

PROBE SELECTOR

PS01-COM

OPERATION MANUAL



Part No. Z1-989-020, IB002392

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Power Requirements of this Product

Power requirements of this product have been changed and the relevant sections of the Operation Manual should be revised accordingly.

(Revision should be applied to items indicated by a check mark)

Input voltage

The input voltage of this product is _____ VAC,
and the voltage range is _____ to _____ VAC. Use the product within this range only.

Input fuse

The rating of this product's input fuse is _____ A, _____ VAC, and _____.

WARNING

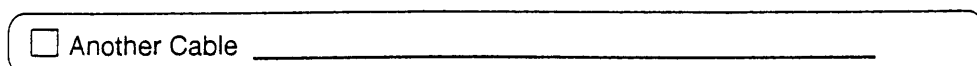
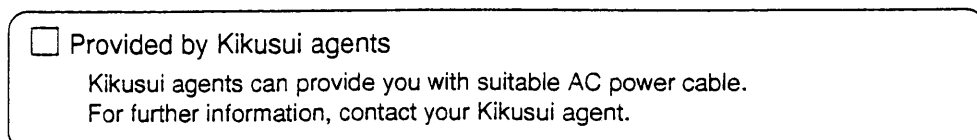
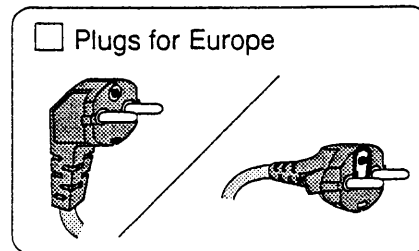
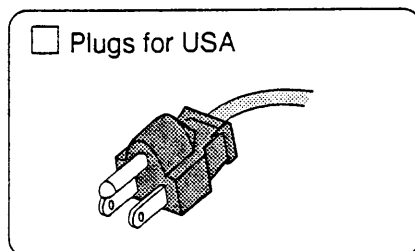
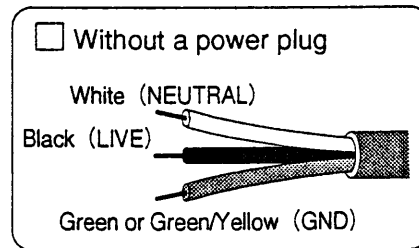
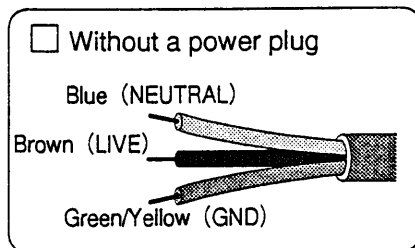
- To avoid electrical shock, always disconnect the AC power cable or turn off the switch on the switchboard before attempting to check or replace the fuse.
- Use a fuse element having a shape, rating, and characteristics suitable for this product. The use of a fuse with a different rating or one that short circuits the fuse holder may result in fire, electric shock, or irreparable damage.

AC power cable

The product is provided with AC power cables described below. If the cable has no power plug, attach a power plug or crimp-style terminals to the cable in accordance with the wire colors specified in the drawing.

WARNING

- The attachment of a power plug or crimp-style terminals must be carried out by qualified personnel.



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1. GENERAL

1.1 Introduction

Kikusui Model PS01-COM Probe Selector has been designed as a member of Kikusui COM7000A Series Instruments, whose basic design concepts are to provide equipment for accurate but easy measurements and communication of the various types of variables and data. The PS01-COM Probe Selector can be used especially advantageously in conjunction with the COM7000A Series Oscilloscope and RC01-COM Remote Controller.

1.2 Features

- (1) When hooked up to the oscilloscope, the PS01-COM is able to serve up to 8 probes per channel (up to 16 channels in total).
- (2) Probe selection, input coupling and amplifier gain can be controlled with external signals.
- (3) When used in conjunction with the COM7000A Series Oscilloscope and the RC01-COM Remote Controller, the setup acts as a programmable system and can store up to 100 different patterns of panel setting data and any of them can be called out by simple key operation.

2. SPECIFICATIONS

Item	Specification	Remarks
Number of inputs	8 inputs×2 channels	BNC connector
Gain factor	×10, ×1, ×0.1, ×0.01	
Accuracy of gain factor	×10 : ±4% ×1, ×0.1, ×0.01 : ±2%	15 - 35°C (59 - 95°F) 1kHz reference, 50Ω termination
Frequency bandwidth	DC - 100MHz within -3dB DC - 50MHz within -3dB (×10)	15 - 35°C (59 - 95°F) 50kHz reference,
Input impedance	1 MΩ ±1%, 20pF ±3pF	In parallel
Allowable maximum input voltage	400V peak (DC+AC peak)	AC : 1 kHz or less
Crosstalk	60dB or less : 50kHz 40dB or less : 100MHz	Between channels
Number of outputs	1 output ×2 channels	BNC connector
Output impedance	50Ω ±5%	
Time difference between channels	±500psec or less	
No. of external input signals	1 for each of channels	External/internal select possible
Terminals for external control signals	1 for COM series instrument 1 for general external control signals	See Section 4.6 through 4.8.

- Frequency bandwidths (typical values) available when the PS01-COM is operated in conjunction with COM Series Oscilloscopes

Models	Frequency bandwidth when PS01-COM is hooked up	Remarks
COM7201A COM7200A	100MHz (- 3 dB)	The values shown in the left are typical ones.
COM7101A COM7100A	85MHz (- 3 dB)	
COM7061A COM7060A	60MHz (- 3 dB)	

Item	Specification	Rmarks
Line voltage	90 to 250V	
Line frequency	50/60Hz	
Power consumption	Approx. 55VA	
Fuse	Slow blow 1 A (250V)	
Operatable Environments	0 to 50°C (32 to 122°F) 95% or less	
Environments for specification performance	5 to 45°C (41 to 113°F) 90% or less	
External dimensions	316W × 59H × 398D mm (12.44W × 2.32H × 15.67D in.)	
	325W × 70H × 430D mm (12.80W × 2.56H × 16.93D in.)	Maximum
Weight	Approx. 4 kg (8.8 lbs)	

Accessories

	Qty
50Ω termination resistors (1/2 W)	×2
50Ω coaxial cables	×2
Inter-device connection cable (for COM)	×1
Power supply cord	×1
Fuse 1A, slow blow	×1
Operation manual	×1

Optional accessory

962BNC 60MHz BNC-BNC ATT cable 1.4m, 1:10

877548

3. PRECAUTION BEFORE USE

3.1 Unpacking

Please unpack the device immediately when it is delivered to you and check for any signs of damage which might have been sustained when in transportation. If any sign of damage is found, please immediately notify the bearer and your Kikusui dealer.

3.2 Environments

The normal ambient temperature range of this device is 0 to 50°C (32 to 122°F). Operation of the device outside of this temperature range may cause damage to the circuits. Do not use the device in a place where strong magnetic or electric field exists. Such fields may disturb the measurement.

3.3 Maximum Safe Input Voltages

The maximum safe input voltages applicable to the input terminals and probes are as shown in the below table.

Do not apply any voltages higher than these limits.

Input Terminals	Maximum Safe Input Voltage
Input terminals (BNC connector)	400 V peak (DC+ AC peak)
Probes	600 V peak (DC+ AC peak)

AC component not higher than 1 kHz

3.4 Note for External Control Signals

All of the signals transacted via the CONTROLLER connectors on the rear panel must of the TTL level. Note that operation errors or failures or even damage to the equipment may result unless the signals are not of the TTL level.

3.5 Output Termination

The output impedance of this device is 50Ω (±5%). Be sure to use the 50Ω coaxial cables and 50Ω termination resistors supplied.

Note that the wattage of the 50Ω resistors is 1/2 W.

4. OPERATION METHOD

4.1 Description of Front Panel

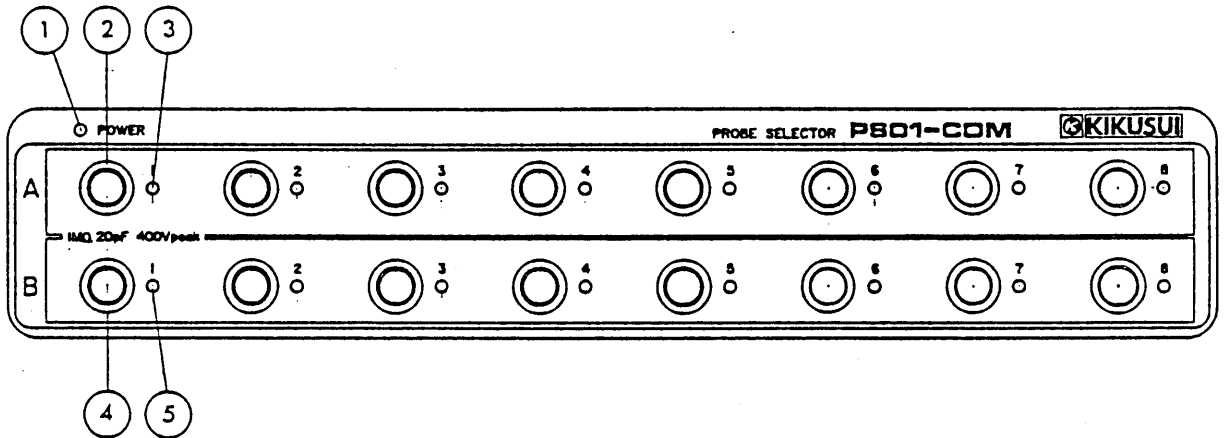


Figure 4-1

- ① Power ON indicator (LED)
- ② Input connectors of channel A (eight connectors, 1 to 8 channel A group)
- ③ Selection indicator lights (LEDs) for input connectors of channel A (1 to 8)
- ④ Input connectors of channel B (eight connectors, 1 to 8 channel B group)
- ⑤ Selection indicator lights (LEDs) for input connectors of channel B (1 to 8)

4.2 Description of Rear Panel

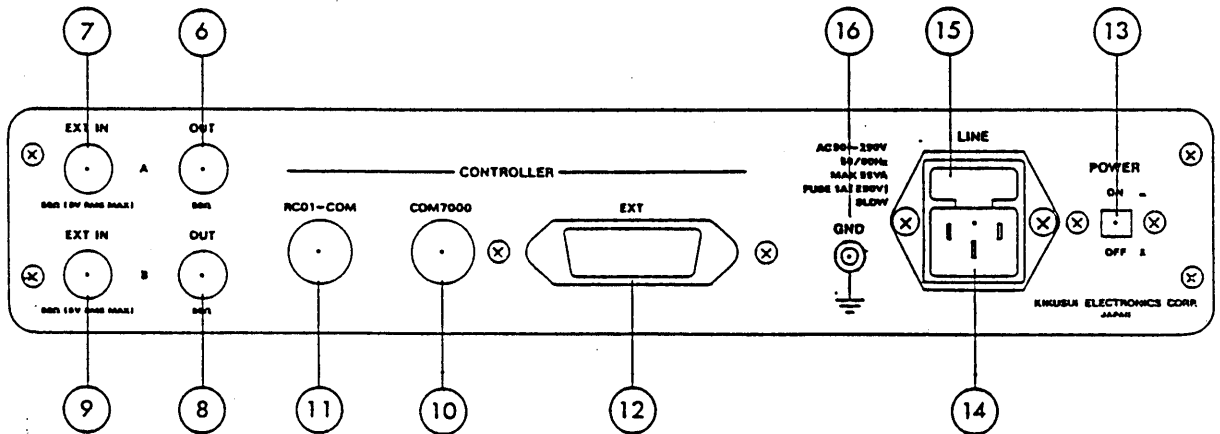


Figure 4-2

- ⑥ Output connector of channel A:

Output impedance 50Ω

- ⑦ External input connector of channel A:

The signal fed through this connector can be delivered through ⑥ "Output Connector of Channel A," instead of that fed through ② "Input Connector of Channel A" on the front panel. Either the front or the rear signal can be selected by switching.

Input impedance 50Ω

- ⑧ Output connector of channel B:

Output impedance 50Ω

- ⑨ External input connector of channel B:

The signal fed through this connector can be delivered through ⑧ "Output Connector of Channel B," instead of that fed through ④ "Input Connector of Channel B" on the front panel. Either the front or the rear signal can be selected by switching.

Input impedance 50Ω

⑩ COM7000A connector:

This connector is a round DIN connector, which hooks up the PS01-COM to the COM7000A Series Oscilloscope.

⑪ RC01-COM connector:

This connector is a round connector, which connects the PS01-COM to the RC01-COM Remote Controller.

⑫ EXT connector:

This connector accepts external control signals for more diversified types of control of the PS01-COM. The connector is a 24-pin type of Series 57.

⑬ Power switch:

The POWER switch of this device

⑭ Power input connector:

The AC power input connector of the device. The power cord (supplied) is to be connected to this connector.

⑮ FUSE holder:

Holds a slow-blow of 1 A.

The cover can be removed by using a screwdriver or other pointed tool. A spare fuse is held inside.

Note: Be sure to turn off ⑬ Power Switch and disconnect the power cord from ⑭ Power Input Connector before replacing the fuse.

⑯ GND terminal

4.3 Setting Up

4.3.1 Hooking Up PS01-COM to COM7000A Series Oscilloscope

The PS01-COM can be hooked up to the COM7201A, COM7101A or COM7061A Digital Oscilloscope which has the interface provision (standard provision) for the RC01-COM Remote Controller, or to the COM7200A, COM7100A or COM7060A Real-time Oscilloscope which has the interface provision (optional provision) for the RC01-COM Remote Controller.

The system setup is as shown in Figure 4-3.

Precaution: Before connecting the instruments, make sure that their power switches are turned off.

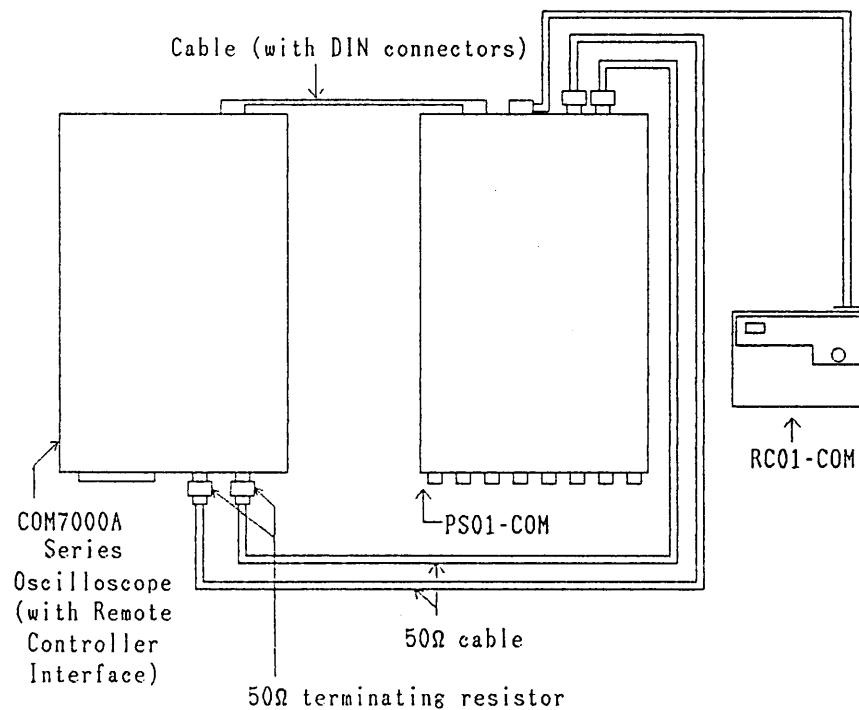


Figure 4-3

To set up the system, proceed as follows:

First, connect the A OUT connector on the rear panel of the PS01-COM to the CH1 Input connector of the COM7000A Series Oscilloscope using a 50Ω

cable terminated with a 50Ω resistor. In the same manner, connect the B OUT connect of the PS01-COM to the CH2 Input connector of the oscilloscope. Next, connect the COM7000 connector (round DIN connector) on the rear panel of the PS01-COM to the REMOTE connector (round DIN connector) on the rear panel of the oscilloscope using the accessory cable (supplied). Finally, connect the cable of the remote controller to the RC01-COM connector (round DIN connector) on the rear panel of PS01-COM. The system setup is complete by the above.

Note: To turn on the system, turn on at first the power switch of the PS01-COM Probe Selector and that of the COM7000A Series Oscilloscope next. If you do this in the reverse order, settings of the COM7000 Series Oscilloscope and RC01-COM. Remote Controller may become abnormal. When this has occurred, turn off once the power switch of the oscilloscope and then turn it on again or press the RESET key of the remote controller. If you press the RESET key, the instrument will be set to the conditions of the starting address of the remote controller.

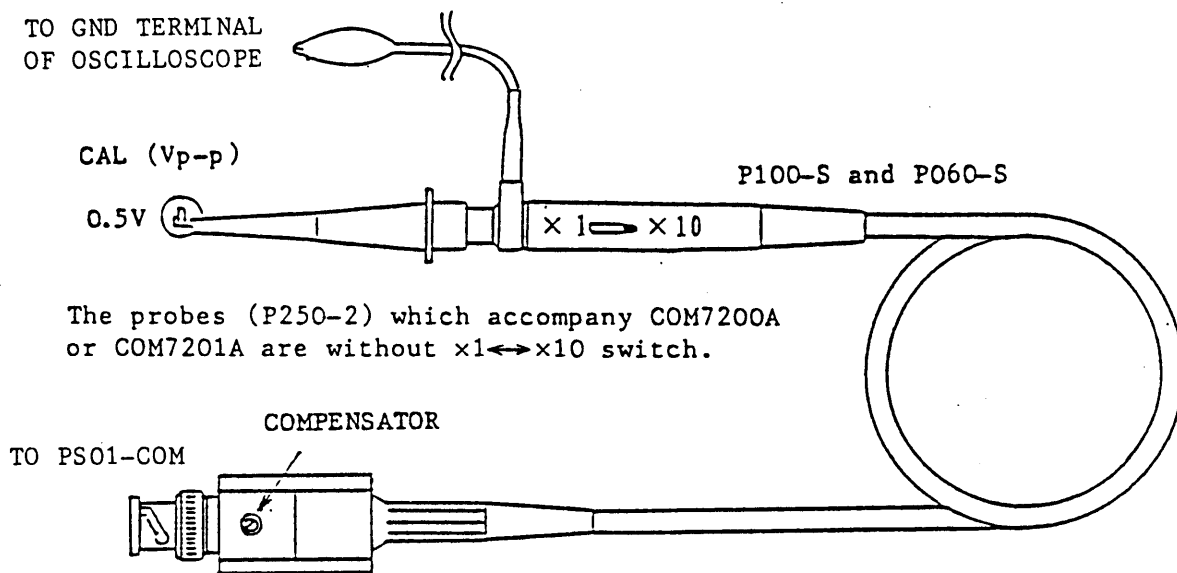
For further operation procedures which are to follow the above, see Section 4.6 and subsequent sections.

4.3.2 Input Signals for PS01-COM

The PS01-COM Probe Selector is able to handle up to 16 inputs (8 inputs of Group A and those of Group B). It selects one of Group A inputs for the CH1 channel of the COM7000A Series Oscilloscope and that of Group B for the CH2 channel. To the sixteen input connectors of the PS01-COM, directly feed the signals using the BNC cables or feed them via the oscilloscope probes. All of the P250-2, P150-2, P100-S, P060-A, P060-2 and P010-1 Probes supplied by Kikusui can be used for this purpose. Use appropriate probes to suit the frequency bandwidth on the PS01-COM, the frequencies of the signals to be measured, and the impedances of the measured signal sources. Model 962 BNC Cables (input impedance $10M\Omega$, attenuation 10:1) for the above purpose is available from Kikusui.

4.4 Calibration of Probes

The probes act as wide frequency band attenuators. Unless they are properly adjusted for phase compensation, displayed waveform may be distorted and measuring errors may be introduced. Be sure to properly calibrate them before measurement.



The probes (P250-2) which accompany COM7200A or COM7201A are without $\times 1 \leftrightarrow \times 10$ switch.

Figure 4-4

To calibrate the probes use the signal of the CAL ② terminal (refer to COM7000A Series Instruction Manual) on the front panel of the oscilloscope and proceed as follows:

Connect one of the probes to the input connector of the PS01-COM and set the input range switch at $\times 1$. For Type P100-S or P060-S Probe, set the switch at $\times 10$.

Connect the probe tip to the CAL terminal. Observing the waveform displayed on the CRT, adjust the compensator (see Figure 4-5) with a screwdriver so that an ideal waveform is obtained (see Figure 4-6).

Calibrate other the probe for input connector in the same method as above. When using a probe with its switch set at $\times 10$, change the readout factor referring to Section 4.5.

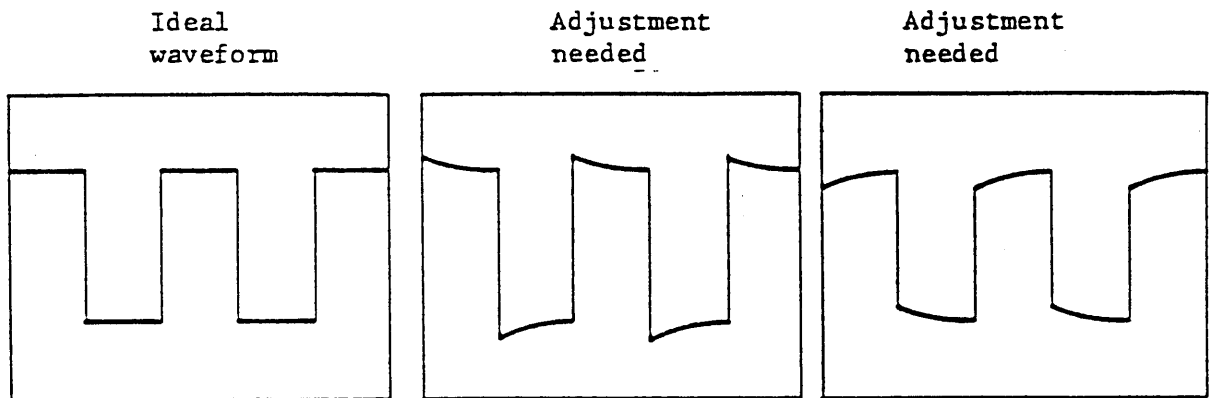


Figure 4-6

4.5 Precautions for Use of Probes

[To Change Readout Factor for Probe]

For the COM7000A Series Oscilloscope, note the following:

The values of vertical deflection factor and ΔV measurement displayed on the CRT readout are as that of the signal at the probe tip. When a 10:1 probe is used, the factor for displaying the value on the CRT readout can be changed to display directly the value at the probe tip.

To change the factor, proceed as follows:

(refer to COM7000A Series Instruction Manual)

For COM7200A, COM7100A or COM7060A, press the GND switch of COUPLING ⑨ ⑬ ⑮ ⑰ of the channel to which the probe is connected within the period the CRT is in the beam find status after pressing the INTEN ② knob once and releasing your hand from the knob.

For COM7201A, COM7101A or COM7061A, press the same switch together with the 2ND FUNCTION KEY ④③ switch. When this is done, the value indicated on the CRT readout is multiplied by a factor of 10 on the selected input and a message "P x10" is displayed on the CRT.

To reset the regular state from the above state, repeat the same procedure as above.

4.6 To Select Probes from RC01-COM Remote Controller

To select the probes (which are connected to the PS01-COM Probe Selector) from the RC01-COM Remote Controller, proceed as follows:

- (1) Press the PROB key. As the instrument is set to the command mode, the display will change to "A" and the set data of Group A will be displayed.
- (2) Press the required one of the "1" - "8" keys to enter the required probe number of Group A.
- (3) Press the ENT key to set the probe of Group A. The display will change to "b" and the set data of Group B will be displayed.
- (4) Press the required one of the "1" - "8" keys to enter the required probe number of Group B.
- (5) Press the ENT key to set the probe of Group B. The display will return to the original state and the command mode will terminate.

4.7 Operation Method of PS01-COM Probe Selector Used in Conjunction with COM7000A Series Oscilloscope and RC01-COM Remote Controller

- o To Store Probe and Panel Setting Data in Memory
 - (1) Set the front panel items of the oscilloscope to the pattern to be stored in memory and then set probe selection as described in Section 4.6. The range of the PS01-COM internal attenuator is automatically set with respect to setting of the vertical deflection range selector on the oscilloscope front panel.
 - (2) Press the WR key to set the instrument to the command mode.
 - (3) Enter the required address number with keys "0" - "9".
 - (4) Press the ENT key so that the set pattern of the front panel items is stored in memory. The address display will change to the next address for the next pattern for continued data storage operation.
 - (5) Change the front panel items as required for the next pattern. If the probe selector and position control also are required to be changed, release the instrument once from the WR mode and then repeat the settings.
 - (6) Repeat the above procedure starting by Step (4).
 - (7) Press the RESET key to reset the instrument from the WR mode.

o To Read Probe and Panel Setting Data

[1] Setting the Start Address and End Address

Note: If the START address code number is larger than the END address code number, an error status will occur (the readout will indicate "--"). If this is the case, set the END address first and the START address next.

- (1) Press the START or END key to set the RCO1-COM to the command mode.
- (2) Press tenkeys (0 - 9) for the address code number.
- (3) Press the ENT key to enter the address code number.

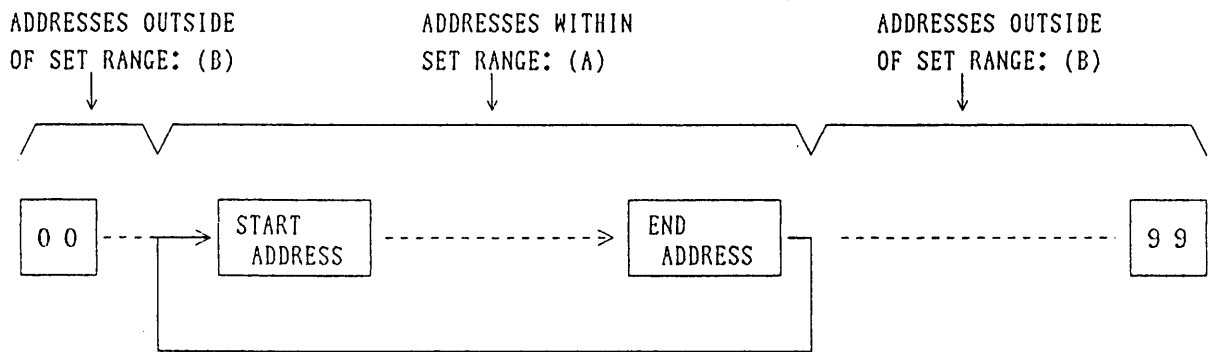
The START and END address code numbers entered as above are protected even when the POWER switch of RCO1-COM is turned off.

When the START and END addresses have been set as above, the addresses between them can be sequentially read by pressing the INC or DEC step control key.

[2] To Read Probe and Panel Setting Data

- (1) Press the RESET key to read the panel setting data stored at the START address.
- (2) Press the INC or DEC key to increment (+1) or decrement (-1) the address code number.

To jump to an address which you may require, press tenkeys (0-9) for the address code number and then press the ENT key. Increment or decrement of address code number thereafter is as illustrated below.



Case (A): This case is that one of the addresses within the range set by the START and END addresses is specified and then the ENT key is pressed. Address number will be incremented or decremented by 1 starting by the specified address within the set range as you press the INC or DEC key, respectively.

Example: Assume that 10 is set for the START address and 20 for the END address and that 15 is specified for the current address. As you press the INC or DEC key, address number will be incremented to 16, 17, 18 and so forth or decremented to 14, 13, 12 and so forth, respectively.

Case (B): This case is that one of the addresses outside of the range set by the START and END addresses is specified and then the ENT key is pressed. Address number will be incremented or decremented starting by the address which has been displayed latest (the current address) as you press the INC or DEC key, respectively.

Example: Assume that 10 is set for the START address and 20 for the END address, address number has been incremented to 15 by pressing the INC or DEC key and, at this instant, you have specified address number 25 which is outside of the set range. As you press the INC or DEC key, address number will be incremented to 16, 17, 18 and so forth or decremented to 14, 13, 12 and so forth, respectively, by returning the scanning to within the set address range of 10-20.

4.8 To Control PS01-COM Probe Selector with an External Controller

When the PS01-COM Probe Selector is operated in conjunction with the COM7000A Series Oscilloscope or other oscilloscope, the probe selector can be controlled with an external device by feeding control signals via the EXT connector of the probe selector. In this case, however, the controllable instrument is the probe selector alone. The vertical ranges and other items of the oscilloscope may be required to be manually controlled. In this case, further, even if the PS01-COM Probe Selector is used in conjunction with the COM7000A Series Oscilloscope, the round DIN connectors are not used for connection between them.

When controlling the PS01-COM with the signal fed to it through its EXT connector, the signal has a priority over that fed from the RC01-COM remote controller.

The entire operation of the PS01-COM is controlled by the signals fed through ⑫ EXT connector shown in Figure 4-2.

For this mode of operation, proceed as follows:

- (1) Set the EXT CONT to "L" and the EXT STRB to "H".
- (2) Enter the required probe number and its attenuator range for each of Groups A and B.
- (3) Apply a negative logic pulse signal to the EXT STRB. The probe number and range for each of the groups will be set internally.

Notes: (1) Since the PS01-COM has no memory, operation must be controlled manually step by step or by employing an external memory device.

(2) Note that each of the signal lines of the ATT range signal has its own meaning.

(3) A timing chart of the EXT STRB is shown in Figure 4-7.

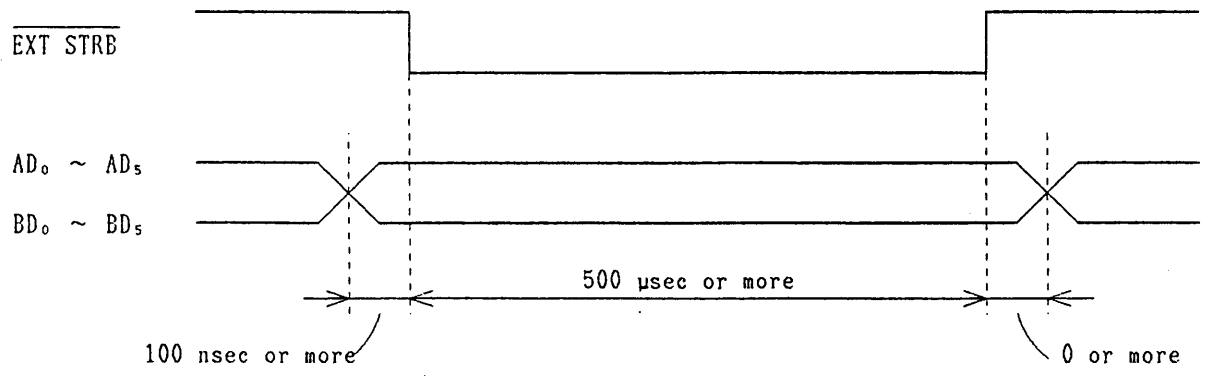


Figure 4-7

o EXT Connector

The pin layout of ⑫ EXT connector on the rear panel of PS01-COM is shown in Figure 4-8.

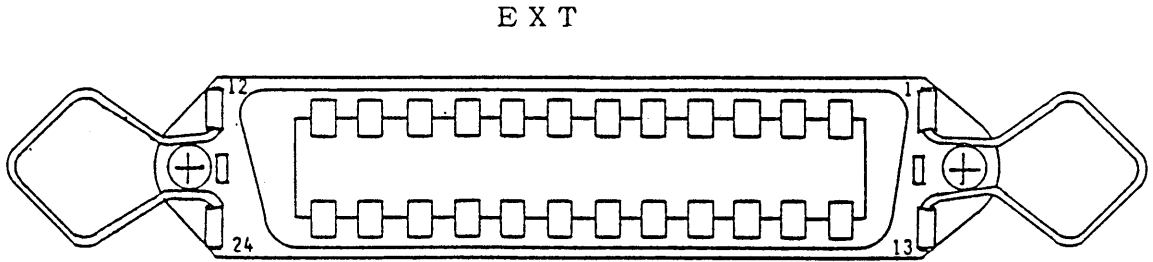


Figure 4-8

Pins and Signals

Group A

- | | |
|----------------------------------|---------------------------------------|
| 1. SEL AA | } Probe No. setting
See Table 4-1. |
| 2. SEL AB | |
| 3. SEL AC | |
| 4. $\overline{\text{EXT IN A}}$ | PROBE/EXT
input switching |
| 5. AD ₀ | } ATT setting
See Table 4-2. |
| 6. AD ₁ | |
| 7. AD ₂ | |
| 8. AD ₃ | |
| 9. AD ₄ | |
| 10. AD ₅ | |
| 11. $\overline{\text{EXT CONT}}$ | "L" when in external
control |
| 12. GND | |

Group B

- | | |
|----------------------------------|--------------------------------------|
| 13. SEL BA | } Probe No. setting
See Table 4-1 |
| 14. SEL BB | |
| 15. SEL BC | |
| 16. $\overline{\text{EXT IN B}}$ | PROBE/EXT
input switching |
| 17. BD ₀ | } ATT setting
See Table 4-2. |
| 18. BD ₁ | |
| 19. BD ₂ | |
| 20. BD ₃ | |
| 21. BD ₄ | |
| 22. BD ₅ | |
| 23. $\overline{\text{EXT STRB}}$ | Setting pulse
input |
| 24. GND | |

o Setting of Probe No.

Control signal	Probe No.							
	1	2	3	4	5	6	7	8
SEL AA (SEL BA)	H	L	H	L	H	L	H	L
SEL AB (SEL BB)	H	H	L	L	H	H	L	L
SEL AC (SEL BC)	H	H	H	H	L	L	L	L

Table 4-1

o Setting of ATT Range

AD 0 H : AC coupling L : DC coupling
(BD 0)

					1/1	1/100	1/100
		1/1	1/10	1/100	$\overline{\text{MAG}}$	$\overline{\text{MAG}}$	$\overline{\text{MAG}}$
AD 1 (BD 1)	AD 1	L	L	H	L	L	H
	(BD 1)						
	AD 2	L	H	H	L	H	H
AD 2 (BD 2)	(BD 2)						
	AD 3	H	H	H	L	L	L
AD 3 (BD 3)	(BD 3)						

AD 4 L : AC or DC coupling H : GND
(BD 4)

AD 5 Not used
(BD 5)

Table 4-2

