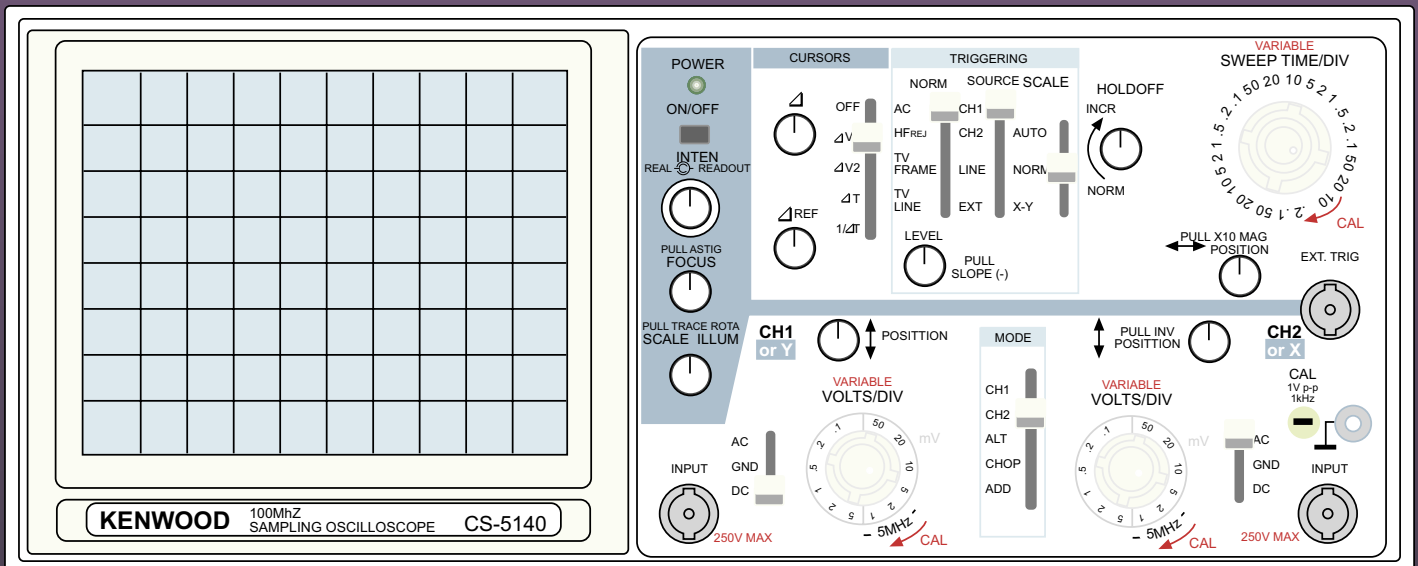


Self Help Guides



Kenwood CS5140 Oscilloscope

Produced by John Wilmot

(1) POWER

Power switch. A press of this switch turns the power ON.

(2) POWER LED

Lights when oscilloscope is turned on.

(3) INTENSITY (REAL)

Adjusts the intensity of trace.

(4) READOUT INTENSITY

Adjusts the intensity of the characters in the READ OUT line and the cursor. Full counterclockwise rotation turns off the READOUT function.

(5) FOCUS/ASTIGMATISM

FOCUS: Adjusts the trace for optimum focus.

ASTIG: Used to bring the waveform into the best focus across the whole screen. Pull the knob to adjust astigmatism.

(6) SCALE ILLUM/ TRACE ROTATION

SCALE ILLUM: Brightness adjustment of the scale of the CRT. For photographing, rotate the knob to adjust brightness to prevent halation caused by too bright illumination.

TRACE ROTA: Use a screwdriver to adjust the trace to a horizontal position. Once adjusted, this control does not require frequent readjustment.

(7) CAL

Provides approximately 1 kHz, 1 V peak-to-peak square wave signal. This is useful for probe compensation adjustment.

(8) GND

Earth and chassis ground Terminal.

VERTICAL CHANNELS

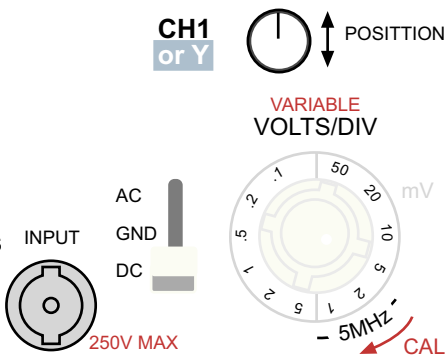
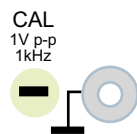
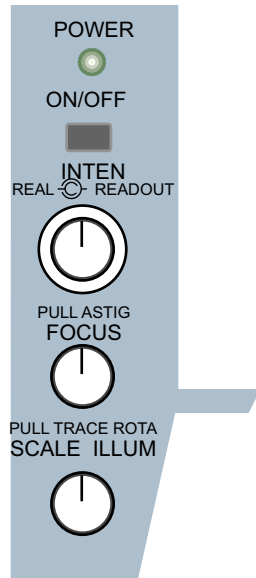
CHANNEL 1

(9) POSITION

Rotation adjusts vertical position of CH 1 waveform on the screen. In X- Y operation, this control adjusts Y axis position.

(10) VOLTS/DIV

Vertical attenuator for channel 1. Provides step adjustment of vertical sensitivity in 1-2-5 sequence. VARIABLE (11) control is turned to the CAL position, the calibrated vertical sensitivity is obtained. In X- Y operation, this control serves as the attenuator for Y axis.



(11) VARIABLE

Provides fine control of channel 1 vertical sensitivity.

(12) AC-GND-DC

This switch is the CH 1 vertical axis coupling mode selector. In X-Y operation, the switch provides input coupling selection of Y-axis

AC: AC input coupling, blocking any DC signal component.

GND: Vertical amplifier is disconnected from the input signal and connected to ground. This mode is useful in determining the zero reference.

DC: DC coupling, with both the DC and AC components of the input signal displayed on the CRT.

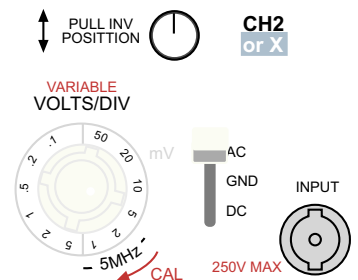
(13) INPUT

Vertical input for channel 1 trace in normal sweep operation. Vertical input for X-Y operation.

CHANNEL 2

(14) VOLTS/DIV

Vertical attenuator for CH2. Provides the same function as VOL TS/DIV Control (10) for CH 1. In X-Y operation, the control serves as the X-axis attenuator.



(15) VARIABLE

Provides fine control of channel 2 vertical sensitivity.

In X-Y operation, this control serves for X-axis attenuation fine adjustment.

(16) AC-GND-DC

Selects the coupling of channel 2 vertical input signal. In X-Y operation, the switch provides input selection of X-axis

(17) INPUT

Vertical input for channel 2 trace in normal sweep operation. Horizontal input in X-Y operation.

(18) POSITION/INV

Adjusts vertical position of channel 2 trace.

INV: Push-pull switch selects channel 2 signal inverted when pulled out.

(19) MODE

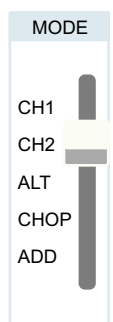
Selects the basic operating modes of the oscilloscope.

CH 1 : Only the input signal to channel 1 is displayed as a single trace.

CH2: Only the input signal to channel 2 is displayed as a single trace.

AL T: Alternate sweep is selected regardless of sweep time.

CHOP: Chop sweep is selected regardless of sweep time at approximately 250 kHz.



ADD: The waveforms from channel 1 and channel 2 inputs are added and the sum is displayed as a single trace. When the CH2 INV ; button is engaged, the waveform from channel 2 is subtracted from the channel 1 waveform and the difference is displayed as a single trace.

TRIGGERING

(20) COUPLING

Selects coupling for AC sync trigger signal.

AC: Trigger is ac coupled. Blocks DC component of input signal; most commonly used position.

HFrej: Sync signal is coupled through a low-pass filter to eliminate high frequency components for stable triggering of low frequency signals.

TV: Vertical sync pulses of a composite video FRAME signal are selected for triggering.

TV: Horizontal sync pulses of a composite video

LINE signal are selected for triggering.

(21) SOURCE

CH1: Channel 1 signal is used as a trigger source.

CH2: Channel 2 signal is used as a trigger source.

LINE: Sweep is triggered by line voltage (50/60 Hz).

NOTE:

When the COUPLING switch is set to other than AC synchronization may not be obtained. In this case, set the COUPLING switch to the AC position.

EXT: Sweep is triggered by signal applied to EXT TRIG INPUT jack

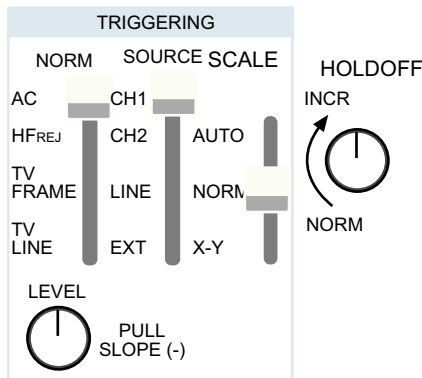
(22) TRIGGERING MODE (TRIG MODE)

Selects triggering mode.

AUTO: Triggered sweep operation when trigger signal is present, automatically generates sweep (free runs) in absence of trigger signal.

NORM: Normal triggered sweep operation. No trace is presented with no input or if the triggering level is not set correctly.

X-Y: X-Y operation. Channel 1 input signal produces vertical deflection (Y axis). Channel 2 input signal produces horizontal deflection (X axis).



This operates regardless vertical MODE selection.

(23) LEVEL/SLOPE (-)

LEVEL: Trigger level adjustment determines level on waveform where sweep triggers.

When COUPLING switch is selected in VIDEO-FRAME or LINE, the trigger level adjustment has no effect.

SLOPE (-) : Two-position push-pull switch.

Switch Pulled out position selects negative going (-) slope and pushed in position selects positive-going (+) slope as triggering point.

(24) HOLDOFF

Adjust the sweep-to-sweep interval. Turning the HOLDOFF from the NORM (full c.c.w.) position varies the hold off time to more than x 10 at the MAX (full c.w.) position.

(25) EXT TRIG INPUT

When SOURCE switch is selected in EXT position, the input signal at the EXT TRIG INPUT BNC connector becomes the trigger.

HORIZONTAL TIMEBASE

(26) VARIABLE

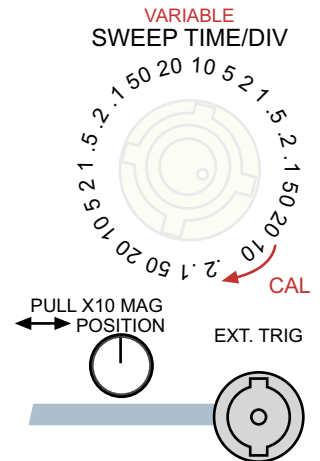
This is the sweep rate fine-adjustment control, which allows continuous variation between SWEEP TIME/DIV ranges.

The sweep rate is calibrated when the control is turned fully clockwise to the CAL position.

(27) SWEEP TIME/DIV

Horizontal coarse sweep time selector.

Selects calibrated sweep times of 0.2 p.S/div to 10 ns/div in 23 steps when sweep time VARIABLE control (25) is set to CAL position (fully clockwise).



Measurement in the range between 0.1 p.S/div and

10 ns/div is automatically performed in the equivalent sampling mode, allowing observations of repetitive waveforms. At the same time, the bandwidth is extended to 100 MHz provided that the vertical axis attenuator is in the range between 5 mV/div and 5 V/div.

(28) POSITION/X 10 MAG

Horizontal position provides horizontal shift of the waveform. By pulling the knob, the sweep time is magnified ten times. In the X-Y operation mode. It functions as an X position controller.

Also functions as an X position controller of the storage waveform.

NOTE: In X-Y operation, keep this knob pressed in (normal sweep mode).

(29) \downarrow

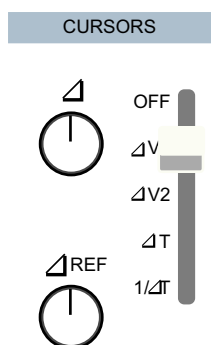
Controller for shifting the measuring cursor (coarse dotted line) out of two cursor lines displayed on the CRT in the cursor measurement. By rotating the controller clockwise, the cursor line moves upward or rightward: by rotating counterclockwise, it moves downward or leftward depending on whether voltage or time measurement has been selected.

(30) \downarrow REF

Controller for shifting the reference cursor (fine dotted line) out of two cursor lines displayed on the CRT in the cursor measurement. By rotating the controller clockwise, the cursor line moves upward or rightward: by rotating counterclockwise, it moves downward or leftward depending on whether voltage or time measurement has been selected.

(31) CURSORS

Cursor measurement mode select switch.



OFF: Cursor measurement is not performed. The cursor, and cursor measurement value are not displayed on the CRT.

\downarrow V1: Two horizontal cursor lines are displayed on the CRT, and voltage difference and voltage ratio between them are displayed in the upper right on the CRT.

Setting the CH1 VARIABLE controller (11) to the CAL position causes voltage difference measurement, and a value calculated in accordance with setting of the CH1 VOL TS/DIV dial (10) is displayed posterior to \downarrow V1.

Setting the CH1 VARIABLE controller (11) to the UNCAL position causes voltage ratio measurement, and a value calculated assuming that 5 div. is 100% is displayed as a percentage RATIO.

When the \downarrow cursor is below the \downarrow REF cursor, a negative value is displayed.

NOTE: Setting of the MODE select switch (11) to the CH2 position causes \downarrow V2 mode cursor measurement.

\downarrow V2: Two horizontal cursor lines are displayed on the CRT, and voltage difference and voltage ratio between them are displayed in the upper right on the CRT.

Setting the CH2 VARIABLE controller (15) to the CAL position causes voltage difference measurement, and a value calculated in accordance with setting of the CH1 VOL TS/DIV dial (14) is displayed posterior to \downarrow V2.

Setting the CH2 VARIABLE controller (15) to the UNCAL position causes voltage ratio measurement, and a value calculated on the basis of 5 div. as 100 % is displayed as a percentage RATIO.

When the \downarrow cursor is below the \downarrow REF cursor, a minus value is displayed.

NOTE: Setting of the MODE select switch (19) to the CH 1 position causes \downarrow V1 mode cursor measurement.

Setting of the MODE select switch (22) to the X-Y position disables \downarrow V2 mode measurement.

\downarrow T: Two vertical cursor lines are displayed on the CRT, and time difference and time ratio between them are displayed in the upper right on the CRT.

Setting the SWEEP VARIABLE controller (27) to the CAL position causes time difference measurement, and a value calculated in accordance with setting of the SWEEP TIME/DIV dial (26) is displayed posterior to \downarrow T.

Setting the SWEEP VARIABLE controller (27) to the UNCAL position causes time ratio measurement, and a value calculated assuming that 5 div. is 100% is displayed as a percentage RATIO.

When the d cursor is on the left of the \downarrow REF cursor, a minus value is displayed.

NOTE: Setting of the MODE select switch (22) to the X-Y position disables \downarrow T mode measurement.

1/ \downarrow T: Two vertical cursor lines are displayed on the CRT, and frequency and phase difference between them are displayed in the upper right on the CRT.

Setting the SWEEP VARIABLE controller (26) to the CAL position causes frequency measurement, and a value calculated in accordance with setting of the SWEEP TIME/DIV dial (27) is displayed posterior to 1/ \downarrow T.

Setting the SWEEP VARIABLE controller (26) to the UNCAL position causes phase difference measurement, and a value calculated assuming that 5 div. is 360 is displayed as a percentage of the PHASE.

When the A cursor is on the left of the A REF cursor, a minus value is displayed. However, frequency is displayed in an absolute value.

NOTE: Setting of the MODE select switch to the X-Y position disables 1/ \downarrow T mode measurement.

