

INSTRUCTION MANUAL

STEP CONTROLLER

MODEL SC02-COS

KIKUSUI ELECTRONICS CORPORATION

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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.

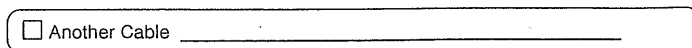
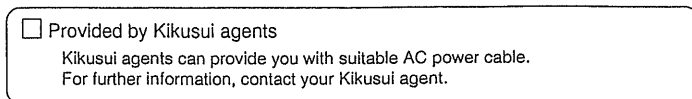
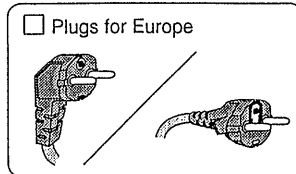
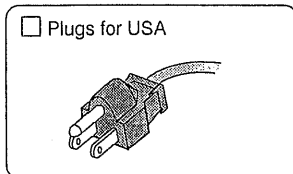
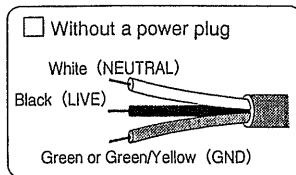
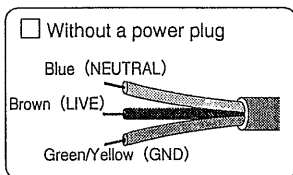


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1. GENERAL

1-1. Description

Step Controller SC02-COS is used in conjunction with Remote Controller RC01-COS and Memory Unit MU01-COS to control steps of programs stored in memory of such devices.

1-2. Features

o Various step control functions:

The various types of step control operations can be done as follows:

If you press momentarily the UP or DOWN button, the step changes only by one step. If you keep depressed either one of these buttons, the step keeps changing for rapid change by many steps.

If you press the RESET button, the step returns to the initial one of the program. An automatic step advancement operation with a presettable time interval of approximately 3 to 30 seconds also is possible.

o A step signal output:

A step signal output, representing the current program step and in a format of BCD code, is provided for external use.

o Manual control functions:

Positioning, sensitivity adjustment, and some other items can be manually controlled by pulling out respective control knobs remotely from the place where the operator stays. These manual control operations do not affect the programs stored in memory.

2. SPECIFICATIONS

Indication function

Program step indication: 0 - 95

Step control modes

MANUAL mode: The step can be changed by manually operating the UP, DOWN, and RESET buttons. If the UP or DOWN button is kept depressed, the step changes continuously.

AUTO mode: In addition to the functions when in the manual mode, if in the READ mode, the step number is counted up at each time-interval preset by the TIME INTERVAL knob.

Manual control functions

Vertical VARIABLE: Can be attenuated to 1/2.5 of selected sensitivity, of both CH1 and CH2

Vertical POSITION: Variable by ± 4 DIV or over, of both CH1 and CH2

Sweep time VARIABLE: Can be attenuated to 1/2.5 of selected sweep time.

Horizontal POSITION: Variable by ± 5 DIV or over

Trigger level: Variable by ± 4 DIV or over (in screen amplitude equivalent value)

Delay time POSITION: Can be set at 5 - 95% of main sweep

Step indication output

Output code: BCD code, positive logic

Output connector: 14-pin receptacle, Amphenol

Dimensions and weight

Outline dimensions

Maximum dimensions: 215 W × 75 H × 120 D mm
(8.46 W × 2.99 H × 4.72 D in.)

Mainframe: 210 W × 45 H × 110 D mm
(8.26 W × 1.77 H × 4.33 D in.)

Weight: Approx. 0.9 kg

Ambient temperature and humidity

Ranges to satisfy specifications: 5°C to 35°C (40°F to 95°F),
up to 85%

Operating ranges: 0°C to 40°C (32°F to 104°F),
up to 90%

Accessory

14-pin cable (for Step Controller) 1
Instruction manual 1

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3. GENERAL PRECAUTIONS

3-1. Unpacking the Step Controller

Step Controller SC02-COS is shipped from the manufacturer's factory after full mechanical and electrical inspection to ensure perfect structures and performances. Please unpack the device immediately upon receiving it and check for any signs of damage which might have been caused when in transportation. If any sign of damage is found, please immediately notify the bearer and your Kikusui dealer.

3-2. Environmental Conditions

This device can be operated within an ambient temperature range of 0°C to 40°C (32°F to 104°F) and ambient humidity of up to 90% RH. Note that malfunctioning may be caused if the device is operated in an ambient condition exceeding any of the above limits, if the device is subjected to rapid temperature and/or humidity change, or if it is subjected to vibration.

3-3. Inter-device Connection Cables

Never connect wrong devices with inter-device connection cables. Never connect or disconnect inter-device connection cables when the powers of devices connected by them are on. Such will cause damage to the devices. Be sure to correctly connect the cables upon insuring that the powers of the devices to be connected are off.

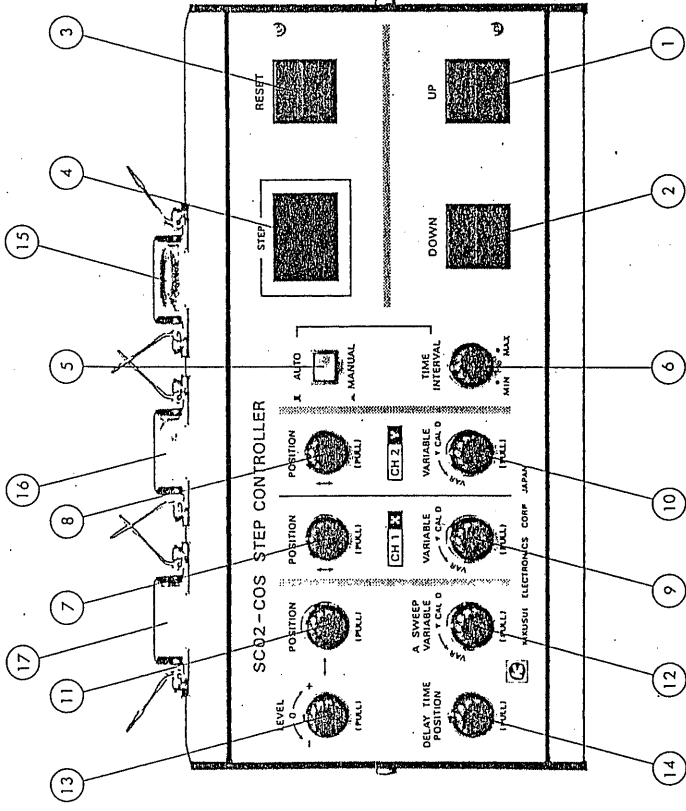


Figure 1. Front panel of Step Controller SC02-COS

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4. OPERATION METHOD

4-1. Description of Front Panel Items (See Figure 1.)

- ① UP: Each time this button is pressed momentarily, the program step number is counted up by 1. If it is kept depressed, the step number changes self-continuing.
- ② DOWN: Each time this button is pressed momentarily, the program step number is counted down by 1. If it is kept depressed, the step number changes continuously.
- ③ RESET: This button is to reset the program step. As you press this button, the step returns to the step number preset by the START digital switches of Remote Controller RC01-COS.
- ④ STEP: These lamps (LED's) indicates the program step for a range of 0 - 95.
- ⑤ AUTO:
 MANUAL: This button selects the step change operation mode between AUTO and MANUAL. In either case, the functions of above items ① - ③ remain effective.
- ⑥ TIME INTERVAL: This control is to preset the time interval for automatic count up of program step number when in the AUTO and READ mode. The adjustable range is approximately 3 - 30 seconds. The time interval becomes longer as this control is turned clockwise.
- ⑦ CH1 and CH2
⑧ POSITION: These knobs are for manual vertical positioning of CH1 and CH2 spots or traces, respectively. These knobs are effective only when they are pulled out. They are ineffective when they are pushed in or when the POSITION knobs of oscilloscope itself are pulled out.

9 CH1 and CH2

10 VARIABLE:

↙ V CAL'D
VAR

These knobs are for manual continuously-variable adjustment of vertical sensitivities of CH1 and CH2, respectively. These knobs are effective only when they are pulled out. When they are turned to counterclockwise extreme positions, the sensitivities become 1/2.5 of those selected by range switches. When they are turned to the clockwise extreme positions or when these knobs are pushed in, the sensitivities remain at values selected by the range switches.

11 ↔ POSITION:

For manual horizontal positioning of spot or trace. When this knob is pulled out and turned clockwise, the spot or trace moves rightward. This knob remains ineffective when it is pushed in or when the POSITION knob of the oscilloscope is pulled out.

12 A SWEEP VARIABLE: For fine manual adjustment of A sweep time.

↙ V CAL'D
VAR

This knob becomes effective when it is pulled out and the sweep time selected by the range switch of the oscilloscope can be made slower to a factor of 2.5 or over. When this knob is turned to the clockwise extreme position or it is pushed in, the sweep time remains at the value selected by the range selector of the oscilloscope. Step Controller SC02-COS remains ineffective when the A SWEEP VARIABLE knob of the oscilloscope is pulled out.

13 LEVEL:

For manual adjustment of trigger level. This knob becomes effective when it is pulled out. As this knob is turned clockwise, the triggering point is shifted in the positive-going direction on the trigger signal. This knob remains ineffective when it is pushed in or when the TRIGGER LEVEL knob of the oscilloscope is pulled out.

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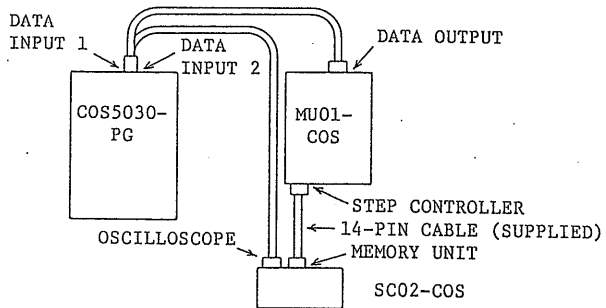
- ⑭ DELAY TIME POSITION: For manual adjustment of delay time position with respect to A sweep. This knob becomes effective when it is pulled out and the portion of A sweep to be magnified can be selected continuously variably. This knob remains ineffective when it is pushed in or when the DELAY TIME POSITION knob of the oscilloscope is pulled out.
- ⑮ BCD OUTPUT: This 14-pin connector (Amphenol) provides a BCD signal representing the step indicated by ④ STEP lamps.
- ⑯ MEMORY UNIT: This connector is for connection to Memory Unit MU01-COS using the 14-pin inter-device connection cable (supplied).
- ⑰ OSCILLOSCOPE: This connector is for connection to Programmable Oscilloscope COS5Q30-PG using the 14-pin inter-device connection cable for manual control operation.

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4-2. Inter-device Connections

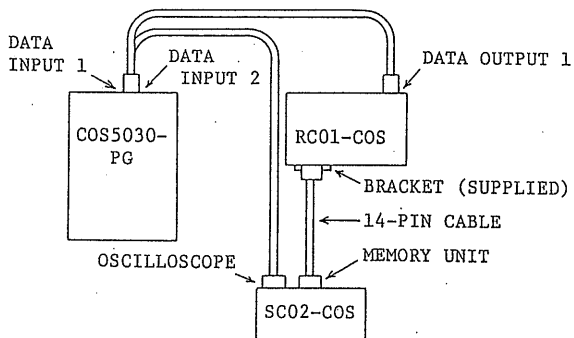
- (1) To operate in conjunction with Memory Unit

Connect the device as follows:



- (2) To operate in conjunction with Remote Controller

Connect the device as follows:



4-3. Operation Method

(1) Up operation:

Each time as you press momentarily (1) UP button, the indicated step number is counted up by 1. When the step number has exceeded that which has been preset by the END digital switches of Memory Unit MU01-COS, the step number automatically returns to that which has been preset by the START digital switches of MU01-COS. If you keep depressed the UP button, the step number keeps changing, enabling you to rapidly reach the required program step.

(2) DOWN operation:

Each time as you press momentarily (2) DOWN button, the indicated step number is counted down by 1. When the step number has exceeded that which has been preset by the START digital switches of Memory Unit MU01-COS, the step number automatically returns to that which has been preset by the END digital switches of MU01-COS. If you keep depressed the DOWN button, the step number goes on changing, enabling you to rapidly reach the required program step.

(3) RESET operation:

As you press (3) RESET button, the program step number returns with a higher priority over other settings to the step number which has been preset by the START digital switches of Memory Unit MU01-COS.

(4) AUTO operation:

Step Controller SCO2-COS is capable of automatic step up operation either when in the READ or WRITE mode. When (5) AUTO/MANUAL switch is set in the AUTO (\square) state, the following operations can be done.

If Memory Unit MU01-COS is in the READ mode, the step number automatically advances at each time-interval preset by (6) TIME

INTERVAL control. The time interval is adjustable for a range of approximately 3 to 30 seconds, with the time interval longest when (6) TIME INTERVAL control turned to the clockwise extreme position. Even when in the AUTO mode, the UP, DOWN, and RESET buttons remain effective and the step number can be changed also manually, enabling you to review or jump steps as required.

If Memory Unit MU01-COS is in the WRITE mode, the step number is changed as a step up signal is received from Remote Controller RC01-COS which is connected to the DATA INPUT connector of Memory Unit MU01-COS and, at the same time, data is stored in Memory Unit MU01-COS.

(5) MANUAL step operation:

When (5) AUTO/MANUAL button is set in the MANUAL (M) state, the program step number can be changed only with the UP, DOWN, and RESET buttons, independent of step up operation of Remote Controller RC01-COS.

(6) Manual control operation:

When Programmable Oscilloscope COS5030-PG is operating in the READ mode with data stored in memory, the items of (7) - (14) knobs can be manually controlled by pulling out these knobs, without affecting stored program data. Knobs for these items, except vertical VARIABLE knobs of CH1 and CH2, are provided also on Programmable Oscilloscope COS5030-PG. When these knobs are made effective on the oscilloscope, the corresponding ones on the step controller remains idle.

When in the WRITE mode also, (7) - (14) knobs are effective. Note, however, that data stored when in such state is for the states that the knobs are pushed in.

4-4. BCD OUTPUT Signal

This device provides a signal representing the indicated program step number. This signal is of a BCD code of positive logic. The connector pins are as shown in the following table.

Pin number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Output	A	B	C	D			G N D	A	B	C	D			G N D
	Least significant digit							Most significant digit						