Diamond$_X$ VI1$_X$

Precision Voltage / Current Source and Measurement with Advanced Features

Exceptionally flexible instrument suitable for testing a variety of devices in the automotive and industrial markets. Designed with the stringent requirements of the automotive market in mind, the VI1x enables high multisite testing using the SmartMux. The VI1x is a 16-channel, four-quadrant voltage/current source and measurement instrument for the Diamondx and DxV test systems.

Automotive

Consumer

Flat Panel Display

Power Management

Industrial & Medical

MCU

Wireless/RF

Highlights

- V/I source mode
- Modulation generator and digitizer functions
- Time measurement
- Differential voltage measurement
- Timers, triggers and gates
- SmartMux 64-channel topology
- Alarms

Features

- 16 channels of precision four quadrant V/I source and measurement capability are integrated into a single instrument for efficient multisite testing
- 4:1 SmartMux 64 channel capability reduces load board complexity
- Advanced features such as a modulation generator and digitizer per channel enable the VI1$_X$ to be used for a wide variety of device measurements
- A combination of internal and external triggers can be used for gating and sampling for maximum testing flexibility
- A time measurement unit measures rise and fall times, pulse, period, frequency and time difference, making the VI1x a truly versatile instrument
- Ganging capability extends the normal current limits allowing the VI1x to be used for testing a wider range of devices

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- **16 Channels Per Board**
- **Four Quadrant Operation**
- **4:1 SmartMux**
- **Differential Vmea**
- **±20 V / 300 mA, ±60 V / 100 mA**
- **AWG and Digitizer Functions**

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V/I Source Mode

The primary function of the VI1x is to source voltage and current. With multiple programmable force, clamp and measure ranges, the VI1x is versatile enough to be used for a broad spectrum of consumer, wireless and automotive applications. Adjacent channels can be ganged to achieve higher current for devices requiring extra power.

Modulation Generator and Digitizer Functions

The VI1x has a built-in modulation generator and a signal digitizer per channel. The modulation generator has a bandwidth of 10 kHz and a resolution of 16 bits. Easy setup of VI1X modulation is possible by using predefined signals like sine and triangle waveforms. Support includes: Source Gate, Clamp Gate, Modulation Gate, Output Gate HI/LO and Measurement Strobe.

Sampling rates up to 100 kS/s per channel are possible for voltage and current digitizing, and the capture memory holds up to 8 kS per channel. Testing of numerous applications is possible with the high sampling rate and the high resolution of the modulation generator and digitizer functions.

SmartMux Capability

The VI1x includes a 4:1 SmartMux which provides 64 outputs to the load board. Cohu's SmartMux topology reduces the complexity of load board design, speeding time to market, reducing cost and risk associated with automotive and power management devices. SmartMux enables high site count, uptime and faster time to market.

Time Measurement

The VI1x has six timers for programmable gate per channel. The input signals are sampled by voltage and current comparators with 100nS resolution. Support includes: Source Gate, Clamp Gate, Modulation Gate, Output Gate HI/LO and Measurement Strobe.

Differential Voltage Measurement

The VI1x offers the ability to make high-precision differential voltage measurements between adjacent channels on the instrument. Four voltage ranges are available for differential measurements: ±20 mV, ±200 mV, ±2 V and ±5 V.

Timers, Triggers and Gates

A powerful network of timers, triggers and gates allows VI1x events to be precisely timed according to the many programmable modes available. Six timers are available for each channel, and 16 synchronization lines connect to the system bus for signaling with other instruments. The user has full program control over each source and measure event.

Alarms

Alarms can be strobed by measurement or checked by a software query. The following functions are monitored: clamp alarm, source-not-ready alarm, over temperature alarm, and over-voltage protection.

Advanced test capabilities such as time measurement, modulation, and differential DC measurements make the VI1x an exceptionally flexible instrument, suitable for testing a full spectrum of devices in the automotive and industrial markets.

- **16 Channels Per Board**
- **Four Quadrant Operation**
- **4:1 SmartMux**
- **Differential Vmea**
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Specifications

VI Pin Configurations

- ±60 V, 100 mA (Gangable to 200 mA)
- ±20 V, 300 mA (Gangable to 600 mA)

Force Voltage

Range	Resolution	Accuracy
±2 V	16 bit	±0.03% FSR
±6 V	16 bit	±0.03% FSR
±20 V	16 bit	±0.03% FSR
±60 V	16 bit	±0.03% FSR

Current Clamp

Range	Resolution	Accuracy
±300 µA	16 bit	±0.2% FSR +1 nA/V
±3 µA	16 bit	±0.05% FSR +1 nA/V
±300 µA	16 bit	±0.05% FSR
±3 mA	16 bit	±0.05% FSR
±30 mA	16 bit	±0.05% FSR
±300mA / 100mA	16 bit	±0.05% FSR

Modulation Source Memory

- Range: DC to 10 kHz
- Resolution: 16 bit
- Waveforms: sine, triangle, arbitrary
- Waveforms Memory: 8 kS/channel

Timer

- Timers/Channel: 6
- Range: 100 ns to 6,7 s
- Resolution: 100 ns
- Programmable gates for SGT, CGT, MGT, OGT_HI/LO Meas. Strobe

Differential Voltage Measurement (Available Between Adjacent Channels)

Range	Accuracy
±20 mV	0.5% FSR
±200 mV	0.1% FSR
±2 V	0.1% FSR
±5 V	0.1% FSR

Digitizer

- Capture memory: Up to 8 k Samples
- Sample Frequency: 100 kSamples/s
- Resolution: 16 bit

Time Measurement

Range	Resolution
0µs – 6.7 s	100 ns

Frequency Counter

- Maximum Frequency: 200 MHz
- Resolution: 32 bit
- Switchable to any pin: Yes

Current Measurement

Range	Resolution	Accuracy
±300 µA	16 bit	±0.2% FSR +1 nA/V
±3 µA	16 bit	±0.05% FSR +1 nA/V
±300 µA	16 bit	±0.05% FSR
±3 mA	16 bit	±0.05% FSR
±30 mA	16 bit	±0.05% FSR
±300mA / 100mA	16 bit	±0.05% FSR

Comparator

- Mode: Voltage /Current
- Resolution: 14 bit
- Accuracy: 0.5% FSR
- Propagation Delay: 1.0 µs

All specifications are subject to change without notification and are for reference only. For detailed performance specifications, please contact Cohu.