

# COR5500U series

## DIGITAL AND CRT READOUT OSCILLOSCOPE



### 100MS/s Digital Oscilloscope

COR5502U (100MHz)

### 20MS/s Digital Oscilloscope

COR5501U (100MHz) / COR5561U (60MHz) / COR5541U (40MHz) / COR5521U (20MHz)

### 100,60MHz Readout Oscilloscope

COR5500U (100MHz) / COR5560U (60MHz)

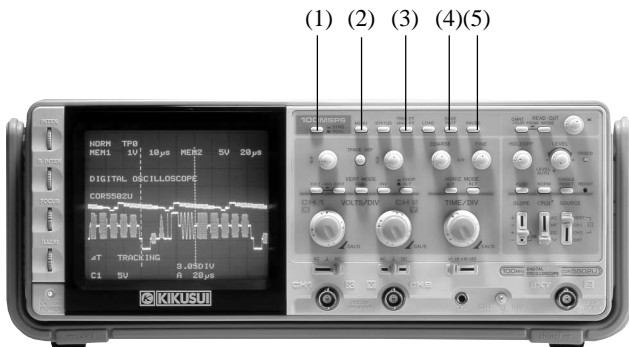
## Outline

The application of electronics technology is no longer limited to the fields of electronics and electricity, but has expanded to include a much wider range which encompasses the fields of automobiles, steel, chemicals and so on. Accompanying this expansion, applications of oscilloscopes are also found in an increasingly large number of fields. As such, there is a strong demand for oscilloscopes that can be used in a variety of ways by practically anyone, are easy to operate and have a multiple number of functions. Kikusui's COR5500U series of oscilloscopes that can be used in a variety of ways by practically anyone, are easy to operate and able to precisely respond to these types of needs. In particular, these oscilloscopes realize reduced size and weight along with a considerable improvement in quality as a result of being equipped with an originally developed dedicated gate array using SMT (surface mount technology). Moreover, they also deliver superior ease of operation. In addition, the digital types of the series are able to reproduce storage waveforms with the feel that is close to that of analog operation as a result of being provided with 4 kilowords of memory display per channel. The entire series consists of 7 models of digital and analog types with variation in the four frequencies of 100, 60, 40 and 20MHz. This lets the user choose the specific model to match the application form among a wide variety of functions and characteristics.

## Features

- CRT readout function for displaying set values along with measured values of voltage, time and frequency, etc. using the cursor function
- Waveform magnification and alternating waveform magnification function
- User-controlled comment function
- Wide power source voltage range of 100-240V
- Storage Mode Features (COR5502U/COR5501U/COR5561U/COR5541U/COR5521U)
- 100MS/s: COR5502U, 20MS/s: COR5501U, COR5561U, COR5541U, COR5521U | 2-channel simultaneous sampling, Vertical resolution: 8bits | Effective bandwidth (Repetitive signal): 100MHz (COR5502U, COR5501U), 60MHz (COR5561U), (Single event signal): 28.5MHz (COR5502U), 5.7MHz (COR5501U, COR5561U, COR5541U, COR5521U)
- Acquisition memory capacity: 4k word/channel
- Two internal storage (save) memories
- Comment function
- CRT Readout function
- Cursor function (DV, DT, 1/DT)
- Optional GPIB or RS-232C interface

### Functions (Storage Mode)



- (1) Real Mode/Storage Mode Selector Switch
- (2) Used to select menu display during the storage mode along with storage menu status.
- (3) This allows selection of the location of the trigger point analog with the location of the magnification point following a pause (0,1,5 or 9 divisions).
- (4) Displayed waveforms can be stored in two storage memories and recalled when desired (4 kw × 2)
- (5) Waveforms following a pause when in the storage mode can be magnified in the horizontal direction up to 1000 times in a maximum of 9 steps.

### Maximum 2-Channel Simultaneous Sampling Rate of 100MS/s (COR5502U)

The digital oscilloscopes COR5502U is equipped with A/D converters having a resolution of 8 bits for each channel and featuring a maximum 2-channel simultaneous sampling rate of 100MS/s, allowing these oscilloscopes to accurately capture single events up to a maximum of 28.6MHz (when using curve interpolation).

### Maximum Memory Capacity of 4 kw per Channel

Both channels are equipped with 4 kilowords of memory allowing 400 points of data to be displayed per 1 division. This results in the realization of storage waveforms that are extremely close to analog waveforms.

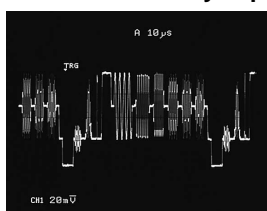
### 100MHz Equivalent Sampling Rate (COR5502U/COR5501U)

The model COR5502U and COR5501U are able to digitize repetitive waveforms up to 100MHz through the use of equivalent sampling. In addition, the use of a random sampling system allows the use of a pre-trigger.

### Pre-Trigger Function

This function allows events prior to the trigger to be observed, something that is not possible in the case of ordinary oscilloscopes. In the case of sporadic events, there are times when it is helpful to observe the events that occur prior to such events. Setting the location of the trigger point allows reliable observation of events stored prior to the trigger point. The trigger point can be selected from among 4 points at 0,1,5 or 9 divisions.

### Maximum memory capacity of 4kw/ch



Waveform displayed with 1kw of memory



waveform displayed with 4kw of memory

### One - Touch Real/Storage Mode Switching



Switching between the real mode and the storage mode can be performed with the single press of a button.

### Menu Display and Storage Mode

#### Storage Menu Display

The storage menu can be displayed by simply pressing the menu key. The status key allows the status of each of the mode to be switched easily (between ON and OFF).

#### Roll Mode

This mode allows events that change slowly and signals having a comparatively slow repetition cycle to be observed continuously. The most recent data that has been incorporated is constantly displayed on the right side of the monitor, with the display then rolling to the left each time new data is incorporated.

#### Repetitive Mode

(COR5502U/COR5501U/COR5561U)

In the case of repetitive signals, this mode allows signals having frequency components that are higher than maximum real-time sampling to be digitized through the use of an equivalent sampling system.

#### Interpolation Function (Interpolation Mode)

When the number of sampling points decreases with respect to the signal period, the display dots become coarse making the observed waveform difficult to see. Interpolation is used to connect the areas between dots in order to display the waveform in a more legible form. Either linear interpolation or curve interpolation can be selected corresponding to the signal being observed. As linear interpolation generates estimated data based on the areas between actual sample data being connected linearly, it is suited to the observation of pulse waveforms such as square waves and so on. On the other hand, as curve interpolation generates estimated data based on the areas between actual sample data being connected with a curve, including data before and after those points, it is suited to observation of curved waveforms such as sine waves.

#### Plot Out

The data shown on the CRT can be directly output to a GPIB plotter compatible with HP-GL commands with the signal press of a button through the use of an optional GPIB interface.

#### View Time

This allows setting of the time from digitizing of the input signal and display on the CRT to beginning of the next acquisition operation. View time is roughly 1 second.

#### Two 4kw Storage Memories

In addition to a 4kw display memory, the waveform memory is also provided with two 4kw storage memories. As the contents of storage memory can be displayed on the CRT at any time comparative observation of waveforms is easy. In addition, as these memories are backed up by batteries, data is continuously stored in memory even if the power is turned off.

#### Magnified Display Function (Pause-Mag Function)

In the case of putting the waveform following storage in the pause state and interrupting loading of the waveform, the waveform displayed on the CRT can be magnified up to 1000 times (in a maximum of 9 steps) in the direction of the time axis. Magnification points can be selected from among 0, 1, 5 or 9 divisions. If the magnification ratio is 2 or greater, the displayed portion can be moved to the left or right through the use of the window function.

#### GPIB/ RS232C Interface Function

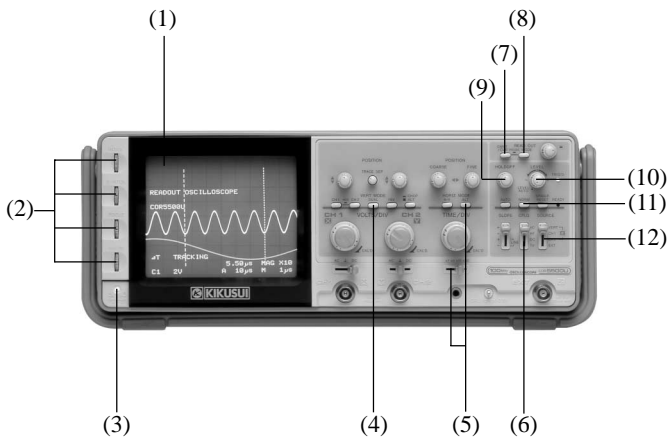
Panel settings, stored waveform data and measured results using the cursor can be transferred to an external controller via GPIB or RS232C Interfaces. In addition, data on the CRT can be directly output to a GPIB plotter (HP-GL compatible) by means of the plot out function.



# COR5500U series

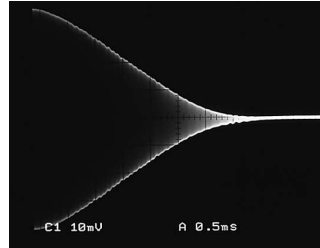
## DIGITAL AND CRT READOUT OSCILLOSCOPE

### Functions (Real Mode)



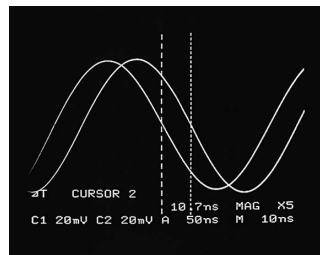
- (1) **Wide-Ranging Power Source Voltage**  
Allows operation over a wide power source voltage range of 100-240V without requiring any switching.
- (2) **Allows observation of the displayed waveform in optimum focus.**
- (3) **Large-Sized, High-Luminance CRT**  
A high-luminance, 6-inch CRT with white internal graticule is used, allowing observation of bright and well-defined waveforms.
- (4) **Operating Mode Selector Switches**  
In addition to single sweep of channel 1 and 2, these selector switches also allow the selection of the ADD (CH1±CH2) mode and CH2 INV mode. In addition, switching between the alternate and chop modes can also be performed. The alternate mode alternately displays the waveforms of channels 1 and 2 ones for each sweep, while the chop mode alternately displays the waveforms of channels 1 and 2 at a chop rate of roughly 500kHz.
- (5) **ALT-MAG Function**
- (6) **Television Synchronization Function**  
This function allows TV-H and TV-V waveforms to be observed accurately.
- (7) **User-Controlled Comment Display Function**
- (8) **CRT Readout and Cursor Functions**
- (9) **Holdoff**  
This function allows the obtaining of stable synchronization for even complex waveforms that are difficult to synchronize by adjusting the trigger level alone.
- (10) **Level Auto Function**  
The level auto mode is entered when this knob is turned all the way to the left. This function automatically sets the range of the trigger level to the optimum value corresponding to the amplitude of the input signal.
- (11) **Single Sweep Mode**  
This function results in only a single sweep being made when the trigger is applied from the reset mode. This allows monitoring of single events and useful in cases when the amplitude and period are unstable preventing the display from becoming stationary.
- (12) **Vert Mode Trigger**  
This allows stable synchronization to be obtained for the respective signals of channels 1 and 2 even if the frequencies of their respective input signals vary.

- Realizes excellent frequency characteristics
- Compact Portable Oscilloscope characteristics

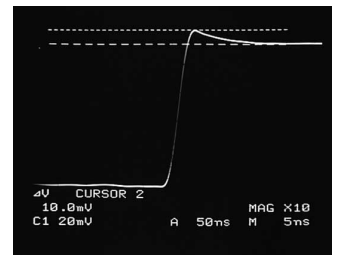


- CRT Readout and Cursor Function

Set values using the CRT readout function and measured values using the cursor function can be displayed with letters and numbers. The cursor function allows measurement and digital display on the CRT of voltage ( $\Delta V$ ), time difference ( $\Delta T$ ) and frequency ( $1/\Delta T$ ) by reading off the distance between two arbitrary points of the waveform which are specified by moving the cursor.



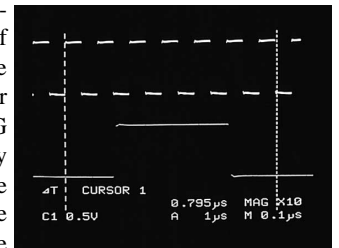
Measurement of Time Difference



Measurement of Voltage

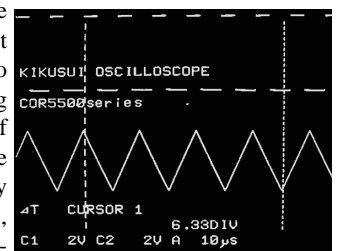
- ALT-MAG Function (Real Mode Only)

The magnification ratio can be selected from among three stages of  $\times 5$ ,  $\times 10$  or  $\times 50$  for magnifying the displayed waveform in the center of the monitor by using the MAG switch. In addition, the primary sweep waveform along with the magnified sweep waveform can be displayed simultaneously using the ALT-MAG function. Moreover, the magnification ratio along with the magnified sweep time can be digitally displayed on the monitor. (In the case of 40MHz and 20MHz type oscilloscopes, the magnification ratio can be selected from among two stages of  $\times 10$ ,  $\times 20$ .)



- Comment Function

These readout oscilloscopes are also equipped with a comment function which allows the user to make his own comments regarding the waveforms. As a maximum of 32 letters or numbers, etc. can be written into the comment display area of the monitor in two rows, this function can prove to be extremely convenient when providing explanation of the waveform or recording measuring conditions.



# COR5500U series

## DIGITAL AND CRT READOUT OSCILLOSCOPE

### Specifications (Digital oscilloscope)

Model	COR5502U	COR5501U	COR5561U	COR5541U	COR5521U
Digital Storage Mode					
Maximum sampling Rate	100MS/s *1	20MS/s *1			
Vertical Axis Resolution	8 bits, 25 points/division				
Horizontal Axis Resolution	12 bits, 400 points/division				
Memory Capacity	Acquisition, 4kW×2				
	Storage memory, 4kW×2				
Effective Storage Frequency	Single event 28.6MHz *2	Single event 5.7MHz *2			
(During Repetitive mode)	100MHz		60MHz		
Equivalent Sampling	20ns to 10μs/DIV		50ns to 10μs/DIV		
Pre-Trigger	0/1/5/9DIV				
View Time	OFF/1s				
Roll Mode	0.2s to 5s/DIV				
Interpolation Function	Linear, Curve				
Magnificaton Function	Horizontal: ×1000				
CRT Readout					
Display of Settings	· CH1/CH2 scale factor ·10:1 probe use display ·A sweep/magnified sweep scale factor				
	· Comments				
Cursor Measurement	ΔV, ΔT, 1/ΔT				
CRT					
CRT Face	6-inch Internal Graticule CRT				
Acceleration Voltage	Approx. 18kV		Approx. 12kV	Approx. 12kV	Approx. 7kV
Real mode					
No. of Vertical Channels	2 channels				
Sensitivity and Bandwidths	1mV, 2mV, DC to 20MHz		1mV, 2mV DC to 20MHz	2mV to 10V DC to 40MHz	2mV to 10V DC to 20MHz
	5mV to 5V, DC to 100MHz		5mV to 5V DC to 60MHz		
Square waveform characteristics	*3 5mV/DIV to 0.5V/DIV ranges, Overshoot: 3% or less, Ringing: 3% or less, Aberration: 5% or less				
X-Y Operation	DC to 2MHz				
Sweep Display	NORM, MAG, ALT-MAG				
Sweep Time	NORM: 20ns to 0.5s/DIV		50ns to 0.5s/DIV	0.1μs to 0.5s/DIV	0.2μs to 0.5s/DIV
	MAG: MAX2ns		MAG: MAX5ns	MAG: MAX5ns	MAG: MAX10ns
Sweep Magnification	×5, ×10, ×50			×10, ×20	
Environments					
To meet performance specifications	+10 to +40°C (50°F to 104°F)				
Allowable range (in operation)	0 to +50°C (32°F to 122°F)				
Mechanical vibration	Frequency 10 to 55Hz, Sweep times: 15 minutes, Amplitude: 0.3mm, Acceleration: 1.8G (55Hz)				
Mechanical shocks	30G, sine half-wave, duration 11msec, applied three times in each of the positive and negative directions on each of the three mutually perpendicular axes (total 18 times)				
EMI	Based on VDE 0871 Class B, and FCC Class B				
Power Souce	AC100 to 240V/50 to 400Hz				
Dimensions (MAX)	Approx. 88W, 140VA	Approx. 55W, 85VA		Approx. 45W, 65VA	
	330W × 125H × 385Dmm (360W × 145H × 420Dmm)				
Weight	Approx. 7kg	Approx.6.5kg			

\*1 2 channel simultaneously

\*2 During curve interpolation

\*3 5mV/DIV to 0.2V/DIV in case of 40MHz, 20MHz oscilloscopes

# COR5500U series

## DIGITAL AND CRT READOUT OSCILLOSCOPE

### Specifications (Readout Oscilloscope)

Model	COR5500U	COR5560U
CRT Readout		
Display of Settings	CH1/CH2 scale factor, 10:1 probe use display, A sweep/magnified sweep scale factor	
Cursor Measurement	Comments $\Delta V$ , $\Delta T$ , $1/\Delta T$	
CRT		
CRT Face	6-inch internal Graticule CRT	
Acceleration Voltage	Approx. 18kV	Approx. 12kV
Vertical Axis		
Operating Modes	CH1, CH2, DUAL (ALT/CHOP), ADD, CH2 INV	
No. of Vertical Channels	2 channels	
Sensitivity and Bandwidths	1mV, 2mV, DC to 20MHz 5mV to 5V, DC to 100MHz	1mV, 2mV, DC to 20MHz 5mV to 5V, DC to 60MHz
Square waveform characteristics	* 5mV/DIV to 0.5V/DIV ranges, Overshoot: 3% or less, Ringing: 3% or less, Aberration: 5% or less	
Trigger		
Signal Source	VERT, CH1, CH2, EXT	
Coupling Types	AC, DC, TV (TV · V, TV · H), HF · REJ	
Level Auto	Provided	
Holdoff	Provided	
Horizontal Axis		
Sweep Modes	AUTO, NORM, SINGLE	
Sweep Displays	NORM, MAG, ALT-MAG	
Sweep times	20ns to 0.5s/DIV MAG: MAX2ns	50ns to 0.5s/DIV MAG: MAX5ns
Sweep Magnification	$\times 5$ , $\times 10$ , $\times 50$	
X-Y		
Operating Modes	CH1: X, CH2: Y	
Frequency Bandwidth	DC to 2MHz -3dB	
Environments		
To meet performance specifications	+ 10 to + 40 °C (50 °F to 104 °F)	
Allowable range (in operation)	0 to + 50 °C (32 °F to 122 °F)	
Mechanical vibration	Frequency 10 to 55Hz, Sweep time: 15 minutes, Amplitude: 0.3mm, Acceleration: 1.8G (55Hz)	
Mechanical shocks	30G, sine half-wave, duration 11msec, applied three times in each of the positive and negative directions on each of the three mutually perpendicular axes (total 18 times)	
EMI	Based on VDE 0871 Class B, and FCC Class B	
Power Source	AC100 to 240V/50 to 400Hz Approx. 45W, 70VA	
Dimensions (MAX)	330W $\times$ 125H $\times$ 385Dmm (360W $\times$ 145H $\times$ 420Dmm)	
Weight	Approx. 6kg	

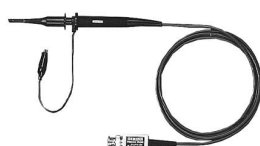
### Options

#### ■ Accessory Probes

Model P100-8CE (10:1)  
(model COR5502U, COR5501U, COR5500U)  
Model P060-6CE (10:1 / 1:1)  
(model COR5561U, COR5541U, COR5521, COR5560U)



P100-8CE



P060-6CE

#### ■ Options

GPIB Interface Board (IF01-COR)\*  
 RS232C Interface Board (IF02-COR)\*  
 Shielding Cylinder for Magnetic Shielding Reinforcement (Factory option, 100MHz and 60MHz types only)

\* Can be mounted on digital oscilloscopes models COR5502U, COR5501U, COR5561U, COR5541U and COR5521U.

\* The Interface Boards are customer installable.

