

HITACHI

Professional Laptops Color Digital Oscilloscopes

Large, 10.4-inch TFT LCD display (VGA)
Easy-to-understand menu-driven operation
Help function
Maximum of 2 Mword/channel of memory
Type III PC card slot
Hard disk drive (260 MB; option)
SRAM card (4 MB max.; option)
Floppy disk drive
Expanded trigger

VC-5810

100 MS/s, 150 MHz, 4 channels
64 Kword (standard), 256 Kword/ 2 Mword (option)

VC-5850

500 MS/s, 300 MHz, 2 channels
256 Kword (standard), 2 Mword (option)



Floppy Disk Drive &
Expanded Trigger in
Europe Standard

These products are manufactured at a position which has received quality control system certification in accordance with the ISO 9001 international standard.



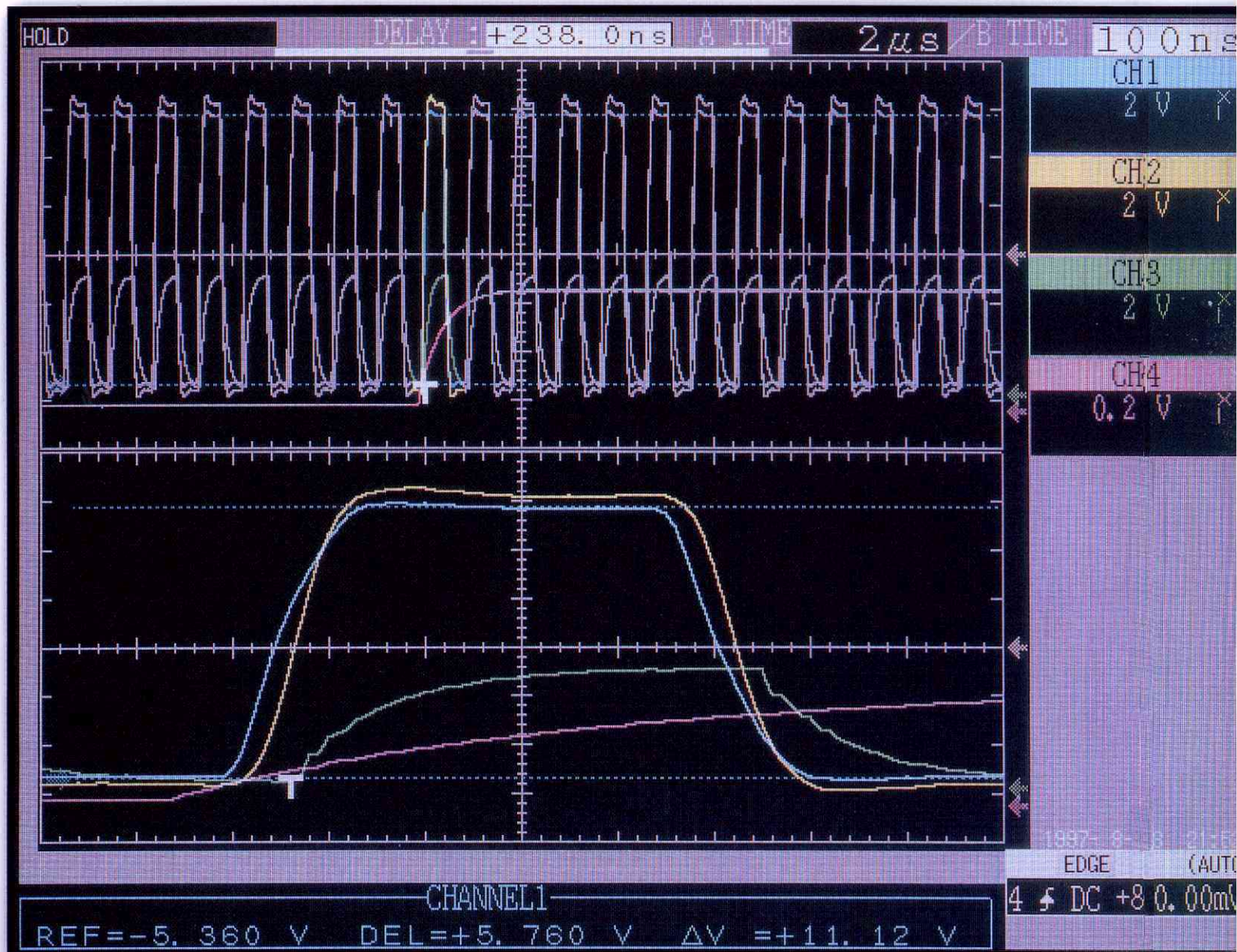
CERTIFICATE No.
JQA-0002
ISO 9001:1994
DS ON 95001:1994
EN-ISO 9001:1994
JIS Z 9901:1994

Easy-to-View Display

Large (10.4-Inch) Color TFT Display

In waveform observation and measurement, in addition to the obvious sampling speed and bandwidth specifications, an essential feature of any oscilloscope is any easy-to-view display. Realizing the importance of this basic feature, Hitachi Denshi adopted a large, high-intensity, highspeed-refresh 10.4-inch color TFT with wide viewing angle.

High-intensity, Wide Viewing Angle, High Speed, Immunity to Magnetic Fields, and Color Display



(Actual size)

Specifications

Measurement Functions

Cursor measurement	Types: Measurement between cursors, waveform-tracking ΔV measurement
Pulse parameter measurement	Items: V (REF, Δ , ΔV), T (REF, Δ , ΔT) Four of the following pulse parameters can be measured simultaneously. Frequency, period, rise time, fall time, positive pulse width, negative pulse width, duty cycle, minimum value, maximum value, peak-to-peak value, base, top, amplitude, pre-shoot, over-shoot, rms, average value.
Automatic measurement	Automatic setup GO-NOGO comparison (action: beeper, hold, save, printer output, open-collector output)

Save Functions

<Standard>	
Display waveform memory function	Waveform memory data and measurement conditions for 4 waveforms is saved.
Setup memory	10 sets of setup conditions
Panel backup	Restarted with the conditions in effect when the power was last switched off.
<Option>	
Floppy disk, hard disk and SRAM card	Floppy disk drive (built-in) Hard disk drive (inserted into PC card slot) SRAM card (inserted into PC card slot) Display image, display waveform memory, acquisition memory waveforms and setup can be saved.

Input/Output Functions

Interfaces	RS-232C, GPIB, Centronics
Panel control	Fully programmable via the RS-232C or GPIB from an external personal computer or other device.
Printer output	ESC/P(color & b/w), Deskjet(color & b/w)
Plotter output	Output to an HPGL compatible printer Number of pen colors: 7 Plot sizes: A6, A5, A4, A3 Paper sizes: A4, A3
PC card slot	One Type III card or two Type II cards Usable with a separately sold SRAM card and hard disk drive.
Video output	Connection is possible to a VGA compatible display.
Calibration output	Frequency: 1 kHz $\pm 20\%$ Voltage: 5 V $\pm 1\%$

Clock Function

Time display	Time and date displayed on the screen. Time and date are included in printer and plotter output. Time and date are stored along with waveform data when saving.
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General Specifications

Outer dimensions	280 (W) x 335 (D) x 80 (H) mm 11.0 (W) x 13.2(D) x 3.15 (H) ins
Weight	Approx. 4.5 kg / 9.92 lb
Line voltage	90 to 132 / 198 to 264 VAC
Line frequency	48 to 62 Hz
Power consumption	VC-5810: 70 W max., VC-5850: 90 W max.
Ambient temperature	Temperature for guaranteed performance: 10 to 35°C (when automatically calibrated at 25°C $\pm 5^\circ\text{C}$)
humidity	Operating temperature: 0 to 40°C Storage temperature: -20 to +60°C Operating humidity: 45 to 80% Storage humidity: 35 to 85% (70% max. at an ambient temperature above 50°C)
Safety compliance	IEC348 Class 1

Standard accessories

Power cord,
Probes (VC-5810: 2, VC-5850: 2),
instruction manual



Specifications

Display																
Display type	10.4-inch color TFT LCD (backlighted)															
Resolution	640 (H) x 480 (V) dots (VGA specifications)															
Scale divisions	10 div (H) x 8 div (V)															
Waveform display resolution	50 dots/div (H) x 50 dots/div (V)															
Vertical Axis																
Resolution	8 bits															
Sensitivity	1 mV/div to 5 V/div (12 steps)															
Accuracy	±2% (±5% in 1 mV and 2 mV ranges)															
Bandwidth (-3-dB point)	VC-5810: DC to 150 MHz VC-5850: DC to 300 MHz															
Frequency cutoff with AC coupling	10 Hz															
Bandwidth limiter	20 MHz															
Number of input channels	VC-5810: 4 VC-5850: 2															
Input coupling	DC, AC, ground															
Input impedance	1 MΩ ±1.5%, 25 pF ±3 pF															
Input withstand voltage	400 V (DC + ACpeak at 1 kHz)															
Operating mode	Each channel independently switchable on/off															
Horizontal Axis																
Maximum sampling rate	VC-5810: 100 MS/s (4 channels simultaneously) VC-5850: 500 MS/s (2 channels simultaneously)															
Maximum Equivalent sampling rate	VC-5810: 25 GS/s VC-5850: 50GS/s															
Acquisition memory capacity	VC-5810: 64 Kword (standard) 256 Kword/channel, 2 Mword/channel (options) VC-5850: 256 Kword (standard) 2 Mword/channel (option) A, ALT, B															
Modes																
Sweep time	A sweep: Equivalent sampling; VC-5810: 2 ns/div to 0.2 μs/div ±1% VC-5850: 1 ns/div to 50 ns/div ±1% Real-time sampling; VC-5810: 20 ns/div to 1 s/div ±0.04% (20 ns to 0.2 μs/div is expanded) VC-5850: 5 ns/div to 1 s/div ±1% (5 ns to 50 ns/div is expanded) Roll mode; 0.2 s/div to 50 s/div ±0.25% B sweep (real-time sampling only): VC-5810: 20 ns/div to 1 s/div (Depends upon A sweep time and memory capacity) VC-5850: 5 ns/div to 1 s/div (Depends upon A sweep time and memory capacity)															
Pretriggering	Up to 10 div															
Post-triggering	Up to 10000 div															
Peak detector	VC-5810: 100% capture of glitches 10 ns or larger VC-5850: 100 capture of glitches 2 ns or larger															
Divided-memory capture	VC-5810: Up to 32 waveforms (up to 1024 waveforms with 2 Mw) VC-5850: Up to 128 waveforms (up to 1024 waveforms with 2 Mw)															
Triggering																
Source	VC-5810: CH1, CH2, CH3, CH4, EXT VC-5850: CH1, CH2, EXT															
Mode	Auto, Norm															
Coupling	DC, AC, HFrej, LFrej															
Slope	+, -															
Trigger level	Manual setting, 50% automatic setting															
Trigger sensitivity	VC-5810															
	<table border="1"> <thead> <tr> <th>Trigger signal</th> <th>Frequency</th> <th>Sensitivity</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td>5 mV to 5 V/div 1 mV, 2 mV/div</td> </tr> <tr> <td>Internal</td> <td>DC to 20 MHz</td> <td>0.5 div min. 2.5 mVp-p min.</td> </tr> <tr> <td>CH1 to CH4</td> <td>20 to 150 MHz</td> <td>1.5 div min. 7.5 mVp-p min.</td> </tr> <tr> <td>External</td> <td>DC to 150 MHz</td> <td>0.1 Vp-p min.</td> </tr> </tbody> </table>	Trigger signal	Frequency	Sensitivity			5 mV to 5 V/div 1 mV, 2 mV/div	Internal	DC to 20 MHz	0.5 div min. 2.5 mVp-p min.	CH1 to CH4	20 to 150 MHz	1.5 div min. 7.5 mVp-p min.	External	DC to 150 MHz	0.1 Vp-p min.
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AC cutoff frequency	Approx. 10 Hz (-3-dB point)
HF, LF cutoff frequency	Approx. 50 kHz
AUTO low end	Approx. 20 Hz
Expanded Trigger Functions (Option)	
TV trigger	Modes: TV-H, TV-V, TV line selector Sensitivity: SYNC part 1 div min. (negative) Line selector: 525/625 lines, switchable 1, 3 / 2, 4 fields, switchable Line number setting
Window trigger	Triggering when a signal either exists or enters a band defined by two trigger levels
Delay trigger	After the occurrence of a first trigger, the wait mode for the second trigger is enabled, triggering occurring on the second trigger.
Dropout trigger	Triggering occurs when the occurrence interval of the edge trigger exceeds a set time.
Event trigger	Triggering occurs after the first trigger, at n-th occurrence of the second trigger.
Logic trigger	The signals of each channel (5 channels in the VC-5850, 3 channels in the VC-5810) are taken as either high or low with respect to the trigger level as a reference. The following three types of trigger are possible. Pattern trigger: Triggering occurs when the logic pattern of the channels coincides with a set pattern. State trigger: Triggering occurs when the states of the channels at the rising or falling edge of an arbitrary clock channel coincide with a set pattern. Pulse width trigger: Triggering occurs when the high or low pulse time width is greater or less than a set time.
Display Functions	
Color coding	Colors are assigned to waveforms, measurement condition setting values, and measurement values for each channel. Up to 15 colors can be used simultaneously for scales, menu, and waveform display.
Waveform display	Refresh display/variable persistence display Window display (number of windows: 1, 2 or 4) Waveform clear, dot display/line display Real-time interpolated display (sine/linear) X-Y display, horizontal expansion/movement, vertical expansion/movement
Other display items	GND point, trigger level Scales (grid, frame, axes) Waveform display position indicator
Processing Functions	
Averaging	Exponential averaging: 2 to 256 weight (powers of 2)
Waveform calculation	Addition, subtraction, multiplication, inversion, absolute value, FFT calculation
Search function	Automatic waveform search for value above or below a specified value. Manual paging Jump position marking
Envelope	Maximum and minimum values held over 2 to 2048 (power of 2) sweeps, and infinite sweeps.

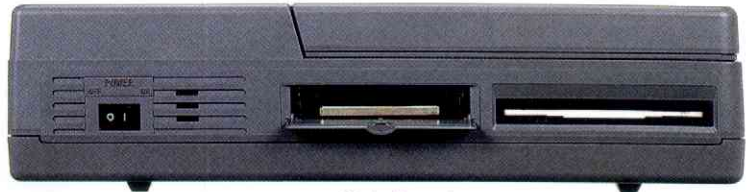
Expandable Measurement Capabilities

Versatile Interfacing Enables Systems Applications

With the widespread use of personal computers and adoption of multimedia environments, oscilloscopes must provide more versatile interfaces to the outside world. Since the oscilloscope is so widely used in fields which include mechatronics, biotechnology, and environmental fields, there is a strong need to avoid designing an instrument so as to lock out specific users and functions. In the VC-5800 Series, to facilitate connections to personal computers and other equipment, GPIB, RS-232C, Centronics, and PC card slot interfaces are provided. Using a flash memory, it is possible to rewrite firmware without disassembling the oscilloscope. The versatility of the VC-5800 Series interfacing also facilitates the accommodation of various PC cards, special implementation, and specially ordered specifications.



Back Panel



Side Panel

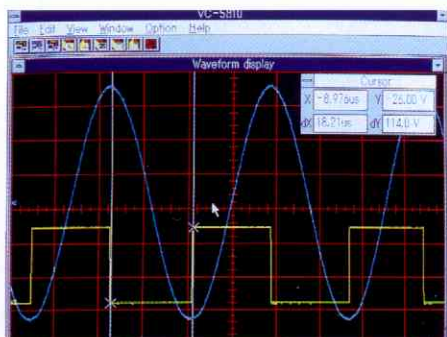
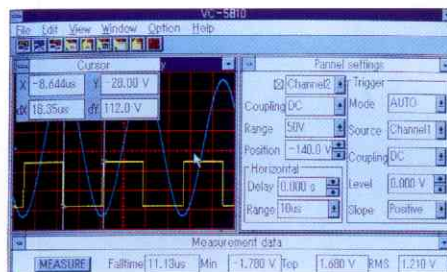
Versatile Interfacing

The GPIB, RS-232C, and Centronics interfaces are provided as standard, enabling connection to a wide variety of external devices, thereby simplifying the implementation of a system built around the VC-5800 Series oscilloscopes.



ScopeLink PC Connection Software (separately sold)

The separately sold ScopeLink software enables the sending from the personal computer of panel control waveforms, setting conditions, and measurements.



Accommodates a Wide Range of Storage Media

It is possible to store data onto a floppy disk (option), to a hard disk (option) connected at a PC card slot, and to SRAM (option), enabling the storage of huge amounts of waveform data and measurement conditions. In all cases the use of DOS format enables the data to be ported to a computer as is.

<Stored files can be arbitrarily named and stored to a selected directory>

<The waveform storage format can be selected as binary, CSV, PRN, or text.>

<The output device for hardcopy can be set to a storage medium to enable storage in the BMP, TIFF, or PCX format.>



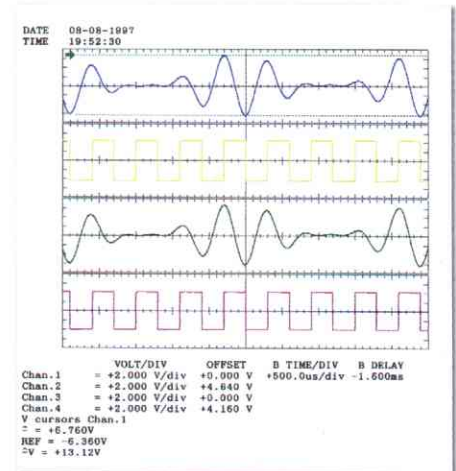
Save Wizard



File tool Wizard

Hardcopy Output to a Color Printer

Hardcopies can be generated by connection to conventional PC printers such as ESC/P or Deskjet printers. Identification of waveforms is further enhanced by making output to a color printer, and plotter output is also possible.



VGA Video Output for Educational and Presentation Applications

By using the VGA video output, it is possible to make a display to a large external display screen or video projector, a useful feature for use in educational and presentation applications.

Overwritable System Software

By overwriting system software, it is possible to write system software to flash memory, to add user-specific software, and to effect version upgrades without having to replace ROMs.

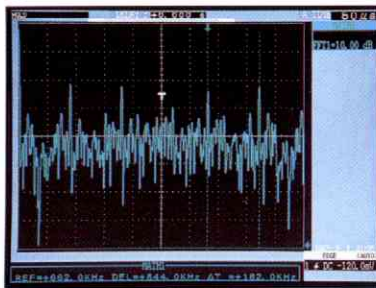
Versatile Analysis Functions

Automatic Measurement, Comparison, and Calculations of Collected Waveforms

It is possible to perform various measurements, comparisons, and post-processing on collected waveforms. For example, using to perform frequency analysis by means of an FFT calculation, enabling harmonic analysis and analysis of noise. GO-NOGO comparisons against set values enable use of these oscilloscopes in automated inspection systems or unattended systems designed to collect abnormal signals.

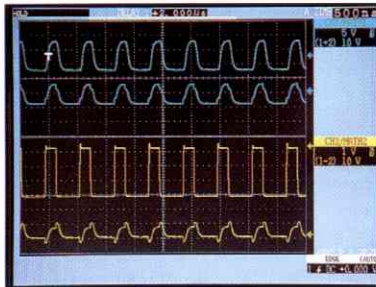
FFT

Frequency analysis is possible using an FFT algorithm. Analysis is possible, enabling frequency analysis of one-time signals, and opening up a wide range of applications, such as power supply harmonic analysis, video signal frequency characteristics analysis, and noise analysis of communications signals.



Waveform Calculations

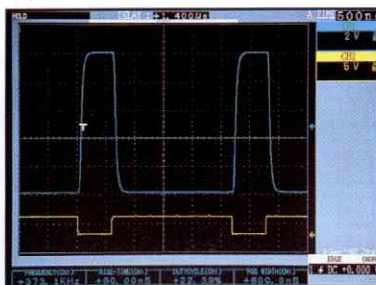
Waveform calculations include addition, subtraction, multiplication, inversion, and absolute value. Fourth types of calculation can be performed simultaneously and, after calculation, a waveform can be measured just like normal waveforms.



Pulse Parameter Measurement

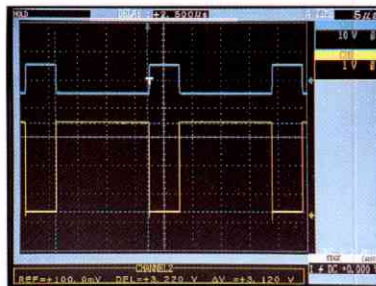
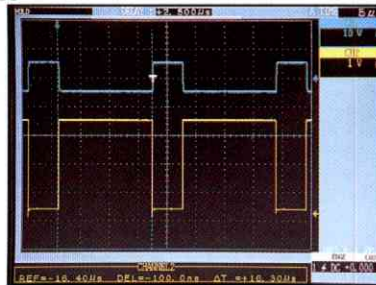
It is possible to select 4 of the 17 IEEE-defined pulse parameters and to measure and display these parameters simultaneously.

Frequency, period, rise time, fall time, positive pulse width, negative pulse width, duty cycle, minimum value, maximum value, peak-to-peak value, base, top, amplitude, pre-shoot, overshoot, rms, average value.



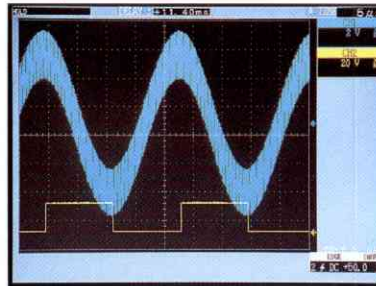
Cursor Readout

The cursor can be used to measure arbitrary voltage ranges, time ranges, and frequencies. It is possible to select a screen paste-up V cursor or a T cursor and a waveform-tracking "+" cursor, depending upon the cursor measurement application.

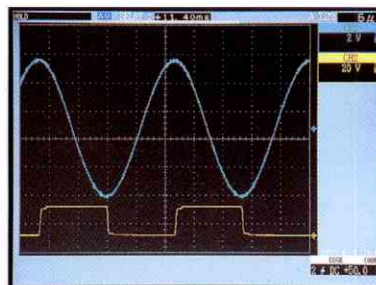


Averaging

Exponential averaging can be used to reduce non-stationary noise.



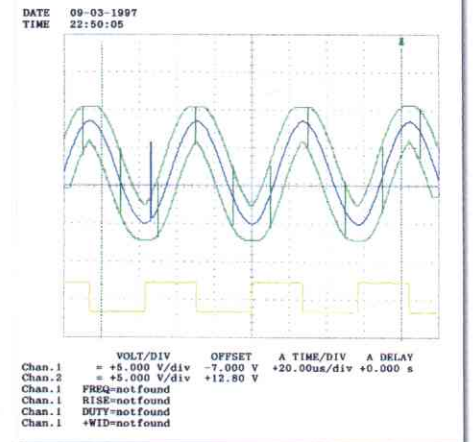
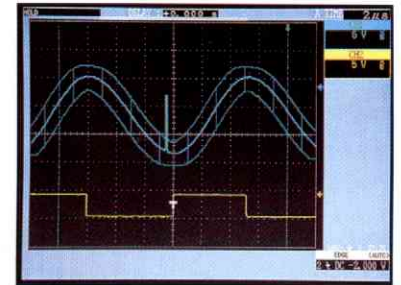
Waveform before Averaging



Waveform after Averaging

GO-NOGO Testing

Based on a reference waveform, a range is set (by manual movement settings or direct numerical input), and a GO-NOGO test is performed against this reference, this feature being useful in performing not only GO-NOGO testing, but triggering on an arbitrary pattern. Action taken after the test can be selected as the sounding of a beeper, the saving of a waveform, the generation of a hardcopy, or an open-collector output.



printout



open-collector output

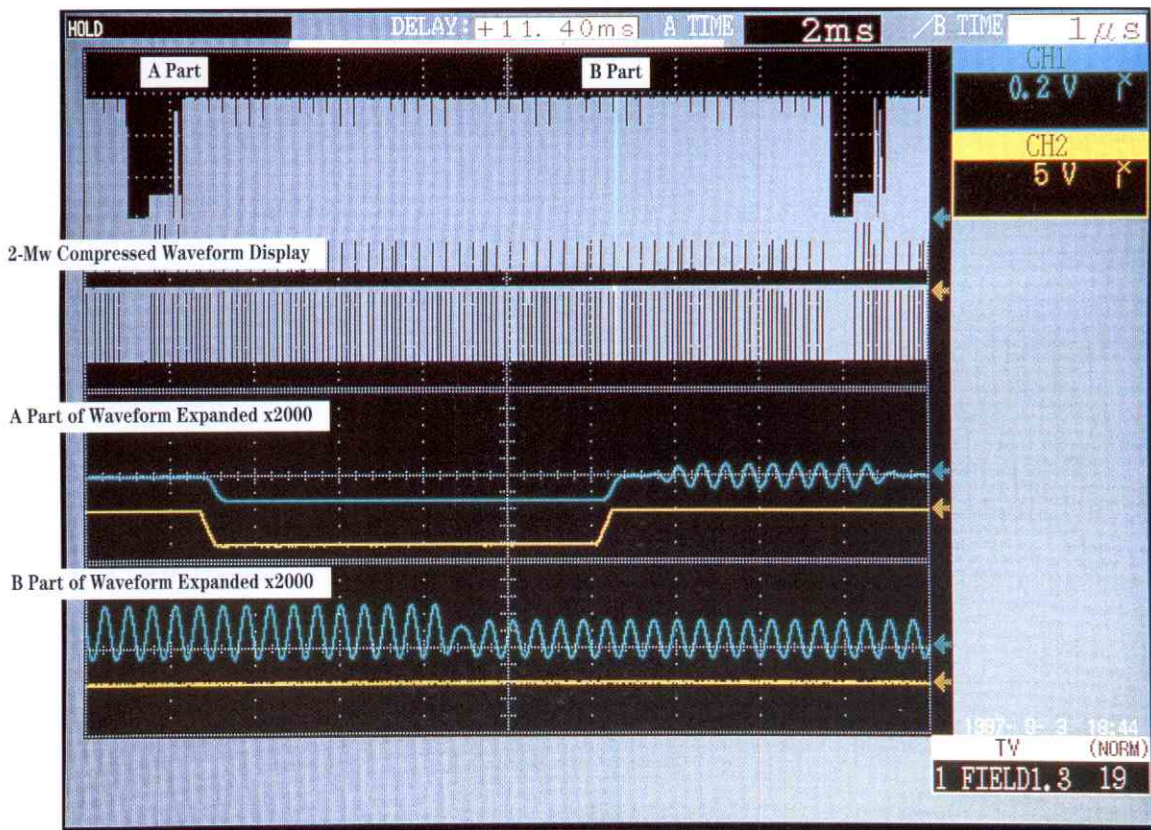
Mass Storage

Non-Stop, Long-Term Signal Recording

To investigate unpredictable signals encountered in communications data in recording devices, in which the amount of data is large and repeatability is poor, it is necessary to continuously record more data over a longer period of time. The VC-5800 Series provides 256 Kw (VC-5850) and 64 Kw (VC-5810) of memory as standard, and can be expanded up to 2 Mwords to enable the recording of large amounts of waveform data.

Optional 2-Mw Acquisition Memory

The 2-Mw memory enables continuous, non-stop storage of even signals with a large amount of information and poor repeatability. Even at a sampling rate of 500 MS/s (2 ns), 4 ms of signal can be captured stored loss. This enables use in a wide variety of applications, such as in measurement and observation of personal computer control signals, pickup signals in DVD, CD, and LD drives, head signals in magnetic recorders, stepping motor control signal, high-speed digital signals, LAN signals, communications data signals such as FAX signals, control signals in automotive, factory, and mechanical equipment, servo signals, transients in switching power supplies, and in non-destructive testing equipment such as ultrasonic testing equipment.



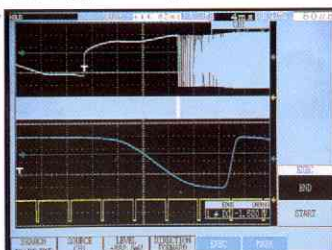
Approx. 1.2 fields of TV signal

Powerful Search Function

After collecting valuable data, it is of little use unless you can quickly find and display the desired part. A powerful search function enables you to quickly locate and display just the desired data.

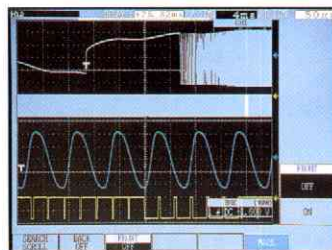
Level Search

It is possible at any time to search for and display a location of maximum or minimum level or, similar to the trigger setting, a location that exceeds a set level.



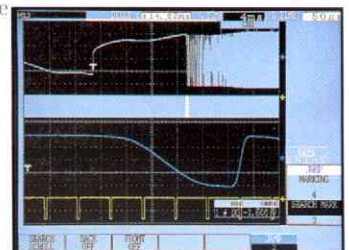
Paging

An expanded display can be scrolled one display page at a time.



Jump Position Marking

Positions that have been found by a level search and jump feed can be marked (up to 5 locations), enabling instant jumping of the display to these locations.



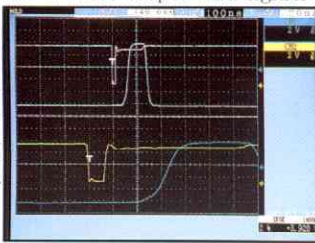
Capture Capability

Capturing the Desired Signal

A major advantage of a digital oscilloscope is its ability to capture and freeze one-time signals to enable their display. To achieve this, it is necessary to be able to grab just the desired signal. The VC-5800 Series provides a variety of sampling modes and expanded trigger functions (option) to provide this signal-capture capability.

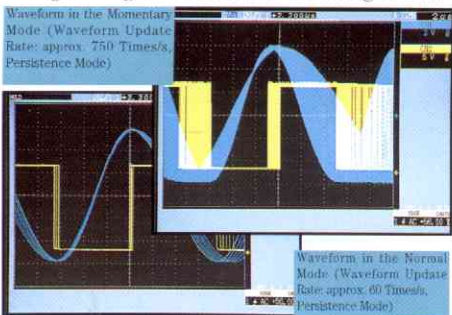
500-MS/s Highspeed Sampling

Sampling at up to 500 MS/s (100 MS/s in the VC-5810) enables use of these scopes with signals encountered in the latest communications and computer circuitry, in addition to a wide range of other applications.



Momentary Mode (Max. 750 times/s)

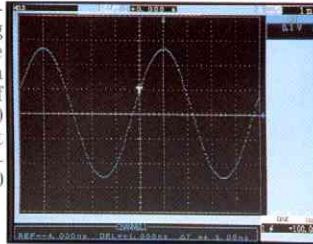
In the momentary mode, it is possible to update the waveform 750 (max.) times each second, enabling the reliable capture of instantaneous changes in signals and seldom occurring events.



Wideband (300-MHz) Input

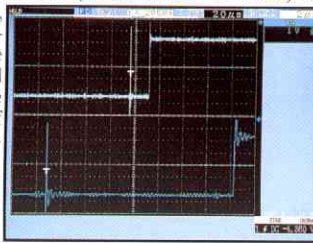
The 300-MHz input (150 MHz for the VC-5810)

enables equivalent sampling of a repetitive signal with a resolution of as small as 20 ps (equivalent to approximately 50 GS/s).



Peak Detector

A 2-ns peak detector (10 ns in the VC-5810) is provided, enabling reliable capture of glitches and envelope detection of even low-speed signals.

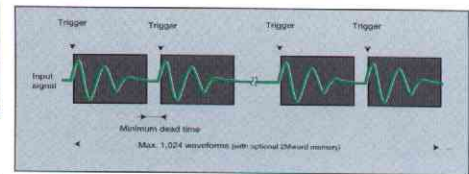


Roll Mode

In this mode, the display scrolls as data is sampled, such as would be done with a chart recorder. It is possible to continuously observe low-speed phenomena in real time down to a speed to 50 s/division.

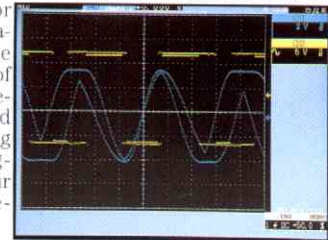
Memory-Division Capture

For even more effective use of the large memory of these scopes, it is possible to divide the memory for continuous storage of signal with individual triggering. Because this enables capture with a dead time of as little as several nanoseconds, it is possible to reliably capture continuous phenomena.



Envelope

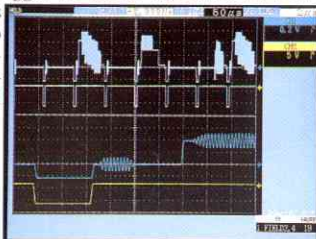
Each time a signal is input over a number of occurrences of a phenomenon, a comparison is made with the previous waveforms, and the maximum and minimum parts are updated. This function is convenient for use in observation of the worst values of such phenomena as jitter, and in observing abnormal signals that occur only infrequently.



Expanded Trigger (Option)

TV Trigger

Using the TV trigger for either the NTSC or PAL system, it is possible to applying triggering on TV-I, TV-V and line number.



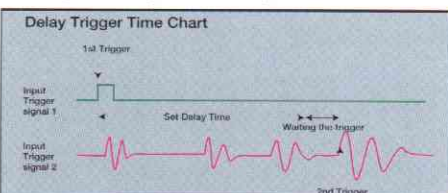
Window

Trigger

It is possible to applying triggering when a signal leaves or enters a trigger band defined by setting set trigger levels, and effective tool for use when it is not possible to specify the polarity of an event.

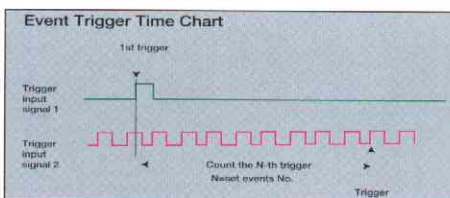
Delay Trigger

It is possible, after the occurrence of the first trigger, to go into the trigger wait mode after the elapse of a specified delay time.



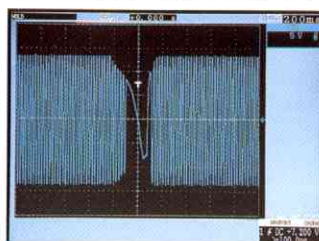
Event Trigger

After a first trigger has occurred, it is possible to applying triggering at the n-th (settable) occurrence of the second trigger.



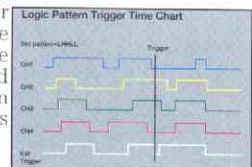
Dropout Trigger

In this mode, triggering is applied when the occurrence interval of an edge is longer than a specified time. This enables triggering on such phenomena as power supply dropout and missing pulses.



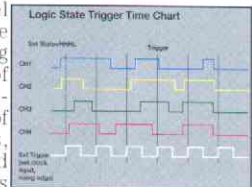
Logic Pattern Trigger

The logic pattern for each channel (5 in the VC-5850 and 3 in the VC-5810) is set and triggering done when coincidence with this pattern occurs.



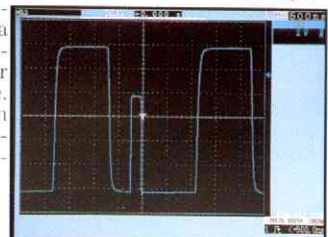
Logic State Trigger

An arbitrary channel can be used as the clock input, the rising edge of falling edge of which is used to capture the logic pattern of the other channels, triggering being applied if that pattern coincides with a set logic pattern.



Pulse Width Trigger

In this mode, triggering is done when the high-level or low-level time of a signal is shorter or longer than a set time. This function enables capture of abnormal pulses.



Easy-to-Use

The Laptop Format Allows a Large, Easy-to-Use Operating Panel

As the number and complexity of oscilloscope functions increase and digital functions are added, operation often tends to become complex. To implement a flat operating panel, hierarchical menus become deep in structure, requiring many steps to make the desired settings. In the VC-5800 Series, this design problem was tackled by using the laptop format, which enabled a large operating panel, and by enabling direct, one-step access of frequently used functions. By combining analog settings by rotating knobs with direct numeric key settings of values, it was possible to achieve a easy-to-approach operating environment.

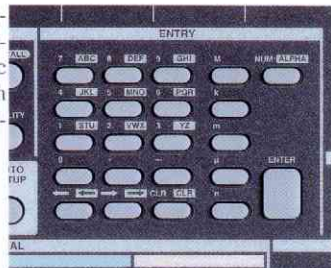


Direct Access

Functions which are used frequently have been assigned dedicated keys. For example, settings such as the vertical range/position for each channel, time range, and trigger level are directly settable.

Direct Numeric Key Input

Names of files to be saved, time settings, and other alphanumeric settings can be made using a numeric key pad, which can be combined with a rotating variable knob to make settings even easier.



Rotating Knobs Maintain the Familiar Analog Feel of Settings

Settings such as vertical range/position, time range, delay position, and trigger level are made using rotating knobs, greatly facilitating fine adjustments.

Automatic Setup

An automatic setup function enables automatic settings such as vertical sensitivity, sweep time, and trigger level. The vertical range for each channel and sweep time can also be automatically set individually.



High Portability

A Highly Mobile Laptop Package

Is it possible to maintain portability in a large-screen oscilloscope? The Hitachi Denshi design team's answer to this tough question was the use of the laptop format, which in spite of the large screen maintained high portability and a room for a large operating panel for easy operation.

An attempt to provide a screen this large and the same size of operating panel in a benchtop oscilloscope would result in a scope having a front panel that measures 220 × 500 mm, making it necessary to move the scope around on a cart.

Achieving this large display and operating panel in a benchtop scope would result in an unbelievably large instrument.

Volume of VC-5800 series
(closed)

7.5ℓ

Volume if implemented as
a benchtop scope

44ℓ

(supposing 500(W) ×
220(H) × 400(D)mm)



Compact, lightweight (4.5 kg/9.9 lb) design.

With the display closed, these scopes
can be easily carried or stored.



Ordering Informations

Options

Carrying Case No.7308

Extended Triggering	TV (TV-H, TV-V, TV-LINE), window, delay, dropout, event, logic (pattern, state, pulse width)	DV-501
Expansion Memory	256 Kw/ch for VC-5810	DV-502
	2 Mw/ch for VC-5810	DV-503
	2 Mw/ch for VC-5850	DV-504
Floppy Disk Driver	3.5-inch(1.44M/720k)	DV-505

The three above options are factory options. When ordering, refer to the configuration table below.

For retrofits after purchase, there will be an installation charge.

Build-in Option Configuration

VC-5810	Memory			FDD	Extended Trigger
	64 Kw	256 Kw	2 Mw		
A	<input type="checkbox"/>				
B		<input type="checkbox"/>			
C			<input type="checkbox"/>		
D	<input type="checkbox"/>			<input type="checkbox"/>	
E		<input type="checkbox"/>		<input type="checkbox"/>	
F			<input type="checkbox"/>	<input type="checkbox"/>	
G	<input type="checkbox"/>				<input type="checkbox"/>
H		<input type="checkbox"/>			<input type="checkbox"/>
J			<input type="checkbox"/>		<input type="checkbox"/>
K	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>
L		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
M			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

VC-5850	Memory		FDD	Extended Trigger
	256 Kw	2 Mw		
A	<input type="checkbox"/>			
B		<input type="checkbox"/>		
C	<input type="checkbox"/>		<input type="checkbox"/>	
D		<input type="checkbox"/>	<input type="checkbox"/>	
E	<input type="checkbox"/>			<input type="checkbox"/>
F		<input type="checkbox"/>		<input type="checkbox"/>
G	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
H		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PC Cards

Hard Disk Card

260MB
HT-4085-26



SRAM Cards

512KB	1MB
ML-512TB4N	ML-1M-TB4N
2MB	4MB
ML-2M-TB4N	ML-4M-TB4N



The above are the options as of September, 1997. They are subject to changes in type, capacity, and price.



Pen Plotters

681-XA (A3, 4 pens, RS-232C, Centronics)
682-XA (A3, 4 pens, RS-232C, GPIB)
HG-730 (A3, 8 pens, RS-232C, Centronics)
HG-730 (A3, 8 pens, RS-232C, GPIB)



ScopeLink Personal Computer Connection Software

Connecting Cables

RS-232C cable	For IBM PC	No.4320
	For plotter	No.4321
Centronics cable	For general-purpose printers	No.4316
GPIB cable		No.4274

Consumables

Voltage Probes
For VC-5810 AT-10CW1.5
For VC-5850 AT-10CU1.5

Specifications and outer appearance are subject to change without prior notice

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