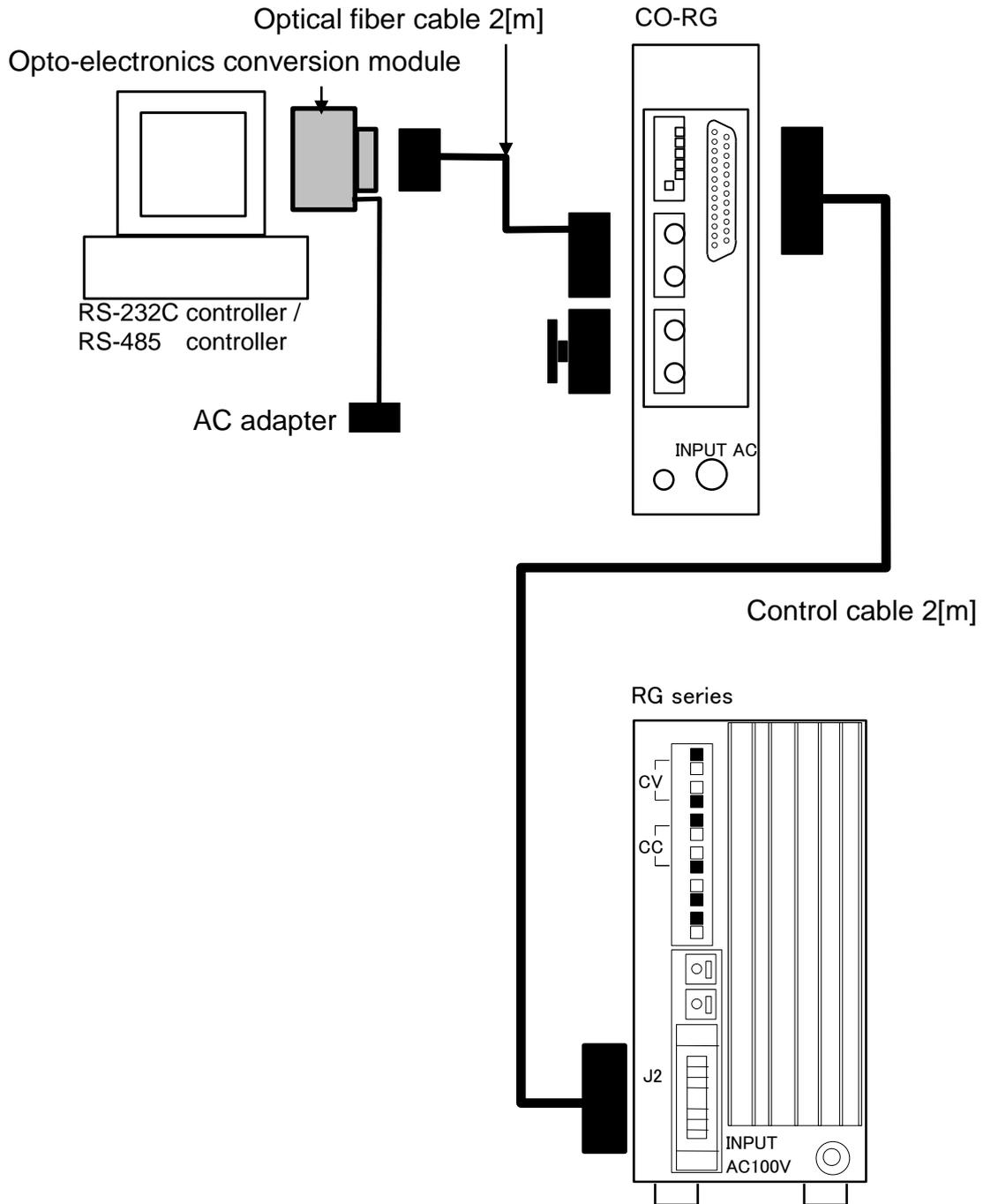
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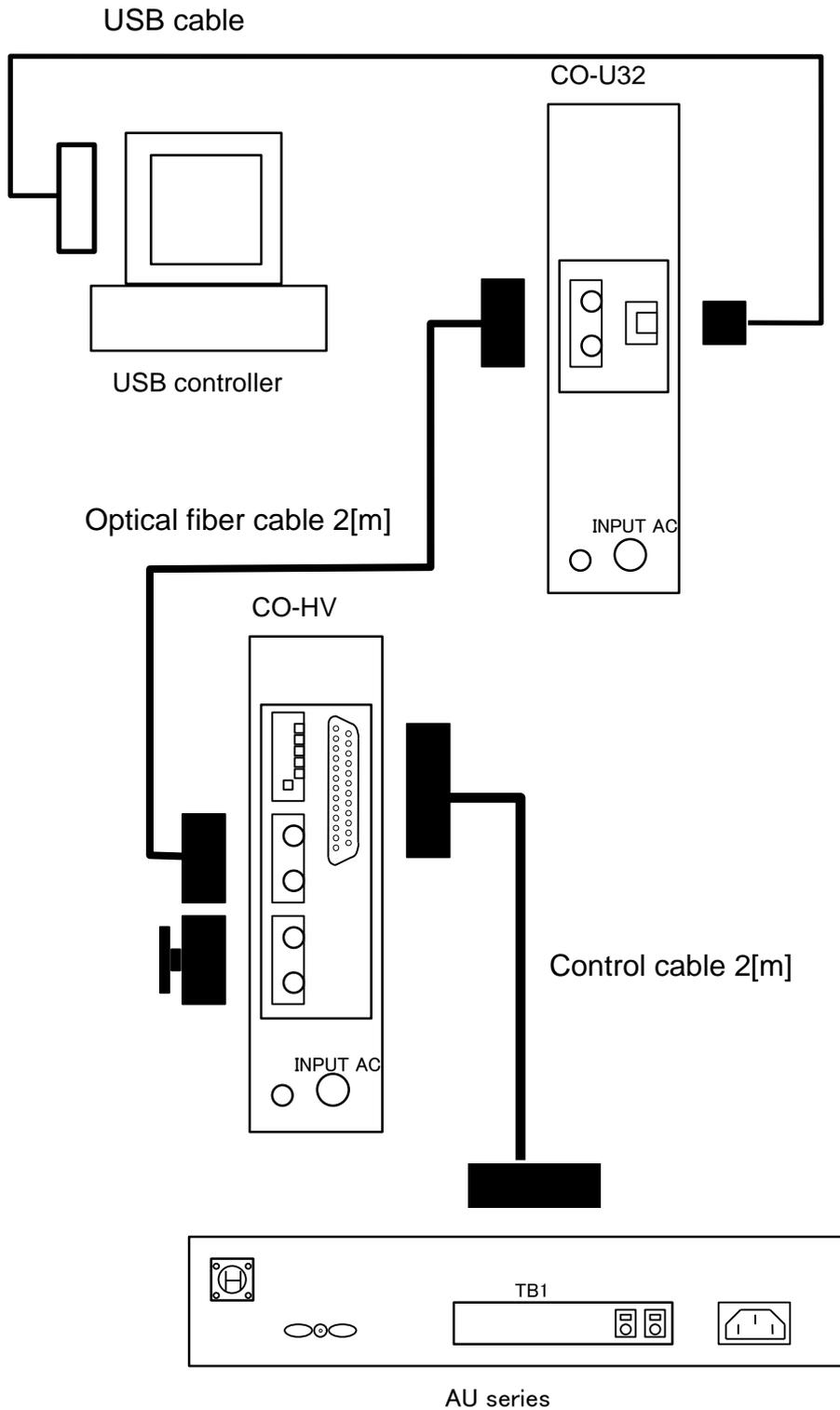


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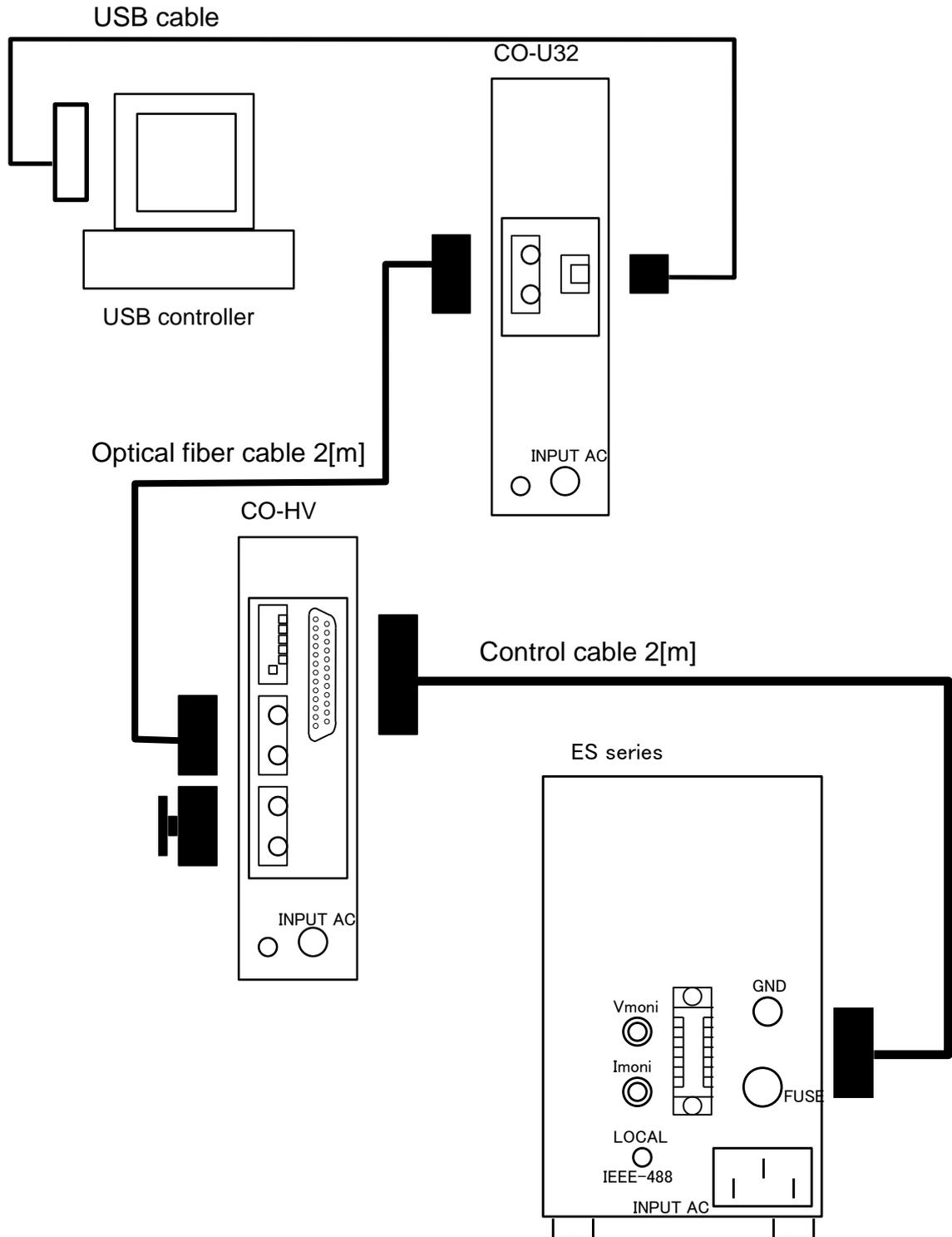
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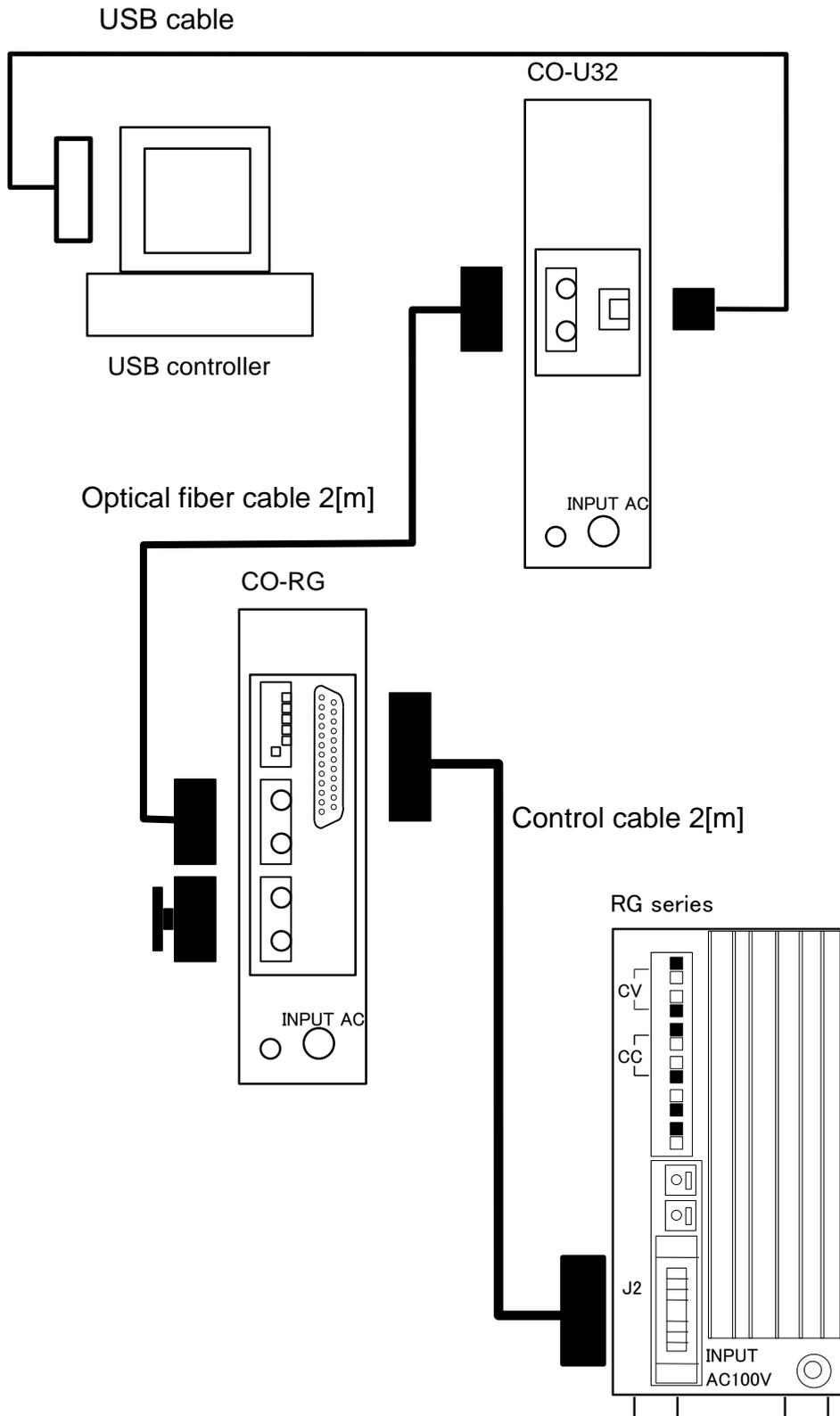


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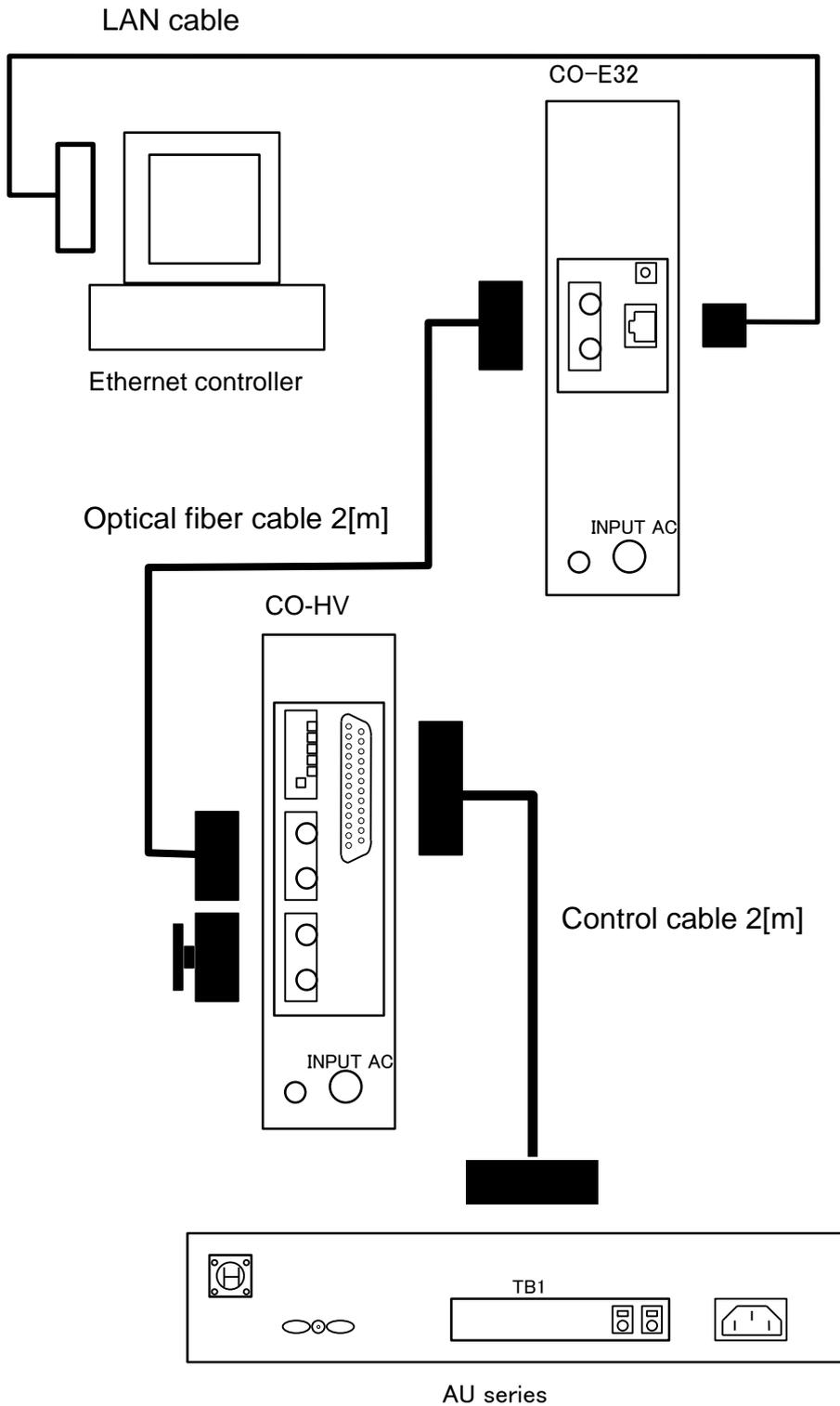
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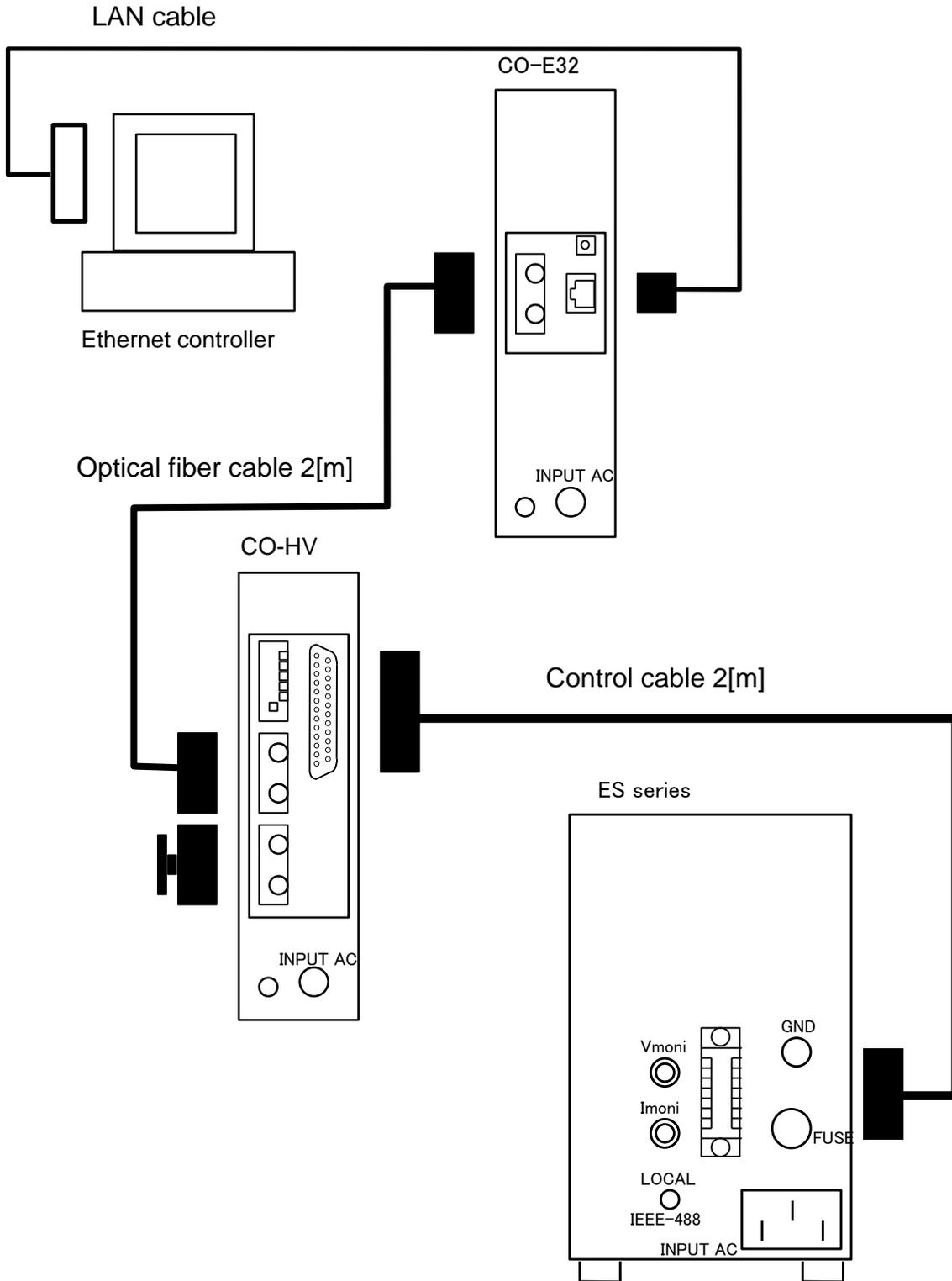
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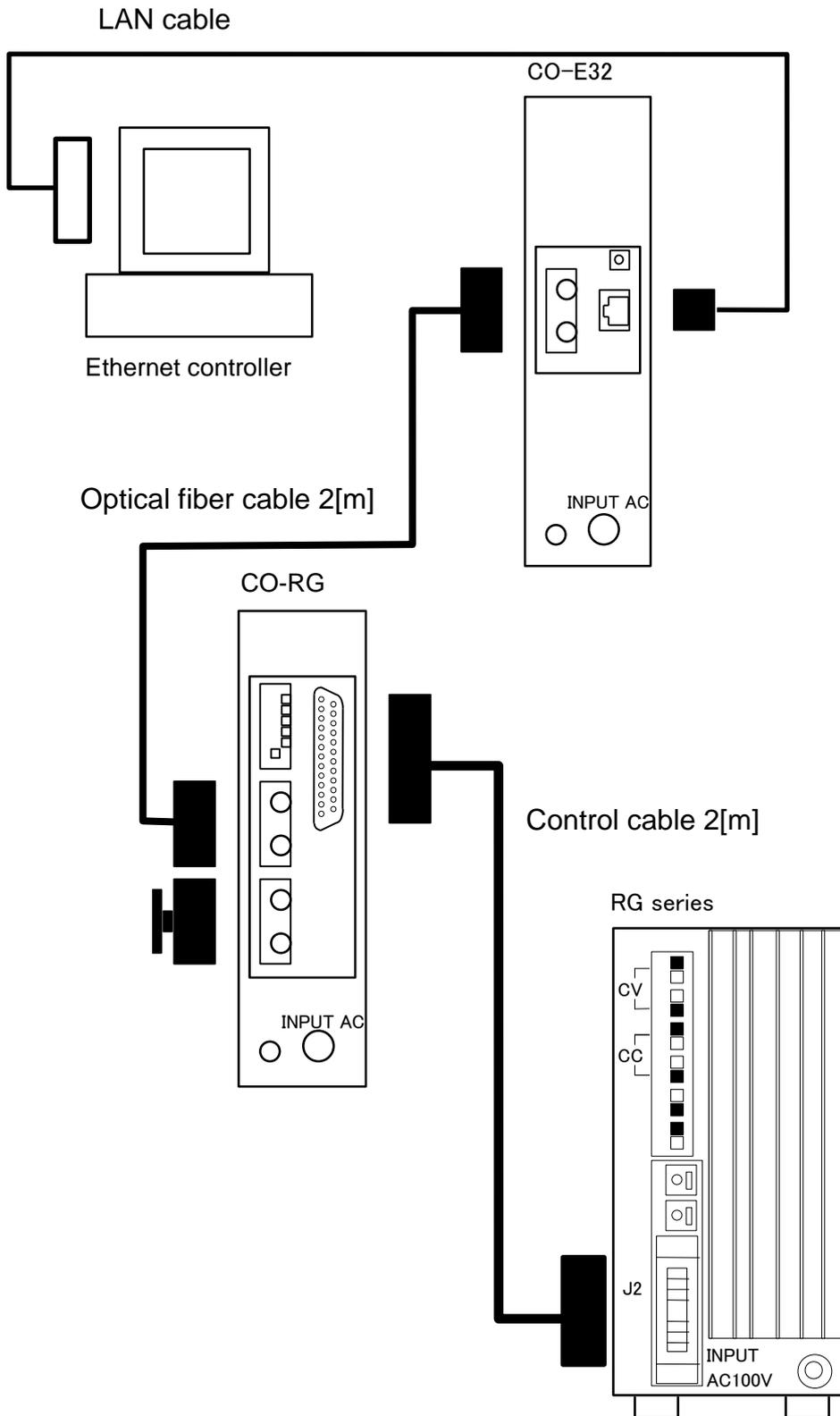
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4 Overview

4-1 System

- ① Program output of both voltage and current(16 bit)
- ② Program output to on or off
- ③ Measure output of both voltage and current(12 bit)
- ④ Generate SRQ onto GPIB, when the power supply is off mode(power or output)
- ⑤ With one device address, assign up to 32 units

4-2 Settings address and delimiter for GPIB

On the rear panel of CO-G32 there is an eight DIL switch labeled "ADDRESS". The desired address is set with this DIL switch from S1 to S5 in the binary format. (S1 is LSB.) "ON" (switch position left) stands for logic 1. The address is valid for the Listener and the Talker function. Take care that the same address is not set on different device. Each value from 0 to 30 can be assigned to the device address.

It is used for the termination mark that the delimiter shows end of the command string in the communication between CO series and the controller. The rest of the three from S5 to S8 make character of delimiter as following.

- S6.....LF(0A_H)
- S7.....CR(0D_H)
- S8.....EOI

The factory setting of address is number 1, and delimiter is EOI.

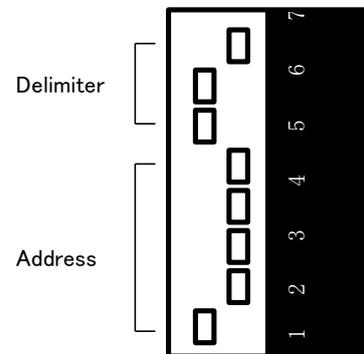


Fig. Example of setting

- GPIB address.....1
- Delimiter.....CR+LF

4-3 Settings unit number and upper connection for CO series

On the rear panel of CO-HV/CO-RG there is an eight DIL switch labeled "UNIT". The desired unit number is set with this DIL switch from S1 to S5 in the binary format. (S1 is LSB.) "ON" (switch position left) stands for logic 1. Take care that the same unit number is not set on different device. Each value from 0 to 31 can be assigned to the unit number.

And S8 selects the upper connection, what unit connects to optical fiber cable connector (IN). The selection is following.

- OFF CO-G32, CO-U32, CO-E32, CO-HV or CO-RG
- ON RS-232C/RS-485 with opto-electronics conversion module

The factory setting of unit number is 1, and upper connection is "CO-G32, CO-U32, CO-E32, CO-HV or CO-RG".

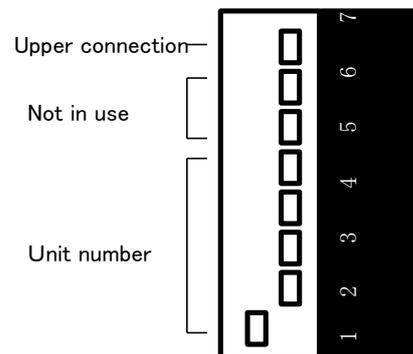


Fig. Example setting

- UNIT number.....1
- Upper connection••CO-G32/U32/E32
CO-HV/RG

Note

These settings must be done when power turns to off. So CO series read these setting only when power turns to on.

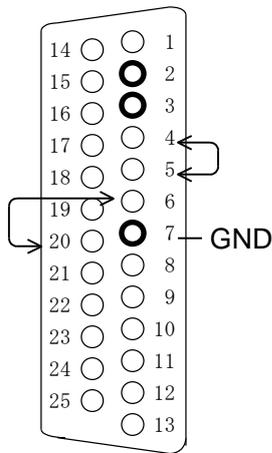
4-4 Settings of Opto-electronics conversion module

(applicable only to Opto-electronics conversion module)

RS-232C

With this module connection, 3 RS-232C signals of TxD, RxD and GND is used for communication.

Referring to the following sketches, properly connect the RS-232C module with controller(e.g. PC).



Pin 4 and 5, 6 and 20 are tied together inside.

Pin assignment
(D-Sub25 pin MALE)

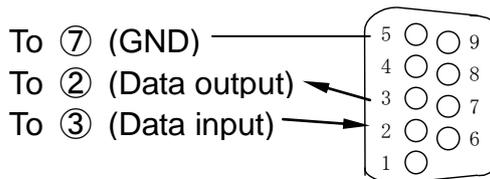
Pin #	Data Direction	Change Switch	
		DTE	DCE
2		RxD (input)	TxD (output)
3		TxD (output)	RxD (input)
7		GND	

The setting of DTE/DCE change switch should be done in accordance with the pin assignment of RS-232C port of controller to be used. So make sure the pin assignment before setting. Incorrect setting will result malfunction.

Example of pin assignment of RS-232C

Case of DTE setting

IBM-AT compatible model

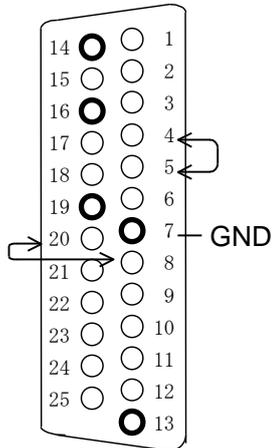


D-Sub 9 pin MALE

RS-485

With this module connection, 5 RS-485 signals of TxD+, TxD-, RxD+, RxD- and GND are used for communication.

Referring to the following sketches, properly connect the RS-485 module with controller(e.g. PC).



Pin 4 and 5, 8 and 20 are tied together inside.

Pin #	Data direction
13	TxD+ (output)
14	TxD- (output)
16	RxD+ (input)
19	RxD- (input)
7	GND

Pin assignment
(D-Sub 25 pin MALE)

Communication Method

Baud Rate	: asynchronous 9600 [bps] (fixed)
Data Length	: 8 [bit]
Stop Bit	: 1 [bit]
Parity	: None
Flow control	: None

Delimiter

Delimiter is fixed to CR(0D_H).

4-5 Settings of USB

To install the USB driver, refer to a separate volume “Install Manual”.
Delimiter is fixed to CR(OD_H).

4-6 Settings of Ethernet

4-6-1 Ethernet connector

Make a connection to by RJ45(10Base-T,100Base-T).
LANTRONIX XPort[®] is used for Ethernet device.
A Category 5 or higher LAN cable should be used.

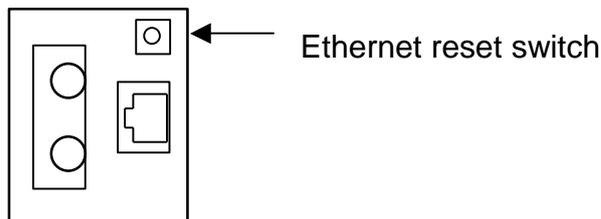
4-6-2 Settings of network

Set up Ethernet according to the network administrator’s directions.

Initial value				
IP Address	192	168	10	1
Subnet Mask	255	255	255	0
Default Gateway	0	0	0	0
Remote Port No.	10001			

4-6-3 Initialization of the network

Initialize of the network, turn on a power supply, pushing the Ethernet reset switch in the rear panel of CO-E32.
After initialization, setting value of the Ethernet such like network address, will be reset to initial value that defined in above.



4-6-4 Settings of the network using Web Manager

Use Web-Manager of Xport, an Ethernet device for network setting of CO-E32. Following is an abstract of the settings of the XPort's Web-Manager, which is supplied from LANTRONIX.

We do not support any setting or operation method except being described by this instruction manual.

* Web-Manager is a registered trademark of the LANTRONIX.

* MS, Microsoft, Windows is a registered trademark of the Microsoft Corporation

4-6-4-1 Accessing Web-Manager

Open the web browser and enter the IP address in the IP Address field.

* When IP address is unknown, you can perform "4-6-3 Initialization of the network" to initialize the IP address to "192.168.10.1". It is the factory default value.

A dialog box appears to prompt for a User name and Password. Leave both field blank and click OK.



The Web-Manager displays.

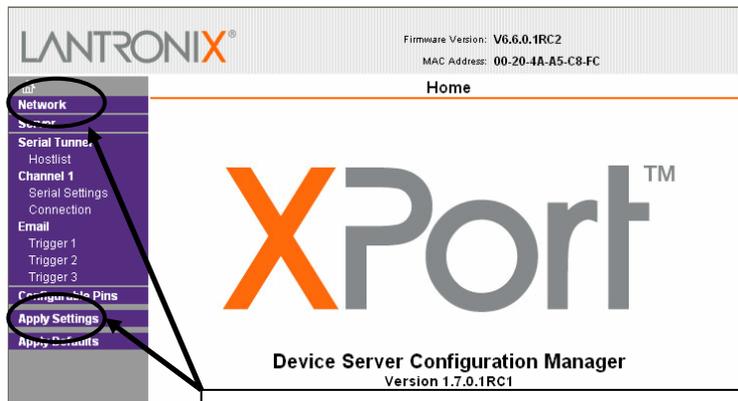


* If the proxy settings in your browser settings done, you cancel it, or exclude the IP address set.

4-6-4-2 Network configuration

Do not make any change in the setting window other than “Network” and “Apply settings”.

Otherwise, even if the connection with the unit becomes impossible, we do not guarantee.



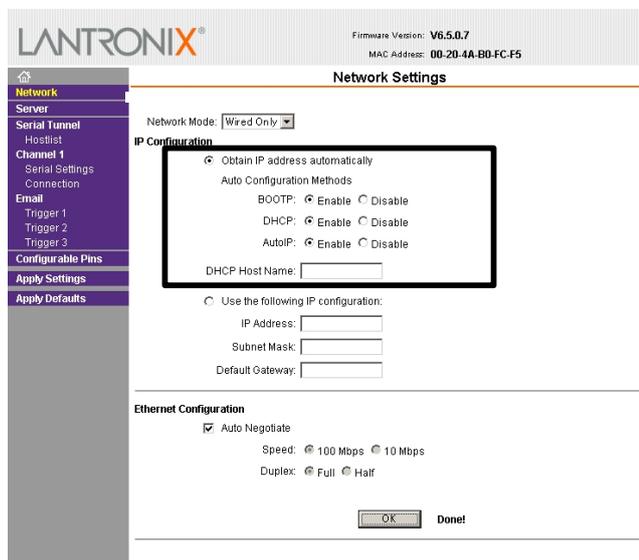
Do not make any change other than “Network” and “Apply settings”.

The unit’s network values are displayed when you select Network form the main menu. The following sections describe the configurable parameters on the Network Settings page.

- Automatic IP address configuration

An IP address can be assigned automatically, then you enter related network settings.

* DHCP or BOOTP server is required in network.



BOOTP	Select Enable to permit the Bootstrap Protocol (BOOTP). Sever to assign the IP address from a pool of addresses automatically. Enable is the default.
DHCP	Select Enable to permit the Dynamic Host Configuration Protocol (DHCP) to assign a leased IP address to the Xport unit automatically. Enable is the default.
AutoIP	Select Enable to permit the Xport to generate an IP in the 169.254.x.x address range with a Class B subnet. Enable is the default.
DHCP Host Name	Enter the desired host name for the Xport.

1. On the main menu, click “Network”.
 2. Select “Obtain IP address automatically”.
 3. Select BOOTP/DHCP/AutoIP.
 4. When setting is completed, click the “OK” button.
 5. On the main menu, click “Apply Settings”.
- Static IP address configuration

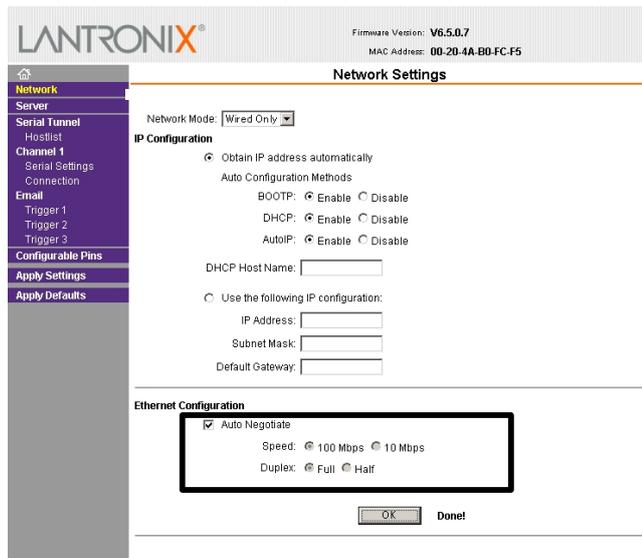
It is possible to assign an IP address manually and enter related network settings.

IP Address	If DHCP is not used to assign IP addresses, enter it manually in decimal-dot notation. The IP address must be set to a unique value in the network.
Subnet Mask	A subnet mask defines the number of bits taken from the IP address that are assigned for the host part.
Default Gateway	The gateway address, or router, allows communication to other LAN segments. The gateway address should be the IP address of the router connected to the same LAN segment as the unit. The gateway address must be within the local network.

1. On the menu, click “Network”.
2. Select “Use the following IP configuration”.
3. Enter the IP Address, Subnet Mask, and Default Gateway.
4. When setting is completed, click the “OK” button.
5. On the main menu, click “Apply Settings”.

• Ethernet configuration

You must specify the speed and direction of data transmission.



<p>Auto Negotiate</p>	<p>With this option, the Ethernet port auto-negotiates the speed and duplex with the hardware endpoint to which it is connected. This is the default.</p>
	<p>If this option is not selected, the complete the fields that become available.</p>
	<ul style="list-style-type: none"> • Speed: The speed of data transmission. The default is 100 Mbps. • Duplex: The direction of data transmission. The default is Full.

1. On the main menu, click “Network”.
2. Check the “Auto Negotiate”
3. When setting is completed, click the “OK” button.
4. On the main menu, click “Apply Settings”.

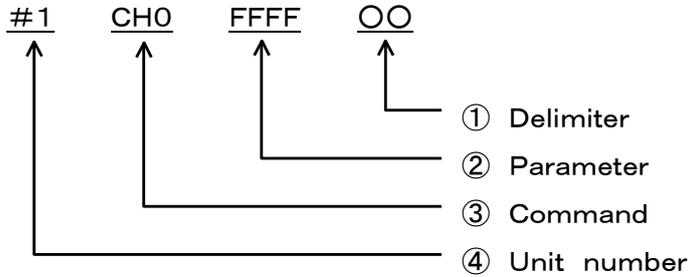
4-6-5 Delimiter

Delimiter is fixed to CR(0D_H).

5 Programming

5-1 Syntax

For example, it makes the unit number 1 to a maximum of rated voltage as following.



- ① Input delimiter.
 - GPIB → refer Section 4-2
 - RS-232C/RS-485 → CR(0D_H)
 - USB → CR(0D_H)
 - Ethernet → CR(0D_H)
- ② Some commands require a parameter.
- ③ It ignores that command is wrong.
- ④ There is no command string without unit number except SRQ command.
If command string does not have unit number, it ignores as wrong.

5-2 Multiple command

It enables all unit to respond when unit number is set to "AL".

- (Syntax) ① #AL CH0 FFFF ← All units set to a maximum of rated voltage.
 ② #AL SW1 ← All units enables to output.

(Description) Multiple command is featured by following.
 CH0, CH1, VCN, ICN, SW, RST, REN, GTL, PL

5-3 Character set for the command

- Command string does not accept to use the characters with the part in the following table.
- Command string accepts to use both LF (0A_H) and CR (0D_H) for only delimiter
- Command string is not case sensitive.
- Command string accepts to use space (20_H) among unit number, command and parameter.

table 2 ASCII code

Upper Lower	0 _H	1 _H	2 _H	3 _H	4 _H	5 _H	6 _H	7 _H
0 _H	NUL	DLE	SP	0	@	P	`	p
1 _H	SOH	DC1	!	1	A	Q	a	q
2 _H	STX	DC2	"	2	B	R	b	r
3 _H	ETX	DC3	#	3	C	S	c	s
4 _H	EOT	DC4	\$	4	D	T	d	t
5 _H	ENQ	NAK	%	5	E	U	e	u
6 _H	ACK	SYN	&	6	F	V	f	v
7 _H	BEL	ETB	'	7	G	W	g	w
8 _H	BS	CAN	(	8	H	X	h	x
9 _H	HT	EM	)	9	I	Y	i	y
A _H	LF	SUB	*	:	J	Z	j	z
B _H	VT	ESC	+	;	K	[	k	{
C _H	FF	FS	,	<	L	¥	l	|
D _H	CR	GS	-	=	M	]	m	}
E _H	SO	RS	.	>	N	^	n	~
F _H	SI	US	/	?	O	_	o	

6 Getting started

6-1 CO-G32 + CO-HV (Case of AU series)

Control a AU power supply connected with CO-G32 and CO-HV via GPIB



CAUTION

- High voltage is output actually.
- Do not connect any load to AU power supply before this procedure.

①Set GPIB address and delimiter

With the switch labeled ADDRESS on the rear of CO-G32, set GPIB address and delimiter. (See Section “4-2 Settings address and delimiter for GPIB”.)

②Set unit number and Upper connection

With the switch labeled UNIT on the rear of CO-HV, set unit number and upper connection. (See Section “4-3 Settings unit number and upper connection for CO series”.)

③Connect to GPIB

Connect IEEE-488 connector of CO-G32 and GPIB controller(e.g.PC) with GPIB cable(available at stores).

④Connect CO-G32 and CO-HV

Connect CO-G32 and CO-HV with the optical fiber cable which is assorted with CO-HV. Connectors for optical fiber cable not in use must be covered with cap. (See Section “3 Connection”)

⑤Connect AU power supply and CO-HV

Connect AU power supply and CO-HV with the control cable which is assorted with CO-HV. (See Section “3 Connection”)

⑥Turn on the power of CO-G32 and CO-HV

Turn on the power switch of CO-G32 and CO-HV. The red LED lights up, and the green LED blink 3 times with CO-HV.

⑦Turn on the power of AU power supply

Turn on the power switch of AU power supply. The red indicator lights up, and AU power supply enters stand-by mode.

⑧Set AU power supply to be ready for operation

Turn on the high voltage switch of AU power supply.

⑨Set AU power supply to be ready for remote control

Send a command string “#1 REN” from the controller. The red indicator (EXT LED) lights up with AU power supply, and the green indicator (LSN LED) blinks with CO-HV. (See Section “7 Command reference”)

⑩Set AU power supply to be enable output

Send command strings “#1 ICN 100”, “#1 RST” and “#1 SW1” from the controller. The red indicator (HV ON LED) lights up with AU power supply, and the green indicator (SRQ LED) turns off after the green indicator (LSN LED) blinks with CO-HV. (See Section “7 Command reference”)

⑪Control the voltage of AU power supply and generate output

Send a command string “#1 VCN xxxx” from the controller. (See Section “7 Command reference”)

⑫Stop output of AU power supply

Send a command string “#1 SW0” from the controller. The red indicator (HV ON LED) turns off with AU power supply, and the green indicator (SRQ LED) lights up after the green indicator (LSN LED) blinks with CO-HV.

⑬Turn off the power of AU power supply

Turn off the power switch of AU power supply.

⑭Quit operation

Turn off the power switch of CO-G32 and CO-HV.

6-2 CO-G32 + CO-HV (Case of ES series)

Control a ES power supply connected with CO-G32 and CO-HV via GPIB



CAUTION

- High voltage is output actually.
- Do not connect any load to ES power supply before this procedure.

① Set GPIB address and delimiter

With the switch labeled ADDRESS on the rear of CO-G32, set GPIB address and delimiter. (See Section “4-2 Settings address and delimiter for GPIB”.)

② Set unit number and Upper connection

With the switch labeled UNIT on the rear of CO-HV, set unit number and upper connection. (See Section “4-3 Settings unit number and upper connection for CO series”.)

③ Connect to GPIB

Connect IEEE-488 connector of CO-G32 and GPIB controller(e.g.PC) with GPIB cable(available at stores).

④ Connect CO-G32 and CO-HV

Connect CO-G32 and CO-HV with the optical fiber cable which is assorted with CO-HV. Connectors for optical fiber cable not in use must be covered with cap. (See Section “3 Connection”)

⑤ Connect ES power supply and CO-HV

Connect ES power supply and CO-HV with the control cable which is assorted with CO-HV. (See Section “3 Connection”)

⑥ Set ES power supply to be ready for remote control

Turn the toggle switch on the rear panel of ES power supply to the IEEE-488 position.

Working with LV option of ES power supply, tie pin 7 and 8 in the terminal board for options of ES series.

⑦ Turn on the power of CO-G32 and CO-HV

Turn on the power switch of CO-G32 and CO-HV. The red LED lights up, and the green LED blink 3 times with CO-HV.

⑧ Turn on the power of ES power supply

Turn on the power switch of ES power supply.

⑨ Set ES power supply to be enable output

Send command strings “#1 REN” and “#1 SW1” from the controller. The green indicator (SRQ LED) turns off after the green indicator (LSN LED) blinks with CO-HV. (See Section “7 Command reference”)

⑩Control the voltage of ES power supply and generate output

Send a command string “#1 VCN xxxx” from the controller. (See Section “7 Command reference”)

⑪Stop output of ES power supply

Send a command string “#1 SW0” from the controller. The green indicator (SRQ LED) lights up after the green indicator (LSN LED) blinks with CO-HV.

⑫Turn off the power of ES power supply

Turn off the power switch of ES power supply.

⑬Quit operation

Turn off the power switch of CO-G32 and CO-HV.

6-3 CO-G32 + CO-RG (Case of RG series)

Control a RG power supply connected with CO-G32 and CO-RG via GPIB



CAUTION

- High voltage is output actually.
- Do not connect any load to RG power supply before this procedure.

①Set GPIB address and delimiter

With the switch labeled ADDRESS on the rear of CO-G32, set GPIB address and delimiter. (See Section “4-2 Settings address and delimiter for GPIB”.)

②Set unit number and Upper connection

With the switch labeled UNIT on the rear of CO-RG, set unit number and upper connection. (See Section “4-3 Settings unit number and upper connection for CO series”.)

③Connect to GPIB

Connect IEEE-488 connector of CO-G32 and GPIB controller(e.g.PC) with GPIB cable(available at stores).

④Connect CO-G32 and CO-RG

Connect CO-G32 and CO-RG with the optical fiber cable which is assorted with CO-RG. Connectors for optical fiber cable not in use must be covered with cap. (See Section “3 Connection”)

⑤Connect RG power supply and CO-RG

Connect RG power supply and CO-RG with the control cable which is assorted with CO-RG. (See Section “3 Connection”)

⑥Set RG power supply to be ready for remote control

Set the [S1(CV VOLT)] and [S3(CC VOLT)] switch, which are located in [remote switch] on the rear panel of RG power supply, to REMOTE side.
Set the [S2(CV RESIST)], [S4(CC RESIST)], [S5(REMOTE SENCE)] and [S6(MASTER/SLAVE)] to LOCAL side.
Refer RG series instruction manual for details.

⑦Turn on the power of CO-G32 and CO-RG

Turn on the power switch of CO-G32 and CO-RG. The red LED lights up, and the green LED blink 3 times with CO-RG.

⑧Turn on the power of RG power supply

Turn on the power switch of RG power supply.

⑨Set RG power supply to be ready for operation

Turn on the output switch of RG power supply. The green indicator (SRQ LED) turns off with CO-RG.

⑩Set RG power supply to be enable output

Send command strings “#1 REN”, “#1 ICN 100” and “#1 SW1” from the controller. The red indicator (OUTPUT LED) lights up with RG power supply, and the green indicator (LSN LED) blinks with CO-RG. (See Section “7 Command reference”)

⑪Control the voltage of RG power supply and generate output

Send a command string “#1 VCN xxxx” from the controller. (See Section “7 Command reference”)

⑫Stop output of RG power supply

Send a command string “#1 SW0” from the controller. The red indicator (OUTPUT LED) turns off with RG power supply, and the green indicator (LSN LED) blinks with CO-RG.

⑬Turn off the power of RG power supply

Turn off the power switch of RG power supply.

⑭Quit operation

Turn off the power switch of CO-G32 and CO-RG.

6-4 RS-232C module + CO-HV (Case of AU series)

Control a AU power supply connected with RS-232C module and CO-HV via RS-232C



CAUTION

- High voltage is output actually.
- Do not connect any load to AU power supply before this procedure.

①Set unit number and Upper connection

With the switch labeled UNIT on the rear of CO-HV, set unit number and upper connection. (See Section “4-3 Settings unit number and upper connection for CO series”.)

②Connect RS-232C module with a controller

Connect RS-232C module to a controller(e.g.PC). Connect AC adapter to RS-232C module.

③Connect RS-232C module and CO-HV

Connect RS-232C module and CO-HV with the optical fiber cable which is assorted with CO-HV. Connectors for optical fiber cable not in use must be covered with cap. (See Section “3 Connection”)

④Connect AU power supply and CO-HV

Connect AU power supply and CO-HV with the control cable which is assorted with CO-HV. (See Section “3 Connection”)

⑤Turn on the power of CO-HV

Turn on the power switch of CO-HV. The red LED lights up, and the green LED blink 3 times with CO-HV.

⑥Turn on the power of AU power supply

Turn on the power switch of AU power supply. The red indicator lights up, and AU power supply enters stand-by mode.

⑦Set AU power supply to be ready for operation

Turn on the high voltage switch of AU power supply.

⑧Set AU power supply to be ready for remote control

Send a command string “#1 REN” from the controller. The red indicator (EXT LED) lights up with AU power supply, and the green indicator (LSN LED) blinks with CO-HV. (See Section “7 Command reference”)

⑨Set AU power supply to be enable output

Send command strings “#1 ICN 100”, “#1 RST” and “#1 SW1” from the controller. The red indicator (HV ON LED) lights up with AU power supply, and the green indicator (SRQ LED) turns off after the green indicator (LSN LED) blinks with CO-HV. (See Section “7 Command reference”)

⑩Control the voltage of AU power supply and generate output

Send a command string “#1 VCN xxxx” from the controller. (See Section “7 Command reference”)

⑪Stop output of AU power supply

Send a command string “#1 SW0” from the controller. The red indicator (HV ON LED) turns off with AU power supply, and the green indicator (SRQ LED) lights up after the green indicator (LSN LED) blinks with CO-HV.

⑫Turn off the power of AU power supply

Turn off the power switch of AU power supply.

⑬Quit operation

Turn off the power switch of CO-HV.

6-5 RS-232C module + CO-HV (Case of ES series)

Control a ES power supply connected with RS-232C module and CO-HV via RS-232C



CAUTION

- High voltage is output actually.
- Do not connect any load to ES power supply before this procedure.

① Set unit number and Upper connection

With the switch labeled UNIT on the rear of CO-HV, set unit number and upper connection. (See Section “4-3 Settings unit number and upper connection for CO series”.)

② Connect RS-232C module with a controller

Connect RS-232C module to a controller(e.g.PC). Connect AC adapter to RS-232C module.

③ Connect RS-232C module and CO-HV

Connect RS-232C module and CO-HV with the optical fiber cable which is assorted with CO-HV. Connectors for optical fiber cable not in use must be covered with cap. (See Section “3 Connection”)

④ Connect ES power supply and CO-HV

Connect ES power supply and CO-HV with the control cable which is assorted with CO-HV. (See Section “3 Connection”)

⑤ Set ES power supply to be ready for remote control

Turn the toggle switch on the rear panel of ES power supply to the IEEE-488 position.

Working with LV option of ES power supply, tie pin 7 and 8 in the terminal board for options of ES series.

⑥ Turn on the power of CO-HV

Turn on the power switch of CO-HV. The red LED lights up, and the green LED blink 3 times with CO-HV.

⑦ Turn on the power of ES power supply

Turn on the power switch of ES power supply.

⑧ Set ES power supply to be enable output

Send command strings “#1 REN” and “#1 SW1” from the controller. The green indicator (SRQ LED) turns off after the green indicator (LSN LED) blinks with CO-HV. (See Section “7 Command reference”)

⑨ Control the voltage of ES power supply and generate output

Send a command string “#1 VCN xxxx” from the controller. (See Section “7 Command reference”)

⑩ Stop output of ES power supply

Send a command string "#1 SW0" from the controller. The green indicator (SRQ LED) lights up after the green indicator (LSN LED) blinks with CO-HV.

⑪ Turn off the power of ES power supply

Turn off the power switch of ES power supply.

⑫ Quit operation

Turn off the power switch of CO-HV.

6-6 RS-232C module + CO-RG (Case of RG series)

Control a RG power supply connected with RS-232C module and CO-RG via RS-232C



CAUTION

- High voltage is output actually.
- Do not connect any load to RG power supply before this procedure.

① Set unit number and Upper connection

With the switch labeled UNIT on the rear of CO-RG, set unit number and upper connection. (See Section “4-3 Settings unit number and upper connection for CO series”.)

② Connect RS-232C module with a controller

Connect RS-232C module to a controller(e.g.PC). Connect AC adapter to RS-232C module.

③ Connect RS-232C module and CO-RG

Connect RS-232C module and CO-RG with the optical fiber cable which is assorted with CO-RG. Connectors for optical fiber cable not in use must be covered with cap. (See Section “3 Connection”)

④ Connect RG power supply and CO-RG

Connect RG power supply and CO-RG with the control cable which is assorted with CO-RG. (See Section “3 Connection”)

⑤ Set RG power supply to be ready for remote control

Set the [S1(CV VOLT)] and [S3(CC VOLT)] switch, which are located in [remote switch] on the rear panel of RG power supply, to REMOTE side.

Set the [S2(CV RESIST)], [S4(CC RESIST)], [S5(REMOTE SENCE)] and [S6(MASTER/SLAVE)] to LOCAL side.

Refer RG series instruction manual for details.

⑥ Turn on the power of CO-RG

Turn on the power switch of CO-RG. The red LED lights up, and the green LED blink 3 times with CO-RG.

⑦ Turn on the power of RG power supply

Turn on the power switch of RG power supply.

⑧ Set RG power supply to be ready for operation

Turn on the output switch of RG power supply. The green indicator (SRQ LED) turns off with CO-RG.

⑨Set RG power supply to be enable output

Send command strings “#1 REN”, “#1 ICN 100” and “#1 SW1” from the controller. The red indicator (OUTPUT LED) lights up with RG power supply, and the green indicator (LSN LED) blinks with CO-RG. (See Section “7 Command reference”)

⑩Control the voltage of RG power supply and generate output

Send a command string “#1 VCN xxxx” from the controller. (See Section “7 Command reference”)

⑪Stop output of RG power supply

Send a command string “#1 SW0” from the controller. The red indicator (OUTPUT LED) turns off with RG power supply, and the green indicator (LSN LED) blinks with CO-RG.

⑫Turn off the power of RG power supply

Turn off the power switch of RG power supply.

⑬Quit operation

Turn off the power switch of CO-RG.

6-7 CO-U32 + CO-HV (Case of AU series)

Control a AU power supply connected with CO-U32 and CO-HV via USB



CAUTION

- High voltage is output actually.
- Do not connect any load to AU power supply before this procedure.

① Set unit number and Upper connection

With the switch labeled UNIT on the rear of CO-HV, set unit number and upper connection. (See Section “4-3 Settings unit number and upper connection for CO series”.)

② Connect to USB

Connect USB connector of CO-U32 and USB controller(e.g.PC) with USB cable(available at stores).

③ Connect CO-U32 and CO-HV

Connect CO-U32 and CO-HV with the optical fiber cable which is assorted with CO-HV. Connectors for optical fiber cable not in use must be covered with cap. (See Section “3 Connection”)

④ Connect AU power supply and CO-HV

Connect AU power supply and CO-HV with the control cable which is assorted with CO-HV. (See Section “3 Connection”)

⑤ Turn on the power of CO-U32 and CO-HV

Turn on the power switch of CO-U32 and CO-HV. The red LED lights up, and the green LED blink 3 times with CO-HV.

⑥ Turn on the power of AU power supply

Turn on the power switch of AU power supply. The red indicator lights up, and AU power supply enters stand-by mode.

⑦ Set AU power supply to be ready for operation

Turn on the high voltage switch of AU power supply.

⑧ Set AU power supply to be ready for remote control

Send a command string “#1 REN” from the controller. The red indicator (EXT LED) lights up with AU power supply, and the green indicator (LSN LED) blinks with CO-HV. (See Section “7 Command reference”)

⑨ Set AU power supply to be enable output

Send command strings “#1 ICN 100”, “#1 RST” and “#1 SW1” from the controller. The red indicator (HV ON LED) lights up with AU power supply, and the green indicator (SRQ LED) turns off after the green indicator (LSN LED) blinks with CO-HV. (See Section “7 Command reference”)

⑨Set AU power supply to be enable output

Send command strings “#1 ICN 100”, “#1 RST” and “#1 SW1” from the controller. The red indicator (HV ON LED) lights up with AU power supply, and the green indicator (SRQ LED) turns off after the green indicator (LSN LED) blinks with CO-HV. (See Section “7 Command reference”)

⑩Control the voltage of AU power supply and generate output

Send a command string “#1 VCN xxxx” from the controller. (See Section “7 Command reference”)

⑪Stop output of AU power supply

Send a command string “#1 SW0” from the controller. The red indicator (HV ON LED) turns off with AU power supply, and the green indicator (SRQ LED) lights up after the green indicator (LSN LED) blinks with CO-HV.

⑫Turn off the power of AU power supply

Turn off the power switch of AU power supply.

⑬Quit operation

Turn off the power switch of CO-U32 and CO-HV.

6-8 CO-U32 + CO-HV (Case of ES series)

Control a ES power supply connected with CO-U32 and CO-HV via USB



CAUTION

- High voltage is output actually.
- Do not connect any load to ES power supply before this procedure.

① Set unit number and Upper connection

With the switch labeled UNIT on the rear of CO-HV, set unit number and upper connection. (See Section “4-3 Settings unit number and upper connection for CO series”.)

② Connect to USB

Connect USB connector of CO-U32 and USB controller(e.g.PC) with USB cable(available at stores).

③ Connect CO-U32 and CO-HV

Connect CO-U32 and CO-HV with the optical fiber cable which is assorted with CO-HV. Connectors for optical fiber cable not in use must be covered with cap. (See Section “3 Connection”)

④ Connect ES power supply and CO-HV

Connect ES power supply and CO-HV with the control cable which is assorted with CO-HV. (See Section “3 Connection”)

⑤ Set ES power supply to be ready for remote control

Turn the toggle switch on the rear panel of ES power supply to the IEEE-488 position.

Working with LV option of ES power supply, tie pin 7 and 8 in the terminal board for options of ES series.

⑥ Turn on the power of CO-U32 and CO-HV

Turn on the power switch of CO-U32 and CO-HV. The red LED lights up, and the green LED blink 3 times with CO-HV.

⑦ Turn on the power of ES power supply

Turn on the power switch of ES power supply.

⑧ Set ES power supply to be enable output

Send command strings “#1 REN” and “#1 SW1” from the controller. The green indicator (SRQ LED) turns off after the green indicator (LSN LED) blinks with CO-HV. (See Section “7 Command reference”)

⑨ Control the voltage of ES power supply and generate output

Send a command string “#1 VCN xxxx” from the controller. (See Section “7 Command reference”)

⑩ Stop output of ES power supply

Send a command string "#1 SW0" from the controller. The green indicator (SRQ LED) lights up after the green indicator (LSN LED) blinks with CO-HV.

⑪ Turn off the power of ES power supply

Turn off the power switch of ES power supply.

⑫ Quit operation

Turn off the power switch of CO-U32 and CO-HV.

6-9 CO-U32 + CO-RG (Case of RG series)

Control a RG power supply connected with CO-U32 and CO-RG via USB



CAUTION

- High voltage is output actually.
- Do not connect any load to RG power supply before this procedure.

① Set unit number and Upper connection

With the switch labeled UNIT on the rear of CO-RG, set unit number and upper connection. (See Section “4-3 Settings unit number and upper connection for CO series”.)

② Connect to USB

Connect USB connector of CO-U32 and USB controller(e.g.PC) with USB cable(available at stores).

③ Connect CO-U32 and CO-RG

Connect CO-U32 and CO-RG with the optical fiber cable which is assorted with CO-RG. Connectors for optical fiber cable not in use must be covered with cap. (See Section “3 Connection”)

④ Connect RG power supply and CO-RG

Connect RG power supply and CO-RG with the control cable which is assorted with CO-RG. (See Section “3 Connection”)

⑤ Set RG power supply to be ready for remote control

Set the [S1(CV VOLT)] and [S3(CC VOLT)] switch, which are located in [remote switch] on the rear panel of RG power supply, to REMOTE side.

Set the [S2(CV RESIST)], [S4(CC RESIST)], [S5(REMOTE SENCE)] and [S6(MASTER/SLAVE)] to LOCAL side.

Refer RG series instruction manual for details.

⑥ Turn on the power of CO-U32 and CO-RG

Turn on the power switch of CO-U32 and CO-RG. The red LED lights up, and the green LED blink 3 times with CO-RG.

⑦ Turn on the power of RG power supply

Turn on the power switch of RG power supply.

⑧ Set RG power supply to be ready for operation

Turn on the output switch of RG power supply. The green indicator (SRQ LED) turns off with CO-RG.

⑨Set RG power supply to be enable output

Send command strings “#1 REN”, “#1 ICN 100” and “#1 SW1” from the controller. The red indicator (OUTPUT LED) lights up with RG power supply, the green indicator (LSN LED) blinks with CO-RG. (See Section “7 Command reference”)

⑩Control the voltage of RG power supply and generate output

Send a command string “#1 VCN xxxx” from the controller. (See Section “7 Command reference”)

⑪Stop output of RG power supply

Send a command string “#1 SW0” from the controller. The red indicator (OUTPUT LED) turns off with RG power supply, and the green indicator (LSN LED) blinks with CO-RG.

⑫Turn off the power of RG power supply

Turn off the power switch of RG power supply.

⑬Quit operation

Turn off the power switch of CO-U32 and CO-RG.

6-10 CO-E32 + CO-HV (Case of AU series)

Control a AU power supply connected with CO-E32 and CO-HV via Ethernet



CAUTION

- High voltage is output actually.
- Do not connect any load to AU power supply before this procedure.

① Set unit number and Upper connection

With the switch labeled UNIT on the rear of CO-HV, set unit number and upper connection. (See Section “4-3 Settings unit number and upper connection for CO series”.)

② Connect to Ethernet

Connect Ethernet connector of CO-E32 and Ethernet controller(e.g.PC) with LAN cable(available at stores).

③ Connect CO-E32 and CO-HV

Connect CO-E32 and CO-HV with the optical fiber cable which is assorted with CO-HV. Connectors for optical fiber cable not in use must be covered with cap. (See Section “3 Connection”)

④ Connect AU power supply and CO-HV

Connect AU power supply and CO-HV with the control cable which is assorted with CO-HV. (See Section “3 Connection”)

⑤ Turn on the power of CO-E32 and CO-HV

Turn on the power switch of CO-E32 and CO-HV. The red LED lights up, and the green LED blink 3 times with CO-HV.

⑥ Turn on the power of AU power supply

Turn on the power switch of AU power supply. The red indicator lights up, and AU power supply enters stand-by mode.

⑦ Set AU power supply to be ready for operation

Turn on the high voltage switch of AU power supply.

⑧ Set AU power supply to be ready for remote control

Send a command string “#1 REN” from the controller. The red indicator (EXT LED) lights up with AU power supply, and the green indicator (LSN LED) blinks with CO-HV. (See Section “7 Command reference”)

⑨ Set AU power supply to be enable output

Send command strings “#1 ICN 100”, “#1 RST” and “#1 SW1” from the controller. The red indicator (HV ON LED) lights up with AU power supply, and the green indicator (SRQ LED) turns off after the green indicator (LSN LED) blinks with CO-HV. (See Section “7 Command reference”)

⑨Set AU power supply to be enable output

Send command strings “#1 ICN 100”, “#1 RST” and “#1 SW1” from the controller. The red indicator (HV ON LED) lights up with AU power supply, and the green indicator (SRQ LED) turns off after the green indicator (LSN LED) blinks with CO-HV. (See Section “7 Command reference”)

⑩Control the voltage of AU power supply and generate output

Send a command string “#1 VCN xxxx” from the controller. (See Section “7 Command reference”)

⑪Stop output of AU power supply

Send a command string “#1 SW0” from the controller. The red indicator (HV ON LED) turns off with AU power supply, and the green indicator (SRQ LED) lights up after the green indicator (LSN LED) blinks with CO-HV.

⑫Turn off the power of AU power supply

Turn off the power switch of AU power supply.

⑬Quit operation

Turn off the power switch of CO-E32 and CO-HV.

6-1.1 CO-E32 + CO-HV (Case of ES series)

Control a ES power supply connected with CO-E32 and CO-HV via Ethernet



CAUTION

- High voltage is output actually.
- Do not connect any load to ES power supply before this procedure.

① Set unit number and Upper connection

With the switch labeled UNIT on the rear of CO-HV, set unit number and upper connection. (See Section “4-3 Settings unit number and upper connection for CO series”.)

② Connect to Ethernet

Connect Ethernet connector of CO-E32 and Ethernet controller(e.g.PC) with LAN cable(available at stores).

③ Connect CO-E32 and CO-HV

Connect CO-E32 and CO-HV with the optical fiber cable which is assorted with CO-HV. Connectors for optical fiber cable not in use must be covered with cap. (See Section “3 Connection”)

④ Connect ES power supply and CO-HV

Connect ES power supply and CO-HV with the control cable which is assorted with CO-HV. (See Section “3 Connection”)

⑤ Set ES power supply to be ready for remote control

Turn the toggle switch on the rear panel of ES power supply to the IEEE-488 position.

Working with LV option of ES power supply, tie pin 7 and 8 in the terminal board for options of ES series.

⑥ Turn on the power of CO-E32 and CO-HV

Turn on the power switch of CO-E32 and CO-HV. The red LED lights up, and the green LED blink 3 times with CO-HV.

⑦ Turn on the power of ES power supply

Turn on the power switch of ES power supply.

⑧ Set ES power supply to be enable output

Send command strings “#1 REN” and “#1 SW1” from the controller. The green indicator (SRQ LED) turns off after the green indicator (LSN LED) blinks with CO-HV. (See Section “7 Command reference”)

⑨ Control the voltage of ES power supply and generate output

Send a command string “#1 VCN xxxx” from the controller. (See Section “7 Command reference”)

⑩ Stop output of ES power supply

Send a command string "#1 SW0" from the controller. The green indicator (SRQ LED) lights up after the green indicator (LSN LED) blinks with CO-HV.

⑪ Turn off the power of ES power supply

Turn off the power switch of ES power supply.

⑫ Quit operation

Turn off the power switch of CO-E32 and CO-HV.

6-12 CO-E32 + CO-RG (Case of RG series)

Control a RG power supply connected with CO-E32 and CO-RG via Ethernet



CAUTION

- High voltage is output actually.
- Do not connect any load to RG power supply before this procedure.

① Set unit number and Upper connection

With the switch labeled UNIT on the rear of CO-RG, set unit number and upper connection. (See Section “4-3 Settings unit number and upper connection for CO series”.)

② Connect to Ethernet

Connect Ethernet connector of CO-E32 and Ethernet controller(e.g.PC) with LAN cable(available at stores).

③ Connect CO-E32 and CO-RG

Connect CO-E32 and CO-RG with the optical fiber cable which is assorted with CO-RG. Connectors for optical fiber cable not in use must be covered with cap. (See Section “3 Connection”)

④ Connect RG power supply and CO-RG

Connect RG power supply and CO-RG with the control cable which is assorted with CO-RG. (See Section “3 Connection”)

⑤ Set RG power supply to be ready for remote control

Set the [S1(CV VOLT)] and [S3(CC VOLT)] switch, which are located in [remote switch] on the rear panel of RG power supply, to REMOTE side.

Set the [S2(CV RESIST)], [S4(CC RESIST)], [S5(REMOTE SENCE)] and [S6(MASTER/SLAVE)] to LOCAL side.

Refer RG series instruction manual for details.

⑥ Turn on the power of CO-E32 and CO-RG

Turn on the power switch of CO-E32 and CO-RG. The red LED lights up, and the green LED blink 3 times with CO-RG.

⑦ Turn on the power of RG power supply

Turn on the power switch of RG power supply.

⑧ Set RG power supply to be ready for operation

Turn on the output switch of RG power supply. The green indicator (SRQ LED) turns off with CO-RG.

⑨Set RG power supply to be enable output

Send command strings “#1 REN”, “#1 ICN 100” and “#1 SW1” from the controller. The red indicator (OUTPUT LED) lights up with RG power supply, the green indicator (LSN LED) blinks with CO-RG. (See Section “7 Command reference”)

⑩Control the voltage of RG power supply and generate output

Send a command string “#1 VCN xxxx” from the controller. (See Section “7 Command reference”)

⑪Stop output of RG power supply

Send a command string “#1 SW0” from the controller. The red indicator (OUTPUT LED) turns off with RG power supply, and the green indicator (LSN LED) blinks with CO-RG.

⑫Turn off the power of RG power supply

Turn off the power switch of RG power supply.

⑬Quit operation

Turn off the power switch of CO-E32 and CO-RG.

7 Command reference

7-1 Command list

table 3 Command list

Mode		Command	Function
Write	Output	CH0	Set output voltage(HEX mode)
		CH1	Set output current(HEX mode)
		VCN	Set output voltage(percent mode)
ICN		Set output current (percent mode)	
Write	Status	SW1/0	Enable/Disable to output
		PL1/0	Set output polarity
		RST	Reset cut-off state and enable to output
REN		Beginning of remote control	
GTL		Ending of remote control	
Write	GPIB	SRQ ON/OFF	Enable/Disable to generate SRQ onto GPIB
		Read	Output	MN1	Measuring output voltage(HEX mode)
MN2	Measuring output current(HEX mode)		
VM	Measuring output voltage(percent mode)		
IM	Measuring output current (percent mode)		
Read	Status	PLM	Query the status of output polarity
		STS	Query the status of the power supply
Read	Setting	CH0?	Read the setting of output voltage(HEX mode)
		CH1?	Read the setting of output current(HEX mode)
		VCN?	Read the setting of output voltage(percent mode)
		ICN?	Read the setting of output current (percent mode)
		SW?	Read the setting of SW command
		PL?	Read the setting of PL command
		SRQ?	Read the setting of SRQ command

7-2 Reference

CH0 command

- This command programs output voltage of power supply with hexadecimal format.
 - (Syntax) ① CH0 FFFF ← A maximum of rated output voltage
 - ② CH0 7FFF ← A half of rated output voltage
 - ③ CH0 F0 ← Same as “CH0 00F0”
 - ④ CH0 12345 ← Output voltage is not changed
- (Default) CH0 0000
- (Description) It ignores as a parameter of a number over 4 digit (e.g. ④)
Parameter requires hexadecimal format from 0000_H to FFFF_H
Featuring multiple command

CH1 command

- This command programs output current of power supply with hexadecimal format.
 - (Syntax) ① CH1 FFFF ← A maximum of rated output current
 - ② CH1 7FFF ← A half of rated output current
 - ③ CH1 F0 ← Same as “CH1 00F0”
 - ④ CH1 12345 ← Output current is not changed
- (Default) CH1 0000
- (Description) It ignores as a parameter of a number over 4 digit (e.g. ④)
Parameter requires hexadecimal format from 0000_H to FFFF_H
Featuring multiple command

VCN command

- This command programs output voltage of power supply with percentage of the rated.
 - (Syntax) ① VCN 100 ← A maximum of rated output voltage
 - ② VCN 12.34 ← 12.34% of rated output voltage
 - ③ VCN 123.4 ← Output voltage is not changed
 - ④ VCN 12.345 ← Same as “VCN 12.34”
- (Default) VCN 0
- (Description) It ignores as a parameter of integer over 3 digit (e.g. ③)
It ignores as a parameter under 2 decimal (e.g. ④)
Parameter requires from 0.0 to 100.0
Featuring multiple command

ICN command

- This command programs output voltage of power supply with percentage of the rated.
(Syntax) ① ICN 100 ← A maximum of rated output current
② ICN 12.34 ← 12.34% of rated output current
③ ICN 123.4 ← Output current is not changed
④ ICN 12.345 ← Same as “ICN 12.34”
(Default) ICN 0000
(Description) It ignores as a parameter of integer over 3 digit (e.g. ③)
It ignores as a parameter under 2 decimal (e.g. ④)
Parameter requires from 0.0 to 100.0
Featuring multiple command

SW command

- This command programs output status of the power supply.
(Syntax) ① SW0 ← Disable to output
② SW1 ← Enable to output
(Default) SW0
(Description) If the power supplies has the HV ON/OFF switch, it must be turned to the on position.
Featuring multiple command

PL command

- This command programs output polarity.
(Syntax) ① PL0 ← Positive polarity output
② PL1 ← Negative polarity output
(Default) PL0
(Description) Featuring multiple command

RST command

- This command cancels Cut-off State of the power supply.
(Syntax) ① RST
(Description) Featuring multiple command

REN command

- This command enables remote control of the power supply.
 (Syntax) ① REN
 (Description) When the power turn to on, CO-G32 keeps waiting only this command. So this command must be sent from the controller before do any other commands.

GTL command

- This command disables remote control of the power supply.
 (Syntax) ① GTL
 (Description) Once CO-G32 has acknowledged this command, it ignores all of any other commands except REN command. So the power supplies keep the setting before GTL command.

SRQ command

- This command programs masking of SRQ generation onto GPIB.
 (Syntax) ① SRQ ON ← Enable to generate
 ② SRQ OFF ← Disable to generate
 (Default) SRQ OFF
 (Description) It makes CO-G32 enable to valid for “service request” that SRQ ON command is sent from the controller. In spite of this command set to on or off, it makes SRQ LED on the front panel of CO-HV/CO-RG light up that the power supplies send SRQ signal to CO-G32.

Power supply	SRQ Condition
AU ES AE W	Output is OFF or Power is OFF
K7	Power is OFF
RG	Output switch is OFF or Power is OFF

In case RS-232C module, RS-485 module or USB is used instead of CO-G32, this command will be ignored. In such case controller receives “!”(21_H) when power supply is in the above condition.

MN1 command

- This command allows receiving the value of output voltage with hexadecimal format.
(Syntax) MN1
(Return) ① MONI1=FFFH ← Output voltage is a maximum of the rated
② MONI1=7FFH ← Output voltage is a half of the rated

MN2 command

- This command allows receiving the value of output current with hexadecimal format.
(Syntax) MN2
(Return) ① MONI2=FFFH ← Output current is a maximum of the rated
② MONI2=7FFH ← Output current is a half of the rated

VM command

- This command allows receiving the value of output voltage with percentage of the rated.
(Syntax) VM
(Return) ① VM=100.0 ← Output voltage is a maximum of the rated
② VM=25.0 ← Output voltage is a quarter of the rated
(Description) Return value is percentage of the rated from 0.0 to 100.0%.

IM command

- This command allows receiving the value of output current with percentage of the rated.
(Syntax) IM
(Return) ① IM=100.0 ← Output current is a maximum of the rated
② IM=25.0 ← Output current is a quarter of the rated
(Description) Return value is percentage of the rated from 0.0 to 100.0%.

PLM command

- This command allows receiving the status of output polarity with 0 or 1.
(Syntax) PLM
(Return) ① PLM=0 ← Positive polarity output
② PLM=1 ← Negative polarity output

VCN? command

- This command allows receiving the setting value of output voltage with percentage of the rated.
(Syntax) VCN?
(Return) ① VCN=100.0 ←—— Output voltage is set to a maximum of the rated
② VCN=12.34 ←—— Output voltage is set to 12.34% of the rated
(Description) Return value is percentage of the rated from 0.0 to 100.0%.

ICN? command

- This command allows receiving the setting value of output current with percentage of the rated.
(Syntax) ICN?
(Return) ① ICN=100.0 ←—— Output current is set to a maximum of the rated
② ICN=12.34 ←—— Output current is set to 12.34% of the rated
(Description) Return value is percentage of the rated from 0.0 to 100.0%.

SW? command

- This command allows receiving the setting output status
(Syntax) SW?
(Return) ① SW0 ←—— Disable to output
② SW1 ←—— Enable to output

PL? command

- This command allows receiving the setting output polarity
(Syntax) PL?
(Return) ① PL0 ←—— Positive polarity output
② PL1 ←—— Negative polarity output

SRQ? command

- This command allows receiving the setting SRQ generation
(Syntax) SRQ?
(Return) ① SRQ OFF ←—— Disable to generate
② SRQ ON ←—— Enable to generate
(Description) This command needs no unit number at all.



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