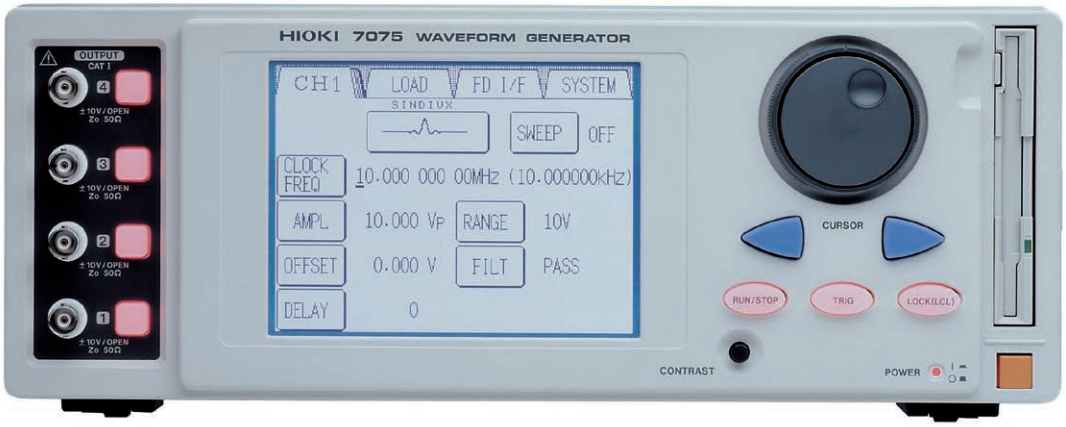
HIOKI

WAVEFORM GENERATOR 7075

SIGNAL SOURCE



CE

Internal Sweep Sequence Functions

Arbitrary Waveform Generator with Four Independently Controllable Channels

The **WAVEFORM GENERATOR 7075** includes both function generator and arbitrary waveform generator capabilities. The function generator provides 8 standard waveforms such as sine and square waves. Basic capabilities of the custom waveform generator include long-duration, high-quality waveform output from a 128,000-word memory, 10 MHz clock rate and 16-bit resolution. The function generator and arbitrary waveform output functions can be swept according to various parameters such as frequency and amplitude, making this waveform generator ideal for simulating multiple signal sources for evaluation.

ISO 9001 JMI-0216

ISO14001 JQA-E-90091

www.hioki.com

HIOKI company overview, new products, environmental considerations and other information are available on our website.

Even for Complex Signals, Evaluation is Made Easy

Features

1. Multiple Channels

Four channels (**7075**) or two channels (**7075-01**) are provided in a compact, lightweight unit. Multi-channel evaluations such as 3-phase motor simulations can be produced with a single device.

2. Channel-Independent Operation

Waveform selection and various settings, including custom waveform sampling clock frequency and sweep control can be set and activated independently for each channel.

3. Simple Operation

Simple, direct operation is provided by a touch panel user interface.

4. Easy to Use with Actual Waveforms

Waveforms measured with a MEMORY HiCORDER can be downloaded to 3.5" floppy disk or GP-IB. Amplitude and time axes data are downloaded together, so the actual waveforms can be reconstructed. Waveforms and settings can also be saved. The floppy drive is compatible with 1.44-MB MS-DOS format.

5. Synchronized Drive Capability

With one unit configured as the master, up to four units (16 channels) can be driven synchronously.

6. Timing Simulation by External Trigger

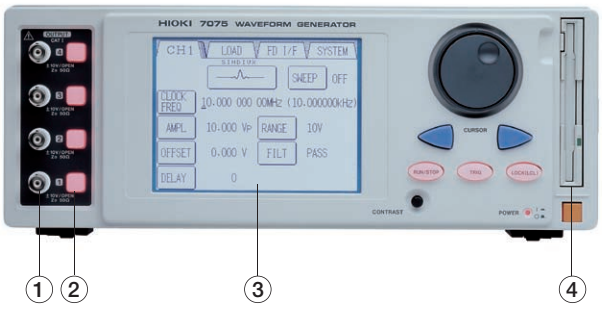
Each channel can be independently triggered by terminals on the rear, so various timings can be simulated.

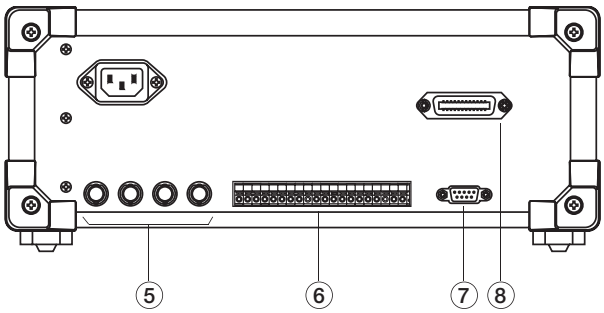
7. Bundled Waveform Creation Software

The bundled **WAVEFORM CREATION SOFTWARE 7990** creates waveforms in the Windows™ environment on a PC. Capabilities range from custom waveform design to processing actual waveform simulations. Created waveforms are transferred to the **7075** by floppy disk or RS-232C interface.

8. External Control

External control can be provided through the GP-IB interface. Waveforms from a MEMORY HiCORDER can also be downloaded by GP-IB.





Basic Features

●Large 128,000-Word/Channel Memory

The large arbitrary waveform memory consists of 128,000 words per channel. Even at the fastest 10 MHz clock, 12.8 ms custom waveforms can be output.

●16-Bit Voltage Axis Resolution, Up to 10 MHz Clock

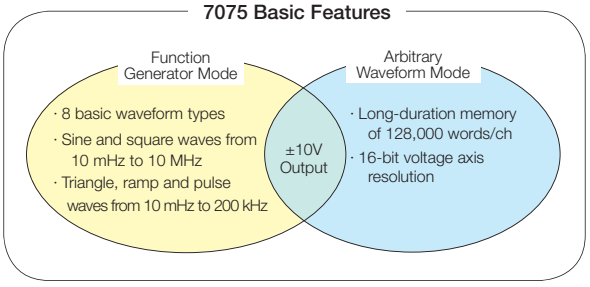
The 16-bit resolution on the voltage axis and 10 MHz maximum clock provide faithful reproduction of actual waveforms and high-quality custom waveform output capability.
Three output ranges (0.1, 1 and 10V peak) are provided.

●Sweep Sequence Functions Installed

Frequency, amplitude and offset can be swept simultaneously, and combinations of sweep conditions in up to 128 steps allow easy generation of complex signals for evaluation.

●Eight Basic Waveforms Built In

Eight basic waveforms: sine, square, pulse, triangle, ramp up, ramp down, noise and DC are selectable in the function generator mode. Eight waveforms can also be stored in the arbitrary waveform mode, allowing quick handling of all types of waveforms.

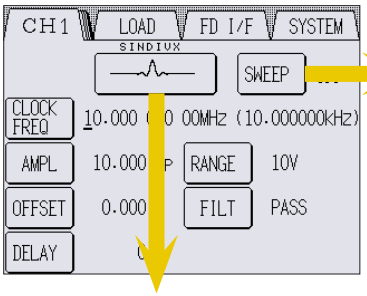


Easy Touch Panel Operation

Operating Screen Examples

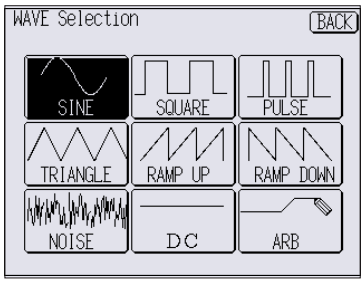
1 Output Settings Screen

The settings for output waveforms on every channel are simultaneously displayed.



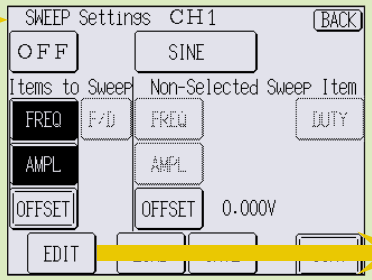
Waveform Selection Screen

The desired standard function generator waveform can be selected from sine wave, square wave, etc., or a list of arbitrary waveforms can be selected.



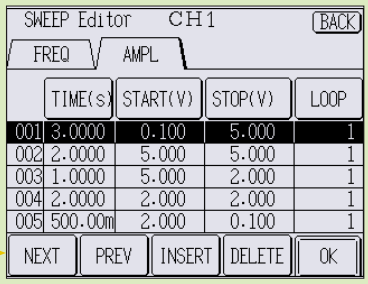
Sweep Setup Screen

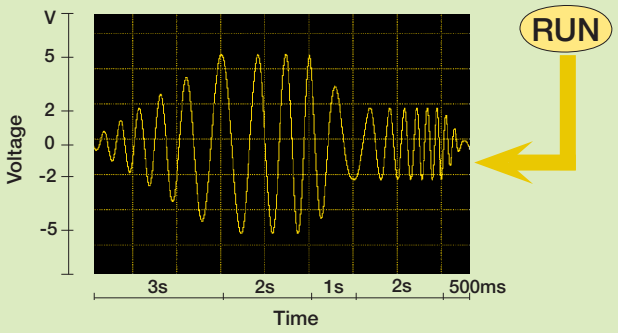
A waveform is selected and related sweep selections such as frequency and amplitude can then be set, as well as basic setting of non-sweep functions.



Sweep Table Editing Screen

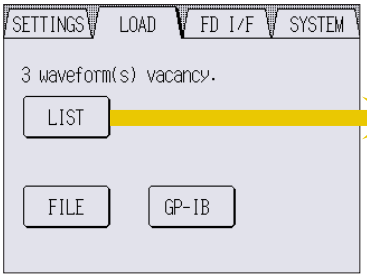
Sweep conditions such as amplitude and frequency for each item can be set, for sequences of up to 128 steps.





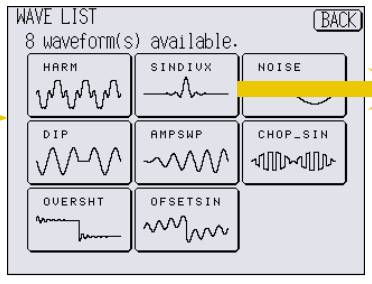
2 Waveform Input Screen

Up to 8 waveforms can be entered and stored in the unit.



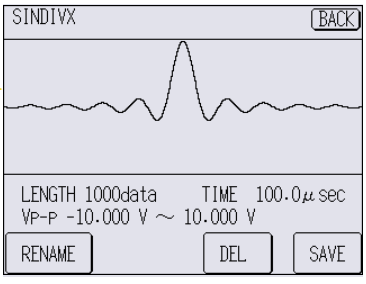
Arbitrary Waveform List Screen

All waveforms entered in the **7075** are displayed.



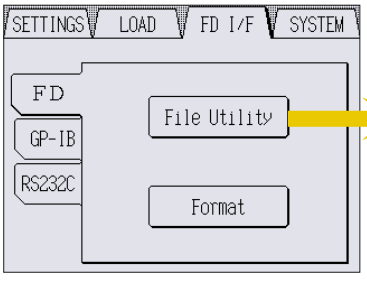
Arbitrary Waveform View Screen

Displays details of an entered waveform. The waveform image, amplitude, output time and other information can be confirmed.



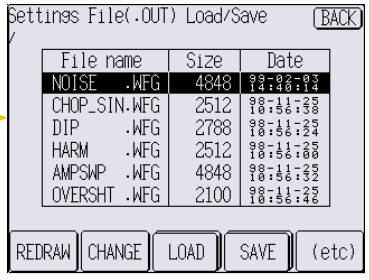
3 Floppy Disk/Interface Setup Screen

Sets up the floppy disk, GP-IB and RS-232C interfaces.



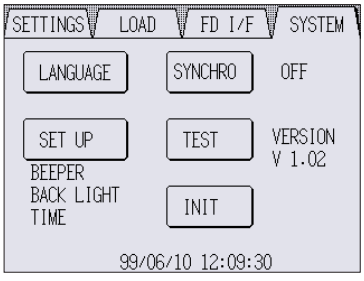
Floppy Disk Save/Load Setup Screen

Waveforms can be saved and floppy disk conditions can be set, or files loaded into the unit.



4 System Screen

Configure basic operating settings of the unit.



High Performance in a Compact Package

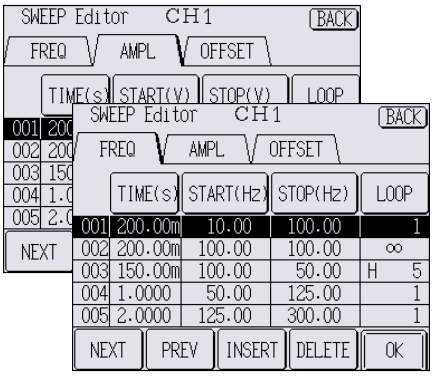
7075 Application Functions

●Sweep Sequence Functions

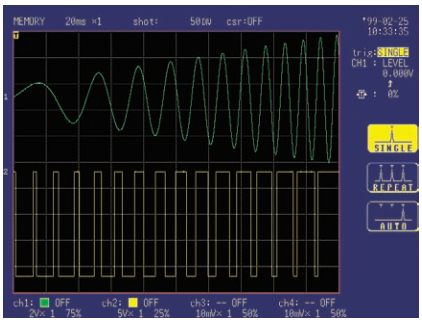
Waveform amplitude, frequency, offset and duty cycle* can be swept simultaneously, so multi-pattern signals can be easily generated.

* Duty cycle setting applies only to pulse waveforms.

· Table-style entry of up to 128 steps
· Settable step loop time
· Sequence control by external signals
· Long-duration sweep and high-speed data refresh
  Sweep time of 0.01 ms to 1000 s
· Maximum data refresh speed of 1 µs



Example of simultaneous amplitude and frequency sweep setting

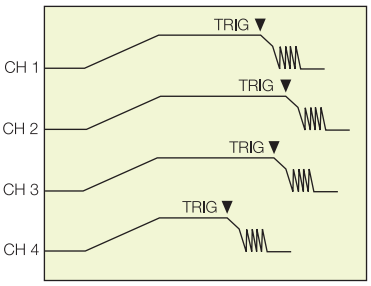


Output waveform example

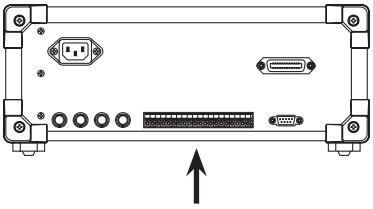
CH1: Simultaneous sweep of amplitude and frequency of a sine wave
CH2: Duty cycle sweep of a pulse wave

●Trigger Functions

When Hold is enabled for a sequence loop, the Hold can be canceled by the trigger. Specifically, an external trigger can be applied to each channel independently, so variations can be imposed on the output according to custom timing differences between channels.
This function is useful in, for example, an automobile ABS simulation in which signals for the four wheels can be controlled independently.



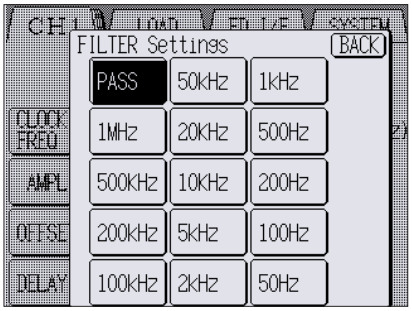
Output controlled by custom timing



Output timing can be controlled by trigger input for each channel at the external control terminals on the rear panel.

●Low-Pass Filter Functions

14 types of low-pass filter with 1-2-5 progression are built in.
Device testing capabilities are enhanced by selectably filtering the test signal, such as for noise tests.



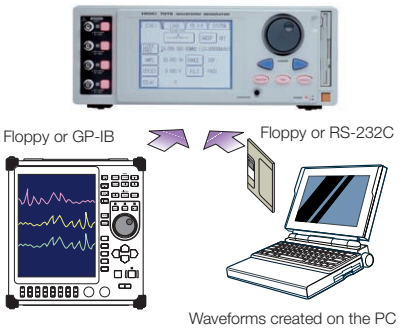
14 types of low-pass filter

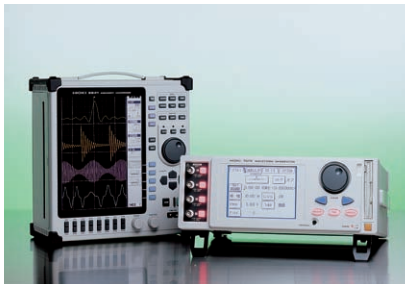
Download Waveforms or Create on a PC

Custom Waveform Input

●Downloading from a MEMORY HiCORDER

Actual measured waveforms saved in a **HIOKI** MEMORY HiCORDER can be downloaded by floppy disk or GP-IB. All data types are loaded, so the actual measured waveforms are accurately reconstructed. Other data besides the waveform image and amplitude- and time-axis information is downloaded, so the regeneration process is straightforward.

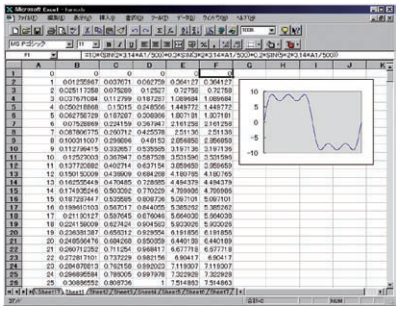


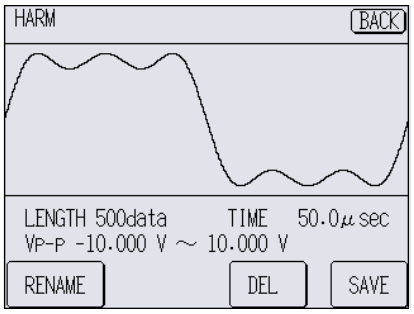


See the list of related products on page 8 for downloadable MEMORY HiCORDER.

●Converts Text Data to Waveforms

Waveforms stored as CSV data can be reconstructed on the **7075**.
Here is an example of waveform data in Excel™ that was saved as text data, loaded into the **7075** and reconstructed.

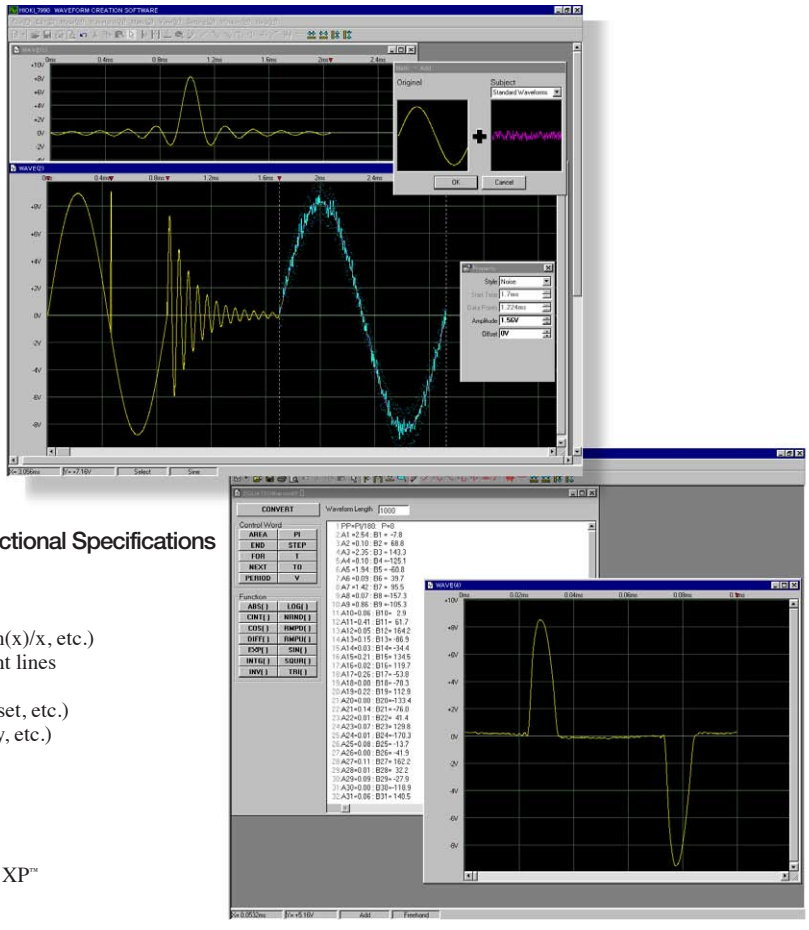




WAVEFORM CREATION SOFTWARE 7990

●Waveform Creation in the Windows™ Environment

Install the bundled **WAVEFORM CREATION SOFTWARE 7990** on your PC to easily create waveforms by entering either waveforms or mathematical functions.
Actual waveform data can also be downloaded and processed, so noise can be added and multiple complex waveforms can be quickly created.



■ WAVEFORM CREATION SOFTWARE 7990 Functional Specifications

●Features

· Create waveforms by entering functions
· Standard waveform entry (sine, triangle, square, ramp, sin(x)/x, etc.)
· Enter waveforms by drawing free-hand curves and straight lines
· Edit entered waveforms (cut, copy, paste, clear, etc.)
· Modify entered waveforms (width, height, amplitude, offset, etc.)
· Calculate with entered waveforms (add, subtract, multiply, etc.)
· Magnify, reduce and scroll waveform displays
· Save and load created waveforms
· Transfer waveform data (RS-232C)

●Operating Environment

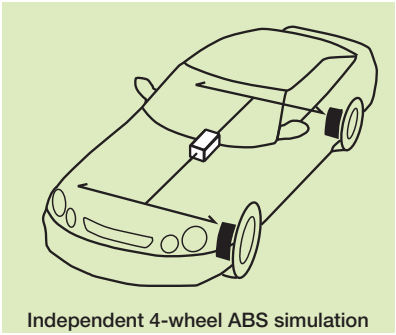
Operating Systems: Windows98™/ Me™/ NT™ 4.0/ 2000™/ XP™
Memory: at least 16 MB
Hard Disk: at least 4 MB free space

Effective Simulations with Four Independently Controlled Channels

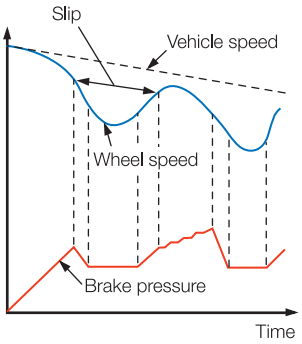
Applications

●ABS Simulation

The external trigger feature can be used to control the output timing of each channel, to simulate signals from the four wheels independently.
Smoothly increasing and decreasing speed waveforms can be easily output with the sweep functions.

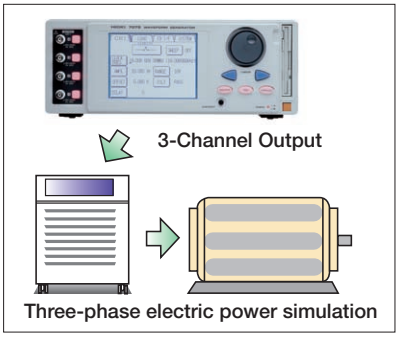


Independent 4-wheel ABS simulation

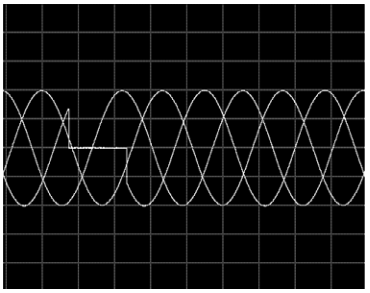


●3-Phase Motor Simulation

A 3-phase waveform controlled at 120° phase can be simulated using 3-channel simultaneous output.
Simulations such as abnormal waveforms and noise can be applied to each phase independently.



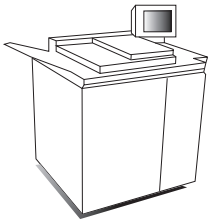
Three-phase electric power simulation



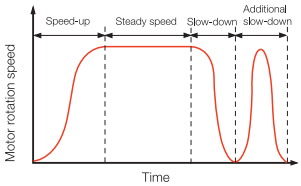
Three-phase momentary drop-out waveform example

●Other Simulations

Automotive, Machinery: Engine electronic control evaluation, vibration testing, etc.
Control simulations requiring high precision such as servo motors.
Home Appliances, OA Devices: Simulation of power source anomalies such as harmonics and noise.
Test signals for inverter control devices, motor speed-up and slow-down tests for copy machines, etc.
Audio, Communications: Frequency characteristic testing by sweep, and transmit modulation testing of radio equipment, phase characteristic testing, etc.
Medicine, Biology: Evaluation signals for medical devices such as EKG and EEG, living tissue signal simulations

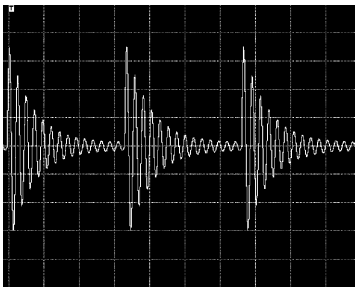


Motor speed-up and slow-down sweep example for copy machine

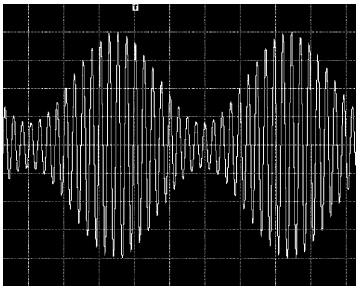


●Output Waveform Examples

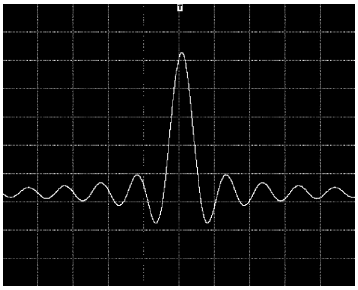
Parameters such as linear sweep and phase control of a waveform can be adjusted within the **7075**, but more complex waveform processing and coupling of different waveforms types requires the bundled **Waveform Creation Software 7990** to carry out the processing on the PC, allowing output of various types of waveforms.



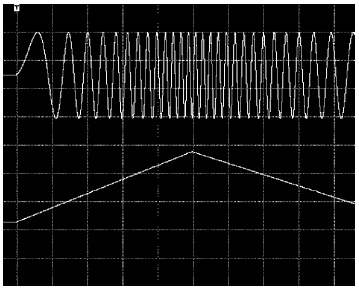
Damping Waveform Example



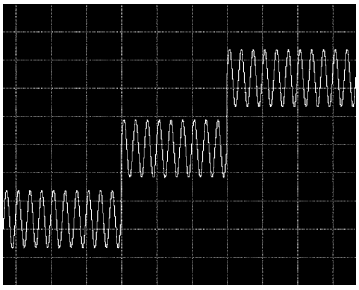
AM Modulation Waveform Example



sin(x)/x Waveform Example



Frequency Sweep Waveform Example



Offset Sweep Waveform Example

Specifications (23°C ± 5°C/73°F ± 9°F, after 30 minutes warmup)

-1. General Specifications

Number of channels	: 4 (**7075**), 2 (**7075-01**)
Output functions	: Function generator, Arbitrary waveform generator (settable for each channel)
Display	: 5.7-inch LCD (with touch panel)
Languages	: Japanese or English selectable
External memory system	: 3.5-inch floppy disk drive Storage capacity: 1.44 MB, 1.2 MB and 720 kB compatible (1.2 MB format not supported) Data format: MS-DOS™ format
Interfaces	: GP-IB (IEEE 488.1 compliant. Refer to IEEE 488.2) RS-232C (Dsub 9-pin connector, Transfer speed 19200, 9600, 4800 bps
Electrostatic dielectric strength	: Power (cumulative)- single pulse to chassis/ AC 1.5 kVrms for 1 min. 25 mA
Environmental conditions (non-condensating)	: Operating temperature:10 to 40°C (50 to 104°F) 85% RH or less Storage temperature:-10 to 50°C (14 to 122°F) 85% RH or less Operating location: Indoors, at less than 2,000m (6,562-ft.) altitude
Power	: Auto selects 100, 120, 200 or 230 VAC (±10%), 50/60 Hz
Maximum rated dissipation	: 120 VA
Dimensions and mass	: 345W × 130H × 286D mm, 7.8 kg (**7075**) / 7.5 kg (**-01**) 13.6" W × 5.1" H × 11.3" D, 275 oz. (**7075**) / 265 oz. (**-01**)
Accessory	: **WAVEFORM CREATION SOFTWARE 7990** (CD-R×1)
Conforming standards	: EMC EN61326, Class A EN61000-3-2, EN61000-3-3 Safety EN61010 Pollution level 2, Overvoltage category II (anticipated transient overvoltage 2,5 kV)

-2. Analog Output (common to Function Generator and Custom Waveform Outputs)

Max. output voltage	: ±10 V o.c. (o.c. = open-circuit)
Amplitude setting ranges (setting is peak level)	: 10 V Range: 0 to 10 V o.c. (1 mV resolution) 1 V Range: 0 to 1 V o.c. (0.1 mV resolution) 0.1 V Range: 0 to 0.1 V o.c. (0.01 mV resolution)
DC offset (setting range)	: 10 V Range: -10 V to 10 V o.c. (1 mV resolution) 1 V Range: -1 V to 1 V o.c. (0.1 mV resolution) 0.1 V Range: -0.1 V to 0.1 V o.c. (0.01 mV resolution)
Minimum load impedance	: 40 Ω
Output impedance	: 50 Ω ±2% (DC)
Rise and fall times	: Within 45 ns (from 10 to 90% of peak amplitude square wave, with LPF bypassed, RL=50 Ω
Overshoot	: Selected amplitude (within ±5% of p-p value of square wave, with LPF bypassed, RL=50 Ω
Interchannel skew	: Within 25 ns (determined at simultaneous waveform selection)
Output range accuracy	: 1 V Range: add 0.2% of range to 10 V range accuracy 0.1 V Range: add 0.4% of range to 10 V range accuracy

Note: refer to the following Function Generator and Arbitrary Waveform Generator sections for 10 V range accuracy

-3. Function Generator Mode (Accuracy is determined at 10V range)

Waveform types	: sine, square (fixed 50% duty), triangle, ramp-up, ramp-down, pulse, noise, DC
Frequency range	: Sine wave: 0 to 10 MHz (10 mHz resolution) Square wave: 0 to 10 MHz (10 mHz resolution) Triangle wave: 0 to 200 kHz (10 mHz resolution) Ramp waves: 0 to 200 kHz (10 mHz resolution) Pulse wave: 0 to 200 kHz (10 mHz resolution)
Frequency accuracy	: within ±50 ppm ±50 μHz of setting
DC offset accuracy	: within ±0.5% ±25 mV of setting
DC offset stability	: within ±DC Offset Accuracy × 0.1 per °C
Amplitude accuracy	: within 2% ±20 mVrms of setting (for 1 kHz sine wave)
Amplitude stability	: within (Amplitude Accuracy × 0.1) per °C
Phase adjustment	: -360.00 to 360.00° (0.01° resolution)
Jitter	: within 100 ns p-p (triangle, ramp and pulse waves)
Square wave duty cycle	: fixed (40 to 60%)
Pulse wave duty cycle	: adjustable from 1 to 99% (0.1% resolution) (Pulse width must be 100 ns or greater)

-4. Arbitrary Waveform Generation Mode (Accuracy is determined at 10V range)

Voltage axis resolution	: 16 bits (64,000 counts)
Waveform memory capacity	: 128,000 Words/channel (channel independent)
Filter	: 2-stage LPF, 50 Hz to 1 MHz (14 steps in 1-2-5 progression)
Waveform input methods	: floppy disk, GP-IB or RS-232C download (direct download from MEMORY HiCORDER)
DC output accuracy	: within ±2% ±25 mV of setting
DC output stability	: within ±DC output accuracy × 0.1 per °C
Amplitude accuracy	: within 2% ±20 mVrms of setting (for 10,000 Words, 10 MHz clock sine wave)
Delay	: Settable within ±128,000 range in 1-clock units
Clock for arbitrary waveform	: Max. 4 channels (same as waveform output) Frequency range: 0 to 10 MHz (10 mHz resolution) Frequency accuracy: within ±50 ppm ±50 μHz of setting Jitter:the larger of the effect within 800 ps-rms, or within 0.05% of period setting

-5. Sweep Functions

Sweep waveform : Function generator or arbitrary Waveform
Sweep form : Linear (within an individual element)
Sweep object : Function generator: frequency, amplitude, offset, duty cycle (duty applies only to pulse waves. Frequency, amplitude and offset can be swept simultaneously)
Custom Waveform: frequency, amplitude, offset, duty (frequency, amplitude and offset can be swept simultaneously)

Sweep time : 10 μs to 1000 s (10 μs or 5 digits resolution)
Sequence functions : Loop: element or group is output at specified times
Hold: output of the last data element persists
Sequence length: maximum 128 elements
Loop Repeats: maximum 1042 times, or infinite loop
Trigger: cancels infinite loop and hold, and moves to next element

-6. Control Input/Output

Inputs : TRIG IN, RUN/STOP IN, SYNC CLK IN, MASTER CLK IN
TTL levels
(only TRIG is independently controllable for channels 1-4)

Outputs : TRIG OUT, RUN/STOP OUT, SYNC CLK OUT, MASTER CLK OUT
TTL levels
(only TRIG is independently controllable for channels 1-4)

-7. Miscellaneous

Setting format selection : Current Function: frequency ↔ period
amplitude, offset ↔ upper/lower limits
Unit selection : Selectable: Hz ↔ r/min (rpm)
Vpeak ↔ Vrms

Save output conditions : Conditions at power off, waveform backup
Synchronized drive : Maximum 4 units (16 channels)
Number of internally storable waveforms : 8

WAVEFORM GENERATOR 7075 (4ch)
WAVEFORM GENERATOR 7075-01 (2ch)

●OPTIONS

CONNECTION CORD 9165 (BNC-BNC/1.5m, 59.1")
CONNECTION CORD 9166 (BNC-CLIP/1.5m, 59.1")
GP-IB CONNECTION CABLE 9151-02 (2m, 78.7")

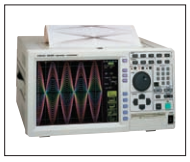
Note : Product names appearing herein are trademarks or registered trademarks of various companies.

Related Products

HIOKI 8800 series MEMORY HiCORDERs are waveform storage devices that can store high-speed and transient phenomena. A full line of versions is available for applications requiring 2 to 32 channels, high-speed sampling or large memory capacity. Actual measured waveform data is saved to the unit's internal memory or external floppy disk for downloading directly to the Model 7075, enabling quick regeneration of actual waveforms. Also, with the bundled Waveform Creation Software 7990, actual measured waveforms can be loaded into the PC for unlimited processing.Waveforms that cannot be directly transferred between a device and the 7075 can first be loaded into a PC and then saved as text using the 7990 software for final loading into the 7075.

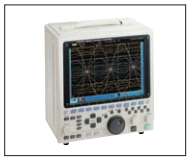
●Downloadable Models (through floppy disk, GP-IB or PC)
8807, 8808, 8826, 8830S, 8841, 8842, 8845, 8846, 8855, 7070, 8860-50*, 8861-50*, 8847* etc.
*Waveforms downloadable via the WaveViewer freeware for MEMORY HiCORDERs.

8807-01/8808-01
2, 4ch
400 kS/s
256k(1ch) to 128kW(2ch),
256k(1ch) to 64kW(4ch)
PC Card



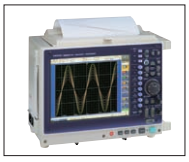
8826
Max. 32 ch
1 MS/s
4M (1 ch) to 500 kW (32 ch)
Floppy disk, PC Card

8835-01
Max. 8 ch
1 MS/s
4MW (1 ch) to 500 kW (8 ch)
Floppy disk, PC Card



8855
Max. 8 ch
20 MS/s
16M (1 ch) to 4MW (8 ch)
Floppy disk, PC Card, HD

8847
Max. 16 ch
20 MS/s
32M (2 ch) to 4MW (16 ch)
PC Card, HD



8860-50/8861-50
Max. 64, 128 ch
20 MS/s
8860-50:32M (1 ch) to 2 MW (16 ch)
8861-50:32M (2 ch) to 2 MW (32 ch)
PC Card, HD

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