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Find the *Fluke / Wavetek 1396* at our website: ***Click HERE***

50 MS/s universal waveform synthesizers



- Up to 50 MS/s sampling with 12-bit resolution
- Up to 2M waveform points
- Versatile inter-module triggering, summing and phase control
- Up to 450 user-defined waveforms
- Waveform linking and looping of up to 4,096 segments
- 16-bit digital output
- Frequency sweep and hopping
- VXI *Plug&play* drivers provided
- Compatible with WaveForm DSP2
- Single-slot, C-size VXIbus message based device

The Fluke 1396 is ideal for applications requiring standard function generator or universal waveform capability. Model 1396 adds advanced waveform sequencing capability of up to 4,096 waveform segments for complex waveform generation. It also provides a 16-bit digital output. Standard sine waves are available to 20 MHz and square waves to 25 MHz. Universal waveforms with 12 bit vertical resolution may be generated at sampling frequencies up to 50 MS/s.
For multichannel applications, multiple units may be phase locked with programmable phase offsets. Waveforms from multiple modules may be summed using the VXI backplane sumbus. Versatile intermodule triggering capabilities are provided.
In addition to built-in frequency sweep capability, a frequency list function can be used for custom sweeping or frequency hopping applications.
To simplify programming and help reduce programming time, all three models support dynamic configuration, are message based, SCPI compatible and are provided with VXI *Plug&play* drivers.

Specifications

Standard waveforms

Sine, square, triangle, ramp, haversine, random, (sine x)/x, and DC.

Frequency

Range: Sine and haversine: 1 mHz to 20 MHz.
Square: 1 mHz to 25 MHz.
All others: 1 mHz to 2 MHz.
Resolution: 8 digits limited by 1 mHz (5 digits above 20 MHz and in noncontinuous modes).
Accuracy: Same as VXI CLK10 backplane signal (± 0.01% typical).

Waveform quality

Sine distortion (elliptic filter selected):

Freq	Ampl Level	Harmonic
<100 kHz	10 Vpp	< -60 dBc.
<100 kHz	>10 Vpp	< -55 dBc.
<5 MHz	10 Vpp	< -45 dBc.
<5 MHz	>10 Vpp	< -40 dBc.
20 MHz	10 Vpp	< -35 dBc.
20 MHz	>10 Vpp	< -28 dBc.

Square transition time: < 9.5 ns.
Square aberrations: < 5 % + 20 mV.

Square wave duty cycle control
Range: 0 to 100%.
Resolution: 3.5 digits.

Triangle wave symmetry Control
Range: 0 to 100%.
Resolution: 3.5 digits.

Universal waveforms

Sampling frequency:
Range: 0.1251 S/s to 50 MS/s.
Resolution:
5 digits limited by 100 µS/s.
Accuracy: Same as VXI CLK10 (± 0.01% typical).
Horizontal resolution:
512k (2M optional).
Vertical Resolution: 12 bits.
Waveform filters: 20 MHz, 4-pole Bessel and 20 MHz, 7-pole, 6-zero elliptic.

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Amplitude
Range:
15 mV to 15 Vpp into 50 Ω
(30 mV to 30 Vpp into > 10 kΩ).
Resolution: 3.5 digits.
Accuracy: ± (1 % of setting).

Offset
Range: -7.5 to +7.5V into 50 Ω
(-15V to +15V into >10 kΩ). Peak amplitude + absolute offset must be 7.5V into 50 Ω.
Resolution: 3.5 digits.
Accuracy: ± (1% of setting).

Operating modes
Continuous, sweep, triggered, gated, linked sequence, and frequency list.
Triggered: One to 1,048,576 cycles on trigger input (limited to 10 MHz).
Gated: Waveform cycle started on trigger high, completed after low.
Linked sequence: Linking, looping, and advancing of up to 4,096 waveform segments. Allows creation of long and complex waveform sequences.
Frequency list: Up to 1024 programmable frequencies. Can be output phase continuously on trigger command. (Maximum rate 2 kHz).

Frequency sweep
Range: 1 mHz to 20 mHz.
Time: 30 ms to 1000 sec.
Modes: Continuous or triggered up, down, or up/down, and triggered sweep and hold.
Spacing: Linear or logarithmic.

Triggering
Sources: External, internal, TTLTRG0-7, adjacent modules via local bus and word serial command.

Internal trigger frequency range:
10 µHz to 5 MHz.

Modulation
AM & SCM.
Range: 0 to 100 % on external voltage.
Bandwidth: DC to 500 kHz.

Multimodule summing
Input from the VXI SUMBUS may be summed with the output, or the programmed output may be sent to the SUMBUS.

Multimodule phase control
Adjacent modules may be phase synchronized on standard waveforms.
Phase resolution: 0.1°.
Phase accuracy: ± (0.05° + 5 ns).

Outputs
Main Out (50 Ω): Main waveform output, programmable on/off.
Sync/horizontal sweep (600 Ω): TTL level synchronous with main output waveform, or a 0 to 10V ramp proportional to sweep frequency.
Position Out (50 Ω): TTL-level marker, selectable for each waveform point.
Clock Out (50 Ω): TTL level, sampling frequency clock output.
Digital Output: 16 bit differential ECL updated at up to 50 MHz.
Aux analog output: ± 1.0V output updated for each segment in a sequence.

Inputs
Clock in (2 kΩ): TTL level, selectable as main waveform clock.

TRIG IN (2 kΩ): TTL level, triggered on rising or falling edge.
AM in (10 kΩ): Used for AM and SCM input.

VXI interface
Device class: DC, message-based, SCPI compatible.
TTLTRG0-7: Programmable as trigger input, output, position out, burst- or loop-complete, or sequence start/advance input.
ECLTRG0-1: Programmable as clock input or output.
SUMBUS: Full driver and receiver support. Accuracy ± 5% typical.
A24 shared memory: Supports high-speed waveform transfers, and fast frequency updates.

General
Operating Temperature: 0° to 50°C; 25° ± 10°C for specified operation.
Dimensions: Single-slot, C-size VXI module.
Weight: < 1.8 kg (3.9 lb).
Power: < 35 Watts.

Ordering information
Model 1396-EM512: VXIbus 50 MS/s Universal Waveform Generator with advanced sequencing, 16-bit digital output, 512k memory and VXI *Plug&play* driver.

Model 1396-EM2M: VXIbus 50 MS/s Universal Waveform Generator with advanced sequencing, 16-bit digital output, 2M memory and VXI *Plug&play* driver.

Wave Form DSP2: Arbitrary Waveform Creation Software.

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